

PUBLISHED BI-MONTHLY BY THE STEAM COMPUTER SOCIETY  
MAINLY FOR USERS OF TATUNG TC01, E256, TPC & TCS COMPUTERS

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(opinions herein are not necessarily those of the publisher)

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# THE SAGA OF THE PHOTOCOPIER

continues unabated, the main problem being that if you have to have a copier of your own to produce your club magazine within your budget, but have very limited funds to acquire one and can only afford to buy at auction, what you are almost certain to get is someone else's discarded cast-off!

The last two issues of the magazine have been produced on an antique Canon NP-125 copier of 1982 vintage, which fixes the toner by cold-pressure rollers, and glazes the paper in the process. The centre pages of the last issue were pretty diabolical (due to used toner having been inadvertently put back into the machine), but during the "print run" we dealt with most of the print quality problems bar two, which will require extensive strip-down of the machine, and new parts.

As this item is being "written", pages 3 to 18 of the current magazine issue have been printed on our newer Canon NP-155 copier (of 1988 vintage). This is an A3-size machine, and thus allows us to print 4 pages at a time, but we've had terrible problems trying to feed the paper through it twice (to print on both sides) without it creasing up, and also in balancing black background streaking on the leading pages against faint print on the trailing pages, to give you readable copy on both. We've now identified the probable causes of both these problems on the "new" machine, and (wind & tides permitting) we hope to be able to deal with them before the next issue of the magazine goes to print.

Meanwhile, if we've slipped up in the checking and collating department, and you've got any totally unreadable pages in this or the last two issues, please let us know exactly which sheets they are, and we'll get replacement sheets out to you as soon as we can.

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# EINSTEIN COMPUTERS WANTED !!!

Over the Christmas period we've placed a single-drive 40-column Einstein and software with a couple of school-age sisters in Manchester, and their friends now show great interest in having an Einstein too. If you have a working Einey (of any sort) surplus to your needs, send us full details, and price required (if any). A new home awaits.

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## FROM THE IVORY TOWER (oops, Ivy Cottage!)

THIS ISSUE (if you can read it!) really begins to confirm the wisdom of encouraging/persuading/cajoling/browbeating (\* delete as appropriate) Ted and Andrew into taking on the challenge of putting the Einstein TC-01 section of the magazine together, since as well as bringing you another valuable "hands-on" EINSTEIN FOR BEGINNERS article on Spreadsheets, both Ted and Andrew have been hard at work ferreting into what makes the Einstein tick and how to upgrade it, and they share with you some of their resulting knowledge and skill in this issue.

Sid Dunn introduces C programming, and if you want to move on from BASIC programming, but are wary of machine code/assembler programming (or want to gain skills that are transferable to the PC as well as Z80 machines), then C is definitely worth exploring, as it is a sort of halfway-house between BASIC and assembler. If you'd like to have a go too, send £2 (plus a disk and return postage) for your copy of PD-224A/B (or £4 if we supply the disk and postage). If you don't have a full software library list, send 2 disks and £4 for your copy of PD-334 AS WELL, plus another volume of your choice (or just £7 if we provide both disks plus postage). PD-334 also has an on-disk Manual of the various Einstein operating systems, and "installing to the Einstein" info.

The BASIC text reader listing looks most useful, but I don't have a note of who provided it, so can't credit them.

There was a mix-up between the various editors in putting the last issue together, so you got a 28-page issue. This meant we couldn't include a Xmas card as we did last year, and it bumped up the postage where replies to letters had to be included. This issue's page size has been reduced by 5% to avoid the same problem again, but the bumper bundle last time has resulted in Ted and Andrew being short of material for the next issue on, as the flow of contributions coming in doesn't match what's going out. More letters, queries, hints, tips, articles PLEASE, on all and every aspect of the Einstein. COPIES ON 3" (or 40T 5") DISK PLEASE

Ted and Andrew don't have a 256, so this is a neglected area at present. Anyone with a 256 out there, who'd like to write and/or edit a 256 column for us (or maybe 2 of you alternating?) Similarly, if anyone has the Tatung TPC-2000 business computer version of the Einstein, please do come out from under that bushel and tell us about it. More BASIC listings would be appreciated too.

Yours Truly has some update info/comment on articles in this issue, but there's no space here now, SO SEE PAGE 19.

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SPRING ALL MICRO SHOW:- Sharward haven't sent us any flyers, but it's on Saturday 15 April at Stafford. 0473-272002 info.

EINSTEIN SECTION:- Editors Ted Cawkwell and Andrew McRobbie

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### INTRODUCING THE KUMA SPREADSHEET

by A.McRobbie

Spreadsheets are to number crunching what wordprocessors are to writing. This is the one program which was designed for the computer and helped make the Apple computer sell so well to businesses at the end of the '70s and start of the '80s.

Spreadsheets are not purely the domain of big business either. You can design a suitable layout (found for example in a Budget Account supplied by a bank) and make the computer work for you.

Spreadsheets are used for forecasting based on the information you give them. A spreadsheet is just a very large grid of pigeon holes, which can be varied in column width. I have used the Kuma Computers Ltd. spreadsheet, which is straightforward to get to grips with. In this particular program's case, it provides 256 columns by 256 rows. In these holes you can put three types of information:

- 1) Numbers
- 2) Labels or text to identify what the numbers are for.
- 3) Formulae - What you want to do with all the numbers.

Add, subtract, multiply or divide the numbers in the holes. (Advanced spreadsheets may include graph creating features too, but the basics are just the same.)

The beauty of the system is that a change to any of the numbers can instantly be reflected in your totals. As financial planning can involve a considerable number of factors, all of which have an impact if varied, you can understand why a result which can be displayed at the press of a button is so popular with the accountants.

This makes the sometimes tedious job of typing in the information so worthwhile. I have for example set up a sheet showing my annual budget in such a way that I can tell at a glance what the figures for a previous year were and what items are over budget.

**USING THE KUMA SPREADSHEET**

From the DOS prompt type SPREAD and press the ENTER key. Pressing the space bar will display a blank worksheet. In the middle part of the screen you will see one highlighted rectangular block or cursor. It is in this general area or "worksheet" that you will add your information. Above this rectangular block is the letter 'A', while to the left of the block is '0:' (Not the DOS prompt). This particular "CELL" as the blocks are referred to, is identified as A0.

Using the cursor keys, the enlarged cursor can be positioned anywhere in the worksheet. The letters in the same row as the letter 'A' and numbers in the same column as '0:' are used to identify any cell in the worksheet.

Above the 0: is an arrow. This changes direction as you change the direction with the cursor keys. The significance of this arrow is that if you decide to type in information in columns or rows, by moving the cursor beforehand to set up the arrow direction, once you have pressed ENTER to confirm the cell entry, the cursor will jump to the next row or column as required. This speeds up information entry.

Like the wordprocessor, the screen is regarded as a window. You only look at part of a worksheet at a time. It would be useless if you were unable to see your titles once you moved the window away from the top or side of your worksheet so you can have the first row or column locked in position using GRAPH 4 or GRAPH 5 keys. The text at the top of the screen is used by the program to inform you, the user about the information if any, added to the worksheet.

As you move the cursor around, the 'Current Cell' and 'Status' information changes. Options are shown at the bottom of the screen, accessed by GRAPH ESC keys. Pressing the spacebar will move a second cursor to highlight each option in turn. Alternatively, holding down the ESC key and pressing the letter Q will list a help screen.

**EXAMPLE:**

Type the following information into the cells as shown. At this stage it is no different to a pen and paper exercise.

**Notes:-**

Do not type 1993 or 1994, as the computer will think they are numbers and place decimal points after them. Your input can be justified centre, right or left using GRAPH 7, GRAPH 8, or GRAPH 9 (i.e. hold down Graph key & tap a numeric key). Widths of Columns can be increased by pressing the SHIFT-INS key, or reduced by pressing the DEL key.



	A	B	C	D
0:	BUDGET	'93	'94	VAT
1:				
2:	CAR TAX	120.00	120.00	
3:	CAR INS	200.00	210.00	
4:	TV LIC	80.00	80.00	
5:	ELEC	260.00	270.00	
6:	GAS	250.00	250.00	
7:	TEL	200.00	200.00	
8:	=====	=====	=====	=====
9:	TOTALS			

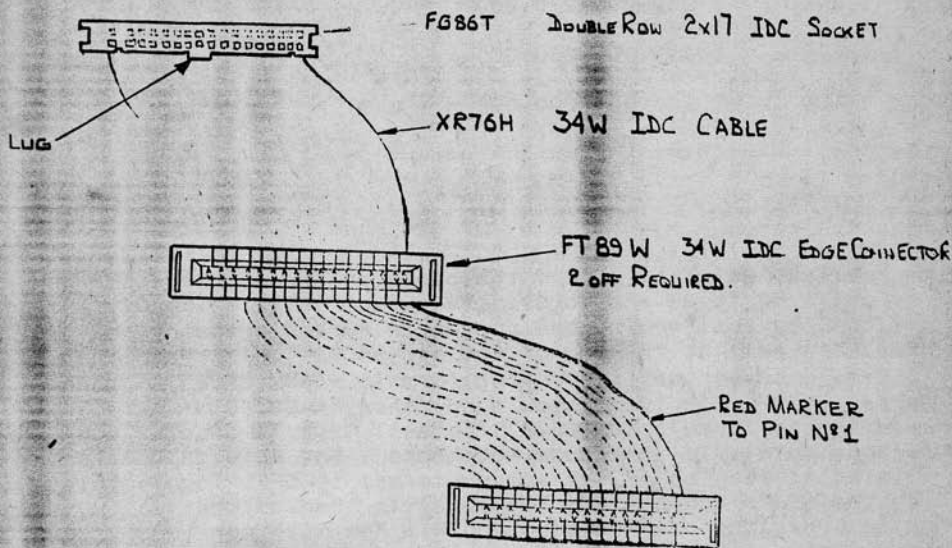
In cell B9 we want to tell the computer to calculate the sum of cells B2 to B7 and in C9, the sum of cells C2 to C7. This is done by positioning the cursor in B9 and pressing the "/" key. The text at the top of the screen will clear and the flashing cursor waits for your formula - SUM(B2,B7) - then press ENTER. The total should now show in B9. Similarly, adding the formula SUM(C2,C7) to cell C9 will display your second total. If this does not happen, the auto calculate listed at the top of the screen is set to OFF. Toggle this by the GRAPH and 2 keys. The total is then automatically displayed. You could also calculate how much more money you could be saving now the 'Caring Sharing' government has been unable to introduce 17.5% (for luxury goods) VAT on the fuel bills after 1995. This is done by placing the cursor in D5 and entering the formula C5\*0.175 and in D6, the formula C6\*0.175.

The Total VAT charged, in cell D9 would be the formula D5+D6. Changing the formula to suit the lower rate of VAT will give an instant display of how much poorer you are now -- all done at the whim of our honourable? MPs. Oh that paying this additional sum should be so easy!

Building up a sheet is as straightforward as the above. Users are limited only by lack of imagination. Like the wordprocessor, the Einstein can show you the concept of tools used in a modern office and you can have fun as you learn.

## FITTING AN ADDITIONAL DRIVE

### WIRING ARRANGEMENT LOOKING INTO SOCKETS



PROJECTS FOR ALL  
FITTING A SECOND DISK DRIVE  
3" INTERNAL OR 5.25" EXTERNAL  
by A.McRobbie

Any of you who has backed up disks on a single drive Einstein will know the excitement of continually swapping disks before the backup task is complete. With a second drive fitted, once you have set the backup operation in motion, you are no longer required until it is complete. 'Tis a wonder to behold and much quicker than the single drive operation. NSWEEP.COM then comes into its own too, even on an Einstein without an 80 column card. (It's only the help screen which is messy.) Marvellous stuff!

There are two main tasks involved in fitting a second drive:

1) Constructing suitable cables.

2) Fitting the drive.

Fortunately both are well within the scope of the average DIY person. No soldering is required.

#### CONSTRUCTING THE CABLES.

This is a similar exercise to that already covered in the last issue of the mag, when a printer cable was made.

#### MATERIAL LIST (from Maplin's Catalogue 1994/95).

(I have just bought the latest catalogue).

Pt.No.	Description	Qty	Price
-----	-----	---	-----
DATA CABLE.			
XR76H	34 Way IDC Cable Sold per 30cm	3 off	£1.35p
FG86T	2x17 Double Row Socket	1 off	£1.69p
FT89W	34 Way IDC Edge Connector	2 off	£6.18p
POWER CABLE.			
HB58N	PCB latch Housing 4 Way	1 off	£0.12p
JW65V	4 Pin 0.2 Polarised Power Connector	1 off	£0.57p
YW25C	PCB Terminals Sold in 10 pack	1 off	£0.39p
XR06G	Ribbon Cable 10 way Sold per metre	1 off	£1.28p

Total £11.58p

#### DATA CABLE - SOCKET

Like the socket on the printer cable, this socket also comes in two parts, the main body and a clamp. At the rear of the main body, the contacts are exposed. All connections are made by pressing the wire against the contacts. The contacts cut through the insulation and make contact with the wire.

To ensure that an even pressure is applied across each cable to the contacts, I used a vice.

It is possible to use the socket and double edge connector from the cable already in use but if you do have problems, you cannot revert to the old system so easily to check what has gone wrong. I wouldn't recommend it.

#### DATA CABLE

The IDC cable comes with one edge or tracer usually coloured red. This is normally taken to mate with pin 1 on a terminal. The socket is numbered on the front face. Offer the cable up to the socket until it is flush with the top, the red tracer aligning with pin 1. (See sketch, P.6).

Attach the clamp (ensuring that the cable does not slip) and exert a firm pressure with the vice, so that the clamp forces the wire on to the contacts. When the cable is fully in position, clips at each end of the socket will engage on lugs to hold the clamp in position.

#### THE EDGE CONNECTOR

At the other end of the cable, follow the same procedure as carried out with the socket but this time the cable has to be flush with the bottom of the edge connector. If the cable has been cut squint, trim it square with a pair of scissors. Again the red cable should line up with pin 1 identified on the edge connector itself. The clamps in this case are inside the edge connector making it harder if you have to dismantle it.

#### CHECKING THE ASSEMBLY.

The second edge connector still has to be fitted but if you check the connections you have just made at this stage, using a meter, (A battery, test bulb and wire will suffice) any errors made are more easily found. Check that pin 1 on the socket is only connected to pin 1 on the edge connector and not pin 2 as well. Similarly check that pin 2 is not connected to pin 1 or pin 3. A bit laborious to say the least but better safe than sorry.

Once this has been done, the second Edge Connector can be fitted to the middle of the cable. My cable had this connector fitted facing in the opposite direction to the other two. This means that the cable has to be twisted to fit the drive - not ideal. Again check your cable once you have completed adding the second edge connector.

I have not encountered any problems so far with straying cables, perhaps because the vice is applying a slow even pressure along the length of the cable.

#### POWER CABLE

All connections are soldered or crimped on. You only need four of the ten wires making up the ribbon cable and only about 9" long. (Depending on the drive you may only require



3 wires, but I'll assume 4). These four wires can easily be pulled away from the remaining six, and cut to length. The PCB terminals and pins can be soldered or crimped to the wire. (Use pliers if you don't have a crimping tool). Once completed, each terminal and wire assembly is simply pushed into the appropriate housing. Both latch housing and polarised power connector are numbered so it is a simple case of ensuring that pin 1 is connected to pin 1 etc.

#### IDENTIFICATION OF ALBERT'S NAUGHTY BITS.

First of all, disconnect the Einstein from the mains supply. At the rear of the machine there are two X-headed screws which hold the top cover or hood in position. Remove these with a screwdriver and store in a safe place. While you are still standing behind the computer, the cover can be lifted up from the back and pulled towards you. This disengages the lugs which hold the cover at the front of the machine.

Viewed from the front, the black box at the LHS rear is the power supply. Four coloured wires connect it to the motherboard at plug numbered M007 on the motherboard. In front of this plug is another, M008, with cables running to the disk drive. To the right of M008 is an identical four pronged plug marked M009. This plug will supply the power to the second drive. The disk drive is also connected to the motherboard by a ribbon cable to a plug numbered M005. This cable eventually has to be removed and a longer cable with another edge connector fitted before the second drive will work. Note which way the power and data cables are fitted to the motherboard BEFORE removal starts!

#### REMOVAL OF THE ORIGINAL DRIVE

This may be seen as not strictly necessary if you have small fingers but it certainly makes the fitting of the new cable very much easier. The disk drive is held in place by two mounting brackets, and is held in position by four screws & lockwashers. The second mounting bracket for your additional drive is already fitted. A blanking plate, held by one screw covers the front aperture for the second drive. This is not required once the drive is in place, so can now be removed.

Slacken off the four screws holding the drive. Take care with the removal of the screw nearest the loudspeaker. Support the drive as the last screw is being removed.

Lift the drive up and rest on top of the power supply. Put the screws and lock washers in a safe place.

Returning to the drive, grasp it in such a manner that you can remove the data and power cables by pulling the sockets, not the cables, and so that the drive does not slip out of the aluminium screening cover on to the floor, leaving you with a sheepish grin on your face.

### TESTING THE SECOND DRIVE

It may be advantageous to test the second drive at this point before doing anything else. This would not normally be required with a new drive but availability of new 3" drives are few and far between.

The second drive should be complete with mounting screws and lock washers. Remove these and store in a safe place. Remove the screening cover noting which way it is fitted as reversal makes the cables impossible to fit

Look at the underside of the drive. Near to where you will eventually fit the edge connector, is a bank of fourteen pins paired together identified as:-

DS0

DS1

DS2

DS3

(DS = Drive Select)

ML

M1

US

Two or more may have a jumper/link across them. The link you are interested in, is the one connecting DS0, DS1, DS2 or DS3 pins. This lets the drive know how it will be referred to by the computer. For testing purposes this should be placed over the DS0 pins. If the link is in the wrong place carefully pull it off and fit over the DS0 pins.

Replace the screening cover and the two front mounting screws. The lockwashers are not required at this stage. With the original data and power cables still connected to the motherboard, fit the other ends to the new drive, ensuring that the key in the data cable mates with the slit on the exposed tracks on the drive pcb (i.e. The data cable should only fit one way). The power cable being D shaped also fits one way only. The drive can then be temporarily mounted using the front mounting brackets while testing takes place. Place the hood over the exposed parts, (there is no need to affix the screws), connect up to the mains and suitable TV/monitor, then switch on. The drive light should come on as normal. Formatting a disc will be enough to let you know if all is fine. Remove the disk, switch off the power and disconnect from the mains before proceeding further.

### FITTING THE DRIVES TO THE COMPUTER

Remove the disk drive from its temporary mounting together with the power and ribbon cables at the drive end. Remove the two screws and slip off the screening cover. Change the link from the DS0 to the DS1 position. The drive will then know it will be addressed as drive 1 instead of drive 0.

Replace the screening cover and fit the four screws and lockwashers. Do not tighten at this stage. Offer the drive

up to the L shaped slots at the front of the mounting bracket in the second drive position. Ensure that the lockwashers do not become trapped between the drive and the mounting bracket. A magnetised screwdriver can prove its worth here. Lower the drive into position.

When it reaches the limit of its vertical travel, the drive can be lowered at the rear to enable the remaining screws to be mounted into their respective slots. Once this has been done, gently push the drive forward as far as it will go and lock in position by tightening the four screws.

Fit the power cable to the drive and also to the motherboard with the socket facing in the same direction as the existing power cable on the motherboard. Do not fit the data cable yet. Remove the existing data cable from the motherboard by pushing the lugs at each side outwards. This has the effect of raising the socket out of the drive. The socket can be pulled the remaining part to free it from the plug on the motherboard.

Take your new cable and fit it to the motherboard. The lugs will move upwards till they lock the socket in position. Fit the data cable to drive 0 as before. Replace the power cable too then mount the drive.

The procedure followed in mounting the first drive is the same for the second except that the power supply gives you much less room to work with. Once mounted, it too is pushed forward and locked in position by the four screws. The data cable can now be fitted to the second drive. A quick check to ensure that no foreign bodies are in the way, then on with the hood. I find that standing at the front of the machine so that you can see where the hood lugs are, makes fitting easier. No force is required but it can prove tricky.

Replace the last two screws at the rear of the machine and the job is complete. Connect up the machine as normal, boot the DOS with a disk in the drive and type 1: at the DOS prompt. Your second drive will burst into life. Don't you just love being in control?

#### FITTING A 5.25" EXTERNAL DRIVE.

Fitting a 5.25" external is an alternative option to the 3" drive and I would guess much more readily available. I obtained mine out of an old PC which was being upgraded to include a hard drive, for the sum of £10. The 5.25" floppies are much cheaper than the 3" types too. Mine is a double sided double density drive. This means that with DOS 2 you can access both sides of the disk at one time, making disk intensive programs (like Grafdraw) much easier to work with.

The drive should ideally be housed in a box of some sort to keep the dust away from its working parts. A stiff plastic or metal container will suffice. Mine is in a metal box with plastic brackets from MFI (the bits left over from a fitted kitchen) should I want to mount to the underside of the computer desk.

#### IDENTIFICATION

Not all that different from the 3" drive, the links/shunts are again close to the where you will fit the edge connector. In this case they are numbered as follows:

- o o TM
- o o L1
- o o LD
- o o D4
- o o D3
- o o D2
- o o D1

D1 is the same as D0 on the 3" drive (i.e. Available drives are 0 to 3 on the 3" drive and 1 to 4 on the 5.25" drive). I have set the jumper/link to D3 so when this drive is connected it is activated by 2: at the DOS prompt. Don't worry if both drives spin when either of them should be reading or writing, as this is quite normal. \*\*\*\*\*

#### THE POWER CABLE

The cable is longer but it is wired as before except that I have fed the cable through one of the ventilation slots on the underside of the Einstein. To enable the power cable to be removed without having to dismantle either of the sockets, I have added a terminal or chocolate block connector. This is small enough to fit underneath the Einstein as it is shorter than Albert's chubby legs. NB. Drives with 3 wires allow one to be terminated at one of the connectors - in effect doing nothing.

#### THE DATA CABLE

The middle edge connector is not required. The socket is fitted to the expansion port on the rear of the machine. A one metre cable is ample no matter which side you want to use the drive from.

Two drives are the maximum you can use with Albert's power supply assuming that they all require the same current as the existing 3" type although a further two can be connected providing they have their own power supply. \*\*\*\*\*

NB. See Ted Cawkwell's article in the last issue regarding fitment of 3.5" drives.

\*\*\*\*\* (see Chief Editor's comments, p.2)



## The 80 Column Card, With Notes On Video Output.

by Ted Cawkwell

I got my 80 col. card by buying a second hand Albert and for a long while it was nothing more than an attachment which let me get more on the screen, albeit in monochrome only, to suit my mono monitor. I remember being slightly irritated that the screen always came up in 40 columns and I had to use Control P to switch over, but I had (and still have) no manual, so I just went with the status quo.

If I wanted colour for games or whatever, I used a portable colour TV off the TV socket on the right-hand flank of the TC01 and for WP work or PD software I used the TM80 monitor off the 6 pin DIN socket at the right rear of the micro, via the 80 col. card, using Control P or Control N to change over.

Then one day I obtained a TM01 colour monitor and soon found that I needed a different 40/80 switch because the one I had only switched the mono signals. On opening the switch box I found that there was a 4 pole change over switch connected as follows:-

	U	V	Y	NC	from 6pin DIN
40 col pole	*	*	*	o	
	NC	NC	Mon	NC	
Wiper	o	o	*	o	
	NC	NC	Card	NC	
80 col pole	o	o	*	o	

The switch amounts to a horizontal row of four change-over switches which I will call 1 to 4 from left to right. With the aspect shown, the switch lever DOWN engages the 40 col. poles, UP for the 80 col. poles.

There was also a solder tag screwed to the box to which all of the coaxial cable screens were connected.

There are two ways to get video out of Albert, via the TV socket or via the 6 pin DIN monitor socket on the back. The TV socket supplies the same sort of signal that your TV aerial does and can only operate into a television set or VCR, as it needs the RF (radio frequency) electronics to decode the signals. The result is a good picture of the 32 or 40 column screen with quite reasonable definition, but individual pixels are distinctly fuzzy.

The 6 pin DIN socket provides three different colour signals equating to red, green and blue, plus something called composite video and synchronising signals, which are needed by monitors as they have no RF circuitry. Quite a number of modern portable TV's have facilities to accept these signals and therefore double as monitors.

However, the definition attained, though better than straight TV, is not as good as with dedicated monitors. This is usually called Video or Audio/Video Mode and it is worth trying to get a sharper monochrome picture.

The connections to the 6 pin DIN are:

PIN	RGB	YUV
1	R	V
2	G	Y + Synchs
3	B	U
4	Synchs	N/C
5	0 volts	0volts
6 (centre)	N/C	N/C

RGB and YUV are different ways of obtaining colour output. Albert is normally set up for YUV, but can be set for RGB via an internal jumper. The Einstein is a bit of an awkward beast colourwise, because its output is Linear, whereas PC's (and most other micros) use a TTL output. This means that a monitor for the TC01 has to be carefully chosen. The TM01 monitor has inputs suitable for both TTL and linear RGB as well as for YUV linear, so presumably is usable with a PC as well, though I have never tried it.

Fitting an 80 col. card allows a third option as it outputs Y + Synchs. The purpose of the switch is to connect your monitor to either the 6pin Din socket for colour, or to the card output for 80 col. mono. If you ever get a problem with the card the first thing you should look at is the Pipe 60 way IDC connector. Being very long this is vulnerable to any forces on the connector (such as when it is being removed) which are liable to lift some of the connections from the IDC pins. The solution is to remove the cover of the card and fold back the circuit board until the top of the plug is accessible and apply pressure with a smooth object, such as a thumb nail, along the length of the plug to firm up all of the pressure connections.

Getting back to the switch, the Y, U and V connections are those from pins 2,3 and 1 of the Din socket. The 3rd switch of the bank can then switch the monitor to either the 80 col. card or to the 6pin DIN socket (upper position). If the monitor is mono this is all that is needed, but for colour two additional leads are required from the monitor to the V and U wipers. On the monitor plug the pins are:

Pin 1	V
Pin 2	Y+Synchs
Pin 3	U
Pin 5	0volts
Other pins	No Connection.

My own set-up has the centre pin of the third switch also connected to a coaxial lead to a phono plug (to suit the TM80 mono monitor) so that I can switch monitors at will.

In theory I could have two monitors connected, but I have never tried this, as I think that trying to drive two monitors off a single output is not a good idea!

Having successfully connected my colour monitor I now became aware that there were certain options available for the 80 col. card via three jumpers on the circuit board, numbered M002 to M004:-

M002	TV standard select	Upper position	525 lines
		Lower	" 625 lines
M003	Display status on boot	Upper	" Normal 40 col.
		Lower	" 80 col. screen
M004	Character set select	Upper	" Mod. CP/M set
		Lower	" Einstein set.

I find Lower, Lower, Upper is the best combination, so that my machine boots up in 80 cols. and without the Einstein graphics. Auto-booting XBAS from the original Master disk brings up the 40 screen with graphics, but using the System 5 Master the same way leaves you in 80 col. mode.

You can switch from one to the other from the keyboard using Control N (40) or Control P (80). It is possible to switch from within an Xbas program by using CHR\$(14) for 40 or CHR\$(16) for 80 in, for example, a PRINT statement.

For those wishing to use Mcals or machine code, there is a lot of information on the ZDOS PD 164 disk (in the file MOS.DQC) re accessing the 80 col. video RAM and switching.

Having two video RAMs to work with enables some interesting effects. For instance, it is possible to have a 32 col. screen showing, say, a circuit diagram done with Grafdraw - AND an 80col. screen with a list of components - and to switch from one to the other with the 40/80 switch, rather like turning the pages of a book.

The above works using a TM80 and TV set. To use two monitors you don't even need a switch. Just plug your colour monitor into the 6 pin DIN and your mono monitor into the 80 col. card. (The card has a Phono socket outlet).

With this set-up the colour monitor is used only for 40 col. colour and the mono monitor only for 80 col. work.

## CHEAP AND CHEERFUL C, Part 1.

by Sid Dunn

Among the many delights to be found among the volumes of the PD library, is PD224, a collection of 10 files which can be used to effect an introduction to the language "C". C is usually described as a 'small' language. By this is meant that its unique set of rules and notation is intended to define the language, while the usual services that would be expected to be part of a language are accessible from 'libraries'. These have been written as required by its users, and placed in the public domain. While this approach provides a remarkably flexible means of expression, it obliges the user to be quite well acquainted with the nuts and bolts of the operating system which will bring all the various bits together. Small-C, the contents of PD224, is the minimalist approach. It will accustom the beginner to the peculiar notation of C, while providing a rather restricted set of tools. Rather than waste these precious few pages of our magazine on an account of the language itself, I will concentrate on putting PD224 to work. Your local library should provide you with the bible itself: 'The C Programming Language', by B W Kernigan & D M Ritchie, pub. Prentice Hall 1978, or 'A Book on C', by Al Kelley & Ira Pohl, pub. Benjamin Cummings 1984, ISBN 0 8053 68680 4.

Best of all, to accompany this brief account, is 'C for Beginners' by Ian Sinclair, pub. Melbourne House 1986, ISBN 0 86161 206 X.

There are two parts to PD224, totalling 370K in 58 files. Some of these are utilities such as NS.COM and TYPE1.COM, which are useful in their own right and also in printing out the seven .DOC files which together make up the description of how to use what is provided.

I recommend getting out the .DOC files because you will spend some time reading them and comparing with what the textbooks will tell you. They take up 26 sides of A4.

I have found it convenient to move the following small selection of the files to one side of a 3" disk for the purpose of this article.

```
1: IOLIB .H      : PRINTF2 .H      : FLOAT .H
1: PRINTF2 .OBJ   : IOLIB .OBJ     : FLOAT .OBJ
1: PRINTF1 .H     : PRINTF1 .OBJ   : CC .COM
1: ZMAC .COM      : ZLINK .COM
```

As a result there is room left for the source (.c), .asm, .obj and .com files which proliferate as work proceeds. The .c files are not needed (unless you find it necessary to recompile any of the .obj files after some catastrophe). I have not made use of the material available in the args. or transen. files.



Although, to begin with, there is room for an editor on the disk, as work proceeds it has to be housed elsewhere.

I also found it useful to print out the source code for the only significant example given, TEST.C.

It is usually said that once you've managed to write 'hello world' to the screen, it's downhill all the way. Whether that's entirely true is another matter but here's how to begin:

```
#include iolib.h /*bring in input/output routines*/
#include printf.h /*and simple screen printing*/
main()
{
    printf("Greetings O King\n"); /*message and newline*/
    printf("I bring you tidings of great joy\n");
}
```

NB. character before 'include' above should be a sharp.

This is a C source program written with an editor or a word processor that can be trusted to turn out simple ASCII text. The #include statements bring in (without you having to type them) the source text for input and output routines. If you are interested in what they contain they can be examined using the disp command.

The 2nd step is to invoke the compiler with: cc greet. If your typing is of the best then the prompt reappears and the disk will be found to contain a new file: greet.asm. This means that your source text has been translated into a Z80 assembler listing.

The third step is to type zmac greet=greet. This will generate object Z80 code and place it on disk in greet.obj, subject to no mishaps.

The fourth step brings together all the machine code versions of the separate bits of the program: the bit you wrote, the two bits from the 'library' that were asked to be included. Thus: zlink greet=greet,iolib,printf1

The documentation explains that printf1 is a simplified version of the printf command which is standard C notation. Assuming you haven't fumbled anything, the disk now contains one more new file called greet.com

Typing greet is followed by the expected message on the screen.

To make sure that this performance is understood I went through it with the printer engaged by CTRL-R:

```
1:cc greet
1:zmac
```

To be continued....

A simple BASIC Text Reader listing to tap in.  
by A. Nonnymouse ???

Those of you who find BASIC enough to deal with (which includes me) may be interested in the following program. For long enough I have wondered how Xtal BASIC could be used to write a program which could read in lines from another file.

What I did not appreciate was that at the input command, a string of characters was read in till an end of line character (or the limit of characters allowed for the string variables) was reached.

```

5 REM TEXT READER
10 DIM A$(10)           :REM EACH LINE STORED AS A VARIABLE
20 COUNT=0              :REM SET COUNT TO ZERO
30 OPEN "KEYBOARD.ASC",FD$ :REM OPEN THE FILE TO BE READ
40 COUNT=COUNT+1       :INCREASE COUNTER
50 INPUT # FD$,A$(COUNT):READ LINE. STORE IN VARIABLE COUNT
55 PRINT A$(COUNT)     :PRINT VARIABLE COUNT
60 ON EOF GOTO 100       :IF END OF FILE JUMP OUT LOOP
70 GOTO 40               :LOOP BACK AS NOT END OF FILE YET
100 CLOSE               :CLOSE FILE

```

I naturally assume from the above that if I have had a programming problem which can be solved by clever chaps (and chapesses?), I am probably not the only one. I was surprised by how quickly my impossible problem could be solved. Do you have some programming problem which could be shared by the readership?

#### ANSWERS PLEASE!

Not many questions this time round as we (Ted and Andrew) have not had time for any feedback from yourselves yet.

Dave Bonner has written asking whether it's easy, hard or impossible to use an IBM-compatible SVGA colour monitor with an Einstein 256. I don't have an SVGA monitor or E256 to try out so I am afraid I'll have to pass the query on to our readers. The only snag is that he ticked the "no publicity" box on the membership form, so any response will have to be relayed through the magazine. (Ch.Ed:- Does Ted's 80-column card article throw any light on this query?)

#### INSIDE THE FEBRUARY/MARCH ISSUE

More basics for beginners. And (hopefully,) more of your letters; with hints, tips, problems, praise (& brickbats?), SO SEND THEM IN PRONTO! On 3" or 40-track 5.25" disk too, please. AS THIS REDUCES OUR REPETITIVE STRAIN INJURIES!!!

## UPDATE INFO ON ARTICLES IN THIS ISSUE

**SPREADSHEETS:-** It's hard to use a word-processor as a spreadsheet, though the SSS WP-80 does have this ability built-in to some extent, but "computerists" have put spreadsheets to some amazing uses, and we've heard of some users who quite happily use them as rudimentary word-processors in the absence of a "pukka" one.

**FITTING AN ADDITIONAL DRIVE:-** Your Chief Editor spoke to a former TC-01 user who had fitted a 3.5" internal drive to the second drive slot, and a 5.25" internal drive in place of the loudspeaker grille, the squeaker being moved to the rear of the casing, and drove all three off the Einstein internal data and power sockets without any problems. In developing the Einstein Portable (in a suitcase) Saxon Electronics did a lot of development work, and confirmed that a standard Einstein will handle 4 drives off the internal power supply without overload, though we'd think that only one heavy old 5.25" drive ought to be included, due to starting inertia.

There is some confusion about drive signals. Some drives can be jumpered not to spin unless specifically addressed (in the same way that READ/WRITE signals are only acted on if the DRIVE SELECT line for that drive is jumpered), but the signal lines from the FDC (floppy disk controller) are daisy-chained to ALL drives, and MOTOR ON/MOTOR OFF (spin) signals will normally activate all drives, tho' it may be hard to detect this activity on many drives.

If you have an externally-powered drive, you can cause yourself much alarm by forgetting to power it on, as it will suffer an identity crisis which afflict your internal drives too, and will stop you booting up or accessing anything!

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**SOFTWARE LIBRARY:-** In case you don't already have one, a software library summary list is enclosed. HALF PRICE TO MEMBERS -- i.e. £4 for the first DISK, or £3.50 PER DISK for 2 or more IF WE SUPPLY DISK & POSTAGE. Or £2 PER DISK if you supply disk & postage. A 3" DISK HAS TWO SIDES, so will normally hold two volumes (but some volumes are multi-part). For a DETAILED LISTING OF EACH DISK, ORDER VOLUME PD-334.  
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## SOFTWARE

Equally popular with new members is our software offer. The Surrey Software WP40/WP80 wordprocessor with manual for £10 (incl. disk & p+p), or the AEGOS games disk for £5 (incl.). Lots of others on the way too, but there's only 36 hours in our day and 9 days in our week. If you need specific SSS/Bell/Supasoft titles just ask, it's probably lurking there in the pipeline, begging for our attention!

\*\*\* N.B. These are special user group MEMBER ONLY prices \*\*\*  
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One copy of this magazine is mailed FREE OF CHARGE to each paid-up member of the U.K. EINSTEIN USER GROUP (UKEUG).

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The magazine and user group are run in their spare time by unpaid enthusiasts on a VERY tight budget. If you require a reply PLEASE INCLUDE A S.A.E. -- OR WE MAY NOT BE ABLE TO AFFORD TO PAY THE POSTAGE BEFORE MAILING YOUR REPLY!

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