



Einstein Magazine

& ALL MICRO NEWS Number 97

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

Publisher and Secretary:-
A E Adams, Ivy Cottage, Church road, New Romney,
KENT TN28 8TY

EDITOR: Ted Cawkwell
9 King Street Winterton N.Lincs. DN15 9RN

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Ted Cawkwell managed to put together one final issue of the magazine for you from items that he had on hand, but as you will see there is a problem with John Marriott's articles as he sent them on disk in a format that Ted has problems in printing, instead of sending them as conventional hard copy on real paper.

Bob Deeley is taking over as Editor from the next issue. He has been through a "crash course" with Ted so he is not really being thrown in at the deep end.

Bob will welcome your input with open arms, so please send him lots of stuff to put in your favourite magazine, at 33 Britain St, Dunstable, Beds. LU5 4JA.



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SHOWS, SOFTWARE LIBRARY and USEFUL BITS

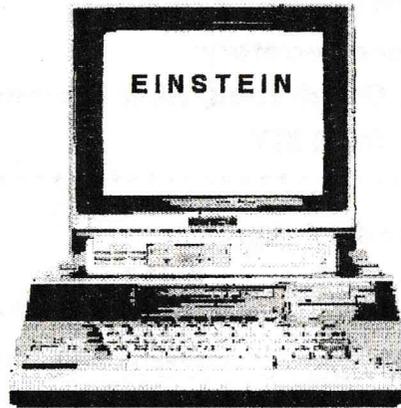
**Steve Potts 85 Thorold Ave, Cranwell Village, Lincs.
NG34 8DS**

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- 3 J.M. evaluates the ADC port.**
- 8 One for the 256 - changing the drive by John.**
- 10 Jumbo Print - an oldie revived by Stan Gibbs.**
- 15 Letter. Using a TV as a monitor . Stan again.**
- 16 Letter. Improving the Mouse. John Marriott**

MY EINSTEINS

Yes, it's me again. On one of my better days it occurred to me that my Mark Two TCO1 has been on the cover of the last dozen or so EMs but the picture is too small for much detail to be seen. I have enlarged it some on this page



Einstein Mark 2

and it is just possible to make out the added DD drives. One is on the right in place of the original 3" drive and the other is in the Epson box below the monitor.

This version also had a silicon drive as drive 3/D. there is a switch at the left end of the box for 80/40 columns. A blanked-off space for another DD drive can just be made out to the right of the box.

I use this machine only with DOS 2, mostly for making copies of 3.5" disks.

My other machine, which is my everyday one, has two 3" drives as normal and one 3.5" DD fitted in my homemade box. The box also has the 40/80 switch and a deep drawer to hold Function key cards. The silicon drive is now fitted to this machine. I have done various experiments with the Si drive, and probably the most successful was when I loaded a 3" disk with WP80, SKETCH and BJDRIIVER, plus COPY. The entire disk was then copied to the Si disk and the drive in use changed to Drive 3. It was now possible to work in WP80 then (saving the text) switch to Sketch to do some illustrations then back to insert them in the text, and finally set up thr BJ4100 for the required text size, colour, etc., and finally back to WP80 to print it all out.

Working on the Si. disk made the various program swaps so quick that it really was a pleasure to work.

Ted Cawkwell

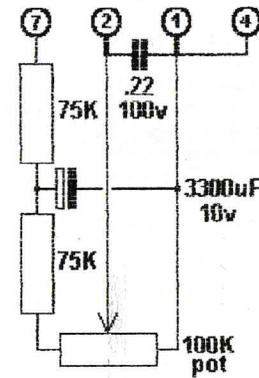
EINSTEIN TCO1 ADC PORT/INTERFACE EVALUATION

There has been some comment on the "noise" problem with the ADC port. During my experimenting in the design/build of a Graphic Digitiser I constructed the following circuit (less the capacitors!) and checked the voltage levels and waveforms (by digital multimeter and oscilloscope) and found that the 5V supply at pin 7 was prone to "effects" going on in the main PCB (especially drive action). The 3300uF electrolytic capacitor was added to provide a "buffered" supply. This did

not result in the improvement I expected and further checks showed that most of the noise was coming from pin 2! The .22 non-polarised capacitor was a result of trial/error (my TCO1!).

From this circuit it is possible to develop it into an electrolytic test meter for when a capacitor replaces the 3300uF the screen display shows a voltage drop then typical capacitor charging curve, just a case getting a "known value" capacitor and fudging a program to suit!

ADC socket - pin numbers



John Marriott
© November 1999

From these tests it seems that the ADC chip on the TCO1 has great limitations (I believe there were 2 types used, having different sampling rates), and it makes we wonder if it could ever have been used as "scientific measurement" standards, even "in its day".

"ADC PLOT.XBS"

```
10 CLS:FOR V=10 TO 190
  STEP 10
20 DRAW 0,V TO 5,V:
  NEXT
30 DRAW 5,191 TO 5,0
  TO 255,0
40 X=8:Y=0
50 L=0:T=0
60 A=ADC(0)
70 T=T+A:L=L+1
80 IF L<20 THEN 60
90 Y=INT(T/20)
100 PLOT X,Y
110 X=X+1
120 IF X>255 THEN 10
130 GOTO 50
```

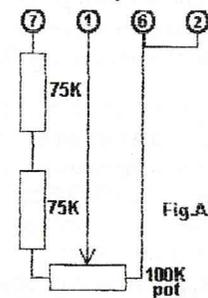
Make sure that any leads to the ADC port are screened, as there will be a tendency for the lead(s) to come close to the monitor, with the possible result of line/frame pulses being induced into the lead(s).

EINSTEIN TC01 ADC PORT EVALUATION

John Marriott © November 1999

Following up on recent articles in EM regarding use of the ADC Port, the following experiences may be of some use as I evaluated a Graphic Digitiser project. Regarding "noise" to be found on this port initially appears to be stabilisation interference on the 5V rail and an oscilloscope check shows this to be so, showing up poor stabilisation of the switch mode power supply, especially if a drive kicks in. Circuit "A" was my first evaluation attempt - the 2 x 75K resistors were the only way my "scrap box" could provide a 150K resistor which in conjunction with the 100K potentiometer would not only restrict the current available to pin 1 of the ADC Port but would also provide 2V at the "top end" of the pot, being the maximum voltage the ADC chip should be subjected to

ADC socket - pin numbers

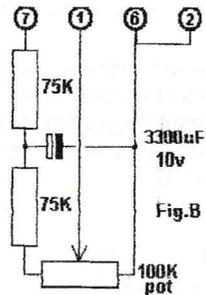


on an "in" pin. Whilst not a frequent problem, should connections to b/2 fail then the voltage/current level to pin 1 will rise considerably with possible damage to the ADC chip - good parts and workmanship! The following program provides a screen plot to "show" this "noise".

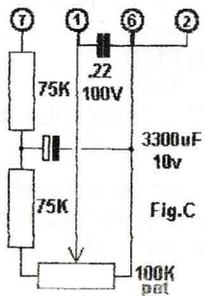
```

10 CLS:X=0
20 Y=ADC(0)
30 PLOT X,Y
40 X=X+1
50 IF X>255 THEN 10
60 GOTO 20
    
```

By way of reducing this noise effect on the 5V pin 7 the 3300uf electrolytic capacitor was fitted as in Fig.B at the same time improving voltage stability at the resistors midpoint. Run the program again



The improvement was not as good as I expected, checking the waveform at pin 1 showed that gate switching in the IC created more noise than the 5V at pin 7! Trial and error led to a non-polarised capacitor to be fitted between pins 1-6/2 as in Fig. C



On my TC01 re-running the program showed improvement, so a program change sampling the port 20 times & averaging gave an acceptable result - but I would hardly call it "scientific measurement standard".

Program - ADCPLOT.XBS

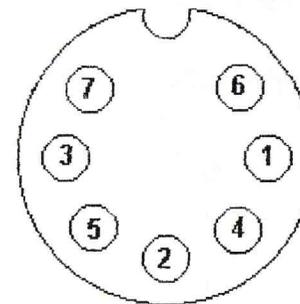
```

10 CLS:FOR V=10 TO 190      60 A=ADC(0)
   STEP 10                  70 T=T+A:L=L+1
20 DRAW 0,V TO 5,V:        80 IF L<20 THEN 60
   NEXT                      90 Y=INT(T/20)
30 DRAW 5,191 TO 5,0      100 PLOT X,Y
   TO 255,0                 110 X=X+1
40 X=8:Y=0                 120 IF X>255 THEN 10
50 L=0:T=0                 130 GOTO 50
    
```

This provides an X,Y graph line with markers. Varying the potentiometer setting should show the effect of "resistors in parallel" through pin 1. Replacing the electrolytic capacitor with an uncharged one should show a screen "voltage drop with a capacitor charging curve". This circuit lends itself to testing/rating electrolytics - just the "i's" to dot and the "i's" to cross as you come up with the program!

It is better to use screened wiring if you are extending the constructed circuit to the keyboard area. This is due to the probability of line/frame signal induction from the monitor sitting on top of the TC01 - it shows on an oscilloscope.

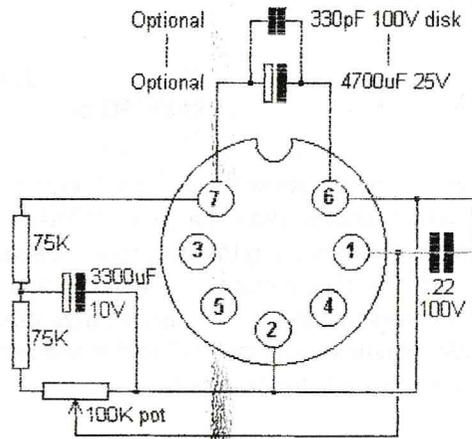
Both EM & myself make the usual legal disclaimers. The resistors aren't critical i.e. instead of 75K+75K=100K you could drop to say 56K total with the pot 2/3rds of that. Also note that pots come in LINEAR & LOG scales, try & see!



ADC Port of Einstein TC01 as looked at from OUTSIDE - so these would be the solder cup positions of the DIN plug to which the components of Fig. C would be soldered.

NOTE the number configuration!

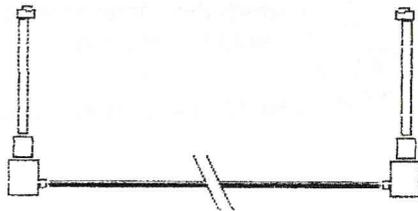
NOTE - there were two types of ADC chips fitted to the TC01, their main difference being "sample timing" but I think that if "sample run" from a BASIC program this difference would not be noticed. There's also the chance that "spreads" in PCB components will mean that the suggested values will not be the best for your TC01, so search through your scrap box for other value components and evaluate your results.



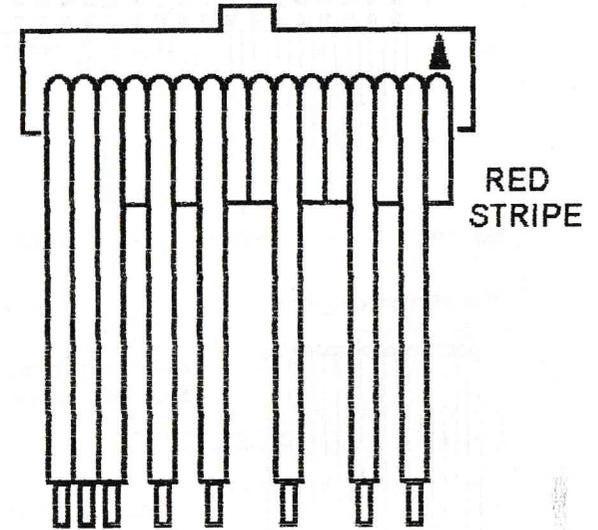
Whilst I have also tried inductors from pin 7 to the restive network to filter out any residual AC ring on the switched mode 5V supply line, the gate switching reflection on pin 1 mimics an AC waveform which is difficult to "dampen down" without actually effecting the "measured voltage level" from the 100K pot i.e. the ADC Port is doing its job and you're trying not to!

When experimenting with different value components, there is the tendency to cut corners e.g. bare-back multistrand wire "temporary made" to components, with the "interface" live ... DON'T!

Get a mini-clip shunt wire, not mini-crocodile clips, they are well worth the money - believe me,



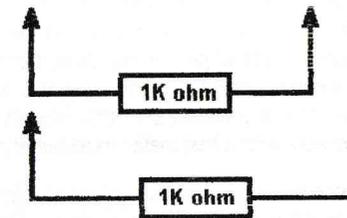
ADC Port of the TC01



Solder connections to 9-way "D" socket for

Amiga mouse

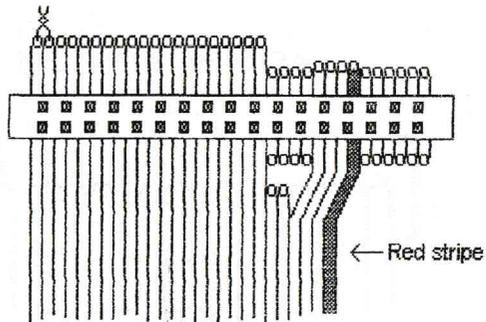
1 7 3 4 2 8 9 6



Modification suggested/outlined in original article by Dave Arts. The problem of the correct AMIGA mouse sensing the fire button(s) being "pressed" when not so, did not show up with the QuickShot Optimal mouse when tried with my Graghic Digitiser earlier. There is another modification where diodes are fitted in another article/magazine but due to "internal removals" at home I've not been able to lay hands on it so DON'T just substitute the resistors for diodes - hoping for the best!

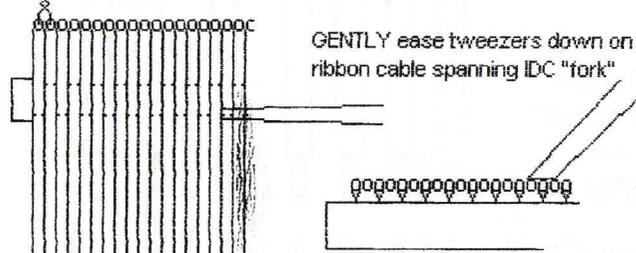
John Marriott - December 1999

EINSTEIN 256 computer - modifications to drive cable in order to replace the existing 3" drive with a 3.5" 720K (or suitable 1.44M drive) - see CAUTION!



Existing 26-way ribbon cable modified for 34-way IDC plug

33 & 34 shorted together!



GENTLY ease tweezers down on ribbon cable spanning IDC "fork"

With ANGLE FACED eyebrow tweezers GENTLY ease the ribbon cable down into the IDC "forks" ALTERNATING across the rows. Start at the "wrong" end ("right" = RED stripe) i.e. slot 34 as this will be a true datum point due to the dummy wires. It's not necessary to include these but it helps YOU not to make any mistakes. CHECK visually for any bent over "forks" and preferably with a test meter (bulb/battery) for continuity.

DON'T be over-enthusiastic as the internal wires can fail AND Murphy's Law will ensure that this shows up when everything's back together!

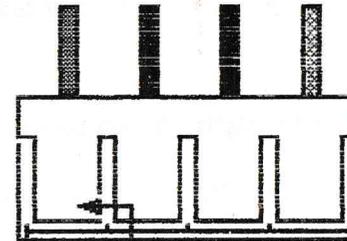
CAUTION - CAUTION - CAUTION

Before going further the +5V & +12V power leads to the drive MUST be switched, for whilst the plug & socket are the same on the 256 3" drive and 3.5" 720K/1.44M drives the power lead voltages aren't. Whilst the latest 1.44M drives only require +5V (there are even some 720K drives also), they still have the "standard" power socket - so don't get miffed if a drive turns up with a FREE power lead with half its wires!

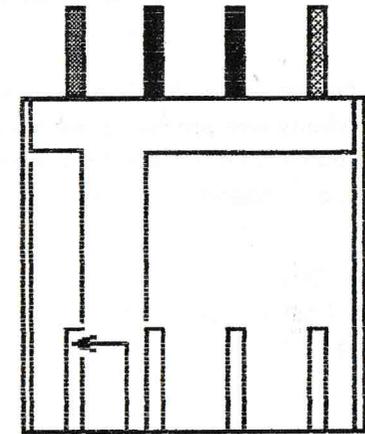
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John Marriott - November 1999

INTERCHANGING 5v & 12v wires i.e. replacement of 3" Amstrad/256 drives for 3.5" PC type drives. Make sketch of wires/colours BEFORE you carry out modification & TEST

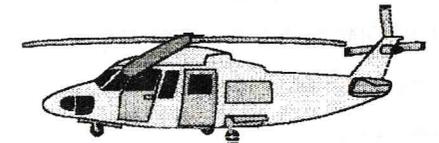


Lift plastic tab to unlatch wire terminal and withdraw wire



Depress metal barb of wire terminal and withdraw wire

John Marriott - December 1999



JUMBO PRINT

enhanced by Stan Gibbs

This must be one of the oldest printing programs there is. I can remember when everybody was producing prints with it. When originally unearthed under the name PPRINT it was sadly deviod of even the most simple instructions, and indeed it required some tortuous cerebration to get any sort of a result.

Passing it to Stan soon saw to it that it was as easy to use as. well... Hangman. I believe he actually enjoyed putting it to rights - though he would never admit it!

```

10 RST:CLS32
20 GOSUB 750
30 GOTO 470
40 PRINT@10,0;"JUMBO PRINT"
50 PRINT@10,1;" _____"
60 INPUT "Enter carriage width (max 10)";LTH
70 IF (LTH>10 OR LTH=0) THEN BEEP:PRINT@0,2;SPC(32):GOTO 40
80 PRINT@0,4:INPUT"Enter keyboard character or C/R for letters made from
letters ";OPT$
90 IF OPT$="" THEN CHECK=1:PRINT@2,7;"(letters made from letters)"
91 IF OPT$<>" " THEN PRINT@2,7;"is chosen keyboard character"
100 PRINT@6,9;"TYPE IN YOUR MESSAGE"
110 PRINT@0,11;"ENTER:- to end a line"
120 PRINT@0,13;"ESC:- to print again or quit"
130 PRINT@0,16;
140 DIM X(LTH):DIM Z$(LTH)
150 I=1
160 REM

```

```

170 REM ECHO MESSAGE TO KEYBOARD
180 REM
190 X(I)= INCH
200 IF X(I)=25 THEN PRINT CHR$(X(I));X(I)=32:I=I+1:GOTO 190:ELSE
210 IF X(I)=27 THEN 430
220 IF X(I)=&OD THEN X(I)=32:I=LTH:ELSE PRINT CHR$(X(I));
230 I=I+1:IF I>LTH THEN PRINT :GOTO 280:ELSE
240 GOTO 190
250 REM
260 REM CONVERT LINE AND SEND TO PRINTER
270 REM
280 PRINT #1
290 FORK=0 TO 7
300 FOR I=1 TO LTH
310 IF CHECK THEN OPT$=CHR$(X(I))
320 Z$(I)=BIN$(VPEEK(X(I)*8+6144+K),8)
330 FOR BIT=1 TO 8
340 IF MID$(Z$(I),BIT,1)="1" THEN PRINT OPT$;:ELSE PRINT " ";
350 NEXT BIT
360 NEXT I
370 PRINT
380 NEXT K
390 PRINT #0:GOTO 430
400 FOR I=1 TO LTH:X(I)=0:NEXT
410 I=1
420 GOTO 190
430 PRINT@0,16:INPUT"EXIT PROGRAM (Y/N) ";Q$
440 IF Q$="N" OR Q$="n" THEN CLS:CLEAR:GOTO 40

```

```

450 IF Q$="Y" OR Q$="y" THEN CLS:GOTO 940
455 BEEP:PRINT@0,16;SPC(30):GOTO430
460 CLS
470 PRINT@10,0;"JUMBO PRINT"
480 PRINT@10,1;"          "
490 PRINT"This program prints jumbo size letters made from letters
or keyboard characters"
500 PRINT
510 PRINT"A sheet of A4 paper will accept 10 characters"
520 PRINT
530 PRINT"A space counts as a character"
540 PRINT
550 PRINT"When asked for the line width enter the number of
characters(max 10 for A4 paper)"
560 PRINT
570 PRINT"When entering the line width remember that when you reach the
last character printing will start automatically"
580 PRINT@10,20;"PRESS ANY KEY":PRINTSPC(16):BEEP
590 KB$=INCH$
600 IF KB$="" THEN 590
610 CLS
620 PRINT@10,0;"JUMBO PRINT"
630 PRINT@10,1;"          "
640 PRINT"If for example you enter 10 for the line width but only want
8 characters you have to press enter to print"
650 PRINT
660 PRINT"It is useful to remember this in case you wish to centre your text
ie start with a space and end with a space"
670 PRINT
680 PRINT"At the screen prompt you can press a key to select a

```

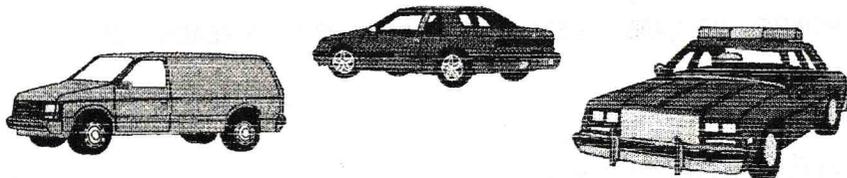
```

keyboard character to form your text"
690 PRINT
700 PRINT"If you press ENTER the text will be made up of letters of your text
eg T will be made up of the letter T"
710 PRINT@3,21;"PRESS ANY KEY FOR PROGRAM":PRINTSPC(15):BEEP
720 KB$=INCH$
730 IF KB$="" THEN 720
740 CLS:GOTO 40
750 REM TEST FOR PRINTER READY
760 A%=INP (&20) AND &1C
770 IF A%=16 THEN RETURN
780 IF A%<>28 AND A%<>12 AND A%<>8 AND A%<>4 AND A%<>0
THEN 790
790 CLS
800 PRINT@10,0;"JUMBO PRINT"
810 PRINT@10,1;"          "
820 PRINT@4,8;"*****"
830 PRINT@4,9;"* *"
840 PRINT@4,10;"* PRINTER NOT TURNED ON *"
850 PRINT@4,11;"* *"
860 PRINT@4,12;"* OR IS NOT ON LINE *"
870 PRINT@4,13;"* *"
880 PRINT@4,14;"*****"
890 BEEP10:FOR P = 1 TO 500:NEXT:BEEP10
900 PRINT@1,20:INPUT"PRESS ENTER WHEN PRINTER READY ";Z$
910 CLS:GOTO 760
920 RETURN
930 REM END OF PRINTER TRAP
940 RST:CLS40

```

- 950 PRINT@15,0;"JUMBO PRINT"
- 960 PRINT@15,1;"_____"
- 970 PRINT@15,2;"BIBLIOGRAPHY"
- 980 PRINT
- 990 PRINT" *****"
- 1000 PRINT" * *"
- 1010 PRINT" * FROM EINSTEIN MONTHLY *"
- 1020 PRINT" * *"
- 1030 PRINT" * VOLUME 1,5 *"
- 1040 PRINT" * *"
- 1050 PRINT" * BY BOB DRAPER *"
- 1060 PRINT" * *"
- 1070 PRINT" * ALTERATIONS/ADDITIONS *"
- 1080 PRINT" * *"
- 1090 PRINT" * S.J.GIBBS UKEUG 1158 *"
- 1100 PRINT" * *"
- 1110 PRINT" *****"
- 1120 PRINT
- 1130 PRINT" THIS PROGRAM IS ERASED"
- 1140 PRINT
- 1150 PRINTSPC(9);"40156 BYTES AVAILABLE":BEEP

1160 NEW



LETTERS

Dear Ted,

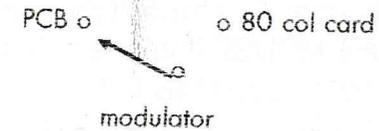
A small offering for the magazine which does not involve the use of fishing line or paper clips (YUK). (Well - to each his own. ED)

For use with a word processor or writing small programs I find my NEC mono TV as good as anything. I also use it for 80 column work where it gives a very acceptable picture. I have adapted one of my Einsteins to be switchable from 40 to 80 columns using the TV output. This does involve opening up the computer and cutting one lead to the modulator.

The connection to the modulator you need to identify is the junction of Q126 and R178. I cut the lead in the middle to give me a small amount of wire to solder to. The lead from the output of the 80 column card goes to one side of a single pole single throw switch. The other side of the switch goes to the lead from the PCB. The centre of the switch goes to the modulator. As you can see the switch then selects either the original connection (40 cols.) or the output of the 80 col. card. (80 cols.)

I used a rotary switch simply because it was to hand. I did this modification on a single drive machine and drilled the blanking plate that covers the second drive aperture in the centre to accept the switch. If you have a second drive fitted and use a miniature single pole single throw switch there should be a place near the modulator where this would fit.

I have tried this on a colour TV but the definition is not so good as on a mono TV.



The output using 80 columns into a TV is obviously not ideal but is useful for the odd half hour of programming.

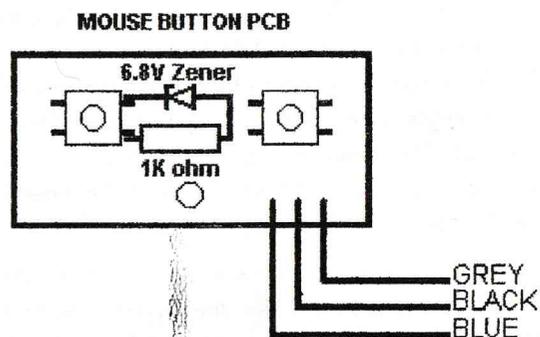
I hope this is of some use in a future magazine. All the best, STAN

Thanks .STAN. It was - as you see!

Another letter over the page.

Ref. AVON NEWS Vol.3 No.10 - EMSOFT
MOUSE MOD - Mike Pugh G4VPD

re. Mouse Art & Disk Tools - requirement for
mouse to be set for MODE 2 on power up and
before program(s) loaded



Ted - just a bit of paperwork catching up, thanks to
this "2 day 'flu" bug over Christmas - nothing as bad
as yours though! As I haven't the earlier articles on
this EMSOFT MOUSE it appears that "normally" the
lefthand mouse button has to be pressed whilst the
program(s) is loading as there's no point afterwards!

Little bit of thinking re. AMIGA mouse - the AMIGA
display screen is 640x400 pixels which "suggests"
that the TC01 program needs a 3:1 re-scale!

...sometimes the obvious? John M/

EINSTEIN MAGAZINE and all micro news No.97

Tony's Tail-End Tidy-Up

Apologies for the slippage in publication dates of your favourite magazine by a little over one whole complete issue. This won't affect how many you get for your subs, of course, and it was unavoidable in the context of a listed building with severe problems that I am responsible for sorting out as Technical Officer of our Historic Buildings Group, plus planning appeals which were the subject of a Public Inquiry, with me presenting the case as a raw amateur up against an impressive array of very experienced professionals. The Secretary of State's decision is imminent, so more next time.

As for other groups, the National Dragon User Group has gone under and the Sharp User Club has major problems this year with members not renewing and a lack of magazine input. They nearly folded, but are continuing for now with a much thinner mag, reduced to only two issues a year in future.

We suffer a continuous trickle of lost members too, but as we operate on a shoe-string we can continue as long as there is something to print in the magazine and someone still left to read it. Tony's unique membership system is far better at keeping members than others who "do it properly!"

If you are interested in the light railways of Col. H.F. Stephens, who ran his on a shoe-string as a private railway empire in the 1920's, why not try the Colonel Stephens Society too? They have a regular magazine, like ours - BUT EVEN BETTER!!! - details from Gateways, Bledlow Rd, Saunderton, Princes Risborough, Bucks. HP27 9NG (01844-343377)

We've just heard from Martyn Sherwood. He's still at 13 Rodney Close, Bilton, Rugby. CV22 7HJ. He's running the United Amstrad User Group as well as editing PD Power, CPC User and Amiga magazine ATM. He has some 3" floppy disks for sale if you need any, at £18 for a pack of 10, postpaid. Cheque or postal order payable to him at that address please.