CORTEX USERS GROUP

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10

CORTEX USER GROUP NEWSLETTER (MAY 1987)

Issue Number 10

CONTENTS

Welcome to the first Cortex newsletter produced by Tim Gray and Ted Serwa. We apologise for its late arrival but this is due mainly to the late handover from Kevin Holloway following newsletter 9, which really should have been published before January. Since announcing our intention to take over the group during February subscriptions have been trickleing in but there are still a lot to come. We have enough information for two newsletters at the moment and so will be producing Them almost at the same time. The next one will be produced as soon as enough material is at hand and from then on hopefully every two months.

The meeting of Cortex users held jointly with TI994A users was a great success in spite of the late notice. Tim Gray and Ted Serwa both had extensive Cortex systems on display showing hardware for external video interface, A.M.X. mouse interface, extended RAM + ROM, a high definition graphics card and lots of CRU based input-output systems. Software on display included Tims Drawtech drawing package plus Teds P.C.B design C.A.D. package and a multi-pass assembler editor. Also at the show with their Cortex machines were John Makenzie demonstrating his Wortex and Speltex package and Alan Badcock with his Disk Menue Generator system. Among the other visitors to the stand were Prem Holdaway from London Dave Hunter from Kent and O.W.Hulme from Hendsford. In fact it was such a good meeting we hope to hold another one later in the year.

We are very short of Program submissions at the moment so please have a look to see if you have anything that may be usefull to another member and send it in for printing in a future newsletter. If at all possible please try to send in Type-written articles or printed programme listings and remember to include your name and a short description of the programme.

We will start this issue off by trying to answer some of your letters sent in recently. Can you please note that if you require a personal reply a stamped addressed envelope must be included, the user group is none profit making and has not got the funds for extra postage. Also on the subject of postage we must ask any overseas members wishing to receive their newsletters by air mail to pay an additional £7.50 per six issues to cover the extra cost. This will make the total cost per year for air mail users £12.50.

LETTERS

Paul Sheridon. Dursley Glostershire

Is the series on machine code programming to be continued as I would like to learn more about it ?

Yes we hope to get some more articles from Kevin Holloway as soon as he can find time to write some.

Alen Badcock. Chandlers ford Hants.

Has anyone found a way of putting basic programmes in ROM. It would be nice to be able to load several programmes at once and switch between them. I am writing a batch file utility programme and also working on a simple multi-tasking program triggered from clock tics. Also does anyone know how to make the MDEX SAVEX command work so that compiled code can be run. Are the MPE 9901 parallel I/O cards still available.

There is a machine code program with details of how to save basic programmes in ROM and recall them using the * Command later in this issue. I don't know however how several could be loaded at once and pointers changed between them. The system pointers are held in such awkward places distributed throughout the Cortex memory map. It would however be possible for one Basic program to branch to another by using the * Command to load in the second program but any parameters would have to be passed by using some un-used memory location or possibly RAM-DISK.
We look forward to seeing your Batch file and Multi-tasking programmes when they are finished.
I don't know about the MDEX SAVEX problem, mayby some other user will know and write in with the answer. We have not had much user information on MDEX yet. The MDEX system its self and anything else from MPE should be available through the group as soon as we can find time for a trip to southampton to collect it all.

Ptrick O'Leary. Eire.

I would appreciate any information on fitting Disk Drives to the Cortex but understand that there is no operating system for the new controller yet.

Any shugart compatible drives can be fitted to the Cortex both 8" and 5" systems are in use. A version of CDOS is available now for the new controller and can be obtained from the group for £45.00. So far we do not have a good PCB design for the new controller although the circuit has been built and tested using wire-wrap techniques.

LETTERS

D.Raison. Hampshire

If anyone is interested I have a small program that allows the graphics mode of the VDP to be used as a 64 column screen. If anyone is interested I will supply a listing or tape. Can you still supply Cortex hardware especially the R.G.B. Kit.

We'r sure lots of people would be interested in your 64 column screen program, why don't you send it in along with anything else that may be of interest to other users. We can supply some Cortex hardware and will be issueing a list soon.

D.Fisher. Workington Cumbria.

Since I have had my Cortex I have had problems with the cassette interface even after trying several tape decks has anyone a fool-proof cure.

Lots of people have had problems with Cassette loading in the past. One suggestion is to add a 1nf capasitor between pins 1 and 2 of I.C. 70 and also to connect pin 3 to +5V. I use a diode clipper on the input and it seems to work on most offending tapes see short tips in this issue.

O.C.Walden

My system is based on 8" double density disks so I have been forced to " roll my own " as far as system software is concerned although I do have MDEX. I would love to here from anyone who has 8" drives for sale with or without case or P.S.U.

We don't understand why you have a problem with system software as both MDEX and CDOS work happily with 8" drives. Tim Gray has 8" drive capability on his Cortex.

P.D.Wrighton. Kent.

I would be interested in obtaining newsletters 1 to 4. Can you supply them ?

Yes all back issues are available from the group for £1.50 each. Also available as a back issue is M.P.E.s one and only newsletter, Brainstorm one.

LETTERS

R.J. Packer. Slough.

Can you supply any more information on any expansion boards especially the alternative disk controller. Also I have problems loading Cassette tapes.

We do have some alternative disk controller boards but at the moment there is a problem with the P.C.B. layout, although the circuit is correct. We will give more details in a future issue.

P.R. Cross. Kent.

I have a problem when running a program that uses a lot of Put and Get statements. After about 12 runs the error message :- " out of memory " is produced.

The early version of CDOS had this problem as it re-allocated space for the file variable for every disk access. In the new version 1.20 and later the problem has been cured. The updated version can be purchased from the group for £5.00. Please return your original master disk.

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VARIABLE LIST ROUTINE

This machine code routine can be used to list all variable names used in a Basic program. All the variable names are stored in encoded form with the program on disc or tape so this routine can be used as soon as the Basic program is loaded without having to run it all the way through first. One interesting thing I have noticed is that Power Basic creates a variable name if it encounters a spelling mistake when expecting a statement.eg. If LOST were typed instead of list a variable name of LOS would be created. The only way to get rid of these " phantom " variables is to do a source save and load.

VARIABLE LISTING DEMO

CALL 0F200H

SP	[912]	AD	
E	[6,3]	RH	
TH		PH	
D		CX	
CY		S1	
CO		TP	
SP		CP	
V	[4,3]	SV	[4,2]
Y		Z	
XE		YE	
ZE		S	[4,4]
J		N	[4,3]

```
 0 ;Variable listing programme
 1 ;by Tim Gray
 2 ;to use just type CALL <ENTRY>
 3 ;variables will be listed to
 4 ;all devices enabled
 5 ;unused dimentioned variables
 6 ;will be shown :-AGH[] etc
 7  ;
 8                          ORG     >F200
 9                  VNT     EQU     >EFBC           ;VARIABLE NAME TABLE
10                  NVD     EQU     >EFBE           ;NEXT VAR DEFINITION
11                  VLT     EQU     >EFBE           ;VARIABLE LOCATION
12                  BUFF    EQU     >FE50           ;DATA BUFFER
13                   ;
14 F200 04C2        ENTRY:  CLR     R2
15 F202 0206 0003           LI      R6,3            ;LOOP COUNT
16 F206 0207 FE50           LI      R7,BUFF         ;TEMP STORE
17 F20A 0208 0380           LI      R8,>0380        ;MASK FOR NUM
18 F20E C020 EFBC           MOV     @VNT,R0         ;NAME TABLE
19 F212 C2A0 EFBE           MOV     @NVD,R10        ;NEXT DEFINIT'
20 F216 6280                S       R0,R10          ;MAX NUM OF VAR
21 F218 0200 0008           LI      R0,8            ;OFFSET TO 1ST
22 F21C 04C9        GETNAM: CLR     R9
23 F21E C0C7                MOV     R7,R3
24 F220 0223 0004           AI      R3,>0004
25 F224 C120 EFBC           MOV     @VNT,R4
26 F228 A100                A       R0,R4
27 F22A C054                MOV     *R4,R1          ;GET NAME
28 F22C 1502        TSTDIM: JGT     TSTNUM          ;not dimentioned
29 F22E 0501                NEG     R1              ;NEGATE DIM'S
30 F230 0709                SETO    R9              ;IDENTIFY DIM'S
31 F232 2048        TSTNUM: COC     R8,R1           ;TEST FOR NUM
32 F234 1311                JEQ     NUM             ;yes numeric
33 F236 0241 7FFF   ALPHA:  ANDI    R1,>7FFF        ;CLEAR TOP BIT
34 F23A C081                MOV     R1,R2           ;COPY
35 F23C 0A82                SLA     R2,8            ;SHIFT TO ALIGN
36 F23E 0242 1F00           ANDI    R2,>1F00        ;ADJUST FOR
37 F242 0262 4000           ORI     R2,>4000        ;-  ASCII
38 F246 0282 4000           CI      R2,>4000        ;TEST FOR VALID
39 F24A 1601                JNE     NOTSP           ;ignor it-
40 F24C 1001                JMP     NXT             ;if no char
41 F24E DDC2        NOTSP:  MOVB    R2,*R7+         ;SEND TO BUFF
42 F250 0951        NXT:    SRL     R1,5            ;ALIGN NXT CHAR
43 F252 0606                DEC     R6              ;DEC LOOP COUNT
44 F254 16F0                JNE     ALPHA           ;LOOP FOR NEXT
45 F256 1009                JMP     BUFF4
46 F258 4048        NUM:    SZC     R8,R1           ;REMOVE CODE
47 F25A D081                MOVB    R1,R2           ;COPY
48 F25C 0922                SRL     R2,2            ;SHIFT TO ALIGN
49 F25E 0262 4000           ORI     R2,>4000        ;ADJ FOR ASCII
50 F262 DDC2                MOVB    R2,*R7+         ;SEND TO BUFFER
51 F264 0241 007F           ANDI    R1,>007F        ;MAX NUM 127
52 F268 2F41                XOP     R1,13           ;OUT THE NUMBER
```

```
53 F26A 80C7           BUFF4:  C       R7,R3           ;4 CHAR ?
54 F26C 1404                   JHE     NAMEND          ;YES
55 F26E 0202 2000              LI      R2,>2000        ;SPACE
56 F272 DDC2                   MOVB    R2,*R7+         ;SEND SPACE TIL
57 F274 10FA                   JMP     BUFF4           ;4 CHAR IN BUFF
58 F276 1000           NAMEND: JMP     DIM             ;
59 F278 C249           DIM:    MOV     R9,R9           ;TEST FOR DIM
60 F27A 1328                   JEQ     FORMAT          ;no
61 F27C 0202 5B00              LI      R2,>5B00        ;  "["
62 F280 DDC2                   MOVB    R2,*R7+         ;SEND OPEN BKT
63 F282 C160 EFBE              MOV     @VLT,R5
64 F286 A140                   A       R0,R5
65 F288 C055                   MOV     *R5,R1          ;GET VAR ADDR
66 F28A 1309                   JEQ     NPOINT          ;jump not used
67 F28C C0B1           GETDIM: MOV     *R1+,R2         ;GET DIMENTION
68 F28E 2F42                   XOP     R2,13           ;OUT DIM INT
69 F290 0202 2C00              LI      R2,>2C00        ;  ","
70 F294 DDC2                   MOVB    R2,*R7+         ;SEND COMMA
71 F296 C0B1                   MOV     *R1+,R2         ;TEST FOR END
72 F298 1101                   JLT     ENDB            ;yes
73 F29A 10F8                   JMP     GETDIM          ;LOOP FOR NEXT
74 F29C 0607           ENDB:   DEC     R7              ;BACK UP POINT
75 F29E 0202 5D00      NPOINT: LI      R2,>5D00        ;  "]"
76 F2A2 DDC2                   MOVB    R2,*R7+         ;SEND CLOSE BKT
77 F2A4 1013                   JMP     FORMAT
78 F2A6 04C2           PRINT:  CLR     R2              ;CLEAR FOR NUL
79 F2A8 DDC2                   MOVB    R2,*R7+         ;SEND NUL
80 F2AA 0002                   DATA    >0002           ;WRIT CRLF
81 F2AC 0FA0 FE50              MSG     @BUFF           ;WRIT BUFFER
82 F2B0 0206 0003              LI      R6,3            ;RELOAD R6
83 F2B4 0207 FE50              LI      R7,BUFF         ;RELOAD R7
84 F2B8 05C0           COM1:   INCT    R0              ;INC NXT NAME
85 F2BA 8280                   C       R0,R10          ;TEST FOR END
86 F2BC 1AAF                   JL      GETNAM          ;LOOP FOR NEXT
87 F2BE 0287 FE50              CI      R7,BUFF         ;IS BUFF EMPTY
88 F2C2 1302                   JEQ     END1            ;YES
89 F2C4 0FA0 FE50              MSG     @BUFF           ;NO PRINT IT
90 F2C8 0002           END1:   DATA    >0002           ;WRIT CRLF
91 F2CA 0380                   RTWP
92 F2CC 0287 FE64      FORMAT: CI      R7,>FE64        ;BUFFER FULL?
93 F2D0 14EA                   JHE     PRINT           ;YES
94 F2D2 0202 2000              LI      R2,>2000        ;SPACE
95 F2D6 DDC2           SNDSP:  MOVB    R2,*R7+         ;SEND SPACE-
96 F2D8 0287 FE64              CI      R7,>FE64        ;UNTIL HALF FUL
97 F2DC 1AFC                   JL      SNDSP           ;
98 F2DE 0206 0003              LI      R6,>0003        ;
99 F2E2 10EA                   JMP     COM1            ;NXT
```

VNT	EFBC	NVD	EFBE	VLT	EFBE	BUFF	FE50
ENTRY	F200	GETNAM	F21C	TSTDIM	F22C	TSTNUM	F232
ALPHA	F236	TSP	F24E	NXT	F250	NUM	F258
BUFF4	F26A	NAMEND	F276	DIM	F278	GETDIM	F28C
ENDB	F29C	NPOINT	F29E	PRINT	F2A6	COM1	F2B8
END1	F2C8	FORMAT	F2CC	SNDSP	F2D6	TSTDIM	F22C
NAMEND	F276						

CDOS - DISK INSPECT (DI) UTILITY

1. If like mine, your CDOS manual makes no reference to DI, and you are struggling in the dark may I attempt to shed some light on on the subject, for you.

DI

2. If you start by amending a copy of DI to match the listing below, I believe it makes it easier to use, and therefore understand.

3. The amendments do a number of things to DI:

a. It displays the Hex and ASCII values at the same time.
b. It accepts Hex values for the track & sector requests. Then displays the decimal values and the sector contents.

(1) To enter a decimal number, enter the number and press RETURN.
(2) To enter a Hex number start with a 0 end with a H and press RETURN. Note if the maximum number of digits is entered then the RETURN is automatic.

c. You can modify the contents displayed either on the Hex or the ASCII displays, the other display is updated as you make the modifications. Which display to modify is indicated by an arrow at the bottom of the screen.
d. The sector byte numbers down the left of the screen are in decimal. The number displayed being that of the first byte on that line. (0 to 127)

4. You should note that DI does not function for double density (DD) though it does work for double sided (DS) and 80T.

BASIC'S

5. CDOS will produce on a disk:

a.	40T Single Sided (SS);	40 tracks	(0 to 39)
b.	40T Double Sided (DS);	80 tracks	(0 to 79)
c.	80T " " (DS);	160 tracks	(0 to 159)
d.	Each track has	16 sectors	(0 to 15)
e.	Each sector has	128 bytes	(0 to 127)
	(DD has 256 bytes per sector)		
f.	Each byte has	8 bits	

(1) A byte of information is displayed on the screen by DI as a 2 digit Hex number or a single digit ASCII character.
(2) A Cortex Word is made up of 2 bytes. (16 bits)

g. Track 0 is always the BOOT strap track.
h. Track 1 is always the directory track.

6. Thus the LDIR indication of System Over Head of 32 sectors. (Blks in LDIR means sectors)

DISK DIRECTORY

7. You can now use the modified DI to see on the screen what follows:

8. Track 1 Sector 0: Bit map of sectors in use. See the User Mag´ 6 page 4 for explanation.

9. Track 1, Sector 1 to 15 is the disk directory, on each sector there is room for the details of two files. Thus the limit of 30 files that can be saved. (DD of course doubles this)

10. Detail of any one of these sectors is:

a. Bytes 0 & 1

00 00	means	Free slot.
A5 A5	"	Auto Run file.
5A 5A	"	Not Auto Run file.
FF FF	"	Sequential Relative Data file.
other	"	Random Relative Data file, and is the record length.

b. Bytes 2 - 9 Title of the file.

c. Bytes 10 & 11

00 00	means	File is Code.
other	"	File is Basic.

d. Bytes 10 - 31 See User Mag 6 page 4.

e. Bytes 32 - 35 Contain the file disk locations for the first portion of the file.

32 & 33	XX XY	XXX Track number in Hex. Y Sector number in Hex.
34 & 35		Total number of sectors in this portion of the file.

(1) The following 7 batches of 4 bytes are the same, giving a total of 8 portions that any file can be split up into to fit it on a disk.
(2) With this modified DI you can input 0XXXH direct to the track request and also 0YH to the sector request. (To reset the sector you press R or RETURN to the command request)

f. Bytes 64 - 127 Next file entry slot.

11. Now that you know what each byte means and also how to find your files on the disk, you can happily move about the disk and make modifications.

12. From the command request mode, select whether you want the next sector (press I), the last sector (press D), to modify in Hex (press H) or in ASCII (press A). Then press M to modify. You now use the arrow key to select the byte to modify. Once on the byte change it as you require then:

a. RETURN passes the changes to the disk and returns you to the command scanner.
b. ESCAPE aborts the program ie. the changes are not passed to the disk. (type RUN then reselect the sector)

13. Note you see how the changes are affecting the other display as you make them.

"MODIFIED DI BY J.MAKENZIE"

Note " ↓ " is produced by GRAPH + SHIFT + 1 KEYS

```
100  TEXT : ? @(1,17);"CDOS disk inspect utility  1.1 (C) 1985"
110  ? @(0,23);"  [Ascii, Dec, Hex, Inc, Mod, Reset]";
115  ? @(16,22);"!"
120  DIM X[4],B[50]: $M="H"
130  AX=ADR[X[0]]: AB=ADR[B[0]]
140  MWD[AX]=0420H: MWD[AX+2]=06260H
145  MWD[AX+4]=0D8C6H: MWD[AX+6]=02H
150  MWD[AX+8]=0380H
160  ? @(0,19);" Drive     ": ? " Track       ": ? " Sector      "
165  ? @(11,19);: INPUT #1;D
167  IF D>3 THEN GOTO 165
170  ? @(8,20);: INPUT #4;T
180  IF T<0 OR T>159 THEN GOTO 170
190  ? @(9,21);: INPUT #3;S
200  IF S<0 OR S>15 THEN GOTO 190
205  GOTO 470
210  E=0
220  CALL AX,D,T,S,ADR[E],AB,0,0
230  IF E<>0 THEN ? @(16,19);"READ ERROR";#E/256 LAND 03FH: GOTO 350
240  ? @(16,19);"                    "
250  BB=AB: CB=AB: ? @"H";
260  FOR R=0 TO 15
270   ? #"000"R*8;"  ";
280   FOR C=0 TO 7
290    ? #;MEM[BB];" ";
310    BB=BB+1
320   NEXT C
325   ? " ";: GOSUB 515
330   ?
340  NEXT R
350  ? @(20,20);"          ";: ? @"10L";: INPUT "Command"#1,$K;
360  IF $K="I" THEN S=S+1: GOTO 430
370  IF $K="D" THEN S=S-1: GOTO 430
380  IF $K="" THEN GOTO 160
390  IF $K="A" THEN $M=$K: ? @(0,22);"      !             ": GOTO 350
400  IF $K="H" THEN $M=$K: ? @(0,22);"                   ! ": GOTO 350
410  IF $K="M" THEN ? @(26,22);"↓": GOTO 720
420  GOTO 160
430  IF S<0 THEN T=T-1: S=15
440  IF S>15 THEN T=T+1: S=0
450  IF T<0 THEN T=0
460  IF T>159 THEN T=159
470  ? @(8,20)#"0000"T: ? @(9,21)#"000"S
480  GOTO 210
490  CALL AX,D,T,S,ADR[E],AB,0,0FFH
500  IF E<>0 THEN ? @(20,19);"WRITE ERROR";#E/256 LAND 03FH
510  GOTO 350
```

```
515  FOR C=0 TO 7
520   IF MEM[CB]<020H THEN $Q="."
530     ELSE $Q=%MEM[CB]%0
540   ? $Q;
545   CB=CB+1
546  NEXT C
550  RETURN
560  BB=AB: R=0: C=30
570  IF MEM[BB]>01FH THEN $SS=%MEM[BB]%0
580    ELSE $SS="."
590  ? @(C,R);$SS;: ? @"L";
600  K=KEY[0]: IF K=0 THEN WAIT 1: GOTO 600
610  IF K=08H THEN C=C-1: BB=BB-1
620  IF K=09H THEN C=C+1: BB=BB+1
630  IF K=0AH THEN R=R+1: BB=BB+8
640  IF K=0BH THEN R=R-1: BB=BB-8
650  IF K=0DH THEN ? @(26,22)"  ": GOTO 490
660  IF K>01FH THEN MEM[BB]=K: GOTO 1000
670  IF C<30 THEN C=37: R=R-1
680  IF C>37 THEN C=30: R=R+1
690  IF R<0 THEN R=15: BB=AB+127
700  IF R>15 THEN R=0: BB=AB
710  GOTO 570
720  IF $M="A" THEN GOTO 560
730  BB=AB: R=0: C=5
740  ? @(C,R);#;MEM[BB];: ? @"2L";
750  K=KEY[0]: IF K=0 THEN WAIT 1: GOTO 750
760  IF K=08H THEN C=C-3: BB=BB-1
770  IF K=09H THEN C=C+3: BB=BB+1
780  IF K=0AH THEN R=R+1: BB=BB+8
790  IF K=0BH THEN R=R-1: BB=BB-8
800  IF K=0DH THEN ? @(26,22)"  ": GOTO 490
810  IF K>02FH THEN IF K<03AH THEN GOSUB 880
820  IF K>040H THEN IF K<047H THEN K=K-7: GOSUB 880
830  IF C<5 THEN C=26: R=R-1
840  IF C>26 THEN C=5: R=R+1
850  IF R<0 THEN R=15: BB=AB+127
860  IF R>15 THEN R=0: BB=AB
870  GOTO 740
880  K=MOD[K,16]
890  MEM[BB]=MOD[MEM[BB],16]*16+K
892  XX=(C-5)/3+30
894  IF MEM[BB]<020H THEN $Q="."
896    ELSE $Q=%MEM[BB]%0
898  ? @(XX,R);$Q;
900  RETURN
1000  XX=(C-30)*3+5
1010  ? @(XX,R);#;MEM[BB];
1020  GOTO 570
```

CORTEX USER GROUP 27.02.87 TIM GRAY

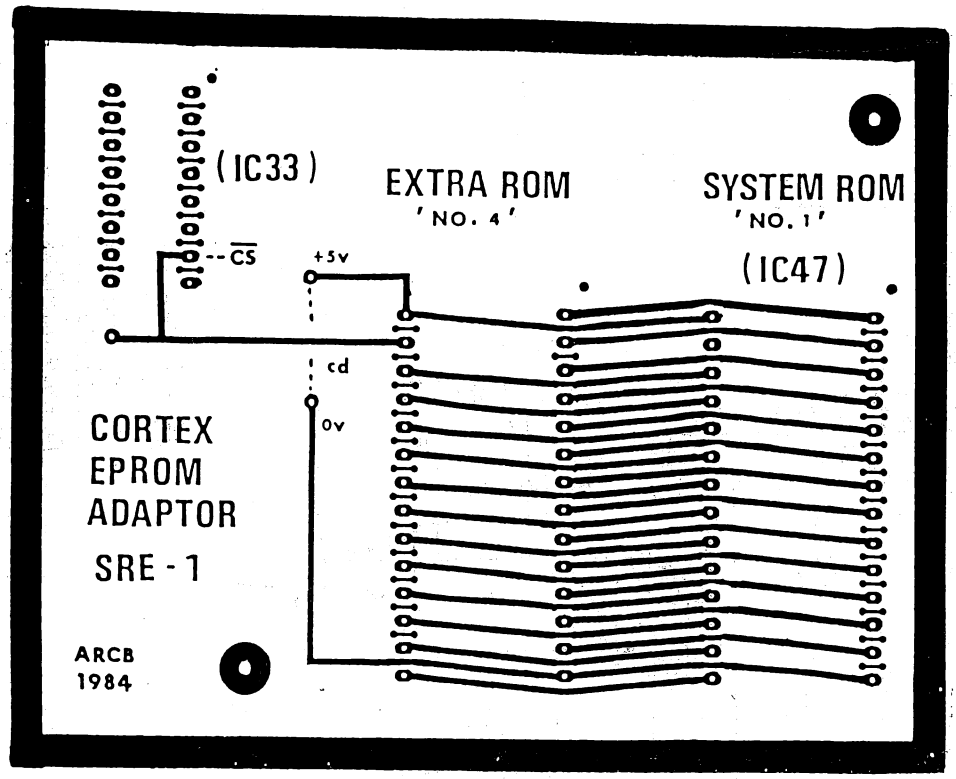
*** STAR BASIC ***

ROUTINE FOR LOADING A BASIC PROGRAMME FROM EPROM AS A * COMMAND

The header block is the same as in the disc directory
The programme is saved from 2090 up to 2090+load length

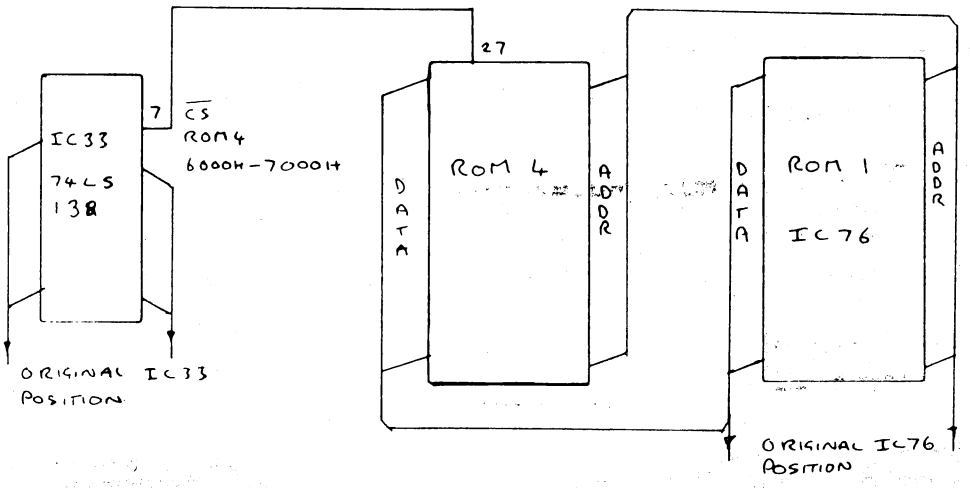
```
       2000 94C2                          ; EPROM IDENTIFIER
       2002 3FFF                          ; NEXT *PROG
       2004 2016                          ; START ADDR OF THIS ONE
HDR:   2006 5053                          ; NAME
       2008 5749                          ; "PSWING"
       200A 4E47                          ;
       200C 0000                          ;
PTR:   200E 0D5A                          ; POINTERS (EFBA-ED04)
       2010 0F40                          ;          (EFBC-ED04)
       2012 0042                          ;          (EFC0-EFBE)
       2014 0FC4                          ; LENGTH   (EFC0-ED04)
START  2016 C120 MOV  @>ED04,R4           ; BASIC PROGRAMME LOAD ADDR
       201A C0E0 MOV  @>2014,R3           ; LOAD LENGTH
       201E 0200 LI   R0,>2090            ; PROGRAMME START
       2022 DD30 MOVB *R0+,*R4+           ; LOAD THE PROG
       2024 0280 CI   R0,>4000            ; CHECK IF PROG IS OVER THE
       2028 1A05 JL   >2034               ; 8K LIMIT AND
       202A 05A0 INC  @>F106              ; INC THE MAPPER IN 4K BLOCKS
       202E 0205 LI   R5,>1000            ; IF REQ'D
       2032 6005 S    R5,R0               ; RESET PTR TO NEW 4K BLOCK
       2034 0603 DEC  R3                  ; END ?
       2036 16F5 JNE  >2022               ; NO BACK FOR MORE
       2038 0202 LI   R2,>200E            ; CALCULATE SLT
       203C C0F2 MOV  *R2+,R3
       203E C060 MOV  @>ED04,R1
       2042 A0C1 A    R1,R3
       2044 C803 MOV  R3,@>EFBA           ; STORE SLT
       2048 C0F2 MOV  *R2+,R3             ; CALCULATE VNT
       204A A0C1 A    R1,R3
       204C C803 MOV  R3,@>EFBC           ; STORE VNT
       2050 C804 MOV  R4,@>EFBE           ; CALCULATE VDT
       2054 6832 S    *R2+,@>EFBE
       2058 C804 MOV  R4,@>EFC0           ; STORE VDT
       205C 020E LI   R14,>3EF2           ; AUTO RUN RETURN
       2060 020D LI   R13,>F0DC           ; BASIC WP
       2064 02CF STST R15
       2066 020B LI   R11,>0202           ; MAPPER RESET VALUES
       206A 020C LI   R12,>0303
       206E 020A LI   R10,>F104
       2072 0200 LI   R0,>03C0            ; ( CKOF )
       2076 0201 LI   R1,>CE8B            ; ( MOV R11,*R10+ )
       207A 0202 LI   R2,>C68C            ; ( MOV R12,*R10  )
       207E 0203 LI   R3,>0380            ; ( RTWP )  AUTO RUN
       2082 0440 B    R0

PROG   2090                               ; PROGRAMME SAVED HERE
```

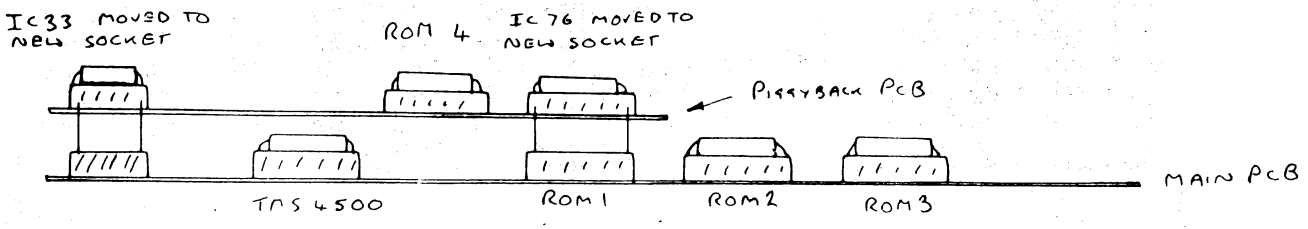
Alen Badcock from Chandlers Ford has sent in this design for a piggy-back board to allow an extra system ROM to be fitted to the main board. All the ROM socket lines from ROM1 are paralleled to ROM4 exept for -CS4 which comes from pin 7 of IC33, If wire-wrap sockets are used for IC33 and IC76 on the piggy-back board the P.C.B. will plug into the old IC33 and IC76 sockets. The new ROM is mapped in between 6000H and 7000H when ROM select is on.



cd = 100nF

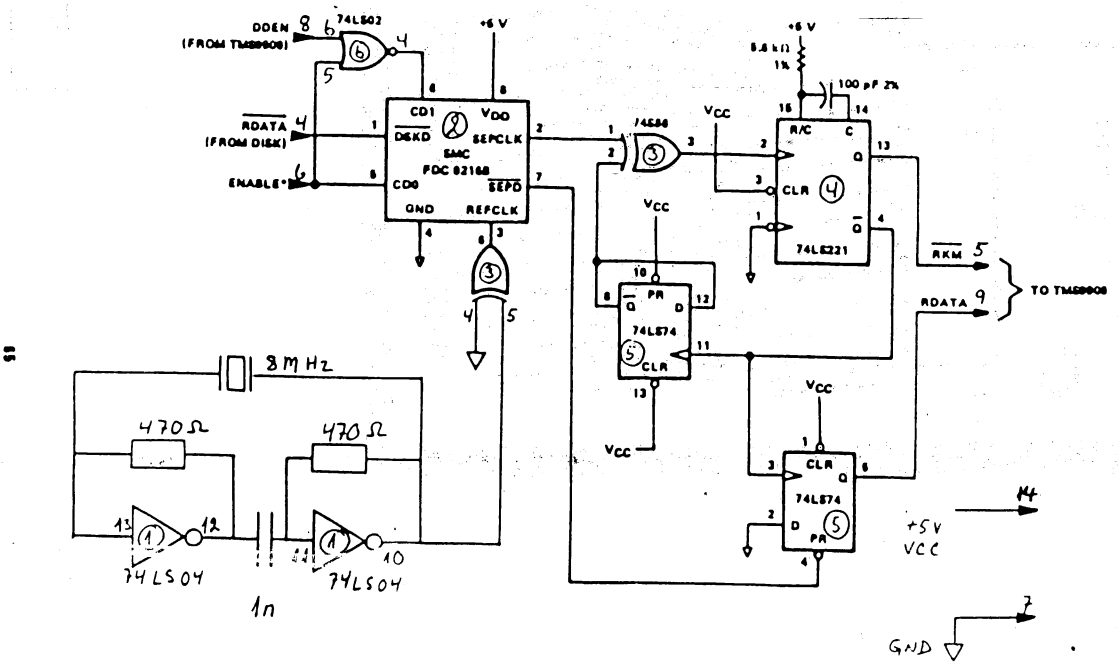
SCALE x2
APPR'D
TRACED
DRAWN
SEVENSOFT
DRG. No. CA005-1/pcb
TITLE
Cortex Eprom Adaptor SRE-1





Soeren Rahbek. from Denmark sent in this circuit diagram and P.C.B. layout for a better data seperator for the TMS9909 floppy disc controller. He also sent in some double sided P.C.B.s for it which are available to anyone who has some software or hardware to swap for them. If you want one send your swap to the user group and we will pass it on. The FDC9126 data seperator is available from Manhatten Skyline.

No	TYPE	+5V	GND
1	74LS04	14	7
2	FDC9216B	8	4
3	74S86	14	7
4	74LS221	16	8
5	74LS74	14	7
6	74LS02	14	7
88	STIK	14	7



Remove IC88 and make following changes on main board !

Disconnect:

IC76 pin 26 to IC69 pin 9

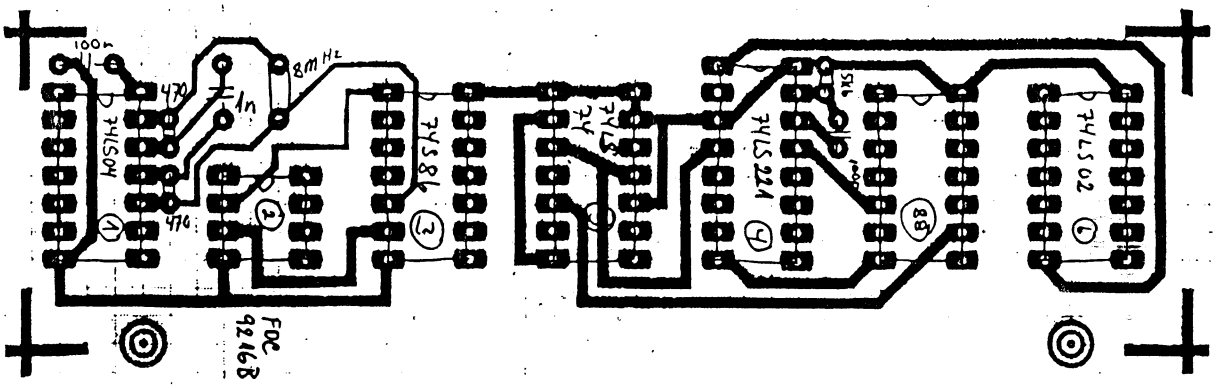
► IC 88 PIN NUMBERS

Connect:

IC77 pin 4 to IC88 pin 8
IC87 pin 4 to IC88 pin 6
IC76 pin 26 to IC88 pin 5

Plug DATA SEPARATOR PC board in IC88 socket ! and you are in the air.

No more disk error any more
****



SHORT TIPS

D. Fisher sent in the following:-

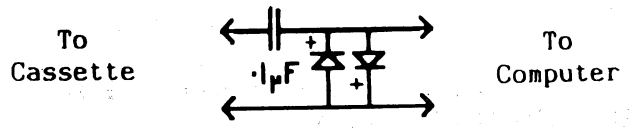
To change the RS232 port to 8 bit change memory location 5546 from 62F1 to 63F1.

To change the cursor character change memory location 5530 from 007F to the ascii code of the preferred character.

Use the following to replace the standard microsoft statement CHR$( ) when entering listings from magazines.

```
5 REM EQUIVALENT OF CHR$( )
10 DIM $A(256)
20 FOR A=0 TO 255
30 $A(A)=%A    !$A(A) IS USED INSTEAD OF CHR$(A)
40 NEXT A
```

Tim Gray uses the following to improve cassette loading



The diodes clip off any modulation distortion caused by mains hum etc.

The value of workspace pointer for Interrupt 1 is incorrect to set things right change location 0004 from ED24 to ED22 this will allow the Interrupt 1 user vector to be used.

Alen Badcock sent in the following :-

To cure a problem with the cassette motor relay not functioning correctly try changing R24 to 10K and R43 to 2K2 also a diode fitted across the relay coil may help, cathode to +V.

A bug in the re-number routine can be cured by changing memory location 2F3E from 1006 to 1007.

The 9909 disk controller timings can be changed directly by the following program. It sets it for 50MS step 35MS settle and 0MS load. The routine may be usefull to people who have trouble booting CDOS for the first time before using Config.

```
10 MEM F140H = 050H
20 MEM F141H = 015H
30 MEM F142H = 011H
40 MEM F143H = 047H
50 MEM F144H = 064H
60 MEM F145H = 046H
70 MEM F146H =   0H
80 MEM F147H = 0A5H
```

CORTEX USERS CLUB SALE

RGB INTERFACE	BARE BOARD £8.00	KIT £20.00
CENTRONICS INTERFACE	BARE BOARD £7.00	KIT £15.00
E BUS -ALL IC'S		KIT £30.00
E BUS BACK PLANE		£15.00

SEMICONDUCTORS

TMS9901	£3.00
TMS9902	£3.00
74LS612 (3 AVAILABLE)	£25.00
74LS611/74LS611 (NEED PULL UP RESISTORS)	£15.00

E BUS EXPANSION

E BUS (4K RAM,8K EPROM SCKT,16 IN/OUT LINES)	£15.00
NOTE-THESE CARDS ARE EX EQUIPMENT TESTED AND WORKING	
E BUS (8*8K EPROM SCKT CARD BUILT NO EPROMS FITTED)	£28.00
E BUS 512K DRAM(ONLY AVAILABLE COMPLETE AT PRESENT)	£100.00

CORTEX EXPANSION

EXTERNAL VIDEO INTERFACE	BARE BOARD £15.00	KIT £80.00
DISK CONTROLLER (WD 2797+BOARD)		£40.00

CORTEX SOFTWARE

DISK OPERATING SYSTEM CDOS 1.20 AND 2.00	£45.00
CDOS 1.20 FOR 9909 SYSTEM	
CDOS 2.00 FOR 2797 SYSTEM	

MEMBERS SOFTWARE

WORTEX-WORD PROCESSING £15.00
INCLUDES SPELLING CHECKER
SEND TO J S MACKENZIE
4 WERSTAN CLOSE
MALVERN WR14 3NH
(INCLUDE TWO 5" DISKS)

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1 LARKSPUR DRIVE
FEATHERSTONE
WOLVERHAMPTON WEST MIDLANDS WV10 7TN

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