

C65 info (15)

Message #4139 "Commodore"

Date: 07-Mar-94 03:59

From: Tplug Sysop

To: Alan Share

Subj: C65 Engine..

-> Please, please, keep it coming!!

-> Never get sick of looking at '3 barz' .....I want some more!!

hehe.. If I had not been distracted with moving, personally, I would have done some more. I did do one other that I really shodso comp.sys.cbm. It didn't come exactly as I would have liked but still is pretty colourful.

Kinda Amazing that the stuff made it way down there. Did you make up a wee booter file for 3+barz?

```
10 dv=peek(186)      rem yup, workz on a c65!
20 bload "ml.3barz" on u(dv)
30 sys 1024
```

..you could actually print some stuff on screen with Basic'z print, just for fun. Watch out for using the l.grey colour as that is the one I used to define all those other colourz in the barz. Hrm.. 94 colourz? Soundz right.

I'll be posting the hi-speed termz shortly and "colour+scroller" soon.

I>ug..

--- FidoPCB v1.5 beta-'e'

\* Origin: CRS Online, Toronto, Ontario (1:229/15)

Again, for the record;

I>ug I2odger, 20 Macdonell Ave, Toronto, Ont., Canada. 416+588+9071 voice and I-[ighllander BBS, a few blocks from the original home of Commodore ..at 416+588+0922, 3/12/2400, C= CG/ASCII/ANSI.

Toronto Pet User Group;

5334 Yonge St, Box 116, Willowdale Ont., Canada. M2N 6M2

TPUG BBS 1, 905+273+6300, on PC PunterNet, Node 2.

TPUG BBS 2, 416+733+4880. TPUG voice 416+253+9637..

And signed as alwayz..

I>ug..

--- FidoPCB v1.5 beta-'e'

\* Origin: CRS Online, Toronto, Ontario (1:229/15)

Message #4144 "CBM-128"

Date: 07-Mar-94 19:56  
From: Tpug Sysop  
To: Russell Alphey  
Subj: Commodore c65 ..more!!

```
-> > a=dec("d0B0");forx=.to10:poke a,64:fory=.to50:nE:poke a, >  
-> .:fory=.to50:nE:nE
```

It should just make your drive lite flash. It won't work from c64 mode, just from c65.

What ROM version do you have? Mine is 91.0111.

```
-> > 20 poke a,128+64+0+16+0+4+2+1+c
```

..sorry about that! They should all be differant numberz as you surmised. The "C" and "D" variables are not initialized, true. When I wrote this, and left it in, I was still "twiddle'n" bitz! So \*I\* could say "c=32:goto10" or "c=-128:goto10".. Whatever.

It must have been realy late, again, when I typed it all out or perhaps I was getting dizzy from looking at the c65 behind me as I typed! I'll re-do it shortly. Unless of course I find a resolve... :)

Did you chat me on the InterNet..? My EMail to you bounced back.

I>ug..

```
--- FidoPCB v1.5 beta-'e'  
* Origin: CRS Online, Toronto, Ontario (1:229/15)  
Message #3329 "Commodore"  
Date: 24-Feb-94 02:27  
From: Tpug Sysop  
To: George Page  
Subj: C65 Engine..
```

```
-> Actually, I don't know which chip is the MPU in the doggone thing. Fred  
-> Bowen said it used a CSG65CE02, but I ain't got one of them. In fact,  
-> there's no chip at all in there that has a "65" anywhere in its' ID.
```

There are two very large chipz for the c65, and one other for the drive. These are integrated onez!

One containz, CPU, 2xCIA and ACIA. The other containz the VIC III, DAT and a frankenstien MMU. Possibly something else too..

One drawback; get the idea of zapping yer joy/port and blowing a CIA..? Welp, it would then zap the whole CPU/CIA/ACIA package!! ..ew!

Do you think we ought to drop some of the c65 in this conferance?

'C65 REV (13)'  
IN 6Mat Buffer

From: litz@cs.uwp.edu (Jeffrey Litz)

Subject: Re: C65 (C64DX)  
Organization: University of Wisconsin - Parkside  
X-Newsreader: TIN [version 1.2 PL2]  
Date: Thu Mar 03 21:22:43 MST 1994  
Lines: 34

: >I already have one with a 1meg expansion. Too bad it was standard with

: Where'd you get it, or did you make it yourself? If so, how about posting  
: the details so that the rest of us can make one too! ;)

These are all the numbers on the board:

COMMODORE ELECTRONICS AWK 313384 Rev 0.3  
C65 RAM EXPANDER ABSY 313381  
FAB 313383

: >only 128K ... a 320x400 8bitplanes display eats just about all of that,  
: >especially with how the bitplane pointers work.

: Then you've seen I>ug's "demo"? ;)

No, actually I wrote a picture display program to view images from my Amiga.

I think the 4510 microcontroller chip is pretty cool... an enhanced 6502  
microprocessor, four independent 16bit timers, two 24 hours TOD clocks  
with alarms, full-duplex programmable baud rate UART, memory map  
functions access up to 1 meg of ram, 2 8bit shift registers, and 30  
programmable I/O lines.

End of article 15898 (of 15901) -- what next? [npq] comp.sys.cbm #15899 (2 more)

later prg would need. So one like "slider" does not enable "one+bit+plane".  
[Please re-post this, full versions will be done and made available shortly  
after I finish my current documenting stretch..]

On Fri, 29 Apr 1994, Jeffrey Litz wrote:

> > Jeff? Who's that? Is he on our mail list??

>

> Yeah - that's me.

Hi Jeff! Why not tell us all a little about yourself and your 65?!

> > > one of 50 developers kits " Nothing said since then to indicate

> >

> > A developer kit? What was in it?? Will he part with any of it??

>

> Actually, I said it one of only a couple hundred of the prototypes produces  
> for developers to write software on.

>

> For those who don't know:

>

> ROM 910612A

> 1 meg RAM expansion

> Serial # 000046

>

> and documentation about all the chips and most of the BASIC commands.  
You have this?

Can you possibly part with copies of any/every-thing? The rest of the C65  
owners would worship you forever! ;)

Photocopies of any documentation, plus schematics of the RAM expansion,  
plus a disk copy of the ROM, would all be welcomed!

Naturally we'd pay your costs!!

~~DEP~~ C65 (17)

Subject: C65 DOS chip...  
Date: Sat Apr 30 14:10:52 MDT 1994

To let everyone know, supposedly (from a reliable source), the latest DOS ROM rev in the C65's was FO 11-F. (this is the 390491?). Also a Shift/d is supposed to do sort of a "super validate". Also supports BR and BW. B-S does a block status check. Tells if sector is in use. Also supports up to 255 partitions (/:/:/:...). I haven't tried any of this yet, so caveat emptor.

George Page Commodore Enthusiast ("Collectors" get hit with higher prices)

Subject: c65 Vic iii  
From: tpug.sysop@canrem.com (Tpug Sysop)  
Distribution: world  
Date: Sat Apr 30 02:25:00 MDT 1994  
Organization: CRS Online (Toronto, Ontario)  
Lines: 276

Well I am back, sort of.. I moved! ..and my SwiftLink blew, right in the middle of a call with R.Alphy's friend! [Australia to Canada!] Now I am limping along at 9600 again. [ewW!] ;)

Just when I was finally getting the various bits of the VIC iii sorted out ..I got some documentation! ..darn! So much work out the tubes.. ;<

..so with previous experiance and some more clues from the documentation we have;

[===] VIC iii [=====]

```
$d030 ;control reg' a [default $20]

bit 0 ;CRAM @ DC00 this will knock out IO stuff so you can get at the second
      1,000 bytes of Colour RAM in the +logical+ area.

  1 ;External Sync, GenLock related, also so you can use the sync in yer VCR
  2 ;Palette enable. Custom colour is turned on.
  3 ;ROM @ 8000 [like c64 basic extentionz]
  4 ;ROM @ A000 [basic replacement]
  5 ;ROM @ C000 Magic c65 D/S inter-bank-interrupt handler, always set!!
  6 ;CROM @ 9000 Alternate Charset! [mostly just lower case shortend]
  7 ;ROM @ E000
```

```
$d031 ;control reg' b

bit 0 ;Interlace enable, can be used w/out v400 bit to take out dots between
      the pixels.
```

```
  1 ;Mono, turnz off crominance in NTSC/PAL output for B&W TV..
```

```

2 ;H1280, each pixel on screen is split into two BIT PLANEz!
3 ;V400, needs BitPlane and Interlace bitz
4 ;BitPlane enable, over ridez c64 type grafix modez
5 ;Attribute enable, yes you can even have a BitPlane FLASH!
6 ;FAST.. :)
7 ;H640, 40/80 bit switch

```

Some pretty funky combinations can be had, like a separate MONO screen on your composite output, a 320 and 640 BitPlanes on screen together.

```

$d032 ;Bit Plane # enable. Like the Sprite enable, one bit per. [0-7]
      [Sprite collision detected on BP2]

```

```

$d033-d03A ;BitPlane Adress's. [BP0-BP7]

```

If you just look at the lower nyble, then EVEN BP is in EVEN RAM Bank. [odd BP in odd RAM] BP0 in RAM0, BP1 in RAM1 and BP2 in RAM0 ..etc.

If you put the offset address in the upper nyble its in the other bank! To confuse us further the lowest bit of each nyble is un-used. To set matterz clear the number reflects the block! [4=\$4000 !!]

```

$d03b ;Complimentary bit for each BP ..uh, reverse. Also sets an offset into
the Palette RAM. If you have 4 BitPlanes enabled, you have 16 colours [0-15],
if you then set the 5th bit [bit 4] your colour palette is from 16 to 31!
Thus if you have 4 BitPlanes you can have 16 palette sub-mix'z!
[see $d100 for definition of what colour *IS*]

```

```

$d03c/3d ;DAT Control, BitPlane Coordinatex X/Y
Asuming you have BP's enabled and thier adress's set, you then write the x/y
coordinates you want here. Column and Line. [0 to 39 or 79 columnz,
0 to 199 linez [400 lines = 2 BitPlanes interlaced]]
The bytes at those coordinates will appear in the registers $d040-d047.
[DAT=Direct Address Translator]

```

```

$d03e/3f ;Horizontal and Verticle Position of Screen Map area.
The bit values here are just like the "old" single byte BRANCHing values.
Zero being center, then offsetting up to +128 to -127. [slick..]

```

```

$d040-d047 ;DAT Portz
The bytes at the coordinates you specified in DAT Control [d03c/3d] will be
visable here. [Not a copy] Read and write to them as you please! [see note on
Screen Updates] Only the BP's enabled will have valid bytes, of course.

```

```

$d080 Drive Controler [later!]

```

Palette RAM Pages \$d100, d200 and d300 [red, green and blue]  
The c64[or text] colours are the first 16 in each page. The bits of the BitPlanes stacked up form an Offset into the palette.  
The standard 16 colourz are also an Offset into the Palette.  
\*\* \$d100 is 5 bitz wide! With this 5th being the Fore/Background bit, it also ties into MONO somehow.



Colour/Attribute RAM \$d800-dfff or 1f800-1ffff!  
Bitz 0-3 ;colour index into Palette.

- 4 ;Blink [FLASH!]
- 5 ;Reverse, if you use this directly then the "reversed part" of the character set is not needed and can be used for a second set!  
[the c128 also has this PLUS a cset bit allowing 4 sets!]
- 6 ;Highlight! A +16 offset into Palette, not sure where the background colour offset is. [prolly +32!] Try <ESC s> while typing on screen!
- 7 ;UnderLine

Flash+UnderLine=Flashing Underline ..etc, many combinationz!

[===] Bit Planes [=====]

First off they are layed out like we all love and hate on the c64, non-linear. Some call'em Cardz or Cellz. With the Colour number being stacked across the BitPlanes, vertically if you will allow me that refferance point!

Letz configure 4 Bit Planes, 640x200. I put each at 08000, 14000, 0c000 and 18000. This keeps them out of the way of thingz, mostly. [I did not move or alter Basic Text or Variable pointerz, so these could mess thingz up]

Now letz get the idea we want to set a couple of pixels to a colour in the top left of the screen. Just think of the gyrations we have to go through to get hold of one byte at each of 08000, 14000, 0c000 and 18000! Stagger'd across banks! ..roll in the DAT!

Write in the coordinates we want instead! [0,0 into d03c/3d!]

Now we can read in the bytes from the 4 BitPlanes in \$d040-d043 and copy them to here, translating them to binary just to make them easily readable;

76543210 ;bit number

```
01010101 ;BPO, [real adr @ 08000]
00110011 ; 1          @ 14000
00001101 ; 2          @ 0c000
00000011 ; 3          @ 18000
```

..to get our colour index number we need to look at them vertically! Bit 7 is our pixel on the top left of the screen. All the bit 0'z in the four bytes are a 0 so our index is combinded to give us 0 or Black using the default colourz.

```
Bit 6 has 1, bit 4 has 1 and bit 1 has 0
      0           1           1
      0           0           0
      0           0           1 ..etc.
```

These would be values 1, 3 and 10 [\$a], respectively.

..so our first 8 pixels will be black, white, red, cyan, purple, green, light red and light gray.

Setting them to a colour \*WE\* want is going to be a real pain!

[==] \*\*\* [=====]

Programming challenge #1: Set a pixel to a colour.

\$400 =bitplanex ;number of bitplanes enabled.

LDA colour ;0-255

LDX <column

LDY >column ;0-639

```
LDZ line ;0-199
JSR set+pixel+colour
```

..anybody have a spirograph type plotter to go before this subroutine?  
Please!! [640x200x4+bit+colour or 320x200x8+bit+colour!]

[===] VIC iii Notes [=====]

If VIC iii Modes are changed, they will only occur at the end of the current CHARACTER ROW. [every eighth raster line!] DAT registers/ports will not be valid until this time as well.

All c64 grafix modes are valid with "logical" 80 column/640 pixel extentions! [40/80, Screen RAM 1000/2000 with Sprite pointerz at the respective 1k/2k ends, Colour RAM \$d800-dbff/d800-dfff]  
Need to set CROM @ dc00 in Control A Register to access second half in I/O map, or directly in physical location \$1f800-1ffff.

320 pixel Multi-Colour mode on 80 column screen is valid.

Sprite proportions do not change in \*any\* mode. [x/y expanded as normal]  
Valid Sprite coordinates are 320x200. In BitPlane Modes spritez colide with bit plane 2. [Best not invert it with Complimentary register!]

Bit 4 of \$d018, is invalid in 80 column mode. [Locate charset]  
[8 valid locations for 80colz, 16 for 40colz]  
[Similar limit with 640 bit-MAP, lower bit invalid]

The 24 Text Line mode can be used in even 640x400 to give you 640x384!  
[quick flip of calculator, hrmm you will need to as 640x400 leaves only 5 sprite blocks! Some could be the same I guess]

Mixing 1280 and 640 pixel bitplanes is possible, not sure HOW I did it though.. :)

In text mode <ESC s> turns on Highlight Attribute, the colours can be anything with and offset of 16 to 31 in Palette RAM.  
so.. PRINT"<white><ESC>s"+a\$ ..will print a\$ in colour 1+16=17. Poke \$d111, d211 and d311 with whatever R.G.B. values you want!

Special Note, VIC ii modes only have 0-15 valid colours. [Spites ..etc]

VIC ii modes can have interlace turned on but image is the same on both. It does help smooth out the image though.. No 400 line versions of VIC ii modes.

[===] Opcode Tease! [=====]

Zero Page can be moved \*anywhere\* in Memory.

```
LDA page#
TAB ;ding..!
```

Bring it back..

```
TBA ;ding..!
;Now you can check A to see *where* it was, in case you didn't know ..haR!
```

[==-

Stack pointer is 16 bit.

```
TSX ;sp-lo to x
TSY ;sp-hi to y
```



```
TXS    ;x to sp-lo
TYS    ;y to sp-lo
```

If NMI or IRQ are liable to happen do not place other codes between these pairs of opcodes. [If next opcode is not one of these, interrupt can occur]

[===

```
SEE    ;set    stack Extend disable bit
CLE    ;clear  stack Extend disable bit
```

[===

```
RTS #xx ;RTS plus ..pull off and discard xx # of bytes from stack!
```

[====] Finale [=====]

Please do try the programming challenge!

I am looking for some Bit Planes I can play with! I don't have FTP access. Some simple 640x200 or 320x200 split into thier planes would be a great start. A decent description of what they \*should\* look like might be helpful too. :) A colour table too I'd guess.

I have yet to see the CBM c65 "demo" disk yet. Who has this?

Has \*anybody\* come up with anything else as yet or should I give this up as a lost cause..?

..next post, converting some c64 bit-Maps.

]>ug..

```
+++++
416+588+9071 voice [Toronto, Canada]
416+588+0922 I-[ighlander BBS [c65 dir] [Image/NISSA Net]
905+273+6300 TPUG BBS [IPC Punter Net]
End of article 18111 (of 18145) -- what next? [npq] comp.sys.cbm #18112 (33 more
)
```

Subject: c65 Pix Fun..
From: tpug.sysop@canrem.com (Tpug Sysop)
Distribution: world
Date: Sat Apr 30 02:27:00 MDT 1994
Organization: CRS Online (Toronto, Ontario)
Lines: 131

[====] Bit-Map to Bit-Plane [=====]

The following prg will rip out the Bit-Map of a Doodle pic and turn it into a doubled up version for use as a single Bit-Plane.

Basicaly it takes a 40 col pic and doubles each line and makes it 80 col.

```
from; 11111 to 1111111111
      22222 2222222222
      33333 3333333333
```

Written in Basic 2 for c64. You will need to fill in the file names as I didn't bother adding an input for these. I will have a ML version shortly, this basic just makes it easily to understand.

[delete lines 13 and 20 if NDT run on a c128 in 64 mode..]

```

1 rem save "@:bm2bp dupe+", dv
10 if dv then 12
11 dv=peek(186):load"doodle",dv,dv
12 a=.:x=.:b=8192:c=24576:d=40*25*8*2+8192:z=40*8
13 poke53296,1
14 :
15 forx=.:toz-1:a=peek(c+x):pokeb+x,a:pokeb+x+z,a:next
16 :
17 c=c+z:b=b+(z*2):ifb=>dthen 19
18 goto15
19 rem done converting
20 poke53296,.
21 :
22 opendv,dv,dv,"bp.filename,p,w"
23 print#dv,chr$(0);chr$(64);:rem $4000 load adr for "slider"
24 forx=8192to40*25*8*2+8192:print#dv,chr$(peek(x));:next:closedv

```

[====] BM/BP [=====]

The real difference between Bit-Map mode and Bit-Plane mode is;

"Not wether the pixel is on or off but rather which colour is it?!"

A single bit-plane does look like a bit map, the similarity ends when there is more than one.

[====] Slider [=====]

Now that you kin make a simulated Bit-Plane above this prg will let you view them on the c65 in 640x200x2.

```

1rem save "@:slider",10
10 poke53280,2,0:rem boarder red, background black
20 a=dec("d031"):rem control b
30 b=dec("d032"):rem bit-plane enable
40 poke a,128+64+00+16+8+0+2+0
50 poke b,1:rem one bit-plane
55 poke b+1,4:rem at $04000
60 forx=1to8:ready#,c:poke53307,c:bload"bmd"+y$:next
70 geta$:ifa$=""then70:rem wait for a key
80 poke53297,224:rem back to normal
90 end
100 data "1",2,"2",3,"3",1,"4",6,"5",6,"6",7,"7",9,"8",10

```

In the above I set up the file names so that I could NAME them but never did, I just used numberz. So the filenames are "bmd" plus a number-\$string in the data statements. c is for the complimentary register and just changes the colour for each, and/or sets reverse.

The final version will have a proper filename.

[====] 4 Bit Planes [=====]

My very first attempt sux rox! It does give us †something† to look at though, even if it is just pretty junk!

First step was to dig up a resonable bit-map.

I then imported it into "GAS.64". [Graffic Assault System] GAS is a util for pictures, allowing you to do thingz paint prg's won't. There is also a c128 version with the last one called "GAS.NOW".

I then made 3 more bit-map'z with each one shifted one pixel over and one pixel down from the last. This gave me a total of 4 bit-mapz offset from each

other by one pixel in two directionz.

Thirdly, I then ran all four through "bp2bm dupe".

Next is memory mapping of four 65 block bit planes.

The Vic3 wants even/odd bit-planes in even/odd RAM banks.

With Basic Text in RAM 0 I put the Bit-Planes at \$8000 and \$c000, Planes 0 and 2. In RAM 1 with drive stuff at the bottom and physical+colour+mem at the top ..I used \$14000 and \$18000 for Planes 1 and 3..

Now mod' slider with;

```
50 poke b,15           :rem four bit-planes
55 poke b+1, 8,4,12,8 :rem $08000, 14000, 0c000, 18000
60 forx=.to255:poke dec("d03b"),x:for y=.to400:nE:nE
```

..now that it works I save them out as two files, one for each bank.

```
s "bank0" 8 08000 0ffff
s "bank1" 8 14000 1bffff
```

[if you are counting, that is two 130 block files/64k!!!]

Now we kin further mod' slider with;

```
57 bload"bank0",d0,u8,b0
58 bload"bank1",d0,u8,b1
```

I put them after the enabling pokes so that I could watch them load.. :)

[====] The Files [=====]

The files Russel got where a bit rushed. I \*knew\* he was doing a UG demo shortly and I \*know\* what its like as I do the same thing myself here with TPUG. As a result the last few file were not 100%, I goofed, sorta.

All the files work fine ..if the previous ones where run first! If the are run individually on a "cold" machine ..some will not. Some of the registers were set in the previous prg'yz, and still valid later.

I'm not sure what he has posted, so expect "final" versionz shortly.  
[disk one stuff is fine, everything in the autoboot]

]>ug..

```
*****
416+588+9071 voice [Toronto, Canada]
416+588+0922 ]-[ighlander BBS [c65 dir] [Image/NISSA Net]
905+273+6300 TPUG BBS [PC Punter Net]
End of article 18112 (of 18145) -- what next? [npq]
To: tpug.sysop@canrem.com
```

C 65 (18)

----- Forwarded message -----  
Date: Sat, 30 Apr 94 14:59:00 UTC  
From: cmd-doug@genie.geis.com  
To: r.alphey@dce.vic.gov.au  
Subject: C64DX ( AKA C65 )

Commodore did not, what I'm aware of, release any printed information to any third parties concerning the C64DX; such information was still being readied by Fred Bowen and his team when the project was cancelled. Any information I had was gleaned purely from conversations I had with Fred and other members of the C64DX development team; and much of this info concerned features which were being implemented, but which never showed up in the alpha units which Grapevine ended up with. Most of the matters I discussed with the team had to do with changes in the command parser, and in specific DOS commands and support functions. Sorry that I can't be of much help right now on this subject.

Message 7/9 From Russell J. Alphey May 2, 94 08:25:12 am +1000  
Old-Return-Path: <r.alphey@dce.vic.gov.au>  
Date: Mon, 2 May 1994 08:25:12 +1000 (EST)  
Subject: Number of C65 owners (fwd)  
To: C65 Mailling list <c65list@dce.vic.gov.au>  
Resent-From: c65list@dce.vic.gov.au  
X-Mailing-List: <c65list@robin.dce.vic.gov.au> archive/latest/11  
X-Loop: c65list@robin.dce.vic.gov.au  
Precedence: list  
Resent-Sender: c65list-request@dce.vic.gov.au

----- Forwarded message -----  
Date: Fri, 29 Apr 1994 02:04:00 -0400  
From: Tpug Sysop <tpug.sysop@canrem.com>  
To: R.ALPHEY@dce.vic.gov.au

Subject: Number of C65 owners  
-> Estimates of the number of machines range from 100 to 1000 to 10000. Peter  
-> Kittel of CBM Germany thinks 1000.

Last I talked to Fred, he said about 300 or so. In my talk with him he said that they blew up any number of them in testing. I could see a couple hundred, but not 500 or so! ..yikes!

In my experiance with "making a run" minimum orderz are usualy a 1000 in order to make them reasonably cost effective.

Example: 3 colour printing press of 4 foot by 3 foot sheets, to turn on the press and set it up cost's \$2,200 and includes 1,000 copiez.

So, educated guess, 1,000 made. Burn 200/300 tops. 300 escape to the Grape! ..there could be 500 sitting. If this is the case then these will be +RAW+ and burnable or +early+ fixed ones like most of these that we have are!

<wave>

[re-post as nessary!]

I>ug..

----- Forwarded message -----  
Date: Fri, 29 Apr 1994 02:15:00 -0400  
From: Tpug Sysop <tpug.sysop@canrem.com>

-> Also note that I had to change the names of some files, to replace the  
-> "space" in their names with an "underscore" as the mail server would never  
-> have been able to send it! You can either rename the file(s) at your end,  
-> or alter the loader programs to cope with the new name(s). Your choice!  
->

-> Thanks again to I>ug for the files! ;)

Hrmmm.. some problems with the files you have "after+the+divider". Quite a few of the pokes and configures are missing. The files will probably work if you run them all, but if you run a FEW form a cold machine they may not!

The reason being, an earlier, prq would have set some registerz that the



C65 1478 (191)

Subject: Developers kit  
To: C65 Mailling list <c65list@dce.vic.gov.au>

Hello Jeffrey,

Thanks for the reply! (And where are the rest of you???)

On Mon, 2 May 1994, Jeffrey Litz wrote:

> Last February, I was flown out to Commodore for a job interview and would  
> currently be working as a software engineer (graphics) if C= wasn't in such  
> a bad financial state (or should I make that current in no state at all).  
Yeah, a real bummer. Maybe a good fairy will take over and bring the 65 back  
to life? :)

> As for a schematic and rom copys, well, I'm not too sure about that just  
> yet. They are still copyrighted...

I understand your concern, especially as you were(?) employed by CBM to help  
build/develop the machine.

Personally, I believe that since the machine is DEAD, there ought to be NO  
problems with releasing any information/data on the machine. It's not like  
we're attempting to ripoff CBM, is it?

> Blah blah blah... it's a few hundred pages of documentation. Covers  
> kernel and basic jump tables, basic commands, pinouts and registers  
> and info on all the chips, details all the assembly language commands  
> (ROW shifts a word of data left one bit with carry), blah blah blah  
I would be VERY happy to pay for a copy of this (I'm sure Alan will help pay?  
:), if you can see your way clear? Please don't feel pressured about this  
tho'!

As an aside, Dug has spoken to one of the VPs at CBM (in charge of Sales?) who  
was more than happy for us to spread/share/get any info on the 65 we liked.  
Dug can confirm this....

As for the documentation.... uummmm... well....

C66 4567 System/Video Controller

I think everyone nows it can do 320x200 in 256 colors or upto

1280x400 in 4 colors.

OLD Pinout (supposedly changed with 4567R7. My C65 has a 4567R7-8A in it.)

1 - *IO2	22 - MA2	43 - A4	64 - E2
2 - *IO1	23 - MA3	44 - A3	65 - D2
3 - NOIO	24 - MA4	45 - A2	66 - E1
4 - AEC	25 - MA5	46 - A1	67 - D1
5 - RW	26 - MA6	47 - A0	68 - E0
6 - NDMAP	27 - MA7	48 - *EXTV	69 - D0
7 - EXROM	28 - MB7	49 - *EXTH	70 - VCC
8 - GAME	29 - MB6	50 - *LP	71 - MEMCLK
9 - *EXPAND	30 - MB5	51 - *RES	72 - *DISK
10 - SIDCLK	31 - A16	52 - *IRO	73 - CASS
11 - VCC	32 - A15	53 - VSS	74 - PSYNC
12 - *CAS	33 - A14	54 - E7	75 - RVIDEO
13 - *CASB	34 - A13	55 - D7	76 - BVIDEO
14 - *CASA	35 - A12	56 - E6	77 - GVIDEO
15 - *RAS	36 - A11	57 - D6	78 - CVIDEO
16 - CPUCLK	37 - A10	58 - E5	79 - SYNC
17 - DOTCLK	38 - A9	59 - D5	80 - FG6G
18 - XTAK14	39 - A8	60 - E4	81 - *SID
19 - XTAL17	40 - A7	61 - D4	82 - *ROML
20 - MA0	41 - A6	62 - E3	83 - *ROMH
21 - MA1	42 - A5	63 - D3	84 - *ROM

#### Color Palette Info

7	6	5	4	3	2	1	0	
x	x	x	FG/BG	RED3	RED2	RED1	RED0	D100-D1FF Red
x	x	x	x	GRN3	GRN2	GRN1	GRN0	D200-D2FF Green
x	x	x	x	BLU3	BLU2	BLU1	BLU0	D300-D3FF Blue

The FG/BG (foreground/background) control is for video mixing applications or to drive a separate monochrome screen.

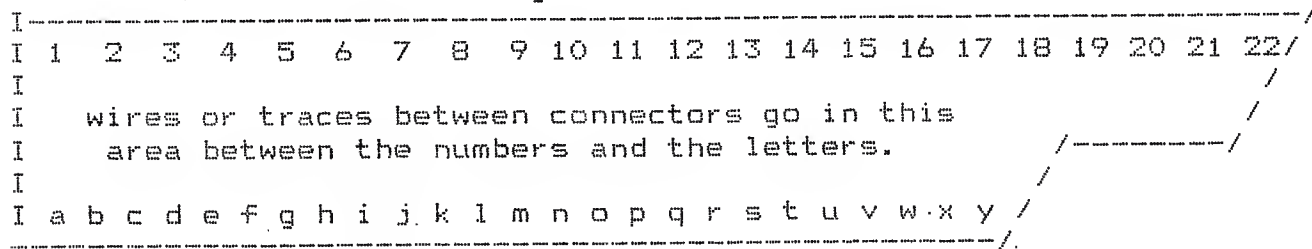
#### DOS Commands...

"F-L" Lock a file  
"F-U" Unlock a file  
"F-R" Attempt to undelete a file  
Open xx,xx,15,"F-L0:FNAME"  
Close xx

Blah blah blah... it's a few hundred pages of documentation. Covers kernel and basic jump tables, basic commands, pinouts and registers and info on all the chips, details all the assembly language commands (ROW shifts a word of data left one bit with carry), blah blah blah

In response to Ralphy's question about how I managed to hook up C64 cartridges to my C65, here is a crude but functional diagram/hook-up instructions. The following diagram is shown looking at the top of the board, with the 44 contact C64 cartridge connector at the top of the screen, and the 50 contact edge connector to plug into the C65 at the bottom. The contacts are labeled from left to right, with the C64 connectors in numeric form, and the C65 connectors in alpha form. In the hookup instructions to follow, I use T and B to mean top and bottom of the board. B1 would be directly below T1, Ba would be directly below Ta, etc. It's up to you as to how you wish to make this thing (if you even want to). I would guess either etching a board, or hand wiring would be suitable. Distance between the two connectors is up to you. (within limits--too long and I'm sure you'll have problems).

44 contact "C64 cartridge socket" end of the board.



50 contact "edge connector to plug into C65" end of the board.

That diagram was just to get us all on the same sheet of music, hopefully. I am doing the best I can to make this legible and logical, but I cannot be held responsible for any damage to your equipment caused by trying this! It works for me, is all I'll claim! Mine is roughly 9 CM total length, by the way.

Hook-up instructions--aargghh!

First, Top and bottom end connectors on the 64 cart end, labeled t1, b1, t22 and b22 are all grounds, and connect to td, ty and by on the 65 end. (all 7 pins are interconnected).

Now for the rest. (actually relatively easy, since they're all in order)

t2 & t3 (joined) to te & tf (joined)	b2 to be	b12 to bo
t4 to tg	b3 to bf	b13 to bp
t5 to th	b4 to bg	b14 to bq
t6 to ti	b5 to bh	b15 to br
t7 to tj	b6 to bi	b16 to bs
t8 to tk	b7 to bj	b17 to bt
t9 to tl	b8 to bk	b18 to bu
t10 to tm	b9 to bl	b19 to bv
t11 to tn	b10 to bm	b20 to bw
t12 to to	b11 to bn	b21 to bx

ta, tb, tc, ba, bb, bc, and bd are not connected.

Have fun, and keep in mind that the older 64 game cartridges seem to work (at least the few I tried), and the speedloader/memory save types don't want to work.

From: Marko.Makela@Helsinki.FI (=ISO-8859-1?Q?Marko\_M=E4kel=E4?)  
Newsgroups: comp.sys.cbm  
Subject: C65 FAQ  
Date: 27 Dec 1993 02:39:05 +0200  
Organization: University of Helsinki, Finland.

Here's the FAQ file I promised. The C65 technical detail posting by Fred Bowen was archived on my VAX/VMS account, which I don't use much these days. Fortunately I remembered to check it.

This file can be retrieved via anonymous FTP from ftp.funet.fi. The filename for the GNU zipped version is /pub/cbm/faq/c65-faq.1.0.gz, the uncompressed version is /pub/cbm/faq/c65-faq.1.0.

So, here it goes:

#### Commodore 65 Frequently Asked Questions - Version 1.0

Around the year 1990 or 1991, Commodore Business Machines was planning to introduce a successor for the famous Commodore 64, the Commodore 65. The project was canned, mainly because of huge amounts of software that pushed the C64's video chip to its limit, and did not work at all with the new C65's video controller, CSG 4567. Also, the machine might have been too expensive to interest the big audience.

In this file there are a few articles captured from the newsgroup comp.sys.cbm and from some other sources. I hope that they will saturate your need of information.

This file was put up by Marko Mkel <Marko.Makela@Helsinki.FI>. I do not have a C65, so please direct your inquiries to the comp.sys.cbm newsgroup.

-----  
From: fred@cbmvax.cbm.commodore.com (Fred Bowen)  
Subject: Re: What's a C-65???  
Date: 17 Sep 93 14:56:25 GMT

>To the best of my knowledge, the C65 was never put into production. I  
>visited the person last week who actually wrote the DOS operating system  
>for it, and saw a prototype of it. According to him, Mr. Gould "pulled  
>the plug" on the system amonth before its' completion date. The Britoish  
>mags had some coverage of it in previews about a year-year and a half ago,  
>but that was the end of it. Too bad, cause it was a decent little  
>critter, with a built-in 3.5" drive, and a lot more features and memory  
>and such than the C64.

Apparently Grapevine picked up some C65's during Commodore's liquidation of its warehouse/storage areas a couple months ago.

What is a C65? A product that almost made it out the door. What you're seeing are "alpha" pilot-production units. There were only something like 50 units made, and a dozen or more of these were distributed around engineering, system developers, etc. Obviously, they were never meant to be sold to the public, but...

CPU CSG65CE02, running at 3.54MHz  
RAM 128K, expansion to ~8MB  
ROM 128K, including C65 mode (v10.0), C64 (v2.2) mode, & DOS  
Video CSG4567 "VIC-III" analog RGB with composite sync on each primary, separate active-high digital sync, composite chroa/luma, digital fgnd/bgnd control (genlock) all original C64 video modes (40x25 text, 320x200 bitmap) new modes (80x25 text, with blink, bold, underline attributes) true bitplane graphics (VGA resolution): 320, 640, 1280 horz. pixels in 8, 4, or 2 planes 200, 400 vert. pixels, non-interlaced & interlaced DAT "display address translator" to access display memory standard 16-color C64 palette programmable 256-color palette with 16 intensity levels per primary color.  
Audio Stereo SID chips  
Keybd 77 keys, including separate cursor keys, ALT, ESC, etc.  
Disk Built-in 3.5" double-sided, 1MB MFM (1581 format) custom 4191 controller with 512 byte buffer and parallel bus external mini-DIN for one A1011-type expansion drive. accepts CBM serial drives (1541,1571,1581), fast/slow/burst  
I/O Built-in DMA/blitter  
Built-in 6511-type UART, supports MIDI data rate.  
All C64 ports: parallel, expansion, etc.  
new RAM expansion port, accessible by DMA and video chips.

I guess that's enough for now. But be warned- these boards are very out of date- the ROMs, PLA's, etc. are pre-pre-preALPHA, there are absolutely NO spare parts (so if it breaks, that's it!), all systems are PAL (but they display okay on regular 1084-type monitors in analog mode). Oh, and there aren't any manuals. I'm surprised that Grapevine can sell them as "new" equipment. Buyer beware, and all that.

All things considered, not a bad machine, though. I still use mine :-)

--

--

Fred Bowen uucp: ...!rutgers!cbmvax!fred  
domain: fred@cbmvax.cbm.commodore.com  
tele: 215 431-9100

Commodore Electronics, Ltd., 1200 Wilson Drive, West Chester, PA, 19380

-----  
Message 60 Thu Dec 23, 1993  
R.DAY at 20:08 EST

I have my c65! Got it today about 3 hours ago. I looked at how the power plug hooks up and it's the same as the 1581! Only it needs 2.2 amps for +5 volts and .5 amps for the 12 volts. I just plugged in my

power supply from my 1581 that will all so power 3 other drives. It came up the 1st time on my 1084 monitor. The 9 pin plug plugs right in and the U shaped din plugs right in. Only black and wight in 40 mode but color in 80 mode. looks like a 128 using 40 or 80 in the 80 mode. The power pupply that comes with it does not have any plug on the end for the power to the wall. Input says 240VAC 0.17A. You can hold down the C= key to be in 64 mode. Stereo player will load and work but does not see the 2nd 8580 sid chip. There is 2 of them in the c65. My guess is the 2nd one is addressed at \$d480. I will have to check it out. The bilt in drive is a 81 says 73,copyright cbm cbdos v1.0,00,00 The one in my C65 does not work too good. I have to figger out how to make it a nother device #. You can plug in a C= modem and the cartridge port will not fit c64 or 128 cartridges. I think it would with a adapter. The pins are closer together just a little. in the c65 mode you can to in a monitor it's like the 128. You can even say go64 and it ask are you sure? It goes there right away. The video is very good. It just has a border on the top and buttom about 1 inch. each and the sides are a little showing. So that the screen is a little wider. Well any one can get this! Just get the HD power pupply from CMD. But this cost I think \$50. It should plug right in to the C65! I got mine from a nother place and had to put a case on it but only cost me about \$30. Has more amps then the CMD one too. Well I will have to figger this one how it works more but looks like it's just a nother 128 with a bilt in 1581. The inside on the board said for some chip names: DMAGIC, VICTOR, BILL, and ELMER. It all so has this:  
 LASSA/GARDEI/NINESPCB/ANDRADE/JP/TL/HM/TC/CW/FISH/HD/GT/DF/BF/ETC and mine says C64 DX REV 2B commodore electronics ltd copyright (c) 191990 all rights reserved. Well I guess that's all I can say about it. It just took them long to get it to me. I will have to clean some of the dust off the keyboard too.

-----  
 From: ralphey@kittyhawk.aero.rmit.OZ.AU (Russell Alphey)  
 Newsgroups: comp.sys.cbm  
 Subject: I have a C65! (!! :))))))))))  
 Date: 1 Dec 1993 06:49:15 GMT  
 Organization: Royal Melbourne Institute of Technology, Melbourne, Australia.

With trembling hands I opened the large box from The Grapevine Group. My wife grabbed the invoice and said, "What's a C65 with built-in disk drive?". This is what I hoped to find out!

"Ta-da!" A box full of foam beads. Dig, dig, what's this? Something solid...

And in the box was -

- 1 D.S.G. packet,
- 1 piece carbon paper - crumpled,
- 1 latex glove - grey,
- 1 packet containing a 75 Ohm co-ax cable with identical ends (the sort that plug into a C64) and a TV-computer switch box,
- 1 beige power supply, with the familiar C= on top, a 4 pin round connector at one end and a flat 2 pin wall plug with round pins. The underside has "FOR C65 ONLY POWER SUPPLY". The word C65 is on a sticker.

Oh, there was one other thing in the box :))))))))))))))))))

A computer.

Normal C= beige colo(u)r. Key lettering like that on a C128. Computer is about 18" by 8", and like a flat 128, but no separate keypad (there's a 3.5" disk drive there instead ;). The drive points forward, with the eject button on the leading edge of the keyboard.

Key layout is as follows.

```

<power                <drive
light>                light>

Run                    Caps No      F1 F3 F5 F7   F9  F11 F13 Help
Stop                   Esc Alt Lock Scroll  F2 F4 F6 F8   F10 F12 F14

<- 1  2  3  4  5  6  7  8  9  0  + -  #  Clr Inst
Tab q  w  e  r  t      y  u  i  o  p  @  *  ^  Restore
Ctrl S/Lock a s d f  g  h  j  k  l  :  ;  =  return
C= Shift z  x  c  v  b  n  m  <  >  /  Shift ^

.....space.....      < v >

```

Note that # is the English pound symbol.

Also, there's a spot where a metal plaque could go, like on the 64s.

Okay, now for a tour around the computer.

Left side has a reset button, Cont port 1 and 2 (joystick ports), the power switch and power inlet.

Right side is blank.

Back has, (from left as you look at it) a round hole labelled disk drive (but nothing there), a video port (like 128's), a switch (or screw) labelled "L H", an RF port, an RGB video port, a Stereo port with R & L ports, a User port, a CBM serial port, and finally an expansion port.

Underneath there's a flap which conceals what appears to be a miniture centronics port, and the manufacturer's label. It reads -

```

C= commodore
Model C65
Power 5vDC @ 2.2A 12vDC @ 5A
SERIAL NO. 000062 :))))))))))))))))))))))
FCC ID NO.
      made in hong kong
Funkenstort n.DBP-Vtg 1046/84

```



- + bad line scroll
- + shrunk screen
- + 8 line update
- \* line by line update
- \* forced DMA
- \* character line redraw
- \* border and border tricks in X-mode
- \* cycle exact screen changes

#### SID

- + 3 channels
- + 8 bit sampled original waveforms
- + ADSR envelope control
- + master volume control
- + pulse width modulation
- no channel to channel effects
- no filters
- \* filtered waveforms may be implemented on GUS

#### CIA 1

- + keyboard emulation (still needs improvements)
- + joystick emulation
- + timer A (real time)
- timer B
- \* time of day (partially implemented)
- serial port
- + IRQ control
- \* rebindable keyboard

#### CIA 2

- + VIC bank select
- other features not implemented

#### 1541

- + ROM level emulation (16K RAM & I/O + 16K ROM)
- + supports CBM DOS commands except format
- + fast (ROM trapped) C64 to 1541 connection
- + image file operation
- protection support (GCR coding)
- \* real 1541 connection
- \* improved (GCR coded) image file format
- \* fast loader support
- \* PC side full disk transfer utilities

#### TAPE

- + ROM trapped tape routines

- + tape image files with directory
- + ultra fast loading
- + Turbo Tape loader for PC tape connector
- + MakeTape utilities
- \* built-in tape tools for comfortable tape image manipulation
- \* SB and GUS versions of Turbo Tape loader

---

#### 5. FILE TRANSFERS

Tape files in the Turbo Tape format are the easiest to transfer using my PC loader. The connector scheme is simple and will be published together with the loader in the registered version.

#### IMPORTANT !

Since all beta tester haven't got my MakeTape utility, a utility named CONV64 has appeared, which creates FALSE .T64 files. The start and end address are not set correctly, that's why many compressed programs refused to work. Please use MakeTape for best results. There's also a C source included in case someone would like to tailor it to his/her needs.

Disk files are possible to be transferred using X1541 program and a special 1541 to LPT cable. All the required schemes are a part of X1541. The files transferred in this way can be converted to tape files with MakeTape program or (if the whole disk contents is transferred) used as a disk image.

I'll also support this type of 1541 connection in the registered version of my emulator.

---

#### 6. UTILITIES

The following utilities are planned to go with the emulator:

- built-in debugger
- Turbo Tape loader with support for SB and GUS inputs
- MakeTape formatter / importer / exporter
- 1541 disk transfer utility
- MakeDisk formatter / importer / exporter
- 6510 Cross Assembler

---

#### 7. RELEASE

The 1.0 release won't be ready in November, because I have

decided (with a lot of help from beta testers) to add a long list of features not planned previously, not to mention the university after all. Please understand that the emulator is written in 100% assembler, which makes me write the code very carefully in order to avoid bugs and allow further enhancements. I also wish I had more time to answer all the mail and email I receive.

IMPORTANT !

Please DO NOT register the emulator until I announce V 1.0 is ready. I may arrange the registered version to be distributed by a software distributing company in which case it could also be shipped with special cables needed for 1541 and tape connection.

---

#### 8. CONTACTS

E-mail:

miha@rsc3.hermes.si (slow reception, fast reply)

miha.peternel@abm.gn.apc.org (fast reception, slow reply)

E-mail messages to both addresses if possible.

Phone:

+386-64-311-959 (fax/modem on demand)

(How come this number reminds me of something ?)

Snail mail:

Miha Peternel (for C64S)

Pot v Bitnje 66

64000 Kranj

Slovenia, Europe

So there you have it, a real? C65. (The :))) above is my editorial comment!)

Unfortunately I can't tell you anything about its operation yet, because I haven't fired it up yet (mainly due to the incorrect plug on the power supply). But rest assured I'll report as soon as I do! :)

Ralphey.

--

From: gpage@nyx.cs.du.edu (george page)  
Newsgroups: comp.sys.cbm  
Subject: Re: Does anyone know??  
Date: 21 Nov 93 15:37:58 GMT

Well, since you posted some pretty interesting historical "trivia", here's a thumbnail description of the C65 from a prototype I saw last September: Case more or less the color of a 64C, drive embedded off to the right where the 128's numeric keypad is, slot slightly raised, wide eject button recessed in the very front edge. Top row keys are (l to r) Run/Stop, ESC, ALT, CAPS LOCK, No Scroll, then 7 F-keys and a Help. Next row is same as a C64 top row (numbers, etc). Third row is the same as the QWERTY row on a 64/128, except that a TAB is first to the left. The next row starts with CTL, and then is standard. Bottom row is standard, except cursor keys are similar to a Plus/4's. By "standar", I mean 64/128 layout. Back and sides, I'm not really sure-uses a mini DIN for an ext drive, seems to have a pair of red/white RCA jacks (for stereo output?), 9pin vid output(?), long user and expansion ports(?). One or two other round ports on the back. Power-in socket, switch and 2 joystick ports towards rear of left side.(?) (working from not-to-finely-detailed snapshots). General styling like a 128 or 64C.

-----  
From: gpage@nyx10.cs.du.edu (george page)  
Subject: A bit more C65 followup.  
Date: Sat, 25 Dec 93 18:30:14 GMT

We finally got a C65 here in the Denver area from Grapevine. A user on a local board posted that his had come in last week. He was a little upset because UPS had left it out back along a wall where he didn't know about it for several days-and it snowed during some of those days! Water came pouring out of the box when he opened it, but the computer apparently wasn't affected. His initial comments follow, roughly quoted, paraphrased mangled and otherwise distorted! (g).

It has two modes of operation, C64 & C65. Use the go64 or hold C= key down to powerup in 64 mode. (Just like a 128). Displays in RGB and Composite screen for both modes. (Very sharp C64 screen) -I don't know yet which monitor he's using.

Both 40 & 80 column screens-both allow sprites.

The cartridge port on the rear appears to have smaller pins than a C64-he doesn't think a regular cart will work-but apparently hasn't tried.

Regular size user port. Also an expansion port on the bottom "along the lines of an Amiga".

ML monitor in C65 mode-"shows that you can program from 0000 to FFFFFF. At this time I don't know how much RAM is built in. Allows use of Bank command."

He has been able to run numerous 64 programs on it. His is a PAL one, so some of the graphics are messed up, mainly demos. I'm still waiting for mine....

This specification describes a proposed C65 partition/subdirectory parser.

```
OPEN la,fa,sa, "[#]/path/:filename"
OPEN la,fa,15, "<cmd>#/path/:[cmd_string]"
```

where: # is an optional "drive" number, 0-9.  
 /path/ is a partition or subdirectory name  
 : delimits the path from the filename

and: <cmd> is a DOS command (such as I,N,S,C, etc.)  
 [cmd\_string] is an optional string required by some commands.

The first example illustrates a typical filename specification, the second example illustrates a command channel instruction.

```
OPEN la,fa,sa, "0/SUBDIR1/SUBDIR2/:FILE,S,W"
```

Action taken	Why
1. Select the "root"	0
2. Find & enter two subdirectories	/SUBDIR1/SUBDIR2/: (the trailing "/" is required to be compatible with CMD?)
3. Create & open file for writing	FILE,S,W

The "root" or "drive number", path, and ":" are all optional. If they are omitted, the file is opened in the current partition. Some similar, and legal, syntaxes are:

```
OPEN la,fa,sa, "FILE,S,W" (create "FILE" in current part)
OPEN la,fa,sa, ":FILE,S,W" (create "FILE" in current part)
OPEN la,fa,sa, "0:FILE,S,W" (create "FILE" in current part)
OPEN la,fa,sa, "/SUBDIR/:FILE,S,W" (from current partition, enter
"SUBDIR" and create "FILE")
OPEN la,fa,sa, "//SUBDIR/:FILE,S,W" (from Root partition, enter
"SUBDIR" and create "FILE")
OPEN la,fa,sa, "@0/SUBDIR/:FILE" (open "FILE" in "SUBDIR" for
writing)
```

Some questionable syntaxes, and their affect, are:

```
OPEN la,fa,sa, "0FILE,S,W" (this would create file "0FILE")
OPEN la,fa,sa, "/SUBDIR/FILE,S,W" (creates file "/SUBDIR/FILE")
OPEN la,fa,sa, "@0:FILE,S,W" (open file "FILE" in current
partition for writing)
OPEN la,fa,sa, "/0:FILE,S,W" (? should create file "0:FILE",
note this is not the cmd chnl)
```

Some legal commands:

```
OPEN la,fa,15, "I0" (initialize current partition)
OPEN la,fa,15, "I//" (initialize Root)
OPEN la,fa,15, "I0/SUBDIR/:" (enter "SUBDIR" and initialize)
OPEN la,fa,15, "N0/SUBDIR/:NAME,ID" (enter "SUBDIR" and "new" it)
OPEN la,fa,15, "S0/SUBDIR/:FILE" (delete "FILE" in "SUBDIR")
OPEN la,fa,15, "/0:SUBDIR" (1581 partition select, "/" in
this context is a command itself)
```

Some general rules, designed to be compatible with both 1581 subpartitioning syntax and CMD syntax:

1. The name of a subdirectory must always be separated from the filename by a colon (":").
2. Each subdirectory name must be delimited by a slash ("/").
3. To select Root directory (partiton), specify two slashes ("//"). This allows older applications specifying the drive number ("0:") to be run in a partition.

### PATTERN MATCHING:

1. ALLOW `*.*`, TYPE SYNTAX?
2. ALLOW `"R0:*.BAK = 0:*.SRC"` TYPE SYNTAX?

I CAN LIVE WITH LIMITING 'X' NESTING TO TWO.  
(ie., DON'T HAVE TO HANDLE `A*B*.*`)



# C65 FAQ V1.0

Subject: C65 FAQ  
Date: Sun Dec 26 17:39:05 MST 1993  
Organization: University of Helsinki, Finland.  
Lines: 310  
Distribution: world  
Mime-Version: 1.0  
Content-Type: text/plain  
Content-Transfer-Encoding: 8bit

Here's the FAQ file I promised. The C65 technical detail posting by Fred Bowen was archived on my VAX/VMS account, which I don't use much these days. Fortunately I remembered to check it.

This file can be retrieved via anonymous FTP from ftp.funet.fi. The filename for the GNU zipped version is /pub/cbm/faq/c65-faq.1.0.gz, the uncompressed version is /pub/cbm/faq/c65-faq.1.0.

So, here it goes:

## Commodore 65 Frequently Asked Questions - Version 1.0

Around the year 1990 or 1991, Commodore Business Machines was planning to introduce a successor for the famous Commodore 64, the Commodore 65. The project was canned, mainly because of huge amounts of software that pushed the C64's video chip to its limit, and did not work at all with the new C65's video controller, CSG 4567. Also, the machine might have been too expensive to interest the big audience.

In this file there are a few articles captured from the newsgroup comp.sys.cbm and from some other sources. I hope that they will saturate your need of information.

This file was put up by Marko Mdkeld <Marko.Makela@Helsinki.FI>. I do not have a C65, so please direct your inquiries to the comp.sys.cbm newsgroup.

---

From: fred@cbmvax.cbm.commodore.com (Fred Bowen)  
Newsgroups: comp.sys.cbm  
Subject: Re: What's a C-65???  
Message-ID: <CDI6u2.2uz@cbmvax.cbm.commodore.com>  
Date: 17 Sep 93 14:56:25 GMT  
References: <a1170866.747909924@academ01> <1993Sep14.212254.1717@mnemosyne.cs.du.edu>

Reply-To: fred@cbmvax.cbm.commodore.com (Fred Bowen)  
Organization: Commodore, West Chester, PA  
Lines: 61

>To the best of my knowledge, the C65 was never put into production.  
>visited the person last week who actually wrote the DOS operating system  
>for it, and saw a prototype of it. According to him, Mr. Gould "pulled  
>the plug" on the system amonth before its' completion date. The Britoish  
>mags had some coverage of it in previews about a year-year and a half ago,  
>but that was the end of it. Too bad, cause it was a decent little  
>critter, with a built-in 3.5" drive, and a lot more features and memory  
>and such than the C64.

Apparently Grapevine picked up some C65's during Commodore's liquidation  
of its warehouse/storage areas a couple months ago.

What is a C65? A product that almost made it out the door. What you're  
seeing are "alpha" pilot-production units. There were only something  
like 50 units made, and a dozen or more of these were distributed around  
engineering, system developers, etc. Obviously, they were never meant  
to be sold to the public, but...

```
CPU          CSG65CE02, running at 3.54MHz
RAM          128K, expansion to -8MB
ROM          128K, including C65 mode (v10.0), C64 (v2.2) mode, & DOS
Video       CSG4567 "VIC-III"
            analog RGB with composite sync on each primary,
            separate active-high digital sync,
            composite chroa/luma,
            digital fgnd/bgnd control (genlock)
            all original C64 video modes (40x25 text, 320x200 bitmap)
            new modes (80x25 text, with blink, bold, underline attributes)
            true bitplane graphics (VGA resolution):
            320, 640, 1280 horz. pixels in 8, 4, or 2 planes
            200, 400 vert. pixels, non-interlaced & interlaced
            DAT "display address translator" to access display memory
            standard 16-color C64 palette
            programmable 256-color palette with 16 intensity levels per
            primary color.
Audio       Stereo SID chips
Keybd       77 keys, including separate cursor keys, ALT, ESC, etc.
Disk       Built-in 3.5" double-sided, 1MB MFM (1581 format)
            custom 4191 controller with 512 byte buffer and parallel bus
            external mini-DIN for one A1011-type expansion drive.
            accepts CBM serial drives (1541,1571,1581), fast/slow/burst
I/O        Built-in DMA/blitter
            Built-in 6511-type UART, supports MIDI data rate.
            All C64 ports: parallel, expansion, etc.
            new RAM expansion port, accessible by DMA and video chips.
```

I guess that's enough for now. But be warned- these boards are very out  
of date- the ROMs, PLA's, etc. are pre-pre-preALPHA, there are absolutely  
NO spare parts (so if it breaks, that's it!), all systems are PAL (but  
they display okay on regular 1084-type monitors in analog mode). Oh,  
and there aren't any manuals. I'm surprised that Grapevine can sell them  
as "new" equipment. Buyer beware, and all that.

All things considered, not a bad machine, though. I still use mine :-)

```
Fred Bowen          uucp:          ...!rutgers!cbmvax!fred
                   domain:        fred@cbmvax.cbm.commodore.com
                   tele:          215 431-9100
```

Commodore Electronics, Ltd., 1200 Wilson Drive, West Chester, PA, 19380

I have my c65! Got it today about 3 hours ago. I looked at how the power plug hooks up and it's the same as the 1581! Only it needs 2.2 amps for +5 volts and .5 amps for the 12 volts. I just plugged in my power supply from my 1581 that will all so power 3 other drives. It came up the 1st time on my 1084 monitor. The 9 pin plug plugs right in and the U shaped din plugs right in. Only black and wight in 40 mode but color in 80 mode. looks like a 128 using 40 or 80 in the 80 mode. The power pupply that comes with it does not have any plug on the end for the power to the wall. Input says 240VAC 0.17A. You can hold down the C= key to be in 64 mode. Stereo player will load and work but does not see the 2nd 8580 sid chip. There is 2 of them in the c65. My guess is the 2nd one is addressed at \$d480. I will have to check it out. The built in drive is a 81 says 73, copyright cbm cbdos v1.0,00,00 The one in my C65 does not work too good. I have to figger out how to make it a nother device #. You can plug in a C= modem and the cartridge port will not fit c64 or 128 cartridges. I think it would with a adapter. The pins are closer together just a little. in the c65 mode you can to in a moniter it's like the 128. You can even say go64 and it ask are you sure? It goes there right away. The video is very good. It just has a border on the top and buttom about 1 inch. each and the sides are a little showing. So that the screen is a little wider. Well any one can get this! Just get the HD power pupply from CMD. But this cost I think \$50. It should plug right in to the C65! I got mine from a nother place and had to put a case on it but only cost me about \$30. Has more amps then the CMD

one too. Well I will have to figger this one how it works more but looks like it's just a nother 128 with a built in 1581. The inside on the board said for some chip names: DMAGIC, VICTOR, BILL, and ELMER. It all so has this: LASSA/GARDEI/NINESPCB/ANDRADE/JF/TL/HM/TC/CW/FISH/HD/GT/DF/BF/ETC and mine says C64 DX REV 2B commodore electronics ltd copyright (c) 191990 all rights reserved. Well I guess that's all I can say about it. It just took them long to get it to me. I will have to clean some of the dust off the keyboard too.

-----  
 From: ralphhey@kittyhawk.aero.rmit.OZ.AU (Russell Alphey)  
 Newsgroups: comp.sys.cbm  
 Subject: I have a C65!!! :))))))))))  
 Date: 1 Dec 1993 06:49:15 GMT  
 Organization: Royal Melbourne Institute of Technology, Melbourne, Australia.  
 Lines: 90  
 Message-ID: <2dhepb\$1f0@aggedor.rmit.EDU.AU>  
 NNTP-Posting-Host: kittyhawk.aero.rmit.oz.au

With trembling hands I opened the large box from The Grapevine Group. My wife grabbed the invoice and said, "What's a C65 with built-in disk drive?". This is what I hoped to find out!

"Ta-da!" A box full of foam beads. Dig, dig, what's this? Something solid...

And in the box was -

1 D.S.G. packet,  
 1 piece carbon paper - crumpled,  
 1 latex glove - grey,  
 1 packet containing a 75 Ohm co-ax cable with identical ends (the sort that plug into a C64) and a TV-computer switch box,  
 1 beige power supply, with the familiar C= on top, a 4 pin round connector at one end and a flat 2 pin wall plug with round pins. The underside has "FOR C65 ONLY POWER SUPPLY". The word C65 is on a sticker.

Oh, there was one other thing in the box :))))))))))

A computer.

Normal C= beige colo(u)r. Key lettering like that on a C128.

Computer is about 18" by 8", and like a flat 128, but no separate keypad (there's a 3.5" disk drive there instead :). The drive points forward, with the eject button on the leading edge of the keyboard.

Key layout is as follows.

```

<power                                <drive
light>                                light>

Run          Caps No          F1 F3 F5 F7   F9  F11 F13 Help
Stop        Esc Alt Lock Scroll F2 F4 F6 F8   F10 F12 F14

<-  1   2   3   4   5           6  7  8  9  0  + -  #   Ctr Inst
Tab  q   w   e   r   t           y  u  i  o  p  @  *  †   Restore
Ctrl S/Lock a s d f   g           h  j  k  l  :  ;  =  return
C= Shift z   x   c   v   b           n  m  <  >  /  Shift †
           .....space.....                < v >

```

Note that # is the English pound symbol.

Also, there's a spot where a metal plaque could go, like on the 64s.

Okay, now for a tour around the computer.

Left side has a reset button, Cont port 1 and 2 (joystick ports), the power switch and power inlet.

Right side is blank.

Back has, (from left as you look at it) a round hole labelled disk drive (but nothing there), a video port (like 128's), a switch (or screw) labelled "L H", an RF port, an RGB video port, a Stereo port with R & L ports, a User port, a CBM serial port, and finally an expansion port.

Underneath there's a flap which conceals what appears to be a miniture centronics port, and the manufacturer's label. It reads -

```

C= commodore
Model C65
Power 5vDC @ 2.2A 12vDC @ 5A
SERIAL NO. 000062 :)))))))))
FCC ID NO.
      made in hong kong

```

Funkenstort n.DBP-Vtg 1046/84

So there you have it, a real? C65. (The :))) above is my editorial comment!)

Unfortunately I can't tell you anything about its operation yet, because I haven't fired it up yet (mainly due to the incorrect plug on the power supply). But rest assured I'll report as soon as I do! :)



Ralphey.

```
-----+-----+
% You are now the proud recipient of a genuine Ralphey .sig!           %
% Accept no imitations.                                           ralphey@kittyhawk.aero.rmit.oz.au%
-----+-----+
```

From: gpage@nyx.cs.du.edu (george page)  
Newsgroups: comp.sys.cbm  
Subject: Re: Does anyone know??  
Message-ID: <1993Nov21.153758.29278@mnemosyne.cs.du.edu>  
Date: 21 Nov 93 15:37:58 GMT

References: <2celdu\$237@pdq.coe.montana.edu> <931120.57786.LMCCLURE@delph  
Sender: usenet@mnemosyne.cs.du.edu (netnews admin account)  
Organization: Nyx, Public Access Unix at U. of Denver Math/CS dept.  
Lines: 17

X-Disclaimer: Nyx is a public access Unix system run by the University  
of Denver for the Denver community. The University has neither  
control over nor responsibility for the opinions of users.

Well, since you posted some pretty interesting historical "trivia", here's  
a thumbnail description of the C65 from a prototype I saw last September:  
Case more or less the color of a 64C, drive embedded off to the right  
where the 128's numeric keypad is, slot slightly raised, wide eject button  
recessed in the very front edge. Top row keys are (l to r) Run/Stop, ESC,  
ALT, CAPS LOCK, No Scroll, then 7 F-keys and a Help. Next row is same as a  
C64 top row (numbers,etc). Thrid row is the same as the QWERTY row on a  
64/128, except that a TAB is first to the left. The next row starts with  
CTL, and then is standard. Bottom row is standard, except cursor keys are  
similar to a Plus/4's. By "standar", I mean 64/128 layout. Back and  
sides, I'm not really sure-uses a mini DIN for an ext drive, seems to have  
a pair of red/white RCA jacks (for stereo output?), 9pin vid output(?),  
long user and expansion ports(?). One or two other round ports on the  
back. Power-in socket, switch and 2 joystick ports towards rear of left

side.(?) (working from not-to-finely-detailed snapshots). General  
styling like a 128 or 64C.

-----+-----+  
From: gpage@nyx10.cs.du.edu (george page)  
Subject: A bit more C65 followup.  
Message-ID: <1993Dec25.183014.1280@mnemosyne.cs.du.edu>  
X-Disclaimer: Nyx is a public access Unix system run by the University  
of Denver for the Denver community. The University has neither  
control over nor responsibility for the opinions of users.  
Sender: usenet@mnemosyne.cs.du.edu (netnews admin account)  
Organization: Nyx, Public Access Unix at U. of Denver Math/CS dept.  
Date: Sat, 25 Dec 93 18:30:14 GMT  
Lines: 24

We finally got a C65 here in the Denver area from Grapevine. A user on a  
local board posted that his had come in last week. He was a little upset  
because UPS had left it out back along a wall where he didn't know about  
it for several days-and it snowed during some of those days! Water came  
pouring out of the box when he opened it, but the computer apparently  
wasn't affected. His initial comments follow, roughly quoted, paraphrased  
mangled and otherwise distorted! (g).

It has two modes of operation, C64 & C65. Use the go64 or hold C= key down  
to powerup in 64 mode. (Just like a 128). Displays in RGB and Composite  
screen for both modes. (Very sharp C64 screen) -I don't know yet which



C65  
INFO 10  
M

comp.sys.cbm #15101 (6 more)

Subject: c65 [sixty-FIVE]  
From: tpug.sysop@canrem.com (Tpug Sysop)  
Distribution: world  
Date: Fri Feb 04 12:36:00 MST 1994  
Organization: CRS Online (Toronto, Ontario)  
Lines: 232

Some stuff for the c65 [sixty-FIVE] crowd. Newz and more Questionz!

Lets start with the Monitor;

```

    pc  sr ac xr yr ZR sp
; 000000 00 00 00 00 00 00

```

A new register, and opcodez to match!

LDZ \$0000 : LDZ \$0000,x ..etc.

The whole family is there with it, all the branches, comparez, transferz ..etc.  
[inz, dez]

What is missing for this one is Zero page stuff!

No; LDZ \$aa : STZ \$aa ..etc. Assembling this in the Monitor nets the Absolute version; LDZ \$00aa.

-----  
Also notice that the ProgramCounter has 3 bytez/6 digitz!

Disassembling will WRAP to next BANK!

```

dF0ffffe
.f0ffffe bl fa    lda  ($fa),y
.f10000 ff ff 02 bbs7 $ff,$0005 ;gadzookx, what's this code..?!

```

-----  
Next are some OpCodez we \*alwayz\* wanted!

```

PHA ; PLA
PHX ; PLX
PHY ; PLY
PHZ ; PHZ

```

BRA ;BRanch Always!

```

TYS ;Tranzfer y to Stack
TSY ;      Stack to y
TSX ;      Stack to x
TXS ;      x to Stack

```

There are quite a few more.

-----  
There are many in the Gadzookx category!

The most baffling one I have seen is MAP! Usualy preceeded with a loading of a, x, y and z. Then MAP. Could this be connected directly to the frankenstein MMU? Might be nice! ..oh, possibly the DAT [Direct Address Tranzlator]?

How about TRB, TSB, NEG, SEE, DEW, ROW, ASW, CLE, PHW, CLV,

```

BBS7 $00,0000
EBR7 $00,0000

```

```

SMB2 $00
RMB5 $00

```

↑

This value ranges from 0 to 7, proll'y branching on bitz ON/OFF.

Going to need Fred for this stuff!

-----  
Letz get back out to Basic 10!

The shortest Stereo tune around;

```
5 vol8 : play "vio1" :rem Volume close to CTRL G, voice and octave to 1
10 play"c" : print "[CTRL G]";: goto 10
```

The sound from play and CTRL G go to differant chanelz on the RCA jackz/Stereo but mono on a monitor w/9 pin separate video cable!

-----  
Function Keyz: 16 of them. Use the c128's KEY command!

Some that are not obvious are F5/7, forward/backward by word or command. A space or colon are delimitierz! [CTRL u/w is equivalent!]

F9/10, Scroll Basic PRG up/down, with wrapping! [last <-> first]  
In the monitor ..memory dump up/down.  
          ..dissassembly down only!      [CTRL p/v is equivalent!]

HELP [F15] highlitez error :between quotes: in Red!

-----  
Atributes:

Flash and Underline are still with us. Characterz can be both, just like the c128. There is an added: +Flash+Underline+ONLY+ !!

I haven't figured out just which CRTL code ..yet.

-----  
All of the c128 ESC sequences seem to be there.  
[ESC i/d, insert/delete blank line. ESC a/c, INSERT mode ON/OFF]

-----  
poke53280,..:poke53281,.. ;have the normal c64 effect on the 80 column screen.

Screen upper left is 2048 for either 40 or 80 coloumn.

poke2048,.. ;will put an @ at HOME position. [0800]

poke55296,.. ;turnz @ to black.          [\$d800]

Pokes to the 2048 to 2048+2000 area work on screen as you would expect, yet the second half of the 2000 does not affect colour memory!!

Try;  
forx=55296 to 55296+1999: pokex,.. :next  
  ..and the last half of the screen charz will not turn black!

Using a BANK command with less than 127 will disable all of these pokes!

-----  
Basic load adress is 8193/\$2001. [I like this number!]

Try this; sys8192 ..it won't mess up you Fkeys or screen colourz!

-----  
c64 Cartridge type code loaded in c65 mode with "8,1", then hit reset.  
..bingo! c64 cartridge auto-start.

-----  
The built in 1581 drive DOS is not debugged fully!

Load and save work grand, a little faster than "41 mode" but seen slower than the 95v5 turbo or Jiffy DOS.

Dload/dsave and the monitor l and s seem to work fine too! <sigh>

Fergit scratch, validate, collect ..etc! Various BAM corrupt/clobbered type errors reported!

-----  
Any drive error incrementz the screen border colour in c65 mode, and \*always\* incrementz the border colour in c64 mode for any drive access. "Development System" indicatorz I'd imagine. Realy annoy'n!!

c64 mode default TAPE device is gone! <yeaAH!>

c64 Basic ROM is 100% indentical, except for the fill bytez in the \$bf50 area. \$ff vs \$aa.

Quite a bit is differant in the main Kernal due mostly to deleted Tape stuff. Too bad they didn't go the rest of the way, and change it to LDX \$ba instead of LDX #\$08. Minor point. In c65 mode woulda been great!

-----  
At reset with disk in the drive file "autoboot.c65\*" is loaded and RUN.

-----  
Bank 020000 has Drive DOS, c64 Basic at \$02a000 to \$02bffff, some odd code right at \$02c000, \*some\* c65 code at \$02c800, char-set \$02d000 to \$02dfff, Kernal \$02e000 on up..

Neat being able to access c64 code in c65 mode ..haR!

Bank 03xxxx has c65 code..

Bank F0xxxx has I/O stuff..

-----  
Here is a funky one, turnz yer whole screen into a flashing cursor!!

First into the monitor w/FB.

Clear screen.

type: mf0d000 <and return>

cursor down to:

>f0d020 d6 d6 d1 d2 .....

↑ ↑

change these to zero'z, and hit return.

Screen colour is now black.

```
Now cursor down to:  
>F0d0f0 00 ...  
↑  
↑
```

Put cursor there!

Bingo! Yer whole screen is flashing!  
Just move yer cursor off to stop it!

-----  
At some point some "underlines" \*stay'd\* on screen after I cleared it!  
Bug or Plan, dunno ..yet!

-----  
J-[ighlander BBS is setting up a c65 file directory and message base to  
support the c65 crowd ..see you there! [416+588+0922, C=/ASCII/ANSI]

-----  
TFUG is starting a c65 Library.. [nothing yet!!]

5334 Yonge St. Box #116, Willowdale, Ont, Can. M2N 6M2

-----  
This is great fun! Lotz more to come of course after some serious head  
scratching!

..I wanna see some of those +eXtRa+ colourz nOW!

[Please pass this on..:]

```
++++ + + + + + + + +  
/ /++// //++ Toronto Pet User Group  
/ / /+//++/ 64/128 Amiga Pet CP/M Vic ..c65! ]>ug..  
End of article 15101 (of 15107) -- what next?
```

```
comp.sys.cbm #15104 (3 more)  
From: c900cade@w255zrz.zrz.tu-berlin.de (Simon. Laule)
```

```
Subject: c65...all new opcodes  
Date: Sat Feb 05 06:17:58 MST 1994  
Organization: TUBerlin/ZRZ  
Lines: 132
```

In addition to the tpug infos heres a list of +all+ new opcodes,  
with some infos. I wanted to post this article for weeks,  
but I havent enough time.

small x,y,z = Register , big X Hex-Wert...  
OPCODE NAME (from monitor) BYTES

02	CLE		1	Clear Emulation ???
03	SEE		1	Set Emulation ???
04	TSB \$XX		2	
07	RMBO \$XX	2		
0b	TSY		1	
0c	TSB \$XXXX	3		
0f	BBRO \$XX,\$XXXX	3		branch on bit reset (0.bit) bbr0-bbr
7				
12	ORA (\$XX).z	2		( also bbs0-7: branch on bit set)

Address	Instruction	Op	Op2	Op3	Comments
13	BPL #XXXX	3			(just like 65c02)
14	TRB #XX		2		
17	RMB1 #XX	2			
1a	INC		1		
1b	INZ		1		increment Z-Register
1c	TRB #XXXX	3			
1f	BBR1 #XX,#XXXX			3	
22	JSR (#XXXX)		3		
23	JSR (#XXXX,x)		3		;new: JSR x-indiziert
27	RMB2 #XX	2			;Reset bit 2, ZP
2b	TYS		1		
2f	BBR2 #XX,#XXXX			3	
32	AND (#XX),z		2		
33	BMI #XXXX		3		
34	BIT #XX,x		2		
37	RMB3 #XX	2			
3a	DEC		1		
3b	DEZ		1		
3c	BIT #XXXX,x		3		
3f	BBR3 #XX,#XXXX			3	
42	NEG		1		negate akku???
43	ASR		1		
44	ASR #XX			2	
47	RMB4 #XX	2			
4b	TAZ		1		;transfer akku -> z-register
4f	BBR4 #XX,#XXXX			3	
52	EDR (#XX),z		2		
53	BVC #XXXX		3		
54	ASR #XX,x		2		
57	RMB5 #XX	2			
5a	PHY		1		
5b	TAB		1		
5c	MAP		1		
5f	BBR5 #XX,#XXXX			3	
62	RTS ##XX	2			
63	BSR #XXXX		3		
64	STZ #XX			2	;trivia
67	RMB6 #XX	2			
6b	TZA		1		;transfer z-reg -> akku
6f	BBR6 #XX,#XXXX			3	
72	ADC (#XX),z		2		
73	BVS #XXXX		3		
74	STZ #XX,x		2		
77	RMB7 #XX	2			
7a	PLY		1		; pull from stack in y-register
7b	TBA		1		
7c	JMP (#XXXX,x)			3	
7f	BBR7 #XX,#XXXX			3	
80	BRA #XX			2	;branch always (relativ)
82	STA (#XX,SP),y		2		SP - StackPointer, like 65c816
83	BRA #XXXX		3		;branch always ( direkt or relativ long)
87	SMB0 #XX	2			;set bit 0, ZP
89	BIT ##XX	2			
8b	STY #XXXX,x		3		
8f	BBS0 #XX,#XXXX			3	
92	STA (#XX),z		2		
93	BCC #XXXX		3		
97	SMB1 #XX	2			
9b	STX #XXXX,y		3		
9c	STZ #XXXX		3		
9e	STZ #XXXX,x		3		
9f	BBS1 #XX,#XXXX			3	
a3	LDZ ##XX	2			



a7	SMB2 \$XX	2	
ab	LDZ \$XXXX	3	
af	BBS2 \$XX,\$XXXX		3
b2	LDA (\$XX),z	2	
b3	BCS \$XXXX	3	
b7	SMB3 \$XX	2	
bb	LDZ \$XXXX,x		3
bf	BBS3 \$XX,\$XXXX		3
c2	CPZ #\$XX	2	
c3	DEW \$XX		2
c7	SMB4 \$XX	2	
cb	ASW \$XXXX	3	
cf	BBS4 \$XX,\$XXXX		3
d2	CMP (\$XX),z	2	
d3	BNE \$XXXX	3	
d4	CPZ \$XX		2
d7	SMB5 \$XX	2	
da	PHX		1
db	PHZ		1
dc	CPZ \$XXXX	3	
df	BBS5 \$XX,\$XXXX		3
e2	LDA (\$XX,SP),y		2
e3	INW \$XX		2
e7	SMB6 \$XX	2	
eb	ROW \$XXXX	3	
ef	BBS6 \$XX,\$XXXX		3
f2	SBC (\$XX),z	2	
f3	BEG \$XXXX	3	
f4	PHW #\$XXXX	3	
f7	SMB7 \$XX	2	
fa	PLX		1
fb	PLZ		1
fc	PHW \$XXXX	3	
ff	BBS7 \$XX,\$XXXX		3

Ok, I know all those z-Register commands, but there are some I dont know, like BBS0-BBS7.

Also there are the W commands (DEW, ROW, ...). Lokks like they are WORD (16 bit) commands, working on stack and/or zeropage,.

Another question is the PC, is it true 24 Bit or not??

Could be the B commands (TRB,..) working directly on the bank register.??

I'm still looking forward for an answer by Fred Bowen, posting the 4510 data-sheet....

Please post any changes, suggestions to this list directly to me...

I will correct and post it again. Any test programs, for bank switching are welcome...

Bye,  
Simon.

End of article 15104 (of 15107) -- what next?

C65 info (14)  
(also part in #2 FAQ?)

Message #3670 "Commodore"  
Date: 05-Mar-94 02:51  
From: Tpug Sysop  
To: C65 User'z..  
Subj: c65 Tips, tricks and puzz

\*@SUBJECT:c65 Tips, tricks and puzzlez! #2 N  
\*\*\*\*\*Long Post Warning!\*\*\*\*\*

[===] Bonzi c65!! [=====]

Welp I nail'd the donkey on the doo-hickey!

Spent nearly a whole day with Jim Butterfield rooting through my c65 a coupla dayz ago, what a hoot. [BTW; Happy birthday Jim!!]

We nailed down all the OpCodes. Complete. The data is in a News Post in the UseNet/InterNet area, "comp.sys.cbm". A rather large file at that. Basically it is a rough draught with all listed. Very few notes but plenty for all of use to get started on!

I am just wrapping up another major session with the thing and am posting some great fun!

-----  
You will be able to type all this one one line;

```
a=dec("d0B0"):forx=.to10:poke a,64:fory=.to50:nE:poke a,.:fory=.to50:nE:nE
```

yep, that is where the drive+job+que controller is!

[the above prg is quite harmless]

-----  
..the c65 Bonzi run;

```
10 a=dec("d031")  
11 :  
20 poke a,12B+64+0+16+0+4+2+1+c
```

```

21 :
10 b=dec("d032")
11 :
20 poke b,128+64+0+16+0+4+2+1+d
21 :
30 forx=.to 255
31 :
40 poke a+13,x
50 poke a+14,x
51 :
60 next

```

[run for your sun-glasses first!] Run it!

1280\*400\*8 resolution! Full of junk, mind you! In fact, only run the above \*after you have run the thing for awhile and memory is full of all kindz of your left over junk! The more ..the better!

Once you have composed yerself somewhat and run this a coupla timez type;  
c=8;goto 10

You will have to type it blind as the grafx screen will still be there!

STOP/RESTORE will bring thingz back to normal, mostly.

\*everyone\* I have shown that one to have choked. ..haR!

-----  
Now for some ColourColourColourColourColour...

The colourz as defined by R.G.B are all defineable on the c65.

Where?

```

R.. $d100
G.. $d200
B.. $d300, each is a full page!

```

The first 16 of each page are the "standard" c64 keyboard colourz and you can poke any value from 0 to 15 in each of the R.G.B pages to change them!

the first three, BLACK to RED, colourz 0 to 2, would be;

```

$d100 0 f f ...
$d200 0 f 0 ...
$d300 0 f 0 ....etc.

```

I would sugest messing with colourz 8 to 15 as this poking around is NOT fixed with the STOP/RESTORE combo! [At least not on my v91.0111!]

These pages are not READable with the monitor, again on my version, but pokes and ML writing to this area works just fine!

-----  
A great area for writing wee ML routines is in the \$400 page. Right where \*old\* c64 screen would be. It is quite safe from resetz and such. Use it like you would the old \$c000 area.

A decent plan would be to put a pattern of C= colourz on screen, then SYS to your ML in the \$400 [1024] area. Here you might want to try stuffing some values into the R.G.B pagez and cycle them!!

```

$000400 idx #7
lda $a1 ;jiffy clock, $a2 is cycling faster.
sta $d208,x ;beat on te G gun :) [orange to l.gray]

```

```
dex
bpl $402      ;including zero
bra $400      ;past zero, start over..
```

I have about 30 or 40 variations now!

-----  
R.Day; How is the Stereo player coming along?!! I'd like some tunes for my riot of colour ..haR!

-----  
BTW; 38.4k term just about done for c65!! Yoikz!

[=====]

]--[ighlander BBS, 416+588+0922, voice 416+588+9071.

]>ug..

--- FidoPCB v1.5 beta-'e'

\* Origin: CRS Online, Toronto, Ontario (1:229/15)

Message #3671 "Commodore"  
Date: 05-Mar-94 02:57  
From: Tpug Sysop  
To: C65 User'z..  
Subj: c65 OpCodez, complete!!

c65 OpCodes, Draft1

=====]94/02/06/04:43p[=====

This text file brought to you courtesy of TPUG via CRSo.

All work done by Jim Butterfield and myself, ]>ug Rodger.

System:

c65 v0.9.910111 CBDOS v1.0, 1084 RGBa [roundy] and 1581 [device 10].

FileName Text . Binary TPUG Disk:  
c65.opz1,s : c65dump,p c65.1

Purpose:

define all the csg65ce02 OpCodez.  
-rough draft so far..

====] Legend [=====

- ++ -LONG Branches! 2 byte operand and Relative Addressing!
- ?? -Unclear as yet, possibly hardwired to another chip.
- \*\* -Unclear, within in easy reach though.
- !! -Surprisingly useful bonus!
- word -Seem to be 2+byte/word related.

..after working through these so long the OpCodez relating to Z register are starting to look normal! BTW; I originally suspected no ZeroPage addressing for Z Register ..[honk!] I wuz quite wrong, there are a few. [stz zp : stz zp,x : cpz zp] No ldz zp!!

]>ug..

====] OpCodez [=====

00	brk	
01 00	ora (\$00,x)	
02	cle	??
03	see	??

```

04 00    tsb    $00    **
05 00    ora    $00
06 00    asl    $00
07 00    rmb0   $00    **
08      php
09 00    ora    #00
0a      asl
0b      tsy
0c 01 00  tsb    $0001    **
0d 01 00  ora    $0001
0e 01 00  asl    $0001
0f 01 00  bbr0   $01,$310e **

```

```

10 00    bpl    $3020
11 00    ora    ($00),y
12 00    ora    ($00),z
13 00 00  bpl    $3008    ++
14 00    trb    $00    ??
15 00    ora    $00,x
16 00    asl    $00,x
17 0a    rmb1   $0a    **
18      clc
19 01 00  ora    $0001,y
1a      inc
1b      inz
1c 01 00  trb    $0001    ??
1d 01 00  ora    $0001,x
1e 01 00  asl    $0001,x
1f 01 00  bbr1   $01,$3020 **

```

```

20 01 00  jsr    $0001
21 00    and    ($00,x)
22 01 00  jsr    ($0001)
23 01 00  jsr    ($0001,x)  !!
24 00    bit    $00
25 00    and    $00
26 00    rol    $00
27 00    rmb2   $00    **
28      plp
29 00    and    #$00
2a      rol
2b      tys
2c 00 00  bit    $0000
2d 00 00  and    $0000
2e 00 00  rol    $0000
2f 00 00  bbr2   $00,$3047 **

```

```

30 00    bmi    $3049
31 00    and    ($00),y
32 00    and    ($00),z
33 01 00  bmi    $3050    ++
34 00    bit    $00,x
35 00    and    $00,x
36 00    and    $00,x
37 00    rmb3   $00    **
38      sec
39 01 00  and    $0001,y
3a      dec    a
3b      dez
3c 01 00  bit    $0001,x
3d 01 00  and    $0001,x
3e 01 00  rol    $0001,x
3f 01 00  bbr3   $01,$306a **

```

```

40      rti
41 00    eor    ($00,x)

```

```

42      neg      ??
43      asr      a
44 00    asr      $00
45 00    eor      $00
46 00    lsr      $00
47 00    rmb4    $00      **
48      pha
49 00    eor      #$00
4a      lsr      a
4b      taz
4c 01 00 jmp      $0001
4d 01 00 eor      $0001
4e 01 00 lsr      $0001
4f 01 00 bbr4    $01,$3088 **

50 00    bvc     $308a
51 00    eor     ($00),y
52 00    eor     ($00),z
53 01 00 bvc     $3091      ++
54 00    asr     $00,x
55 00    eor     $00,x
56 00    lsr     $00,x
57 00    rmb5    $00      **
58      cli
59 01 00 eor     $0001,y
5a      phy
5b      tab      !!!
5c      map      !!!
5d 01 00 eor     $0001,x
5e 01 00 lsr     $0001,x
5f 01 00 bbr5    $01,$30a9 **

60      rts
61 00    adc     ($00,x)
62 00    rts     #$00
63 01 00 bsr     $30b1      ++
64 00    stz     $00
65 00    adc     $00
66 00    ror     $00
67 00    rmb6    $00      **
68      pla
69 00    adc     #$00
6a      ror
6b      tza
6c 01 00 jmp     ($0001)
6d 01 00 adc     $0001
6e 01 00 ror     $0001
6f 01 00 bbr6    $01,$30ca **

70 00    bvc     $30cc
71 00    adc     ($00),y
72 00    adc     ($00),z
73 01 00 bvs     $30d3      ++
74 00    stz     $00,x
75 00    adc     $00,x
76 00    ror     $00,x
77 00    rmb7    $00      **
78      sei
79 01 00 adc     $0001,y
7a      ply
7b      tba      !!!...
7c 01 00 jmp     ($0001,x) !!!...
7d 01 00 adc     $0001,x
7e 01 00 ror     $0001,x
7f 01 00 bbr7    $01,$30ed **

```



```

80 00      bra  $30ff      ++
81 00      sta  ($00,x)
82 00      sta  ($00,sp),y  !!!!
83 01 00   bra  $30f6      +++!!
84 00      sty  $00
85 00      sta  $00
86 00      stx  $00
87 00      emb0 $00        **
88         dey
89 00      bit  #$00
8a         txa
8b 01 00   sty  $0001,x
8c 01 00   sty  $0001
8d 01 00   sta  $0001
8e 01 01   stx  $0001
8f 00 00   bbs0 $00,$3111  **

```

```

90 00      bcc  $3113
91 00      sta  ($00),y
92 00      sta  ($00),z
93 01 00   bcc  $311a      ++
94 00      sty  $00,x
95 00      sta  $00,x
96 00      stx  $00,y
97 00      emb1 $00        **
98         tya
99 01 00   sta  $0000,y
9a         txs
9b 01 00   stx  $0001,y
9c 01 00   stz  $0001
9d 01 00   sta  $0001,x
9e 01 00   stz  $0001,x
9f 01 00   bbs1 $01,$3136  **

```

```

a0 00      ldy  #$00
a1 00      lda  ($00,x)
a2 00      ldx  #$00
a3 00      ldz  #$00
a4 00      ldy  $00
a5 00      lda  $00
a6 00      ldx  $00
a7 00      emb2 $00        **
a8         tay
a9 00      lda  #$00
aa         tax
ab 01 00   ldz  $0001
ac 01 00   ldy  $0001
ad 01 00   lda  $0001
ae 01 00   ldx  $0001
af 01 00   bbs2 $01,$3159  **

```

```

b0 00      bcs  $315b
b1 00      lda  ($00),y
b2 00      lda  ($00),z
b3 01 00   bcs  $3162      ++
b4 00      ldy  $00,x
b5 00      lda  $00,x
b6 00      ldx  $00,y
b7 00      emb3 $00        **
b8         clv
b9 01 00   lda  $0001,y
ba         tsx
bb 01 00   ldz  $0001,x
bc 01 00   ldy  $0001,x
bd 01 00   lda  $0001,x
be 01 00   ldx  $0001,y

```

```

bf 01 00 bbs3 $01,$317e **

c0 00    cpy  ##00
c1 00    cmp  ($00,x)
c2 00    cpz  ##00
c3 00    dew  $00      ??word
c4 00    cpy  $00
c5 00    cmp  $00
c6 00    dec  $00
c7 00    smb4 $00      **
c8      iny
c9 00    cmp  ##00
ca      dex
cb 01 00 asw  $0001     ??word
cc 01 00 cpy  $0001
cd 01 00 cmp  $0001
ce 01 00 dec  $0001
cf 01 00 bbs4 $01,$31a1 **

d0 00    bne  $31a3
d1 00    cmp  ($00),y
d2 00    cmp  ($00),z
d3 00 00 bne  $31aa     +++
d4 00    cpz  $00
d5 00    cmp  $00,x
d6 00    dec  $00,x
d7 00    smb5 $00      **
d8      cld
d9 01 00 cmp  $0001,y
da      phx
db      phz
dc 01 00 cpz  $0001
dd 01 00 cmp  $0001,x
de 01 00 dec  $0001,x
df 01 00 bbs5 $01,$31c4 **

e0 00    cpx  ##00
e1 00    sbc  ($00,x)
e2 00    lda  ($00,sp),y !!!
e3 00    inw  $00      ??word
e4 00    cpx  $00
e5 00    sbc  $00
e6 00    inc  $00
e7 00    smb6 $00      **
e8      inx
e9 00    sbc  ##00
ea      nop
eb 01 00 row  $0001     ??word
ec 01 00 cpx  $0001
ed 01 00 sbc  $0001
ee 01 00 inc  $0001
ef 01 00 bbs6 $00,$31e7 **

f0 00    beq  $31e9
f1 00    sbc  ($00),y
f2 00    sbc  ($00),z
f3 01 00 beq  $31f0     ++
f4 01 00 phw  ##0001    !!word, immediate!!
f5 00    sbc  $00,x
f6 99    inc  $00,x
f7 00    smb7 $00
f8      sed
f9 01 00 sbc  $0001,y
fa      plx
fb      plz
fc 01 00 phw  $0001    !!word

```

```
Fd 01 00 sbc $0001,x
Fe 01 00 inc $0001,x
ff 01 00 bbs7 $01,$320b **
```

```
=====

Welp, there ya have it. A good rough draft start. As mentioned in the
header there is a binary file of this exact dump available. So far though
the TPUG c65 disk is a myth and will be until it is +full+ but the files
for it will be available on the BBS's listed below. Otherz will be there
also, like a wee ML thing that showz all the text charz and
colour+code/atributez available and MultiColour mode.
```

In the next couple of dayz we'll have at the WORD OpCodes and see whatz
what. Our first attemp went for not! PHW #bb77 ; RTS ..and we couldn't
find it #anywhere\*!! <Push Word immediate?>

]>ug..

Last minute Newz!

The WORD opz generally relate to the Stack and the +EXTENDED+STACK+.
ES is in at \$1100, heavily used by the system. Simply amazing! Kind of
remindz one of UNIX type systemz. System/User Stack.. oh boy.

```
=====
J-[ighlander BBS, 416+588+0922, 3/12/2400, C=/ascii/ansi, NISSA/Image Net.
```

```
]>ug.. @ CBM (Node28) :NISSA
TPUG SYSOP :CRSo
TPUG SYSOP 1:229/15.0 :Fido
tpug.sysop@canrem.com ;)
--- FidoPCB v1.5 beta-'e'
 * Origin: CRS Online, Toronto, Ontario (1:229/15)
```

```
Message #3672 "Commodore"
Date: 05-Mar-94 03:07
From: Tpug Sysop
To: C65 User'z..
Subj: c65 tips, trix and puzzle
```

```
*@SUBJECT:c65 tips, trix and puzzlez!! #3 N
*****Another looong one!*****
```

```
[====] c65 Technical [=====]
```

This is for those who a real technical hackerz. Those that can twiddle
single bitz in a single bound ..those that can't, skip right to the end and
find some tipz to get you started! ..haR!

```
[====] The VIC page [=====]
```

It seems that all you know and love about the VIC at \$D000 is still there
when in c65 mode. All the various registerz work as you would expect. Like
the SCROLY/SCROLX \$D011/D016 registerz. These control the vertical and
horizontal fine scrolling just as they would on the c65, except they now
work on the c65 80 column screen! Same with your EXTENED BACKGROUND colour
and MULTI-COLOUR modez.. bonus!

There are a number of registerz that have "unused bitz" on the c64. I have
not chased these down on the c65. Perhaps some one familer with these will
step on them and see if they are in fact used. I suspect some will and some
won't have a whole new meaning. Quite possibly these will cause some trouble
with c64 programz.

What I have been chasing are the NEW registerz.

Namely \$D030 and above. It seemz the \$d000 to \$d02f is almost mirrored at

\$d040 to \$d06f with a wee bit of a hole at \$d030 to \$d03f. This is the area I have been beating on!

The lowest bit of \$d030 controlz the higher speed of the CPU just like the c128. I have not messed with the rest as cyclin showed no obvious effect.

\$d031 and \$d032 create some dramatic changes though. ;)

What I have so far..

	\$d031	\$d032
bit	Effect	
0	interlace	?
1	[something differant]	?
2	[darker, Genlock?]	400 linez!
3	Multi-Colour!	[darker/lighter]
4	BitMap Enable!	.bit plane
5	Attribute Enable!	.bit plane
6	?	.bit plane
7	40/80, maybe 640/1280	.bit plane

The registerz from \$d033 to \$d03c seem to do nothing, but prolly do in conjunction with something else.

\$d03e and \$d03f are pretty powerful!! These move the screen "map" area \*anywhere\* on the scan linez!! Where the SCROLx/SCROLy allow you move the text or bit-map area within the screen "map" ..these move to whole frig'n map on the scan lines themselves!! [What I am calling the screen "map" is the whole area you'd call -background-. The usable area. NOT the boarder]

Cycle all the bitz in \$d03e and the whole screen rollz off one side of the monitor and rollz back on from the other side! Wrapping right around! Same with \$d03f except vertically!!

There will be another bit to control these as they have a twitch in them. Something along the linez as the SPRITEZ rolling past location 255. The screens can have locationz greater than 255. [640/1280 horiz', and at least 200/400 vert']

So, try this;  
a=dec("d03e":b=a+1:forx=,to255:pokea,x:pokeb,x:next  
[and the screen takes off diagonaly!] ..haR!

It does not matter what other bitz are set up, it movez, period! [Text/bitmap]

\*\*We can now have PART of our bitmap[or text] FLASH, interlaced, one colour in Genlock mode and have the screen \*anywhere\* on the scan linez! ..yikeZ!

In an earlier post I gave a wee prg'y that set up an interlaced hi-rez, screen and wrapped it on the scan linez ..from basic!

Dropping back to earth for a bit, there is one thing that is bothering me a wee bit. Bear with me and follow thee stepz to create the "effect":

```
Jump into the monitor
do a memory dump of *any* page ;m 8000
now use this fill command;
  f 1f800 1fff0 72
```

If you used the default colourz you now have, blue boarder, blue background, red text[as the low-byte in the fill] ..yet the screen background is flashing Light Green and the text is Green ...!!!

..where is the extra colour coming from??

[===] Back to VIC page [=====]

Again a previous prg'y post, I flashed the drive light.

Welp it seemz the internal drive controller is in the VIC page too!

All of \$d080 to \$d0Bf seem to be valid adress space and mirrored to the end of the VIC page. Dropping a \$40/64 into \$d080 is a valid JOB code into the JOB-QUE. Turning on the drive light in this case.

Other valid JOBS would be position head, read, write and format!

I am not very fluent with this stuff so have steared clear of it, mostly. It may also be that the mirrored area ..is not! And controls other functionz. [differant bufferz and such]

A friend of mine laughed when he saw the drive light come on and set up a wee prg'y on the main irq;

"if SHIFT key is pressed, turn on drive light, else turn it off, resume irq"

If you guyz realy want this, lemme know and I'll post it.

Some thoughtz come to mind; it would be crazily simple to drop a FORMAT JOB command in the JOB-QUE... with no praramz, or carzy onez at that! Randomly? On purpose!! ..yikeZ! [givez me the williez]

[===] Puzzler, another! [=====]

Try this one;

```
a 400 sei
    dex
    stx $d020
    stx $d021
    bra $401
```

Enter it at \$400/1024 to disable interuptz, or \$401/1025 ..not! Notice that once the scan is running across the "map" area colourz are NOT changed. You cannot interfere!

But there could be a bit somewhere to alow it. ..duh?

Set \$d03e with \$80 and enter the above again to see the "scan-line-wrap" area.. [what do you call al this stuff anyway?]

[===] Anyone else? [=====]

So, pass this on.. and Puh-lease bring some feedback ..back!!

Hey guyz, some how I missed the cartridge adapter layout? [thanx!]

Fred, I'm starting to sweat coffee! My finger nailz have left scarz in my palmz.

[==] Tipz for Tackling [=====]

Peek a register first, then put itz value and a poke command in an Fkey!! This could restore thingz back to if you happen to step on something hot! I used this trick to get back from bit-map modez! <grin>

Try poking them with this layout;

```
a=dec("d03e")
pokea,128+64+32+16+8+4+2+1
pokea,128+00+00+00+0+0+0+0 ;if you use the above valuez only you can see
                             ;exactly which bitz you are setting/clearing.
```



..have fun!

]>ug ]Zodger

The J-[ighlander, a few blocks from the original home of commodore..  
Toronto [Can], 416+588+0922, C=/ASCII/ANSI, Image/NISSA NetWork.  
--- FidoPCB v1.5 beta-'e'  
\* Origin: CRS Online, Toronto, Ontario (1:229/15)

Message #3673 "Commodore"  
Date: 05-Mar-94 03:12  
From: Tpug Sysop  
To: C65 User'z..  
Subj: c65 3 colour Barz ML.prg

+++++Long Post Warning!+++++

[====] ml.3barz.400 [=====]

]-(ere is some nice colourful "barz" for the c65.. enjoy!

[ Please pass this along to the various places where the c65 userz can  
find it! ..thank you! ]

ml.3barz.400 memory dump;  
>000400 a9 00 8d 21 d0 8d 20 d0 a9 88 aa ea ea a0 0f ad  
>000410 11 d0 30 fb ec 12 d0 d0 fb ea ea 8c 20 d0 8c 21  
>000420 d0 98 99 00 d1 99 00 d2 99 00 d3 4b e8 ec 12 d0  
>000430 d0 fb 3a 30 08 99 00 d2 99 00 d3 80 ef 98 e8 ec  
>000440 12 d0 d0 fb 3a 30 05 99 00 d1 80 f2 ea ea ea ea  
>000450 98 99 00 d1 99 00 d2 99 00 d3 4b e8 ec 12 d0 d0  
>000460 fb 3a 30 08 99 00 d1 99 00 d3 80 ef 98 e8 ec 12  
>000470 d0 d0 fb 3a 30 05 99 00 d2 80 f2 ea ea ea ea ea  
>000480 98 99 00 d1 99 00 d2 99 00 d3 4b e8 ec 12 d0 d0  
>000490 fb 3a 30 08 99 00 d1 99 00 d2 80 ef 98 e8 ec 12  
>0004a0 d0 d0 fb 3a 30 05 99 00 d3 80 f2 20 b3 04 4c 00  
>0004b0 04 99 00 ad b1 04 d0 12 ae 09 04 e0 9a f0 06 e8  
>0004c0 8e 09 04 80 04 ca 8e b1 04 60 ce 09 04 ae 09 04  
>0004d0 e0 3a d0 05 a9 00 8d b1 04 60 ea ea ea ea ea 60

Instructionz;

1. buffer this message ..convert to PETSCII if needed.
2. Trim out the memory dump area above, save it, as text.
3. Using the TYPE command put it on the c65 screen.  
[type"filename"]
4. Using your cursor move this text to the top of the screen.  
ESC v, a few times will work too.
5. Put yer cursor on the line below the memory dump text.
6. Hit yer FB and enter the Monitor, hopefully this did not scroll off  
the top of the screen.
7. Now just cursor up and hit return on each line!
8. Save the ML if you like for future use with;  
s "ml.3barz.400" 8 400 4e0
9. Exit the Monitor.. clear screen, and sys1024!

The code itself is not particularly graceful as there are trail endz of  
some odd thingz I wuz tring before this. And this works nice. Real clean.

What is surprizing is how clean the colour is and smooth the "swing" is  
without using or even disabling the system interuptz!

For those of you who will miss out; it is 3 colour barz on screen 32 linez  
high each! Each shading from white to dark ..red, green and blue! The basic  
colourz of the c65.

```

+++++ +++++
 / /++// //++ Toronto Pet User Group
 / / /+//++/ 64/128 Amiga Pet CP/M Vic ..c65!
---- FidoPCB v1.5 beta-'e'
 * Origin: CRS Online, Toronto, Ontario (1:229/15)

```

Message #3674 "Commodore"  
Date: 05-Mar-94 03:33  
From: Tpug Sysop  
To: C65 User'z..  
Subj: c65 prg'yz..

I just dropped a whole bunch of c65 related info here, there are a number of wee prg'z that I have written during, and some more, since..!

Most were just for snooping/debugging. One in particular may be of use!

I have written two Terminals for the c65! Not full fledged thingz, they just allow you to call and read and write in either ASCII or commie CG modez.

..what is surprising as they run from 2400 clean through to 57.6k speed!

In long form: 57,600 baud.. [Not the right expresion, but you get the idea]

I wrote the terms with about 6 lines of simple basic. [Clear screen, c128 ESC command to create a whole screen widow minus top line for status and an open 2,2,2 command] Then about 17 bytes of kernal calls, get char from key/modem and char+out screen/modem!

..anyway, the c65 coulda been an amazing boost to the commie world. <sigh>

Any c65 user'z need these

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..anyway, the c65 coulda been an amazing boost to the commie world. <sigh>

Any c65 user'z need these in here? I could post them, sorta.. :)

```

+++++ +++++
 / /++// //++ Toronto Pet User Group
 / / /+//++/ 64/128 Amiga Pet CP/M Vic ..c65!
---- FidoPCB v1.5 beta-'e'
 * Origin: CRS Online, Toronto, Ontario (1:229/15)

```

C65 info 3

From: gpage@nyx10.cs.du.edu (george page)

Subject: Some more C65 stuff.

X-Disclaimer: Nyx is a public access Unix system run by the University  
+ of Denver for the Denver community. The University has neither  
+ control over nor responsibility for the opinions of users.

Organization: Nyx, Public Access Unix at U. of Denver Math/CS dept.

Date: Fri Dec 31 17:49:30 MST 1993

Lines: 32

Had my hands on a C65 for a little while today, and managed to get a few of my questions answered! The local user who had already received his came by to try it out on my monitor, cause his Amiga one didn't totally like it. Anyway, his is a PAL machine. No serial number or ID or anything on it, unlike Ralpheys, who had numbers on his. On my 1084S monitor, in 80 column ANALOG RGB mode (as opposed to the digital that the 128 likes), it behaved beautifully, except for some minor flicker--almost like a really mild interlace flicker. BOTH (yes BOTH) the 40 column 64 screen and the 40 & 80 column come up in full, sharp, clear, brilliant color in the monitor's 80 column RGB mode! They apparently double the pixel size or whatever it is that does that, to create a simulated 40 column screen. In the 40 column Chroma/Luma/Sync mode of the monitor and 64 mode of the computer, it just comes up in black & white. It runs about 85% of the tested NTSC games/demos/whatever with no problems. Had mixed results trying some PAL demo's and games on it. F'instance, running a preview of Lemmings from Force or Format that had a Euro title screen on it cleared up the intro, but the game tore up badly. On an NTSC machine, the intro was the normal (for NTSC) PAL glitchy, but the game was fine! The second Lemmings demo that I snapped from the magazine tape recently runs fine on both machines. We ran Stereo-Sid player V10/11 on it with a couple of songs, and it worked fine when we selected the proper address--with one minor quirk. Don't know if it was my receivers fault, or a quirk of the computer, but when the 2 cables were plugged in tightly, only one channel would come through the receiver. But when either one was loosened enough to break one ground connection, they both came through.

We tried, but were unable to access any external drives through the serial port. His did not have the "external drive" mini-DIN socket installed on the motherboard.

(Oh, and by the way, when we were connected to the monitor for 80col mode, it was through the normal 9pin DIN cable that my 128 normally uses).

Message To: All  
Title: More c65 info...

--- Enter text -> [CTRL-Z] When done ---

---

The local person who has already received his C65 brought it over this morning for several hours of show & tell. Got David over here towards the end of the session as well to pick his brain a bit. Did a bit of experimenting and testing of a few things. First off, using my 1084S monitor: in 64 mode using the standard c64 to chroma/luma/sync cable, it only displays in black & white. However, using the normal 128 80 col 9pin DIN connector, and switching the monitor to Analog RGB, it displays it's C65 screen in 80 col in full color, and then if you switch or bring it up in 64 mode, it expands the characters or whatever (David knows what I mean-cause he did it in his menu), so you get your normal C64 screen, but you're in 80 column mode on the monitor! Very sharp images!!! Colors beautiful in both modes. We also ran the stereo Sid program with it, and had it working, with one minor quirk -when both cables were fully plugged into the computer, we would lose one channel. By backing one cable out so that both grounds weren't connected, it output both channels. Don't know if that was cause of my cheap receiver, or some glitch in the board. Since there is no cassette port, they bypassed the cassette default loads, like on a SX. Shift/RUN-stop loads the first program from disk, just like the SX Rom. We did find some of the cassette commands in memory, as well as a number of others that were added to make the Basic 10. Can't remember them all. David will probably jump in here with more about the monitor stuff-since I left the two of them to do that while I was trying unsuccessfully to get in touch with Grapevine to find out when they had shipped mine. We also tried some PAL demo's, and compared them to a standard NTSC 64, with varying results. Some were easier to see, some were worse or crashed. The power supply is basically a beefed up 1541 II/1581 supply. Same pin-outs, but 2.2 amps on the 5 V side, vs 1Amp on the '81 supply. The one they sent him was designed to run on 220V input. He picked up a step-up xformer locally that put out 220VAC at 500VA. Worked it OK, but both the xformer and the P/S run quite warm to the touch. More details as they develop!



Subj : C-65 specs  
From : Ramlinker @ Emrg  
To : Craftsman @ 7-11  
Date : Thu 23-Dec-1993 3:16am  
Origin: Tue 21-Dec-1993 9:54am

---

Hey, Craftsman! A personal Thank You for posting the details on your long-awaited C-65. Very interesting stuff...

I can't remember if you mentioned anything about hooking up external serial drives. Is it possible to change the device number on the built-in '81? (Is it actually a true '81?) Does the new architecture mean JiffyDOS is out of the question?

Does the smaller cartridge port mean you can't use a RAMLink? (don't laugh! This is a serious compatibility issue!) What about joystick ports?

Now it looks like this is the 64 that SHOULD have been released. But because it seems like the 128 has a much larger user base, how will you get software for the exotic 65? I mean, the potential is there, but the motivation to provide excellent software for such a small number is NOT (witness the Plus/4 and 16).

The Canadian EMS Connection

Resp : (3) of (13)

---

Subj : C65's 4 sale @ Grapevine  
From : Randy  
To : Craftsman @ 7-11  
Date : Thu 23-Dec-1993 2:48pm

---

Well, congratulations! Maybe I'd better go out and look in the bushes and the snowdrifts around my house, since we're in the same city and mine hasn't shown up yet! Yours' is the 3rd now that I've heard of being recieved, and the first in this country!

Resp : (4) of (13)

---

Subj : C65's 4 sale @ Grapevine  
From : Craftsman @ 7-11  
To : Ramlinker @ Emrg  
Date : Thu 23-Dec-1993 6:16pm  
Origin: Thu 23-Dec-1993 9:05am

---

The C65 does have a serial port on the back side but I have not attempted to hook anything up to it. It does not have any dip switches to change device numbers on the outside. It appears that it would not be Jiffy Dos or RamLink compatible (sob sob), but it could more than likely be changed to work with it. I had to open up the computer because UPS had shipped it so hard that it would only work when it wanted to. I located the problem. It was a lose 16 Mz timing chip.

The computers board was only approx. 4 1/2 X 11" long. It did not look like any other Commodore 8 bit computer I have ever seen.

The drive reads 1581 disks fine but I dont think its dos is the same. The Computer appears to be about 85% comp. with programs for the 64. I dont know if the programs that dont run are because of bugs in the computer or because this is a PAL version.

Another thing that I talked about in the last post was the computer while in



64 mode displayed its picture in RGB mode. This makes me think that it will run in 4Mz mode and still show the picture. I cant remember how to put the 128 into 2Mz mode via programing other than the FAST command. If I have the 1902 Monitor in comp. mode the picture is in black and white. I think commodore was going to combine the composite picture with the RGB to make more colors on the screen (Hard to explain you would have to see it).

While in C65 mode the pokes that you would use to turn on sprites on the 128 and 64 are the same. It appears that many of the memory locations are the same.

Got to let you go so I can play with the C65.

Craftsman

7-Eleven BBS (303) 745-7018

Resp : (5) of (13)

---

Subj : C65's 4 sale @ Grapevine  
From : Craftsman @ 7-11  
To : Rundy @ Cave  
Date : Fri 24-Dec-1993 4:53pm  
Origin: Fri 24-Dec-1993 1:10pm

---

Rundy,

Is your computer an NTSC or PAL version. If it is a PAL let me know and I will tell you where to get the power supply converter and another part. Don't go to Radio Shack. Since your in the Denver Metro Area we could get together.

I failed to answer one question from the prior post the C65 does have two joystick ports and next to them a reset switch. It does not have a cassette port. There is a hole in the back of the unit near the disk drive above the hole it says disk drive. There is nothing to plug into and I think that it may be to hook up a differnt style drive directly to the motherboard. There is a seperate serial port.

Craftsman

7-Eleven BBS (303) 745-7018

---

Subj : Argh.....  
From : X-> Mike <-X @ Diam  
To : All  
Date : Mon 27-Dec-1993 1:49am  
Origin: Sat 25-Dec-1993 2:36pm

---

I'm sure it's GREAT, but.....

1) You will not see any C65 commercial software.

2) If you want a machine that is a 64 and more than a 64, there are still plenty of used 128's selling for ridiculous prices.... :D

I see it as a really neat collector's item, the last hiccup from C='s 8 bit days....

Imagine how neat it would be to own the last Zukov-made Cobra-killer Corvettes....only 6 were made before GM Management ix-nav'ed production!

Now, the question is how did these C65 prototypes get released...  
I'm real worried that it could mean C= is really hard up for cash!!  
I don't believe this "warehouse find" rumor one bit!

Mike

Was the at\$ or at% you were talking about? DiamondBack BBS: Miami, Fla.

Resp : (8) of (13)

---

Subj : C65's 4 sale @ Grapevine  
From : Craftsman @ 7-11  
To : X-> Mike <-X @ Diam  
Date : Mon 27-Dec-1993 1:29pm  
Origin: Mon 27-Dec-1993 8:59am

---

Well I never expected there to be any commerical software for the 65 side of the machine and I wanted it as a collectors item. I hope to be able to get some imports from Europe beacuse mine is a PAL version.

I don't think Commodore knew that they sold the C65 to the grapevine group. The computers did not have a name tag or serial number. I hope that someone inside of Commodore U.S.A. or Europe noticed the demand that there was for the C65. Maybe they would start to sell them instead of the Commodore 64c. If the price was 149 they would sell millions of them in Europe.

I know that there will be no support from Commodore on how to program the 65 side of the machine so I will get support for other members of the boards that have one.

Craftsman

Resp : (9) of (13)

---

Subj : C65's 4 sale @ Grapevine  
From : Randy @ 7-11  
To : Craftsman  
Date : Mon 27-Dec-1993 6:28pm  
Origin: Mon 27-Dec-1993 3:11pm

---

The one that got to Oz had a serial number, also some German label-might have been the equivalent of German FCC approval or sumpin. I'm still trying to find out just how many Grapevine did get hold of. According to CBM's rep on I'net, there were only 50 or so made, and a number of them were in the hands of programmers and such (I know of two in Fla). But Grapevine is talking like they had sevral hundred. And anyone found snooping around in my backyard looking for UPS packages will be found there the next morning!! (g).  
Snoopers welcome: the dog just finished the last one!

7-Eleven BBS (303) 745-7018

Resp : (10) of (13)

---

Subj : C65's 4 sale @ Grapevine  
From : Moog-Wamp @ Smgl  
To : Craftsman @ 7-11  
Date : Tue 28-Dec-1993 6:42am  
Origin: Sat 25-Dec-1993 6:10pm

---

Did it come with any manuals or startup software? What did the box look like?

Long Live Commodore!!

Resp : (12) of (13)

---

Subj : C65's 4 sale @ Grapevine  
From : Craftsman @ 7-11  
To : Moog-Wamp @ Smgl  
Date : Tue 28-Dec-1993 8:38pm  
Origin: Tue 28-Dec-1993 10:54am

---

The computer did not come its own box but did have the foam inserts that go around each side of the computer. It was shipped in a large box. There were no manuals.

Craftsman

Resp : (13) of (13)

---

Subj : C65's 4 sale @ Grapevine  
From : Rundy @ 7-11  
To : All  
Date : Sat 1-Jan-1994 6:15pm  
Origin: Sat 1-Jan-1994 11:42am

---

Craftsman came over yesterday with his new toy, and we had a few hours worth of fun discovering some of its' capabilities. Really nice little machine. The 2 I had seen in Fla were not hooked up, so this was the first operational one I had a chance to play with. It worked fine on my 1084s moniotr, using (get this!) the 80 column RGB ANALOG mode for all operating screens of the C65!!! It does that character enlargemnt trick to expand the 40 column screen on both the C64 and C65 modes to fill the 80 column display! Really sharp, and even better detail on the 64 side than with my 1802 in Chroma/Luma Sync sep mode. We couldn't get any access to an exterani dive through the serial port, though. Plus his never had the mini-DIN external drive connector installed. Had mixed results trying some PAL demo's and games on this PAL machine. It also sometimes works and soemtimes not on NTSC stuff. Got the stereo SID player working on it, with one minor quirk-don't know hwether it was my receiver, or the C65's output, but it wouldn't play both channels through the amp unless either cable was loosened so that only one ground was connected. I'm a little more anxious now about getting mine than I was before!

7-Eleven BBS (303) 745-7018

*C65 INFO 6 ↓*

Mine got here a couple of days ago. Been doing some testing and snooping and such. Mine had a "Warranty Sticker" over one of the screw holes, but no other labels. The external drive connector also wasn't installed on mine. Tried a cartridge adaptor I had, and discovered that the old C64 games carts would work OK. However, none of the Utility/fastload/snapshot type carts I tried w would work. Epyx at least came up with its' menus, but wouldn't access the d drive. The fancier carts mostly garbaged out on powerup. The built-in monitor in 65 mode allows you to actually view all 255 banks. We discovered that some of the old "pseudo-opcodes" that people have been warned about not using have been inplemented in the new chip, with different functions than in the old. This could be the reson for the only 85% or so compatibility. I didn't take a chance and try using RAMlink with it, but might in the future, I really doubt that it will be compatible, since no other drives are (at least

"NTSC" Machine S/N 000047 \* = Different From PAL  
(From Dennis)

- \* U1 4510 R4A (Write Protect Sticker) Square
- U2 4667 R5 Square
- \*? U3 PAL 16 L8 BCN 929 A2EY (16Ø R3 written on in pencil)
- U4 8580 R5
- U5 "
- \* U6 C65 910626X \$AESC (Masking Tape Label) EProm
- U7 TMS4464-10NL
- U8 "
- U9 "
- U10 "
- \*? U11 PAL 16 L8 BCN 929 A2EY (HAD paper Label, now missing)
- U12 →
- U13 MC 14Ø66 BCP
- U14 "
- U15 DM74 LS125AN
- U16 7809 CT (3 pin pwr resistor?)
- U17 39Ø957-Ø1
- U18 SN74 ALS 244 BN
- U19 XTAL 28.37516 mhz
- U20 - vacant
- U21 - EP4978-15
- U22 Ø11D IN pencil on square chip
- X1 - XTAL 8.000

ENGLISH keyboard  
 EXPANSION RAM  
 NO EXTERNAL FLOPPY DRIVE  
 ROM CHECKSUM \$AESC

TOP MESSAGE:  
 The Commodore 64DX,  
 Development System  
 COPYRIGHT 1991 COMMODORE  
 Electronics, LTD,  
 COPYRIGHT 1977 MICROSOFT  
 BASIC 1Ø.Ø VØ.9B.91Ø624,  
 all rights Reserved

Red
OR
Yel
LT GRN
<del>BLU</del> BLUE
Violet

Has blue wire - one end soldered to "sync" on TP1, other end JUST hanging out back expansion port.

also HAS SN74LS 74AN "TACKED" Between U5 & U11/U14 with jumper wires connecting it

REU HAS 8 - TC514256 AP-10" chips (U1ØØ - U1Ø7)  
 Commodore Electronics AWK 313384 Rev 9.3  
 C65 RAM Expander 1 - U1 - TIB PAL 2ØL8-15CNT  
 ASSY 313381 1 - U3 - MC 74F175 N  
 FAB 313383 1 - U2 - SN 74ALS 245AN  
 C'90

Chinon Mech  
 Model FB354C  
 S/N 1Ø1ØØ135 01/91

PL/BG/JA/VA/HD/NINES pcb

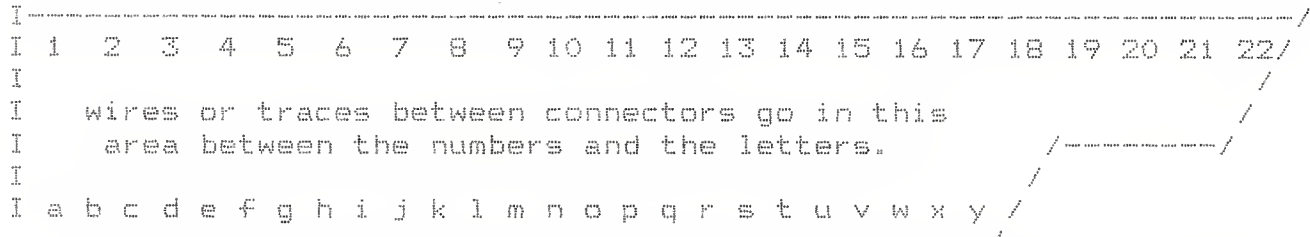
MITSUMI keyboard  
 2Ø9 1Ø13Ø



Making a board to adapt C64 cartridges to use on a C65.

In response to Ralph's question about how I managed to hook up C64 cartridges to my C65, here is a crude but functional diagram/hook-up instructions. The following diagram is shown looking at the top of the board, with the 44 contact C64 cartridge connector at the top of the screen, and the 50 contact edge connector to plug into the C65 at the bottom. The contacts are labeled from left to right, with the C64 connectors in numeric form, and the C65 connectors in alpha form. In the hookup instructions to follow, I use T and B to mean top and bottom of the board. B1 would be directly below T1, Ba would be directly below Ta, etc. It's up to you as to how you wish to make this thing (if you even want to). I would guess either etching a board, or hand wiring would be suitable. Distance between the two connectors is up to you. (within limits-too long and I'm sure you'll have problems).

44 contact "C64 cartridge socket" end of the board.



50 contact "edge connector to plug into C65" end of the board.

That diagram was just to get us all on the same sheet of music, hopefully. I am doing the best I can to make this legible and logical, but I cannot be held responsible for any damage to your equipment caused by trying this! It works for me, is all I'll claim! Mine is roughly 9 CM total length, by the way.

Hook-up instructions-aargghh!

First, Top and bottom end connectors on the 64 cart end, labeled t1, b1, t22 and b22 are all grounds, and connect to td, ty and by on the 65 end. (all 7 pins are interconnected).

Now for the rest. (actually relatively easy, since they're all in order)

t2 & t3 (joined) to te & tf (joined)	b2 to be	b12 to bo	
t4 to tg	t13 to tp	b3 to bf	b13 to bp
t5 to th	t14 to tq	b4 to bg	b14 to bq
t6 to ti	t15 to tr	b5 to bh	b15 to br
t7 to tj	t16 to ts	b6 to bi	b16 to bs
t8 to tk	t17 to tt	b7 to bj	b17 to bt
t9 to tl	t18 to tu	b8 to bk	b18 to bu
t10 to tm	t19 to tv	b9 to bl	b19 to bv
t11 to tn	t20 to tw	b10 to bm	b20 to bw
t12 to to	t21 to tx	b11 to bn	b21 to bx

ta, tb, tc, ba, bb, bc, and bd are not connected.

Have fun, and keep in mind that the older 64 game cartridges seem to work (at least the few I tried), and the speedloader/memory save types don't want to work.



"PAL" MACHINE (NO LABEL)

MY C65 chips / specs, etc. \* = socketed

\* = socketed

Basic 10.0 V0.9.910111

- \* U6 (ROM?) C'91 390488-02 03 CAFF
- \* U1 4510 R3 (Victor) (SQUARE) (CBM)
- \* U2 4567 R5 (Bill) (SQUARE) (CBM)
- \* U3 390989-01 (Paper Label) (20pin) (CBM)
- \* U4 8580 R5 (28pin) (CBM)
- \* U5 " " "
- ~~U6~~
- \* U7 + MS4464-10 NL (18pin) (Texas Inst)
- \* U8 " " "
- \* U9 " " "
- \* U10 " " "
- \* U11 390548-01 (Paper Label) (ELMER) (20pin) (CBM)
- U12 MC14066 BCP (14pin) (Motorola)
- U13 MC14066 BCP (14pin) (Motorola)
- U14 LC 3517 B-15 (24pin) (SANYO)
- \* U15 DM74LS125 AN (14pin) (2x)(?)
- \* U16 7809 CT (3pin pw xistor) (Motorola)
- \* U17 390957-01 (D-MAGIC) (48pin) (CBM)
- \* U18 SN74ALS244 BN (20pin)

27C010 EPROM (32pin)

THE COMMODORE C65  
 Development System  
 Copyright 1991 Commodore  
 Electronics, LTD.  
 BASIC 10.0 V0.9.910111  
 All Rights Reserved

English keyboard  
No expansion RAM

20910130  
 MITSUBI KeyBOARD  
 CHINON DRIVE MECH  
 #FB-354C RevA  
 S/N 10100183 01/91

\* XTAL "U19" 28.37516 Mhz (4pin)

U20 -VACANT socket

XTAL "X1" 8.0000  
 U21 EP 4978-15 (PCA) WEIRD LITTLE Vertical Mount thingie  
 U22 390491-02 SQUARE (CBM)

Red sticker  
 ↓  
 (8.2)

B Rev Dos chip

LASSA/GARDEL/NINES PCB  
 ANDRADE/JP/TL/HM/TC/CW  
 FISH/HD/GT/DF/IBF/ETC

~~BOARD LABELING~~  
BOARD LABELING

C64 DX REV 2B  
 COMMODORE ELECTRONICS LTD  
 COPYWRT 1990

assembled  
 in Hong Kong

Rumours about letters being  
sent to Gould to produce,

Apparently Grapevine picked up some C65's during Commodore's liquidation of its warehouse/storage areas a couple months ago.

What is a C65? A product that almost made it out the door. What you're seeing are "alpha" pilot-production units. There were only something like 50 units made, and a dozen or more of these were distributed around engineering, system developers, etc. Obviously, they were never meant to be sold to the public, but...

```
CPU          CSG65CE02, running at 3.54MHz
RAM          128K, expansion to -8MB
ROM          128K, including C65 mode (v10.0), C64 (v2.2) mode, & DOS
Video       CSG4567 "VIC-III"
            analog RGB with composite sync on each primary,
            separate active-high digital sync,
            composite chroma/luma,
            digital fgnd/bgnd control (genlock)
            all original C64 video modes (40x25 text, 320x200 bitmap)
            new modes (80x25 text, with blink, bold, underline attributes)
            true bitplane graphics (VGA resolution):
                320, 640, 1280 horz. pixels in 8, 4, or 2 planes
                200, 400 vert. pixels, non-interlaced & interlaced
            DAT "display address translator" to access display memory
            standard 16-color C64 palette
            programmable 256-color palette with 16 intensity levels per
            primary color.
Audio       Stereo SID chips
Keybd       77 keys, including separate cursor keys, ALT, ESC, etc.
Disk        Built-in 3.5" double-sided, 1MB MFM (1581 format)
            custom 4191 controller with 512 byte buffer and parallel bus
            external mini-DIN for one A1011-type expansion drive.
            accepts CBM serial drives (1541,1571,1581), fast/slow/burst
I/O         Built-in DMA/blitter
            Built-in 6511-type UART, supports MIDI data rate.
            All C64 ports: parallel, expansion, etc.
            new RAM expansion port, accessible by DMA and video chips.
```

I guess that's enough for now. But be warned- these boards are very out of date- the ROMs, PLA's, etc. are pre-pre-preALPHA, there are absolutely NO spare parts (so if it breaks, that's it!), all systems are PAL (but they display okay on regular 1084-type monitors in analog mode). Oh, and there aren't any manuals. I'm surprised that Grapevine can sell them as "new" equipment. Buyer beware, and all that.

All things considered, not a bad machine, though. I still use mine :-)

---

```
Fred Bowen          uucp:          ...!rutgers!cbmvax!fred
                   domain:         fred@cbmvax.cbm.commodore.com
```

---MORE---(97%)

```
tele:              215 431-9100
```

Commodore Electronics, Ltd., 1200 Wilson Drive, West Chester, PA, 19380  
End of article 11873 (of 11878)--what next? [npq]

Daniel Fandrich

MIME

Directory Tracking System 128  
for Crimson

also asked about when I was  
going to send Kaboom file?

Mike

Was the at\$ or at% you were talking about? DiamondBack BBS: Miami, Fla.

Resp. : (3) of (3)

---

Subj : Suckers and ZIP chip  
From : X-> Mike <-X @ Diam  
To : Rundy @ Cave  
Date : Tue 21-Dec-1993 2:35am  
Origin: Sun 19-Dec-1993 11:52am

---

As far as I know, those who sent in CHECKS as deposits never had their CHECKS cashed.....

If you sent in CASH.....then well you made a mistake in that CASH doesn't trace very well.....they may have no idea it is your cash or you may have been taken....which I find strange because the CHECKS were not originally cashed..

As far as I know.....

---

Subj : C65's 4 sale @ Grapevine  
From : Craftsman @ 7-11  
To : Craftsman  
Date : Mon 20-Dec-1993 4:56pm  
Origin: Mon 20-Dec-1993 1:38pm

---

Well after three months the Commodore 65 finally arrived but no thanks to UPS. The '%&'&%\$ drivers left the computer on the back steps along a wall where you could not see it. The poor thing sat outside for several days while it snowed here in Colorado. When I opened up the box water came pouring out. Thank God it did not seem to effect the computer.

So far I have it up and running and here are a few of the facts I have learned so far.

1. There are two modes of operation a C65 and C64. You switch with the command GO 64 or hold down the commodore key.
2. The Computer displays in RGB and Composite video for both modes it used the RGB also (Very sharp C64 Screen).



3. There are two sound channels at the back of the computer (2 sides I believe).
4. The computer has both 40 and 80 column screens. Both allow sprites.
5. There is a 1581 style drive built in.
6. The computer is approx. the size of the Commodore 128D's key board or if you took a regular 128 and cut it in half right above the power light.
7. The key board layout is similar to the 128 but there are several differences. The crsr keys from the top of the 128 key board are moved to where you would find the keys on the 64. They are laied out much better not straight across. There is the following keys across the top RUN STOP, ESC, ALT, CAPS, NO Scroll then F1, F3, F5, F7 and finally F9, F11, F13, HELP. There is no Key Pad instead the disk drive is there and the disks slide in toward the front for the computer.
8. There is a cartridge port on the left rear (The Pins are smaller then a Commodore 64). I don't think that an old cartridge will run on it.
9. There is a regular size user port. There is also an expansion port the bottem of the computer along the lines of the Amiga.
10. In the C65 mode there is a Machine Monitor. It shows that you can Program from locations 0000 to FFFFFFF. At this time I dont know how much ram is built in. It allows the use of the BANK command.
11. I have been able to run numerous C64 programs on it. The verison I have is a PAL one so some of the graphics are messed up mainly on Demos.

Well I know that there is a lot more to it then the above. Please excuse any typos. If anyone has any questions please ask.

CRAFTSMAN

Base : Commodore Support  
From : Craftsman  
Date : Thu 23-Dec-1993 9:05am

Subj : C65's 4 sale @ Grapevine  
To : Ramlinker @ Emrg  
Origin: [Local] (7-11)

---

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The computers board was only approx. 4 1/2 X 11" long. It did not look like any other Commodore 8 bit computer I have ever seen.

The drive reads 1581 disks fine but I dont think its dos is the same. The Computer appears to be about 85% comp. with programs for the 64. I dont know if the programs that dont run are because of bugs in the computer or because this is a PAL version.

Another thing that I talked about in the last post was the computer while in 64 mode displayed its picture in RGB mode. This makes me think that it will run in 4Mz mode and still show the picture. I cant remember how to put the 128 into 2Mz mode via programing other than the FAST command. If I have the 1902 Monitor in comp. mode the picture is in black and white. I think commodore was going to combine the composite picture with the RGB to make more colors on the screen (Hard to explain you would have to see it).

While in C65 mode the pokes that you would use to turn on sprites on the 128 and 64 are the same. It appears that many of the memory locations are the same.

Got to let you go so I can play with the C65.

Base : Commodore Support  
From : Craftsman  
Date : Fri 24-Dec-1993 1:10pm

Craftsman  
Subj : C65's 4 sale @ Grapevine  
To : Rundy @ Cave  
Origin: [Local] (7-11)

---

Rundy,

Is your computer an NTSC or PAL version. If it is a PAL let me know and I will tell you where to get the power supply converter and another part. Don't go to Radio Shack. Since your in the Denver Metro Area we could get together.

I failed to answer one question from the prior post the C65 does have two joystick ports and next to them a reset switch. It does not have a cassette port. There is a hole in the back of the unit near the disk drive above the hole it says disk drive. There is nothing to plug into and I think that it may be to hook up a differnt style drive directly to the motherboard. There is a seperate serial port.

Craftsman

936-0848  
James Miller

From: Lonnie McClure <LMCCLURE@delphi.com>

Subject: Re: A bit more C65 followup.  
Date: Tue Jan 04 20:50:26 MST 1994  
Organization: Delphi Internet  
Lines: 38

It has arrived!

After sacrificing a good deal of time I should have been sleeping (and paying for it that night at work), I learned a few things about the C65:

First, a 1581 power supply (at least the one I have) \*is\* sufficient to power the machine. The power supply does get quite warm in doing so, but I worked at least a few hours with no problems. However, for long term reliability (of the power supply), I would still advise the use of something with more reserve, such as a CMD HD power supply, or a PC power supply with a 4-pin DIN grafted on.

The only flaw I have found in the construction of the machine is that the right cursor key binds. This was true for another person on comp.sys.cbm, and in his case, turned out to be a fixable construction flaw. Since I will be taking mine apart, I should be able to remedy this on mine in much the same manner as he did.

The cursor keys are in a inverted "T" arrangement, just like the Amiga and most modern PC keyboards.

The C65 screen comes up beautifully on my 1080's screen in gloriously crisp RGB analog, with a deep blue background, and white text, defaulting to 80 columns. The borders are very small, giving more screen real estate than a C64. There is a rainbow of color bars at the top left, the "COMMODORE C65 DEVELOPMENT SYSTEM" logo, and the BASIC 10 logo with the revision number (which is 0.9xxxxx something; I forgot to write all those numbers down <grin>). Oh, and it also says "NO EXPANSION RAM PRESENT". (The C65 has a hatch on the bottom roughly 3" x 6" [I have not measured it yet] with an expansion connector inside, similar to the Amiga 500 and 1200).

Now for some info most of you might find of some interest, but fellow and future C65 owners will especially want to take note of. (Most of this message will be posted on the Commodore groups on Delphi, GENie, and comp.sys.cbm).

End of article 14333 (of 14360) -- what next? [npq] comp.sys.cbm #14334 (26 more)

From: Lonnie McClure <LMCCLURE@delphi.com>

Subject: Re: A bit more C65 followup.  
Date: Tue Jan 04 20:52:15 MST 1994  
Organization: Delphi Internet  
Lines: 87

#### FUNCTION KEYS:

- F1 - Toggles from 40 columns to 80
- F3 - "DIR"
- F5 - Moves cursor to beginning of prior word (or space if blank line)
- F7 - Moves cursor to beginning of next word

F9, F11, F13 - No apparent function  
HELP - "HELP"

The shifted function keys:

F2 - Erases all below cursor  
F4 - "DIR "\*=PRG"  
F6 - "KEY 6"  
F8 - Goes in machine language monitor

F10, F12, F14 - "KEY x" (x = fkey#)

Issuing a "PRINT FRE(0)" command gives a result of 57,085. An argument of (1) gives 55,296. (2) gives 0, and (3) gives an illegal quantity error.

POKE 53280,x still changes the border color, but there is a BORDER command that does the same (and a FOREGROUND and BACKGROUND command, as well). Only 1-16 is accepted, in both 40 and 80 column mode, so evidently the 265 color mode is not available in text mode (or at least, is not the default). 0-255 is accepted if one uses the POKE, but it rolls over after each increment of 16, resulting in the same colors.

THE REGISTER COMMAND DECIPHERED:

The REGISTER command takes the following form:

REGISTER x,y,a,b,c

x = 0 or 1 (I don't know what this does yet)

y = 0-255 (the register number)

--MORE--(48%)

a = 0-15 (red value)

b = 0-15 (green value)

c = 0-15 (blue value)

Unfortunately, this has no effect on the text screen, and the GRAPHIC command apparently has a different syntax than the C-128's BASIC.

OTHER NEW COMMANDS DECIPHERED (at least partially):

DMA: Accepts DMA0,DMA1,DMA2,DMA3. I do not know what this does, other than the fact that a value of 1 or 3 fills the screen with "@" symbols.

TYPE: Apparently displays a file (sequential) to screen. (Sorry folks, I did not have my disks handy to try this out).

PEN: Form is PEN x,y, where x=0-2, and y=0-255.

DPAT: Form is DPATx, where x=0-63

GENLOCK: Either GENLOCK ON or GENLOCK OFF. You will note a difference in the screen, but I doubt this will do much without genlock hardware. <grin>

CHANGE: I used the form CHANGE "CHARLE" TO "CHARLIE", and it did not give me an error. I suspect this is a text editing command.

FIND: Using FIND "CHARLIE" gave no error. (In retrospect, I really should have written a program with REM CHARLIE in it and then tried this.

*← changes in a program*

*← Finds in a PGM*



## UNIMPLEMENTED COMMANDS:

Issuing the following commands results in an "UNIMPLEMENTED COMMAND ERROR" (BASIC 10 was not yet finished, folks):

PAINT, PASTE, CUT, LOCATE, SCALE, WIDTH, QUIT, OFF, SET, VIEWPORT

There may have been others, but these were the ones I recorded. BTW, if you want to search for commands, look in memory, starting around decimal 9380.

## OTHER COMMANDS:

Many other commands (such as WINDOW) appear to work just as in BASIC 7.0 on the 128. GRAPHIC CLR works, but as noted, the standard 7.0

syntax for GRAPHIC otherwise gives a syntax error.

End of article 14334 (of 14360) -- what next? [npq] comp.sys.cbm #14335 (25 more

From: ralphey@kittyhawk.aero.rmit.OZ.AU (Russell Alphey)

Subject: C65 - more user notes

Date: Wed Jan 05 22:20:56 MST 1994

Organization: Royal Melbourne Institute of Technology, Melbourne, Australia.

Lines: 174

This message was posted in Fidonet's CBM echo. It has been reproduced, with some editorial comment, without permission! :)

(595) Mon 3 Jan 94 10:32p

By: Alan Share

To: GEORGE PAGE

Re: My C65 has arrived..

---

And the first thing i did was take to it with a screw-driver!! That won't surprise people that know me! Couldn't do much else as it arrived with bare wires at one end of the power supply. Was expecting some plug, not the right one, but any one, as I have an adapter waiting for it.

Anyway, after peeking through cartidge port (hmmm, bit small!) and user port, something didn't look right in there, so had to investigate. Found what looks to be a crystal (28.37156) stuck into U19, which is a 14 pin socket. Next to it is another socket (U20) which is empty. Anyway, this crystal was 3/4 out of the socket, and one leg was bent awkwardly, wasn't too sure where that leg belonged so that entailed a phone call to Ralphey to get him to pull his apart and tell me where that leg belonged. Not where it was pointing either.

GP> yet. Has another "disk drive" hole in

GP> back, but doesn't appear to be a

GP> connection inside for it, unless it somehow hookes directly to the

GP> motherboard.

On the motherboard just inside that 'disk drive' hole, is a square area marked 'CN12' with 8 holes for a connector of some kind.

There is one Eprom amongst the chips, and damn, its a 32 pinner, so I guess I won't be playing with that in the Promenade! 3 of the chips are rather large square thingos with pins on all sides. One of these is



called Victor, and another Bill! Another smaller chip is called Elmer!

These are markings on the board beside the chip. Another large chip is a 48 pinner and its called DMAGIC. Has that both on the chip, and on the board. Oh, that Eprom is a 27C010 BTW.

Some other markings on the board are

C64 DX REV 2B

Commodore Electronics Ltd  
Copyright (c) 1990  
All rights reserved

lassa/gardei/ninespcb  
Andrade/jp/tl/hm/tc/cw  
Fish/hd/gt/df/bf/etc

There now, this thing must be that elusive C64 DX!!! Odd, can't find a second drive in here tho :-)

Getting back to that cartridge port that seemed smaller, well that was the hole in the case that is smaller. C64 carts won't fit thru that, and even if they did, well no good, as the connector inside is a 50 pin as against the C64's 44 pin.

The video chip, as noted in Fred Bowens message is a 4567. That may be a problem here, as I notice that the Video chip in U.S. C64's is a 6567, whereas here in Oz, we get them with a 6569 video chip. Wonder what the difference is and what sort of a problem it will cause us. No chance there will be a '4569' around anywhere :-)

:: Note... Alan doesn't seem to get the "rolling screen" problem that  
:: I do.

Well, after finding a useless piece of electronic equipment with a plug on it, and a bit of rewiring on the power supply - normal looking C64 brick type, says underneath...for C65 only. Peel off the C65 sticker, and it then says 'for C64 only' hmmm. Another sticker says '+5 VDC 2.2A.....+12 VDC 0.5A' Won't bother seeing whats under that, I think I can guess. Plugged it all in, hooked up a 1701, turned it all on.....Nothing... Uh Oh! hmmm try the 1084S, ah thats better, a picture, various shades of black and white. Oh yeah, its got an RGB d plug, maybe that'll help. Yep, that did the trick, lovely colour... a blue screen, and an orange border. Do a G064 and its just like a 64 screen, and yet somehow different. Pixels seem wider, the C= opening screen spreads from one side to the other, without the normal side borders, just a hint of the border, thats all, and its a white border too, not the normal light blue.

.....Much later... ..next message

---

(596) Mon 3 Jan 94 10:59p  
By: Alan Share  
To: GEORGE PAGE  
Re: My c65 has arrived #2.

---

Yeah, it runs SOME C64 prgs.

Back to C65 mode....  
Blue screen, if a disk is in drive, attempts to autoboot, and failing, changes border to orange. Seems to change the border color each time an unsuccessful drive attempt is made.

ENGLISH KEYBOARD

NO EXPANSION RAM

READY.

Bit worried by that Version # up there, didn't even make it to

Version 1 :- ( Oh, did I mention my serial #. its 000165.

:: Note...my power-up screen is rather different!

+++++

% red bar ++/

THE COMMODORE C64DX DEVELOPMENT SYSTEM

% ++++++/

% +orange? bar++/

COPYRIGHT 1991 COMMODORE ELECTRONICS, LTD.

% +lime green/

COPYRIGHT 1977 MICROSOFT

% +white+++/

% +purple/

BASIC 10.0 V0.0B.910429 ALL RIGHTS RESERVED

GERMAN/AUSTRIAN KEYBOARD

NO EXPANSION ROM

NO EXTERNAL F011 DRIVE

ROM CHECKSUM \$E96A

READY.

:: end note.

It doesn't seem to like another drive hooked in on the serial port. I attached a device 9 1541 there, but it wouldn't access it. Although

the drive light flickers normally when the C65 is switched on, when I do a LOAD"\$",9 it responds with 'searching' but no activity from the drive at all. Returns with a 'ready' a few seconds later. List gives me nothing. If I try a Load"\$",10 I correctly get a 'device not present error'

:: Note. I was able to access a 1571 as drive 11. Haven't tried with other device numbers yet.

Seems to respond to a lot of the C128 commands. 'KEY' gives the F-Keys.

Header correctly formats a 1581 disk.

Went searching with the monitor and found lots of command words, many of them as found in the C128, some of which react the same, some don't though. Graphic won't do what I expect, can't find how to get it to do anything.

I find a number of them give me 'Unimplemented command error' namely:-  
paint paste cut locate scale width sprdef off set viewport gcopy pic  
Is this common to them? Ralphey?

:: Dunno. Haven't tried anything other than to discover all the "hidden" keywords! :)

Curious to know if there are other version numbers, and if there are other rom numbers. My rom has a 390488-02 sticker on it with a pencilled line thru the 02 and a 03 beside it.

:: Mine (assuming he means chip U6) is labelled C64DX DEVELOPMENT  
:: GERMAN PILOT @1, (C)1991 CBM, CS=\$E96A 910501

Anyway, thats my tuppence worth!

Cya.....Alan

& Ralphey! :)

-----  
+-----+  
| You are now the proud recipient of a genuine Ralphey .sig! |  
| Accept no imitations. ralphey@kittyhawk.aero.rmit.oz.au |  
+-----+  
End of article 14349 (of 14360) -- what next? [npq]

From: gpage@nyx10.cs.du.edu (george page)

Subject: Re: C65 - more user notes  
X-Disclaimer: Nyx is a public access Unix system run by the University  
+ of Denver for the Denver community. The University has neither  
+ control over nor responsibility for the opinions of users.  
Organization: Nyx, Public Access Unix at U. of Denver Math/CS dept.  
Date: Thu Jan 06 16:42:25 MST 1994  
Lines: 20

Durn--someone needs to give FIDO a thump! Haven't recived these messages yet on there! Oh, well, it's longer to OZ through FIDO than I'net, right? Here's my additional bunch o' cents worth. Finally got mine in. No serial number or other such labels on it, but I did have a warranty seal over the screw hole (which I quickly voided)--had the "loose chip syndrome". keyboard acting flakey until all were pushed in firmly. The built-in C65 mode monitor allows you to access all 255 banks. There are a number of new opcodes in their, that are using the numbers of the old "undocumented pseudo-opcodes" that we've all been warned about. These could be the reason for some of the C64 software not working?. I tried a number of my cartridges using an adaptor board I had, and found that the old 64 game carts seemed to work OK. However, none of the utility/fastload/snapshot type carts commonly available would access the drive. In fact, only the lowly Epyx would even give functional menus. I also have been unable to access any other than the internal drive. Mine is a PAL model I guess, and gives varying results on PAL and NTSC demo's and such. The recent "theparty" demo on here at least showed part of the title screen, but the text never showed up properly. More details as they develop.

End of article 14361 (of 14362) -- what next? [npq] comp.sys.cbm #14362

ATASI 33.0MB 5.25 3 645 17 ST412  
3033 28.0MB FULL 5 320 MFM

From: all170866@academ01.mty.itesm.mx (Adrian Gonz lez Garcia)

Subject: What's a C-65???  
Date: Mon Sep 13 02:45:24 MDT 1993  
Organization: ITESM, Campus Monterrey  
Lines: 16

Hello everyone!

Well, do you have any ideas? I recently saw an ad on the latest Amiga World by the Grapevine Group. They advertise a 'C65', which they claim to be a new european c64 with a built-in 3.5" drive.

Any info on the subject (a picture maybe? :- ) would be greatly appreciated!

Thanx!

-Adrian Gonzalez  
all170866@academ01.mty.itesm.mx

How recent? So far this machine (a super 64) has been considered non-existent, a shelved CBM project. nada. I think I've got deja-vu, but let us in on the exact ad!

--  
: The Crimson Knight : "The world is full of kings and queens :  
:crimson@rigel.cs.pdx.edu : Who blind your eyes and steal your :  
:-----: Dreams, it's Heaven and HELL!!" :  
: : -R.J.Dio, with Black Sabbath 1980 :

Subject: Re: [Computer] Game ID question... Kaboom  
Date: Mon Sep 13 13:10:10 MDT 1993  
Organization: Evans & Sutherland Computer Corp.  
Lines: 38  
Distribution: world  
X-News-Reader: VMS NEWS 1.11  
In-Reply-To: gpage@nyx.cs.du.edu's message of Mon, 13 Sep 93 02:50:18 GMT

In <1993Sep13.025018.20624@mnemosyne.cs.du.edu> gpage@nyx.cs.du.edu writes:

>  
> And another one I always hoped someone would port over to the 64 was the  
> old Activision game for the 2600 called Kaboom. (the little mad bomber).  
> I've seen a couple of lame imitations of it (well, not too lame-don't want  
> to hurt anyones' feelings!), but nothing quite as good as it was. It was  
> the only game our whole family actually got into. The old arcade and 5200  
> portover of Kangaroo was one I always wanted to see, personally, as well.  
> Guess ya always want what ya can't have.  
>

I don't know if it was "lame," but I wrote a c64 version of Kaboom when  
--MORE--(51%)

I was in high school. All of the action was in assembly so it was quite fast. (Without any delay, you would NOT see the bombs come down before they hit.) It won first place at our district computer programming competition.

One problem with it, however, was that it requires paddles, instead of the joysticks or keyboard. But I have found that the old Atari 2600 paddles



seemed to work great with the 64. But to be compatible with the c64 paddles (which I have), you must have the double paddles, which were used for things like racing games. (The ones that turn around and around...)

It didn't use any of the sophisticated scoring, etc, that the 2600 version had, but that part was in Basic so it could easily be modify. If anyone wants this, maybe I could find someway to get it to the net. I uses about 5 or so separate files and I don't know anything about commodore compression utilities. Maybe someone could help me with that. (Anyone want to volunteer to let me send them the disk and put it into a format uploadable to the net?)

(Maybe this could be one of the first posts for the binary group, which I voted yes for.)

LBR,

---MORE---(99%)

Darvell

Subject: Re: What's a C-65???

Date: Mon Sep 13 19:22:27 MDT 1993

Organization: ITESM, Campus Monterrey

Lines: 18

More about the Grapevine Group's ad on the C65:

this is basically what the ad said:

(new item) Commodore C65: This is a new c64 just released in Europe with a built in 3 1/2" floppy drive in the front (PAL or NTSC) \$95.50 US

their phone # is 1-800-292-7445  
and (914) 368-4242

if you do call them, please post whatever info you get! If not, I will call this weekend and see what I can find out!

later all!

-Adrian Gonzalez

---MORE---(96%)

all170866@academ01.mty.itesm.mx

Subject: C= HACKING #6 Revision // PLEASE READ

Date: Tue Sep 14 09:06:15 MDT 1993

Organization: Pembroke State University

Lines: 17

Due to some misunderstandings, the 64 documentation should \*NOT\* have been included in C= Hacking #6. Hence, those individuals who already have issue #6 should disregard/ignore that article and/or request the corrected #6 via my mailserver at:

to: duck@pembvax1.pembroke.edu  
subj: MAILSERVER  
body:

send iss6.

--

- Craig Taylor - 919-521-3814 All Relevant Disclaimers Apply!!!  
duck@pembvax1.pembroke.edu (Pembroke State University)



--MORE-- (92%)

I'm a creationist; I refuse to believe that I could have evolved from man.  
End of article 11789 (of 11800) -- what next? [npq]

To the best of my knowledge, the C65 was never put into production. I visited the person last week who actually wrote the DOS operating system for it, and saw a prototype of it. According to him, Mr. Gould "pulled the plug" on the system amonth before its' completion date. The Britoish mags had some coverage of it in previews about a year-year and a half ago, but that was the end of it. Too bad, cause it was a decent little critter, with a built-in 3.5" drive, and a lot more features and memory and such than the C64.

End of article 11797 (of 11802) -- what next? [npq] comp.sys.cbm #11798 (4 more)  
From: gpage@nyx.cs.du.edu (george page)

Subject: Re: What's a C-65???

X-Disclaimer: Nyx is a public access Unix system run by the University  
+ of Denver for the Denver community. The University has neither  
+ control over nor responsibility for the opinions of users.  
Organization: Nyx, Public Access Unix at U. of Denver Math/CS dept.  
Date: Tue Sep 14 15:26:40 MDT 1993

Yes indeed, how recent an Amiga World. I'm looking in the Sep'93 issue of Amazing Amiga (purchased to read the "CBM Doomsday" editorial), and the Grapevine ad makes no mention of a c65.

Subject: Re: What's a C-65???

Date: Tue Sep 14 13:15:26 MDT 1993

Organization: Cooley Godward Castro Huddleson & Tatum, San Francisco, Ca  
Lines: 41

In article <all70866.747966147@academ01>, all70866@academ01.mty.itesm.mx (Adrian Gonz lez Garcia) writes:

> More about the Grapevine Group's ad on the C65:

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> their phone # is 1-800-292-7445  
> and (914) 368-4242

>  
> if you do call them, please post whatever info you get! If not, I will  
> call this weekend and see what I can find out!

--MORE-- (50%)

I called them today at about 11:00, the guy I spoke to told me that there was a price change "not five minutes ago" and the new price was \$129.00. When I asked if they were in staoock he said, and I quote:

"Well, yeah, they're instock in the warehouse. First we have to get um from the warehouse, bring 'em over here, plug 'em in and test 'em. And then we can ship. Oh I'd say around a week, okay. So just be patient."

Now in the add in AmigaWorld they(Grapevine) have just started placing "N" and "R" infront of some products to show whether they are New or Refurbished. The C65s are marked as "N"ew. So why would they have to "bring 'em over and plug 'em in and test 'em." first? Frankly, though I'm sure they are waiting to get some in, I believe that in the grand Grapevine fashion, they are full of kaka

In article <all170866.747966147@academ01>, all170866@academ01.mty.itesm.mx  
(Gonzalez Garcia) writes:

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---MORE---(50%)

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and have not seen even one yet.

>

> later all!

>

> -Adrian Gonzalez

> all170866@academ01.mty.itesm.mx

>

---MORE---(97%)

Mike Armstrong  
armstrongmw@cgc.com  
(415) 693-2678

Apparently Grapevine picked up some C65's during Commodore's liquidation of its warehouse/storage areas a couple months ago.

What is a C65? A product that almost made it out the door. What you're seeing are "alpha" pilot-production units. There were only something like 50 units made, and a dozen or more of these were distributed around engineering, system developers, etc. Obviously, they were never meant to be sold to the public, but...

CPU CS665CE02, running at 3.54MHz  
RAM 128K, expansion to -8MB  
ROM 128K, including C65 mode (v10.0), C64 (v2.2) mode, & DOS  
Video CS64567 "VIC-III"  
analog RGB with composite sync on each primary,  
separate active-high digital sync,  
composite chroma/luma,  
digital fgnd/bgnd control (genlock)  
all original C64 video modes (40x25 text, 320x200 bitmap)  
new modes (80x25 text, with blink, bold, underline attributes)  
true bitplane graphics (VGA resolution):  
320, 640, 1280 horz. pixels in 8, 4, or 2 planes  
200, 400 vert. pixels, non-interlaced & interlaced  
DAT "display address translator" to access display memory  
standard 16-color C64 palette  
programmable 256-color palette with 16 intensity levels per  
primary color.  
Audio Stereo SID chips  
Keybd 77 keys, including separate cursor keys, ALT, ESC, etc.  
Disk Built-in 3.5" double-sided, 1MB MFM (1581 format)  
custom 4191 controller with 512 byte buffer and parallel bus  
external mini-DIN for one A1011-type expansion drive.  
accepts CBM serial drives (1541,1571,1581), fast/slow/burst  
I/O Built-in DMA/blitter  
Built-in 6511-type UART, supports MIDI data rate.  
All C64 ports: parallel, expansion, etc.  
new RAM expansion port, accessible by DMA and video chips.

I guess that's enough for now. But be warned- these boards are very out of date- the ROMs, PLA's, etc. are pre-pre-preALPHA, there are absolutely NO spare parts (so if it breaks, that's it!), all systems are PAL (but they display okay on regular 1084-type monitors in analog mode). Oh, and there aren't any manuals. I'm surprised that Grapevine can sell them as "new" equipment. Buyer beware, and all that.

All things considered, not a bad machine, though. I still use mine :-)

--  
--

Fred Bowen

uucp: ...!rutgers!cbmvax!fred  
domain: fred@cbmvax.cbm.commodore.com

--MORE-- (97%)

tele: 215 431-9100

Commodore Electronics, Ltd., 1200 Wilson Drive, West Chester, PA, 19380  
End of article 11873 (of 11878)--what next? [npq]

The  
**GRAPEVINE  
GROUP**  
Inc.

3 Chestnut Street, Suffern, New York 10901  
914-357-2424 • 1-800-292-7445  
Fax 914-357-6243

November 23, 1993

To: Our Grapevine Group Customers

Re: Your order for a Commodore C65 computer

We would like to thank you for your order of a C65 computer and the patience you have shown waiting for delivery. Our first shipment of the computers were configured on the American NTSC system, were tested and everyone was pleased with them.

It appears that our second large release was configured or designed to work only on the European PAL system, which is incompatible with televisions and monitors here in the U.S. We have tried but were unable to obtain the proprietary conversion chip(s) needed to convert the C65 to NTSC.

We are writing this letter to you to inform you of this unfortunate situation. If, for any reason, you should still want the C65 on the European PAL system, please call and tell us. If we have not heard from you within two weeks, we will assume that you do not want the computer and will automatically cancel your order.

We apologize for any inconvenience this may have caused.

JK:ng

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*on some cheap old stuff he might have*

From: c900cade@w255zrz.zrz.tu-berlin.de (Simon Laule)

Subject: c65 - graphics info...  
Date: Mon Jan 31 04:45:35 MST 1994  
Organization: TUBerlin/ZRZ  
Lines: 87

File - C65MAN-Followpp  
on disk

Hi!

In addition to the infos that were posted last week from the c65 manual, here are some *REAL* infos, tested on my c65.  
ROM version was 0.09.910111.

Ok.

For displaying graphics the following commands are necessary:

```
screen def screen#,width,height,depth - define screen# and resolution..
screen open screen# - allocate memory for screen#...
screen set drawscreen#,viewscreen# (normally the same..)
- display screen...
```

... now all normal (basic 3.5/7.0) drawing cmds are allowed, line, etc. etc.

```
screen close screen# - give memory free, and display text screen...
```

If, because of RESTORE-NMI, the text screen reappears without screen close, all commands normally fail, because of lost memory.

Possible Resolutions are:

Resolution	screen def	Memory allocated
1280*400*1	2 1 1 - ok	64k
1280*200*1	2 0 1 - ok	32k
1280*200*2	2 0 2 - ok	64k
640*400*1	1 1 1 - ok	32k
640*400*2	1 1 2 - ok	64k
640*200*1	1 0 1 - ok	16k
640*200*2	1 0 2 - ok	32k
640*200*4	1 0 4 - ok	64k
320*400*1	0 1 1 - ok	16k
320*400*2	0 1 2 - ok	32k
320*400*4	0 1 4 - failed	64k
320*200*1	0 0 1 - ok	8k
320*200*2	0 0 2 - failed	16k
320*200*4	0 0 4 X failed	32k
320*200*8	0 0 8 X failed	64k

- failed means display ok, but screen clr palette# crashes system - RESET  
X failed means screen set crashes with blank screen - RESET

I don't know, why the last three modes crash, they need the same amount of memory as the others, 320\*200\*2 needs only 16k, but crashes...  
Any ideas??????

Also I don't know where the memory is allocated, a print fre



I think the 128k Modes (320\*400\*8) will only available with RAM Expansion. Any suggestion, for this expansion???

The MOUSE command mentioned in the last weeks c65 article, is not available in 0.09.91011, also RMOUSE.  
GRAPHIC command# [,args] brings syntax error.

The screen modes use the color palette  
PALETTE screen#,color#,R(0-15),G(0-15),B(0-15)

Changing the palette when displaying a screen crashes the system...

I don't know how the 1-7 bitplane graphics point to their palette color, just because i have only a green monitor.

Ok, thats enough for now. Any comments, hints etc.  
please directly to me, i will post corrections/additions....

Oh, and Im still curious about all the ROM versions out there.  
Until now i have mine (0.09.910111) and ralpheys (something like 0.0b.910429). Are other versions??

Im still looking for version 0.0b.910429 on disk, ralphey owns no eprommer, so he cannot get the image...???

Any hints???

OK, bye

Simon.

End of article 14970 (of 14978) -- what next? [npq]



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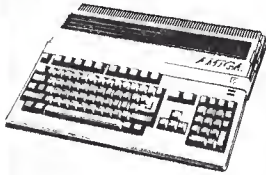
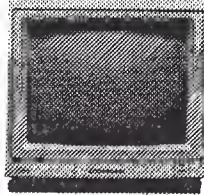
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-----

Command Channel 15

"F-L", D#, : file name Locks file

"F-U" - Unlocks

F-R - Restore (unscratch)

\$ of Scratched file maybe ~~0~~ left arrow key or bit 7 of \$  
Pattern matches same as mainframe

(for instance  $a * c * B$ )  
no activity LED

Block Status

Background color flashes once on 40 column screen

B-S: (ch #), (Drive #), T, S

0 means Sector is free  
" " " in use

1 means

for ease of copying, etc.

New user commands

$U0 < C$  = system track

Directory Sector Increment ( $U0 > D$ )

$U0 > L$  =  $chr(N)$

Set layer rel files on or off

$U0$  MSB & MSB  
change user vector

0 trapped out

(0 to 255 value)  
(super side sectors)

0 off  
1 on

lets you address

- U5 = Compress directory
- U9 = Returns DOS msg
- U10 = Inits DISK

CG5  
DOS  
Notes  
From  
DENNIS  
10 Oct 93  
(telephone)

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PGMNG THE 6502,6502 APPS  
CP/M HANDBK WITH MP/M, MSTRNG CP/M  
TAB-1001 THINGS TO DO W/YR PC  
MSTRNG THE VIC-20  
CPTR PERIPHERALS U CAN BUILD  
M'CPTR LANGUAGES 2ND ED.  
1001 THINGS WITH C128,SAME 64  
CDR CARE MANUAL (AND A COPY)  
ARTIF.INTELL.PROJS. F/T C64  
T'SHOOTING & REPAIR 128,ALSO64  
INTRFCNG TST CRCTS W/SNGL BRD CPTR  
33 CHLNG C'TER GAMES F/T TRSBO/APPLE/PET  
C64 ASSBLY LNG ARCD E GAME PGMNG  
64/128 GRAPH & SND 2ND EDIT.,  
C64 PGMNG HANDS ON APPRCH TO BASIC  
C64 ADVNCD GAME DSGN  
ELECTRONIC PRJCTS F/T 64/128  
128 BAS PGMNG TECH,C= PGMRS CHALLNG  
ADV128 GRPCS/SND PGMNG  
TEACH YRSLF-CPTR PGMNG W/C64  
THE BOOK CO.-ATARI SFTWR 83, 84  
C64 COLOR GRPCS F/BEGINNERS  
TRANSACTOR-INNER SPCE ANTHLGY  
TRILLIUM PRESS-KIDS WRKNG W/CPTRS  
USBORNE-CPTR BATTLE6AMES  
VALUE SOFT-BLACK BOOK OF 128  
VNR- GUIDE TO PGMNG CDR CMPTRS  
WARNER-C64 FUN & GAMES VOL2  
WCB-BASIC PGMNG F/T C64  
WSI-C64 USRS HANDBK  
WEST-COMLETE BASIC PGMNG  
BAS PGMNG F/T C64  
WORKMAN-BAS CPTR GAMES  
MORE BAS CPTR GMS  
WILEY-MASTERING THE 64  
USING CP/M, BASIC F/HME CPTRS  
BASIC/2ND EDITION, PROPER BASIC  
WINNING GAMES ON THE C64  
C64 DATA FILE PGMNG  
WINDCREST-L.SANDERS TIPS & TRICKS  
WOODSTOCK SFTWR-TRNG C64 1&2  
LOU SANDER'S GOLD MINE  
ZILOG-280 ASSBLY LNG PGMNG  
\*\*\*\*\*MAGAZINE DISKS\*\*\*\*\*  
HAVE RERUN-BEST OF '84,#1(JAN-JUN84)  
#2(SPRNG'85),#3(SUM'85)  
MAY-DEC86,'87 (ALL),'88(ALL)  
'89(ALL),JAN-DEC'90,FUNPAK128  
HAVE MAY/JUN '91,NOV91-DEC92(FINAL)  
RR ERRORS ON JUL/AUG86  
HAVE GOLD DISKS 1-16,18  
GAZETTE-ALL TO DATE,SPEC'88  
NEED JUL-SEP'90(IF PUBLISHED)  
HAVE OPTIME-VOL1#2,4-12  
VOL2#1,2,4,6-8  
LOADSTAR-#109 LATEST.BEST OF 2-5  
FUNFOUR '90 BONUS DISK.

HAVE LOADSTAR128 1-20  
KEN AHOY-BEST'84,'85,DEC'85,JAN8  
MAR-DEC'86, ALL'87(ERROR MAY'87)  
JAN-APR,JUN,JUL,SEP-DEC88,JAN'89(  
HAVE COMPUTE!-MAR85,NOV85/JAN86,  
FEB/MAR86,MAY/JUN86,AUG/OCT86,  
NOV86/JAN87,FEB/MAR87,MAY/JUL87  
NOV87/JAN88,FEB/APR88  
HAVE QUEST(CWEST)-  
MAY,JUN,OCT,NOV'89  
JAN'90  
HAVE HOME CPTR-VOL4#2,4  
HAVE TPUG FEB-APR84,DEC88-JUL89  
PLUS MUCH MORE NOT CATTED.  
128 APR-MAY89,SEP89,NOV90-MAY91  
HAVE DISK MAG VOL1  
HAVE C64 ALIVE! ALL TO DATE  
HAVE THE FINAL HORIZON(LARAMIE,W  
C64 BONUS DISKS 2-7, 13,14, 16,1  
C128 BONUS DISKS 13,14, 16,17  
\*\*\*\*\*BOOK DISKS\*\*\*\*\*  
ABACUS-GRPCS, 64 PEEKS & POKES,  
1571 INTERNALS, 128 INTERNALS  
128 TIPS & TRICKS, 7.0 INTRNLS  
ANTHY1541.RESTON-INSIDE DOS  
BRADY-ML FOR C64 & OTHER C'S (I  
CONCOR-FRNDLY FLPPY.WILEY-MSTRM  
SAMS-64 GRPCS & SND,64 TRIVIA D  
UPDATED 01AUG93  
-----



Read & Write track routines Don't  
work (Bad programming on custom  
Chip in Drive)

Drive: reading directors like a file one byte at  
a time will read "Fred" and later "DJ"  
(for Dennis)

Shift B (Shift Backup) only copies  
active sector sectors

built in partition path commands  
,,,)

Has un-new for Short new (forgets right now how  
to call it)

NYX 28 Jan 94

file C65 Manual  
Name ON  
FAQ DISK

From: Lonnie McClure <lmclure@delphi.com>

Subject: C65 Commands

Date: Wed Jan 26 05:03:12 MST 1994

Organization: Delphi (info@delphi.com email, 800-695-4005 voice)

Lines: 138

The following info on the C65 was provided by M. Matting (a lucky guy with the C65 manual):

(He ordered "Several" C65's & giving included a possibly photocopied Manual of SORTS).

GRAPHIC - select graphic mode

GRAPHIC CLR

GRAPHIC command#, [,args]

Basically this is a modified C64-type SYS command, minus the address. In the C64DX system, this will represent the ML interface, not the BASIC 10.0 interface which is implemented in the development system.

[\*\*\* THIS COMMAND IS SUBJECT TO CHANGE \*\*\*]

GRAPHIC CLR initializes (warm-starts) the BASIC graphic system. It clears any existing graphic modes, screens etc. and allows a program to commence graphics from scratch

DMA - Perform a DMA operation

DMA command [,length,source(l/h/b),dest(l/h/b),subcmd,mod(l/h) [,...]]

[\*\*\* THIS COMMAND IS SUBJECT TO CHANGE \*\*\*]

The DMA command defines and executes a DMA operation. The parameters are used to construct a DMA list, which is then passed to the DMA processor for execution. Refer to the DMA chip specification for details. Chained DMA commands are not allowed. (...)

DMA 3,2000,ASC("+"),0,DEC("800"),0      Fill screen with "+"

DMA 0,2000,DEC("800"),0,DEC("8000"),1    Copy screen to \$18000

DMODE - Set graphic display mode

DMODE jam,comp,inverse,stencil,style,thickness

jam 0-1, complement 0-1, inverse 0-1, stencil 0-1, style 0-3,  
thickness 1-8

FRE(0)    memory left in the program area (bank 0)

FRE(1)    memory available in variable area (bank 1)

FRE(2)    number of expansion RAM banks present

GENLOCK - Enable or disable video sync mode & colors

GENLOCK ON [,color#]

GENLOCK OFF [,color#,R,G,B]

To enable video sync mode and specify which colors are affected, use the GENLOCK ON command, and list the palette color indices (0-255) which will display external video

MOUSE - Enable or disable the mouse driver

MOUSE ON [,port[,sprite[,position]]]

port = joyport 1,2 or both (1-3)

sprite = sprite pointer (0-7)

position(x,y)

The user must load a pointer into the proper sprite area (\$600-\$7ff).

PALETTE - Define a color

PALETTE [screen# COLOR],color#,red,green,blue

RMOUSE - Get the mouse position and button status

SCREEN - Graphic command

The SCREEN command is used to initiate a graphic command. It always precedes another command word which identifies the graphic operation to be performed.

SCREEN CLR color# Clears the currently opened graphic screen using the given color value

SCREEN DEF define a graphic screen

SCREEN DEF screen#,width,height,depth

screen# (0-1), width (0=320, 1=640, 2=1280), height (0=200, 1=400)

depth (1-8 bitplanes = 2-256 colors)

Defines a logical screen, specifies size and color. Does not allow access to it and does not display the screen.

SCREEN SET - Set draw and view screens

SCREEN SET DrawScreen#,ViewScreen# (0-1 both)  
screen must be defined and opened first.

SCREEN OPEN - Open a screen for access.

SCREEN OPEN screen#[,error+variable] (0-1)

This command actually sets up the screen and allocates the necessary memory for it. If it's the view screen it will be displayed. If it's the draw screen, it can now be drawn to. (...)

SCREEN CLOSE - Close a screen

=====

I have not had a chance to try all of these on my C65, so there is a good chance one or more are unimplemented on most or all versions of BASIC 10.0

Subject: Re: Time keeping on C65

On Thu, 12 May 1994, Tpug Sysop wrote:

```
> -> If anybody really wants a ROM I guess Alan & I could have them blown for yo
> -> all.
> The chances of this actually working are next to nil. Fred did say that there
Bzzt! :)
Alan & I have successfully swapped ROMs with no problems!
> where differant mod'z to the mapping and hardware. But then again, maybe the
> 910111 versions have the last hardware change. I didn't get any specifics.
Hmmm. We have different chips, altho' the same Motherboard. The ROMcode is
quite different too, but basically everything seems to work!
> If one of you have an SSv5.xx cart' then a COMPARE of the two images might be
> in order. Easiest with SS and REU combo.
Or on a unix system? :)
> Now te SS monitor will spit out any adress's that are differant. See if you ca
>n notice what area's are NOT differant versus what areas are.
There are a real LOT of differences, at first look.
I think it will be easier to isolate bits of the ROMs, eg. Disk code, C64 and
compare that alone. Otherwise, too many things to look at in one go!
```

----- Forwarded message -----

Date: Thu, 12 May 1994 01:41:00 -0400  
From: Tpug Sysop <tpug.sysop@CANREM.COM>  
Message 3/7 From Russell J. Alphey

Page 2

(following is the part of original msg not quoted in above)

Save out bank 3 on both versions with:

```
s "version XX" B 30000 3ffff
```

Then in side the SS monitor kick out all ROM stuff with;

```
:i 00 <cr> [You are left with 64k ..stem da stern!]
```

Then load in the first c65 image with;

```
l "version XX" [you might need to use "ls" instead of "l" if it chokes]
[ls =Load Slow, no turbo. Sometimes needed for loading into
[the SS RAM area..]
```

Then transfer that first image to an REU bank with;

```
*r1 [move to REU bank 1 (0-7, 1750)]
```

```
t #0 ffff 0 [copies *comp' memory to REU]
```

Now go back to c64 mem' and load second image;

```
*l "version XX"
```

Then move to REU bank and compare...;

```
*r1
```

```
c #0 ffff 0
```

Now te SS monitor will spit out any adress's that are differant. See if you can notice what area's are NOT differant versus what areas are. ]>ug..

-----  
Following is another message from Tpug sysop

-> A. There are 363 cycles per raster line.

fast	slow	
277	138	total cycles/line available with..
-6	-3	for reffress and
-32	-16	for sprites.

-----  
239 119 available CPU cycles/line (no video)

..video fetches with/without sprites:

fetch: 1	2	3	4
----------	---	---	---

199	159	119	79	fast, all sprites
-----	-----	-----	----	-------------------

231	191	151	111	fast, no sprites
-----	-----	-----	-----	------------------

79	79	39	39	slow, all sprites
----	----	----	----	-------------------

95	95	55	55	slow, no sprites
----	----	----	----	------------------

Out of the possible 239, 271, 119 and 135 with no video, including one refresh!  
80 col, max BitPlanes and sprites in slow mode worst case is 9 cycles left!!!

-> B. Machine code "won't work" at \$2010, but will work at \$0410. This happens



-> when using a SYS call, and possibly from the monitor as well. If anybody  
-> can explain or refute this, please do so!

This is due to ROM being switched in in the default Basic mode. Pokes to  
screen colour work as I/O is "in" too..  
"bank0:sys dec("2010")" would work, but then there is only RAM to work with, no  
I/O chips around.. :)

-> 380 - 3DD : code (interrupt stuff)

-> 3DE - 3EF : ?

The JSR+*FAR* and JMP+*FAR* routines are here. On the c128 they are around the  
\$280 are. You use these to JMP/JSR across banks, setup needs the address you  
want and the register values in \$2 to \$10 in zero page.

[bank, hi, lo, a, x, y, z, sr] (sr might be after lo, dis-assemble \$380..)

-> 1100 - 11BF : ? (extended stack?)

..yuppers, used mostly for system ..interrupts and stuff.

-> 1FB00 - 1FFFF : 80 col color mem

..the REAL area, only 2000 bytes. Image of it at \$0d800. For 40 or 80 col.

-> 29000 - 29FFF : char ROM?

Sorta, alternate char ROM. there is two! :)

Dead RAM? Naw, there is a shadow over it. Try it some more...

The MAP command allows you to configure memory in Bk blocks, roughly any one  
anywhere! Map needs 4 bytes. Two for each 32k half. 12 bits for offset and one  
4 bits for which Bk block of that 32k. [a and x for lower 32k, y and z upper]  
With the upper nybble for the block bits in each pair.

a =8 offset bits. x lower nybble 9-12 offset bits, upper nybble block bits.

During MAP, interrupts are off. When finished NOP is used to re-enable. In this  
case it would be called EDM, End Of Map instead of NOP.

[ah, so NOP finally does \*something\*! ..haR!]

..more later?

]>ug..

BTW; Last call for photocopy requests of the c65 "manual".

---

From Russell J. Alphey

Date: Mon, 16 May 1994 12:57:35 +1000 (EST)

Subject: C65 - ROMs / video

On Thu, 12 May 1994, James Hanson wrote:

> Are the roms controlling the PAL - NTSC config or is it in the hardware?  
I understand it's hardware - PAL / NTSC depends on the crystal?

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