A Beginners Guide to kees Uniflex System

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There is a lot of information on the github (kees1948/UniFLEX) page.

This should be an essential step-by-step guide to get started.

1. Build the Cards

you need:

CPU09MM3 (v1.0) – This is the CPU, Dual Port RAM and Buffers.

CPU09MON (v1.1) – Here is the ROM, RAM, ACIA and PIA.

CPU09GPP (v1.0) – This is the IO Processor for the Floppy Card.

09FLP (v1.1) – This is the Floppy Interface,

BP4,7 – any of the Backplane Cards will do.

For older card versions see the modifications.

2. Burn the GALs and the ROMs

CPU09MM3 needs:

GAL G1: Hardware/CPU09MM3/GALs/CPU_1.JED

GAL G2: Hardware/CPU09MM3/GALs/CPU_2.JED

GAL G3: Hardware/CPU09MM3/GALs/CPU_3.JED

Put the Card in Slot 1.

CPU09MON needs:

ROM 28C64 (U6): one can burn all three Monitors into the ROM.

6309 needs: Software/UniBug/UniBUG_D/unibugd.bin

Use the Jumper RA and RB to select the correct Image.

GAL G1: Hardware/CPU09MON/GALs/MON_1.JED

GAL G2: Hardware/CPU09MON/GALs/MON_2.JED

GAL G3: Hardware/CPU09MON/GALs/MON_3.JED

Set Jumper H1 for correct Baudrate.

Put the Card in Slot 2.

09FLPF needs:

GAL (U2): Hardware/CPU09GPP/09FLP/GALS/09FLP.JED

Jumper J4 and J5 to the left (“B”)

CPU09GPP needs for Floppy Function:

ROM 28C256 (U5): or equiv. with:

Software/Boards/CPU09GPP/09FLP/gppbin. Put it at the end of the ROM.

GAL G1(U2): Hardware/CPU09GPP/GALS/GPP_1.JED

GAL G1(U2): Hardware/CPU09GPP/GALS/GPP_2.JED

GAL G1(U2): Hardware/CPU09GPP/GALS/GPP_3.JED

Jumper L1 and L2 closed (MDRY/), J2 to IRQ

Put the Card in Slot 3.

CPU09IDE needs:

GAL G1: Hardware/CPU09IDE/GALS/IDE_G1B.JED

GAL G1: Hardware/CPU09IDE/GALS/IDE_G2D.JED

GAL G1: Hardware/CPU09IDE/GALS/IDE_G3B.JED

GAL G1: Hardware/CPU09IDE/GALS/IDE_G4B.JED

J6 on IRQ, J3 A and B closed, J5 to DACK.

Put the Card in Slot 4.

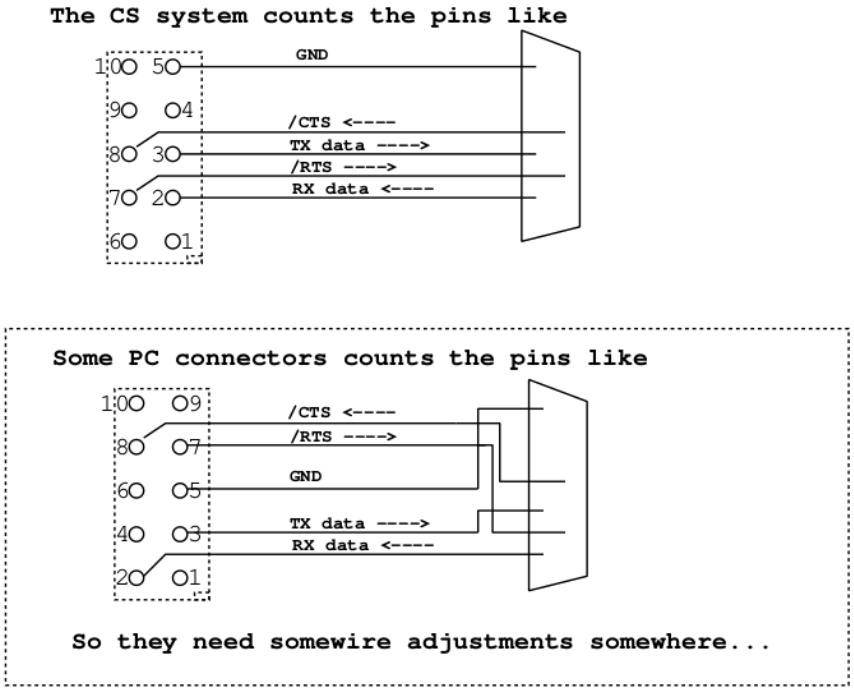
3. Finish the Backplane

For the Backplane there is one important connections! C2A to wherever the IDE Card is in.

So for ex. Slot 1: CPU09MM3 Card, Slot 4: IDE – conn. C2A to C23D. This is the DIV6 Signal.

4. Get the Monitor working

The Pinout of connector J2 is different:



I made a Cable with a DB-9 female connector so I can connect it directly to a Serial-USB Adapter.

I had to cross RX and TX and RTS and CTS.

So this is my cable:

Pinheader | DB9F Conn. | Signal

1	n.c.	
2	3	RXD
3	2	TXD
4	n.c.	
5	5	GND
6	n.c.	
7	8	RTS
8	7	CTS

5. Use a Lab. Power Supply with current limit at 500mA.

Insert only the CPU09MM3 and CPU09MON Cards. Current draw should be about 400mA.

Connect to the serial port at the correct baudrate. I use picocom with linux, for Windows there is Tera Term or Realterm. (picocom -b 19200 --send-cmd "ascii-xfr -sv" /dev/ttyUSB0)

Check the Output when switching the Power off and on.

It should be:

UniFLEX Boot ROM (CPU09:MMU/IDE/MON/FLP:0.50)

%

Check the Reset Button. If it doesn't work, there is a Jumper on the BP7 Board.

6. Check the IDE Card

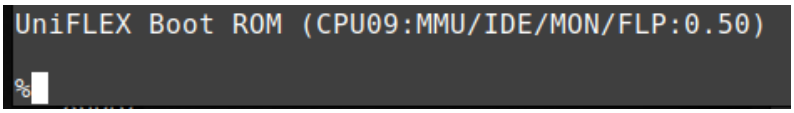
Make the SD-Card. If you put a UniFLEX disk image on a drive or SD-card with 'dd', the commandline should read:

dd if=<name_of_image> of=<name_of_disk_on_your_os> bs=512 conv=swab

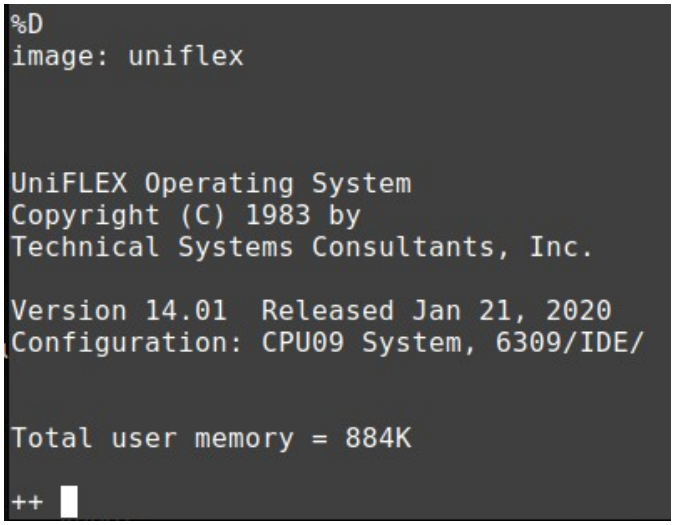
The latter is important to get the image with the right byte sequence.

See: Software/Disk_Images. Start with wd0_kees.dsk

After Power on, one should see a prompt.



Now Enter "D". Output should be like this:



With D0 and D1 one can boot from Master or Slave Disk, and after the string "uniflex" shows a number can select the kernel.

For example: D0 2 loads the kernel with IDE and floppy support while the "standard" kernel only has IDE support.

7. Modify your Gotek

The PC Implementaion is slightly different from the Shugart implementation.

Disk Change Detect	/DCD		2	13	2	/REDWC	Density Select
NO PIN - KEYING	Key	N/A	3				
Device In Use	/INUSE		4		4	N/C	No Connection
Device Select 3	/DS3	←	6		6	N/C	No Connection
Index	/INDEX	→	8	2	8	/INDEX	Index
Device Select 0	/DS0	→	10	4	10	/MOTEA	Motor Enable A
Device Select 1	/DS1	→	12		12	/DRVSB	Drive Sel B
Device Select 2	/DS2	→	14		14	/DRVSA	Drive Sel A
Motor On	/MTRON	→	16	10	16	/MOTEB	Motor Enable B

The Pins 10, 12, 14 and 16 are the “twist” in the cable. IBM has two Motor On Signals and all drives are Jumpered to DS1. The Gotek has no Jumper for DS2 or DS3. The Monitor has a Feature which can sense the used cable. For this to work properly a modification is necessary.

See: “GoTek FLEX/GoTek Modification/GoTek Modification”

8. Check the Floppy Card

If the CPU Card works, insert the Floppy card. Current is about 500mA with my Setup.

Jumper the Gotek to S0 and MO Jumper, Connect the Gotek with a straight cable.

Unzip “GoTek UniFlex/UniFlex_images.zip”

Copy “Master.FD-DD.DSK” to a USB Stick, copy also the configfiles to the same USB Stick (GoTek UniFlex/GoTek config files/FF.CFG and IMG.cfg)

Now, select it on the Gotek Display.

Turn on and Enter “F”. Output should be like this:

```
%F
image: uniflex



UniFLEX Operating System
Copyright (C) 1983 by
Technical Systems Consultants, Inc.

Version 14.01  Released Jan 21, 2020
Configuration: CPU09 System, 6309/IDE/LOOP/


Total user memory = 884K

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If so, congratulations!