



# PicoMite Pear

Version 0.1

This is a board looking for an application:)

Power is 5V DC via a single 3.5mm barrel jack socket.

There are two PicoMites onboard:

## PICO1

A PicoMite VGA with:

Power via an onboard 3.3V linear regulator (SMPS is disabled)

VGA display

PS/2 keyboard (with 5V supply and level shifter)

Micro SDcard module (from ebay)

Optional LM4040 3V reference

20-pin I/O port

Pin GP22 can optionally be connected to a piezo sounder.

4 pins go to a female comms header

## PICO2

A standard PicoMite (not VGA)

Power supply is from I/O pins, SMPS or can be connected to the regulated supply

Optional SSD1306 I2C display (using the first I2C port)

I2C pull-ups optional (via links. This port can also connect to external I2C devices)

Micro SDcard module (from ebay)

Optional LM4040 3V reference

40-pin I/O port with same layout as PicoMite

4 pins go to a female comms header

The two PicoMies can be run completely independently of each other or interconnected.

SDcard and comms pins are included in the I/O headers so they can be used as general I/O if an SDcard or comms are not required.

The RUN pin is available for PICO2 so it should be possible to reset it from PICO1. :)

The 4-pin comms headers can be wire linked in various ways. Both are wired to the I/O connectors so that spare pins can be used as general I/O. Possible connections allow for communication between the devices using COM port, I2C or SPI

Possible interconnections:

(PICO1 comms header is labeled A,B,C,D and PICO2 header is labeled 1,2,3,4)

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LINKS
For I2C connection
PICO1 I2C2_SDA [A] - PICO2 I2C2_SDA [2]
PICO1 I2C2_SCL [B] - PICO2 I2C2_SCL [1]

For COM connection
PICO1 COM1_TX [C] - PICO2 COM2_RX [1]
PICO1 COM1_RX [D] - PICO2 COM2_TX [2]

For SPI connection
PICO1 SPI2_CLK [A] - PICO2 SPI_CLK [4]
PICO1 SPI2_TX [B] - PICO2 SPI_RX [2]
PICO1 SPI2_RX [C] - PICO2 SPI_TX [3]
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Note that in there will always be one spare pin, in the cases of I2C and COM there will be 2 spare pins. All these are available on the I/O ports. They could also be used as interrupt or flow direction pins. e.g. SPI can only have a single master to produce the clock and received data is not buffered (in the MMBasic implementation). So a slave device could trigger an interrupt on the master the master to request data that is ready to transmit. The slave then has no need to produce the clock signal and the master doesn't have to keep checking for received data.

You could, of course, invent some sort of new system instead. :)

It is suggested that links should actually made using low value resistors (say 220R) to give the PicoMite pins some protection in case the pins on the other device are incorrectly programmed. Connecting a high output to a low output is not generally considered to be a "good thing". :(

Not all I/O pins are available to the user if some items are fitted. The pins affected are marked with a " \* " on the PCB and their possible on-board use is indicated on the circuit diagram.

## Assembly Notes

The microSD socket adapters are supplied with the pins on the socket side. This is correct, and they are mounted "upside down". The one in K7 position (for PICO2) will probably have to be soldered directly to the PCB if the display is to be used.

## Bill Of Materials

QTY	Ref.	Description & source
1		PicoMite Pear PCB
1	K1	3.5mm/1.3mm barrel jack connector - Mouser 490-PJ-031D, ebay
1	K2	PS/2 female socket - ebay - HA1607
1	K3	15-pin 3-row DB15F 90 degree VGA connector
		RS 481-443, AMP 1-1734530-1, MULTICOMP SPC15430, Element14 1557991, Toby Electronics HL15S
1	K4	20-way I/O header for PICO1
1	K5	40-way I/O header for PICO2
1	K6	Optional MicroSD socket module (ebay)
1	K7	Optional MicroSD socket module (ebay)
1	D1	SB140, 1N5818 or similar 1A Schottky diode.
4	D2-D5	1N4148, 1N914 etc. small silicon diode
2	Q1, Q2	VN10KN3-G or 2N7000 mosfet
1	Q3	2N7000 mosfet
1	U1	LM1117T 3.3V LDO voltage regulator
1	U2	Raspberry Pi Pico with PicoMite VGA firmware
1	U3	Raspberry Pi Pico with PicoMite firmware
1	U4	Optional LM4040 3V reference for PICO1
1	U5	Optional LM4040 3V reference for PICO2
4		20-way female SIP connector for PicoMite
1	H1	2-way male header (link)
1	H2	2-way male header (link)
1	H3	4-way female header (comms)
1	H4	4-way female header (comms)
1	H5	2-way male header (link)
1	H6	2-way male header (link)
1	H7	4-way female header (SSD1306 display)
1	H8	2-way male header (link)
5		Header links
1		Optional SSD1306 0.96" 4-pin I2C display
1		Optional active 5V piezo sounder
1	C1	100uF 10V 2.5mm pitch aluminium electrolytic
6	C2-C7	100nF multi-layer ceramic capacitor - Bitsbox CC004
2	R1, R14	2R2 resistor
9	R2-R5, R10,R11,R13,R15,R16	10k resistor
3	R6, R9,R12	220R resistor
1	R7	330R resistor
1	R8	680R resistor

## Setup for the Picomite Pear

Applicable to both PICO1 and PICO 2 if SDcard modules are used:  
OPTION SDCARD GP2, GP4, GP3, GP5

Applicable to PICO2 only, if a display is installed:  
OPTION SYSTEM SPI GP16, GP17  
OPTION LCDPANEL SSD1306I2C, L, 2

RL can be used for inverted landscape, 2 can be changed to correct the display positioning.

### NOTE!

**It is possible to set up the power supply for PICO2 to link the SMPS output to the linear regulator output. This is an illegal arrangement and may cause damage under certain circumstances. DO NOT FIT THE 3V3\_REG (H2) LINK UNLESS THE 3V3\_EN LINK (H1) IS ALSO FITTED.**

Communication port availability:

On PICO1:

I2C2

- SDA = GP10 - SCL = GP11

COM1

- TX = GP12 - RX = GP13

SPI2

- SCLK = GP10 - TX = GP11 - RX = GP12

On PICO2:

I2C2

- SDA = GP20 - SCL = GP21

COM2

- RX = GP21 - TX = GP20

SPI

- SCLK = GP18 - TX = 19 - RX = GP20

Obviously, as the two PicoMites can communicate, this opens up several possibilities:

PICO1 could act as a dumb terminal for PICO2

PICO1 could be an intelligent graphics display for PICO2

PICO2 could act as I/O expansion for PICO1

PICO2 could act as a co-processor for PICO1