

Cluso's TriBladeProp Board (PCB)

Each Prop circuit is called a "Blade". There are 3 Blades (or Propeller circuits) on a TriBladeProp board. Each Blade has a unique and flexible circuit.

I have been able to squeeze everything I wanted on my SixBladeProp into two identical TriBladeProp boards.

Specifications:

- Ultra-flexible design, enabling the user to decide what options to fit. Options can be easily added later.
- Optional on-board Power Supply Regulator: 1 x DC input connector, center positive 6-9V DC with optional protection diode. The 5V and 3V3 regulators are LM1117 and can be either TO220 through hole or TO252 SMT.
- Optional on-board PropPlug circuit: 1 x USB mini B connector, FT232RL and reset transistor, with connector pins.
- All parts are through hole except the microSD connector and FT232RL which are surface mount (SMT). Regulators may also be SMT.

Common to all Blades:

- Propeller IC (8 processors in one chip)
- EEPROM I2C 32KB-128KB (AT24C256, AT24C512 or AT24C1024) – optional and located on the underside of the pcb, with pullups.
- All Blades have provision for their own crystal (HC49U/S) or use a common oscillator provided by another Prop.
- PropPlug input connector pins
- Serial connection links to all Blades - optional
- Each Blade has an uncommitted LED circuit via resistor to GND.
- Decoupling capacitors. Additional 2 x optional decoupling capacitors located immediately under the Propeller chip power pins (underside of board) – may be required if overclocking

Blade #1:

A similar Prop Proto Board circuit (without USB, but see Additional Features) plus more...

- VGA connector and it's own resistors via links – optional. Uses Propeller P8-P15.
- TV connector and it's own resistors via links – optional. Uses common pins with VGA or could be wired to another Propeller (e.g. Blade #3). Permits TV or VGA to be selected via links (shunts).
- PS2 Keyboard connector and it's own resistors via links – optional. Can connect to Propeller P27 & P26 or to the unused VGA pins if TV is used via links (shunts), or to another Propeller (e.g. Blade #3).
- PS2 Mouse connector and it's own resistors via links – optional. Can connect to Propeller P25 & P24 or to the unused VGA pins if TV is used via links (shunts), or to another Propeller (e.g. Blade #3).
- Provision for an optional 128KB or 512KB SRAM and 74HC573 latch. Address pins A0-10 (Propeller P16-P26) direct to the SRAM, A11-18 are latched from the A0-7 pins (permits faster block access). D0-7 is on Propeller P0-7. Note: uses the normal mouse and keyboard pins and may not be used if the SPI Flash is used.
- Provision for an optional 1MB, 4MB or 8MB SPI Flash Memory (W25X80, W25X32, W25X64 – these may be read 2 bits at a time). May not be used if SRAM is used (to be confirmed – may be other ways to have both).
- The PropPlug input connector may be linked (shunts) to the Blade #2 PropPlug for high speed serial communications. The Reset pin may be linked (shunts) to the Blade #2 optional latch).

Blade #2:

- This Prop is designed to be the **powerhouse** with most of the I/O used for SRAM.

- It is designed to run large programs, such as microcomputer emulations (see the PropAltair thread), large LMM programs, large C programs, etc.
- Provision for 1 or 2 128KB, 512KB or 2MB (2MB is expensive) SRAMs. Data D0-7 are connected to P0-7. Address A0-18 are connected to P8-26.
- An optional 74HC573 latch can be fitted on the underside of the board. It latches on A0-7 and uses P27 for the latch signal. Four latched pins are used to decode the CE pins for the optional parts - 2 x SRAMs, 1 x SPI Flash memory and 1 x microSD interface. Two latched pins are used for A19 & A20 (for 2MB SRAMs) or are otherwise available for other use. Two latched pins are used for (via links/shunts) to tie to the Reset Pins of the Props on Blade #1 and Blade #3. Otherwise they are available for other use. Pullups (resistor network) on the input pins are provided to ensure no bus contention during the Prop power-up.
- Provision for an optional 1MB, 4MB or 8MB SPI Flash Memory (W25X80, W25X32, W25X64 – these may be read 2 bits at a time).
- Provision for an optional microSD connector. Beware, the microSD specification does not demand that the SPI Interface be present, so check the microSD card. 2GB currently seems to be the maximum usable because of the FAT format.
- PropPlug connector pads are provided. Links (shunts) can be used to connect to the SI/SO pins (P31/P30) of Blade #1 and also to either SI/SO (P31/P30) or P27/P26) of Blade #3. This is for high speed serial communications between the 3 Blades (Props).

Blade #3:

- This Prop is designed for I/O peripheral use.
- An optional 40 (2x20) pin connector brings out all Prop I/O pins, with +5V, +3V3 and GND. (+5V needs a long wire under the board to the Power Regulators – holes provided). This connector is overlaid with two 20 (2x10) pin connectors with 16 I/O plus +3V3 and GND (No +5V) with spacing between the connectors.
- Two optional sets of 20 (2x10) pin Spin Studio compatible connectors (2 with 8 I/O pins (P0-7 and P8-15) plus +5V, +3V3 and GND).
- The PropPlug input connector may be linked (shunts) to the Blade #2 PropPlug for high speed serial communications. The Reset pin may be linked (shunts) to the Blade #2 optional latch).
- Optional connectors 1x8 for P15-23 and 1x4 for P24-27 for possible connection to other Blades.
- Some I/O pins are expected to be wired to the other Blade(s) for communications, possible code loading (saving I2C eproms), and oscillator output (5.00 or 6.00MHz) (saving crystals and keeping the clocks in sync for high speed communications).

Additional Information:

- PCB size is 2.9"x8.0". Also available in panels of up to 5 boards with V-Groove cut (14.5"x8.0").
- The PCB is double sided, plated through hole, with solder resist both sides and component overlay (top side only).
- 5 x 3mm mounting holes. Can be used for stacking multiple boards.
- The boards are actually manufactured in 2 @ 5 TriBladeProp board panels. Multiple TriBladeProp boards will normally be broken apart (V-Grooved) for individual use. They may be left intact (if required) for use with jumpers to connect power supplies, etc together in multiple configurations.

PCB pricing is estimated to be A\$30 (US\$20) per TriBladeProp board (bare board only, no components) plus shipping at cost (express international post) and any taxes in your country (if required), provided I can get enough orders.

Anyone interested should email me at cluso@bluemagic.biz

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