

Radio Telescope Control System

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Revision & Notes:

* 11/9/2022: Initial Schematic, Zach Martin

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Program/Debug Port

5V, R1 10K, J1 TagConnect, C7 100nF, GND, VDD, VPP/MCLR, PGD/U2TX, PGC/U2RX, Diags

Processor

5V, C2 100nF, C3 100nF, C4 100nF, C5 100nF, C6 100nF, GND, Vcap, 7, 17, 28, 30, 40, 47, 12, 13, 18, 25, 26, 27, 36, 37, 38, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100

Rotary Encoders

5V, C1 100nF, GND, R2 10k, R3 10k, U4A 74HCT14, U4B 74HCT14, J2 4-MTA-100, AZ_ENCODER2, AZ_ENCODER1, AZIMUTH ENCODER INPUT

Local Control Interface

5V, C9 100nF, GND, R11 10k, R12 10k, R13 10k, R14 10k, R15 10k, R16 1k, U4E 74HCT14, U4F 74HCT14, U4A 74HCT14, J4 8-MTA-100, EXT_LED, USB, I2C_CLK, I2C_DAT, LED_GND, BUTTON1, BUTTON2, BUTTON3

USB-UART Interface

5V, C10 100nF, C11 100nF, GND, R19 10k, FT232RL, U2, TXD, RXD, RTS, CTS, DTR, DSR, DCD, RI, CBUS0, CBUS1, CBUS2, CBUS3, CBUS4, TEST, GND, GND@1, GND@2, R21 0R, R22 0R, R23 0R, R24 0R, R25 0R, R26 0R, R27 4.7k, R28 4.7k, R29 4.7k, R30 OMIT, J5 MICRO USB, SH1, SH2, SH3, SH4, SH5, SH6, SH7, SH8

Pin Configurations:

- ANX: Analog Input/Channel X
- GND: Digital Output
- GP1: Digital Input
- GP0/OB: Digital Output, Open Drain
- UART: UART Peripheral I/O
- I2C: I2C peripheral I/O
- SPI: SPI peripheral I/O

Notes:

- TODO: What to do with CTS, DSR, DCD, RI
- TODO: We may not want two LEDs here. Also, CBUS can be configured to blink an LED on both RX and TX
- Place Near 74HCT14
- Make sure VCC rails are tied together
- Make sure GND nets are tied together

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Main Electronics		
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Program/Debug Port

5V, R1 10K, J1 TagConnect, C7 100nF, GND, VDD, VPP/MCLR, PGD/U2TX, PGC/U2RX, Diags

Processor

5V, C2 100nF, C3 100nF, C4 100nF, C5 100nF, C6 100nF, GND, Vcap, 7, 17, 28, 30, 40, 47, 12, 13, 18, 25, 26, 27, 36, 37, 38, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100

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5V, C1 100nF, GND, R2 10k, R3 10k, U4A 74HCT14, U4B 74HCT14, J2 4-MTA-100, AZ_ENCODER2, AZ_ENCODER1, AZIMUTH ENCODER INPUT

Local Control Interface

5V, C9 100nF, GND, R11 10k, R12 10k, R13 10k, R14 10k, R15 10k, R16 1k, U4E 74HCT14, U4F 74HCT14, U4A 74HCT14, J4 8-MTA-100, EXT_LED, BUTTON1, BUTTON2, BUTTON3, LED_GND, BUTTON1_4, BUTTON2_3, BUTTON3_2

USB-UART Interface

5V, C10 100nF, C11 100nF, GND, R19 10k, FT232RL, U2, TXD, RXD, RTS, CTS, DTR, DSR, DCD, RI, CBUS0, CBUS1, CBUS2, CBUS3, CBUS4, TEST, GND, GND@1, GND@2, R21 0R, R22 0R, R23 0R, R24 0R, R25 0R, R26 0R, R27 4.7k, R28 4.7k, R29 4.7k, R30 OMIT, J5 MICRO USB, SH1, SH2, SH3, SH4, SH5, SH6, SH7, SH8

Pin Configurations:

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