SCL_RPI — R47 — SCL
RES 0603 5%
0R

SDA_RPI — R48 — SDA
RES 0603 5%
0R

TX_RPI — R49 — RX_STM
RES 0603 5%
NC

RX_RPI — R50 — TX_STM
RES 0603 5%
NC

MOSI — R51 — MOSI_STM
RES 0603 5%
NC

MISO — R52 — MISO_STM
RES 0603 5%
NC

SCK — R53 — SCK_STM
RES 0603 5%
NC

CS0 — R54 — IO5
RES 0603 5%
NC

5V

J13

SDA_RPI	1	2	
SCL_RPI	3	4	
PPM	5	6	TX_RPI
	7	8	RX_RPI
	9	10	
	11	12	
	13	14	INT_ICM
	15	16	
	17	18	
MOSI	19	20	
MISO	21	22	
SCK	23	24	CS0
	25	26	CS1
	27	28	
	29	30	
	31	32	
	33	34	
	35	36	
	37	38	
	39	40	

2x20P

GND

GND

Robot Controller v1.0 Schematic Explanation

This schematic appears to be part of a circuit design for a robot controller, version 1.0, as noted in the project title.

Here's a detailed explanation of the different sections:

Main Component (Center - J13)

- J13: The central component is a 40-pin connector, which appears to be used for interfacing with a microcontroller or similar IC (Integrated Circuit).

  The pins are labeled for various functions, including communication interfaces and control signals:

  - SDA_RPI/SCL_RPI: Likely I2C communication lines (Serial Data and Serial Clock) for interfacing with I2C-compatible devices.

  - MOSI/MISO/SCK: These are standard SPI communication lines (Master Out Slave In, Master In Slave Out, and Serial Clock).

  - TX_RPI/RX_RPI: UART communication lines (Transmit and Receive), typically used for serial data communication.

  - CS0, CS1: Chip Select lines for SPI devices.

  - INT_ICM: Likely an interrupt line from a sensor or another module, such as an Inertial Measurement Unit (IMU).

Power and Ground Connections

- The connector provides 5V power (pin 2) and multiple GND pins for the circuit.

- Decoupling capacitors (labeled as "220pF") are included near the power supply lines to stabilize the voltage and reduce noise.

Pull-Up Resistors (Right Side)

- Resistors labeled as R47, R48, etc., are 0603 SMD (Surface Mount Device) components with 5% tolerance.

- SCL_RPI and SDA_RPI: Pull-up resistors are used for the I2C lines to ensure proper signal levels when no device is actively driving the line.

- TX_RPI and RX_RPI: These may have resistors for signal conditioning or to handle voltage level shifting.

- SPI Lines (MOSI, MISO, SCK): These are also conditioned with resistors, likely to manage impedance or protect the microcontroller from short circuits.

Unconnected Pads (NC - Not Connected)

- Several components or pads are marked as "NC" (not connected), which might serve as placeholders for future modifications or optional components.

Footer Information (Bottom Right)

- Project Title: Robot Controller v1.0.

- Author: The design was created by Ruchira Tilan Munasinghe.

- Date and File Information: The design is dated July 10, 2023, and saved as part of a PCB design project.

- Organization: Orise, possibly a company or organization involved in robotics and electronics design.

This schematic is part of a larger electronic design for a robotic controller. It includes provisions for communication with external devices (via I2C, SPI, and UART),

power management, and signal interfacing, making it suitable for embedded systems applications in robotics.