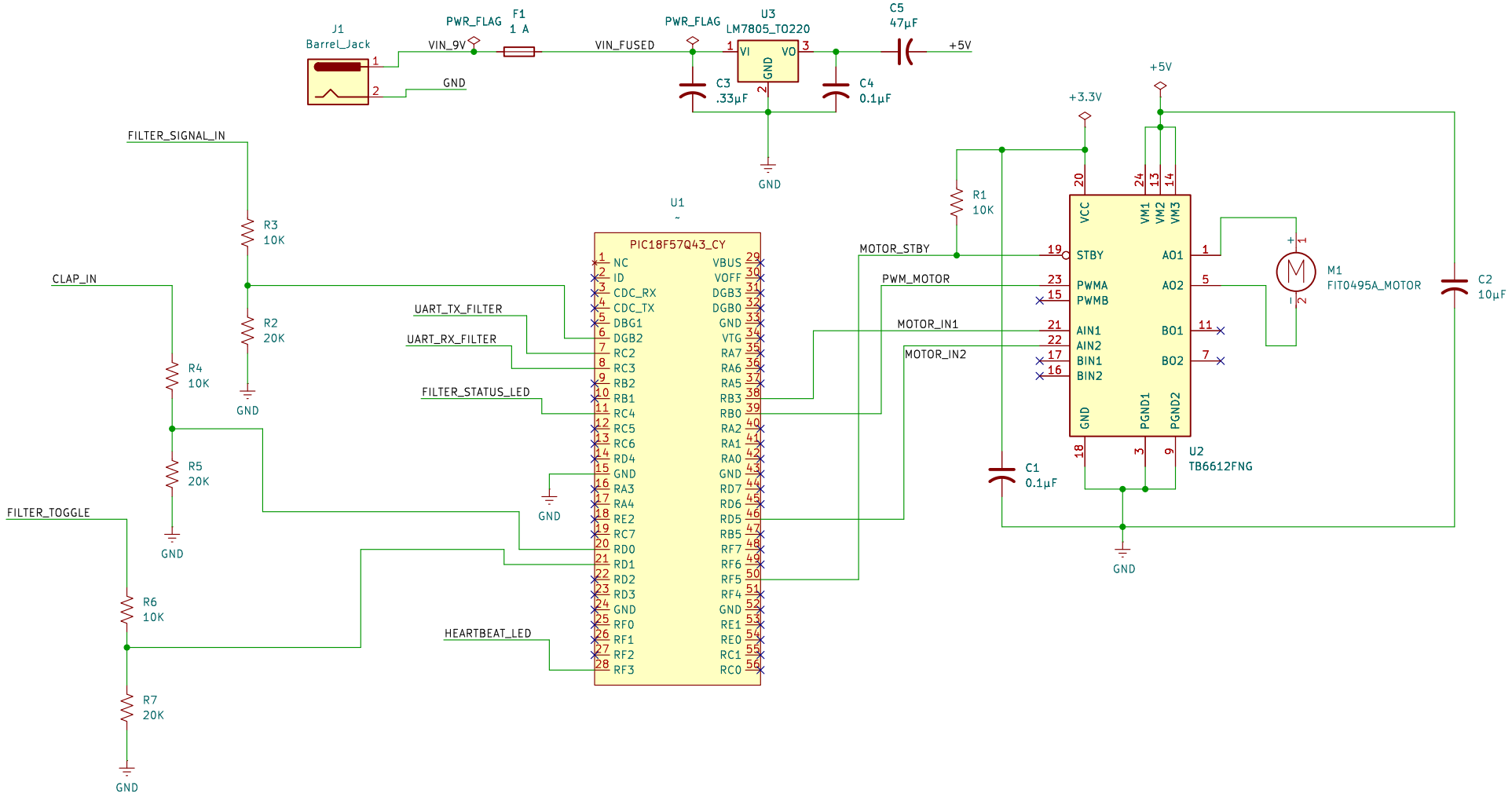

Notes:

1. 9 V DC input through barrel jack (J1) with 1 A fuse protection (F1).
2. LM7805 linear regulator (U3) provides +5 V power for the system and motor driver.
3. Bulk (47 µF) and bypass (0.33 µF input, 0.1 µF output) capacitors used for power stability.
4. All grounds unified as GND for shared reference across subsystems.
5. PIC18F57Q43 operates at 3.3 V logic level.
6. External 5 V signals (CLAP_IN, FILTER_SIGNAL_IN, FILTER_TOGGLE) protected by 10 kΩ / 20 kΩ voltage dividers to step down to ≈ 3.3 V.
7. TB6612FNG motor driver (U2): VM = +5 V, VCC = 3.3 V logic. STBY held low by 100 kΩ pull-down resistor (default off).
8. Channel A configured for motor output; Channel B inputs tied low to prevent floating.
9. Heartbeat LED indicates system status (blink heartbeat).
10. FILTER_STATUS_LED driven by Hub for user feedback on Filter Board.
11. Test points recommended for +5 V, GND, CLAP_IN, FILTER_SIGNAL_IN, PWM_MOTOR.
12. Only +5 V and GND are shared between boards; motor supply remains local to Sensor Front-End.
13. All unused inputs tied low through resistors to prevent floating nodes.

Hub Subsystem (Master Controller) – Interfaces with Filter & Sensor Front-End

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Title: Hub Subsystem (PIC18F57Q43 + TB6612FNG)

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