Warning: Serial Configuration Mismatch (SERIAL1_PROTOCOL)

SERIAL1_PROTOCOL is set to MAVLink2 (2.0), but its default of '33.0' points to DJIFPV, indicating a possible misconfiguration. This could lead to unexpected behavior for SERAIL1.

Suggested Action: Verify the intended protocol for SERIAL1; if DJIFPV is desired, set to 33.0, otherwise adjust to the correct value.

Parameters:

- SERIAL1_PROTOCOL: 2.0

Warning: Serial Baud Rate Mismatch (SERIAL1_BAUD)

SERIAL1_BAUD is 115200, but its default is 57600. A different baud rate than the default can indicate proper customization or an unintentional setting that could cause communication problems.

Suggested Action: Confirm that the connected device supports 115200 baud rate and that this intentional setting matches hardware.

Parameters:

- SERIAL1_BAUD: 115.0

Warning: Serial Baud Rate Mismatch (SERIAL3_BAUD)

SERIAL3_BAUD is 115200, but its default is 230400. This could be an intentional setting for a specific GPS module, but might also lead to communication issues if not intended.

Suggested Action: Verify the connected GPS module's baud rate requirement and adjust SERIAL3_BAUD accordingly, typically 230400 for modern GPS units.

Parameters:

- SERIAL3_BAUD: 115.0

Warning: Serial Protocol Mismatch (SERIAL5_PROTOCOL)

SERIAL5_PROTOCOL is disabled (-1.0), but its default of '16' suggests ESC Telemetry as a common configuration. This will disable any functionality commonly associated with the default.

Suggested Action: If ESC Telemetry is intended for SERIAL5, verify the setting or revert to default (16). If disabled intentionally, no action is needed.

Parameters:

- SERIAL5_PROTOCOL: -1.0

Warning: Serial Baud Rate Mismatch (SERIAL6_BAUD)

SERIAL6_BAUD is 38400, but its default is 230400. This baud rate deviation from the default could be an intentional setup for a specific device or an error.

Suggested Action: Verify the connected device's baud rate requirement for SERIAL6 and adjust accordingly, or revert to the higher default if appropriate.

Parameters:

- SERIAL6_BAUD: 38.0

Informational: GPS HDOP Good Threshold Set High

GPS_HDOP_GOOD is set to 180, which is higher than the default of 140. A higher threshold means the system accepts a less accurate GPS position as 'good'.

Suggested Action: Consider lowering GPS_HDOP_GOOD to 140 or below for improved GPS position quality checks during pre-arm.

Parameters:

- GPS_HDOP_GOOD: 180.0

Warning: RC Input Values Outside Defaults

Multiple RC channels have MIN, TRIM, or MAX values outside of their typical defaults (1000/1500/2000). Channel 3 has a slightly larger deadzone (30 vs 20). RC8 (MIN 995, TRIM 1995, MAX 1995) and RC9 (MIN 1195, TRIM 1195, MAX 1795) are significantly different. RC11 MIN/TRIM are 999 and MAX is 2000. RC12 MIN 1095, TRIM 1935, MAX 1935. RC13 TRIM/MAX are 1945. RC16 is heavily configured between 1841 and 1973. These deviations could be custom calibrations but should be verified.

Suggested Action: Verify that all RC channel MIN/TRIM/MAX settings are a result of proper radio calibration and match the transmitter's output for all channels to ensure correct control response. Recalibrate RC input if unintended.

Parameters:

- RC1_MIN: 1045.0
- RC1_TRIM: 1495.0
- RC1_MAX: 1945.0
- RC2_MIN: 1045.0
- RC2_TRIM: 1495.0

- RC2_MAX: 1945.0
- RC3_MIN: 1045.0
- RC3_TRIM: 1045.0
- RC3_MAX: 1945.0
- RC3_DZ: 30.0
- RC4_MIN: 1045.0
- RC4_TRIM: 1495.0
- RC4_MAX: 1945.0
- RC5_MIN: 1045.0
- RC5_TRIM: 1495.0
- RC5_MAX: 1945.0
- RC6_MIN: 1045.0
- RC6_TRIM: 1495.0
- RC6_MAX: 1945.0
- RC7_MIN: 1045.0
- RC7_TRIM: 1495.0
- RC7_MAX: 1945.0
- RC8_MIN: 995.0
- RC8_TRIM: 1995.0
- RC8_MAX: 1995.0
- RC9_MIN: 1195.0
- RC9_TRIM: 1195.0
- RC9_MAX: 1795.0
- RC10_MIN: 1045.0
- RC10_TRIM: 1495.0
- RC10_MAX: 1945.0
- RC11_MIN: 999.0
- RC11_TRIM: 999.0
- RC11_MAX: 2000.0
- RC12_MIN: 1095.0
- RC12_TRIM: 1935.0
- RC12_MAX: 1935.0
- RC13_MIN: 1045.0
- RC13_TRIM: 1945.0
- RC13_MAX: 1945.0
- RC14_MIN: 1045.0
- RC14_TRIM: 1495.0
- RC14_MAX: 1945.0
- RC15_MIN: 1045.0
- RC15_TRIM: 1495.0
- RC15_MAX: 1945.0
- RC16_MIN: 1841.0
- RC16_TRIM: 1897.0
- RC16_MAX: 1973.0

Informational: Unusual LOG_BITMASK Value

LOG_BITMASK is set to 407549, which is not the typical recommended default of 65535 (all basic log types enabled). This custom logging configuration might exclude or include specific log types.

Suggested Action: Verify that the custom LOG_BITMASK value (407549) includes all desired log types for flight analysis. If the intention was to log all basic types, set to 65535.

Parameters:

- LOG_BITMASK: 407549.0

Informational: ARMING_CHECK Configuration

ARMING_CHECK is set to a custom value (9354.0) instead of the default 1 (all checks enabled). This means some pre-arm checks are explicitly disabled.

Suggested Action: Review the ARMING_CHECK bitmask (9354.0) to ensure all critical pre-arm checks are enabled for safe flight operations. A value of 1 (All) is generally recommended.

Parameters:

- ARMING_CHECK: 9354.0

Informational: ANGLE_MAX Set to a Custom Value

ANGLE_MAX is set to 60, significantly lower than the default 3000 (30 degrees). This might be an intentional limit for specific flight characteristics or a misconfiguration.

Suggested Action: Confirm that the lean angle limit of 60 cdeg (0.6 degrees) is intentional; otherwise, adjust to a more typical value (e.g., 3000 for 30 degrees) if higher maneuverability is desired.

Parameters:

- ANGLE_MAX: 60.0

Informational: Acro Mode Trainer Disabled

ACRO_TRAINER is set to 0 (Disabled), while the default is 2 (Leveling and Limited). This means there will be no assistance in Acro mode.

Suggested Action: If acro training assistance is desired, set ACRO_TRAINER to 1 (Leveling) or 2 (Leveling and Limited); otherwise, no action is needed.

Parameters:

- ACRO_TRAINER: 0.0

Informational: Compass Offsets and Motion Compensation

Compass offsets (X, Y, Z) are significantly non-zero, indicating potential magnetic interference or an unideal mounting location. COMPASS_ORIENT is set to 6.0 (Yaw270). COMPASS_EXTERNAL is set to 1, indicating external connection. Secondary and tertiary compasses are disabled.

Suggested Action: Ensure a recent compass calibration was performed in the final vehicle configuration and that COMPASS_ORIENT and COMPASS_EXTERNAL settings are correct for the physical mounting. Re-evaluate if secondary/tertiary compasses could be enabled for redundancy.

Parameters:

- COMPASS_OFS_X: 29.935699462890625
- COMPASS_OFS_Y: 261.6036071777344
- COMPASS_OFS_Z: 147.74752807617188
- COMPASS_ORIENT: 6.0
- COMPASS_EXTERNAL: 1.0
- COMPASS_USE2: 0.0
- COMPASS_USE3: 0.0

Informational: INS Filter Frequencies

INS_GYRO_FILTER is 34 (default 20) and INS_ACCEL_FILTER is 10 (default 20). Higher gyro filter might introduce more latency, lower accel filter might be too aggressive. Fast sampling is enabled on IMU1 (INS_FAST_SAMPLE=1). Batch logging is configured for 256 samples on IMU1 with option 4.

Suggested Action: Evaluate if the customized INS filter frequencies are appropriate for the vehicle's vibration profile; typically, 20Hz is a good default for both. Ensure batch logging settings are intentional.

Parameters:

- INS_GYRO_FILTER: 34.0
- INS_ACCEL_FILTER: 10.0
- INS_FAST_SAMPLE: 1.0
- INS_LOG_BAT_CNT: 256.0
- INS_LOG_BAT_MASK: 1.0
- INS_LOG_BAT_OPT: 4.0

Informational: Waypoint Navigation Speed Overrides

WPNAM_SPEED is 1400 cm/s (default 1000) and LOIT_SPEED is 2200 cm/s (default 1250). These are higher than default which can imply faster navigation but could also decrease precision or be unsafe if not tuned properly.

Suggested Action: Verify that the increased WPNAV_SPEED and LOIT_SPEED are safe for the vehicle, environment, and desired precision. Consider reducing if precision or stability is an issue.

Parameters:

- WPNAV_SPEED: 1400.0
- LOIT_SPEED: 2200.0

Informational: LOIT_ACC_MAX Values Outside Defaults

LOIT_ACC_MAX is set to approximately 10.27 cm/s/s, which is significantly lower than the default of 500 cm/s/s. This will make the copter correct position errors very slowly.

Suggested Action: Increase LOIT_ACC_MAX to a value closer to the default (e.g., 500 cm/s/s) for a more responsive position hold, or confirm that this low value is intentional for very slow, smooth movements.

Parameters:

- LOIT_ACC_MAX: 10.269874572753906

Informational: ATC Accelerations and Gains

Multiple ATC parameters are outside their default values. The ATC_ACCEL_Y_MAX, ATC_ACCEL_R_MAX, and ATC_ACCEL_P_MAX parameters are customized. Roll and Pitch angular P gains (ATC_ANG_RLL_P, ATC_ANG_PIT_P) are high, while Yaw P gain (ATC_ANG_YAW_P) is low. All ATC_RATE_X_MAX are 0.0 (disabled). Multiple Rate P, I, D gains (ATC_RAT_RLL, ATC_RAT_PIT, ATC_RAT_YAW) are non-default, and filtering values (FLTT, FLTD) are customized. ATC_THR_MIX_MAX is set to a higher value than default.

Suggested Action: Review and evaluate if these advanced tuning parameters are appropriate for the vehicle's size and flight characteristics, potentially through a new Autotune or manual tuning, especially for the disabled rate limits and customized mix maximum. For ATC_RATE_X_MAX, consider setting to typical values like 180 or 360 deg/s unless intentional.

Parameters:

- ATC_ACCEL_Y_MAX: 17359.5703125
- ATC_ACCEL_R_MAX: 160290.8125
- ATC_ACCEL_P_MAX: 149539.8125
- ATC_ANG_RLL_P: 12.760000228881836

- ATC_ANG_PIT_P: 9.479999542236328
- ATC_ANG_YAW_P: 2.8499999046325684
- ATC_RATE_R_MAX: 0.0
- ATC_RATE_P_MAX: 0.0
- ATC_RATE_Y_MAX: 0.0
- ATC_INPUT_TC: 0.14000000059604645
- ATC_RAT_RLL_P: 0.04298757016658783
- ATC_RAT_RLL_I: 0.04298757016658783
- ATC_RAT_RLL_D: 0.002307032933458686
- ATC_RAT_RLL_FLTT: 17.0
- ATC_RAT_RLL_FLTD: 17.0
- ATC_RAT_PIT_P: 0.05277744680643082
- ATC_RAT_PIT_I: 0.05277744680643082
- ATC_RAT_PIT_D: 0.0025758687406778336
- ATC_RAT_PIT_FLTT: 17.0
- ATC_RAT_PIT_FLTD: 17.0
- ATC_RAT_YAW_P: 0.24793444573879242
- ATC_RAT_YAW_I: 0.024793444201350212
- ATC_RAT_YAW_FLTT: 17.0
- ATC_RAT_YAW_FLTE: 1.0
- ATC_RAT_YAW_FLTD: 0.0
- ATC_THR_MIX_MAX: 0.8999999761581421

Informational: PSC Vertical Jerk Setting

PSC_JERK_Z is set to 30, which is significantly higher compared to the default value of 5. This causes the aircraft to vary its vertical acceleration more rapidly.

Suggested Action: Consider reducing PSC_JERK_Z to default (5) or a lower value for smoother vertical maneuvers, especially during altitude changes. Only increase if aggressive vertical changes are necessary and stability won't be compromised.

Parameters:

- PSC_JERK_Z: 30.0

Informational: RangeFinder Types Not Set

Multiple rangefinder types (RNGFND1_TYPE, RNGFND6_TYPE to RNGFNDA_TYPE) are set to 0, indicating they are disabled. This may be intentional but means no rangefinder data is being used.

Suggested Action: If rangefinders are physically installed, configure their respective TYPE parameters with the correct value (e.g., 1=Analog, 16=VL53L0X) to enable them.

Parameters:

- RNGFND1_TYPE: 0.0
- RNGFND6_TYPE: 0.0
- RNGFND7_TYPE: 0.0
- RNGFND8_TYPE: 0.0
- RNGFND9_TYPE: 0.0
- RNGFNDA_TYPE: 0.0

Informational: OSD RSSI and Satellite Count Display Values

OSD1_RSSI_EN is disabled (0.0), meaning RSSI will not be displayed on OSD screen 1. OSD1_SATS_Y is set to 4.0, which is not the default of 3.0.

Suggested Action: If RSSI display is desired, enable OSD1_RSSI_EN (1.0). Verify the positioning of OSD1_SATS_Y is suitable for the screen layout.

Parameters:

- OSD1_RSSI_EN: 0.0
- OSD1_SATS_Y: 4.0

Informational: OSD RangerFinder and Airspeed Display Values

OSD1_RNGF_EN is enabled for Rangefinder display but its X, Y coordinates are different from default settings (1,3 vs 0,0). OSD1_ASPEED_X is 1.0 (default 2.0) and OSD1_ASPEED_Y is 1.0 (default 13.0).

Suggested Action: Verify that the OSD1_RNGF_X, OSD1_RNGF_Y, OSD1_ASPEED_X, and OSD1_ASPEED_Y coordinates are positioned correctly for your OSD layout and desired readability.

Parameters:

- OSD1_RNGF_EN: 1.0
- OSD1_RNGF_X: 1.0
- OSD1_RNGF_Y: 3.0
- OSD1_ASPEED_X: 1.0
- OSD1_ASPEED_Y: 1.0

Informational: Board Boot Delay

BRD_BOOT_DELAY is set to 5000ms, which is higher than the default of 0ms. A significant boot delay might be necessary for certain peripherals to initialize.

Suggested Action: Confirm that the 5000ms boot delay is required for all connected peripherals to initialize correctly; otherwise, consider reducing it for faster boot times.

Parameters:

- BRD_BOOT_DELAY: 5000.0

Warning: Battery Monitor Amplifier Default

BATT_AMP_PERVLT is set to 40.0, which is higher than the default of 25.0, meaning the current sensor calibration is specific. This ensures accurate current measurements based on your Power Module.

Suggested Action: Verify that your power module requires an BATT_AMP_PERVLT setting of 40.0, as incorrect values will lead to incorrect current and mAh consumption readings. Calibrate the current sensor if needed.

Parameters:

- BATT_AMP_PERVLT: 40.0

Informational: GPS BLEND_MASK

GPS_BLEND_MASK is set to 5, which corresponds to Horizontal Position and QZSS. The default is Horizontal Position (0). This setting affects how multiple GPS devices are blended.

Suggested Action: Verify that blending Horizontal Position and QZSS is the intended configuration for GPS blending. Otherwise, adjust to a suitable value based on the available GPS features.

Parameters:

- GPS_BLEND_MASK: 5.0

Informational: Motor Output Type DShot

MOT_PWM_TYPE is set to 6 (DShot600), which is a high-performance digital protocol, different from the default of 0 (Normal PWM).

Suggested Action: Ensure all ESCs are DShot600 compatible for optimal performance. If issues arise, consider trying a lower DShot rate or PWM type, or confirm wiring for DShot is correct.

Parameters:

- MOT_PWM_TYPE: 6.0

Warning: MOT_SPIN_MAX and MOT_SPIN_MIN Configuration

MOT_SPIN_MAX is 1.0, which is outside the default maximum of 0.95. MOT_SPIN_MIN (0.07) is lower than the default of 0.15. MOT_SPIN_ARM (0.04) is lower than the default of 0.1. Having MOT_SPIN_MAX at 1 means 100% of the output range is used by thrust, removing head room for attitude control. Low min/arm values might indicate motors spinning too slowly or stopping when they shouldn't.

Suggested Action: Set MOT_SPIN_MAX to the default of 0.95 to ensure adequate headroom for attitude control. Adjust MOT_SPIN_MIN and MOT_SPIN_ARM to ensure stable motor operation at low throttle, usually higher than 0.07 and 0.04 respectively.

Parameters:

- MOT_SPIN_MAX: 1.0
- MOT_SPIN_MIN: 0.07000000029802322
- MOT_SPIN_ARM: 0.03999999910593033

Informational: MOT_THST_HOVER Lower than Default

MOT_THST_HOVER is set to approximately 0.13, which is lower than the default of 0.35. A very low hover throttle setting might indicate an issue with the power system or vehicle weight.

Suggested Action: Verify the vehicle's weight and power system configuration. If this value is a result of automatic learning, ensure it is accurate for stable flight. If it is too low, it can lead to unstable hover behavior.

Parameters:

- MOT_THST_HOVER: 0.1303796023130417

Informational: EKF3 IMU Mask Setting

EK3_IMU_MASK is set to 1, meaning only the first IMU is enabled for EKF3. The default is 3 (first and second IMU).

Suggested Action: Consider enabling more IMUs (e.g., set to 3 for first and second IMU) for improved redundancy and robustness in the EKF, if available and resources allow.

Parameters:

- EK3_IMU_MASK: 1.0

Informational: RSSI Type Not MAVLink or PWMInputPin

RSSI_TYPE is set to 2 (RCChannelPwmValue), which is a less common option than AnalogPin, PWMInputPin, or ReceiverProtocol. RSSI will be read from channel 11.

Suggested Action: Ensure that the RC receiver is configured to output RSSI as a PWM value on channel 11 and that this is the intended method for RSSI input.

Parameters:

- RSSI_TYPE: 2.0
- RSSI_CHANNEL: 11.0

Informational: Pilot Vertical Speed Limits

PILOT_SPEED_UP is significantly higher than its default (1800 cm/s vs 250 cm/s). PILOT_SPEED_DN is higher than its default (800 cm/s vs 0 for using PILOT_SPEED_UP). These settings could lead to aggressive vertical ascent/descent.

Suggested Action: Verify that these high vertical speed limits are intentional and safe for the aircraft's capabilities. Consider lowering them for smoother and safer manual flight control if not desired.

Parameters:

- PILOT_SPEED_UP: 1800.0
- PILOT_SPEED_DN: 800.0

Informational: Acro & Pilot Yaw/Pitch Rates

ACRO_RP_RATE (200 deg/s) and ACRO_Y_RATE (200 deg/s) are both lower than their default values (360 and 202.5). PILOT_Y_RATE is at its default value (202.5 deg/s for yaw). Lower rates can make the vehicle feel less responsive in Acro mode.

Suggested Action: Consider increasing ACRO_RP_RATE and ACRO_Y_RATE if greater agility in Acro mode is desired. Ensure that the combination of ACRO and PILOT settings provides the expected flight characteristics.

Parameters:

- ACRO_RP_RATE: 200.0
- ACRO_Y_RATE: 200.0
- PILOT_Y_RATE: 202.5

Informational: SERVO_BLH_AUTO Enabled with DShot_ESC

SERVO_BLH_AUTO is enabled (1.0), which auto-enables BLHeli pass-thru for multicopter motors. SERVO_DSHOT_ESC is set to 2 (BLHeli_S/BlueJay) which indicates DShot ESCs. This is an intended configuration for BLHeli ESC telemetry.

Suggested Action: Confirm that all multicopter ESCs are BLHeli_S or BlueJay compatible DShot ESCs to ensure proper functionality of the BLHeli passthrough.

Parameters:

- SERVO_BLH_AUTO: 1.0
- SERVO_DSHOT_ESC: 2.0

Warning: RC Output Channel Configuration

The RC output is configured for DS600 on channels 1-4, standard PWM on channels 5-8, and NeoPixel on channel 9. This mixed configuration might be unusual for a standard quadcopter setup.

Suggested Action: Verify if this mixed RCOut configuration is intentional and matches the connected hardware and intended control scheme.

Messages:

- RCOut: DS600:1-4 PWM:5-8 NeoP:9,4.39E-4