🖥 **MarlinFirmware** / **Marlin**

`<>` Code　　⦿ Issues **584**　　⑂ Pull requests **42**　　▶ Actions　　▥ Projects **1**　　🛡 Security

Releases　　Tags

Marlin 2.0.9.1

🏷 2.0.9.1　⦿ b878127

Latest release

Compare ▾

🦖 **thinkyhead** released this 17 days ago

This maintenance release includes a number of fixes and improvements from contributors, testers, and co-developers.

Issues Fixed

- 🐛 Fix Air Assist ([#22159](#))
- 🩹 Extruders 0 patch for PWM Motor Current ([#22163](#))
- 🐛 Fix env validation for 1280/2560 boards ([#22150](#))
- 🐛 Fix MKS Robin E3 build ([#22149](#))
- 🐛 Fix IJK axis references, E stepper indices ([#22176](#), `906fa05`)
- 🐛 Fix dual Neopixels ([#22174](#))
- 🐛 Fix heater display options/compile ([#22185](#))
- 🐛 Fix compact sensitive pins array ([#22184](#))
- 🐛 Redundant Temp Sensor followup ([#22173](#))
- 🐛 Fix LCD define typos (`927a1a1`)
- 🐛 Define 'HEAD' axes for Markforged (`cce585f`)
- 🐛 Fix Z_MULTI_ENDSTOPS + NUM_Z_STEPPER_DRIVERS 4 compile ([#22203](#))
- 🔧 Fix E.S.T. sanity-check errors ([#22224](#))
- 🐛 Trigger existing endstops on G38 hit (`4763116`)
- 🐛 Fix Octopus build on case-sensitive FS ([#22206](#))

Improved / Optimized

- ✨ Update/extend Quiet Probing ([#22205](#))

LCD / Controller

- 🌐 Update Russian language (#22193)
- 🌐 Update Ukrainian language (#22183)
- 🌐 Update Italian language (#22182)
- ⚠️ MarlinUI Move Z >= 1000 (#22192)
- 🎨 Fix and enhance FTDI Eve Touch UI (#22189, #22223)

Hosts / Protocols

- ⚠️ Include 'H' value in M412 report (#22138)

Boards / Pins

- 🐛 TFT encoder pin for BTT GTR (#22162)

General Cleanup

- 📝 Update probe heating value (`34066c1`)
- 💡 Add G28 L description (#22144)
- 🎨 Cosmetic cleanup (`f2f23e8` , `651f15f` , `ec518e6` , `003ce25`)
- 📝 Update TMC SPI endstops comment (#22221)

😊 👍 5 🎉 6 🚀 8 13 people reacted

▼ **Assets** 2

📦 **Source code** (zip)
📦 **Source code** (tar.gz)

Marlin 2.0.9

🏷 2.0.9 ⦿ d7c7740   Compare ▼

🐢 **thinkyhead** released this 29 days ago

Marlin 2.0.9 is a progressive release featuring a major overhaul of the motion system. The number of linear axes can now be configured, allowing anywhere from one linear axis (X only) up to a total of six (X, Y, Z, U, V, W). The names of the axes can also be customized to your liking (barring conflicts with other G-code parameters).

New Features

- ✨ TMC Driver distinct baudrates (#22008)
- 🏗️ Support for up to 6 linear axes (#19112, #22056, #22068, #22075, #22094, #22112)
- ✨ Add Laser Based I2C Ammeter Feature (#21835, #22079)
- ✨ More flexible redundant temp sensor (#22085)
- ✨ Single Extruder with Dual Stepper Drivers (#21403)
- ✨ Redundant Part Cooling Fan (#21888)

New Machines and Boards

- ✨ BigTreeTech Octopus V1.1 (#22042)

LCDs and Controllers

- 🌐 Update Slovak language (#22000)
- 📺 Fix and enhance FTDI EVE Touch UI (#22047)
- 🩹 Fallback ID for MKS TS35 V2.0 (#22031)
- 🎨 Reorganize FTDI Touch UI variants (#22066)
- 🎨 Fix and improve FTDI Eve Touch UI (#22093)
- 🌐 Update Hungarian language (#22083)
- 🐛 Fix ExtUI/DGUS Celsius display (#22121)
- 🐛 Include common TFT driver macros (#22125)
- 🎨 ExtUI "user click" and other tweaks (#22122)
- ✨ MULTI_VOLUME for Color UI and MarlinUI (#22004)

Optimized / Improved

- ♻️ Refactor Linear / Logical / Distinct Axes (#21953)
- ⚡ Optimize Sensitive Pins array (except STM32) (#22080)
- ⚡ Home Z (and maybe XY) at the start of G35 (#22060)

Fixed Boards / Pins

- 🎨 Reorganize BTT_E3_RRF_IDEX_BOARD (`b99411b`)
- 🎨 Clean up stops, sdss pins (`dc202b3`)
- 🐛 Fix Creality v4 servo timer (#22021)
- 🔧 EEPROM options for BTT SKR 1.4 (#22092)

- 🐛 Fix boot / SD for STM32 (F103Rx) boards (#22087)
- 🔨 Robin Nano V3 overridable POWER_LOSS_PIN (#22123)
- 🔨 Fix Serial+MSC for _USB envs (#22116)
- 🔥 Remove Chitu default Touch Calibration (#22133)

Issues Fixed

- 👽 Fix usb-host-msc-cdc-msc issue (#22025)
- 🐛 Fix Z endstop enum (`72b9f84`)
- 🐛 Fix MMU compile with >5 EXTRUDERS (#22036)
- 🐛 Fix M140 print job timer autostart (#22046)
- ✨ Update `G34` for 4x Z steppers (#22039)
- ♻️ Patches for Zero Extruders (with TMC) (`82ea06e`)
- 🐛 Fix small/huge I2C EEPROM address (#22081)
- 🐛 Fix UBL 'R' parameter and adjust 'P' (#22129)
- 🚑 Prevent BFT unaligned compressed data corruption (#22134)
- 🐛 Prevent stepper sleep during long UBL idle (#22137)

Configuration

- 🔧 Check G29_RETRY_AND_RECOVER requirements (#21921)
- 🔧 Expose hidden BLTOUCH setting changes (#22069)
- 🔧 Enforce BLTouch settings (#22086)
- 🐛 Use whole PROBE_TEMP_COMPENSATION values (#22130)

New HAL/STM32 Targets

- 🔨 Creality v4 with STM32 HAL (#21999)
- 🐛 Fix env:STM32F103RE maple/unified split-up (#22019)
- 🔨 MKS Robin E3 for HAL/STM32 (#21927)
- 📦 STM32F103RE_btt(_USB) with HAL/STM32 (#22040)
- 📦 Malyan M200 with HAL/STM32 (#22052)
- 👽 Include <EEPROM.h> in STM32 (for now) (#22054)

Build / Upload

- 📌 Use U8glib-HAL@~0.4.5 (`2505357`)

- 🐛 Fix Probe Temp Calibration compile ([#22032](#))
- 🔨 Move FLY_MINI env to stm32f1.ini (`c207111`)
- 🔨 Consolidate BTT linker scripts (`62dc3e7` , [#22038](#))
- 🐛 Fix STM3R / BEAST envs ([#22028](#))
- 📌 Update FYSETC E4 to espressif32@2.1.0 ([#22049](#))
- 🔨 MightyBoard envs for Auto Build Marlin ([#22100](#))
- 🔨 Envs for BTT SKR Mini with RET6 (512K) ([#22050](#))
- 🏗️ Refactor build encrypt / rename ([#22124](#))

General Cleanup

- 📝 Update G61 comment (`8f59d44`)
- 🏷️ Remove obsolete CUSTOM_SPI_PINS ([#22058](#))
- 📝 Describe G12 XYZ (`799a4ec`)
- 🔨 Remove obsolete ON_BOARD_SPI_DEVICE (`87344ae`)
- 🎨 Clean up LPC1768 SPI init (`fd3f7b3`)
- 📝 Number SKR EXP headers (`c221ee1`)
- 🩹 Use `#pragma once` in pins files (`9bf5cdd`)
- 🎨 General cleanup of extui/dgus (`d5510ea`)

For Developers

- 👷 Add caching to CI workflow (`0e40d47`)
- 🐑 32-bit float constants (STM32F1) ([#21996](#))
- 🔧 Treat TPARA like SCARA in mfconfig (`62a5957`)
- 🎨 Adjust some conditionals (`0e1e159`)

😊   👍 8   🎉 4   ❤️ 4   🚀 5   👀 6   13 people reacted

▸ **Assets** 2

Marlin 2.0.8.2

🏷️ 2.0.8.2   ⦿ 5b7b065   Compare ▾

🐢 **thinkyhead** released this on May 29

Marlin 2.0.8.2 is a maintenance release with a number of small improvements and issues fixed.

This release adds `cap:HOST_ACTION_COMMANDS:0/1` to the `M115` extended capabilities report so hosts like OctoPrint can check for **basic** host-firmware interaction with `//action:` commands. For more complete interactivity you should enable `HOST_PROMPT_SUPPORT` and this will report `cap:PROMPT_SUPPORT:1` to the host.

New Machines and Boards

- ✨ Malyan M180 ([#21992](#))

New Features

- ✨ `MEDIA_MENU_AT_TOP` for MarlinUI ([#21925](#))
- ✨ Independent baud rates ([#21949](#))

Host and Protocol

- 🔶 `cap:HOST_ACTION_COMMANDS` ([#21987](#))

Configuration

- 🎮 Add `MESH_EDIT_MENU` sanity check ([#21922](#))

Board / HAL

- 🐛 Fix BTT002 variant MMU2 serial pins ❌ ([#21980](#))
- 🐛 Fix Selena Compact probe pin (`83f9413`)
- 🐛 Fix Octopus High Speed USB ([#21961](#))
- 🐛 Fix MKS Robin E3 `BLTOUCH` and Fan PWM timer conflicts ([#21889](#))

LCD / Controller

- 🌐 Update Polish language ([#21993](#))
- 🩹 Improved SKR2 12864 LCD Delays ([#21956](#))
- 📝 Update ExtUI example (`f60965a`)

Optimized / Improved

- ♻️ LEDs refactor and extend ([#21962](#))
- 🎨 Combined `M104` / `M109` and `M140` / `M190` code (`e573611`)

Other Issues Fixed

- 🩹 Fix multi_volume + SDIO onboard compile ([#21975](#21975))
- 🐛 Fix `G29 K` value (`f1f622d`)
- 🐛 Fix `EEPROM_CHITCHAT` ([#21934](#21934))
- 🐛 Fix flowmeter calculation ([#21959](#21959))
- 🐛 Fix wrong `Z_ENDSTOP` flag bit ([#21963](#21963))
- 🐛 Fix Toshiba FlashAir (`SDCARD_COMMANDS_SPLIT`) ([#21944](#21944))
- 🐛 Fix `DELTA` with `SENSORLESS_PROBING`

Build and Upload

- ⚡ PIO filters for `M117` , `M300` and `M414` ([#21972](#21972))
- 🐛 Fix envs using `mks_encrypt.py` ([#21933](#21933))
- 🐛 Fix compile with `PREVENT_COLD_EXTRUSION` off (`94e67a0`)
- 🐛 Fix Teensy `PINS_DEBUGGING` compile ([#21958](#21958))

For Developers

- 🎨 Macros for optional arguments ([#21969](#21969))
- 🎨 Null heating message method (`d1502f7`)
- ♻️ Refactor axis homing/trusted state bits (`57eef65`)
- ♻️ Minimize endstop bits (`894c954`)
- 👷 Add a test for `SAVED_POSITIONS` (`3220c49`)
- ♻️ Refactor, comment endstop/probe enums (`4dae589`)
- 🎨 Flags for homing directions (e.g., `Z_HOME_TO_MIN`) (`49b05ba`)
- 📝 Document `diveToFile` , `printListing` (`ddc82b8`)
- ♻️ Simplify TMC utilities for more axes (`765720e`)
- ♻️ Refactor axis counts and loops (`26a2443`)

Maintenance

- 🎨 Apply shorthand and cleanups (`7597b4f`)
- 🎨 `pause` => `pause_heaters` (`7cd0f2a`)
- 🎨 Shorten lcd relative paths (`3995e83`)
- 🎨 Move `HAS_EXTRUDERS` (`87a9437`)
- 🎨 Update a condition (`8e28731`)

- 🎨 Rename all/no axis enums (`cdbd438`)
- 🎨 `MULTI_MANUAL => MULTI_E_MANUAL` (`c977e82`)
- 🎨 Move switch sensor strings (`2de914c`)
- ✅ Fix tests for `EXTRUDERS 0` (`046bac6`)
- 🎨 Misc cleanup and fixes (`f7d28ce`)
- 🎨 Use defined strings (`c85633b`)
- 📝 Add Configurations section to README (#21955)

☺

▸ **Assets** 2

Marlin 2.0.8.1

🏷 2.0.8.1   ⚯ 1dfa6cb   Compare ▾

🐢 **thinkyhead** released this on May 15

This release patches various issues discovered since the 2.0.8 release and also includes some useful enhancements.

New Features

- `M154 S` Position Auto-Report (#18427)
- Laser Cutter Air Assist (#21753)
- ExtUI event for PID tuning start (#21734)
- Echo LCD message to serial in kill
- UBL Mesh Wizard (#21556, #21791)
- Support a third serial port (#21784)
- Instant Freeze/Resume Function (#17462)

New Machines and Boards

- BigTreeTech SKR V2 Rev B (#21805)
- BigTreeTech Octopus (STM32F446ZET6) (#21826, #21882, #21883, #21901)

Optimized / Improved

- Debounce for Power-Loss pin
- Optimize G-code flag parameters ([#21849](#))
- Move temp errors calling `kill()` out of ISR ([#21832](#))

Configuration

- Allow disable of `POWER_TIMEOUT` ([#21771](#))
- Allow Creality V4 SERVO0 and PROBE pin overrides ([#21770](#))
- `SOFT_RESET_VIA_SERIAL` sanity-check
- Better error message for bad array sizes
- Fix `G29_RETRY_AND_RECOVER` dependency ([#21907](#))
- 🔧 Improve `SD_DETECT_STATE` default ([#21885](#))
- Update Advanced Pause description ([#21829](#))
- Fix multi volume config typo ([#21880](#))
- Make `[XYZ]_ENABLE_PIN` an optional pin ([#21801](#))

LCD / Controller

- Capacitive Touch Screen (GT911) for SKR SE BX ([#21843](#))
- Add `MKS_LCD12864B`
- Fix E3V2 Control Menu icon/text order ([#21838](#))
- Fix MKS UI missing font select condition ([#21905](#))
- Fix Nextion compile error ([#21884](#))
- Active MMU slot indicator ([#21842](#))
- TFT pins for BTT GTR V1
- TFT SPI for BTT SKR v1.3 ([#21794](#))
- Update SKR 1.3 touch pins
- Update Robin Pro TFT Pins ([#21879](#), [#21900](#))

Build and Upload

- BigTreeTech SKR Mini E3 with HAL/STM32 ([#21488](#))
- Only look for target disk during Upload ([#21804](#))
- Update STM32 platform to 12.1
- Use `adafruit/Adafruit NeoPixel@~1.8.0`
- Update `FLSUN_HISPEED` env to `flsun_hispeedv1` ([#21510](#))

For Developers

- Move ExtUI subfolders up a level (#21820)
- Add and apply `REPEAT_1` macro
- Apply SBI/CBI/TEST in HAL
- Additional utility macros
- Simplify macro expansion with recursion (#21859)
- Better `opt_set` comment of old val
- Simplify / undef extra endstops (#21808)

General Issues Fixed

- Fix "undefined `abl_points`" error
- Fix `SDCARD_CONNECTION` default for BTT SKR (#21755)
- Fix Singlenozzle Standby issues (#21759)
- Fix Power-Loss Save on Pause (#21749)
- Fix Z raise in filament load `M701` (#21762)
- Add missing ExtUI method (#21763)
- Fix parser temperature rounding
- Fix bad call to 'diskIODriver' (#21775)
- Fix bad DELTA probe move (#21781)
- Fix `flush_and_request_resend`
- Prevent watchdog reset in `setup()` (#21776)
- Pause and PLR refinements
- Fix MMU2 compile with include (#21809)
- Update `Chart.js` to 2.9.4 for e4d@box UI
- 📝 Fix version reference
- 🐛 Fix excessive MMU2 timeout (#21855)
- `G60` - `G61` Save E position (#21810)
- Patches for `CASE_LIGHT_USE_RGB_LED` (#21811)
- Let `M421 C` select any point
- Always prompt in `M125` if host-prompt (as with Ext UI) (#21828)
- Lerdge K EEPROM and TFT (#21812)
- Consider SD print complete only when commands are done (#21840)
- 🐛 Fix Lerdge USB Flash Drive envs (#21847)

- Unify BTT Motor Expansion Options ([#21823](#))
- Fix and improve Power-Loss Recovery ([#21779](#), [#21894](#))
- Fix L64xx init for Z4 axis
- 🐛 Fix G5 IJ with Motion Mode ([#21858](#))
- Fix compilation failure in `M1001` ([#21897](#))
- 🐛 Fix Realtime Reporting with Motion Modes ([#21902](#))

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▸ **Assets** 2

Marlin 2.0.8

🏷 2.0.8 ⦿ d92decb   [Compare ▾](#)

🐢 **thinkyhead** released this on Apr 30

New Features

- Tool sensors ([#17239](#))
- Z Probe Offset Wizard ([#18866](#), [#19647](#), [#19742](#), [#20167](#), [#20239](#), [#20344](#), [#20414](#), [#20439](#))
- `G34` Mechanical Gantry Calibration (like Prusa `M915`) ([#18972](#))
- Swedish language for MarlinUI ([#20826](#))
- Custom move feedrate for `G26` ([#20879](#))
- Chamber servo vent, auto fan ([#19519](#), [#21594](#))
- Support for Debug Codes - `Dnnn` ([#19225](#), [#19697](#))
- `REPORT_TRAMMING_MM` option ([#19682](#))
- Power-on/off G-code options ([#19837](#))
- `SPINDLE_SERVO` option ([#19971](#))
- `POWER_OFF_DELAY` option ([#19987](#))
- `ASSISTED_TRAMMING_WAIT_POSITION` ([#20063](#))
- `HOME_Z_FIRST` option ([#20113](#))
- SMUFF (MMU2 clone) support ([#19912](#))
- Allow cold Filament Load/Unload with `M302 P1` ([#20262](#))
- Level Corners with Probe option ([#20241](#))
- `M808` Repeat Markers / "End Repeat Loops" menu item ([#20084](#))

- Make `M220` `B` / `R` parameters standard (#20355)
- Probe Tare, Probe Activation Switch (#20379, #20550)
- Laser Test Fire (#20452)
- `NO_SD_DETECT` option (#20741)
- "MeatPack" (OctoPrint plugin) serial encoding (#20802, #20893, #20896, #20903, #21306, #21336)
- STM32 Shared Media - USB Mass Storage Device (#20956)
- Postmortem Debugging to serial port (#20492)
- Chamber Heater PID (#21156)
- `PROBING_HEATERS_OFF` sub-option `WAIT_FOR_HOTEND` (#20835)
- Preheat Menu shortcut option (#20350)
- RGB Caselight (#20341)
- Filament Runout handling for Mixing Extruder (#20327)
- G-code Digital Buttons (#18389, #21284)
- Cooler (for Laser) - `M143`, `M193` (#21255)
- Add `M207` / `8` / `9` reporting (#21335)
- Custom menu items confirm option (#21338)
- TPARA - 3DOF robot arm IK (#21005, #21248)
- Hilbert space-filling curve for UBL / `G26` (#21387, #21453, #21480)
- Extend `M106` / `M107` for better laser module support (#16082)
- Laser Coolant Flow Meter / Safety Shutdown (#21431, #21498, #21573)
- Multi-Volume. Select Media for LVGL (#21344)
- Realtime Reporting, `S000`, `P000`, `R000` (#19330, #21630)
- `M10` - `M11` Air Evacuation for Spindle/Laser (#21668)
- Soft Reset via Serial or post-kill button click (#21652)
- Backlash Compensation for COREnn (#21612, #21731)
- Stepper Driver Anti-Reverse Protection (#21503)

New Machines and Boards

- Anet ET4 / ET4P and Anet TFT28 / TFT35 (#20280)
- BigTreeTech E3 RRF
- BigTreeTech SKR CR6 (#20522)
- BigTreeTech SKR Mini MZ V1 (#19818, #20069)
- BigTreeTech SKR V2.0 (#21503, #21717, #21741)

- BigTreeTech SKR-SE-BX (STM32H743IIT6 ARM Cortex M7) and BIQU_BX_TFT70 (#21536)
- Creality v4.2.10 board (#20647)
- Creality v4.3.1 (Ender 6) board (#20512)
- Creality v4.5.2 (#20378)
- Creality v4.5.3 (CR-6 SE, CR-6 MAX) (#20468)
- Eryone Thinker V2 (#21190)
- FLSUN Delta QQS-Pro (#19793)
- FLY CDY (#19979)
- FLY MINI (#19185)
- FYSETC Cheetah 2.0 (#20897)
- FYSETC E4 (#20032)
- FYSETC Spider (#21458)
- KRATOS32 / K.32 board and LCD controllers (#21334)
- Longer LK Pro / Alfawise PRO (#20185, #20372)
- MKS Robin E3 / E3D v1.1 (#20216)
- MPX_ARM_MINI board (Mingda MD-16) (#20711)
- NUCLEO-F767ZI dev board (#19373)
- Ramps-S v1.2 (#19815)
- SMART RAMPS 1.4 with Mega2560 (#21059, #21128)
- Zonestar Z8 XM2 (#19991)

Configuration Updates

- Ensure A4988 for unspecified driver type (#19798)
- Allow MAX31865 resistance values configuration (#19695)
- TFT Presets, Generic options, Sanity checks (#19723)
- Default `LASER_POWER_INLINE` to OFF (#19727)
- Distinct Chopper Timing settings (#19781, #19850)
- Longer3D: `LONGER_LK_TFT28` now set by config (#19817)
- Configure TMC interpolation per driver (#19828)
- Guards for large `BLOCK_BUFFER_SIZE` (>=128) (#20130)
- Allow dummy thermistors without pin definitions (#20159, #20247)
- Add Thermistor 20-21 notes (#19246)
- Permit touch calibration override
- Optional `M42` / `M226` ; Add more features filters (#19664)

- Option to prevent (extra) Watchdog init on STM32 ([#19693](https://github.com/MarlinFirmware/Marlin/pull/19693))
- Sanity-check mutually-exclusive `G34` features ([#19706](https://github.com/MarlinFirmware/Marlin/pull/19706))
- Add `HAS_MEDIA_SUBCALLS` to enable/disable `M32`
- Option to ignore SD at startup ([#20099](https://github.com/MarlinFirmware/Marlin/pull/20099))
- Option to open the File Browser on Media Insert ([#20151](https://github.com/MarlinFirmware/Marlin/pull/20151))
- Use `MANUAL_PROBE_START_Z` for UBL manual probing ([#20160](https://github.com/MarlinFirmware/Marlin/pull/20160))
- Proper pullup/pulldown configurability ([#20242](https://github.com/MarlinFirmware/Marlin/pull/20242))
- No `Z_MULTI_ENDSTOPS` when `HOMING_Z_WITH_PROBE` ([#20254](https://github.com/MarlinFirmware/Marlin/pull/20254))
- Group related homing options ([#20283](https://github.com/MarlinFirmware/Marlin/pull/20283))
- Leveling Fade Height default setting ([#20316](https://github.com/MarlinFirmware/Marlin/pull/20316))
- Clarify Delta & SCARA config location ([#20403](https://github.com/MarlinFirmware/Marlin/pull/20403))
- Clarify "not Interrupt-capable" error message ([#20419](https://github.com/MarlinFirmware/Marlin/pull/20419))
- Add `Z_SENSORLESS` sanity checks ([#20421](https://github.com/MarlinFirmware/Marlin/pull/20421), [#20438](https://github.com/MarlinFirmware/Marlin/pull/20438))
- `SHORT_MANUAL_Z_MOVE` is now `FINE_MANUAL_MOVE`
- Option to always enable leveling after `G28`
- Minimum temp options for Probing and `G12` Nozzle Clean ([#20383](https://github.com/MarlinFirmware/Marlin/pull/20383))
- Improve STM32 timer conflict messages ([#20544](https://github.com/MarlinFirmware/Marlin/pull/20544))
- Add `OPTIMIZED_MESH_STORAGE` option (for UBL) ([#20371](https://github.com/MarlinFirmware/Marlin/pull/20371))
- Validate defined probe points ([#20572](https://github.com/MarlinFirmware/Marlin/pull/20572))
- Allow define of `HOMING_FEEDRATE_(XY|Z)`
- Apply `SHOW_BOOTSCREEN` to `TFT_COLOR_UI` ([#20586](https://github.com/MarlinFirmware/Marlin/pull/20586))
- Clarify sanity-check for custom status bitmap ([#20588](https://github.com/MarlinFirmware/Marlin/pull/20588))
- Adjustable precision in `M105` temperature report ([#20602](https://github.com/MarlinFirmware/Marlin/pull/20602), [#20687](https://github.com/MarlinFirmware/Marlin/pull/20687))
- Multi-Z stepper inverting ([#20678](https://github.com/MarlinFirmware/Marlin/pull/20678))
- Configurable Corner Leveling point order ([#20733](https://github.com/MarlinFirmware/Marlin/pull/20733))
- `USE_M73_REMAINING_TIME` sanity-check ([#20751](https://github.com/MarlinFirmware/Marlin/pull/20751))
- Configure / disable `PRINTCOUNTER` save interval ([#20856](https://github.com/MarlinFirmware/Marlin/pull/20856))
- Configure / disable PRINTCOUNTER save interval ([#20856](https://github.com/MarlinFirmware/Marlin/pull/20856))
- Touch Calibration Screen auto-save option ([#20971](https://github.com/MarlinFirmware/Marlin/pull/20971))
- Allow Zero Endstops (e.g., for CNC) ([#21120](https://github.com/MarlinFirmware/Marlin/pull/21120), [#21188](https://github.com/MarlinFirmware/Marlin/pull/21188))
- Combine `Z_AFTER_DEACTIVATE` with `UNKNOWN_Z_NO_RAISE` ([#20444](https://github.com/MarlinFirmware/Marlin/pull/20444))
- Renamed some " `SPEED` " options as " `FEEDRATE` " ([#21217](https://github.com/MarlinFirmware/Marlin/pull/21217))
- Default microsteps to axis first stepper ([#21230](https://github.com/MarlinFirmware/Marlin/pull/21230))
- Safe Z homing for Power Loss Recovery ([#16909](https://github.com/MarlinFirmware/Marlin/pull/16909))

- Extend Heater Overshoot Options ([#21273](#))
- Undef unused 2nd serial option(s) ([#21331](#))
- Sanity-checks for `NOZZLE_CLEAN_FEATURE` ([#21332](#))
- Main / Config Custom Submenus ([#18177](#))
- Better chopper defaults
- More detailed serial config error
- Sanity check `MIXING_EXTRUDER` + `DISTINCT_E_FACTORS` ([#21689](#))
- Make Cancel Objects reporting optional ([#21698](#))

Optimized / Improved

- Fix various errors, warnings in example config builds ([#19686](#))
- Add loose soft endstop state, apply to UBL fine-tune ([#19681](#))
- If needed, home before `G34` ([#19713](#))
- Handle `M410` in the main task ([#19752](#))
- Fix Color UI `external_control`, `wait_for_release` ([#19771](#))
- Fix HAL/STM32 FastIO for analog pins ([#19735](#))
- Fix `G35` PROGMEM strings ([#19926](#))
- Handle UTF in long filenames ([#20087](#), [#20115](#), [#20121](#), [#20135](#))
- `G34 Z` stepper locking ([#20091](#))
- Optimize `M360`
- Update IDEX menus, add post-`M605` event G-code ([#20133](#))
- Reduce RAM usage for TFT Color UI on SGen-L ([#20179](#))
- Abort print on media removal ([#20200](#))
- Skip unnecessary (costly) SW Stepper Enable ([#20218](#))
- Allow Status Message without LCD ([#20246](#))
- Optimize emergency parser check
- On pause release the extruder for easier filament change ([#20346](#))
- Fix, improve Tramming Wizard behavior ([#20437](#), [#20796](#))
- MAX Thermocouples rework ([#20447](#))
- Support RGBW on PCA9632 ([#20455](#))
- Preheat *before* Power Loss Recovery homing ([#20697](#))
- Support up to 6 Tramming points ([#20720](#), [#21646](#))
- Init KILL, SUICIDE, PSU earlier ([#20810](#))
- Init serial ports first ([#20944](#))

- Improve probe preheat behavior (#21033)
- Use 'H' value for UBL G29 z-clearance (#21114)
- Fix and improve G-code queue (#21122)
- Pause SD queue early on `M25` (#21317)
- Add reporting to `M207 / 8 / 9` (#21335)
- Optimize `MarlinSettings` with template methods (#21426)
- Optimize LSF for size, efficiency (#21443)
- Optimize BLTouch code for size (#21477)
- Generalize MMU (#21469)
- Move last bootscreen delay to end of setup (#21665)
- Use `temp_info_t` for `temp_redundant` (#21715)

Board / HAL Updates

- Retire HAL for STM32F4 / F7 (#20153)
- Improved MKS Robin support (#19333)
- Minor SPI fixes, `systick_callback` for STM32F1 HAL compatibility (#19565)
- Update MKS SGen-L V2 RGB LED pins (#19762)
- Teensy 4.1 Ethernet support (#19801, #21316)
- Ignore NativeEthernet on AT90USB1286 (#19885)
- AZTEEG X5 mini LED pins (#19909)
- Generalize BTT SKR E3-DIP version (#19910)
- Rename, adjust Dagoma F5 (#19947)
- `FAST_PWM` for STM32F1 (#19952)
- `FAST_PWM` for STM32 (#20025)
- Get STM32 clock rates from framework (#19978)
- HAL support for 8s watchdog
- Standardize Marlin SPI (#19989)
- STM32F1 cleanup, incl. SoftwareSerial removal (#20046)
- BTT SKR driver expansion board (#20088, #20123)
- Allow overriding servo pin for MKS Robin Mini (#20158)
- FLSun Hispeedv1 Board update (#19959)
- Migrate Hispeedv1 (QQS-Pro) to HAL/STM32 (#20354)
- Use RTD for MAX31865 reading (#20188)
- Add `BTN_ENC_EN` for many boards (#19796, #19890, #20684)

- SKR E3 Turbo Controller Fan ([#20320](https://github.com/MarlinFirmware/Marlin/pull/20320))
- Permit SD EEPROM emulation on Ender-3 V2 ([#20353](https://github.com/MarlinFirmware/Marlin/pull/20353))
- Suspend Servos for STM32+NeoPixel ([#19963](https://github.com/MarlinFirmware/Marlin/pull/19963))
- SPI TFT for STM32F4 boards ([#20384](https://github.com/MarlinFirmware/Marlin/pull/20384))
- MKS Robin Pins fixes for STM32 and STM32F1 ([#20404](https://github.com/MarlinFirmware/Marlin/pull/20404))
- Add `HAS_PIN_27_BOARD` for `CREALITY_V4` ([#20446](https://github.com/MarlinFirmware/Marlin/pull/20446))
- MKS Robin Nano V3 and STM32F4x0Vx Variant ([#20430](https://github.com/MarlinFirmware/Marlin/pull/20430), [#21174](https://github.com/MarlinFirmware/Marlin/pull/21174), [#21238](https://github.com/MarlinFirmware/Marlin/pull/21238))
- Let boards set Default TMC Slave Addresses ([#20498](https://github.com/MarlinFirmware/Marlin/pull/20498))
- 12-bit ADC resolution for STM32 ([#20519](https://github.com/MarlinFirmware/Marlin/pull/20519), [#20562](https://github.com/MarlinFirmware/Marlin/pull/20562))
- Overrides to prevent STM32 timer conflicts ([#20545](https://github.com/MarlinFirmware/Marlin/pull/20545))
- Unify FYSETC F6 1.3 / 1.4 ([#20507](https://github.com/MarlinFirmware/Marlin/pull/20507))
- Better defaults, compatibility for SDIO + STM32 ([#20570](https://github.com/MarlinFirmware/Marlin/pull/20570), [#21440](https://github.com/MarlinFirmware/Marlin/pull/21440))
- USB Flash Drive via native USB Host + MSC ([#20571](https://github.com/MarlinFirmware/Marlin/pull/20571))
- Prefix SD SPI pins (SCK, MISO, MOSI, SS) ([#20606](https://github.com/MarlinFirmware/Marlin/pull/20606))
- Define SANGUINOLOLU 1.1 enable pins ([#20682](https://github.com/MarlinFirmware/Marlin/pull/20682))
- Wanhao One+ SD Detect pin ([#20724](https://github.com/MarlinFirmware/Marlin/pull/20724))
- ESP32 Tone Generator ([#20704](https://github.com/MarlinFirmware/Marlin/pull/20704))
- `NEOPIXEL` overridable on BTT SKR ([#20797](https://github.com/MarlinFirmware/Marlin/pull/20797))
- FYSETC_242 OLED 12864 for S6 ([#20767](https://github.com/MarlinFirmware/Marlin/pull/20767))
- Lerdge K/S/X support for Flash Drive ([#20593](https://github.com/MarlinFirmware/Marlin/pull/20593))
- Add labels, condition for BTT GTR M5 pins ([#20772](https://github.com/MarlinFirmware/Marlin/pull/20772))
- Updated display timing for SKR Pro ([#21346](https://github.com/MarlinFirmware/Marlin/pull/21346))
- ZONESTAR_LCD warning for RAMPS / ReARM ([#20702](https://github.com/MarlinFirmware/Marlin/pull/20702))
- Refactor serial class with templates ([#20783](https://github.com/MarlinFirmware/Marlin/pull/20783), [#21249](https://github.com/MarlinFirmware/Marlin/pull/21249), [#21287](https://github.com/MarlinFirmware/Marlin/pull/21287), [#21318](https://github.com/MarlinFirmware/Marlin/pull/21318))
- Allow SERVO0_PIN override on Creality Melzi ([#21007](https://github.com/MarlinFirmware/Marlin/pull/21007))
- EXP headers for RAMPS 1.x ([#21054](https://github.com/MarlinFirmware/Marlin/pull/21054))
- Trigorilla Pro: Allow for swapped Z-stops
- Add `BOARD_PREINIT` (for Longer3D open drain pins) ([#21159](https://github.com/MarlinFirmware/Marlin/pull/21159))
- Lerdge-K TMC 2208/9 UART pins ([#21299](https://github.com/MarlinFirmware/Marlin/pull/21299))
- Lerdge-X I^{2}C EEPROM pins, size ([#21322](https://github.com/MarlinFirmware/Marlin/pull/21322))
- Update display timing for SKR Pro ([#21346](https://github.com/MarlinFirmware/Marlin/pull/21346))
- Update Anet V1.0 display timing ([#21425](https://github.com/MarlinFirmware/Marlin/pull/21425))
- GT2560 Rev.A Plus Z Max Pin with BLTouch ([#21375](https://github.com/MarlinFirmware/Marlin/pull/21375), [#21512](https://github.com/MarlinFirmware/Marlin/pull/21512))
- Board IDs for G2560 Rev B, G2560 v4, GTM32 VD ([#21499](https://github.com/MarlinFirmware/Marlin/pull/21499))

- `EXP2_01_PIN` for BTT BTT002 1.0
- Changes supporting "Prussia3D" MK3 ([#21617](#))
- MCP4451 Digipot Support for Azteeg X5 GT ([#21680](#))

Board / HAL Fixes

- Fix onboard SD card support for Teensy 3.6 & 4.1 ([#19593](#))
- Fix `TEMP_ADC_PROBE` support for STM32F1 ([#19582](#))
- Fix Archim1 stepper timing (with new variant) ([#19596](#))
- Fix HAL/STM32 FastIO for analog pins ([#19735](#))
- Fix Smoothieboard digipots i2c pin ([#19784](#))
- Fix TMC serial port for FYSETC AIO_II ([#19842](#))
- Fix BTT002 PeripheralPins PWM assignments ([#20036](#))
- Fix E4d@box pins, stepper i2s ([#20055](#))
- Fix FYSETC S6 timer conflict ([#20044](#))
- Fix FYSETC S6 I2C EEPROM size ([#20340](#))
- Fix FYSETC_S6 heaters pins ([#21483](#))
- Fix SKR E3 DIP pin `CLCD_SPI_CS` ([#20078](#))
- Fix GTR NeoPixel pin with FYSETC Mini12864 ([#20203](#))
- Fix BTT GTR 1.0 endstop/DIAG pins ([#20296](#))
- Fix and optimize MightyBoard ([#20493](#))
- Fix Creality EEPROM watchdog freq. ([#20510](#))
- Fix TMC220x short circuit ([#20731](#))
- Fix Trigorilla Pro STOP pins ([#20801](#))
- Fix ESP32 I2S init placement ([#21019](#))
- Fix mini12864 v2.1 + PSU control + NeoPixel backlight ([#21021](#))
- Fix STM32F1 emergency parser ([#21011](#))
- SAMD51: Respect serial buffer size ([#21194](#))
- Fix SKR E3 Mini V2.0 Fan Bug ([#21079](#))
- Fix and add STM32 SDIO DMA ([#21476](#))
- Add E1 pins for RAMPS 1.4.4 / AGC
- Fix Grand Central SD dependency ([#21660](#))

New LCDs / Controllers

- Two additional EVE displays ([#18839](#))

- Support 4.3" (480x272) Color UI display (#20334)
- LVGL and Classic UI for STM32 (#20552)
- MKS H43 controller (#20609, #21240, #21267, #21388, #21485, #21500, #21511, #21619)
- Nextion TFT touch screen (#21324)
- New-style Anycubic Chiron TFT (#21597)

New LCD / Controller Features

- Add Touch Calibration screen (#20049, #20454, #20524)
- "Sound: ON/OFF" menu item (#19901)
- Fysetc Mini 12864 + GT2560 A(+) (#19878)
- Multi-platform `DWIN_CREALITY_LCD` support (#20738)
- Touch UI support for X2, Y2 and Z2 (#19538)
- Implement `wait_for_user` for Color UI (#19694)
- `ANET_FULL_GRAPHICS_LCD_ALT_WIRING` for SKR 1.4 (#20011, #20427)
- Anet 1.0 alternative graphical LCD wiring (#20022)
- Color UI single touch menu navigation (#20053)
- Tramming Wizard submenu option (#20000)
- `COLOR_UI` without `TOUCH_SCREEN` 👍 (#20178, #20269)
- Remaining Time for Prusa-style LCD layout (#20148)
- TFTGLCD support for STM32F1xx (#20515)
- Small / Large Bootscreen option for `TFT_COLOR_UI` (#20578)
- LVGL G-code preview (#20589, #20564)
- MKS WiFi for `TFT_LVGL_UI` (#20191)
- LVGL UI G-code console (#20755)
- LVGL "more" menu (#20940, #21004)
- Mesh Editor for FTDI Eve Touch UI (#21381)
- MKS LVGL UI: Display/edit fan percentage (#21544)
- E3V2 DWIN Advanced Settings menu (#21534, #21700)
- Color UI Move Screen for 320x240 TFT (#21708)

LCD / Controller Updates

- Update French language (#20472)
- Update Hungarian language (#20996, #21266, #21407)
- Update Italian language (#19654, #19953, #20480, #20551, #20663, #20789, #21537)

- Update Russian ([#20508](), [#20529]())
- Update Ukrainian ([#20508](), [#20668]())
- Update Slovak language ([#19561](), [#20181](), [#21224]())
- Add Spanish translations ([#20020]())
- TFT Refactoring ([#19192]())
- Provide FYSETC F6 v1.3 LCD pins for HD44780 ([#19769]())
- Color UI for MKS SGen-L V2 ([#19919](), [#20209]())
- Color UI circular task queue ([#19918]())
- Reset calibration screen touch timer on click ([#19951]())
- Y-center GLCD status logo, reorganize ([#19954]())
- Increase SPI Speed on LPC. Color and Classic UI for MKS SGEN L. ([#19945]())
- Show un-mounted media slot ([#20005]())
- Better Classic UI touch resolution ([#20004]())
- Use status bitmaps based on `LCD_FIRST_TOOL`
- Better edit range for Linear Advance K ([#20155]())
- Reapply superscript substitution ([#20219]())
- Clear menu history for browse media on insert ([#20236]())
- Display position on LCD in current units ([#20145]())
- Set " `lcd_move_e` " index to fix the label ([#20263]())
- Shorter Filament Load/Unload Strings to fit Graphical Display ([#20369]())
- Allow BTT EXP-MOT be used with 10-pin (EXP1) displays ([#20396]())
- Move ExtUI ABL mesh edit, limit to bilinear ([#20381]())
- Cutter Power in percent format ([#20410]())
- Legacy MKS WiFi Cura plugin compatibility ([#20589]())
- Assisted Tramming improvements ([#20298]())
- 4 / 5 digits for some edit items ([#20793]())
- Color UI Multi-language support ([#20725](), [#20915](), [#20972]())
- Increase filament runout distance edit limit ([#20828]())
- `lcd_put_wchar_max` for `COLOR_UI` ([#20838]())
- `ZONESTAR_LCD` warning for RAMPS / ReARM ([#20702]())
- Graphical TFT fixes, cleanup ([#20861]())
- KILL, BEEPER pins for LCD_FOR_MELZI ([#20924]())
- Refresh screen on `M22` (detach) ([#20958]())
- Re-calibrate touch after EEPROM reset, if needed ([#20934]())

- Fix and extend FTDI EVE Touch UI (#20393, #20466, #20517, #20518, #20532, #20549, #20987, #21232, #21148, #21167, #21487, #21607)
- Ender 3 V2 display improvements (#20983, #21072, #21369, #21035)
- Support for FYSETC mini12864 with BTT002 (#21096)
- Support for YHCB2004 with GT2560 v4.1B (#21091, #21111, 21450, #21472)
- Clean up, optimize ExtUI/TFT code (#21333)
- MKS UI: Monitor state when idle (#21452)
- Update u8g / AVR display timing defaults (#21518)
- Touch UI Bed Mesh Screen refactor, enhancements (#21521)
- Delay U8glib init using U8glib-HAL 0.4.4 (#21496)
- Space-separate scrolling Status Message (#21523)
- `ExtUI::onPostprocessSettings` (#21683)

LCD / Controller Fixes

- Fix Move Screen with disabled Touch (#19558)
- Restore ° (degree symbol) to 6x9 small info font (#19645)
- Fix screen click reading too often (#19696)
- Fix Anycubic i3 Mega target temperature display (#19572)
- Fix German translation purging/unloading (#19615)
- Use `LiquidCrystal_I2C@1.1.4` for `RA_CONTROL_PANEL` (#19875)
- Fix Tune/Fan edit items
- Fix "autotune" LCD message (#20127)
- Fix and improve Ender-3 V2 (#19642, #20324, #20338, #20352, #20443, #20526, #20837, #21272)
- Fixes for TFTGLCD Panel, FastIO (#19614)
- Fix UTF8 handling for Color UI (#19708)
- Fix and optimize MKS UI (#19869, #20813)
- Fix some LVGL bugs (#19900, #19904, #20214)
- Fix 320x240 touch buttons Y (#20079)
- Fix Filament Change menu items (#20201, #20565)
- FIX TMC menu message (#20294)
- Fix "back" location for Level Bed Corners
- Fix Spindle/Laser Control menu (#20347)
- Fix ZoneStar LCD 2004 buttons (#20489)

- Fix DOGM status message scrolling (#20557)
- Fix ST7920 timing for Rumba32, Fysetc S6 (#20556)
- Fix Menu Mixer for Color UI (#20566)
- Fix SD SPI Speed override, FTDI mesh edit (#20657)
- Fixes for TFTGLCD (#20734)
- Fix Anycubic Chiron TFT issues (#20807, #21152, #21183)
- Fix Ender 3 V2 unwanted E motion on manual moves (#20806)
- Fix MKS SGen-L with FYSETC_MINI_12864 LCD (#20998)
- Fix AZSMZ_12864 on SMART RAMPS (#21056)
- Fix MKS LVGL UI Main screen / buttons / icons (#21468, #21595)

Serial / Host Updates

- `G35` workaround for Pronterface "feature" (#19577)
- Fix `M503` output for `M907` motor current (#19777)
- Fresh Web GUI (based on `bootstrap.js`) (#19812)
- Help hosts when Marlin is password-locked (#20348)
- Fix " `//action` " prefix (#20600)
- Fix `M48` output (#20713)
- Fix reporting of TMC_S2VSA/B (#20730)
- Improve RPi host kernel panic mitigation
- Refactor Serial ports for more flexibility
- Enable Purge More / Resume with EP + Host Prompt (#21671)

General Issues Fixed

- Ignore `M22` during SD print
- Fix `G2` / `G3` arcs over 180° (#20292, #20314, #20322)
- Improve `plan_arc` circle detection (#20440)
- Fix Buzzer (pin) init for uninitialized FastIO (#19559)
- No move on Park = No move on Resume (#19569)
- Fix compile of MMU2 with S-mode disabled (#19584)
- Fix `Z_AFTER_HOMING` without probe (#19607)
- Allow bypass for cold E movement (#19606)
- Keep HAL tasks running during PID Autotune (#19671)
- Fix starting fan with bad material preset index (#19773)

- Watchdog Refresh for LVGL Asset Load (#19724)
- Fix `SET_SOFT_ENDSTOP_LOOSE` w/out soft endstops (#19734)
- Fix IDEX layer shift and DIR states (#19756)
- Apply home offsets to probing, Z Safe Homing (#19423)
- Fix `G2` / `G3 P<circles>` E and Z motion (#19797)
- Fix Anycubic Chiron "Ready" detection (#19880)
- Fix Chiron probe low point (#19962)
- Fix PASSWORD compile w/out LCD (#19888)
- Fix DAC-related bugs (#19907, #19921, #20205)
- Keep SPI active on LPC176x (#19932)
- Fix Laser / Spindle issues (#19970, #20509)
- Fix STM32 HW Serial + EP compile (#19990)
- Don't close diveDir in fileExists (#20035)
- Fix Endstop Interrupts with SPI endstops, sanity checks (#20051)
- Fix tool-change servo index for E2 and up (#20060)
- Use extra `G35` BLTouch HS Mode clearance in Tramming Wizard (#20057)
- Fix Linux GPIO logging (#20093)
- Fix MAX6675 SPI init, conflicts (#20086)
- Fix MAX31865 on SPI (PT100/1000) support (#20074)
- Fix extraneous Linear Advance DIR change (#20131)
- Multi-Hotend Preheat Fixes (#20165)
- Fix `NaN` mesh entries with `ABL_BILINEAR_SUBDIVISION` (#20143)
- Fix bad `SET_FAST_PWM_FREQ` calls (#20227)
- Fix backward Filament (Presence) Sensor pulls (#20228)
- Fix Load Filament wait (#20243)
- Fix UBL manual mesh adjust behavior (#20248)
- Fix `Z4` in `ENABLE` / `DISABLE_AXIS_Z` (#20256)
- Add missing header to use `HAS_SD_HOST_DRIVE` (#20270)
- Fix `M73` LCD code typo (#20300)
- Prevent Watchdog reset writing Creality 4.x EEPROM (#20328)
- Fix `MESH_BED_LEVELING` without `SEGMENT_LEVELED_MOVES` (#20363)
- Fix `TMC_HOME_PHASE` divide-by-zero (#20368)
- Fix `auto#.g` file handling, add `NO_SD_AUTOSTART` (#20071)
- Fix UBL Debug Messages (#20423)

- Fix issues with preheating before leveling
- Fix SD print completion logic ([#20456](#20456))
- Fix `RESTORE_LEVELING_AFTER_G28` behavior ([#20471](#20471))
- Apply `HOME_AFTER_DEACTIVATE` to `G28 O` ([#20525](#20525))
- Fix `G34` compile with bed leveling disabled ([#20537](#20537))
- Fix UBL mesh inset Z position ([#20538](#20538))
- Fix G28 leveling state, UBL compile ([#20499](#20499))
- Apply `NO_MOTION_BEFORE_HOMING` to joystick motion ([#20462](#20462))
- Fix `PARKING_EXTRUDER` homing with solenoid ([#20473](#20473))
- Fix `CHAMBER_FAN_MODE` 0 build ([#20621](#20621))
- Fix UBL mesh edit delta moves ([#20620](#20620))
- Fix thermal error protection, reporting ([#20655](#20655))
- Fix IDEX reboot on travel after `G28 X` ([#20654](#20654))
- Defer "quiet probing" till the last Z bump ([#20610](#20610))
- Don't apply `hotend_offset.z` to Z soft endstops ([#20675](#20675))
- MMU2 as a standard serial device ([#20771](#20771), [#20794](#20794), [#20811](#20811))
- Raise Z on exit from 'Level Bed Corners' ([#20817](#20817))
- Remove extra G29 V newlines ([#20955](#20955))
- Fix ARM delay function ([#20901](#20901))
- Fix `TEMP_0_TR_ENABLE`, rename temp conditions ([#21016](#21016))
- Fix: Unsupported use of %f in printf ([#21001](#21001))
- Fix remaining time divide-by-zero ([#21080](#21080))
- Fix IDEX broken endstop test ([#21110](#21110))
- Fixes for `MP_SCARA` ([#21113](#21113), [#21686](#21686))
- Fix `cleaning_buffer_counter` check ([#21115](#21115))
- Fix `LEVEL_CORNERS_USE_PROBE` with `BLTOUCH_HS_MODE` ([#21161](#21161))
- Init (stow) BLTouch before X/Y homing ([#21192](#21192))
- Fix `M355` with `NEOPIXEL` ([#21200](#21200))
- Fix GTR / SKR PRO + USB Flash Drive build ([#21197](#21197))
- Fix `M876` when called from EP ([#21210](#21210))
- Duplicate fan speed in `M106 / 7` IDEX Duplication Mode ([#21208](#21208))
- Apply `AUTO_POWER_CONTROL` later in `setup()` ([#21193](#21193))
- Fix Host Keepalive serial target ([#21283](#21283), [#21290](#21290))
- Fix LPC + TMC boot loop ([#21298](#21298))

- Fix TouchMI stow in `G34` (#21291)
- Fix password menu stickiness before first auth (#21295)
- Un-pause fans on STOP
- Fix macros that call macros crashing (#21383)
- Apply endstops-always-on for `G28` sensorless (#21441, #21442)
- Avoid watchdog reset in all wired EEPROMs (#21436)
- Remove extraneous 'extern' hints (#21516)
- Fix FAT delete of items with longname (#21528)
- Make `DELAY_NS` round up on AVR (#21546)
- Park Magnetic Switching Toolhead at the very end (#21552)
- Fix `M114 E / R` broken by `LIN_ADVANCE` (#21579)
- Fix Resume Print with UBL (#21564)
- Fix Max Temperature not enforced (#21592)
- Fix and improve Power Monitor (#21551)
- Always swap with `PRIME_FIRST_USED` disabled (#21622)
- Don't display service prompt unless needed (#21654)
- Prevent extrusion on `M600` un-park (#21670)
- Fix Thermal Runaway false-alarm in `M303`, add `HeaterWatch::check` (#21743)
- Fix compile with `DISTINCT_E_FACTORS` + `SLIM_LCD_MENUS` (#21733)

Build and Upload

- Fix 'bossac' upload on Windows (#19545)
- Fix and improve `Makefile` / CMake (#19640)
- Fix at90usb1286 build (#19687)
- Fix digipot compilation (#19731)
- Fix mega2560ext environment (#19730)
- More PIO dependencies optimizations
- Update ZMIB_V2 env names (#19886)
- Permit spaces in dependencies g++ path (#19929)
- PIO env for MKS Nano boards in STM32 (#19905)
- Fix 0 extruders & bed compile (#20030)
- Sanity-check illegal native USB (#20047)
- Optimized (non-optiboot) Melzi env (#20021)
- Windows LPC Upload for non-admins (#20208)

- Fix STM32F1 '`freeMemory()`' warnings ([#20319](#))
- Update to STM32 v10, optimize build ([#20325](#))
- Fix up start, monitor baud ([#20326](#))
- Require a minimum PlatformIO version ([#20361](#))
- Use a newer LPC176x framework ([#20469](#))
- Check for misplaced configs on build ([#20599](#))
- Set `build_flags` via `custom_marlin.FEATURE` ([#20692](#))
- Silence unused parameter warnings
- Compile fewer extraneous sources ([#20822](#))
- USB Flash Drive env hints for Auto Build Marlin ([#20592](#))
- *Replace* `lib_deps` for `custom_marlin.FEATURE` ([#20858](#))
- Update platform ststm32 ([#20928](#), [#21219](#))
- Let libmaple accept `RX` / `TX_BUFFER_SIZE` ([#21177](#))
- Fix LERDGE 'extends' env references ([#21305](#))
- Preflight checks for PlatformIO build ([#21068](#), [#21191](#), [#21361](#), [#21372](#), [#21658](#), [#21574](#))
- Misc build fixes ([#21413](#))
- Split up `platformio.ini` into `ini` folder ([#21507](#))
- Require PlatformIO >= 5.0.3
- Fix Rumba32 variant for Marlin ([#21497](#))
- Add 'jump relaxing' compile flag to AVR targets ([#21566](#))
- Fix Flash size (512KB) for STM32F103ZE ([#21590](#))
- Skip scripts during `platformio init` ([#21643](#))
- Let compiler do `Temperature.h` inlining

For Developers

- Bring "`mftest -a`" up to date with latest codebase
- Digipots refactor / cleanup ([#19690](#))
- Rename ultralcd => marlinui
- Internal `G29N` for `G28` + `G29` ([#20800](#))
- Pins post-process header ([#19860](#))
- Add `mfconfig` script used to manage configurations
- Add alternative ternary macros `IF_ENABLED` , `IF_DISABLED`
- Distinct runout states ([#19965](#))
- Add `parser.is_command(letter, code)`

- Local testing with `Makefile`, Docker, `mftest` ([#19981](#))
- Better USB Media Host conditions ([#20176](#))
- Adjust axis homed / trusted methods ([#20323](#))
- Avoid invalid memory optimizations ([#20389](#))
- More configurable animated bootscreen
- Homing feedrates as XYZ array ([#20426](#))
- Balance CI tests ([#20485](#))
- Add manual move type `ALL_AXES` for UBL mesh editing
- Fix and consolidate `PSTR` aliases ([#20812](#), [#20831](#))
- Move singlenozzle temp/fan ([#20829](#))
- Internal `G29N` code as shortcut for `G28\nG29`
- Clean up `MarlinCore` and `MarlinUI` ([#20832](#), [#20846](#), [#20852](#), [#20868](#), [#20869](#), [#20874](#))
- Init `KILL`, `SUICIDE`, PSU earlier ([#20810](#))
- No extra build folder for st/jlink upload ([#21341](#))
- Script to generate Marlin TFT Images ([#21340](#))
- Read extra ENVS from `pins.h` in preflight checks ([#21361](#))
- `AutoReport` class (Temperature, Cardreader) ([#20913](#), [#20959](#))
- Allow `mftest -t` to select test by number
- Add `-g3` to include macros in debug symbols ([#21052](#))
- Script to download & build Configurations ([#20992](#))
- Make `F_CPU` a compile-time constant ([#21051](#))
- Tweak tests, consolidate pins target validation ([#21254](#), [#21261](#))
- Script to generate Marlin TFT Images ([#21340](#))
- Added `typedef celsius_t` ([#21374](#), [#21678](#))
- Group UBL parameters in a structure
- More IntelliSense-friendly declarations
- Define HW serial ports needed for TMC UART ([#21446](#))
- Apply TMC UART to STM32, simplify
- Improve `uncrust` script
- Replace `const float &` with `const_float_t` ([#21505](#))
- `getHighESpeed` => `autotemp_task`
- Macros to eliminate 'f + 0.0' ([#21568](#), [#21642](#))
- Drop return value from `Serial::write()` ([#21567](#), [#21577](#))
- Rename `tick()` to `isr()` to hilight interrupt-time

- Disable `assert()` by default with `-DNDEBUG`
- Add whole-degree accessors ([#21685](#))
- Clean up / improve `generate_version` script ([#21674](#))
- Add `INO` to `.editorconfig`
- Prettier output from `opt_enable`, et.al. ([#21707](#))
- Drop compiler flag `merge-constants` due to GCC bug ([#21711](#))

☺

▸ **Assets** 2

Marlin 2.0.7.2

🏷 2.0.7.2   ⟜ 88a2ac9   **Compare** ▾

🐙 **thinkyhead** released this on Oct 29, 2020

Issues Patched

- Define `IS_ULTIPANEL` properly for new configs
- Fix various errors, warnings in example config builds ([#19686](#))
- Fix `I2C_ADDRESS` sign warning ([#19685](#))
- Save PLR on resume from pause ([#19676](#))

New Machines and Boards

- Add NUCLEO-F767ZI dev board ([#19373](#))

New Features

- Add `G34` Mechanical Gantry Calibration (like Prusa `M915`) ([#18972](#))

Configuration

- Allow MAX31865 resistance values configuration ([#19695](#))
- Add `REPORT_TRAMMING_MM` option ([#19682](#))
- Sanity-check mutually-exclusive G34 features ([#19706](#))

Board / HAL

- Fix HAL/STM32 FastIO for "A#" analog pins (#19735)
- Restore correct STM32 port-bits code (#19678)
- Fix SAMD Serial name macro (#19765)
- Option to prevent (extra) Watchdog init on STM32 (#19693)

LCD / Controller

- Improved TFT support (#19192, #19710)
- Prevent watchdog timeout in LVGL init (#19724)
- Fix UTF8 handling for Color UI (#19708)
- Fixes for TFTGLCD Panel, use FastIO (#19614)
- Implement `wait_for_user` for Color UI (#19694)
- Fix screen click reading too often (#19696)

Optimized / Improved

- If needed, home before G34 (#19713)
- Add loose soft endstop state, apply to UBL fine-tune (#19681, #19734)
- Digipots refactor / cleanup (#19690)

Build and Upload

- Fix mega2560ext environment (#19730)
- Fix motion compile w/out probe-oriented settings (#19684)
- Fix AT90USB1286 build (#19687)

For Developers

- Add `D100` Watchdog Test (#19697)

☺

▶ **Assets** 2

Marlin 2.0.7.1

🏷 2.0.7.1   ⚭ 11662bf   Compare ▾

🔴 **thinkyhead** released this on Oct 10, 2020

Issues Patched

- Fix Ender-3 V2 Stop SD Print (#19642)
- Fix Archim1 stepper timing (with new variant) (#19596)
- Fix `Z_AFTER_HOMING` without probe (#19607)
- Fix `TEMP_ADC_PROBE` support for STM32F1 (#19582)
- Fix compile of MMU2 with S-mode disabled (#19584)
- No move on Park = No move on Resume (#19569)
- Fix Buzzer (pin) init for uninitialized FastIO (#19559)
- Keep HAL tasks running during PID Autotune (#19671)

New Machines and Boards

- FLY MINI (#19185)

New Features

- Chamber servo vent, auto fan (#19519)
- Z Probe Offset Wizard (#18866)

Configuration

- Permit touch calibration override
- Move `SF_ARC_FIX` option to `Configuration_adv.h`

Board / HAL

- Use 0xFF (not 'ff') for SPI byte transfer
- Fix onboard SD card support for Teensy 3.6 & 4.1 (#19593)
- Minor SPI fixes, `systick_callback` for STM32F1 HAL compatibility (#19565)

LCD / Controller

- Update Slovak language (#19561)
- Update Italian language (#19654)
- Update German language (#19615)
- Restore ° to 6x9 small info font (#19645)

- Fix small font section directive, mixer warning
- Run language font data update
- Improve retract / unretract labels
- Allow bypass for cold E movement ([#19606](https://github.com/MarlinFirmware/Marlin/pull/19606))
- Fix Tune/Fan edit items
- Touch UI support for X2, Y2 and Z2 ([#19538](https://github.com/MarlinFirmware/Marlin/pull/19538))
- Fix Anycubic i3 Mega target temperature display ([#19572](https://github.com/MarlinFirmware/Marlin/pull/19572))
- Fix Move Screen with disabled Touch ([#19558](https://github.com/MarlinFirmware/Marlin/pull/19558))

Host and Protocol

- `G35` workaround for Pronterface "feature" ([#19577](https://github.com/MarlinFirmware/Marlin/pull/19577))

Optimized / Improved

- More accessible `PROBE_OFFSET_WIZARD` ([#19647](https://github.com/MarlinFirmware/Marlin/pull/19647))

Build and Upload

- Optional `M42` / `M226` ; Add more features filters ([#19664](https://github.com/MarlinFirmware/Marlin/pull/19664))
- Fix and improve `Makefile` / `CMake` ([#19640](https://github.com/MarlinFirmware/Marlin/pull/19640))
- Use `env:mega2560ext` for some boards ([#19624](https://github.com/MarlinFirmware/Marlin/pull/19624))
- Fix 'bossac' upload on Windows ([#19545](https://github.com/MarlinFirmware/Marlin/pull/19545))

For Developers

- Custom Debug Codes - `Dnnn` ([#19225](https://github.com/MarlinFirmware/Marlin/pull/19225))

Known Issues

- The `M85` timeout might crash `M600`
- Possible layer shift (stepper DIR signal bug) on IDEX machines.

😊

▶ **Assets** 2

Marlin 2.0.7

🏷 2.0.7 ⦿ e817773

🐙 **thinkyhead** released this on Sep 28, 2020

New Features

- "MarkForged" kinematics (#19235)

New Machines and Boards

- MKS SGEN L V2 (#18822, #19462)
- STM32F1 EP with `USB_COMPOSITE` (#19281)
- Teensy 4 (#19311)
- MKS Gen L V2.1 (#19314)
- MKS Robin E3P (#19442)
- BigTreeTech SKR E3 Turbo (#19500)
- Anycubic Chiron full feature support (#19505)

Board / HAL

- Update HAL/STM32 platform to 8.0 (#18496)
- Adjust GTR PeripheralPins to avoid timer conflicts (#19183)
- LPC176x: Finish DMA transfer, use HW SPI class (#19191)
- Fix Anycubic LCDs / Trigorilla 1.4 pins (#19220)
- Fix STM32F1 SPI device init, `MKS_LCD12864` (#19271)
- Emergency Parser for STM32F1 (#19279)
- Raise STM32F1 UART IRQ Priority, add error handling (#19301)
- Allow SWD debug on Robin Nano (#19345)
- Ultratronics Pro SPI pins (#19444)
- Replace Serial with Serial1 in pins files (#19459)
- MKS Robin Mini uses `ONBOARD_SPI_DEVICE` (#19460)
- Define UART pins for LPC debug based on `LPC_PINCFG_UART` (#19475)

LCD / Controller

- Change "FR" on LCD to ">>" (#18830)
- Update German, fix Mix component index (#19206)

- Fix Anycubic I3 Mega (S) original screen % display (#19210)
- Smoothieboard GLCD w/ SD support (#19241)
- Fix Longer3D TFT defines, disable DMA (#19251)
- Fix Touch UI long filenames, etc. (#19262, #19349)
- Fix Info Menu, Print Stats appearance (#19348, #19404)
- Fix extra string substitution bug (#19351)
- Update Italian language (#19365)
- MarlinUI for SPI/I2C TFT-GLCD character-based display bridge (#19375)
- Move screen for Color UI (#19386)
- Add warning to ExtUI Bed Mesh Screen. (#19397)
- `SHOW_REMAINING_TIME` for HD44780 character LCD (#19416)
- TFT: No timeout on Move Screen (#19426)
- New Touch UI buttons (#19465)
- Improve LVGL UI (#19442)
- Allow ColorUI color customization (#19484)
- Fix MBL "Click to continue" on Color UI touchscreen (#19514)
- Working `LCD_USE_DMA_FSMC` (#19522)
- Various updates for Ender 3 V2 controller:
  - No "Bed Leveling" item on Ender 3 V2 for manual probing
  - Highlight Creality DWIN menu icons (#19368)
  - Revert LCD language to English on next boot
  - Add more DWIN commands, docs (#19395)
  - Use F() for Ender 3 V2 DWIN strings
  - Other Ender 3 V2 (DWIN) issues (#19441, #19268)

Other Peripherals

- Fix Power-Loss Recovery for Ender 3 V2
- Fix Separate Neopixel (#19179, #19224, #19250, #19280, #19287, #19303)
- Read from backup TMC StealthChop state (#19364)
- Fix Allen Key Probe pin test (#19520)
- Add sensor for Kis3d Silicone heater + precision cast plate (#19528)

Host and Protocol

- Allow `M524` between `M23` and `M24`

- Escape the `M33` string arg ([#19515](#))
- Add Host Action: Start ([#19398](#))
- `M872` : Wait for Probe Temperature ([#19344](#))

Issues Patched

- Fix lost brightness during EEPROM load ([#19485](#))
- Fix "too cold" in M600 ([#19332](#))
- Fix and improve STM32F1 serial ([#19464](#))
- Fix case light brightness save/load ([#19436](#))
- Fix compile with Danish, Basque ([#19325](#))
- Fix CoreXY compile with backlash calibration ([#19422](#))
- Fix Creality V4 SD Detect
- Fix `diveToFile` with open Dir object ([#19539](#))
- Fix EXP2 pin define for MKS SGEN_L ([#19369](#))
- Fix `M166` Gradient Mix for DELTA ([#19285](#))
- Fix missing `BOARD_K8800` ([#19331](#))
- Fix SKR 1.4 thermistor pin comments ([#19510](#))
- Fix UBL 'G29 I' for large meshes ([#19231](#))
- Fix up K8800 pins ([#19476](#))
- Fail SD mount without SPI re-init ([#19226](#))
- No 'ls' if media isn't mounted

Optimized / Improved

- Only show "SD Init Fail" with detectable media ([#19236](#))
- Make `M600` heat up the nozzle. Reset runout on fail. ([#19298](#))
- Improve temperature runaway, idle timeout ([#19339](#))
- Only set up SPI pins as needed ([#19372](#))
- MMU2 S Mode spins the BMG gears during `C0` ([#19429](#))
- Misc. Power-Loss Recovery improvements ([#19540](#))

Configuration

- Warning if `SDCARD_READONLY` should be disabled
- Permit touch params override w/ Robin nano ([#19196](#))

- Clarify disabling StallGuard for axes ([#19263](#))
- Sanity-check `BABYSTEP_DISPLAY_TOTAL` with ColorUI ([#19284](#))
- More configurable E3 V2 DWIN ([#19384](#))
- Expose `JOYSTICK_DEBUG` to general users ([#19394](#))
- Demo and test multiple PID defaults ([#19413](#))
- Optional Host Start menu item ([#19443](#))
- Optional menu item for Assisted Tramming ([#19447](#))
- Catch TMC address conflicts early ([#19458](#))
- Temp sensor for Kis3d Silicone heater + precision cast plate ([#19528](#))
- Cleanup of to configuration comments and formatting
- Sanity check old serial names

Build and Upload

- Fix AnyCubic LCD dependencies
- Warn in `platformio.ini` about RCT6 512K ([#19312](#))
- Fix compile for Taz Pro ([#19424](#))
- Include `pins.h` in dependency check ([#19468](#))
- Fix MKS Robin undefined pins error ([#19507](#))

For Developers

- Add extra `CardReader` debugging
- Add `CardReader::fileExists` (also updates the long name)
- Tweaks to git helper scripts
- New names for LCD conditionals ([#19533](#))

Known Issues

- The `M85` timeout might crash `M600`
- Possible layer shift (stepper DIR signal bug) on IDEX machines.

☺

▸ **Assets** 2

[Marlin 2.0.6.1](#)

🏷 2.0.6.1 ⦿ `ca194ca`

Compare ▾

🧑 **thinkyhead** released this on Aug 28, 2020

New Features

- Use `Z_AFTER_DEACTIVATE` to account for gravity ([#18906](#))
- Support for the Ender-3 V2 W25QXX EEPROM ([#18897](#))
- Password via G-code and MarlinUI ([#18399](#))
- `NOZZLE_CLEAN_NO_Y` for X-mounted cleaning station ([#18870](#))
- Independent second Neopixel strip option ([#19115](#))

Configuration

- Fix WiFi / ESP32 sanity check ([#18808](#))
- Clarify Nozzle-to-Probe offset ([#18828](#))
- Fix URLs to websites and resources ([#18844](#))
- SanityCheck: No Adafruit NeoPixel for STM32F1 ([#18833](#))
- Assisted Tramming requires a probe ([#18912](#))
- Increase Manual E Move Feedrate to 2mm/s ([#18937](#))
- HW PWM sanity checks for `SPINDLE_LASER_FREQUENCY` ([#18947](#))
- `EVENT_GCODE_SD_STOP` => `EVENT_GCODE_SD_ABORT` ([#18978](#))
- Clarify units in various places ([#18993](#))
- Checks for `CR10_STOCKDISPLAY` with Creality v4 ([#19019](#))
- Default Filament Runout Sensor enabled state ([#19013](#))
- Configurable number of M106 fans ([#18883](#))
- Use HIGH/LOW naming for some pin state settings ([#19089](#))
- Fix probing margin sanity-check

New Machines and Boards

- FYSETC S6 2.0 ([#19140](#))

Board / HAL

- Add `TEMP_PROBE_PIN` for Einsy Rambo ([#18823](#))
- Add Chitu 3D V6 2nd Filament Runout pin ([#18922](#))

- Fix Robin nano `Z_DIR_PIN` conflict (#18832)
- Fix Duplicator i3 Plus pin diagram (#18862)
- Fix FLYF407ZG pins (#18865)
- ZoneStar Z6FB (#18918)
- Creality3D v4.2.7 (#19088)
- `DIGIPOT_I2C` pins for SMOOTHIEBOARD (#19098)
- Fix SD pins for SKR Pro and GTR (#19047)
- Add Einsy Rambo Filament Runout Pin (#19136)
- Fix Creality V4 probe pin

LCD / Controller

- Support for TFT & Touch Screens (#18130)
- SPI Emulated DOGM (like FSMC_GRAPHICAL_TFT, but SPI) (#18817)
- Fix Cancel Objects index display (zero-based) (#18841, #18930)
- Translatable strings on Ender-3 V2 DWIN (#18893, #19053)
- Fix MKS Nano v1.2 FSMC display (#18901)
- More Anycubic + Trigorilla mappings, ExtUI (#18903)
- Update Italian language (#18886)
- Update Slovak language (#18884)
- Make ILI9341 rotatable (e.g., Anycubic Predator) (#18877, #19010)
- Fix / optimize FSMC init (#18941)
- Marlin Color UI for STM32F1 (SPI and FSMC) (#18952, #18958)
- Remaining Time for `LIGHTWEIGHT_UI` (#18875)
- Fix Ender-3 V2 DWIN with manual mesh, host prompt (#18981)
- For FTDI800 compatibility, remove `VERTEX_FORMAT` dependency (#18982)
- MKS Robin new 320x240 TFT Color UI support (#18985)
- Translated String interpolation for 2-digit numbers (#18998)
- Optimize LVGL with HAL TFT IO (SPI and FSMC) (#18974)
- `ENDER2_STOCKDISPLAY` for BTT SKR 1.4 (and Turbo) (#19002)
- Show "SD init fail" status error (#19064)
- Fix Select Screen "cancel" button destination
- Fix up the Mixer menu appearance
- Emulated DOGM via HAL TFT, XPT IO (#19017)
- Use `G28 O` optional homing in LCD Repeatability Test (#19104)

- `GRAPHICAL_TFT_ROTATE_180` for ST7789V ([#19042](#))
- Permit ST7789V orientation override ([#19044](#))
- TFT32 for MKS Robin Nano 1.2 ([#19031](#))
- Fixes to FTDI Touch UI ([#19134](#))
- TFT (plus Hardware SPI) for LPC176x ([#19139](#))

Other Peripherals

- New option to arrange Neopixel sets in series ([#18992](#))

Host and Protocol

- Broadcast SD Print Completion ([#19102](#))
- Updates for `G6` Direct Stepping ([#19135](#))

Issues Patched

- Fix garbled print_xyz output ([#18810](#))
- Fix DELTA + TMC sensorless homing + SPI endstops ([#18811](#))
- Fix `NEOPIXEL_LED` compile w/out `PRINTER_EVENT_LEDS` ([#18824](#))
- Fix `UNKNOWN_Z_NO_RAISE` in `G28`
- Fix `HEATER_0_PIN` check with 0 `EXTRUDERS` ([#18827](#))
- Fix Spindle/Laser PWM DC ([#18871](#))
- Fix Z height after tool change ([#18951](#))
- Fix `DISABLE_[XYZE]` handling ([#18970](#))
- Fix 'sync_plan_position' call ([#19016](#))
- Do a `runout.reset` after EEPROM read
- Wait for hotend temp before Resume move ([#19009](#))
- Fix `IS_PROBE_PIN` test macro ([#19024](#))
- Fix PSU power-on for PID autotune ([#19066](#))
- Fix `DUET_SMART_EFFECTOR`
- Fix auto-power in PID autotune ([#19119](#))
- No `COM_PIN` needed for Ender-3 V2 display plus probe
- Fix `SINGLENOZZLE` fan speed bug ([#19152](#))
- Fix potential stack corruption in Move Menu

Optimized / Improved

- SAMD51 Endstop Interrupts (#18836)
- SPI Flash data compression (#18879)
- Shorthand values for `M575 B` Set Baud Rate
- Let laser/spindle use free AVR servo timers (#19011)
- Prefer Servo AVR timer4 over 3 (#19025)
- Small rework of axis homed / trusted handling (#18907)

Build and Upload

- Improve dependency filter for faster builds (#18919, #18935, #18960)
- Tailor the PlatformIO serial monitor
- No mks_robin `extra_scripts` in Trigorilla build (#18872)
- Update build script for PIO 4.4 (#19034)
- Env `mega2560ext` adds pins 70-85 (#19022)
- Add `custom_verbose`, `custom_gcc` flags for native / simulator builds

For Developers

- Use `uintptr_t` for pointer-to-int conversion
- Fixed the `hex_print` function
- Fixed shell scripts that use `gawk` and `wget`
- Miscellaneous CI / git helper script improvements
- Move `ExtUI` displays to sub-folder (#19070)
- Post a warning about `MARLIN_DEV_MODE`

Known Issues

- The `M85` timeout (still) might crash `M600`.
- Very long filenames on the SD card might cause instability with some LCD controllers.
- Mixing Extruder machines may freeze when an active Gradient updates the mix.

☺

▸ **Assets** 2

Marlin 2.0.6

🏷 2.0.6   ⦿ 92076c6   Compare ▾

🐢 **thinkyhead** released this on Jul 26, 2020

For this release we focused on compatibility with a wider range of boards and controllers, especially STM32-based boards, color screens, and touch screens. With so many new files being added, a lot of work has gone into optimizing the PlatformIO build by peeking at enabled features and only downloading libraries and compiling code required for your enabled options. And we tackled a whole host of issues from stepper timing and interrupt priority down to the details of controller-wheel responsiveness.

New Machines and Boards

- BigTreeTech SKR Pro 1.2
- Malyan M200 V2
- Malyan M300
- Creality Ender 3 V2 board (Creality v4.x)
- MKS Robin E3 / E3D
- MKS Robin nano V2
- BTT SKR Mini E3 V2
- Funmat HT V4.0
- Ortur 4.3
- Tenlog D3 Hero
- MEEB 3DP
- Tronxy X5SA (V5 / V6 boards)
- Vertex Nano with Vellemann K8600
- Trigorilla Pro

New Features

- `G6` External Motion Controller (like Klipper) support. See [#17853](#).
- Prusa MMU2 Extruder Sensor support
- Add settings for Prusa MMU2S
- Inline laser / spindle power control
- Add `M150 I` to set an individual Neopixel's color
- Automatic Tool Migration (beta). See [#17248](#)
- Composite USB for STM32 SDIO (experimental)

- `M600 R` to resume at a new temperature
- Optional move-to-center after UBL G29 J (3-point)
- Trinamic driver serial multiplexing
- Add `M122 I` to reinitialize TMC drivers at any time
- Option to enable `M360` for Repetier Host
- `M115_GEOMETRY_REPORT` adds machine info to `M115`
- Add `HOTEND_IDLE_TIMEOUT` **safety feature**
- Add `M200` `S` and `L` for Volumetric Extruder Limit
- Add `G35` Bed tramming assistant
- Sensorless Homing for Core kinematics
- Power monitor and display. ([#17437](#))

Configuration

- Add `USE_PROBE_FOR_Z_HOMING` option
- Add `SERIAL_FLOAT_PRECISION` option
- Add `SD_PROCEDURE_DEPTH` option (for `M32 P`)
- Add `JD_HANDLE_SMALL_SEGMENTS` option. ([#18316](#))
- Add `REPORT_FAN_CHANGE` option
- Add `CONTROLLER_FAN_IGNORE_Z` option
- Change `FIL_RUNOUT_INVERTING true` to `FIL_RUNOUT_STATE HIGH`
- Use Material Preset 1 as defaults for `M303` PID autotune
- Allow different Default PIDs for each hotend
- Option to set Babystep Size in mm
- Trinamic steppers Homing Phase. See [#17299](#).
- Add a TMC Chopper Timing Preset for 24V 0.9°
- Homing bump is now an array
- Improved, extended "digipot" settings
- Add `AUTOTEMP` default proportions
- Adjustable `XY_FREQUENCY_LIMIT`
- `NOZZLE_PARK_FEATURE` X-only / Y-only move option
- Fix overridden U8G+SPI delay overrides
- Fix EEPROM type selection and fallbacks
- Add `SDCARD_READONLY` option to reduce binary size
- Add `VOLUMETRIC_EXTRUDER_LIMIT`. See [#17017](#).

- Add `NOZZLE_PARK_Z_RAISE_MIN` option
- Add sanity-check for Nozzle Park position
- Use Preheat 1 temperature as `M303` default
- More Probe Temperature Compensation options
- Add `XYZ_NO_FRAME` option for Graphical LCD
- Allow larger ADC button debounce values
- Configurable kill pin state
- Change default filament diameter to 1.75mm
- Fix, clarify `LCD_TIMEOUT_TO_STATUS`
- Longer default power-up delay
- Disable Z stallGuard by default
- Allow `CASE_LIGHT_PIN` override from config
- Sanity check 3-point defines
- Sanity-check Chamber thermistor pin
- Add thermistor 502 for Zonestar Prusa P802M
- Use center XY for Z Safe Homing default
- Independent X2,Y2,Z2,Z3,Z4 endstop inverting
- Add a custom nozzle wipe G-code option

Board / HAL

- Fix BTT SKR Pro 1.0 issues
- Fix BTT GTR 1.0 issues
- Fix MKS S-Gen standard pins
- Fix FYSETC_AIO_II build
- Fix Fysetc stm32flash usage
- Fix FYSETC Cheetah issues, SD re-insert
- Fix MKS Robin nano issues, use Flash EEPROM
- Fix GTM32 Rev B LCD pins
- Fix BIQU BQ111-A4 pins
- Fix RAMPS 1.4.4 filament runout pin
- Increase STM32F1 Servo Timer Interrupt Priority
- Add Chitu V5 (with extra GPIO init)
- Add Chitu V6 (with Z2 stepper pins)
- Add Lerdge S,X,K boards

- Add Emergency Parser for the STM32 HAL
- Various Mightyboard improvements
- More complete RUMBA32 support
- Permit more Creality pin overrides
- Improve DIAG pin endstop management
- Various SAMD51 (AF Grand Central) improvements
- Add ReARM SDSS pin (for RRD LCDs)
- SD detect override for older Creality3D RAMPS
- Add Servo and E1 pins for the PICA board
- Allow timers to be set by STM32 pins files
- Improved STM32 timer allocation and prioritization
- Support TMCStepper with MKS Robin Pro
- Declare extended STM32 serial ports
- Add LPC176x SPI / I2C EEPROM support
- Add board-based ST7920 delays
- Fix STM32F103VE Flash EEPROM size
- Use MCP4451 interface for MKS SBASE
- Support GT2560 3rd extruder
- Consolidate MKS Robin / SKR Mini E3 pins
- Allow SDIO clock/retry overrides. See #18223.
- Patch BLTouch `Z_MAX_PIN` for GT2560 Rev.A (non-plus)
- Support BL24C16 EEPROM in HAL/STM32F1 (Ender 3 V2)

New LCDs and Controllers

- TFT LVGL UI
- FTDI EVE Touch UI
- Ender 3 V2 controller
- MKS UI / Little VGL TFT (#18438)
- FYSETC TFT81050 LCD
- FYSETC 2.42 inch OLED
- MKS LCD12864 A/B Controller
- TFT 2x-3x scale for Anycubic, TronXY
- ExtUI support for Anycubic I3 Mega
- Touch-select for MarlinUI menu items

- Touch-to-jog for MarlinUI edit items
- Support for FT81050 to FYSETC F6

LCD / Controller

- Improved alert for EEPROM errors
- `MarlinUI` support for up to 5 Material Presets
- Suppress the initial SD status message
- Fix, extend, and improve ExtUI touch screens
- Fix LCD throttling issues
- Fix Graphical Display cosmetic issues, progress bar
- Fix low contrast on Minipanel display
- Implement MarlinUI for color touchscreens
- Display status during PID Autotune
- Add `M73` remaining time for MKS UI
- Fix DGUS serial buffer size and other issues
- Fix GTR 1.0 CR-10 stock display pins
- Fix Silvergate GLCD display timing
- Fix Fan Speed menu items
- Fix click sound with `TOUCH_BUTTONS`
- Fix leveling "Point n of 3" message
- Add Bed PID Edit and Autotune menu items
- Move Case Light to LEDs submenu
- Remove "Media Released" message
- Shorter BLTouch menu item titles
- Add HD44780 mapping for Czech accents
- Bring language fonts up to date
- Clean up LCD Manual Move / UBL Mesh Edit
- ExtUI mesh support for Malyan LCD
- Add UI and TMC stall reset for multi-axis
- Add menu items to run `G425` and `G35`
- Add Romanian language
- Updated languages:
  - English
  - Chinese

- ○ French
- ○ Galician
- ○ German
- ○ Hungarian
- ○ Italian
- ○ Polish
- ○ Brazilian Portuguese
- ○ Romanian
- ○ Russian
- ○ Slovak
- ○ Spanish

Other Peripherals

- SKR Pro 1.1 WiFi / external SD card
- Flash-based EEPROM for Robin E3D
- Adjust Melzi ST display timing
- Store Case Light brightness in EEPROM
- Add Zonestar P802M bed thermistor
- Fix BLTouch early deployment with ABL `G29`
- For L64XX `M17` can use `hardStop`
- Extend thermistor 1047 to 500°C

Host and Protocol

- Respect backspaces in G-code
- Real build date in `M115` report
- Add `M303 D` to enable/disable PID debug output
- Add `G12 E` to set soft endstops state
- Allow `M421` to modify a row, a column, or all
- More verbose probing error
- Prefix `M503` output with `echo:`
- Fix some Host Actions issues
- Broadcast actions to all "hosts"
- Report fan speed on change
- Fix SD finished ExtUI / host action

- Fix `M710` output formatting
- Separate G-code line numbers for each serial port
- Tweaks to `M114 D` output
- Fix Host Actions support with LPC176x
- Fix lingering Filament Change host dialog
- New `M115` capabilities:
    - `Cap:LONG_FILENAME`
    - `Cap:SDCARD`
    - `Cap:ARCS`
    - `Cap:BABYSTEPPING`
    - `Cap:RUNOUT`

Issues Patched

- Fix BLTouch PWM reliability on STM32
- Fix Filament Change lengthy wait for heating
- Fix Due wired EEPROM init
- Fix ESP01 (module) WIFI initialization
- Fix CoreXY babystepping and homing
- More reliable double-click detection
- Fix extra TMC serial begin calls
- Fix `M42 M` with other parameters
- Fix `M43` analog pins
- Fix position sync on `M420 S0`
- Fix `G2` / `G3` Arcs segment bugs
- Fix LPC176x RGB NEOPIXEL startup
- Fix issues with probing margins
- Fix `G76` probe height / position
- Fix detection with multiple Filament Runout sensors
- Fix Mixer virtual tools reset
- Fix Power Loss Resume when card isn't mounted yet
- Fix false alarm interrupting probing
- No extraneous pins with ADC Keypad
- Fix Probe Temperature Compensation build
- Fix PID autotune timeout

- Fix Power Loss Resume with `HAS_LEDS_OFF_FLAG`
- Fix `G12` for SINGLENOZZLE
- Fix Max Jerk and Stepper PWM menus
- Fix XY Frequency menu
- Save/restore leveling on toolchange with `SINGLENOZZLE`
- Fix BTT002 SPEAKER timer conflict
- Fix STM32F4 flash / servo conflict
- Reserve 'probing failed' for the last attempt
- Fix SD printing pause with parking
- Fix multiplication/division for `xyz_pos_t`, *et.al.*
- Bring thermistor names up to date
- Ignore spurious thermocouple errors
- Fix alignment of 3-point leveling points
- Fix `G34` move in wrong direction
- Fix Malyan LCD crash bug
- Allow TMC Stall Sensitivity to be set to 0
- Fix `M125` unretract length
- Fix `M261`, i2c EEPROM, i2c Encoder on LPC176x
- Fix E DIAG pins for multi-axis auto-assignment
- Fix STM32F1 EEPROM access start
- Confirm XY position before Z Safe Homing
- For `G28 Z` with Safe Homing, raise before move to XY
- Fix `SD_FINISHED_RELEASECOMMAND` bug
- Fix extra call to `unskew()`
- Limited backlash editing for Core kinematics
- Support up to 8 Trinamic E drivers
- Apply `HOME_BEFORE_FILAMENT_CHANGE` if any axis is unknown
- Consider `HOME_AFTER_DEACTIVATE` for Z safe homing
- Improve reliability of `POWER_LOSS_RECOVERY`
- Fix User Temp Sensor (1000), reversed Pt100 / Pt1000
- Fix Hotend Idle Timeout trigger (#18657)
- Fix passive Chamber Temp reading
- Fix SD reverse sorting
- Fix `PSU_POWERUP_DELAY` when over 2 seconds

- Improve SAMD51 Servo / BLTouch PWM reliability

Optimized / Improved

- Reduce Step Smoothing ceiling to 50% CPU usage
- Improved Junction Deviation with lookup table
- More accurate Junction Deviation fast-acos
- Improve `G2` / `G3` motion accuracy
- Improve UBL Mesh Editor behavior
- Improved support for no bed / hotends / fans
- Reorder Marlin `setup()` and init serial early
- Minor Toolchange improvements
- EEPROM Flash Leveling for more STM32F4 boards
- Relax bed cooling safety check
- Save/Load distinct TMC Stallguard thresholds
- Better ooze prevention during pause
- Consider Chamber also in Print Job Timer auto-start
- Non-blocking MAX7219 init sequence
- MAX7219 pause / resume for interrupt-safe usage
- Minor optimizations in SD file listing
- Handle SD sort order in CardReader
- More conservative Trinamic DIR delay
- Add `M32` subcall overflow error message
- Prevent setting temperature target outside sensor range
- Avoid excess E DIR changes in Linear Advance ([#18744](https://github.com/MarlinFirmware/Marlin/pull/18744))

Build and Upload

- `platformio.ini` specifies library versions to prevent unexpected build errors
- PlatformIO will only download and build libraries needed for enabled features
- Randomize name of `firmware...bin` in Ender 3 V2 build
- Allow HAL_TIMER_RATE override for STM32
- Fix CMSIS / USB-FD name conflicts
- Use "extends" in `platformio.ini` for better organization
- Get more `lib_deps` from the PlatformIO registry
- Fysetc S6 variant with direct DFU upload

- Use "melzi" envs for `MELZI_CREALITY` board
- Add a Chitu variant for disk-based update
- Use TMCStepper 0.7.0 for best LPC176x support
- Sanity check SERIAL_STATS options for LPC, STM32
- Use STM32F407VGT6 for BTT002 V1
- Fix Archim PIO upload on Windows, Arduino IDE LCD
- Fix Archim LCD with Arduino IDE
- FIx Sanguino/1284p board_upload.maximum_size

For Developers

- The `ENABLED` / `DISABLED` macros are now usable in code
- Add " `TERN` " macros for conditional one-liners
- Allow pins to override *TIMER_NUM and HAL_*TIMER_ISR
- Add `uncrust` script/config for uncrustify source formatting (beta)
- Add `pinsformat.js` script to format pins files (beta)
- Add Git attributes specifying UNIX line endings
- Refine EEPROM types and manage in `HAL/*/inc/Conditionals_post.h`
- Add "Bed" / "Chamber" string substitutions
- Add a script to put identifiers on Configurations
- Add GitHub Actions to label, close, and lock issues
- Add SRAM command string injection
- Allow more parameters in `SERIAL_ECHO*PAIR` macros
- Define HAL ADC resolution in terms of bit-width
- Ensure `language.h` include order
- Fix `I2C_ADDRESS` ambiguity
- Move `tests` folder up (to `buildroot/tests`)
- Add pulldown items for all FastIO headers
- SD-detect handling refactored to `CardReader` . See #17380
- Allow for `STEPPER_TIMER_RATE` calling a function
- Use `MARLIN_EEPROM_SIZE` with `E2END` as fallback
- More customizable DGUSDisplay (#18700)

Known Issues

- The `M85` timeout might crash `M600`
- `M600` after starting SD print but before heating is complete is not supported.

☺

▸ **Assets** 2

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