

A clearer prototype to build.

Public version 28.1 is the R3.4 engineering checkpoint. This update keeps the R3.3 core layout and simplifies fragile printing details.

78 x 150 x 24 mm rigid case

The rim and controls project beyond it. M04 projects 1 mm farther forward than R3.3.

21 rigid + 2 flexible + 2 optical fit parts

Twenty-five unique part IDs, one each. The default print set contains four PLA plates.

Identity matters

The R3.4 prefix in filenames is intentional. Keep this set separate from 28.2 and earlier R3.2 A parts.

For Max / RPS

Use the full-reference STEP to inspect the assembly and individual current STEP files to review the printable parts. STEP and STP are the same format.



Shells. Legacy thin locators and the 0.05 mm cage strip removed. Old pockets receive nominal 2.2 mm skin; functional openings recut. Butt-joint rim replaces the fine casting tongue.

Integrated controls. P03/P06/P07 combine cap and carrier. Former M01/M02/M03 and their bond films are absorbed. Do not fabricate a second cosmetic cap for these printed parts.

Switch seats. Former 0.40 mm seat shims and paired 0.10 mm stops are built into the parents. Seat floors total 1.3 mm, broad rails 1.2 mm; fragile lips/end strips removed.

Talk guides. 5.0 mm OD / 2.6 mm bore yields 1.2 mm nominal wall. Broad cheeks replace tiny nibs; lower bearing 22 mm. Upper/lower fixing centers move 0.8/0.6 mm from R3.3.

Use this as a prototype checkpoint.

The digital print checks passed. Real switches, complete wiring, optics, RF and supplier-process approval remain to be verified. Do not fabricate every reference body in the assembly.

Every part in the print set

Quantity one per ID. Bounding size in CAD axes, mm; these dimensions include mounting extensions and are not manufacturing tolerances.

ID	PART	X	Y	Z	MIN*	PLATE
P01	Front shell	78.00	150.00	14.51	1.035	02
P02	Rear shell	78.00	150.00	15.65	1.000	02
P03	One-piece play button	29.00	28.40	4.05	1.200	01
P04	Front switch clamp	40.00	16.00	9.40	1.000	03
P05	Talk carrier	29.70	54.00	12.00	1.050	01
P06	One-piece volume up	6.65	18.80	11.00	1.000	01
P07	One-piece volume down	6.65	18.80	11.00	1.000	01
P08	Talk switch cradle	5.05	9.00	7.15	1.000	01
P09	Volume-up switch cradle	5.05	9.00	7.15	1.000	01
P10	Volume-down switch cradle	5.05	9.00	7.15	1.000	01
P11	Lower speaker keeper	23.20	4.40	1.40	1.050	03
P12	Upper speaker keeper	23.20	4.40	1.40	1.050	03
P13	Microphone keeper	29.00	13.80	1.85	1.039	03
P14	LED keeper	12.80	17.20	3.10	1.201	03
P15	Lower antenna frame	33.40	62.85	2.63	1.000	03
P16	Upper antenna frame	33.40	40.60	1.20	1.200	03
P17	Lower talk guide	22.00	9.10	2.50	1.198	01
P18	Upper talk guide	24.70	9.30	2.50	1.199	01
P19	Battery keeper 1	15.80	35.60	2.00	1.399	03
P20	Battery keeper 2	15.80	37.60	2.00	1.399	03
M04	Printed grille bezel	48.00	50.00	1.65	1.200	04
F01	Flexible rim	80.70	152.70	24.38	1.187	Flex
F02	Flexible talk grip	1.30	54.00	12.00	1.300	Flex
L01	Lens fit proxy	5.40	5.40	3.92	1.350	05
L02	Light-guide fit proxy	4.20	4.20	5.55	1.800	05

***Sampled minimum:** smallest accepted surface-normal chord. The 225,102-start screen flagged no accepted structural wall below 1 mm; it is not a certified global minimum. Dimensions rounded to 0.01 mm; MIN to 0.001 mm.

P1S / 0.4 mm / PLA: 0.12 mm layers, four walls, 25% infill, automatic supports. Open the 3MFs as projects, select actual filament and bed, slice and review. Main plates total about 8 h 13 min / 84.4 g in the supplied profile; settings change estimates.

F01/F02 need a separate flexible process. Plate 05 is opaque optical fit only. The supplied 55 C textured-PEI PLA profile has Bambu's bed warning; follow door-open guidance or the actual filament settings. Do not print both 3MFs and backup STLs.

Materials and exact colour references

Default appearance: Chalk Ember. Colour intent is inherited from corrected R3.1 DOC C1 and R3.3; it does not change the current print process.

SURFACE	SUPPLIER APPEARANCE INTENT	TARGET
Shells	Matte tough rigid cast urethane; grade to agree	9081 C
Flexible rim	Matte elastomer; 85A starting target to qualify	Warm Gray 9 C
Smooth PTT grip	Matte flexible elastomer; qualify hardness/bond	173 C
Play / bezel	Prior 304 stainless, fine brush/satin intent	Metal coupon
Volume caps	Prior 6061 aluminium, brushed / clear intent	Metal coupon
Grille / scrim	Purchased graphite metal mesh / black scrim	Supplier coupon
Lens / guide	Clear optical polymer; controlled diffusion	No pigment

Current R3.4 reality: P01-P20 and M04 print in PLA. Play and volume caps are integrated with their carriers; they are not separate metal jobs. F01/F02 are flexible. Opaque L01/L02 prove fit only. Any cast/metal conversion needs a new part/process review.

OPTION / SURFACE	EXACT PANTONE CODE / LINK	LIBRARY
Chalk Ember / shell	9081 C	Pastels & Neons Coated
Chalk Ember / rim	Warm Gray 9 C	Solid Coated
Chalk Ember / PTT grip	173 C	Solid Coated
Palladium / shell	428 C	Solid Coated
Palladium / rim	423 C	Solid Coated
Palladium / play if painted	7541 C	Solid Coated
Palladium / PTT, volume	444 C	Solid Coated

Enter the full code including C and choose the named library. 9081 C belongs to Graphics / Pastels & Neons Coated; TCX, U and CP are different references. These exact names and links were recorded in DOC C1 on 11 September 2026.

Pantone targets are proposed physical samples, not certified matches to a screen render. Approve actual resin/elastomer/finish coupons under agreed lighting. Palladium is optional: solid colour references do not define a metallic coating or approve a solid-metal/RF design.

The hardware beyond the printer

The full assembly includes purchased components and reference envelopes. The 25 print IDs are not the complete procurement BOM.

SCREW LOCATION	QTY	NOMINAL SIZE	REFERENCE HEAD / MATERIAL
Shell closure	4	M2.5 x 14	ISO 7046 countersunk, metal
Front switch clamp	2	M2 x 8	ISO 7046 countersunk, metal
Speaker keepers	4	M2 x 5	ISO 7046 countersunk, metal
Microphone keeper	2	M2 x 4	ISO 7046 countersunk, metal
LED keeper	2	M2 x 5	ISO 7046 countersunk, metal
Antenna service frames	4	M2 x 3	ISO 1580 pan/slotted, nylon
PTT guides	2	M2 x 5	Modeled reference; match actual head
Battery keepers	4	M2 x 6	Modeled reference; pilot unqualified

24 modeled screw references: 18 inherited, plus two PTT guides and four battery keepers. Actual SKU, engagement, pilot/thread method and torque remain unqualified. Confirm head geometry and screw-tip clearance on spare prints; four antenna screws remain nylon.

COMPONENT	QTY	CURRENT IDENTIFICATION / BOUNDARY
Populated PCB	1 assembly	Flux fb5acde7; 60 x 80 mm outline. U6 SIM7670G included on PCB, not a separate purchase.
Battery	1	Adafruit 2011, 3.7 V / 2000 mAh. Nominal 60 x 36 x 7 mm; measure actual pack and intact leads.
Speaker	1	Same Sky CMS-40504N-L152. Use actual frame and received wire exit.
Microphone	1	Adafruit 3421 SPH0645 breakout. Bottom acoustic port faces the offset seal.
RGB LED	1	Kingbright WP154A4SUREQBFZGW; four separately insulated leads to J8.
Cellular antenna	1	Taoglas FXUB63.07.0150C with supplied 150 mm coax. J5 CELL_RF; no GNSS antenna/cable.
Tactile switches	4	LIDUOLE: one 6 x 6 x 6 PTT; two 6 x 6 x 5 volume; one 12 x 12 x 4.3 front. Nominal assortment dimensions only.

Also required: purchased woven mesh/scrim, installed pads/seals/films/contacts and a completed harness. Exact grades, cutting stock, connector SKUs and wire lengths are not a released procurement order. The supplied PCB STEP omits U6; a 24 x 24 x 2.4 mm placeholder is included for preliminary fit.

Assemble for a meaningful fit test

A face-down front assembly supports the broader switch rails until the rear shell completes capture. Check each stage before closing.

01 / Start with the small fit plate

Print plate 01 first. Remove supports, trial the four real switches and their solder/insulation envelopes, and check seating without forcing the cradles.

02 / Prepare shells and retainers

Print plates 02-04. Clean active holes, guide bores, mounting seats and the seam. Inspect pilot depth and screw-tip clearance before tapping or fastening.

03 / Build the front face down

Keep the front shell face down while fitting the carriers, switches and broad rails; the rear shell completes capture. Install current compliant contacts/backings/pads, but no old seat or stop shims.

04 / Fit acoustic parts and optics

Support the speaker frame, not its cone. Keep the mic bottom port and offset seal open. Fit a real clear lens/guide for light testing; opaque PLA L01/L02 are fit proxies only. Preserve LED lead insulation and forming space.

05 / Fit guides, antenna and electronics

Fit P17/P18 and trial the long PTT at center and both ends. Use nylon screws at antenna frames. Fit PCB/battery cushions and keepers to measured hardware; preserve stock battery connector and coax route.

06 / Resolve and dry-fit the complete harness

The R3.3 connector/adaptor study has unresolved collisions. Validate actual sockets, all return branches, service slack and solder insulation before claiming a closed-case fit; do not force the cover over wiring.

07 / Close by hand and inspect

Verify the cover seats without screws pulling an interference together. Tighten only using the established sample fastening method; recheck free return and electrical release of all controls.

08 / Finish after fit checks

Add purchased mesh/scrim, flexible rim/grip and appropriate bonding stock. Test indicator output, sound, cellular RF and powered thermal/charging behavior before any production/casting approval.

Do not double the old stack.

Former 0.40 mm seat shims and paired 0.10 mm stop shims are integrated. P03/P06/P07 already include their caps. Retained compliant contact / backing / rear-pad stock is separate and still needs actual thickness/compression checks. No extra superseded front battery pads.

Evidence, limits and the next approval

Use the companion inspection checklist to record measured results. Printing success and a valid STEP are useful evidence, not proof of a fully validated device.

Completed digital checks

25 valid single-solid STEP parts; 25 single watertight STLs; 225,102 structural-wall sample starts; 20 nominal motion positions without unintended intersection; native archives reopened; all five projects test-sliced with no mesh repairs. Local reservation checks do not validate a complete harness.

Controls. Measure switch body/terminals, free/operating height, travel and force. Confirm electrical continuity/contact pair, free return at PTT ends and release with case closed.

PCB and U6. Supplied populated STEP omits U6 solid. Current 24 x 24 x 2.4 mm placeholder supports preliminary clearance only; check corrected populated STEP or physical board, connectors and heights.

Full harness. R3.3 tested J2 CK reservations and both stock-PH adapter poses conflict; all 12 tested J3/J10 local bend patterns conflict. No complete closed-case harness, common-return branch route or cover-opening slack is validated.

Battery and USB. Measure actual pack/tape/lead envelope, establish pad behavior and no-pressure retention, verify USB plug seating and approach with the chosen cable. Nominal dimensions are not maximum tolerances.

Fasteners. Confirm actual head geometry, blind depth, engagement, tapping/fastening method and torque on sacrificial prints; inspect screw tips near battery, wires and controls.

Optics, sound and RF. Use functional optical material, real mesh/seals and antenna. Validate light output, sound, cellular RF, thermal behavior and durability after assembly.

Finish / process. Approve actual resin/elastomer or finish samples with RPS. Printed simplifications and integrated caps do not automatically constitute a urethane-casting or metal-machining release.

Exact release identity

Full STEP SHA-256: 8225c7b494a1dba6cc91e7251539007268a1fd52d0bb531302c7296d3b7adaa0

The companion Release_and_Verification.md and documents manifest record sources and native-file identities. Further geometry edits receive a new revision.

walkieone.com/cad-handoff/concept-28-1 | Engineering filenames retain R3.4.