WalkieOne

v30 to v31

CAD changes, assembly structure and verification

A detailed record of the new Fusion document: what was rebuilt, what was reorganized, and what remains physically identical to version 30.

73.5 x 143.25 x 19.4

Preserved body dimensions, in millimeters

Scope of this revision

CAD construction was simplified. The exterior, mechanical interfaces and physical printed-part count were preserved.

23 new native CAD captures, plus the supplied designer-model reference. All dimensions are in mm unless stated otherwise.

Two inputs, one preserved foundation

The designer file informed the organization. Version 30 remained the dimensional and mechanical authority.

DESIGNER REFERENCE

Fig. 01. Designer reference: native Fusion assembly supplied in the 20-09-2026 archive.

V30 FOUNDATION

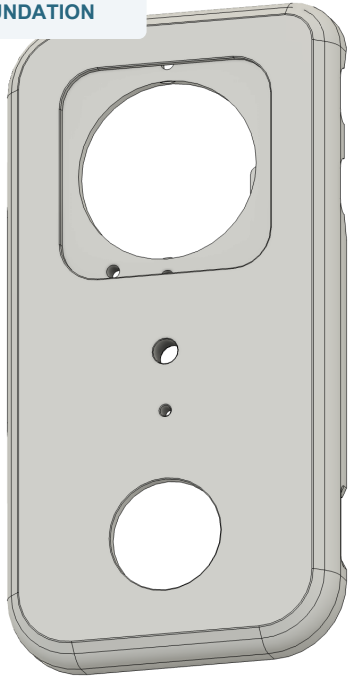

Fig. 02. Original v30 front-shell solid, imported into Fusion for this comparison.

V31 DELIVERABLE

Fig. 03. New v31 Fusion assembly, retaining v30 geometry and positions.

Why the professional enclosure was not transplanted

The designer enclosure solids span about 80 x 150 x 24 mm before the separate rim. V30 is smaller. Directly substituting those shells or scaling their features would conflict with the requirement to preserve v30 dimensions.

What actually changed

The revision changes CAD definition and organization. It does not claim a new physical mechanism or a lower printed-part count.

Area	V31 change	Physical effect
Front shell	75 redundant face splits removed	No added or removed volume
Assembly organization	10 named modules; PRINT / REF labels	Positions retained
PTT links	One native component, 2 instances	Same link shape and centres
Shoulder sleeves	One native component, 4 instances	Same bearing and screw interfaces
Speaker spacers	One native component, 2 instances	Same 0.7 mm stack thickness
Edit history	3 timeline groups; named features	No moving-joint simulation
STEP handoff	Validated full and printed-only exports	Same nominal solid geometry
Visual presentation	Role-based colors; wiring hidden by default	Display only; no filament mandate

22

Physical printed pieces - unchanged

17

Unique printed component definitions

8 / 3

Repeated pieces / shared definitions

What was not changed

Shell size, external controls, component locations, mounting lands, button stops and existing assembly clearances.

The 17-definition count reflects reuse of identical links, sleeves and spacers. It does not mean five parts can be omitted from assembly.

The exterior envelope stays fixed

Orthographic views of the final native file. The LED and volume-button projections remain outside the quoted body envelope.

Fig. 04. Front: grille seat, LED, microphone opening and play cap.

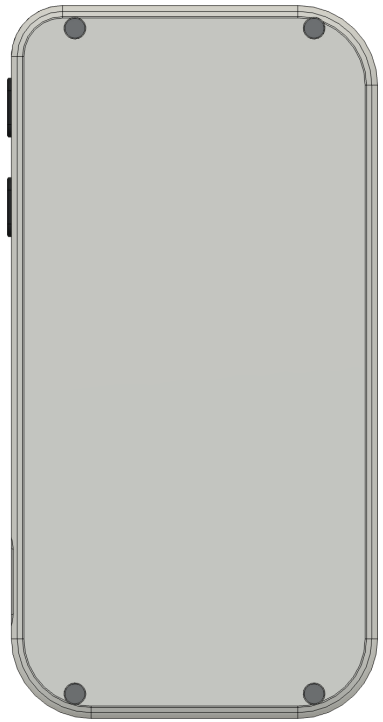

Fig. 05. Rear: preserved shell and four closure locations.

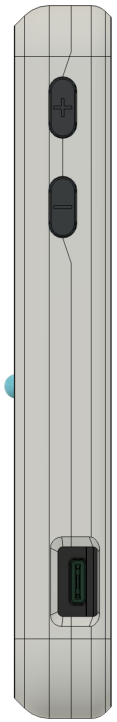

Fig. 06. Right: existing volume caps and USB opening.

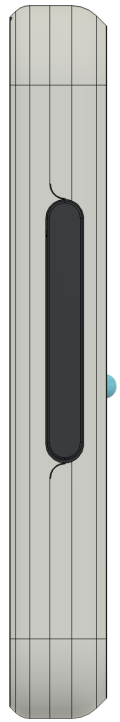

Fig. 07. Left: retained PTT cap and curved assembly seam.

73.5
Body width

143.25
Body height

19.4
Body thickness

Internal packaging is retained

Views from the rear with the back shell hidden. The second view also hides the PCB and battery to expose the mechanisms.

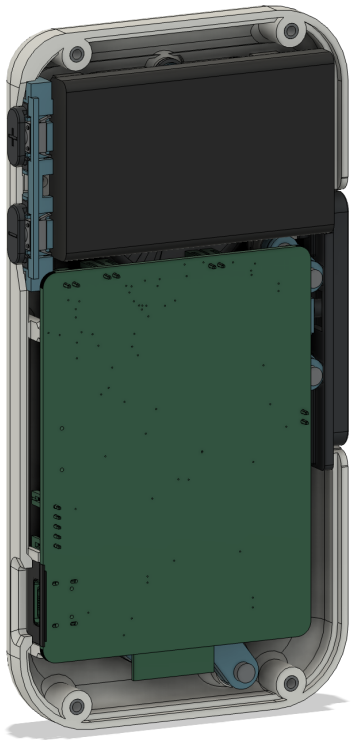

Fig. 08. Installed electronics references. Battery and board positions are unchanged.

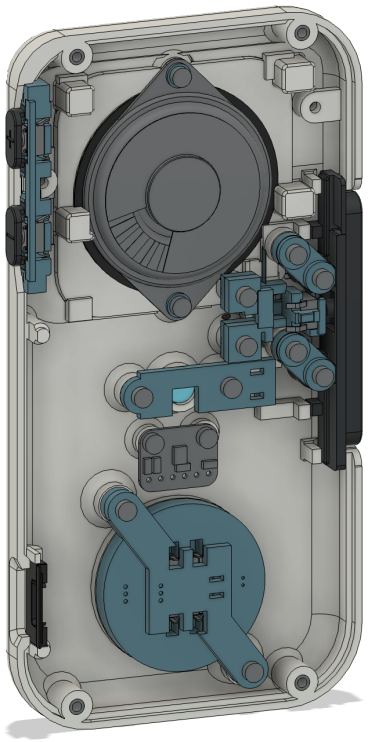

Fig. 09. Mechanisms exposed for inspection; hidden items are not removed from the CAD file.

Speaker

The centered speaker and its mounting stack are retained.

Side controls

PTT and volume assemblies retain their released positions.

Lower controls

Play carrier, retainer, LED and USB interfaces keep their v30 datums.

Interpretation

These are visibility-isolated CAD views, not assembly-motion results. The model retains the nominal static fit of v30; physical wiring and button return still require a printed prototype.

Shell cleanup changes topology, not shape

The front shell was simplified by merging redundant splits on the same underlying surfaces.

BEFORE

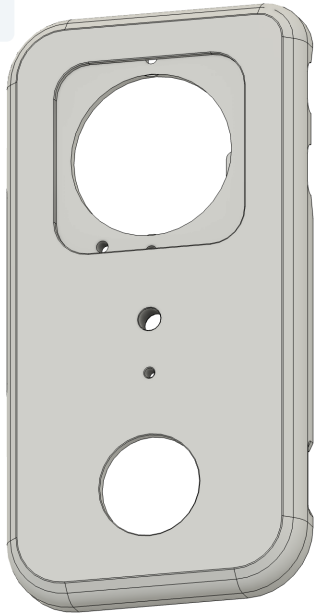

Fig. 10. Before: original v30 front shell. 951 source BRep faces.

AFTER

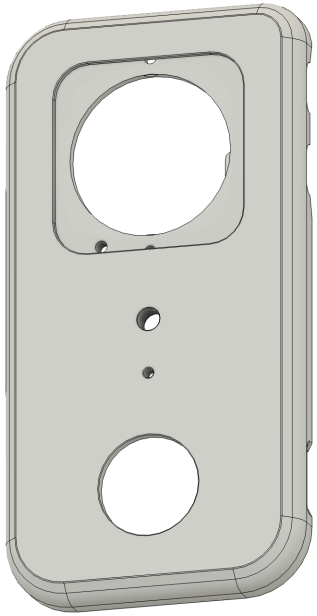

Fig. 11. After: same front-shell volume and boundary. 876 faces.

RETAINED

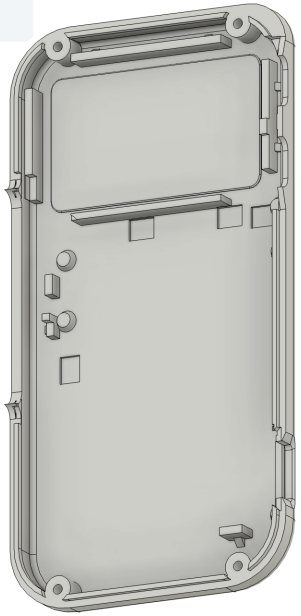

Fig. 12. Rear shell: internal supports and mating geometry retained.

Check	Before	After	Meaning
Front-shell faces	951	876	75 fewer faces, about 7.9% fewer source faces
Front-shell solid difference	Baseline	0 added / 0 removed mm3	The physical surface was not restyled
Rear-shell source faces	362	362	No rear-shell geometry simplification claimed

A component tree organized around assembly

The following map is transcribed from the native Fusion component names; it is an explanatory diagram, not a UI screenshot.

01	**Enclosure**	Front and rear shells
02	**Play button**	Cap, carrier, travel retainer and references
03	**Push to talk**	Cap, cassette, links, sleeves and hardware
04	**Volume controls**	Caps, guide, keeper, switches and fasteners
05	**Light indicator**	LED fork and retained fit references
06	**USB interface**	Collar and thin-film liner references
07	**Speaker and grille**	Speaker stack, grille blank and adhesive
08	**Electronics and microphone**	PCB, battery and microphone references
09	**Assembly hardware**	Case screws and inserts
99	**Wiring allowances**	Hidden by default; reference volumes only

PRINT prefixes identify manufactured prototype parts. REF prefixes identify purchased, cut-sheet or clearance-reference items. Colors support this distinction.

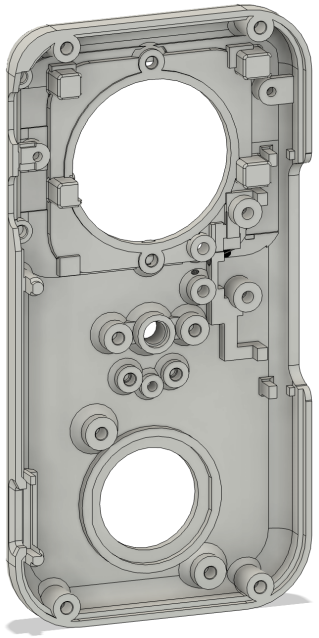

Fig. 13. The enclosure remains a precise solid foundation. Complex shell surfaces were not replaced with approximate sketches.

Three timeline groups

1. Assembly modules
2. Preserved v30 interfaces
3. Editable shared parts and assembly positions

PTT: preserve the mechanism, simplify the definitions

The cap, switch seat, clamp and their mounting interfaces are retained. Repeated links and sleeves now share native definitions.

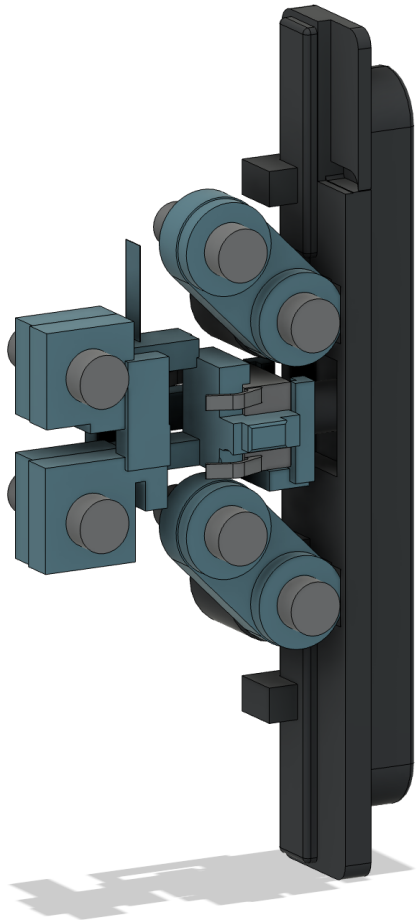

Fig. 14. Isolated PTT module, viewed from the internal side. Hardware and switch references remain in place.

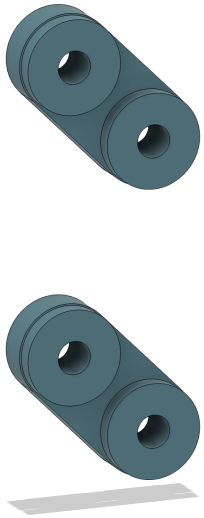

Fig. 15. The two links and four sleeves at their retained assembled locations.

2 links

One component definition controls both identical links.

4 sleeves

One stepped-sleeve definition controls all four pivots.

Retained interfaces

Switch cassette mounting datums and cap stop surfaces are unchanged.

No mechanism redesign

The same springless linkage remains. The simplification reduces duplicate CAD definitions; it does not merge pieces that must move or be assembled separately.

The final model is a static assembly. No kinematic joints or simulated return-force result were added.

Native PTT link: one fully constrained sketch

The slot-shaped outline, bearing bores and extrusion replace duplicate imported link definitions.

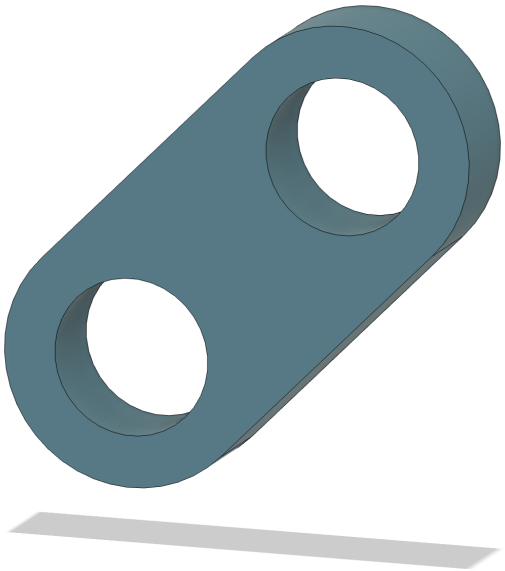

Fig. 16. Rebuilt link, shown in isolation. The source geometry is dimensionally matched.

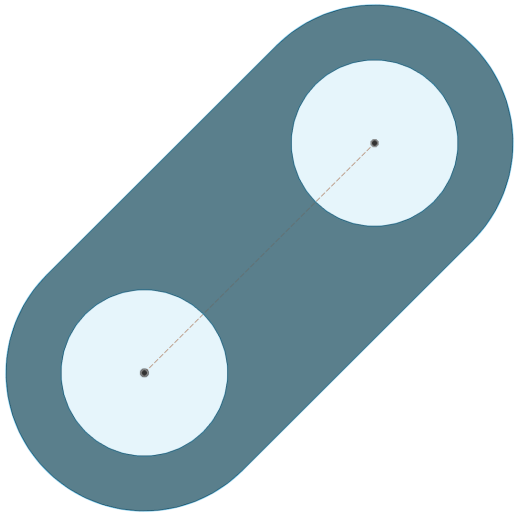

Fig. 17. Normal view of the native link profile. Parameter values are listed at right.

Control	mm
Centres	8.0
Width	6.8
Bore dia.	4.1
Thickness	2.4

Editable construction

The sketch has slot-shape constraints, a centre distance, bore dimensions and horizontal alignment. The 2.4 mm extrusion is driven by a named parameter.

Preserved fit

The 4.1 mm bore runs on a 4.0 mm sleeve bearing: 0.10 mm nominal diametral clearance. Geometry comparison found zero added or removed volume for both link instances.

Native shoulder sleeve: one part at four pivots

Two concentric sketches and two extrusions define the flange and bearing. Both sketches are fully constrained.

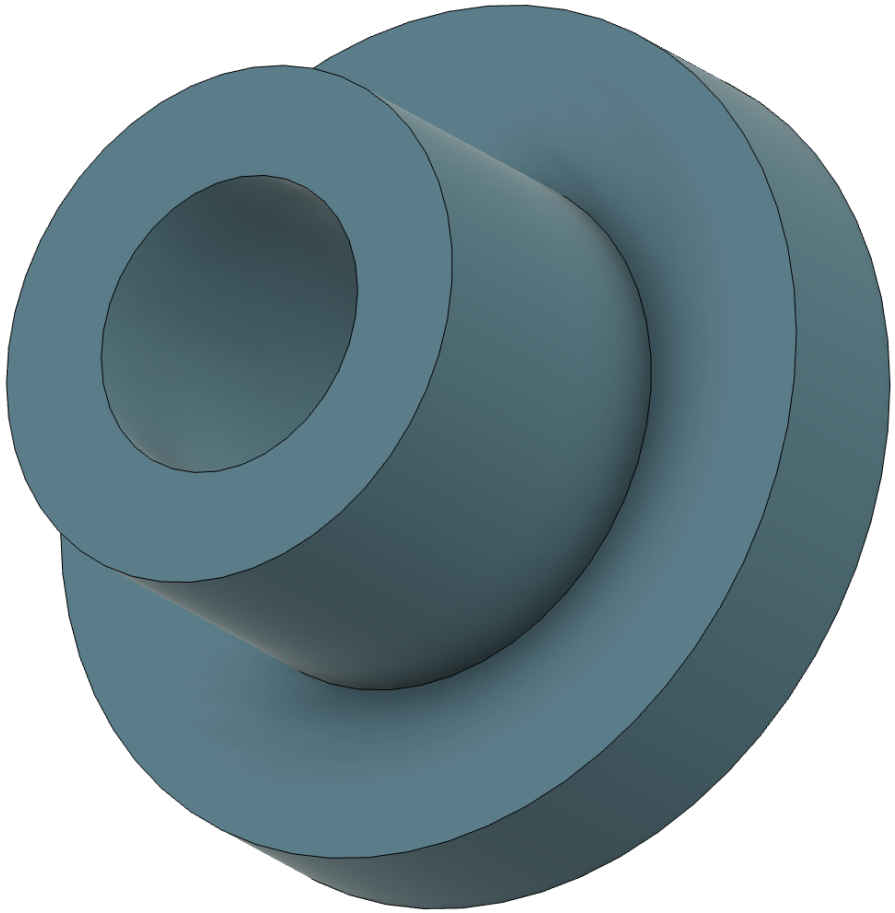

Fig. 18. Isolated stepped sleeve. The through-bore, bearing diameter and flange remain at v30 dimensions.

Driving parameter	Value
Flange outside diameter	6.6 mm
Bearing outside diameter	4.0 mm
Through-bore diameter	2.3 mm
Flange thickness	1.2 mm
Bearing length	2.55 mm

Axial fit retained

Bearing length 2.55 mm minus link thickness 2.40 mm gives 0.15 mm total nominal axial clearance. This is a geometric allowance, not a measured printed fit.

Shared definition

The moving and fixed pivots use four placed instances of the same component. Each placement was checked after reopening the F3D.

Native speaker spacer: preserve the acoustic stack

Two printed spacers share one constrained annular sketch and one thickness extrusion.

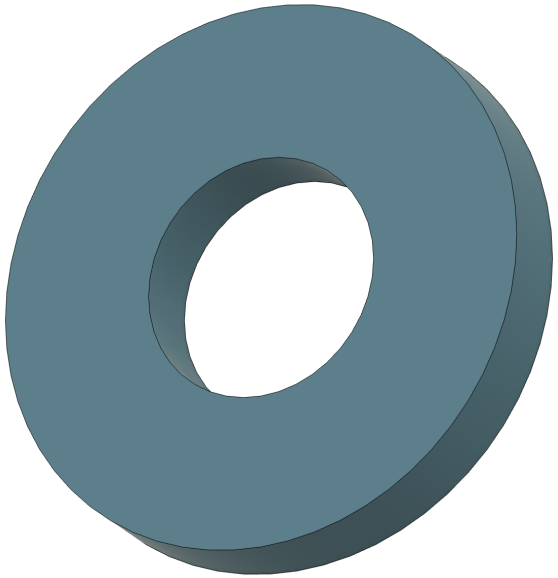

Fig. 19. One of the two rebuilt spacers. The model retains the exact 0.7 mm thickness.

Fig. 20. Speaker and grille module viewed from inside. The mounting stack is retained.

Control	mm
Outside dia.	5.0
Bore dia.	2.2
Thickness	0.7

Preserved assembly order

From the screw head toward the front: screw head, 0.7 mm printed spacer, speaker tab, 0.3 mm metal washer, then the flush short insert. The soft acoustic gasket remains a separate required item. These requirements come from the v30 assembly guide; they are not new v31 hardware changes.

Volume controls: cleaned organization, retained clearances

The guide frame, rear keeper, caps, switches and hardware remain a matched module.

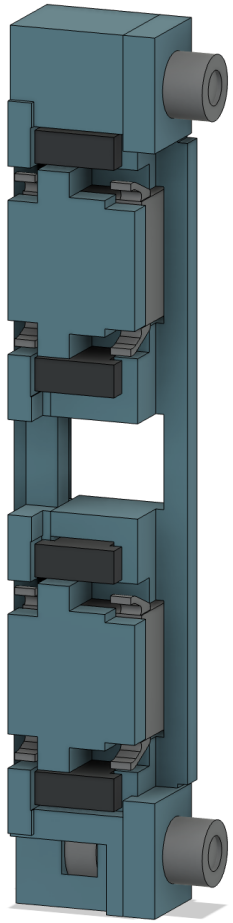

Fig. 21. Internal view of the volume module. Reference switches are retained with the printed guide and keeper.

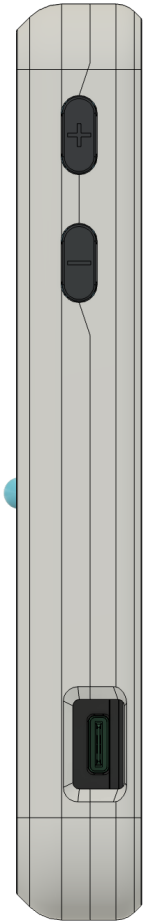

Fig. 22. Exterior location and button projections are unchanged.

Four printed parts retained

Volume guide frame, rear seat/keeper, plus cap and minus cap remain separate pieces.

Existing v30 details preserved

The 0.30 mm exposed cap-edge rounding, switch support lands and recessed adhesive pockets are inherited, not newly introduced by v31.

Assembly sequence remains valid

Caps still load into the guide; the loaded keeper completes the module before installation from the open back.

No clearance retuning

V31 does not change cap pushers, travel stops, switch positions or adhesive thickness. Physical switch click and release remain prototype checks.

Play button: keep the accepted carrier and stop geometry

The play cap, C carrier and C / 0.40 retainer remain exact solid foundations in the new module.

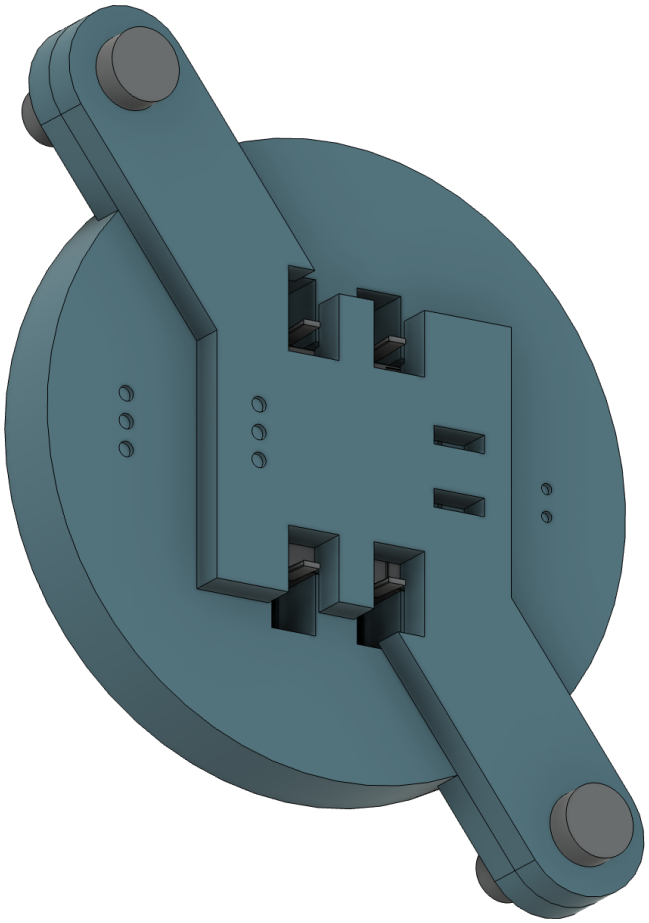

Fig. 23. Isolated play-button assembly from the internal side, including the retained reference hardware.

Why these parts were not merged

The carrier and retainer locate the switch and establish the short travel. Keeping them separate preserves access and the accepted assembly sequence.

What is easier to navigate

The cap, switch carrier, travel retainer, hardware, foam and switch references are collected under 02 Play button and explicitly labeled PRINT or REF.

What remains exact

Mounting surfaces, cap shape, pusher position and the retainer stop are retained. The source guide describes the accepted springless arrangement.

Editing boundary

These complex pieces are solid base features. Their full original construction history was not reconstructed as a parametric feature tree.

LED and USB: small interfaces, distinct material roles

Both modules retain the v30 installation and clearance geometry. Printed and nonprinted parts remain clearly separated.

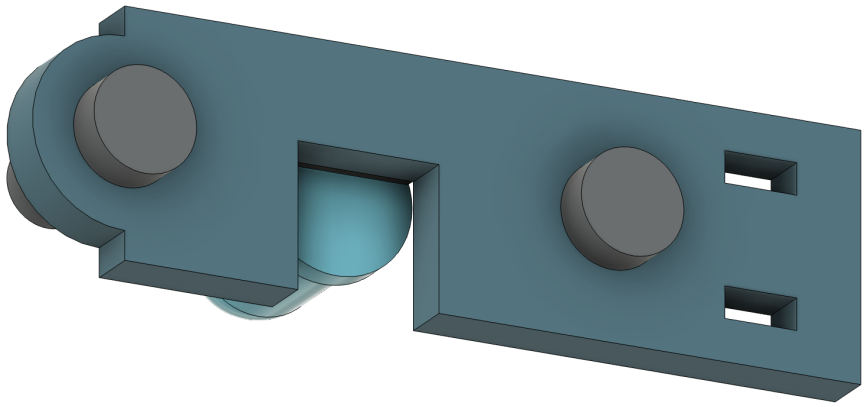

Fig. 24. LED fork retainer and reference interfaces, shown in isolation.

Fig. 25. Printed USB collar with the retained thin-film liner reference volumes.

Light indicator

The printed fork, mounting lands, LED body and lead references remain in the model. The LED projection outside the body envelope is unchanged. The screenshot colors identify roles only.

USB interface

The collar remains printed. The opaque PET liner is a thin-film assembly, not a printable mesh. Its opening, returns and support relationship remain as defined by v30; cable engagement still needs a physical check.

Electronics and acoustics remain reference geometry

The new document retains exact packaging references without presenting them as printable parts.

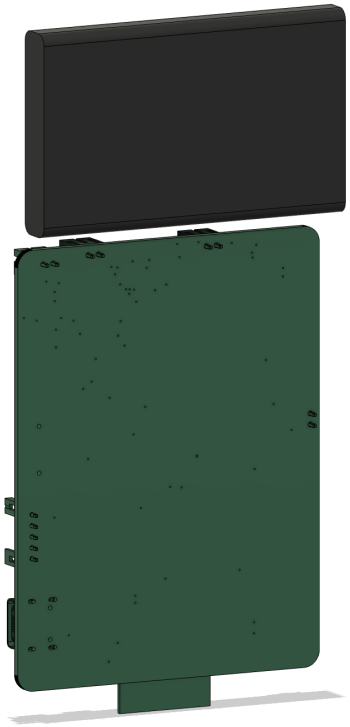

Fig. 26. PCB, battery and microphone references at their retained positions.

Fig. 27. Speaker, gasket, grille blank and hardware preserve the existing stack.

Centered speaker

The v30 speaker remains at X36 / Y106.5 in the retained coordinate system.

Grille blank

46 x 46 x 0.50 mm, R8 corners. The illustration of perforations is omitted; the solid blank is a fit envelope.

Wiring references

Local wire and joint allowances remain available under module 99, hidden by default.

No new functional claim

Keeping the same packaging does not establish audio performance, adhesion, cable compatibility, fatigue life or drop resistance. Those are physical prototype checks, separate from the geometric equivalence verified here.

Verification: native file and neutral exports

The model was reopened, compared and checked across Fusion and OpenCascade. These results describe the released files.

468
Native solids checked

22
Printed solids checked

0
Native timeline warnings

Check	Result	Interpretation
Native F3D reopened	PASS	Saved file retained component placement and shape
Body envelope	73.5 x 143.25 x 19.4 mm	Matches the requested v30 body dimensions
Printed-part Boolean comparison	0 added / 0 removed mm3	All 22 printed pieces match the retained foundation
Front / rear intersection	0 mm3	No new nominal shell overlap
Native sketch constraint state	4 fully constrained sketches	Link: 1; sleeve: 2; spacer: 1
Neutral full assembly	468 valid solids	Independent STEP reimport validation
Neutral printed-only assembly	22 valid solids	Per-part bounds within 0.001 mm; relative volume error below 1e-5
Rear-shell STEP translation repair	0 added / 0 removed mm3	Pcurve serialization issue corrected without changing solid volume

Primary records: RELEASE.json, native-reopen-check.json, final-native-check.json and step-roundtrip-check.json. Physical printing and assembly were not performed for this revision.

How to use and edit the new file

Open the F3D for native feature editing. Use STEP for transfer to another CAD package. Keep print and reference geometry distinct.

File or feature	Use	Important boundary
WalkieOne-v31-refined-prototype.f3d	Main editable Fusion assembly	Contains base features plus the new parametric shared parts
WalkieOne-v31-complete-assembly.step	Full cross-CAD reference assembly	Includes electronics, hardware and wiring allowance solids; do not slice the whole assembly
WalkieOne-v31-printed-parts.step	Only the 22 printed pieces	Parts remain in assembled positions, not print orientations
individual-printed-parts/	Per-part neutral geometry	The speaker-spacer file contains both placed spacers
PTT_* and Speaker_Spacer_* parameters	Drive rebuilt shared-part dimensions	Edits change all instances and require the mating fits to be rechecked
REF_Body_* parameters	Document the fixed envelope	Reference values only; changing them does not resize the shell solids

Printing

Retain v30 print orientations, materials, support strategy and hardware requirements. CAD appearance colors do not request multiple filament colors.

Assembly

Retain the v30 guides for insert installation, adhesive, gaskets, wiring, USB fitting and button-return checks. No physical parts have been removed from the BOM.

Source record and review boundaries

A traceable visual explanation of the delivered CAD, with no claim that its existing mechanisms were mechanically redesigned.

INPUTS

Designer: 20-09-2026 (1).zip
Native file: Walkie_One_28_1_R3_6_FULL_REFERENCE_ASSEMBLY.f3d

Foundation: WalkieOne-v30-print-package.zip
Native file: WalkieOne-v30-finished-case.FCStd
Supporting geometry: frozen BRep solids and the supplied STEP.

Requirements: Preserve v30 dimensions and focus on the 3D-printed prototype.

CAD IMAGE SOURCES

23 new native Fusion viewport captures were made for this report. Views isolate components or hide covers as stated in each caption. The designer image is the existing native capture associated with the byte-identical supplied F3D. The original-front comparison imports the uncleaned v30 shell solid. Images are cropped only to remove empty viewport margins.

WHAT THIS REPORT ESTABLISHES

The new file is easier to navigate and edit in the rebuilt repeated-part areas. The front-shell topology is simpler. The original dimensions, exterior, fit interfaces and nominal assembled geometry remain preserved.

WHAT REMAINS TO BE PROVEN PHYSICALLY

Button click and return, actual printed fits, trapped-wire avoidance, USB engagement, grille adhesion and acoustic performance. These were not established by the CAD reconstruction. Existing v30 limitations carry forward where geometry was retained.

Released CAD artifact	SHA-256 prefix
WalkieOne-v31-refined-prototype.f3d	dcc19031aa8be893f6250835...
WalkieOne-v31-complete-assembly.step	8b7ca2f226e9e6761b66c0bd...
WalkieOne-v31-printed-parts.step	633a44b0d369a2e86fd62b86...

Full hashes and verification details are in verification/RELEASE.json inside the CAD package. The original archives and delivered CAD files were not changed while preparing this PDF.