

Weight & Load

The mass-properties and loading section of the design package, written for the completion center that engineers, prices, and builds this interior. Every operating weight carries its source and its date; where the published record disagrees with itself, the honest range is stated and the disagreement is named, never resolved by picking one figure. The interior weight budget is set as a target band the shop refines under configuration control, not a false-precise number. The warm, light register of this scheme is engineered light as well as specified light; the two are the same set of decisions, laid out here as engineering.

1. Why the interior is load-bearing

On an ultra-long-range airframe the cabin interior is not a finish laid over a finished machine. It is mass installed inside a fixed weight envelope, and every pound of it is subtracted from something the owner bought the aircraft to carry: fuel, and therefore range, or payload, and therefore who and what flies.

The arithmetic runs one direction and does not negotiate. Maximum takeoff weight is a hard limit the airframe never exceeds. From it, subtract the basic operating weight — the green aircraft, its systems, its crew, and, decisively, its completed interior. What remains is the useful load, and useful load divides between fuel and payload. A heavier interior does not make the aircraft heavier at takeoff; the aircraft always departs at or below the same limit. A heavier interior makes it **carry less of everything else**. Ten occupants and full tanks toward the far end of a 7,000-plus-nautical-mile leg is a payload-and-fuel budget counted to the pound, and the interior spends against that budget before anyone boards.

This is why weight is engineered first and finished second. A completion that treats weight as a late clean-up has already lost it: by the time panels are cut and veneers are bonded, the mass is committed. The discipline the senior completion centers hold — AMAC Aerospace states it directly — is that *"effective lightweighting is less about a late optimisation exercise and more about maintaining weight awareness throughout the design and completion process,"* and that because VVIP interiors are highly customized, *"seemingly small design decisions can have cumulative impacts."*¹ Configuration control is the tool: hold the weight budget from the first specification meeting, allocate it by zone and by system, and price every material against its line.

This scheme was drawn with that discipline underneath it. The moves that make the cabin bright, warm, and residential — cream and ivory hides, light warm woods, warm-metal plating, stone used as a jewel rather than a field — are also the lighter moves. Here, lightness of palette and lightness of mass point the same way. What follows makes that logic explicit for the shop.

¹ **Provenance.** The two quoted sentences are Geoffroy Vincent, director of workshops, AMAC Aerospace, in *"Lightweighting in business jet cabin completions," Business Jet Interiors International (businessjetinteriorsinternational.com), read this session, 2026-09-24.* The weight-envelope arithmetic in this section is standard airframe physics; the configuration-control principle is the AMAC feature.

2. The envelope — what the airframe gives, and what the interior spends against

These are the published operating weights for the G650ER. A sourcing note the shop should have in hand: **Gulfstream's live product page no longer publishes the G650ER.** Production ended in February 2025 and the type is superseded by the G800; the current Gulfstream pages describe the G700 and G800, and the G650ER URL redirects. The figures below are therefore compiled from the cross-referenced aviation-specification record — Aviation Week's aircraft overview (which cites Gulfstream's own figures), Jetcraft's type overview, and GlobalAir's specification sheet, all cross-referenced 2026-09-24, together with the Wikipedia specification table, read 2026-09-24. Where the sources disagree, the range is shown and the

disagreement is named. **None of these is a live manufacturer figure; each is a cross-referenced figure, and any weight in this package that a performance engineer will check against the aircraft's own approved data must be checked against that aircraft's actual weighing record, not against this table.**

Weight	Figure	Provenance / note
Maximum ramp weight	104,000 lb ($\approx 47,174$ kg)	Jetcraft.
Maximum takeoff weight (MTOW)	103,600 lb	Consistent across all sources. The kg conversion varies by source (46,193 / 46,992 / 47,000 kg); Wikipedia gives $\approx 47,000$ kg. The hard ceiling; the interior's mass lives inside it permanently.
Maximum landing weight (MLW)	83,500 lb (37,875 kg)	Consistent across all sources.
Maximum zero-fuel weight (MZFW)	60,500 lb (27,442 kg)	Jetcraft / cross-referenced. Airframe + interior + payload with no fuel; the interior consumes headroom here directly.
Basic operating weight (BOW), 4 crew, standard outfitting	54,000–54,500 lb ($\approx 24,500$ –24,720 kg)	Sources differ — see note below. The completed, outfitted aircraft ready to fly. The interior lives inside this number.
Maximum payload	6,500 lb (2,900 kg)	Consistent across all sources. People and bags.
Maximum payload with full fuel	1,800 lb (≈ 820 kg)	Consistent across all sources. The full-range case; this is where interior weight bites hardest.
Maximum fuel capacity	48,200 lb (21,900 kg)	Consistent; 4,000 lb more than the base G650, the reason for the extended range.

The BOW disagreement, stated plainly. The published record does not agree on the G650ER basic operating weight. Aviation Week (citing Gulfstream), GlobalAir, and the Wikipedia specification table give **54,000 lb**; Jetcraft's overview and Wikipedia's own G700 narrative treat the G650ER base as **54,500 lb**. The spread is roughly 500 lb — about one adult passenger's worth. It is not an error to correct from the design side; it

reflects real variation in how the standard-outfitting reference weight is stated. Both figures carry Gulfstream's own standing caveat that these are *theoretical* weights and "*actual weights will be affected by outfitting options.*" **This package uses the 54,000–54,500 lb band and names it as a band.** The number that matters for this aircraft is not on any of these pages: it is the completed aircraft's own weighed BOW, which this interior sets and which the shop establishes at final weighing under the aircraft's weight-and-balance program.

The line to read twice: maximum payload with full fuel — 1,800 lb. At the aircraft's design mission, tanks full and reaching for the far end of its range, the remaining budget for passengers, crew bags, and cargo is on the order of eight or nine people with no margin to spare. A completed interior that runs a few hundred pounds heavy than its target does not shorten that number in the abstract; it removes a passenger's worth of payload from the exact mission an ultra-long-range aircraft is bought to fly. This is the constraint that outranks every finish decision. It is also why this scheme is built light from the palette outward rather than trimmed light at the end — the interior is the lever the design controls over the completed BOW, and the design keeps the lever in the owner's favor.

***Provenance.** G650ER operating weights: Aviation Week aircraft overview (citing Gulfstream), Jetcraft G650ER overview, and GlobalAir G650ER specification, cross-referenced 2026-09-24; the Wikipedia G650/G700/G800 specification table, read 2026-09-24. The G650ER live Gulfstream page was retired at end of production (Feb 2025); no figure here is a live manufacturer figure. The BOW is shown as the 54,000–54,500 lb band because the sources disagree. "Actual weights will be affected by outfitting options" is Gulfstream's standing note on the specification, quoted via Aviation Week.*

3. The target interior weight budget

A completion is priced against a budget set before a panel is cut. The senior centers do not weigh an interior after they build it and hope; they build an initial estimate from historical data on comparable programs, adjust it for this cabin's layout, monument count, material selections, and systems architecture, then **allocate the budget by cabin zone and by system category to find the areas of greatest weight sensitivity.**² This section

sets that target discipline for this scheme so the shop has something to price and engineer toward from day one.

The honest caveat, stated first. The delivered weight of a bespoke VVIP interior is shop-specific. It depends on the completion center's own panel constructions, its certified material stock, its systems architecture, and the exact monument build as detailed engineering resolves it. No responsible single delivered-weight figure can be published from the design side, and a precise pounds number offered here without the shop's structural and systems engineering behind it would be false precision — exactly the kind of number a completion engineer checks against their own data and catches. What the design *can* set, and what a shop *can* price against, is a target band and the discipline that holds the build inside it.

Design intent: a lean completion at full appointment. This package is deliberately specified toward the lighter end of what a four-living-area ultra-long-range cabin at this level of appointment can weigh. The scheme is not stripped — it carries full hide, real stone, real veneer, a complete cabin-management and entertainment fit — but every one of those elements is specified in its **weight-managed form** (Section 5), so the appointment is held without the mass penalty the same appointment in solid, heavy form would carry. Comlux states the same balance from the other side: the pursuit of reduced cabin weight demands specialized materials *"without any concession to the levels of elegance and craftsmanship."*² The register's warm, light materials give the shop margin to hold the line without conceding elegance.

How the shop uses this budget:

- **Allocate at first specification.** Split the target interior contribution to BOW across the four zones and the system categories (structure/monuments, seating and soft goods, galley, lavatories, CMS/IFE and wiring, lighting, surfaces/plating) at the first specification meeting, following the allocate-by-zone-and-system method. Price each monument, each finish, and the systems fit against its allocated line.
- **Trade at the line, never into BOW.** When a line runs heavy, make the trade *at that line* against the register — a lighter substrate, a thinner section, a wireless run — never by silently accepting the overage into the completed BOW, and never by cheapening the finish the owner approved.
- **Hold it under configuration control.** The budget is not a soft target to spend past in the finishing weeks. It is held from the specification discussions forward, with configuration control on every change, because the cumulative drift of "small" heavier substitutions is precisely what pushes a completion over its band.

The design's contribution to this budget is that it is **achievable at this appointment level** — the materials that make the cabin warm and bright are the materials that make the band reachable. The closing number is the shop's, established at final weighing.

² **Provenance.** *The weight-estimation method (historical data from comparable programs, adjusted for layout, monument count, materials, and systems; budgets allocated by zone and system category) and the Comlux quote (Jean-Marc Larochelle, director of technical sales, Comlux America) are the AMAC/Comlux feature in Business Jet Interiors International, read this session, 2026-09-24. The target band is a design intent explicitly the shop's to refine; no single delivered figure is asserted.*

4. Center of gravity and loading

Weight is half the engineering problem. *Where* the weight sits is the other half, and it is as binding as the total.

The aircraft flies inside a center-of-gravity envelope — a permitted fore-and-aft band the loaded CG must hold through every phase of every flight, from a full cabin at takeoff to a near-empty one at the end of a long leg. The interior is a large fraction of the mass that sets that CG, and unlike fuel and passengers, the interior's mass distribution is **fixed at build**. Fuel burns off and its CG shifts; passengers move and deplane; the monuments do not. So monument placement is a balance decision before it is a design decision, and the two are made to agree.

How this scheme distributes. The four-zone sequence runs forward to aft: the forward club (the work zone), the mid-cabin conference and dining zone, the aft lounge (the family room), and the private aft stateroom with its lavatory. The heaviest fixed masses in any cabin are the monuments — the galley, the lavatories, the credenzas and cabinetry, and the stone surfaces. The distribution logic:

- **Forward mass is anchored by the galley**, which sits forward in the airframe's standard architecture (galley forward, lavatories forward *and* aft — Gulfstream's published G650ER layout). The galley is among the densest monuments in the cabin: appliances, stowage, work surfaces, plumbing,

and its potable-water provision. Its forward position is a fixed given the design works with, not against — a large forward mass anchoring the front of the moment arm.

- **Aft mass is anchored by the aft stateroom, its lavatory, and the aft baggage compartment** (195 cu ft, aft). The private stateroom is a genuine monument — a berth and its structure, wardrobe and cabinetry, an en-suite lavatory — and it, with the aft lav and the loaded aft baggage, is the counterweight to the forward galley. This is the balance pairing that lets the cabin carry both a heavy working front and a heavy private aft.
- **The mid-cabin carries the distributed seating masses and the conference/dining credenza** between the two anchors, keeping the seated payload spread along the cabin's length rather than piled at one station.
- **Stone placement is a CG tool, not only a finish choice.** Stone is dense. Concentrating it — a heavy stone field forward or aft — is a balance liability as much as a weight one. This scheme uses stone as a **jewel, distributed** (Section 5): a mid-cabin dining tabletop, and the two vanity tops in the forward and aft lavatories. That distribution spreads the densest decorative material along the cabin rather than loading it at one station, serving both the total budget and the CG.

The balance discipline for the shop. Every monument's placement in this package is fixed with its mass and its station in mind. When detailed engineering resolves final monument weights, the loaded-CG cases are checked against the CG envelope across the mission — at minimum the full-cabin takeoff case and the long-range, light-payload landing case, plus the empty-return case — and any monument whose final mass would push a loaded case toward an envelope edge is a balance question routed back to the design, not silently absorbed. **The two configuration decisions carried this session both act at the aft end and pull opposite ways** (the deleted aft shower removes aft mass; the selected fixed double bed adds aft mass at the aftmost position — Sections 5.6 and 5.7), so the aft end is where the loading check is most sensitive and where the design has kept the most attention. Both are now decided, so the aft-CG cases are run against a known configuration: the fixed-double mass and station added, the no-shower saving subtracted, the two partially offsetting at the same station. The layout is drawn to hold the loaded aircraft comfortably inside its CG band across the mission; holding that as monuments are engineered to the fixed-double build is a first-order check, flagged here, not an afterthought.

Provenance. *CG-envelope physics and the fixed-versus-variable-mass distinction are standard airframe loading. Galley-forward / lavatory-forward-and-aft architecture and the 195 cu ft aft baggage volume are Gulfstream's published G650ER cabin specification (verified by the room against Gulfstream's pages, 2026-09-24). The monument distribution logic is this design's, made explicit as a balance discipline for the shop.*

5. The monument-by-monument weight strategy

Every warm-register material choice in the finishes specification was made twice: once for the register, once for the weight. This section calls out, monument by monument, the weight strategy already threaded through the materials board — so the completion engineer reads it as engineering, not only as finish. The items are ordered by their weight consequence, heaviest decision first. Figures are given as **order-of-magnitude engineering ranges** where a range is honest and useful, and withheld where a single number would be a lie the shop's own data would expose.

5.1 Stone — a jewel, never a field (*the single largest surface-weight decision*)

Stone is the densest decorative material in the cabin, and where it goes and how it is built is the largest single surface-weight lever the design controls.

- **Where it goes:** stone is used **only** as accent surfaces — the mid-cabin dining tabletop and the two lavatory vanity tops (forward and aft). Never a floor, never a wall field, never a running counter. It reads as a jewel because it is rare; rarity is also what keeps its mass negligible against the weight of a field of it.
- **How it is built:** every stone surface is **thin-stone lamination** — a 3–5 mm slice of natural stone bonded to an aluminum-honeycomb core, not a solid slab. This is the industry-standard lightweight aircraft stone construction and it delivers the authentic stone face — real material, real depth, real coolness to the touch — at a fraction of a solid slab's weight. A useful order-of-magnitude for the shop: a solid natural-stone slab runs roughly 13–16 lb per square foot at $\frac{3}{4}$ -inch thickness, while a 3–5 mm stone facing on honeycomb typically lands on the order of **2–4 lb per square foot** finished — call it a **three-to-five-fold reduction** on every stone surface. Across three modest accent surfaces the absolute saving is tens of pounds,

not hundreds, but it is a **high-CG-leverage** saving because stone is dense and would otherwise concentrate mass at a point. The warm register's light stones (a warm-toned marble or quartzite for the dining top, a soft stone vanity) carry through unchanged; only the substrate is engineered.

- **Spec callout:** *Natural stone, 3–5 mm honed slice, laminated to aluminum-honeycomb core; accent surfaces only (mid-cabin dining top; fwd + aft vanity tops). No solid-slab stone anywhere in the cabin. Substrate and adhesive to the shop's certified stone-panel standard, FAR/CS 25.853 compliant.*

5.2 Cabinetry, monuments, and panels — honeycomb-cored, never solid wood (*the single largest structural-weight decision*)

Solid wood is the wrong material for an aircraft monument on every count: it is heavy, it moves with pressure and humidity cycles, and it fails flammability qualification without treatment. This scheme's cabinetry, credenzas, monument walls, and partitions are **honeycomb sandwich construction** — an aluminum or Nomex (aramid) honeycomb core between thin composite skins, with the warm veneer as a face, not a structure. This is where the largest share of the interior's structural mass lives, and where the largest structural saving is taken.

- **The core does the structure; the wood is a face.** The warm light-wood look — bleached or warm oak, warm figured maple, light walnut — is a **thin veneer or engineered decorative surface** bonded to the sandwich panel, never solid timber. The register is fully delivered: real veneer, real grain, warm tone, matte or satin finish. Only the mass behind the face is engineered out.
- **The construction is proven light, with published order-of-magnitude figures the shop can hold against its own:** a current carbon-fibre sandwich panel is stated at roughly 50% lighter than an equivalent epoxy-glass panel; a monocoque/composite cabinet approach is documented reducing cabinet weight by up to 30% versus conventional construction; and where the veneer is cure-integrated into the panel lay-up (bonded during the sandwich cure rather than applied to a wood backer afterward), the finished decorative surface is on the order of 30–50% lighter than a standard veneer-on-backer application because the backing wood is eliminated. Assembly method compounds it: an optimized mortise-and-tenon monument assembly can approach half the weight of a conventional pin-based assembly. These are cited ranges, not a promise for this build; the shop's own panel standard sets the delivered figure.
- **Spec callout:** *All cabinetry, credenzas, monument walls, and partitions: honeycomb sandwich (aluminum or Nomex core, composite skins) to the shop's certified panel standard, FAR/CS 25.853 compliant. Warm-wood finish delivered as thin veneer or engineered decorative surface, cure-*

integrated into the panel where the shop's process allows (eliminates the backer). No solid-wood structural members. Mortise-and-tenon monument assembly preferred over pin-based.

5.3 Seating and soft goods — light cream hides and wool over anything heavier

The seats are the register's lead — cream and ivory hides carrying the cabin's warmth and light — and they are a soft-goods weight line the design manages. **Seats are typically the single largest payload-side mass category in the cabin after the monuments**, so their specification matters to the budget as much as to the look.

- **Hides:** cream/ivory hides at the light, supple grade the register calls for. A lighter, more pliable hide is also lighter per square meter than a heavy, thick upholstery leather; the warm look and the lighter mass agree. Hide selection is a per-square-meter weight line the shop should track, because the total hide area across four zones of seating, divans, and a stateroom is large.
- **Foams and mattresses:** seat foams and the stateroom mattress specified in the **current certified light-foam technologies** — comfort and support held, mass reduced. This is a live area of completion-center lightweighting; the shop specs to its current certified light-foam stock.
- **Carpet and headliner:** light warm carpet in 100% wool (the industry-standard cabin carpet fiber, warm and light-toned to the register) over a light underlay, and a warm light headliner. Where the headliner and non-structural surface finishing can use a **thin-film surface finish** (a Tedlar-type film) in place of a conventional paint system, the finish weighs on the order of **one-third of a sprayed paint system** — a meaningful saving across the large surface area of the headliner and upper cabin.
- **Spec callout:** *Cream/ivory hides at light supple grade, area tracked; certified light-technology seat foams and stateroom mattress; 100% wool carpet, light warm tone; warm light headliner with thin-film (Tedlar-type) surface finish where applicable ($\approx \frac{1}{3}$ the weight of conventional paint). All to FAR/CS 25.853.*

5.4 Warm metals — PVD plating, microns thin, never solid

The warm-metal family — soft brass, champagne, warm bronze — reads across hardware, trim, visible seat-frame metal, table bases, and fittings. None of it is solid precious or heavy metal.

- **How it is built:** the warm-metal appearance is delivered as **PVD (physical vapor deposition) plating** — a coating measured in microns over a light substrate (typically aluminum or a light alloy). The eye and the hand read solid warm brass or bronze; the mass is the light substrate underneath. A solid-brass fitting is heavy and unnecessary; the plating gives the identical finish at the substrate's weight. Brass is roughly three times the density of aluminum, so every fitting rendered as plated aluminum rather than solid brass is a two-thirds-plus mass saving on that fitting — small individually, cumulative across a cabin's worth of hardware.
- **Spec callout:** *All warm-metal finishes (soft brass / champagne / warm bronze): PVD plating over light-alloy substrate. No solid brass or bronze fittings. Plating color and finish to the warm-metal palette in the materials board.*

5.5 Cabin systems, CMS, and "screens everywhere" — miniaturized and wireless

The register keeps screens present but reading as quiet architecture; the weight strategy keeps the systems that drive them light. **The single largest hidden weight in a screen-rich cabin is not the displays — it is the wiring loom behind them.**

- **The lever is integration and wireless.** Miniaturization and integration of the cabin-management system, the in-flight-entertainment architecture, and the lighting have made a real weight difference in current cabins, and wireless functionality removes substantial cabling from an increasingly connected interior. Every display driven wirelessly rather than by a dedicated cable run removes copper along the full length of that run.
- **Platform is Gulfstream's own.** The cabin runs on the **Gulfstream Cabin Management System (GCMS)**, standard on the G650/G650ER, with the Gulfstream Cabin Control app on personal devices and Gulfstream CabinView for the moving-map layer (platform names verified against Gulfstream's own materials). The specific build — display count and sizes, wireless architecture, current-generation CMS options — is a completion-shop specification confirmed against Gulfstream's current interior offering at build, and it is a weight line, not only a feature line.

- **Spec callout:** *Cabin management on GCMS; entertainment and control architecture specified for miniaturized, integrated, wireless-where-certified operation to minimize the cabling loom. Display count and sizes to the shop's build spec, tracked as a systems-weight line.*

5.6 The aft lavatory — no shower (*a configuration decision locked this session*)

The aft lavatory is built **without a shower**. This is a genuine engineering saving and it lands where the aircraft is most sensitive to it — at the aft end, and against the full-fuel payload budget — so it is worth stating as a system decision, not a subtraction.

Deleting the aft shower removes a **linked chain of masses and systems**, not just a shower pan:

- **Water.** A shower requires dedicated potable-water capacity beyond the sink allowance, and that water is dead payload carried for the whole flight. Water weighs about **8.34 lb per US gallon**; even a modest dedicated shower supply of 10–20 gallons is on the order of **85–165 lb of water alone** at the aft end when full.
- **Waste.** A shower drains to a grey-water or waste holding provision that must itself be plumbed, tanked, and carried.
- **Structure and the wet floor.** A shower requires a sealed, drained wet-floor structure, additional pan and enclosure structure, and typically a heated floor — added structure, added heater mass, and added electrical load, all aft.
- **Plumbing and heating runs.** Supply, drain, and water-heating provision run to the aft lav, each a mass and a system to certify and maintain.

Taken together, an installed VVIP shower system — enclosure, pan, dedicated water, waste provision, heated wet floor, plumbing, and heater — is realistically a **low-hundreds-of-pounds installed system, of which a large share is aft-loaded dead-payload water when the tanks are filled**. A precise figure is the shop's to establish against its own shower-system standard; the honest engineering statement is that this is a **low-hundreds-of-pounds, aft-heavy, payload-consuming, maintenance-bearing system, and deleting it returns that budget to the owner**.

Why the saving is worth more than its pounds: it is aft mass, so it eases the aft-CG loading the stateroom already concentrates (Section 4); it is dead-payload water carried the whole flight, so on the full-fuel long-range mission — the 1,800-lb payload case — it returns directly to the payload the owner can actually carry; and it removes a plumbed, heated, drained system from the maintenance and certification burden. On an ultra-long-range aircraft whose entire mission is the long leg, deleting the aft shower is a payload-and-balance **win**, framed correctly, not a comfort the owner gave up.

- **Spec callout:** *Aft lavatory: no shower. Vanity, sink, and toilet only. Aft potable-water provision sized for the lavatory and galley demand without shower supply. The forward and aft lavs are both non-shower; the aircraft carries no shower system.*

5.7 The aft stateroom berth — a fixed double bed (*the owner's decision, made this session*)

The owner has selected the **fixed double bed** — a permanent, made-and-ready bed, no daytime conversion. This is the berth the shop engineers and prices. A proper bedroom aft, not a convertible arrangement pressed into double duty. This section states the weight-and-balance consequence of that chosen build so the shop runs its loading cases against the right mass at the right station, and so the offset it pairs with is on the record.

What the chosen build is, as engineering. A fixed double is dedicated bed structure, a full mattress, and a fixed headboard and surround, none of it doing daytime double duty. It occupies the **aftmost stateroom position** — the residential logic that makes it a real bedroom is also what places it at the very end of the cabin. So it adds mass **and** adds aft moment arm together, at the very station where the loading check is most sensitive. This is the heavier and more-aft of the arrangements a stateroom can carry, and it is the one being built. A convertible berth would have been lighter and more forward; that is not the build, and it is noted here only to mark that the fixed double sits at the heavier, more-aft end of the range — the consequence the shop engineers to, not an option still on the table.

The delta, stated as engineering. The fixed double carries, order-of-magnitude, **tens to low-hundreds of pounds** of dedicated structure and furnishing, placed **further aft** than a converting arrangement would. The exact pounds and the exact station are the shop's to resolve against its stateroom standard, but the **direction is certain and points the same way on both axes: this build spends both an interior-budget increment and an aft-CG increment at the aftmost station.** That is the fact the aft-CG cases in Section 4 are run against.

The offset — the load-bearing point. The two configuration decisions carried this session act at the same aft station and pull opposite ways. The fixed double **spends** aft mass and aft moment arm at the aftmost position (this section). The deleted aft shower (\$5.6, already booked) **returns** aft mass and aft moment there — a low-hundreds-of-pounds, aft-loaded system removed from the same end of the cabin. So the heaviest single berth choice and the largest aft saving land at the same sensitive station and partially offset each other. The aft-CG cases are run with **both booked together**: the fixed-double mass and station added, the no-shower saving subtracted, at the aft end. Neither decision reads correctly alone; the net aft effect is what the loading check sees, and it is materially eased by the shower deletion sitting against the fixed bed at the same station.

- **How the aft section locks:** the aft-CG loading cases are re-run with the fixed double's engineered mass and station, together with the no-shower saving already booked, and the aft end locks. The stateroom is drawn to the fixed double at the aftmost position; the pocket-door line and the aft-lav position hold.
 - **Spec callout:** *Aft stateroom berth: fixed double bed, permanent (no daytime conversion), at the aftmost stateroom position. Berth mass and station engineered to the shop's stateroom standard. Aft-CG loading cases run against the fixed-double mass and station AND the booked no-shower saving at the same aft station — the two offset. Space reserved for the full stateroom around the fixed bed.*
-

6. What the shop takes from this section

1. **Use the weight envelope in Section 2 as a cross-referenced record, not a live manufacturer figure**, and establish this aircraft's own weighed BOW at final weighing. The BOW is a **band** (54,000–54,500 lb) because the published record disagrees; do not carry a false-precise BOW into a performance calculation.
2. **Set the interior weight budget at first specification, allocated by zone and system**, and hold it under configuration control to the delivery. The design is specified to make the lean band reachable at full appointment; the closing figure is the shop's.
3. **Run the loaded-CG cases against the CG envelope** as monuments are engineered — full-cabin takeoff, long-range light-payload landing, empty return — with the **aft end as the most sensitive check**, because the deleted shower (a saving) and the selected fixed double bed (aft mass,

aftmost position) both act at the aft end and partially offset. Run both booked together: the fixed-double mass and station added, the no-shower saving subtracted, at the same aft station.

4. **Book the no-shower saving** as a low-hundreds-of-pounds, aft-loaded, payload-and-balance win — mostly dead-payload water on the full-fuel mission — and reflect it in the aft-water provision and the aft-CG cases.
5. **Lock the aft section to the fixed double bed** at the aftmost stateroom position — the owner's selection is made — re-running the aft-CG cases against the fixed-double mass and station together with the booked no-shower saving. The stateroom is drawn to the fixed double; the pocket-door line and aft-lav position hold.

Nameless. This section, like the whole package, carries no name, no wordmark, and no studio mark — the owner's fixed constraint, held here as everywhere.

Sourcing summary for the shop's engineers. Operating weights: Aviation Week aircraft overview (citing Gulfstream), Jetcraft G650ER overview, and GlobalAir G650ER specification — cross-referenced 2026-09-24; the Wikipedia G650/G700/G800 specification table — read 2026-09-24; the G650ER live Gulfstream page is retired (production ended Feb 2025). BOW shown as a 54,000–54,500 lb band because sources differ. Lightweighting principles and figures: AMAC Aerospace and Comlux America in Business Jet Interiors International, "Lightweighting in business jet cabin completions," read 2026-09-24; HILITECH monocoque-cabinet figure cross-referenced 2026-09-24. Cabin architecture (galley forward, lav fwd + aft, 195 cu ft aft baggage, 16 panoramic windows/side, up to 4 living areas): Gulfstream's own published G650ER cabin specification, verified by the room 2026-09-24. Water weight and material densities are standard engineering constants. Every delivered weight and CG figure in the completed program is the completion center's to establish under the aircraft's weight-and-balance program; the numbers here are the cross-referenced record and honest engineering ranges, marked as such.*