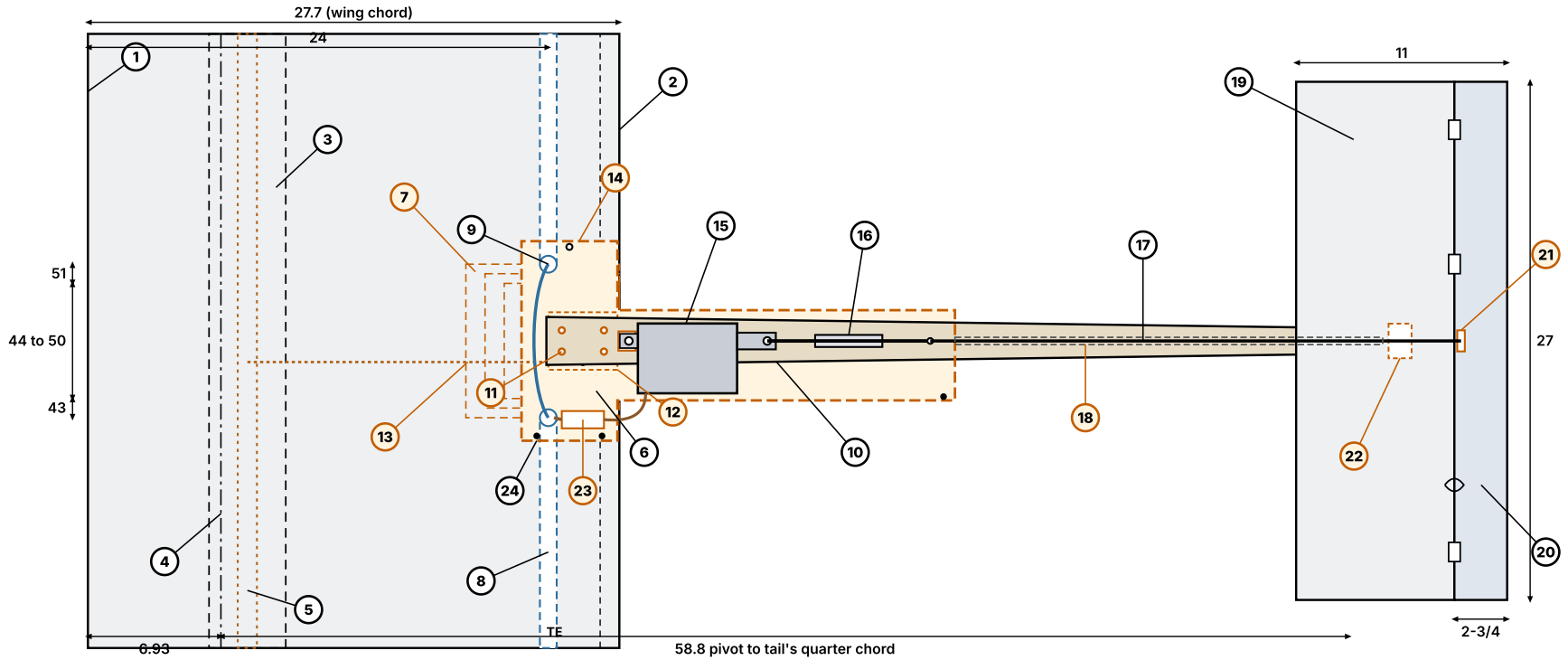
Replaced for the actuator spot and the PEX route by Wing_Actuator_Forward_Option_2026-10-27 (actuator forward, hanging, on a cradle; one vertical PEX at 12 in with a branch). The boom, tail, joints and guide problems on these pages still stand.



wing cable — actuator cable (18/4) and its own lead — copper, far face — proposed, in no guide — inside the wing, under the skin

1 Wing nose. Section NACA 0015, 4.16 in thick at its thickest, 8.31 in back (A4 ribs)

2 Wing back edge, 27.7 in. Ribs stop at 26.7; the last inch is packed solid (Stage 11)

3 Box spar inside: 4 in wide, 3 in deep, centered 8.31 in back (Stage 3)

4 Pivot: 6.93 in back. The mast tops out about 25 in up, below this view (Stage 11)

5 Copper strap, 1 in wide, on the FAR face along the spar line (Stage 11)

6 Boom root zone: back 4 in of the wing solid, 44 to 50 in up (Stage 10)

7 Doublers 8×8, 7×7, 6×6 in, 3 layers biax, both faces (Stage 10). Placement P

8 PEX, 7/8 in outside, 24 in back, in the boom face (Josh's plan, decided)

9 PEX mouths at 43 and 51 in, inside the fairing (Josh's plan)

10 Boom: 1.5 in thick, 2.5 in deep at the wing end to 1.25 at the tail end (Stage 12). Its ends P

11 Four 5/16 in bolts, Belleville, nyloc, ~130 in-lb (Stage 12). Pattern P

12 Clamping plate, far face (Stage 10). Size P

13 Copper jumper, strap to the plate's 1/4 in silicon bronze bolt (Stage 10). Route P

14 Fairing: gasketed lid, breather, drains (Trim Guide sec 4). Shape and size P

15 Electrak MD, to scale from Thomson's catalog; rod aft (Trim Guide)

16 Wing tab spring link, about 8-1/2 in pin to pin from its parts (Trim Guide sec 6)

17 Pushrod, 1/4 in 316, two 24 in pieces joined by a 1/4-28 coupling nut (Trim Guide sec 4)

18 Lined pushrod conduit along the boom (Stage 12). Its height P, see page 3

19 Fixed tail, 27 × 11 in, NACA 0012, front edge 63.0 in back (Stage 12). Height P

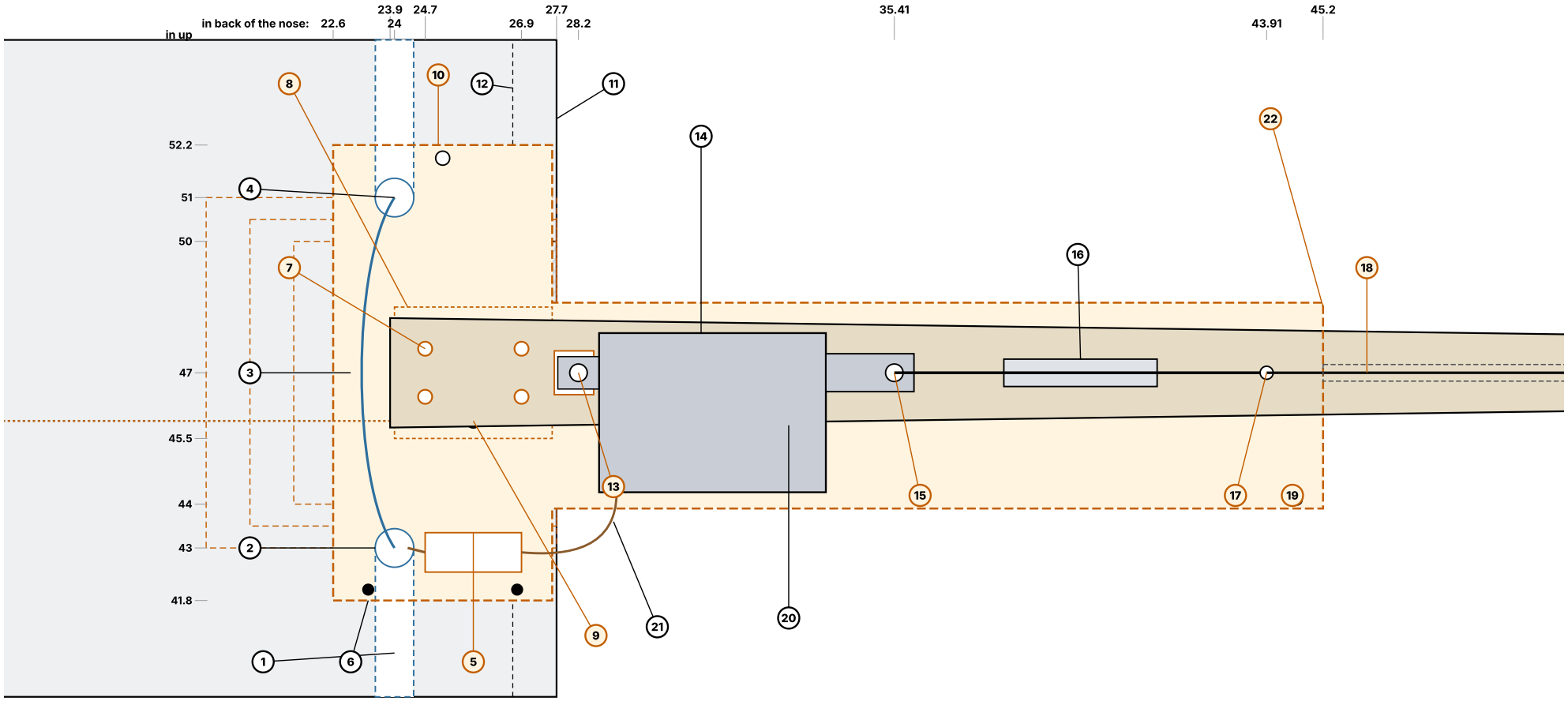
20 Tail flap: back 2-3/4 in, 3 pin hinges, torsion spring, stops about 30 degrees (Stage 12)

21 Flap horn: arm open, drawn 1 in (Trim Guide sec 6). Spot P

22 Breakaway link, tail to boom, lets go at 40 to 60 lb (Stage 12). Its form P

23 Plug for the actuator cable, so it comes out without cutting. P (the guide allows one)

24 Two drains at the low point, countersunk outside; the long arm needs a third. P



1 PEX root length, 7/8 in outside, 24 in back, under the skin (Josh's plan)

2 Lower PEX mouth, 43 in up: the actuator cable and the wing cable come out; silicone-sealed. P

3 Wing cable, carried across the fairing head ahead of the boom (Josh's plan)

4 Upper PEX mouth, 51 in up: the wing cable goes back in, on to the tip

5 Plug joining the 18/4 to the actuator's own lead, greased and booted. P

6 Two drains at the head's low edge, countersunk outside (Trim Guide sec 4)

7 Four 5/16 in boom bolts. Pattern P: 2.2 in apart along the boom, 1.1 in up and down

8 Clamping plate, far face, 3.6 × 3 in. P

9 1/4 in silicon bronze jumper bolt in the plate (Stage 10). Spot P

10 Breather at the top of the head (Trim Guide sec 4). Spot P

11 Wing back edge, 27.7 in

12 Ribs stop at 26.7; the last inch packed solid (Stage 11)

13 Rear lug: G10 block on the boom with a 10 mm hole, 10 mm pin and R-clip. P

14 Electrak MD, pulled in, its rod axis on 47 in, hanging: motor below the rod line

15 Front 10 mm pin, actuator fork to the link's eye. P (the guide has a clevis there)

16 Spring link (Trim Guide sec 6)

17 Link to pushrod joint: one fork, one eye, 3/16 pin. P

18 Pushrod conduit mouth at the fairing's back wall; conduit on its strip along the boom. P

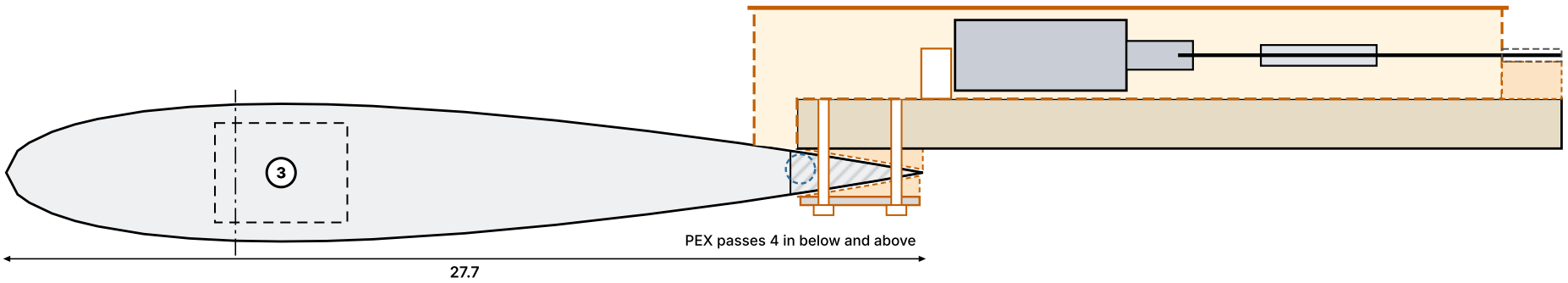
19 Third drain, at the long arm's low corner. P

20 Boom, 2.5 in deep here (45.75 to 48.25 in up), front end at 23.9. P

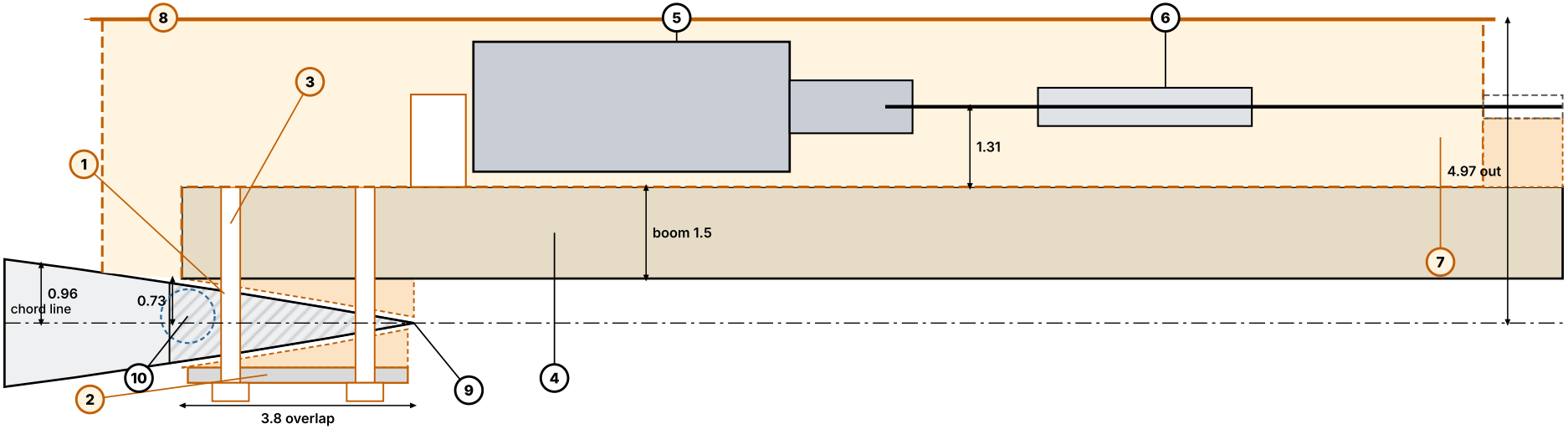
21 Actuator's own lead from its back lower corner to the plug

22 Fairing: head 5 in wide x 10.4 tall over the mouths and plug, arm 17.6 long x 4.7 tall (43.9 to 48.6 in up) over the hanging actuator and link. P

WHOLE SECTION AT 47 IN UP, LOOKING DOWN (boom face up)



ENLARGED: THE BOOM ROOT AT 47 IN UP



1 Filler on the boom face. The wing face falls 0.63 in over the 3.8 in the boom covers (A4 ribs); a flat boom needs a wedge of thickened epoxy, or a boom root shaped to the slope. The guide does not say. P

2 Same wedge under the clamping plate on the far face, plate drawn 1/4 in. P

3 5/16 in bolts through boom, wedge, solid zone, wedge and plate. Pattern P; Bellevilles and nylocs per Stage 12

4 Boom, 1.5 in thick (Stage 12), against the boom face

5 Electrak MD body, 2.13 in across (Thomson), on 1/4 in G10 pads (Trim Guide sec 4)

6 Spring link, 5/8 in tube (Trim Guide sec 6), on the actuator's rod line

7 Pushrod conduit raised on a strip so its line meets the actuator's rod line, 1.31 in off the boom. P. The pins turn only in the plane of the wing face, so the rod and pushrod must share one height

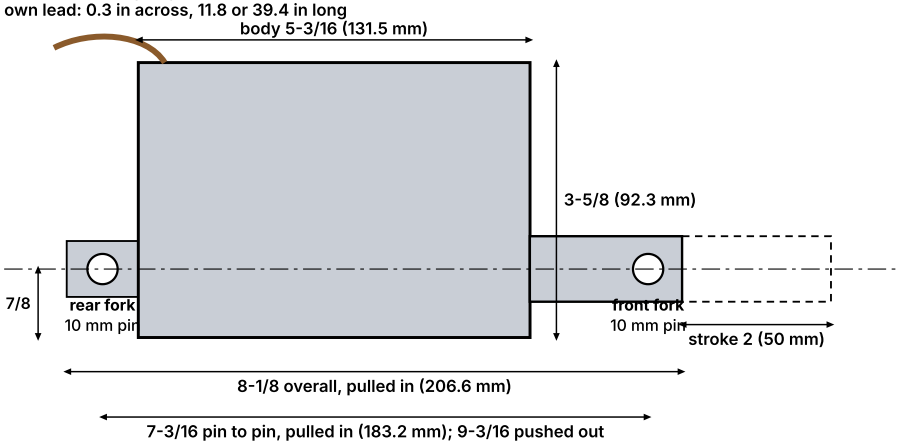
8 Fairing lid, 4.97 in out from the chord line, 2.75 in above the boom. P

9 Wing back edge, packed solid (Stage 11)

10 PEX in its channel, 24 in back, flush in the boom face; it stops at 43 and starts again at 51, so it is not in this section

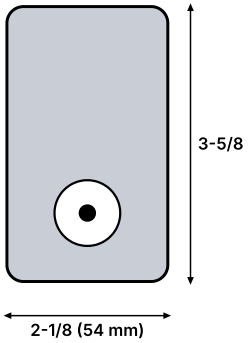
ELECTRAK MD24A025-0050, SIDE VIEW, PULLED IN (as in the catalog; on the wing it hangs, turned over)

Thomson catalog pages 71 to 73
own lead: 0.3 in across, 11.8 or 39.4 in long

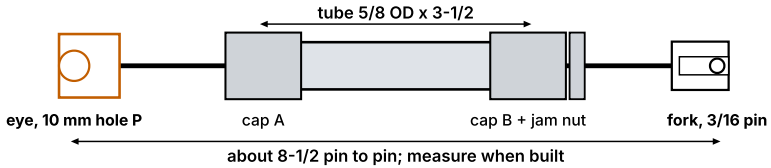


END VIEW, LOOKING FORWARD

the 2-1/8 in side stands out from the boom



WING TAB SPRING LINK, to scale from its parts (Trim Guide sec 6)



EVERY PIN JOINT: ONE FORK, ONE EYE

JOINT	FORK	EYE	PIN
Actuator rear	actuator (Thomson)	G10 lug on the boom P	10 mm, R-clip P
Actuator front	actuator (Thomson)	on the link's cap A stud, in place of the guide's clevis P	10 mm, R-clip P
Link to pushrod	link rod-end clevis (guide)	1/4-28 rod eye on the pushrod, in place of its clevis P	3/16, R-clip
Pushrod to flap	pushrod clevis (guide)	flap horn plate	3/16, R-clip

TAKE THE ACTUATOR OUT WITHOUT CUTTING (MIKE, OCT 27)

1. Lid screws out, lid off. The whole outer face is the lid. P
2. Unplug the actuator's lead at the plug in the fairing head. P (the guide pots a splice, and allows a greased, booted plug instead: Trim Guide sec 4, Step 4)
3. R-clip off, front 10 mm pin out.
4. R-clip off, rear 10 mm pin out.
5. Lift it out. Both pins point straight out of the wing face, so they pull toward you.

The link and pushrod stay rigged, so the flap's neutral is not disturbed.

FROM THOMSON'S CATALOG

Code in the guide	MD24A025-0050CNO: 24 V, 56 lbf acme screw, 50 mm stroke, J1939 CAN
Ends	both "forked cross hole for 10 mm pin" (option N)
Own lead	0.3 m (11.8 in) or 1 m (39.4 in), flying leads, 0.3 in across; motor wires 18 AWG, signal 22 AWG
Weight	2.4 lb (1.1 kg)
End play	up to 0.047 in (1.2 mm)
Speed	2.04 in/s empty, 1.72 at full load
Sealing	IP67/IP69K standing, IP66 moving, 500 h salt spray

The guide's code stops after CNO. The full code also picks the lead (1 or 2), the end adapters (N) and their turn (S or M). Thomson's order acknowledgement shows which lead is coming.

FACTS USED, AND WHERE THEY COME FROM

FACT	SOURCE
Chord 27.7 in; section NACA 0015, half-widths at 31 to 78 in span	Wing Guide App. A4
Pivot 6.93 in back; spar 4 × 3 in centered 8.31 back	Wing Guide Stage 3, App. A
Boom zone 6 in tall centered 47 in up; back 4 in solid; doublers 8, 7, 6 in, 3 layers biax, both faces	Wing Guide Stage 10
Clamping plate with one 1/4 in silicon bronze bolt; copper jumper from the strap	Wing Guide Stage 10, 11
Boom 1.5 in wide, 2.5 deep tapering to 1.25; four 5/16 bolts, Bellevilles, nylocs, ~130 in-lb, witness marks; bolted, never glued	Wing Guide Stage 12
Tail 27 × 11 in NACA 0012; tail quarter chord 58.8 in behind the pivot; flap is the back 2-3/4 in, 3 pin hinges, torsion spring, stops about 30 degrees; breakaway link 40 to 60 lb	Wing Guide Stage 10, 12
Fairing on the boom root, gasketed lid, breather, two countersunk drains; actuator on G10 pads; rod aimed at the conduit mouth	Trim Guide sec 4
Spring link parts; clevises 1/4-28 with 3/16 pins; pushrod 1/4 in 316 in two 24 in pieces	Trim Guide sec 4, 6
Actuator sizes, ends, lead, weight	Thomson catalog pp. 71 to 73
PEX 7/8 in at 24 in back, mouths at about 43 and 51 in, inside the fairing; strap on the other face	Pending Amendments, Josh's plan (decided)
18/4 bends at 3/4 in radius, pulls through 1 in	Mike, Oct 27

PROPOSED HERE (ORANGE), IN NO GUIDE

- Where the boom's ends sit (front end 23.9 in back, back end 69 in), the bolt pattern, the plate size, the jumper's route.
- The fairing's shape: a head over both PEX mouths and the plug, and a long arm over the actuator and link, 22-1/2 in long in all.
- The actuator's spot: rear pin 28.2 in back, which puts its middle about 24 in behind the pivot. The guide says only "about 20 in aft of the pivot", for balance.
- The tail centered on the boom's height; the horn at the pushrod's height.
- A plug on the actuator lead; 10 mm pins with R-clips; G10 lug; a third drain.

WRONG OR MISSING IN THE GUIDES (FOUND DRAWING THIS)

1. **Fork meets fork.** Both actuator ends are forks for a 10 mm pin (Thomson option N). The guide puts a clevis (also a fork) on the link's cap A to take the actuator, and clevises on both pushrod ends, so the link-to-pushrod joint is fork to fork too. Each joint needs one fork and one eye (page 3).
2. **Pin size.** The guide's clevises take a 3/16 in pin; the actuator's ends take 10 mm (0.39 in). A 3/16 pin there would rattle about 0.2 in, far past the free-play limit the proof tests set.
3. **One rod line.** The pins turn only in the plane of the wing face, so the actuator's rod and the pushrod must sit the same distance out from the boom. The actuator's rod is about 1.3 in off the boom (1/4 in pad plus half its 2.13 in width); a conduit glued flat on the boom is about 1/4 in off. The guide does not say how they meet (page 2, item 7).
4. **Sloped boom seat.** Over the back 3.8 in the wing face falls about 0.63 in to the edge, and the boom is flat. A filler wedge, or a boom root shaped to fit, is needed on the boom face and under the plate (page 2).
5. **The fairing is bigger than "small".** Actuator plus link is about 15-3/4 in pin to pin, and the fairing that covers them and the cable head is about 22-1/2 in long. The guide's fairing was drawn for a smaller part (Trim Guide sec 2).
6. **Two cables, one mouth.** The guide fits one gland where the cable enters the fairing floor; Josh's lower mouth brings out both cables, and two cables of different size never share a gland (Mike, Oct 13). Seal that mouth with silicone instead.
7. **Two low points.** An L-shaped fairing has two; each needs a drain.
8. **Order code incomplete** (page 3).

STILL OPEN

- The actuator's real spot along the chord, and Mike's idea of a forward edge at 12 to 18 in. Forward, the pushrod gets longer by the same amount and the fairing reaches the faster air near the thickest point (8.3 in back).
- How the wing's two cables leave the can and reach the PEX (Pending Amendments).
- The horn arm (Trim Guide sec 6).