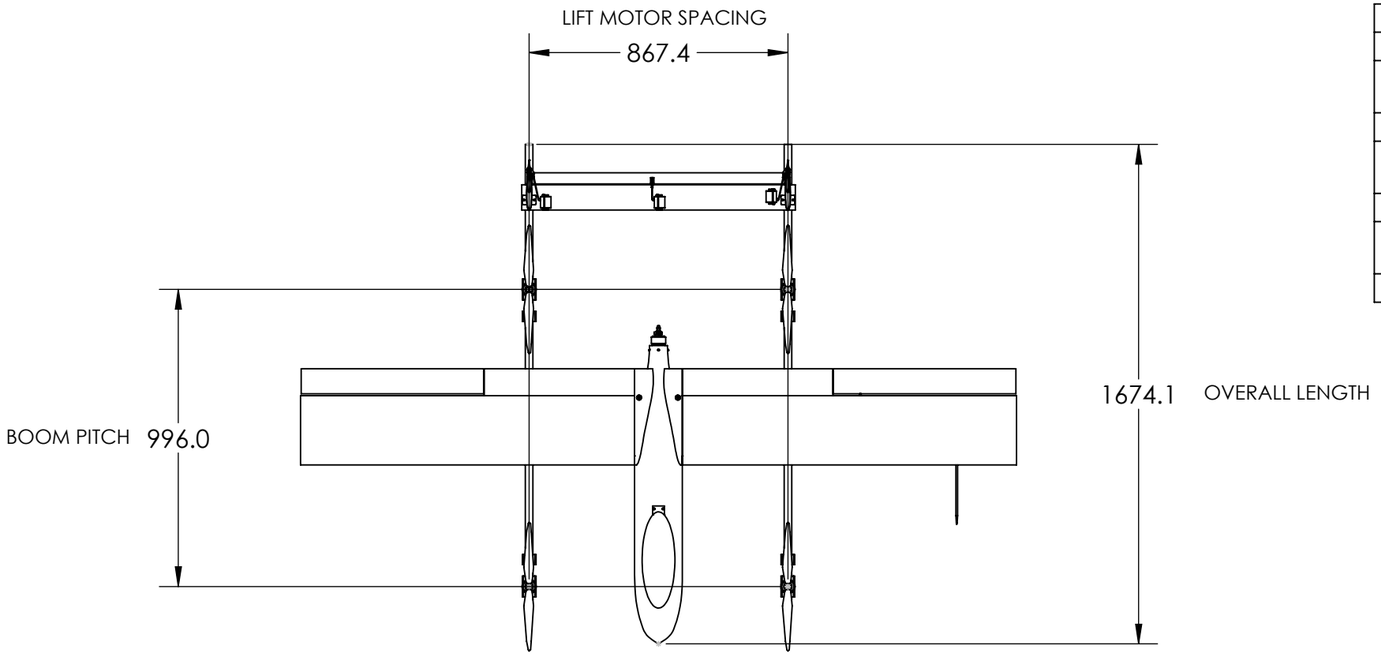
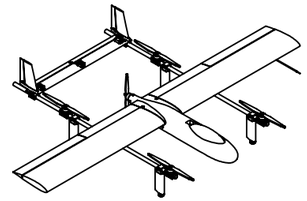
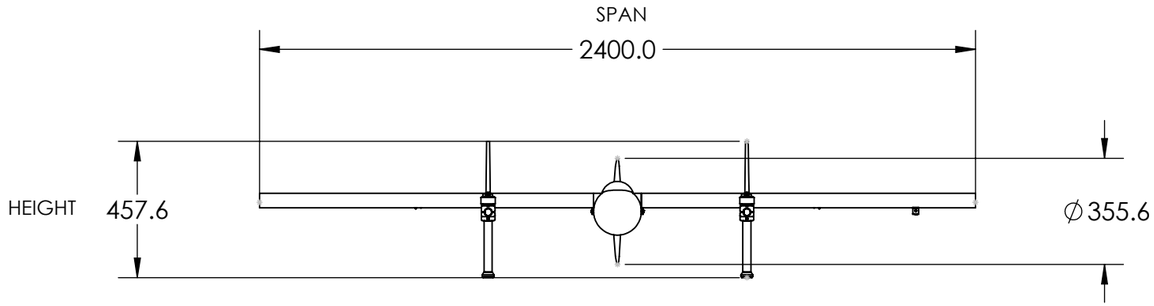
REV	DATE	DESCRIPTION	BY
A	2026-10-18	CONCEPT GEOMETRY FOR DESIGN REVIEW (v0.3.1), 5 SHEETS	DBF
B	2026-10-21	HARDWARE SPEC: SPLIT MOUNTS, CLAMPS, SPLICE, M5 BOLTS, RUDDERS, FASTENERS, TOLERANCES, SCHEDULE; 9 SHEETS	DBF
C	2026-10-23	DRAWING LAYOUT AND BALLOONING CORRECTED	DBF
D	2026-10-25	WING RESIZED FOR R11 STALL (CHORD 266.6, S 0.640 M2); SIZES FROM PARAMS	DBF
E	2026-10-25	WING RESIZED TO 11.75 M/S DESIGN STALL (CHORD 322.3, S 0.774 M2)	DBF
F	2026-11-03	CAD CLASHES CLEARED (CANOPY SLOTS, RUDDER CLEVIS, SPAR CHANNEL Ø26.0 FT05); FOAM TOLERANCE; JOINER COAXIALITY	DBF
G	2026-11-03	BATTERY WELL; BAY 225 (±30 CG SLIDE); TRAY 220; FC FWD	DBF



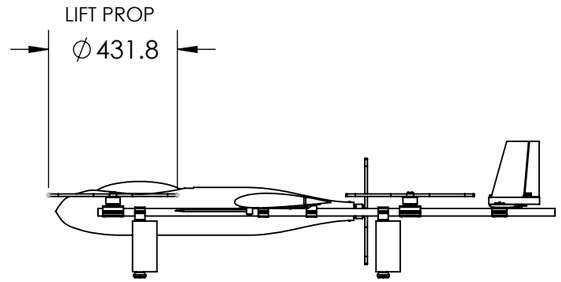
PLAN 1:20



ISOMETRIC 1:40



FRONT ELEVATION 1:20



SIDE ELEVATION 1:20

NOTES
1. DIMENSIONS IN MM, THIRD-ANGLE PROJECTION. PROPS SHOWN PARKED FORE-AFT (NOTIONAL: THE ESCs CANNOT PARK THEM).
2. SIZED CONCEPT, MTOW 7.44 kg, SPAN 2400 (analysis/results.json). EVERY FASTENER IS MODELLED: SHEETS 2, 3 AND 8.
3. TRANSPORT BREAKDOWN: 2 x M5 WING BOLTS, 8 x M3 BOOM-CLAMP SCREWS, 4 x M3 TAIL-SHOE SCREWS; THE JOINER SLIDES OUT OF THE SADDLE (SHEET 4).
4. NO PAYLOAD, NO BALLAST (R12): THE PACK STATION SETS THE CG AT 28 % MAC. PUSHER PROP GROUND CLEARANCE 45 mm.

GENERAL TOLERANCES	UNLESS NOTED
PRINTED PARTS (DESKTOP FDM)	±0.5 % OF SIZE, MIN ±0.5
CONTROLLED BORES, INSERT HOLES	FIT TABLE FT02 / FT03 / FT08 (hardware.json)
HOLE POSITION	Ø0.4; MOTOR PATTERN Ø0.2
CUT TUBES (ISO 2768-m), ANGLES	±0.5 (120–400), ±0.8 (400–1000), ±1.2 (>1000); ±1°
HOT-WIRED FOAM (XPS), EST	±0.5 SECTIONS, POCKETS, CHANNELS (FT05)

DESIGN-BUILD-FLY
UC BERKELEY CAPSTONE
REV G 2026-11-03
FIRST-ARTICLE M1–M7 APPLY

UNLESS OTHERWISE SPECIFIED:
DIMENSIONS IN MM
THIRD-ANGLE PROJECTION
TOLERANCES: SEE TABLE
FITS: hardware.json
INTERPRET GEOMETRIC TOLERANCING PER:
MATERIAL: SEE PARTS LIST
FINISH: SEE PARTS LIST
NEXT ASSY | USED ON
APPLICATION | DO NOT SCALE DRAWING

	NAME	DATE
DRAWN	DBF	2026-11-03
CHECKED	—	
ENG APPR.		
MFG APPR.		
Q.A.		
COMMENTS:		

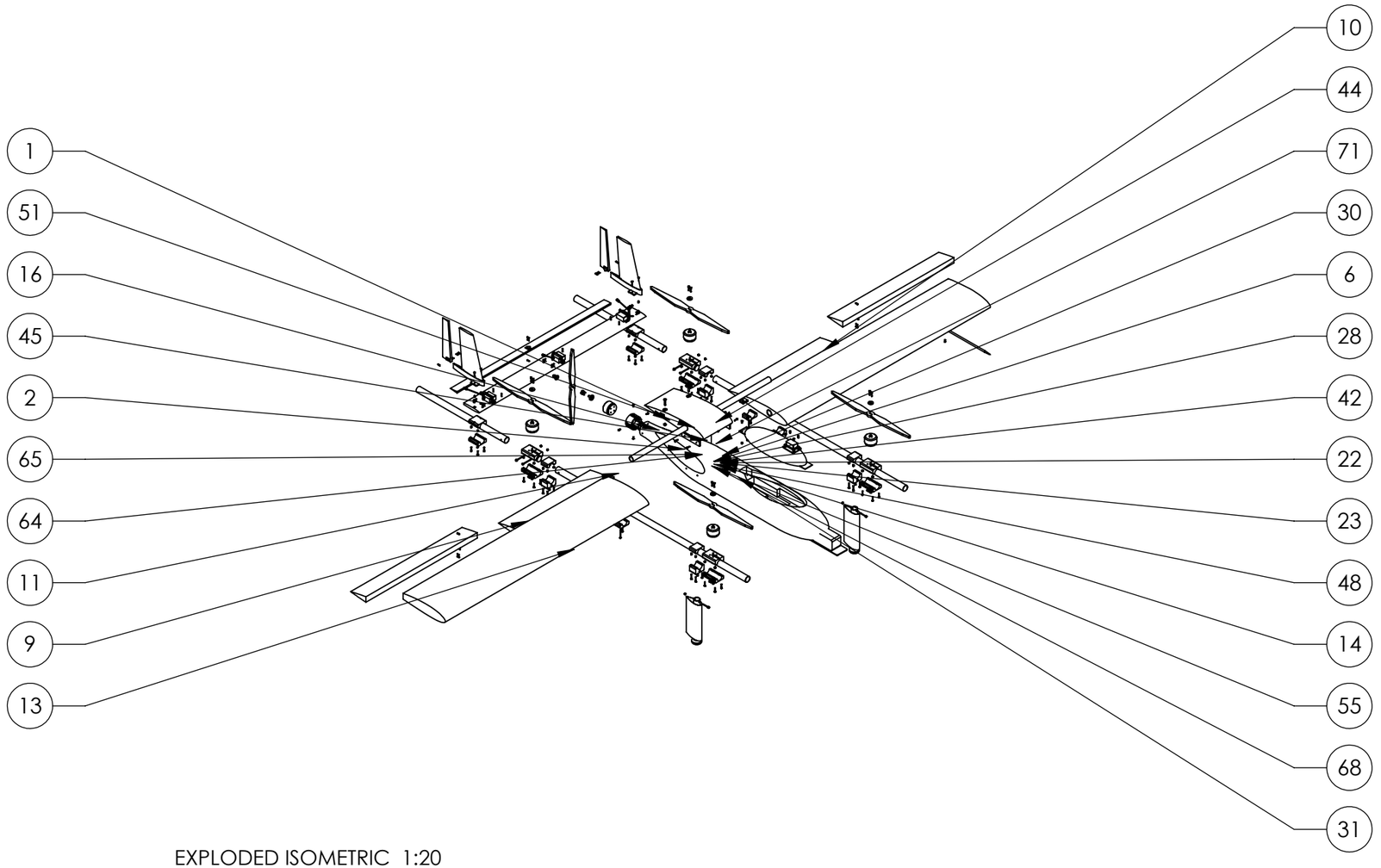
DESIGN-BUILD-FLY

TITLE:
LIFT + CRUISE VTOL
GENERAL ARRANGEMENT

SIZE	DWG. NO.	REV
B	DBF-DRW-001	G

SCALE: 1:20 | WEIGHT: | SHEET 1 OF 9

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EXPLODED ISOMETRIC 1:20

NOTES
1. EXPLODED LAYOUT (VTOL_Exploded.SLDASM): PARTS MOVED BY THE OFFSETS IN cad/params.mjs; FASTENERS PULLED 50 mm ALONG THEIR AXES.
2. ONE BALLOON PER MAJOR PART TYPE; ITEM NUMBERS ARE THOSE OF THE PARTS LIST (SHEET 3). FASTENERS, INSERTS AND SMALL PRINTED HARDPOINTS ARE NOT BALLOONED: SEE SHEETS 3, 8 AND 9.
3. JOINT IDs (J01–J20) AND FITS (FT01–FT11): docs/research/hardware-spec.md.

GENERAL TOLERANCES	UNLESS NOTED
PRINTED PARTS (DESKTOP FDM)	±0.5 % OF SIZE, MIN ±0.5
CONTROLLED BORES, INSERT HOLES	FIT TABLE FT02 / FT03 / FT08 (hardware.json)
HOLE POSITION	Ø0.4; MOTOR PATTERN Ø0.2
CUT TUBES (ISO 2768-m), ANGLES	±0.5 (120–400), ±0.8 (400–1000), ±1.2 (>1000); ±1°
HOT-WIRED FOAM (XPS), EST	±0.5 SECTIONS, POCKETS, CHANNELS (FT05)

DESIGN-BUILD-FLY
UC BERKELEY CAPSTONE
REV G 2026-11-03
FIRST-ARTICLE M1–M7 APPLY

		UNLESS OTHERWISE SPECIFIED:		NAME	DATE
		DIMENSIONS IN MM THIRD-ANGLE PROJECTION TOLERANCES: SEE TABLE FITS: hardware.json	DRAWN	DBF	2026-11-03
			CHECKED	—	
			ENG APPR.		
			MFG APPR.		
		INTERPRET GEOMETRIC TOLERANCING PER:	Q.A.		
		MATERIAL SEE PARTS LIST	COMMENTS:		
NEXT ASSY	USED ON	FINISH SEE PARTS LIST			
APPLICATION		DO NOT SCALE DRAWING			

DESIGN-BUILD-FLY

TITLE:
EXPLODED ASSEMBLY WITH BALLOONS

SIZE	DWG. NO.	REV
B	DBF-DRW-001	G

SCALE: 1:10 WEIGHT: SHEET 2 OF 9

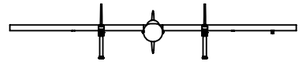
SOLIDWORKS Educational Product. For Instructional Use Only.

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	Fuselage_Pod	Fuselage pod 1.00 x 0.16 m, foam +…	1
2	Canopy	Avionics hatch blister (EST)	1
3	F07_M3x8_BHCS	ISO 7380-1 button head M3x0.5 x 8 A2…	11
4	I01_M3_Insert	ruthex RX-M3x5.7 heat-set insert OD…	67
5	Battery_Tray	Printed PETG battery tray 220 x 56 x 3…	1
6	Battery_6S_LiPo	6S 6500 mAh LiPo envelope (dims EST)…	1
7	FC_Tray	Printed PETG flight-controller tray 60…	1
8	Flight_Controller	CoreWing F405 Wing V2 envelope 52 x 32…	1
9	Wing_Panel_R	Right wing panel, NACA 2415 (EST), XPS…	1
10	Wing_Panel_L	Left wing panel, NACA 2415 (EST), XPS…	1
11	Aileron_R	Right aileron, 26 % chord, 55 % of…	1
12	Aileron_L	Left aileron, 26 % chord, 55 % of…	1
13	Spar_Tube	6061-T6 1.000 x 0.058 in spar socket…	2
14	Wing_Joiner	6061-T6 0.875 x 0.058 in joiner, 760 mm	1
15	Joiner_Stop	Printed PETG joiner stop 22.4 x 10…	2
16	Wing_Saddle	Wing centre-section saddle	1
17	Bolt_Pillar	Printed PETG wing-bolt pillar dia 16 x…	2
18	Root_Tongue	Printed PETG panel root tongue 20 x…	2
19	F09_M5x25_BHCS	ISO 7380-1 button head M5x0.8 x 25 A2…	2
20	N02_M5_Nylock	DIN 985 nylon-insert lock nut M5x0.8…	2
21	F08_M3x12_SHCS	ISO 4762 M3x0.5 x 12 A2 (18-8)…	4
22	Boom_Front	Front boom, 6061-T6 1.000 x 0.035 in…	2
23	Boom_Rear_Stub	Rear boom stub carrying the tail…	2
24	Splice_Plug	Printed PETG splice plug 23.2 x 80…	2
25	F04_M3x40_SHCS	ISO 4762 M3x0.5 x 40 A2 (18-8)…	8

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
26	W01_M3_Washer	DIN 125 (vendor) M3 flat washer OD 7…	28
27	N01_M3_Nylock	DIN 985 nylon-insert lock nut M3x0.5…	8
28	Motor_Mount_Upper	Printed PA6-CF motor mount, upper half…	4
29	Motor_Mount_Cap	Printed PA6-CF motor mount, lower cap…	4
30	Lift_Motor	SunnySky X4110S lift motor (envelope…	4
31	Lift_Prop	JeeFly 1755 carbon lift prop (planform…	4
32	Prop_Plate	X4110S prop holding plate dia 20 x…	4
33	F02_M3x16_SHCS	ISO 4762 M3x0.5 x 16 A2 (18-8)…	36
34	F01_M3x8_SHCS	ISO 4762 M3x0.5 x 8 A2 (18-8) stainless	20
35	Boom_Clamp_F_Upper	Printed PETG front boom clamp, upper…	2
36	Boom_Clamp_F_Lower	Printed PETG front boom clamp, lower…	2
37	Boom_Clamp_R_Upper	Printed PETG rear boom clamp, upper…	2
38	Boom_Clamp_R_Lower	Printed PETG rear boom clamp, lower…	2
39	Spar_Collar	Printed PETG spar collar 32 x 46…	2
40	Rear_Hardpoint	Printed PETG rear wing hardpoint 60 x…	2
41	F06_M3x35_SHCS	ISO 4762 M3x0.5 x 35 A2 (18-8)…	4
42	Gear_Clamp_Upper	Printed PETG gear clamp, upper half…	4
43	Gear_Clamp_Lower	Printed PETG gear clamp, lower half…	4
44	Landing_Leg	Gear leg: 6061 1.000 x 0.058 in offcut…	4
45	Gear_Fairing	Printed PETG landing-leg fairing	4
46	F03_M3x20_SHCS	ISO 4762 M3x0.5 x 20 A2 (18-8)…	16
47	F05_M3x30_SHCS	ISO 4762 M3x0.5 x 30 A2 (18-8)…	4
48	Tail_Clamp_Upper	Printed PETG tail clamp, upper half…	2
49	Tail_Clamp_Cap	Printed PETG tail clamp, lower cap…	2
50	Fin_Shoe	Printed PETG fin root shoe	2

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
51	Fin	Vertical fin, NACA 0009, lofted taper…	2
52	Rudder	Rudder, 30 % of the local fin chord (2…	2
53	Crush_Sleeve	Printed PETG crush sleeve 7 x 3.4 x…	4
54	Servo_Tray	Printed PETG servo tray (L-bracket)	5
55	Servo	EMAX ES3005HV servo 38.6 x 18.8 x 34.9…	5
56	F10_M2x10_SHCS	ISO 4762 M2x0.4 x 10 A2 (18-8)…	20
57	N03_M2_Hex_Nut	DIN 934 hex nut M2x0.4, s 4 h 1.6	30
58	Control_Horn	Nylon control horn 11 x 11 x 20 from…	5
59	Horn_Backplate	Kit horn backplate 20 x 11 x 1.5 (EST)…	3
60	F11_M2x14_PAN	— M2x0.4 x 14 —: Control-horn screws…	10
61	Pushrod_Rudder	Du-Bro 230 2-56 pushrod cut to 88 mm…	2
62	Horn_Hardpoint	Printed PETG aileron horn hardpoint 20…	2
63	Pushrod_Aileron	Du-Bro 230 2-56 pushrod cut to 56 mm…	2
64	H_Tail	Horizontal stabiliser, NACA 0009…	1
65	Elevator	Elevator, 30 % chord, NACA 0009, tape…	1
66	Pushrod_Elevator	Du-Bro 230 2-56 pushrod cut to 56 mm…	1
67	Pusher_Cup	Printed PA6-CF pusher motor cup dia…	1
68	Pusher_Motor	SunnySky X4110S pusher motor, same…	1
69	Pusher_Adapter	X4110S bolt-on prop adapter, supplied	1
70	F13_M3x8_SHCS	— M3x0.5 x 8 — (supplied)	4
71	Pusher_Prop_14in	APC 14 x 8.5EP pusher prop (planform…	1
72	Prop_Washer	Pusher prop washer dia 17.8 x 2.5, dia…	1
73	N04_M6_Bullet_Nut	M6 x 1.0 bullet prop nut, supplied…	1
74	Pitot_Tube	Pitot probe under the left wing…	1
75	Pitot_Clamp	Printed PETG pitot clamp 20 x 20 x…	1

NOTES
1. ITEM NUMBERS ARE THE BALLOONS OF SHEET 2; QTY IS PER AIRCRAFT. FASTENERS, NUTS, WASHERS AND INSERTS ARE ONE LINE PER TYPE.
2. PART NUMBER = SOLIDWORKS FILE (cad/model). FASTENER IDs F01–F13, N01–N04, W01, I01 ARE THOSE OF cad/hardware.json AND SHEET 8. FULL DESCRIPTIONS: PART FILE PROPERTIES.
3. PURCHASED ITEMS, PRICES AND VENDORS: docs/purchasing/C0_BOM.csv.
4. MATERIALS: 6061-T6 TUBES; A2 STAINLESS FASTENERS; BRASS INSERTS; PETG PRINTS EXCEPT MOTOR MOUNTS AND PUSHER CUP IN PA6-CF; XPS FOAM.



REFERENCE: FRONT ELEVATION 1:50

GENERAL TOLERANCES	UNLESS NOTED
PRINTED PARTS (DESKTOP FDM)	±0.5 % OF SIZE, MIN ±0.5
CONTROLLED BORES, INSERT HOLES	FIT TABLE FT02 / FT03 / FT08 (hardware.json)
HOLE POSITION	Ø0.4; MOTOR PATTERN Ø0.2
CUT TUBES (ISO 2768-m), ANGLES	±0.5 (120–400), ±0.8 (400–1000), ±1.2 (>1000); ±1°
HOT-WIRED FOAM (XPS), EST	±0.5 SECTIONS, POCKETS, CHANNELS (FT05)

DESIGN-BUILD-FLY
UC BERKELEY CAPSTONE
REV G 2026-11-03
FIRST-ARTICLE M1–M7 APPLY

NEXT ASSY | USED ON
APPLICATION

UNLESS OTHERWISE SPECIFIED:
DIMENSIONS IN MM
THIRD-ANGLE PROJECTION
TOLERANCES: SEE TABLE
FITS: hardware.json
INTERPRET GEOMETRIC TOLERANCING PER:
MATERIAL SEE PARTS LIST
FINISH SEE PARTS LIST
DO NOT SCALE DRAWING

	NAME	DATE
DRAWN	DBF	2026-11-03
CHECKED	—	
ENG APPR.		
MFG APPR.		
Q.A.		

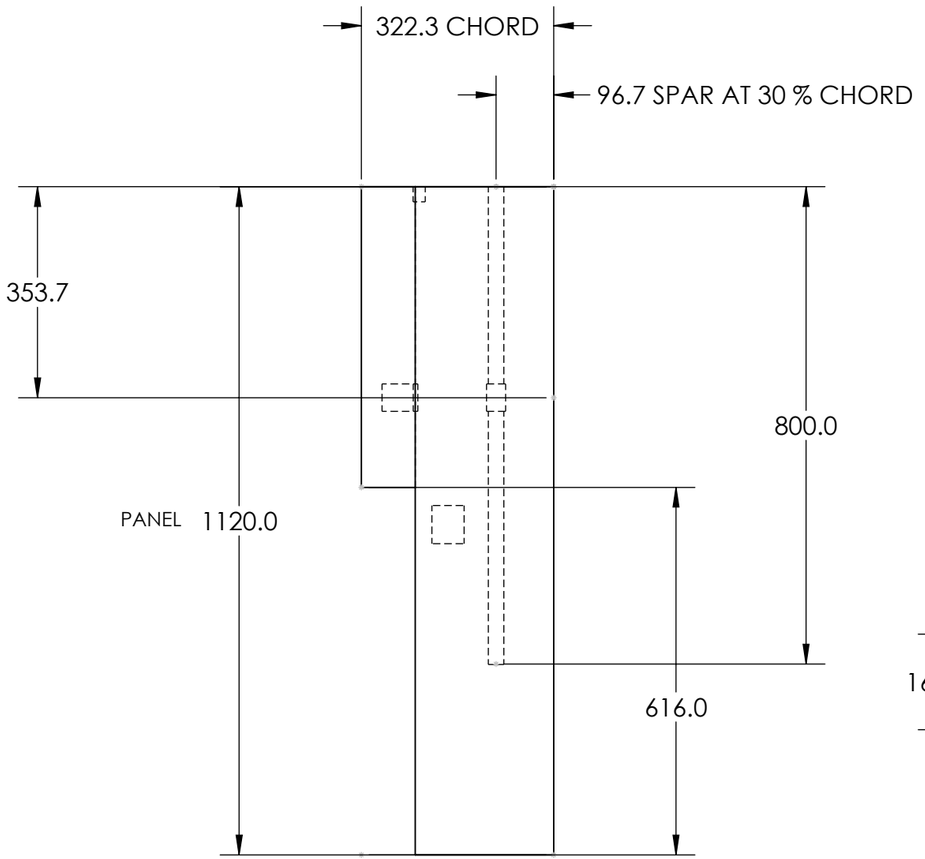
COMMENTS:

DESIGN-BUILD-FLY

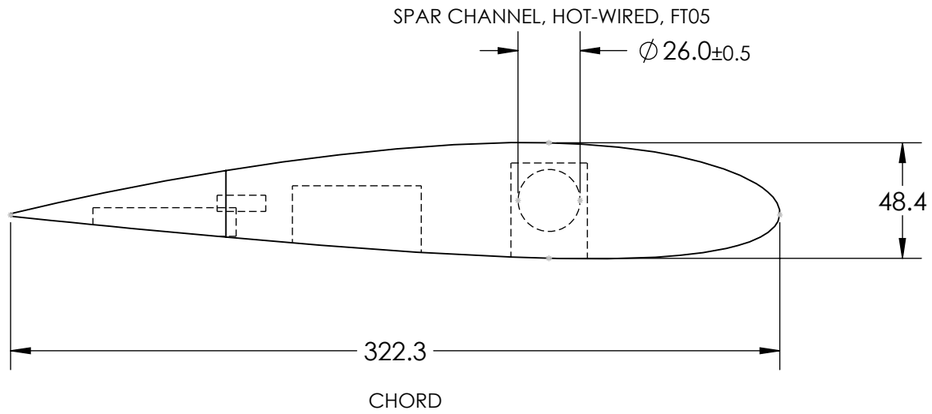
TITLE:
LIFT + CRUISE VTOL
PARTS LIST

SIZE B | DWG. NO. DBF-DRW-001 | REV G
SCALE: 1:50 | WEIGHT: | SHEET 3 OF 9

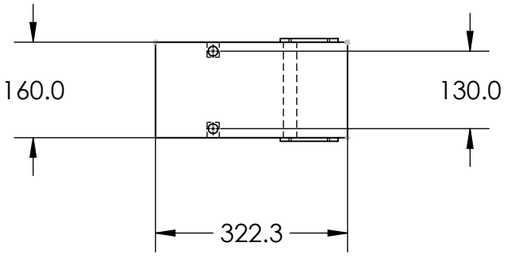
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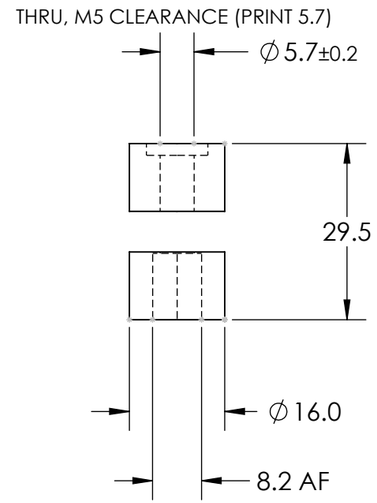
WING PANEL, RIGHT (LEFT IS MIRROR) 1:10



ROOT SECTION 1:2.5



WING SADDLE 1:10



BOLT PILLAR 1:1

JOINER AT 30 % CHORD

SADDLE SECTION 1:2.5

NOTES
1. NACA 2415, XPS CORE, PACKING-TAPE SKIN. AILERON 26 % CHORD, 2 % HINGE GAP, OUTER 55 % OF SPAN (616 DIM). SPAR SOCKET 800 DIM, BOOM STATION 353.7 FROM THE ROOT, ROOT THICKNESS 48.4 AT 30 % CHORD. SADDLE: 2X BOLT PILLARS ∅16 IN ∅16.4 BORES AT 130 (DIM), 70 % CHORD.
2. SPAR SOCKET 1.000 x 0.058 in 6061-T6 BONDED 800 mm INTO THE ROOT AT 30 % CHORD IN A ∅26.0 ±0.5 HOT-WIRED CHANNEL (FT05, FOAM-SAFE GLUE).
3. JOINER 0.875 x 0.058 in, 760 mm: SLIP FIT IN THE SOCKETS (FT01, -0.08/+0.53 DIAMETRAL, MEASURE M1) AND THE SADDLE (FT06); NOT BONDED, CAPTURED BY TWO PRINTED STOPS 300 mm INSIDE THE SOCKETS.
4. WING BOLT J10: F09 ISO 7380 M5 x 25 THROUGH THE PILLAR AND THE ROOT TONGUE (SHEET 9) INTO N02 M5 NYLOCK, 1.0 N·m EST; HEAD IN A ∅10.3 x 2.0 SPOT-FACE; NUT POCKET 8.2 AF x 11.1 FROM THE LOWER SURFACE (SCREW END 3.5 PAST THE NUT NOMINAL, >= 2 THREADS WORST CASE; POCKET NOT ABOVE THE TONGUE-SLOT FLOOR).
5. PANEL POCKETS (SPAR COLLAR, REAR HARDPOINT, SERVO TRAY, TONGUE, PITOT CLAMP) CUT TO THE PART OUTLINES OF SHEET 9, BONDED WITH FOAM-SAFE GLUE.
6. SADDLE TABS: 2 x F08 M3 x 12 PER SIDE INTO RX-M3x5.7 INSERTS IN THE POD FRAME RAILS (J11).
7. JOINER BORE COAXIAL TO BOTH SPAR SOCKETS ∅0.4 (EST, < FT01 + FT06 NOMINAL CLEARANCE 0.46): DRY-FIT THE JOINER THROUGH SADDLE AND SOCKETS BEFORE BONDING.

GENERAL TOLERANCES	UNLESS NOTED
PRINTED PARTS (DESKTOP FDM)	±0.5 % OF SIZE, MIN ±0.5
CONTROLLED BORES, INSERT HOLES	FIT TABLE FT02 / FT03 / FT08 (hardware.json)
HOLE POSITION	Ø0.4; MOTOR PATTERN Ø0.2
CUT TUBES (ISO 2768-m), ANGLES	±0.5 (120–400), ±0.8 (400–1000), ±1.2 (>1000); ±1°
HOT-WIRED FOAM (XPS), EST	±0.5 SECTIONS, POCKETS, CHANNELS (FT05)

DESIGN-BUILD-FLY
UC BERKELEY CAPSTONE
REV G 2026-11-03
FIRST-ARTICLE M1–M7 APPLY

UNLESS OTHERWISE SPECIFIED:
DIMENSIONS IN MM
THIRD-ANGLE PROJECTION
TOLERANCES: SEE TABLE
FITS: hardware.json
INTERPRET GEOMETRIC TOLERANCING PER:
MATERIAL: SEE PARTS LIST
FINISH: SEE PARTS LIST
NEXT ASSY | USED ON
APPLICATION
DO NOT SCALE DRAWING

	NAME	DATE
DRAWN	DBF	2026-11-03
CHECKED	—	
ENG APPR.		
MFG APPR.		
Q.A.		
COMMENTS:		

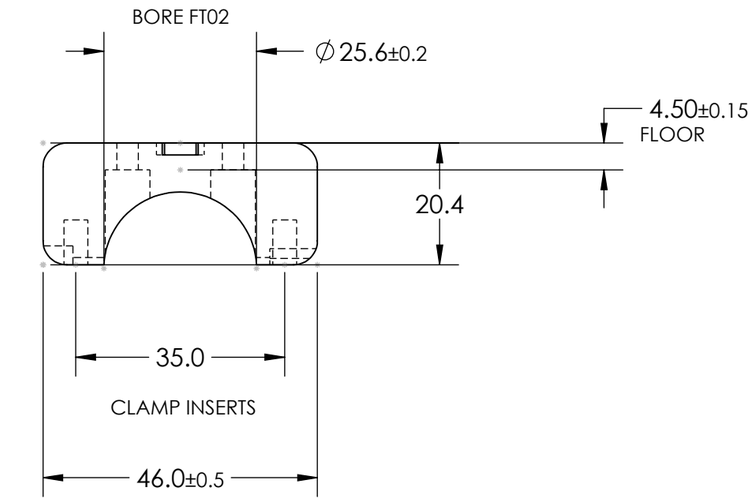
DESIGN-BUILD-FLY

TITLE: WING PANEL, SADDLE AND WING BOLT

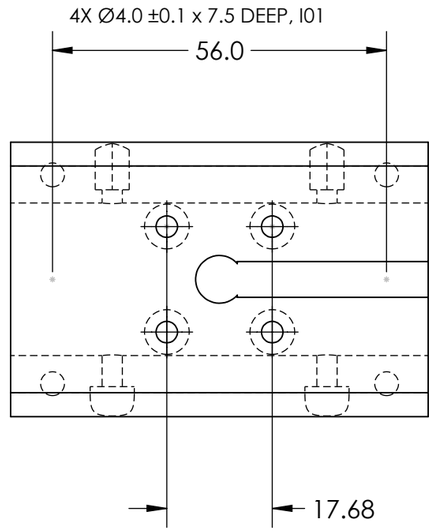
SIZE B | DWG. NO. DBF-DRW-001 | REV G

SCALE: 1:10 | WEIGHT: | SHEET 4 OF 9

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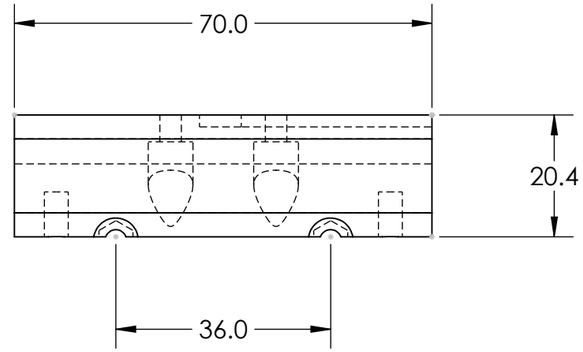


UPPER HALF, SECTION 1:1



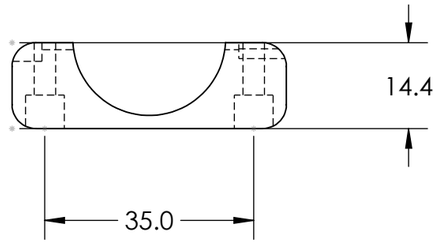
4X Ø3.4 THRU ON Ø25 B.C., POS Ø0.2

UPPER HALF, TOP 1:1

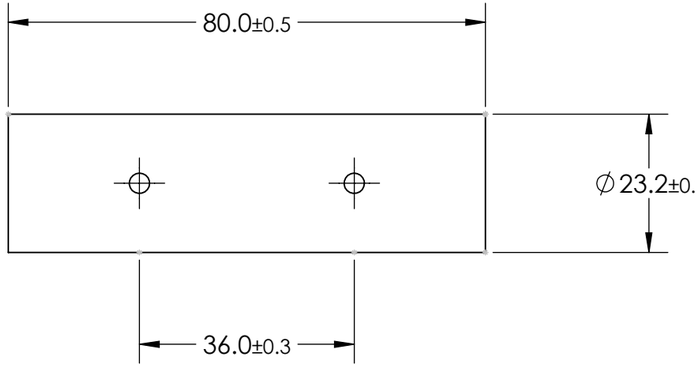


2X Ø3.4 THRU Z, SPLICE J04

UPPER HALF, SIDE 1:1

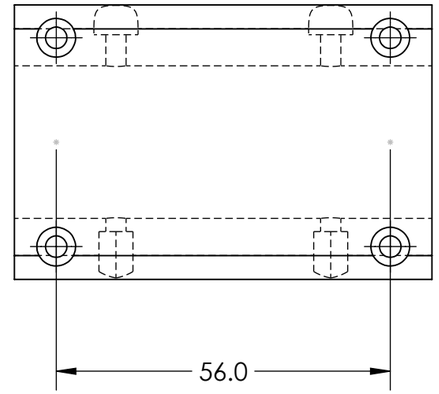


CAP, SECTION 1:1



2X Ø3.4 THRU

SPLICE PLUG 1:1



4X Ø3.4 THRU, CBORE Ø6.5 x 5.6

CAP, BOTTOM 1:1

NOTES
1. PA6-CF (HDT 173 °C), 4 UPPER HALVES + 4 CAPS. BORES PRINTED 0.2 UNDER (COUPON M2), REAMED TO 25.6 ±0.2 (FT02). SPLIT GAP 1.2 (0.6 EACH HALF).
2. J01 MOTOR: 4X F01 M3 x 8 + W01 FROM INSIDE THE BORE BEFORE THE HALVES CLOSE (CBORE ∅7.5 FROM THE BORE SIDE, HOLES DRILLED 3.4 AFTER PRINTING); ENGAGEMENT 3.0, LIMIT 3.3 (M4); 0.6 N·m EST, LOCTITE 242.
3. J02 CLAMP: 4X F02 M3 x 16 FROM BELOW INTO THE INSERTS, 0.5 N·m EST, NO THREADLOCKER, WITNESS MARK.
4. J04 SPLICE (REAR STATION): BOOMS BUTT AT THE MOUNT CENTRE OVER THE PLUG; 2X F04 M3 x 40 + W01 + N01 ALONG Z AT x ±18, HEAD CBORE ∅7.5 x 5.0 (+Z), NUT POCKET 5.7 AF x 8.0 (-Z); DRILL BOTH TUBE WALLS ∅3.4 THROUGH THE MOUNT, ±0.3.
5. WIRE GROOVE 6 x 2 ON THE TOP FACE TOWARDS +X; CENTRE RELIEF ∅8 x 2 FOR THE MOTOR BOSS.

GENERAL TOLERANCES	UNLESS NOTED
PRINTED PARTS (DESKTOP FDM)	±0.5 % OF SIZE, MIN ±0.5
CONTROLLED BORES, INSERT HOLES	FIT TABLE FT02 / FT03 / FT08 (hardware.json)
HOLE POSITION	Ø0.4; MOTOR PATTERN Ø0.2
CUT TUBES (ISO 2768-m), ANGLES	±0.5 (120–400), ±0.8 (400–1000), ±1.2 (>1000); ±1°
HOT-WIRED FOAM (XPS), EST	±0.5 SECTIONS, POCKETS, CHANNELS (FT05)

DESIGN-BUILD-FLY
UC BERKELEY CAPSTONE
REV G 2026-11-03
FIRST-ARTICLE M1–M7 APPLY

		UNLESS OTHERWISE SPECIFIED:		NAME	DATE
		DIMENSIONS IN MM THIRD-ANGLE PROJECTION TOLERANCES: SEE TABLE FITS: hardware.json	DRAWN	DBF	2026-11-03
			CHECKED	—	
			ENG APPR.		
			MFG APPR.		
		INTERPRET GEOMETRIC TOLERANCING PER:	Q.A.		
		MATERIAL SEE PARTS LIST	COMMENTS:		
NEXT ASSY	USED ON	FINISH SEE PARTS LIST			
APPLICATION		DO NOT SCALE DRAWING			

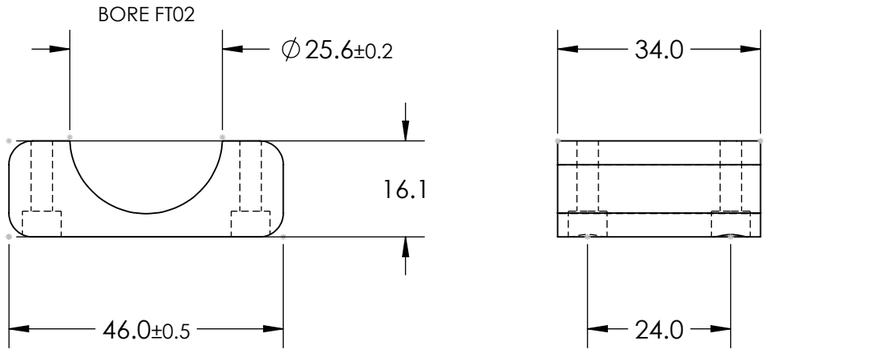
DESIGN-BUILD-FLY

TITLE:
MOTOR MOUNT
AND BOOM SPLICE

SIZE	DWG. NO.	REV
B	DBF-DRW-001	G

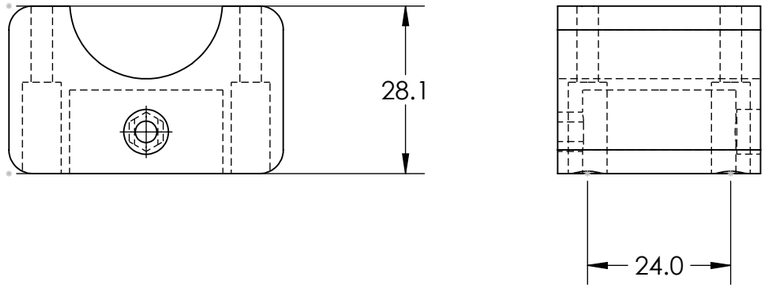
SCALE: 1:1 | WEIGHT: | SHEET 5 OF 9

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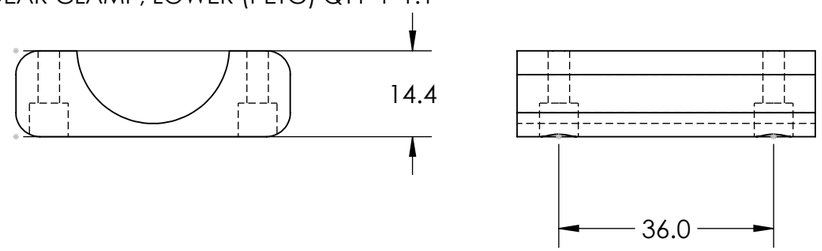
2X Ø3.4 THRU, CBORE Ø6.5 x 4.3 (FRONT) / x 7.5 (REAR)

FRONT / REAR BOOM CLAMP, LOWER (PETG) QTY 2 + 2 1:1

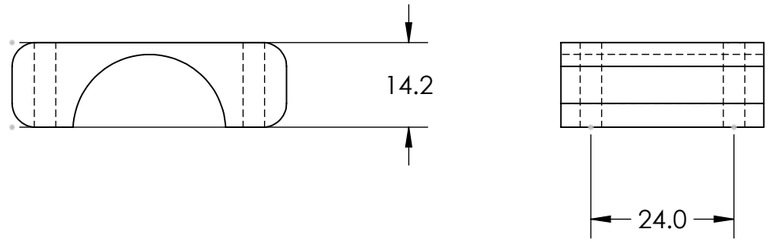


4X Ø3.4, CBORE Ø6.5 x 15.3

GEAR CLAMP, LOWER (PETG) QTY 4 1:1

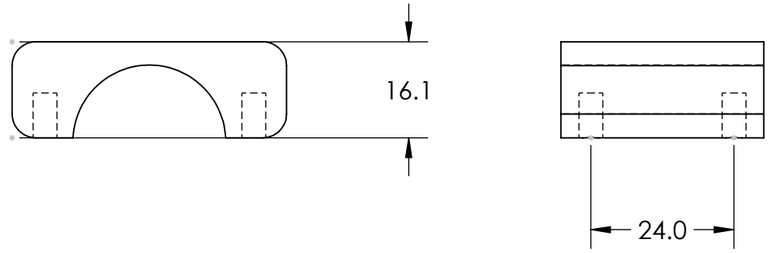


4X Ø3.4, CBORE Ø6.5 x 5.6



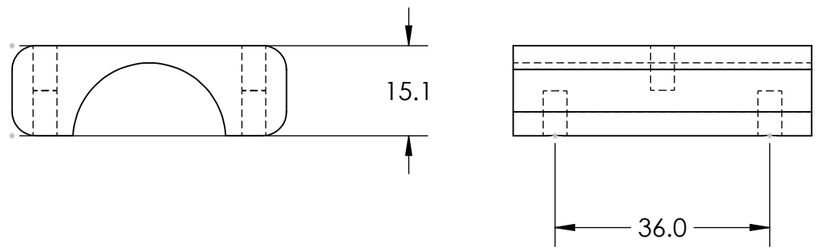
2X Ø3.4 THRU, DIAGONAL

FRONT BOOM CLAMP, UPPER (PETG) QTY 2 1:1



4X Ø4.0 ±0.1 x 7.5 DEEP, I01

GEAR CLAMP, UPPER (PETG) QTY 4 1:1



4X Ø4.0 x 7.5 DEEP (I01), 2 FROM TOP

TAIL CLAMP, CAP (PETG) QTY 2 1:1

TAIL CLAMP, UPPER (PETG) QTY 2 1:1

NOTES
1. EACH PAIR: SECTION THROUGH THE BORE (LEFT), SIDE ALONG THE BOOM (RIGHT). ALL CLAMPS 46 WIDE, BORE ∅25.6 ±0.2 (FT02) PRINTED 0.2 UNDER AND REAMED, SPLIT GAP 1.2; BOOM AND GEAR CLAMPS 34 LONG, TAIL CLAMPS 50.
2. REAR BOOM CLAMP UPPER = FRONT UPPER, TOP AT 26.0; REAR LOWER = FRONT LOWER WITH THE DEEPER COUNTERBORE.
3. SCREWS, TORQUES, THREADLOCKER: SHEET 8 (J05 F06 / F04 ON A DIAGONAL INTO THE WING INSERTS, FIELD BREAKDOWN; J06 F03; J08 F02). LEG SOCKET AND J07 CROSS-BOLT: SHEET 7.

GENERAL TOLERANCES	UNLESS NOTED
PRINTED PARTS (DESKTOP FDM)	±0.5 % OF SIZE, MIN ±0.5
CONTROLLED BORES, INSERT HOLES	FIT TABLE FT02 / FT03 / FT08 (hardware.json)
HOLE POSITION	Ø0.4; MOTOR PATTERN Ø0.2
CUT TUBES (ISO 2768-m), ANGLES	±0.5 (120–400), ±0.8 (400–1000), ±1.2 (>1000); ±1°
HOT-WIRED FOAM (XPS), EST	±0.5 SECTIONS, POCKETS, CHANNELS (FT05)

DESIGN-BUILD-FLY
UC BERKELEY CAPSTONE
REV G 2026-11-03
FIRST-ARTICLE M1–M7 APPLY

		UNLESS OTHERWISE SPECIFIED:		NAME	DATE
		DIMENSIONS IN MM THIRD-ANGLE PROJECTION TOLERANCES: SEE TABLE FITS: hardware.json	DRAWN	DBF	2026-11-03
			CHECKED	—	
			ENG APPR.		
			MFG APPR.		
		INTERPRET GEOMETRIC TOLERANCING PER:	Q.A.		
		MATERIAL SEE PARTS LIST	COMMENTS:		
NEXT ASSY	USED ON	FINISH SEE PARTS LIST			
APPLICATION		DO NOT SCALE DRAWING			

DESIGN-BUILD-FLY

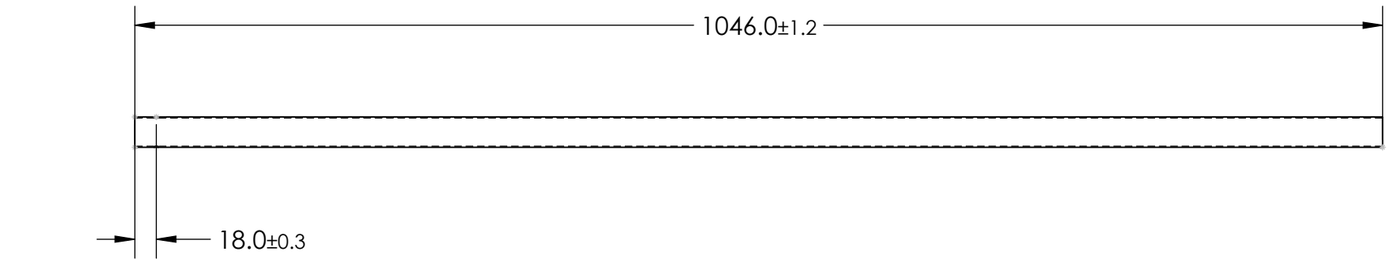
TITLE:
BOOM, GEAR AND TAIL CLAMPS

SIZE	DWG. NO.	REV
B	DBF-DRW-001	G

SCALE: 1:1 | WEIGHT: | SHEET 6 OF 9

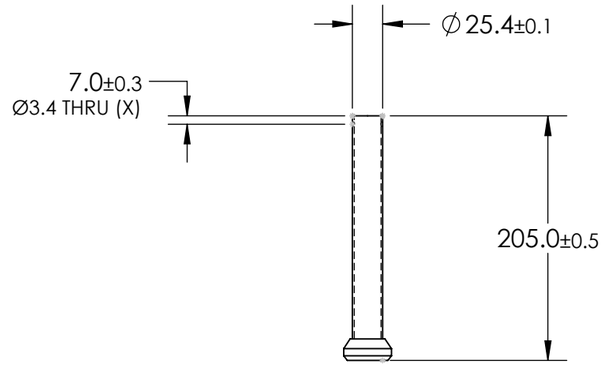
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ITEM	PART	STOCK (6061-T6)	CUT LENGTH mm	TOL mm (ISO 2768-m)	QTY	HOLES
T01	Wing spar socket	1.000 x 0.058 in	800.0	±0.8	2	none; bonded in the panel (FT05)
T02	Wing joiner	0.875 x 0.058 in	760.0	±0.8	1	none; slip fit FT01/FT06, lap if tight
T03	Front boom	1.000 x 0.035 in	1046.0	±1.2	2	1 x Ø3.4 cross hole (Z) 18 ±0.3 from the splice end, drilled through the mount
T04	Rear boom stub	1.000 x 0.035 in	485.9	±0.8	2	1 x Ø3.4 cross hole (Z) 18 ±0.3 from the splice end
T05	Landing leg	1.000 x 0.058 in	205.0	±0.5	4	1 x Ø3.4 cross hole (X) 7 ±0.3 from the top end, drilled through the gear clamp

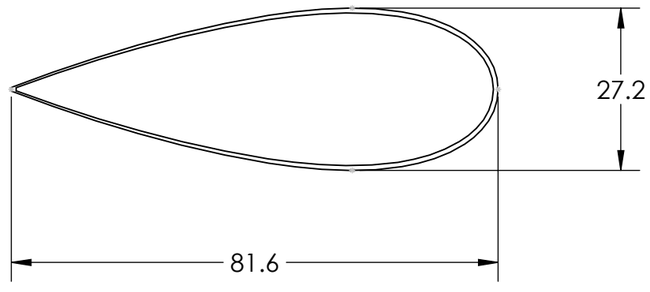


Ø3.4 THRU (Z), SPLICE BOLT

FRONT BOOM, SPLICE END AT LEFT 1:5

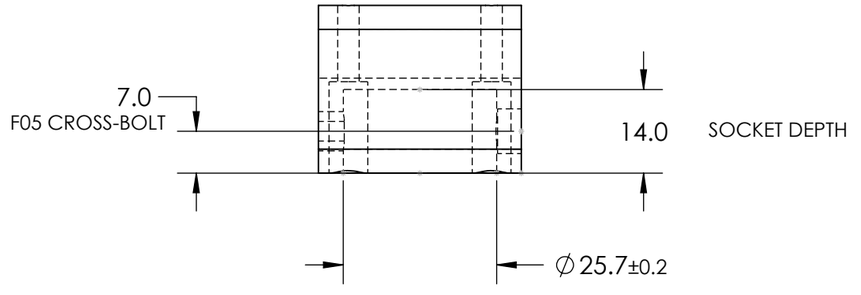


LANDING LEG 1:5



CHORD

LEG FAIRING SECTION (PETG, 170 LONG) QTY 4 1:1



BLIND SOCKET FT03

LEG SOCKET IN THE GEAR CLAMP LOWER (SHEET 6) 1:1

NOTES
1. LEGS ARE CUT FROM THE SPAR-SOCKET TUBE OFFCUT: 2 x 800 + 4 x 205 = 2420 mm OF A 96 in (2438 mm) LENGTH. BOOMS: 2 x (1046.0 + 485.9) = 3064 mm FROM TWO 72 in LENGTHS.
2. END SQUARENESS 0.5 (EST). DEBURR ALL CUT ENDS AND HOLES. TUBE OD ±0.10, WALL ±0.05 (VENDOR, HS §5a): MEASURE ON RECEIPT (M1).
3. BOOMS BUTT AT THE REAR MOTOR MOUNT CENTRE OVER THE PRINTED SPLICE PLUG (SHEET 5). LEG: J07 F05 M3 x 30 + W01 + N01 CROSS-BOLT, HEAD CBORE ∅7.5 x 4.0, NUT POCKET 5.7 AF x 4.3; LEG DRILLED ∅3.4 THROUGH THE CLAMP.
4. LEG FAIRINGS: 3:1 TEARDROP (NACA 0033) SLIPPED OVER EACH LEG, TRAILING EDGE AFT, VASE-MODE 0.8 mm WALL (EST), CLOCKED AGAINST THE GEAR CLAMP AND TAPED; NO FASTENERS (DRAG: analysis/aero/aero_results.json).

GENERAL TOLERANCES	UNLESS NOTED
PRINTED PARTS (DESKTOP FDM)	±0.5 % OF SIZE, MIN ±0.5
CONTROLLED BORES, INSERT HOLES	FIT TABLE FT02 / FT03 / FT08 (hardware.json)
HOLE POSITION	Ø0.4; MOTOR PATTERN Ø0.2
CUT TUBES (ISO 2768-m), ANGLES	±0.5 (120–400), ±0.8 (400–1000), ±1.2 (>1000); ±1°
HOT-WIRED FOAM (XPS), EST	±0.5 SECTIONS, POCKETS, CHANNELS (FT05)

DESIGN-BUILD-FLY
UC BERKELEY CAPSTONE
REV G 2026-11-03
FIRST-ARTICLE M1–M7 APPLY

UNLESS OTHERWISE SPECIFIED:
DIMENSIONS IN MM
THIRD-ANGLE PROJECTION
TOLERANCES: SEE TABLE
FITS: hardware.json
INTERPRET GEOMETRIC TOLERANCING PER:
MATERIAL: SEE PARTS LIST
FINISH: SEE PARTS LIST
NEXT ASSY | USED ON
APPLICATION
DO NOT SCALE DRAWING

	NAME	DATE
DRAWN	DBF	2026-11-03
CHECKED	—	
ENG APPR.		
MFG APPR.		
Q.A.		
COMMENTS:		

DESIGN-BUILD-FLY

TITLE: TUBE CUT LIST AND LANDING LEG

SIZE	DWG. NO.	REV
B	DBF-DRW-001	G

SCALE: 1:2 | WEIGHT: | SHEET 7 OF 9

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ID	STANDARD	SIZE	QTY	ORDER	JOINTS	TORQUE N·m	THREADLOCKER	VENDOR / PART NO.
F01	ISO 4762 (DIN 912)	M3x0.5 x 8	20	30	J01, J12	0.6	Loctite 242, one drop on the last 2-3 threads only; keep off the PA6-CF (TDS	Bolt Depot 6379
F02	ISO 4762 (DIN 912)	M3x0.5 x 16	36	50	J02, J08, J09, J03	0.5	none (brass insert in plastic); witness mark	Bolt Depot 6382
F03	ISO 4762 (DIN 912)	M3x0.5 x 20	16	24	J06	0.5	none	Bolt Depot 6383
F04	ISO 4762 (DIN 912)	M3x0.5 x 40	8	12	J04, J05b	0.5	none (nylock)	Bolt Depot 6387
F05	ISO 4762 (DIN 912)	M3x0.5 x 30	4	8	J07	0.5	none (nylock)	Bolt Depot 6385
F06	ISO 4762 (DIN 912)	M3x0.5 x 35	4	8	J05a	0.5	none	Bolt Depot 6386
F07	ISO 7380-1 button head (vendor lists no standard	M3x0.5 x 8	11	20	J12, J13, J16, J15	0.4	none	Bolt Depot 7219
F08	ISO 4762 (DIN 912)	M3x0.5 x 12	4	12	J11	0.5	none	Bolt Depot 6381
F09	ISO 7380-1 button head (vendor lists no standard	M5x0.8 x 25	2	6	J10	0.5	none (nylock)	Bolt Depot 6636
F10	ISO 4762 (DIN 912)	M2x0.4 x 10	20	30	J14	0.15	none	Bolt Depot 6365
F11	— (supplier states M2x14 only)	M2x0.4 x 14	10	0	J17	0.15	none (nylon horn)	Amazon (kit item 7) B0B58ZSC8J
F12	ISO 4762 (DIN 912)	M3x0.5 x 16	8	0	J03	0.8	Loctite 242 on the screw tip (metal into motor hub)	Bolt Depot (from F02 or F08 stock) 6382 / 6381
F13	— (supplied; ISO 4762 geometry assumed in the CAD)	M3x0.5 x 8	4	0	J03b	0.8	Loctite 242 (metal to metal)	SunnySky (in motor box) —
I01	ruthex RX-M3x5.7	M3 x 5.7	67	100	J02 J03b J05 J06 J08 J09 J11 J12 J13 J15 J16	—	—	Amazon (ruthex) B08BCRZZS3
N01	DIN 985 nylon-insert lock nut (vendor	M3x0.5 x 4	8	16	J04, J07	—	—	Bolt Depot 4792
N02	DIN 985 nylon-insert lock nut	M5x0.8 x 5	2	6	J10	—	—	Bolt Depot 4794
N03	DIN 934 hex nut	M2x0.4 x 1.6	30	100	J14, J17	—	—	Bolt Depot 7362
N04	M6x1.0 bullet (acorn) prop nut, supplied with motor	M6x1.0 x 19.5	1	0	J03b	—	—	SunnySky (in motor box) —
W01	DIN 125 (vendor)	M3 7 x 0.5	28	100	J01, J12, J04, J07	—	—	Bolt Depot 4513

NOTES
(docs/research/hardware-spec.md §2d, §4)
1. QTY PER AIRCRAFT; ORDER INCLUDES SPARES. F12 PROP SCREWS AND F13 ADAPTER SCREWS: LENGTH PROVISIONAL, CHECK M5 (HUB THICKNESS NOT PUBLISHED).
2. TORQUES MARKED EST IN THE SPEC: CONFIRM INSERT TORQUE-OUT >= 2x ON A COUPON (M3). NO TORQUE DRIVER ON HAND: HANG A KNOWN MASS FROM THE HEX KEY, T = m g L (0.6 N·m = 1.02 kg AT L 60 mm; 0.5 N·m = 0.85 kg; 1.0 N·m = 1.70 kg).
3. LOCTITE 242 ONLY ON METAL-TO-METAL THREADS (F01 MOTOR BASE, F12/F13 HUB SCREWS), ONE DROP ON THE LAST 2–3 THREADS, KEPT OFF THE PA6-CF. NEVER ON NYLOCKS.
4. SCREWS IN BRASS INSERTS GET NO THREADLOCKER: TORQUE, THEN A PAINT WITNESS MARK CHECKED PRE-FLIGHT. REPLACE A NYLOCK THAT TURNS BY HAND.
5. INSERTS RX-M3x5.7 IN Ø4.0 ±0.1 HOLES >= 7.0 DEEP (FT08, INTERFERENCE INTENDED); SOLDERING IRON ~20 °C ABOVE THE PRINT TEMPERATURE, SET PER MATERIAL.
6. CLEARANCE HOLES: ISO 273 NORMAL (M2 2.4, M3 3.4, M5 5.5) PRINTED AT +0.2 AND CHECKED ON THE HOLE COUPON (M2); MOTOR-PATTERN HOLES DRILLED TO 3.4 AFTER PRINTING.
7. MOTOR SCREWS: TIP <= 3.2 mm PROUD OF THE FLOOR BEFORE EVERY MOTOR INSTALL (M4); 3.3 mm REACHES THE WINDINGS.
8. FIELD BREAKDOWN (R4): 2 x F09, 8 x BOOM-CLAMP SCREWS (F06/F04), 4 x F02 SHOE SCREWS; 14 SCREWS IN A LABELLED BAG.

GENERAL TOLERANCES	UNLESS NOTED
PRINTED PARTS (DESKTOP FDM)	±0.5 % OF SIZE, MIN ±0.5
CONTROLLED BORES, INSERT HOLES	FIT TABLE FT02 / FT03 / FT08 (hardware.json)
HOLE POSITION	Ø0.4; MOTOR PATTERN Ø0.2
CUT TUBES (ISO 2768-m), ANGLES	±0.5 (120–400), ±0.8 (400–1000), ±1.2 (>1000); ±1°
HOT-WIRED FOAM (XPS), EST	±0.5 SECTIONS, POCKETS, CHANNELS (FT05)

DESIGN-BUILD-FLY
UC BERKELEY CAPSTONE
REV G 2026-11-03
FIRST-ARTICLE M1–M7 APPLY

UNLESS OTHERWISE SPECIFIED:	
DIMENSIONS IN MM THIRD-ANGLE PROJECTION TOLERANCES: SEE TABLE FITS: hardware.json	
INTERPRET GEOMETRIC TOLERANCING PER:	
MATERIAL	SEE PARTS LIST
FINISH	SEE PARTS LIST
NEXT ASSY / USED ON	
APPLICATION	DO NOT SCALE DRAWING

	NAME	DATE
DRAWN	DBF	2026-11-03
CHECKED	—	
ENG APPR.		
MFG APPR.		
Q.A.		
COMMENTS:		

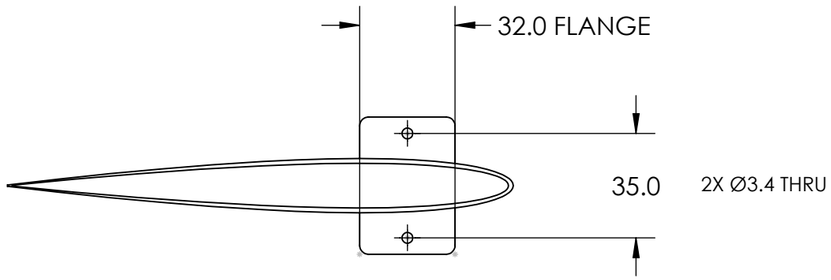
DESIGN-BUILD-FLY

TITLE:
FASTENER SCHEDULE AND TORQUES

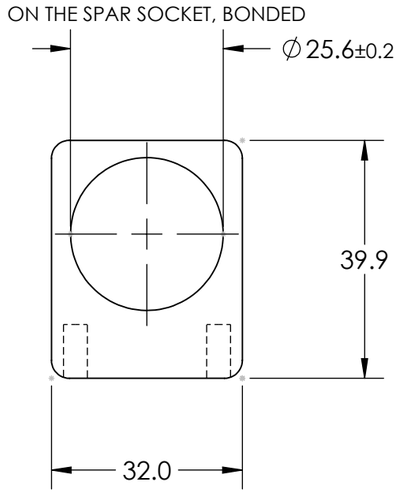
SIZE	DWG. NO.	REV
B	DBF-DRW-001	G

SCALE: 1:1 | WEIGHT: | SHEET 8 OF 9

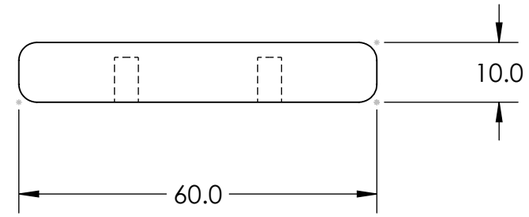
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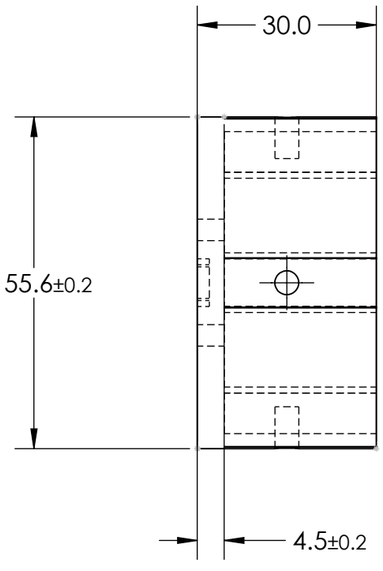
FIN SHOE (PETG) QTY 2 1:2



SPAR COLLAR (PETG) QTY 2 1:1

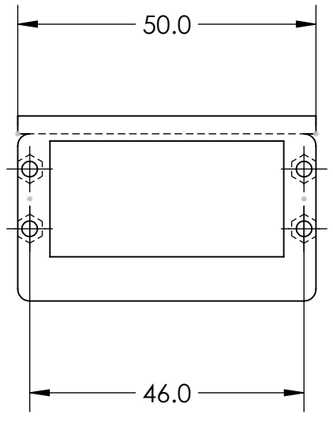


REAR HARDPOINT (PETG) QTY 2 1:1



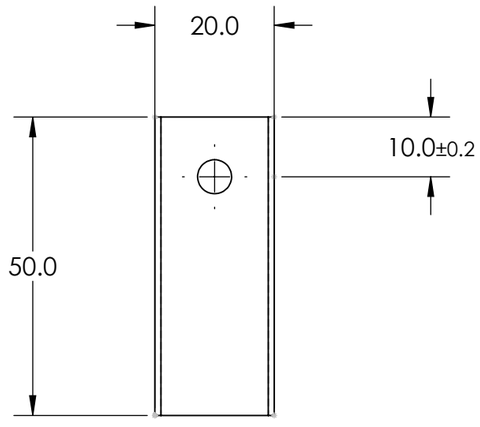
FLOOR

PUSHER CUP (PA6-CF) QTY 1 1:1



4X Ø2.6 + M2 NUT POCKET 4.2 AF x 2

SERVO TRAY (PETG) QTY 5 1:1



ROOT TONGUE (PETG) QTY 2 1:1

NOTES
1. FIN SHOE J09: FLOOR 3.0, WALLS 20 x 1.6 AROUND THE FIN ROOT (FIN BONDED IN); 2X F02 M3 x 16 THROUGH THE FLANGE AND A CRUSH SLEEVE 7 x 3.4 x 6.8 INTO THE TAIL-CLAMP INSERTS.
2. SPAR COLLAR J05a, REAR HARDPOINT J05b: BONDED FLUSH INTO THE WING LOWER SURFACE AT THE BOOM STATION, INSERTS ∅4.0 x 7.5 FACE DOWN.
3. PUSHER CUP J12: 4X F01 + W01 FROM INSIDE INTO THE MOTOR BASE, 4X F07 RADIAL THROUGH THE POD RING. SERVO TRAY J14: 4X F10 + N03, TAB HOLES PROVISIONAL (M6).
4. ROOT TONGUE J10: 25 mm BONDED IN THE PANEL ROOT, 25 mm IN THE SADDLE PILLAR. OTHER PRINTED PARTS: DIMENSIONS IN THE PART FILES (PARTS LIST). TORQUES: SHEET 8.

GENERAL TOLERANCES	UNLESS NOTED
PRINTED PARTS (DESKTOP FDM)	±0.5 % OF SIZE, MIN ±0.5
CONTROLLED BORES, INSERT HOLES	FIT TABLE FT02 / FT03 / FT08 (hardware.json)
HOLE POSITION	Ø0.4; MOTOR PATTERN Ø0.2
CUT TUBES (ISO 2768-m), ANGLES	±0.5 (120–400), ±0.8 (400–1000), ±1.2 (>1000); ±1°
HOT-WIRED FOAM (XPS), EST	±0.5 SECTIONS, POCKETS, CHANNELS (FT05)

DESIGN-BUILD-FLY
UC BERKELEY CAPSTONE
REV G 2026-11-03
FIRST-ARTICLE M1–M7 APPLY

		UNLESS OTHERWISE SPECIFIED:		NAME	DATE
		DIMENSIONS IN MM THIRD-ANGLE PROJECTION TOLERANCES: SEE TABLE FITS: hardware.json	DRAWN	DBF	2026-11-03
			CHECKED	—	
			ENG APPR.		
			MFG APPR.		
		INTERPRET GEOMETRIC TOLERANCING PER:	Q.A.		
		MATERIAL SEE PARTS LIST	COMMENTS:		
NEXT ASSY	USED ON	FINISH SEE PARTS LIST			
APPLICATION		DO NOT SCALE DRAWING			

DESIGN-BUILD-FLY

TITLE:
PRINTED PARTS
HARDPOINTS AND TRAYS

SIZE	DWG. NO.	REV
B	DBF-DRW-001	G

SCALE: 1:1 | WEIGHT: | SHEET 9 OF 9

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