GOAT4

WING SPAN.....36 FT.
WING AREA.......174 SQFT.
EMPTY WEIGHT, WITH
PARACHUTE........120 LBS.

GOAT4 IS A HOMEBUILT EXPERIMENTAL ULTRALIGHT
GLIDER OF AMATEUR DESIGN WHICH HAS NOT BEEN
LOAD TESTED OR FLIGHT TESTED TO ANY RECOGNIZED
STANDARD, AND WHICH HAS NO EXTENSIVE HISTORY
OF SAFE OPERATION. THE GOAT4 HAS BEEN FLOWN
FOR SOARING ONLY, HAS NOT PERFORMED AEROBATICS,
AND HAS NOT BEEN KNOWN TO EXCEED AN AIRSPEED
OF 45 M.P.H. THESE DRAWINGS ARE A DESCRIPTION
OF THE GOAT4 AS IT HAS BEEN FLOWN AND DO NOT
CONSTITUTE PLANS OR ADVICE.
THESE VIEWS ARE CONSTRUCTED FROM PARTS OF THE CONTROLLING DRAWINGS AND ARE FOR REFERENCE ONLY. COMBINED ASSEMBLIES AS SHOWN MAY NOT BE COMPLETE OR CONSISTENT WITH EACH OTHER. VIEWING OF DETAIL WILL REQUIRE DISPLAY IN VECTOR FORMAT (.DXF VIEWER OR COMPUTER ASSISTED DESIGN (CAD) PROGRAM).
WING CARRYING SLING FOR ONE PERSON WING CARRY

LIFT Hook FOR WING CARRYING SLING, 3/4 X 18 X 5 ALUM. BAR

BEND

7/8 R

1/4 DIAM. HOLE

FOR CAR TOP TRANSPORT THE WINGS ARE STACKED ONTO A FLAT PADDDED RACK, WING TIPS FORWARD. WEBBING STRAPS ARE PASSED OVER THE WINGS. ADDITIONAL TIES ARE APPLIED AS NEEDED, ESPECIALLY TO SECURE THE ALERONS AGAINST FLAPPING, WHICH CAN CAUSE DAMAGE.

USE OF WING CARRYING SLING FOR ONE PERSON WING CARRY

WING CAN BE CARRIED BY ONE PERSON USING THIS WING CARRYING SLING. THE HOOK IS PLACED AROUND THE AFT SPAR TUBE AT THE BALANCE POINT NEAR THE CENTER OF THE WING.
TENSIONING CABLE CONNECTORS ARE USED FOR THE AFT SWEEP CABLE PAIRS. EACH CONNECTOR CONSISTS OF TWO PLATES ASSEMBLED INTO A CONTINUOUS CABLE, WHICH BRANCHES INTO THE UPPER & LOWER AFR SWEEP CABLES. SEE G4A11 FOR THE METHOD OF USE.

Quick Pin per G3A4 & AS, 3/16 X 1-1/4

AFT UPPER SWEEP CABLE

AFT LOWER SWEEP CABLE

TENSIONING CABLE CONNECTOR PLATE

1/4 DIAM. HOLE, 2 PLACES

1/4 R, BOTH ENDS

TENSIONING CABLE CONNECTOR PLATE,
1/2 X 1/8 ALUM. BAR, 2 IN. LONG,
MAKE 4 PLATES TO MAKE 2 CONNECTORS

FORWARD SWEEP CABLE TANG ON WING, SEE G3W4

FORWARD SWEEP CABLE

NON-TENSIONING CABLE CONNECTOR ASSEMBLY

1/8 RIVET WITH 1 THICK & 1 THIN WASHER

1/4 DIAM. HOLE

3/16 DIAM. HOLE

1/4 R, BOTH ENDS

1/2 X 1/8 ALUM. BAR, 2 IN. LONG, 2 PLACES

NON-TENSIONING CABLE CONNECTION (RIVETED CONNECTOR) MAKE 2
1. UNLOAD THE 6 MAJOR PARTS
   (2 WINGS, NOSE, TAIL BOOM,
   HORIZONTAL TAILPLANE, KING
   POST), LAY THEM OUT IN THE
   ASSEMBLY AREA.

2. SWING OUT EACH CABANE TO PROP
   UP THE WING PANELS, TRAILING EDGE
   DOWN.

3. JOIN WING
   PANELS (2 PINS)

4. ATTACH NOSE SECTION
   (3 PINS) & FORWARD
   SWEEP CABLES (2 PINS)

5. OPEN TRAILING EDGE PANELS,
   ATTACH KING POST (2 PINS),
   TENSION & TIE OFF UPPER
   (LANDING) CABLES.

6. ROTATE SKID ONTO GROUND,
   ATTACH AILERON CONTROLS
   (2 PINS, 3 SNAPHOOKS)

7. ATTACH TAIL BOOM (2 PINS)
   & AFT SWEEP CABLES (2 PINS,
   2 QUICKLINKS FOR FLAP PANELS)
   SIT BACK ON TAIL SKID

8. ATTACH HORIZONTAL TAIL PLANE, TAIL
   STRUTS, & ELEVATOR CONTROL ARM
   (4 SWIVEL SNAPS), ELVATOR LINES (2 SNAPHOOKS),
   & RUDDER LINES (2 SNAPHOOKS). DO
   PREFLIGHT INSPECTION BEFORE FLYING.

G4A12 ASSEMBLY SEQUENCE GOA4 ULTRALIGHT GLIDER M. SANDLIN, FEBRUARY 17, 2007
1. Bring open connector close to cable end

2. Use quick pin to engage cable

3. Use quick pin as lever to tension cable

4. Engage lower plate, fully insert and lock quick pin (elastics loop retainers not shown)

5. Same as step 4 but with elastic loop retainers now shown (the line that attaches the pin to the sweep cables is still not shown)

6. Retainer loops wrap around plates to help hold them together

7. Retainer loops are secured around pin end
ALL AIRCRAFT FABRIC COVERING MATERIALS AND PRACTICE ARE BASED ON CONVENTIONAL AIRCRAFT COVERING METHODS, NOMINALLY THE POLYFIBER (STITS) PROCESS AS DESCRIBED BY THEIR MANUAL AND WEBSITE. COVER AIRCRAFT WITH 1.8 OZ./SQYD. DACRON (POLYESTER) AIRCRAFT FABRIC (UNCERTIFIED, HEAT SHRINKABLE), ALL FLIGHT CRITICAL PARTS (WINGS, AILERONS, & TAIL SURFACES) MUST BE COVERED SO AS TO ESTABLISH A CONTINUOUS ENVELOPE OF FABRIC WHICH COMPLETELY ENCLOSES THE METAL FRAME STRUCTURE AND THUS DOES NOT DEPEND ON THE CEMENTING OF FABRIC TO METAL FOR STRENGTH. APPLY TAPE IN THE PRESCRIBED POLYFIBER MANNER SO AS TO REINFORCE ALL HIGH STRESS AREAS (EDGES WHERE FABRIC DEPARTS THE SOLID STRUCTURE) OR AREAS SUBJECT TO ABRASION (OUTSIDE EDGES). FABRIC MUST BE SEALED TO REDUCE ITS PERMEABILITY FOR BEST AERODYNAMIC PERFORMANCE. THIS GLIDER HAS 6 COATS OF BRUSH APPLIED SILVERING (DOPE WITH ALUMINUM POWDER) ON THE UPWARD FACING SURFACES FOR RADIATION PROTECTION.

ALL FABRIC TREATMENTS WERE APPLIED BY BRUSH. NO SPRAY RIG WAS USED. ENAMEL SPRAY PAINT (FROM CANS) WAS APPLIED OVER SOME SILVERED AREAS TO CREATE LARGE PANELS OF BRIGHT COLOR TO MAKE THE AIRCRAFT MORE VISIBLE IN FLIGHT.
SNAPHOOK, 2 INCH, MARINE HARDWARE.
THE SPRING GATES ON THESE HOOKS SHOULD OCCASIONALLY BE OILED AND ALWAYS CHECKED DURING THE FINAL ASSEMBLY INSPECTION BECAUSE THEY WILL SOMETIMES FREEZE OPEN AND FAIL TO SECURE THE CONTROL LINE CONNECTION.

ALL LINE ENDS ARE TIED WITH A SERIES OF FIVE HALF HITCH KNOTS. THE KNOTS AND LINE END ARE THEN COVERED WITH TAPE, AND/OR GLUED IN PLACE WITH FLEXIBLE ADHESIVE.

TYPICAL CONTROL LINES

MARINE PULLEY.
(20 MM SINGLE LOOP TOP BLOCK, RONSTAN RF20101, OR HARKEN 224 SINGLE MICRO)

1/8 INCH QUICKLINK. WHEN USED IN A CONTROL LINE, THE THREADED GATE OF THE QUICKLINK SHOULD BE TAPED OVER OR GLUED CLOSED TO PREVENT ITS REMOVAL OR DISCONNECTION ONCE IT HAS BEEN INSTALLED. ALL CONTROL LINES END WITH A SNAPHOOK, A 1/8 INCH QUICKLINK, OR ARE TIED AROUND A BOLT AS SPECIFIED.

ALL CONTROL LINES ARE SAMSON “LIGHTNING ROPE” BRAIDED LINE, (VECTRAN/DYNEEMA BLEND) 7/64 INCH NOMINAL DIAMETER. CUT-OFF ENDS CAN BE MELTED WITH A FLAME AND FINGER TIP TWISTED TO TO PREVENT UNRAVELING. LINE MAY REQUIRE PERIODIC REPLACEMENT DUE TO DETERIORATION IN SUNLIGHT. CONTROL SHOULD BE PERIODICALLY INSPECTED FOR WEAR AT ALL CONTACT POINTS, INCLUDING LINE GUIDES & PULLEYS. NO SHARP EDGE CONTACTS OR RUB POINTS ARE ALLOWED.

ALL LINES & CABLES MAY BE TENSIONED TO THE POINT OF ELIMINATING SLACK, BUT THERE IS NOT USUALLY MUCH TO BE GAINED BY ADDITIONAL TENSIONING BEYOND THAT.
VIEWS OF CABLE ASSEMBLIES

CABLE TANG, "FIGURE 8", STAINLESS STEEL, BEND AS REQUIRED BUT USE LARGEST PRACTICAL BEND RADIUS

CABLE THIMBLE, 3/32 INCH (AS PER CABLE SIZE) STAINLESS STEEL

NICOPRESS SLEEVE, 3/32 INCH (AS PER CABLE SIZE), SWAGE CENTER BUT LEAVE ENDS FLARED TO AVOID STRESS CONCENTRATIONS IN CABLE

1/8 IN. OF CABLE END LEFT PROTRUDING

IF THE CABLE HAS A VINYL OR NYLON COATING, STRIP OFF THE COATING IN AREAS TO BE SWAGED. (DO NOT SWAGE OVER ANY PLASTIC COATING, REMOVE IT FIRST). COATINGS ARE THICK, THEY WILL ALMOST DOUBLE THE THICKNESS OF THE CABLE AND ARE USED TO PROTECT THE CABLE AND TO PROTECT OTHER THINGS FROM THE CABLE. HANG GLIDERS USE COATED CABLES TO REDUCE POTENTIAL DAMAGE TO THE EMERGENCY PARACHUTE BRIDLE DURING AN EMERGENCY PARACHUTE DEPLOYMENT. GOAT4 DOES NOT USE COATED CABLES.

ALL CABLE, 7X7 STAINLESS STEEL, 3/32 INCH NOMINAL DIAMETER. ANY CABLE WITH A BROKEN STRAND OR A SHARP AND PERMANENT BEND (KINK) IS UNACCEPTABLE AND MUST BE REPLACED.

USE HEAVY GRADE HEAT SHRINK TUBE ("MARINE SHRINK") TO COVER FINISHED SWAGE AND PROTRUDING CABLE END (OR WRAP WITH CLOTH TAPE, OR COVER WITH FLEXIBLE ADHESIVE)

ALL LINES & CABLES MAY BE TENSIONED TO THE POINT OF ELIMINATING SLACK, BUT THERE IS NOT USUALLY MUCH TO BE GAINED BY ADDITIONAL TENSIONING BEYOND THAT.

CABLE TENSION IS IN SOME PLACES MADE ADJUSTABLE BY PROVISION FOR THE ADDITION OR REMOVAL OF WASHERS ON THE RETAINING BOLT. THIS SETUP EXERTS A BENDING LOAD ON THE BOLT, SO FOR POTENTIALLY LARGE LOADS AN ONSIZE BOLT IS USED. GOAT3 DOES NOT USE TURNBUCKLES FOR CABLE TENSIONING BECAUSE THEY ARE HEAVY AND COMPLEX TO INSTALL & ADJUST. STEEL CABLES ARE EXPECTED TO STRETCH IN SERVICE, SO IF THE RIGGING GETS LOOSER, RE-TENSIONING BY WASHER REMOVAL MAY BE DESIREEABLE.

CABLE SWAGING TOOL

DEDICATED COMMERCIAL TOOL FOR SWAGING NICOPRESS SLEEVES MUST BE USED FOR PROPER FINISHED SWAGE SHAPE. CHECK FINISHED DIMENSION OF SWAGED SLEEVE WITH NICOPRESS GAGE OR MICROMETER. THIS BOLT-DOWN TOOL CAN BE SECURED IN A VICE FOR USE.

CABLE FABRICATION METHOD

TEMPORARY CABLE LOCK

TEMPORARY CABLE LOCK IS USED FOR EASE OF CABLE ASSEMBLY & IN-PLACE TRIAL FITTING PRIOR TO FINAL SWAGING AND CABLE END TRIMMING. CABLE LOCK IS REMOVED AFTER SLEEVE IS SWAGED.

G4A8
STANDARDS FOR STEEL CABLES
GOAT4
ULTRALIGHT GLIDER
M. SANDLIN, FEBRUARY 9, 2007
FABRICATION OF GENERALIZED COMPOSITE RIB

ALUMINUM TUBE SURFACES WHERE RESIN WILL BE APPLIED ARE LIGHTLY SANDED FOR CLEANING & ROUGHENING.

WET LAYUP OF WOVEN FIBERGLASS FABRIC TAPE & EPOXY RESIN IS APPLIED TO PRODUCE CONTINUOUS BANDS AROUND TUBES. LAYUPS MUST BE DONE AT ROOM TEMPERATURE OR WARNER, ELSE RESIN WILL NOT PENETRATE & BONDING WILL BE TOO WEAK.

STYROFOAM RIB 1 INCH WIDE IS CUT TO MATCH THICKNESS OF BANDS WITH HACKSAW BLADE, SMOOTHED & SHAPED BY SANDING, GLUED TO BANDS WITH EPOXY RESIN. AT PANEL ENDS, SUCH AS THE INBOARD END OF THE AILERON, THE EXPOSED SIDE OF RIB IS COATED WITH RESIN OR MICROSLURRY TO SEAL IT AND PREVENT THE STYROFOAM RIB FROM DISSOLVING WHEN THE FABRIC SEALANT (POLYBRUSH OR OTHER) IS APPLIED.

CROOVES ARE SCORED IN THE TOP AND BOTTOM OF THE RIBS, USING A FLAT EDGE SCREWDRIVER BLADE, TO ALLOW CARBON/EPOXY RODS TO BE EMBEDDED IN THE RIB & EPOXYED IN PLACE. FILL OVER RODS WITH MICROSLURRY TO RESTORE RIB SURFACES, SAND AS REQUIRED.

WET LAYUP OF WOVEN FIBERGLASS FABRIC TAPE & EPOXY RESIN IS APPLIED OVERALL TO PRODUCE A CONTINUOUS CAP STRIP AROUND THE RIB AND TUBES, SANDB LIGHTLY FOR SMOOTHING BEFORE APPLYING FABRIC.

SAME AREA AS BELOW, VIEW FROM OUT OF PLANE

STYROFOAM, BLUE, SMALL CELL 2 LB./CUFT, 1 IN. THICK.

WOVEN FIBERGLASS FABRIC TAPE, 1 INCH WIDE, 8.7 OZ./SQYD., WET LAYUP WITH EPOXY RESIN

.063 INCH DIAM. CARBON/EPOXY ROD

SECTION A

SECTION A, FROM VIEW AT LEFT

GENERALIZED COMPOSITE RIB, VIEW ACROSS TUBE SECTION

ALUMINUM FRAME TUBE

CARBON/EPOXY ROD (WHEN SPECIFIED)

FIBERGLASS TAPE TUBE BAND (WHEN SPECIFIED)

STYROFOAM RIB

FIBERGLASS TAPE CAP STRIP

EXPLODED ISOMETRIC VIEW OF GENERALIZED COMPOSITE RIB

G4A7

COMPOSITE RIB STRUCTURE

GDA4/ULTRAFLIGHT GLIDER

M. SANDLIN, FEBRUARY 9, 2007
ALL CUT EDGES AND DRILLED HOLE EDGES MUST BE SMOOTH. ALL CUTS SHOULD BE SMOOTHED BY FILING OR DE-BURRING.

HOLES ARE TO BE DRILLED GENEROUSLY LARGE FOR LOOSE BOLT FITS (IN MOST CASES) FOR EASE OF ASSEMBLY.

NOMINAL TOLERANCE IS 1/16 INCH, SO THIS DIMENSION IS 2 INCHES PLUS OR MINUS 1/16 IN.

THE ENDS OF TUBULAR SLEEVES MUST BE SMOOTH. SLEEVES ARE TO BE PADDED BY WRAPPING THEM WITH LAYERS OF 10 MIL. VINYL TAPE (PIPE WRAP) TO FILL THE GAP BETWEEN THE TUBES, RESULTING IN A MARGINAL SLIDING FIT. TAPE PADDING NEED NOT BE USED WHEN A CLOSE TELESCOPING FIT IS ALREADY POSSIBLE (I.E., WHEN THE OUTER TUBE IS .058 IN. THICK AND FITS THE INNER TUBE CLOSELY, NO TAPE PADDING IS USED).

ALL RIVETS ARE 1/8 INCH CHERRY BISP OR BISP ALUMINUM BLIND RIVETS WITH STEEL MANDREL (HIGH QUALITY POP RIVETS). NOMINAL MINIMAL RIVET SEPARATION IS 1/2 INCH.

MINIMUM BEND RADIUS FOR ANY ALUMINUM BAR OR STEEL TANG SHOULD BE 3 THICKNESSES (MAKE LARGER THAN MINIMUM RADIUS BENDS WHEREVER POSSIBLE).

SMALL TUBES (1/4 OR 3/8 DIAM.) MAY BE SPICED WITH A PIECE OF LARGER TUBE OR SPLIT TUBE OF THE SAME SIZE, SECURED BY RIVETS.

ALL TUBES, BAR, ANGLE, & ROD STOCK ARE 6061-T6 ALUMINUM OR EQUIVALENT. CHANNEL IS 6063 T5.

NUTS, BOLTS, WASHERS, AND COTTER PINS ARE AIRCRAFT GRADE UNLESS OTHERWISE SPECIFIED. DO NOT OVER TIGHTEN BOLTS OR PARTS WILL BE CRUSHED. FOR BOLTS THRU SOLID PARTS, AGAIN DO NOT OVER TIGHTEN, OR ELSE BOLTS MAY BE WEAKENED OR BROKEN. NUTS ARE ELASTIC STOP NUTS UNLESS OTHERWISE SPECIFIED. DEPICTIONS OF THE USE OF NUTS AND WASHERS MAY NOT BE EXACT (USE MORE OR FEWER WASHERS AS NEEDED).

IF THREADED END OF BOLT MUST BE LOADED, USE LONG BOLTS WITH WASHERS TO AVOID SHEAR LOADING ACROSS THREADS.

TUBE OVALIZING IS DONE IN A PADDED VICE. SMALL IRREGULARITIES ARE ACCEPTABLE SINCE WHEN OVALIZATION IS FULL LENGTH THERE IS A ROUND TUBE INSIDE FOR ADDITIONAL STRENGTH. WHEN THE END OF AN OVALIZED TUBE IS CLOSED TO FLATNESS, THE TRANSITION MUST BE SMOOTH AND NOT GREASED.

G4A6
METAL FABRICATION & FASTENERS

G4A4 ULTRALIGHT GLIDER
M. SANDUS, FEBRUARY 9,
2007
Quick pin, from G4A4. The tapered end of the quick pin allows it to serve as a drift pin during assembly, drawing the parts together into flight position as it is inserted. This permits the initial parts alignment to be performed quickly with no need for precision, thus making the assembly easier and faster.

Stretch handle, small cord or control line, joins the two bungee loops, handle tied in a series of square knots.

Knotted loop of 1/8 elastic cord, 2 places. Adjust length to suit stiffness of the cord for firm retention. Two independent loops are used for redundancy (if one loop fails the other still retains the pin in place).

Retention cord, 7/64 "lightning rope" (same as control line). Tied to airframe at one end. All fasteners are attached to the glider so they will not be missing when aircraft is assembled.

Quick pin retained in flight position, as a shear pin fastener (flight loads on the pin are shearing force only).

Quick pin (shown with only a single elastic (bungee) loop for clarity).
BOLT, AN4-32A OR AN3-24A (OR LONGER)
ADD 1/8 IN. ADDITIONAL THREAD
SECURE PIN HANDLE WITH LOW PROFILE ELASTIC STOP NUTS

1/4 INCH DIAM. SHAFT QUICK PIN (FROM AN4 BOLT), MAKE 9
(2 FOR WING JOINING, 2 FOR THE KING POST, 1 FOR NOSE TUBE, 2 FOR TAIL BOOMS, 2 FOR LOWER CABANE)

CUT SHAFT, DISCARD HEX HEAD

3/16 DIAM. SHAFT QUICK PIN (FROM AN-3 BOLT), MAKE 6 (4 FOR SWEET CABLES, 2 FOR AILERONS)

1/4 R. BOTH ENDS
3/16 DIAM. OR 1/4 DIAM. HOLE, AS NEEDED
5/16, 2 PLACES
3/16 DIAM. HOLE, 3 PLACES

QUICK PIN HANDLE, 1/2 X 1/8 X 1-1/2 ALLUM. BAR., MAKE 15

QUICK PIN FASTENERS WERE DESIGNED BY ME FOR MY PURPOSES, AND ARE EXPERIMENTAL AND UNPROVEN IN SERVICE. THESE FASTENERS DO NOT REPRESENT THE CONTINUATION OF ANY CONVENTIONAL DESIGN OR TRADITION OF FASTENER EVER USED ON ANY KIND OF AIRCRAFT.
ALL FABRIC SURFACES ARE FLAT EXCEPT FOR THE TOP OF THE MAIN WING PANEL. MAIN WING RIB AIRFOIL IS 12% THICK AT 26% CHORD (7-1/4 IN. AT 15-1/2 IN.). NOMINAL WING CHORD IS 60 INCHES. REFERENCE PITCH LEVEL FOR AIRCRAFT IS FLAT BOTTOM OF THE WING AT CENTERLINE.

WING WASHOUT IS PROVIDED BY AILERON TAPER & CABLES RIGGED TO TWIST WING (WING TIP IS RIGGED TO 1 OR 2 DEGREES LOWER ANGLE OF ATTACK THAN WING ROOT)

TIRE AT 29% OF CHORD, DIAM. 13 IN. FOR PROPER BALANCE LOADED AIRCRAFT MUST BE SLIGHTLY NOSE HEAVY WHEN LEVELED.

G4A3

NOMINAL DIMENSIONS

GOAT4
ULTRALIGHT
GLIDER

M. SANDLIN, FEBRUARY 6, 2007
FABRIC COVERING IS BY A CONVENTIONAL AIRCRAFT PROCESS, BUT USING LIGHT, UNCERTIFIED CLOTH (POLYESTER). FABRIC PANELS ARE CUT TO SIZE, CEMENTED INTO THE FRAME, THEN SHRUNK TO CONTOUR WITH A CLOTHES IRON. FABRIC IS SEALED BY BRUSHING ON A SEALANT/ADHESIVE (POLYBRUSH OR BUTYRATE DOPE). SURFACES EXPOSED TO SUNLIGHT ARE PROTECTED BY ADDITIONAL COATS OF DOPE MIXED WITH ALUMINUM PASTE (SILVERING). BRIGHT PAINT IS APPLIED OVER SILVERED SURFACES TO MAKE THE AIRCRAFT HIGHLY VISIBLE.

MAIN WING RIBS ARE SMALL ALUMINUM TUBES BENT TO SHAPE, SPANNING MAIN SPARS

RIBS FOR THE TAIL SURFACES ARE A WET LAYUP OF FIBERGLASS CLOTH TAPE, GRAPHITE/EPOXY ROD, & EPOXY RESIN OVER STYROFOAM

HORIZONTAL STABILIZER

AFT UPPER SWEEP CABLE

VERTICAL STABILIZER

LEADING EDGE SHELL IS MADE OF STYROFOAM BLOCKS CEMENTED BETWEEN THE RIBS, SHAVED DOWN TO MATCH RIB CONTOUR, THEN SEALED WITH EPOXY RESIN

WHEEL AT CENTER OF LIFT (LOADED GLIDER MUST BALANCE NOSE DOWN FROM LEVEL POSITION FOR SAFE STATIC MARGIN)

FLAP PANELS HELD IN FIXED POSITION

4 POINT SEAT BELTS

FORWARD SWEEP CABLE

TOW LINE RELEASE KNOB

TRADITIONAL STICK & RUDDER CONTROLS

TOW HOOK & RELEASE FOR USE WITH WEAK LINK (HANG GLIDER STANDARD)

NOSE SKID GROUND BRAKE (NO WHEEL BRAKE)

HAND DEPLOYED EMERGENCY PARACHUTE BRINGS DOWN PILOT & GLIDER TOGETHER, TAIL FIRST

MAIN STRUCTURE IS MADE OF ALUMINUM TUBE FASTENED WITH NUTS & BOLTS (GOAT IS FABRICATED WITH HAND TOOLS, USING NO SPECIALLY MACHINED OR WELDED PARTS). FIXED RIDING IS BRAIDED STAINLESS STEEL CABLE WITH THIMBLES, TANGS, & NICOFRESS SLEEVES. FOR TRANSPORT, GOAT4 BREAKS DOWN INTO 6 MAIN PIECES: HORIZONTAL TAIL PLANE, TAIL BOOM & RUDDER, NOSE SECTION, 2 WING PANELS, & THE KING POST, WHICH IS FOLDED AND STOWED IN THE NOSE SECTION.

GOAT4 UTRALIGHT SLIDER

N. SANDLIN, FEBRUARY 5, 2007
SIDE SEAMS OF THE COVER BAG TOP PANEL HAVE BEEN UNDONE TO ALLOW THE TOP PANEL TO OPEN UPWARD.

ATTACH SMALL LOOPS TO COVER BAG FOR TIE-ON TO NOSE SECTION.

BUG4 OR GOAT EMERGENCY PARACHUTE SYSTEM IS AN ORDINARY COMMERCIAL HANG GLIDER CHEST PACK HAND DEPLOYED SYSTEM (22 GORE, 20 FT. BRIDLE), WITH THE EXTERNAL COVER BAG MODIFIED TO ALLOW AN UPWARD REMOVAL OF THE CHUTE IN ITS DEPLOYMENT BAG (OR EQUIVALENT MODERN DEPLOYMENT STAGING DEVICE). THE BUG4/GOAT MODIFICATIONS ARE: UNDOING THE SIDE SEAMS OF THE TOP PANEL & CLOSING/LOCKING THE COVER WITH THE TOP PANEL ON THE OUTSIDE.

LOCKING PINS & LOOPS, DEPLOYMENT BAG HANDLE IS SECURELY FASTENED IN PLACE ON THE COVER BAG.

POSSIBLE EMERGENCY PARACHUTE DESCENT ATTITUDE. (THE INTENT IS THAT THE PILOT BE SHIELDED FROM GROUND CONTACT BY COLLAPSABLE STRUCTURE).

PARACHUTE IN DEPLOYMENT BAG BEING PULLED FORWARD PRIOR TO BEING THROWN BY PILOT. (NOT THE BUG4/GOAT SYSTEM.)

CONVENTIONAL HANG GLIDER HAND DEPLOYED EMERGENCY PARACHUTE SYSTEM, CHEST PACK WITH 23 FT. BRIDLE, ROUND CANOPY 22 GORE CHUTE OR EQUIVALENT. USING THIS SYSTEM FOR THE BUG4 OR GOAT REQUIRES THAT THE COVER BAG BE MODIFIED TO ALLOW AN UPWARD DEPLOYMENT PULL AS OPPOSED TO THE "OUTWARD FROM THE CHEST" PULL (SHOWN HERE) FOR WHICH IT WAS DESIGNED.

APPLY OR REMOVE VELCRO STRIPS TO SEAL COVER BAG BUT STILL ALLOW A FAST & EASY UPWARD DEPLOYMENT PULL (DO PULL TESTS).

2 VIEWS OF BUG4/GOAT EMERGENCY PARACHUTE, AS SEEN FROM REAR WHEN MOUNTED ON THE RIGHT HAND SIDE OF THE NOSE SECTION.

G4N20
EMERGENCY PARACHUTE 2

GOAT4 ULTRALIGHT GLIDER
M. SANDLIN
JANUARY 30, 2007
BELT/BRIDLE CONNECTION LOOP, SEWN WEBBING LOOP, ROCK CLIMBING TYPE, 20 INCHES LONG, ATTACHES BOTH LAP BELT LOOPS TO THE EMERGENCY PARACHUTE CARABINERS.

EMERGENCY PARACHUTE RIPCORD, LOCKED ONTO TOP FLAP OF COVER BAG, IS LOCATED TO THE RIGHT OF THE SEAT PAD SO AS TO BE REACHABLE BY EITHER HAND.

ISOLATED VIEW OF LAP BELTS & CONNECTING LOOP, SAME AREA AS AT RIGHT

PARACHUTE BRIDLE IS ATTACHED TO BELT/BRIDLE SEWN WEBBING LOOP BY TWO NON-LOCKING ALUMINUM "D" CARABINERS IN AN OPPOSING GATE ORIENTATION.

SIMPLIFIED VIEW OF NOSE SECTION SEEN FROM BEHIND

VIEW OF NOSE SECTION SEEN FROM RIGHT

G4N19 EMERGENCY PARACHUTE 1 GOAT4 ULTRALIGHT GLIDER M. SANDLIN, JANUARY 30, 2007
RIG CONTROL LINES TO DIMENSIONS SHOWN WITH RUDDER, ELEVATOR, CONTROL STICK AND RUDDER PEDALS IN THEIR NEUTRAL POSITIONS. RUDDER & ELEVATOR LINE PAIRS HAVE OPPOSITE CONNECTOR PARITY (HOOK/RING), & LINE ENDS ARE STAGGERED TO HELP PREVENT ACCIDENTAL LINE CROSSOVER DURING ASSEMBLY. LINE END MATING PAIRS ARE ALSO COLOR CODED FOR IDENTIFICATION DURING ASSEMBLY & FOR THE PREFLIGHT CHECK.

QUICKLINK, 1/8 INCH, 4 PLACES
MARINE SNAPHOOK, 2 INCH, 4 PLACES
RED TAPE
RED TAPE
WHITE TAPE
WHITE TAPE
BLACK TAPE
BLACK TAPE
GREEN TAPE
GREEN TAPE
QUICK PIN, 3 INCH, SEE G4A4

RIGHT RUDDER CONTROL LINE
RIGHT (LOWER) ELEVATOR CONTROL LINE
LOWER TAIL BOOM
LEFT (UPPER) ELEVATOR CONTROL LINE
LEFT RUDDER CONTROL LINE

REAR SOSE SECTION ATTACHED TO LOWER TAIL BOOM, SEEN FROM ABOVE

G4N18 RUDDER & ELEVATOR CONTROL LINES
GOAT4 ULTRALIGHT GLIDER
M. SANDELIN, JANUARY 30, 2007
TOW RELEASE HANDLE, 3/4 X 1/8 ALUM. BAR, 2-1/4 IN. LONG
1/2 DIAM. HOLE, 3 PLACES

AN4-24 BOLT (DRILLED) WITH AN310-4 CASTLE NUT & COTTER PIN

FORWARD SWEEP CABLE, 1 PER SIDE, SEE G4W4

TAPE IS CUT FROM FABRIC AND SPIRAL WRAPPED AROUND TOP TUBES (OR WHEREVER USEFUL) TO PROVIDE FABRIC SURFACE FOR ATTACHMENT OF THE SIDE WALL FABRIC.
SMALL ELASTIC LOOP (AS USED FOR PONY TAIL HAIR LOOPS, ABOUT 1/8 IN. DIAM.) IS PASSED THROUGH AND WRAPPED AROUND TOW PLATE TO PROVIDE A RETAINER FOR THE TOW PIN WHEN THE LINE IS SLACK.

TOW PIN, PARACHUTE BAG PIN WITH STRAIGHTENED SHANK OR MAKE FROM THE SHANK OF A LARGE FISH HOOK WITH WELDED EYE, RIGGED WITH CONTROL LINE AS PER METHOD OF G4A9 (“LIGHTNING ROPE”)


SMOOTH EDGES OF HOLE TO REDUCE WEAR ON WEAK LINK LOOP

ON TOW, THE TOW LOOP SERVES AS A WEAK LINK & IS INTENDED TO BREAK WHEN THE TOWING FORCE REACHES 100% TO 120% OF GROSS AIRCRAFT WEIGHT. IN THIS CASE, A SINGLE STRANDED PORTION OF LINE HAS BEEN TIED INTO THE LOOP SO AS TO SUSTAIN HALF THE TOW FORCE BECAUSE THIS LINE HAS A BREAKING STRENGTH OF ABOUT HALF OF THE AIRCRAFT GROSS WEIGHT. USE OF A WEAK LINK IS INTENDED TO PROVIDE A MEANS OF EMERGENCY SEPARATION OF THE AIRCRAFT FROM THE TOW LINE IN CASE THE PRIMARY TOW RELEASE FAILS OR IF EXCESSIVE TOW FORCES ARE OTHERWISE ENCOUNTERED.
TIE PILOT SEAT NET FROM FRONT SEAT TUBE TO BACK SEAT TUBE USING LIGHT NYLON CORD (PARACORD/CAMPING LINE). SECURE LINES TO TUBE USING FLEXIBLE ADHESIVE (SHOEGOO).

MAKE SEAT BACK NET SIMILAR TO PILOT'S SEAT NET BUT WITH LINES RUNNING SIDE TO SIDE (SEE 64N16).

SEAT & BACK PADS ARE SOFT FOAM CUSHIONS, 3 OR 4 IN. THICK, ABOUT 17 IN. X 15 IN., PATIO FURNITURE PADS OR EQUIVALENT. ATTACH TO SEAT NET BY TACK STITCHING.

NOSE SECTION SEAT AREA, VIEWED FROM LEFT.

1/4 IN. DIM. HOLE, 3 PLACES, 1/2 IN.

TOW RELEASE PLATE, 3/4 X 1/8 ALUM. BAR, 3 IN. LONG, SEE 64N15.
SIDEWALLS, NON-STRUCTURAL, FOR FABRIC ATTACHMENT & TO PREVENT DAMAGE FROM BRUSH AND GRASS CONTACT IN VICINITY OF SKID PLATE. MAKE FROM 1 INCH THICK STYROFOAM BLOCKS USING SAME CONSTRUCTION METHODS AS FOR LEADING EDGE SHELLS.

PITCH TRIM BUNGEE, 1/4 IN. ELASTIC SHOCK CORD, TIE ENDS TO ATTACH AS SHOWN, TENSION TO COMPENSATE FOR ELEVATOR WEIGHT OR AS DESIRED FOR INFLIGHT TRIM.
VIEW B FROM G4N10, SIMPLIFIED FOR CLARITY

SLEEVE RETAINER. 1/4 X .035 TUBE, ABOUT 4 IN. LONG, RIVET TO DIAGONAL BRACES, SECURE TORQUE TUBE SLEEVE TO RETAINING STRUCTURE WITH FLEXIBLE ADHESIVE OR EPOXY RESIN.

3-1/2
1-3/4

LINE GUIDE FOR SINGLE LINE, SAME AS ON G4N11, 4 PLACES

SAME AREA AS AT LEFT, SEEN FROM BEHIND

RIGHT RUDDER CONTROL LINE
RIGHT (LOWER) ELEVATOR CONTROL LINE

SAME AREA AS ABOVE, SEEN FROM ABOVE

LEFT RUDDER CONTROL LINE
LEFT (UPPER) ELEVATOR CONTROL LINE

G4N12 REAR NOSE CONTROL LINES

G0AT4 ULTRAIGHT SLIDER
M. SANDLIN, JANUARY 29, 2007
AN3-14 BOLT, DRILLED, WITH AN310-3 CASTLE NUT & COTTER PIN & 3 NYLON WASHERS

SAME AREA AS BELOW, SEEN FROM ABOVE

Rudder Control Line, Right Side. See G4A9 for Control Line Specifications

Marine Pulley, Single Block, 1 IN. Diam Wheel, Secure With AN3-14A Bolt With 3/4 Diam. Washer, 2 Places

Upper Elevator Control Line

Lower Elevator Control Line

Tube, 1/4 x .035 x 7/8, Ovalize to 3/16 IN. Thick, Secure With Rivets Thru 1/4 IN. Spacers

Line Guide, Single, 4 Places

Line Guide, Viewed From Forward

1/2

3-1/2

5/8

2-1/2

G4N11

FORWARD NOSE CONTROL LINES

GOAT4 ULTRALIGHT GLIDER

M. SANDLIN, JANUARY 29, 2007

View A, From G4N10, Seen From Left of Centerline
Rudder Pedal Return Bungee, 3/16 in. shock cord, tie to front center bolt, both sides.

Control stick & torque tube assembly from G4N8.

View A, see G4N11.

View B, see G4N12.

Skid plate, form & rivet to bottom of skid tube, see inset below.

Nose section viewed from left.

3/8 r, both ends 1 typical 1/2

1/8 diam. hole, 12 places

Skid plate, 3/4 x 1/8 alum. bar, 12 in. long

1/3 diam. hole, 2 places 1/4 r, both ends 1/2 1/4 diam. hole

Nose tube spacer plate, 1/2 x 1/8 alum. bar, 1-1/2 in. long, make 2, see G4N13.
COVER PEDAL, EXCEPT BOTTOM TUBE ENDS, WITH WET LAYER OF OVERLAPPING BANDS OF 1 IN. FIBERGLASS TAPE & EPOXY

RUDDER PEDAL FOOT BAR, ATTACH TO MAKE 1 RIGHT & 1 LEFT PEDAL, BRACE WITH 1/4 X .035 X 5-3/8 ALUM. TUBE, 1/8 IN. RIVETS

AN3-12A BOLT, 2 PER PEDAL

3/4 X .035 X 7-1/2 ALUM. TUBE, 2 PLACES PER PEDAL, EPOXY ONTO CORE, THEN SAND CORE TO SMOOTH CONTOUR

CORE, STYROFOAM (2 LB./CUFT.), 1 X 2-3/4 X 7-1/2

3/16 Diam. bungee cord for pedal return

INSTALLED RUDDER PEDAL, LEFT PEDAL SEEN FROM FRONT

1/8 QUICKLINK WITH 7/64 LIGHTNING ROPE RUDDER CONTROL LINE AS PER G4A9

AN3-6 (DRILLED), AN310-3 CASTLE NUT & COTTER PIN, 2 PER PEDAL

AN42B-12A EYEBOLT, 2 PER PEDAL

INSTALLED RUDDER PEDAL, LEFT PEDAL SEEN FROM GLIDER CENTER LINE

RUDDER PEDAL TUBE, FROM G4N1

G4N9 RUDDER PEDALS GOAT4 ULTRALIGHT GLIDER M. SANDLIN, JANUARY 29, 2007
AN3-12A BOLT, 4 PLACES THRU CHANNEL FIXTURES

AN3-14A BOLT

BEND RADIUS 24 IN.

SKID TUBE, 1 X .035 X 41, SMOOTH BEND

8

12

22

Nose section viewed from left

11

22

20

19-1/2

6-3/4

ULTRALIGHT AIRCRAFT WHEEL & TIRE, NOMINAL 14 IN. DIAMETER, AZUSALITE NYLON 6 IN. WHEEL, 5/8 INCH BEARINGS, WITH 2 PLY TIRE & TUBE (13 X 400 X 6)

Nose section rear structure viewed from rear

All truss braces are 3/4 X .035 AL TUBE. AN APPROXIMATE LENGTH IS GIVEN ABOVE FOR EACH PAIR. SEE G4N4 FOR DETAIL

Nose section lower frame, viewed from above, left is forward

Wheel axle, 5/8 diam. Alum. solid rod, 7-3/4 in. long

G4N3 FORWARD NOSE STRUCTURE

G0A4 ULTRALIGHT GLIDER

M. SANDLIN, JANUARY 29, 2007
TCW RELEASE PLATE, INSTALLED ON TCW LINE ATTACHMENT RING, SEE G4N14

CUTAWAY VIEW OF AREA AT RIGHT

TOW LINE ATTACHMENT RING, USE 1/8 QUICKLINK, CUT SLOT IN PLASTIC TUBE END CAP TO ALLOW PROTRUSION OF QUICKLINK END.

NOSE PLATE, SEE INSET, 2 PLACES

TUBE END CAP, PLASTIC, 1-1/8 INCH, 2 PLACES

UPPER NOSE CHANNEL, SEE INSET

UPPER NOSE CHANNEL, SEE INSET

LOWER NOSE CHANNEL, SEE INSET

BOLT, AN3-16A, 4 PLACES

BOLT, AN4-20A

1/4 DIAM. HOLE THRU BASE TUBE & SLEEVES

1/4 DIAM. HOLE

3/8 R, 4 PLACES

3/4

1/4 DIAM. HOLE

3/16 DIAM. HOLE, 3 PLACES

3/8 R, 2 PLACES

OFFSET CHANNEL, 1 X 1 X 1/8, ALUM. CHANNEL, 1 IN. LONG, SEE G3N1, MAKE 6

G4N2 NOSE SECTION DETAIL

GOAT4 ULTRALIGHT GLIDER

M. SANDLIN, JANUARY 28, 2007

1/2 R, 2 PLACES

1/2

1/4 DIAM. HOLE

NOSE CHANNEL

1-1/4 X 1-1/4 X 1/8, ALUM. CHANNEL, 1-1/2 IN. LONG, MAKE 1 UPPER & 1 LOWER

NASE PLATE, 1-1/2 X 1/8 X 3, ALUM. BAR, MAKE 2
TOP FRAME OF NOSE SECTION VIEWED FROM ABOVE, DRAWING LEFT IS AIRCRAFT FORWARD

NOSE TOP TUBE, 1-1/8 X .058 X 57, 2 PLACES

VIEW A, SEE G4N2

RUDDER PEDAL TUBE, 1 X .035 X 17, WITH SLEEVE, 7/8 X .035 X 10

TUBE END CAP, PLASTIC, 1 INCH, 6 PLACES

CONTROL STICK MOUNTING TUBE, 3/4 X .035 X 11-1/2 (SEE INSET)

SEAT TUBES, 1 X .035, FORWARD TUBE IS 14 IN. LONG, AFT TUBE IS 18 IN. LONG

HEEL TUBE, 1-1/2 X .035 X 15, OVALIZE TO 2 IN. WIDE, TRIM CORNERS

BASE TUBE, 1-1/8 X .058 X 20, FULL SLEEVE 1 X .035 X 20, END SLEEVES 7/8 X .035 X 2

VIEW B, SEE G4N2

CONTROL STICK MOUNTING TUBE, ISOLATED VIEW FROM FORWARD

CONTROL STICK MOUNTING TUBE IS OVALIZED AT ENDS

G4N1 NOSE SECTION TOP FRAME G0A4 ULTRALIGHT GLIDER M. SANDLIN, JANUARY 28, 2007
COVER COMPRESSION STRUTS WITH SPIRAL WRAP OF FABRIC TAPE. THEN COVER BOTTOM SURFACE WITH ONE LONG PANEL OF FABRIC. USE HAND STICKING TO ATTACH FABRIC TO STRUT WRAPPING, 4 STRUTS PER WING. APPLY TAPE OVER STICKING. REINFORCE & SLOT FABRIC WHERE CABLES, LINES, OR CONTROL RODS PASS THROUGH. LARGE HOLES MAY BE LEFT IN THE INBOARD END PANELS (IF ANY) FOR INSPECTION, LINE STOWAGE, PASS-THROUGH, ETC.

COVER TOP SURFACE WITH ONE LONG PANEL OF FABRIC. LEAVE 1 OR 2 INCHES OF CHORDWISE SLACK WHEN CEMENTING PANEL AT EDGES, RESULTING IN FULL SPAN WRINKLES AS SHOWN. THEN, HEAT SHRINK FABRIC TO REMOVE WRINKLES, RESULTING IN HIGH SPANWISE FABRIC TENSION WITH MINIMAL CHORDWISE TENSION, SO FINISHED CONTOUR CONFORMS TO RIB SHAPE WITH MINIMAL SAG BETWEEN RIBS.

WING PANEL TRANSPORT LOCK, VELCRO STRIP, 2 X 23 IN., FORWARD END IS SEWN ONTO 10 X 10 IN. FABRIC PANEL, WHICH IS DOPED ONTO TOP WING SURFACE.

1 IN. WIDE VELCRO STRIP ON BOTTOM OF PANEL, 2 PLACES, FOR SECURING PANELS DURING TRANSPORT

SMALL VELCRO STRIP IS CEMENTED ONTO TOP OF WING TO SECURE LOCKING STRIP IN FLIGHT

G4S14 WING FABRIC COVERING

G4AT4 ULTRALIGHT GLIDER

M. SANDLIN, JANUARY 24, 2007
LINE GUIDE, PVC SPLIT RING, SAME AS ON G4S12, TIE ONTO CABLE WITH SMALL LINE & FLEXIBLE ADHESIVE.

MARINE SNAP HOOK, 2 INCH.

INSPECTION PLATE, 4.75 IN. DIAM., USED TO COVER 3-1/2 IN. I.D. INSPECTION RING. INSTALL ONTO LOWER SURFACE FABRIC OF LEFT WING FOR CROSSOVER LINE ASSEMBLY ACCESS.

CROSSOVER LINE PASSES THROUGH SLOTS OR OPENINGS IN FABRIC AT THE INBOARD ENDS OF THE WING. FOR ASSEMBLY, LINE FROM RIGHT WING IS PASSED THROUGH OPENING INTO THE LEFT WING TO MAKE CROSSOVER CONNECTION.

LINE STIFFENER, 1/4 X .035 X 1D ALUM. TUBE, TAPE ONTO LEFT FORWARD AILERON CONTROL LINE IN THE VICINITY OF THE LINE GUIDE, TO FACILITATE LINE ASSEMBLY AND TO PREVENT THE LINE FROM ACCIDENTLY BEING WRAPPED AROUND A CABLE OR STRUT DURING ASSEMBLY.

AILERON CROSSOVER PULLEY, MARINE PULLEY, BOLTED ONTO RIGHT INBOARD COMPRESSION STRUT WITH ANJ-14A BOLT & 5/8 IN. DIAM. WASHER. CAN BE TILTED SLIGHTLY FORWARD AS NEEDED.

INSPECTION PLATE & RING, ON LOWER SURFACE FABRIC, SEE DETAIL AT RIGHT.

SAME AREA AS ABOVE, SEEN FROM BEHIND.

AILERON CROSSOVER CABLE WITH SMALL LINE & FLEXIBLE ADHESIVE.
ADDITIONAL, ROTATED VIEWS OF THE AILERON CONTROL LINES COMING DOWN FROM THE WINGS. THESE 2 LINES HAVE REVERSED FASTENER PARITY (THE RIGHT LINE ENDS IN A SNAPHOOK, THE LEFT ENDS WITH A QUICKLINK) TO ASSURE THAT THE LINES CANNOT BE CROSSED OVER WHEN THE GLIDER IS ASSEMBLED FOR FLIGHT.

LEFT AILERON CONTROL LINE SHOWN ATTACHED TO CRANK TUBE

RIGHT AILERON CONTROL LINE SHOWN ATTACHED TO CRANK TUBE

QUICKLINK, 1/8 INCH, TAPED IN PLACE SO IT CANNOT BE OPENED, 3 PLACES

MARINE SNAPHOOK, 2 INCH, 2 PLACES

SAME AREA AS BELOW, SEEN FROM OUTBOARD

SAME AREA AS BELOW, SEEN FROM AHEAD

COMPRESSION STRUT LINE GUIDE, SPLIT RING MADE FROM P.V.C. TUBE, 3/4 ID X 1/4, ATTACH TO TOP OF STRUT WITH FLEXIBLE ADHESIVE OR EPOXY. TYPICAL FOR 2 PLACES ON EACH OF 3 COMPRESSION STRUTS ON EACH WING. PLACE GUIDE TO CENTER ON TENSIONED AILERON CONTROL LINE.

AILERON CONTROL LINE

AILERON CRANK TUBE (PART OF NOSE SECTION)

VIEW B, FROM G4S11

VIEW C, FROM G4S11

G4S12
AILERON CONTROL LINE ROUTING 2

GOAT4 ULTRALIGHT GLIDER

M. SANDLIN, JANUARY 23, 2007
THE UPPER AND LOWER AFT SWEEP CABLES ARE ACTUALLY A SINGLE CONTINUOUS CABLE Routed THROUGH A THIMBLE & SLEEVES AS SHOWN. THE FORWARD END IS RIGGED TO A PAIR OF TENSIONING END PLATES FOR ATTACHMENT WITH A QUICK RELEASE PIN (SEE G4A6).

AT THE SWEEP CABLE ATTACHMENT STATION THE FLAP PANEL RIB IS DOUBLE WIDTH & HAS AN EXTRA LAYER OF FIBERGLASS TAPE.

AN3-6A BOLT WITH 3/4 DIAM. WASHER, 2 PLACES

SAME AREA AS ABOVE, SEEN FROM INBOARD.

FABRIC GAP COVER, 6 IN. WIDE. APPLY FULL SPAN, PASSES THROUGH HINGE AXIS SO FABRIC TENSION DOES NOT CHANGE WHEN PANEL ROTATES, (THICKNESS EXAGERATED), SEE G4S14.

FLAP PANEL FLANGE, FROM INSET, BOLT TO REENFORCED FLAP PANEL RIB

QUICK ASSEMBLY PIN, 3/16 X 1-1/4, SEE G4A4, SHOWN WITHOUT ELASTIC RETAINERS FOR CLARITY

THE FLAP PANEL IS LOCKED IN FLIGHT POSITION BY A 1/8 QUICKLINK WHICH IS CLOSED AROUND THE TWO AFT SWEEP CABLES DURING ASSEMBLY. THE QUICKLINK STAYS ON THE FLAP PANEL DURING TRANSPORT & STORAGE.
RIG UPPER & LOWER WING CABLES FIRST, THEN RIG THE SWEEP CABLES. SWEEP CABLES SHOULD BE JUST AS LOOSE AS THE LOWER WING CABLES, OR MORE SO, WHEN THE GLIDER IS FULLY ASSEMBLED ON THE GROUND. THIS IS INTENDED TO ALLOW FOR SOME INCREASE IN SWEEP CABLE TENSION IN FLIGHT, WHEN THE WING IS LIFTED AND THE LOWER WING CABLES COME UNDER TENSION.

LEADING EDGE SHELL IS MADE FROM 1 1/8 INCH STYROFOAM BLOCKS. CUT LENGTH TO FIT BETWEEN RIBS, ABOUT 18 INCHES LONG.

BOND BLOCKS BETWEEN THE RIBS (EPOXY), 12 BLOCKS PER WING. FORM THE STYROFOAM BY REMOVAL DOWN TO THE RIB OUTER CONTOUR (SHAVE OR SAND).

TWO VIEWS OF TYPICAL WING RIB AND LEADING EDGE SPAR TUBE, SEEN FROM SIDE.

LIGHT CONSTRUCTION SPACKLE IS APPLIED TO FILL TOP SURFACE OF SHAPED STYROFOAM, THE SHELL IS THEN Sanded SMOOTH. TOP OUTER FACE IS SEALED WITH EPOXY RESIN TO PREVENT STYROFOAM FROM BEING DISSOLVED BY FABRIC SEALANT.
RIB PATTERN IS PRINTED ON 5 SHEETS OF LETTER SIZE PAPER AT FULL SCALE. SHEETS ARE COMBINED INTO A SINGLE FULL SIZE PATTERN. RIBS ARE COMPARED TO THIS PATTERN AS THEY ARE FORMED BY HAND BENDING OR USE OF A VICE OR MANDREL.

TYPICAL WING RIB, VIEWED FROM SIDE, MAKE 22

SEE INSET FOR RIB ATTACHMENT METHOD. DO NOT DRILL HOLES IN SPAR TUBE

FRONT SPAR TUBE

DUALIZE RIB TUBE ENDS TO LIE FLAT ON FRAME TUBES, INSTALL ON WING FRAMES AT EVEN SPACING (ABOUT 17-5/8 IN. APART) AS SHOWN ON G451.

WING RIB ATTACHMENT TO LEADING EDGE TUBE. TRAILING EDGE IS THE SAME

ATTACH RIB ONTO SPAR TUBE USING 1/2 IN. WIDE FIBERGLASS TAPE (MADE FROM 1 IN. TAPE) COMPLETELY AROUND SPAR TUBE. BOND WITH WET LAYUP OF EPOXY, 44 PLACES.

G4S8
WING RIBS

GCAT4 ULTRALIGHT GLIDER
M. SANDLIN, JANUARY 14, 2007
TIP RIB, 1/2 X .035, ABOUT 51 IN. LONG, SMOOTH BENDING, SECURE TO MAIN FRAME TUBES WITH RIVET AT EACH END

SAME AREA AS VIEW BELOW, SEEN FROM BEHIND

TIP RIB UPPER BRACE, 3/8 X .035 X 20, FLATTEN ENDS & SECURE TO OTHER TUBES WITH END RIVETS, 2 PLACES

BRACES, 1/4 X .035 AL. TUBE, LENGTH ABOUT AS MARKED, FLATTEN ENDS & SECURE TO OTHER TUBES WITH RIVETS, 4 PLACES

SKID/HANDLE MOUNTING BRACKET, SEE INSET, 4 PLACES

VIEW OF TIP RIB LAID FLAT

VIEW A FROM G4S1

LEFT WING OUTBOARD END SEEN FROM LEFT

TIP SKID & HANDLE, 1/2 X .028 X 12 ALUM. TUBE, BEND IN SMOOTH CURVE, 7 INCH RADIUS, FASTEN WITH RIVETS

LOWER TIP RIB, 1/2 X .035, 44 IN. LONG, FLATTEN ENDS & SECURE TO MAIN FRAME TUBES WITH AN3-4 BOLTS WITH BOLT HEADS DOWN TO SERVE AS WING TIP CORNER CLEATS

G4S6 WING OUTBOARD END STRUCTURE

G0AT4 ULTRAIGHT GLIDER

M. SANDLIN, JANUARY 16, 2007
AILERON FORWARD TUBE, 1 X .035 X 109-1/2

SLEEVE, 3 PLACES, SEE G4S2

VIEW A, FROM INSET BELOW

90-1/8 FROM INBOARD END OF AILERON FORWARD TUBE

BEND REAR AILERON TUBE TO FORM SMOOTH CURVE, 36 R

TRIM OUTBOARD END OF AILERON FORWARD TUBE TO ACCEPT TRAILING EDGE TUBE, SECURE WITH RIVET

58-3/8 FROM INBOARD END OF AILERON FORWARD TUBE

15-3/8 FROM INBOARD END OF AILERON FORWARD TUBE

AILERON CONTROL ARM ASSEMBLY, SEE G4S4

AILERON REAR TUBE, 1/4 X .035, 114 IN. LONG (THEN TRIM)

VIEW C, FROM INSET BELOW

AILERON PANEL G4S3

G4AT4 ULTRALIGHT GLIDER

M. SANDLIN, JULY 26, 2007

VIEW A, SEE ABOVE

VIEW B, SEE ABOVE

VIEW C, SEE ABOVE

LEFT AILERON LAYOUT, SEEN FROM ABOVE

10 10 10 20-1/2

9-1/2

5 PLACES
Panel hinge pivot bolt, AN3-6 bolt (drilled) with AN310-3 castle nut & cotter pin, 5 places per wing.

Flap panel front tube, 1 x .035 x 91-3/4.

Sleeve, .875 x .035, 6 in. long, 5 places per wing.

Diagonal ribs are used to stiffen panels against tensioning of the cover fabric.

View A, from inset below.

View B, from inset below.

View C, from inset below.

View D, from inset below.

View E, see G4310.

Flap panel rear tube, 1/4 x .035 x 91-3/4.

65 deg. or 14 mm. on tube surface.

Composite rib per G447.

Panel aft hinge, eyebolt, AN42B-20A, with 3/4 in. spacer, 5 places per wing.

Side view of typical trailing edge panel rib & hinge.

G4S2 flap panel.

Goat4 ultralight glider.

Elevator snap hook secures control arm to slide tube eyebolt.

Elevator connection.

Same view as at lower left.

Elevator is unfolded.

Control arm is unfolded.

Control arm is set in place with eyebolt flange thru slot, then retained by snap hook thru eyebolt flange (see inset).

Rudder & aft tail section viewed from left with views of horizontal tail plane being installed.

Horizontal tail plane is set down onto aft pin, then slid forward to engage pin & front slot.

Tail struts shown stowed for transport, rotated forward & inboard flush to vertical stabilizer, retained in position by strut end bungee fasteners.

Tail strut fairing, same as on G4W15.

G4T20 horizontal stabilizer attachment.

G0A4 ultra light glider.

TAIL STRUT

VIEW A, SEE INSET

EYEBOLT SPACER, SAME AS ON G4T18, 1 EACH SIDE

VIEW A, FROM ABOVE

STABILIZERS SEEN FROM REAR, ASSEMBLED IN FLIGHT POSITIONS

STRUT ROTATES FORWARD & INBOARD ONTO VERTICAL STABILIZER FOR TRANSPORT & STORAGE

TAIL STRUT HINGE BOLT, AN3-10 BOLT (DRILLED) WITH AN310-3 CASTLE NUT & COTTER PIN, 1 EACH SIDE

SAME AS VIEW F, G4T10, BUT WITH COVER FABRIC AND TAIL STRUT SHOWN

TAIL STRUT ASSEMBLY FITTING, 1/2 X 1/8 ALUM. BAR, 3 IN. LONG, MAKE 2

40 TO 45 DEG. SMOOTH BEND TO FIT, 3/8 R MINIMUM

1/8 DIAM. HOLE, 4 PLACES

1/8 X 1/2 SLOT

1/2 TYPICAL

1/4 R, BOTH ENDS

2 VIEWS OF RIGHT TAIL STRUT, MAKE 1 RIGHT & 1 LEFT

TAIL STRUT TUBE, 3/8 X .035 X ABOUT 35-3/4

TAIL STRUT ASSEMBLY FITTING, SEE INSET, FASTEN WITH 1/8 RIVETS

STRUT END FITTING, SEE G4T10, FASTEN WITH 1/8 RIVETS, USE SPACERS (WASHERS) AS REQUIRED

G4T19
TAIL STRUTS

GOAT4 ULTRALIGHT GLIDER

M. SANDLIN, JANUARY 27, 2007
1/8 ELASTIC SHOCK CORD (BUNGEE CORD)

SMALL SWIVEL SNAP HOOK, 3/16 IN. SOLID STEEL SHANK (NOT CAST METAL)

VIEW A. FROM G4T16

VIEW A. FROM G4T19 (BOTH VIEWS)

SMALL SWIVEL SNAP HOOK, 3/16 IN. SHANK, RETAINED BY ELASTIC CORD, SIMILAR TO HORIZONTAL TAILPLANE CENTERLINE REATINER AT LEFT. 1 PER TAIL STRUT.

ANCHOR LOOP PASSES AROUND UPPER TAIL TUBE, PASSING THROUGH HOLES IN FABRIC

SAME AREA AS IN VIEW ABOVE, WITH HORIZONTAL TAIL PLANE IN PLACE

G4T18
SWIVEL SNAPHOOK CONNECTIONS

GOAT4 ULTRALIGHT GLIDER
M. SANDLIN
JANUARY 27, 2007
Vertical Stabilizer & Rudder, Fabric Covered and Joined, Viewed from Left

Tail Sweep Cable Assembly, 1 per side, see G4S10

Elevator Slide Tube Eyebolt protrudes thru 6 inch slot in fabric

Elevator Control Lines pass thru slots in fabric, both sides

Fabric tape is applied over the main fabric to reinforce the places where fabric extends from a solid surface into an open bay (the edge of a rib, for example), or to reinforce areas that protrude and may be subject to abrasion.

Rudder Control Lines per G4A9, 1 left & 1 right,

"S" pattern gap cover (fabric tape) passes through panel hinge axis so it is not stretched or slackened by rudder rotation.

Section View of Rudder Attachment to Rudder Post, seen from above

Isometric View of Area of View B Above
SECTION VIEW, AREA OF VIEW A ABOVE

INTERNAL STRUTS ARE PAIRS OF 1/4 X .035 TUBES FASTENED ONTO THE MAIN TUBES WITH 1/8 IN. RIVETS, INTENDED TO RESIST DISTORTION OF THE VERTICAL STABILIZER CAUSED BY TENSIONING OF THE COVERING FABRIC.

STYROFOAM BLOCK, 1 X 1-1/4 OR TAPERING, LENGTH AS REQUIRED, CEMENT BETWEEN STRUTS WITH EPOXY RESIN

VIEW A SEE INSET

INTERNAL STRUTS, & PAIRS

VIEW B SEE G4T16

VERTICAL STABILIZER, UNCOVERED, VIEWED FROM LEFT

ELEVATOR CONTROL LINE, SEE G4A9

G4T15 VERTICAL STABILIZER INTERNAL STRUTS

GUAT4 ULTRALIGHT GLIDER

M. SANDLIN, JANUARY 27, 2007
FOR TRANSPORT & STORAGE, LOWER TAIL TUBE LOCKS TO UPPER TUBE USING QUICK PIN, SAME PIN AS SHOWN ON G4T10.

ROUND EDGES OF BRACKETS IN VICINITY OF CONTROL LINES TO REDUCE RUBBING WEAR.

TYPICAL CONTROL LINE, ROUTED THRU LINE GUIDE.

RIVET WITH TUBULAR SPACER, 1/4 X 1/4, 3 PER SIDE.

FORWARD LINE GUIDE BRACKET, SEE INSET, ONE PER SIDE.

LINE GUIDE PLATE, SEE INSET, ONE PER SIDE.

SAME VIEW AS BELOW.

REAR LINE GUIDE AREA, SECTION VIEW.

RIVET WITH TUBULAR SPACER, 1/4 X 1/4, ONE SPACER EACH SIDE.

AN3-26 BOLT WITH TUBULAR SPACER, 1/4 X 1/4, 4 PER SIDE.

FORWARD LINE GUIDE AREA, SECTION VIEW.

RIVET, 2 PER SIDE.

RIVET, 2 PER SIDE.

VIEW FROM G4T13.

ABOUT 10-1/2 FROM FORWARD END OF TUBE, LOCATE BY ASSEMBLY, WITH LOWER TAIL TUBE IN FOLDED POSITION, LOCKED TO UPPER TAIL TUBE FOR TRANSPORT.

G4T14 VERTICAL STABILIZER LOWER TUBE DETAIL.

LOWER TAIL TUBE PIN Bracket, USE STRUT FITTING FROM G4T10, ENLARGE 3/16 IN. HOLE TO 1/4 IN., ONE PER SIDE. DRILL 1/4 IN. HOLE THRU LOWER TAIL TUBE TO ACCEPT 1/4 IN. QUICK PIN.

FORWARD END OF LOWER TAIL TUBE, SEEN FROM FORWARD.

LINE GUIDE PLATE, 1/2 X 1/8 ALUM BAR, 1-1/2 IN. LONG, MAKE 4.

G0AT4 ULTRALIGHT GLIDER.

VIEW C, FROM G4T9

HORIZONTAL STABILIZER AFT PIN ASSEMBLY FROM G4T8

SLEEVE, 1/4 IN.
AN3-16A BOLT, 2 PLACES

ELEVATOR CONTROL LINE UPPER PULLEY, MARINE PULLEY AS PER G4A9, WITH 1/8 INCH QUICK LINK, BOLTED TO ELEVATOR PULLEY BRACKET WITH 3/4 IN. WASHER

REAR TUBE OF HORIZONTAL STABILIZER SHOWN IN ASSEMBLED POSITION

AN3-14A BOLT
AN3-5A BOLT
AN3-24A BOLT WITH SPACER WASHERS FOR CABLE TENSIONING
AFT END OF UPPER CABLE OF LEFT TAIL SWEEP CABLE ASSEMBLY, SEE G4S14, G4T17

VERTICAL STABILIZER CORNER PLATE, FROM G4T10, 2 PLACES

RUDDER HINGE PLATE FROM G4T10. TRIM REAR EDGE FOR FREE ROTATION OF RUDDER EYEBOLT, REAR UPPER EDGE CAN BE FILED FOR MORE FLUSH CONTACT AREA WITH EYEBOLT FLANGE.

AN3-5A BOLT, 2 PLACES

ELEVATOR PULLEY BRACKET FROM G4T10

SLOT TO PASS ELEVATOR PULLEY BRACKET, 1/2 X 1/8

SAME AREA AS AT LEFT, VIEWED LOOKING FORWARD

SAME AREA AS VIEW C, G4T9, BUT SEEN FROM ABOVE

G4T11 VERTICAL STABILIZER DETAIL 2
G0AT4 ULTRALIGHT GLIDER
M. SANDLIN, JANUARY 27, 2007
STABILIZER MOUNTING CHANNEL. 1-1/4 X 1-1/4 X 1/3 ALUM. CHANNEL

MAKE AFT PIN ASSEMBLY FROM AN3-30A BOLT OR EQUIVALENT, 2 LOCK NUTS, AND STABILIZER MOUNTING CHANNEL (SEE AT LEFT). CUT HEX HEAD FROM BOLT, ADD THREAD, ASSEMBLE AS SHOWN.

STABILIZER MOUNTING ANGLE. 1-1/4 X 1-1/4 X 1/8, ALUM. ANGLE

SLOT IN ANGLE FACE ALLOWS EYEBOLT FLANGE INSERTION

1/8 X 1/2 SLOT TO FIT EYEBOLT FLANGE, MAKE BY DRILLING A ROW OF 1/8 DIAM. HOLES. THEN JOIN USING SIDE OF DRILL BIT & SMALL FILE.

SAME AREA AS ABOVE, VIEWED FROM SIDE

SAME AREA AS BELOW, VIEWED FROM FORWARD

STABILIZER EYEBOLT SPACER. MAKE FROM NEOPRENE FAUCET WASHER, 1/8 X 5/8 DIAM., CUT SLOT TO FIT EYEBOLT FLANGE, 3 PLACES ON STABILIZER. FABRIC OVER OR SECURE WITH FLEXIBLE ADHESIVE.

G4T8
TAIL ASSEMBLY DETAIL

GOAT4
ULTRALIGHT GLIDER
M. SANDLIN, JANUARY 26, 2007
ELEVATOR REAR HINGE EYEBOLT, AN42B-10A, 3 PLACES ON ELEVATOR FORWARD TUBE

SIDE VIEW OF ELEVATOR HINGE REAR EYEBOLT

RIVET, 12 PLACES

ELEVATOR CRANK TUBE, 3/4 X .035 TUBE, 6 IN. LONG

VIEW OF AREA SHOWN AT FAR LEFT, LOOKING OUTBOARD TO THE LEFT FROM CENTERLINE

G4T6
ELEVATOR DETAIL
GD4T4
ULTRALIGHT GLIDER
M. SANDLIN, JANUARY 28, 2007
**G4T4**

**HORIZONTAL STABILIZER DETAIL**

**GO4T4 ULTRALIGHT GLIDER**

M. SANDLIN, JANUARY 25, 2007

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**View D**

- **Stabilizer Forward Eyebolt, AN42B-12A (Spacer Will Be Added, See G4T9)**

**View E**

- **Same Area As View D, G4T3, But Seen From Left**

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- **Bridge Between Ribs With Styrofoam 1 Inch Cube, Epoxy In Place, Seal Top & Bottom With Wet Layup of Fiberglass Fabric Tape**

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- **Elevator Hinge Forward Eyebolt, AN42B-16A, 3 Places On Rear Tube**

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- **60 Deg., (13 MM, On Tube Surface)**

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- **Eyebolt Flange Spaced Out From Tube 1/4 In.**

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- **This 3 X 1 Inch Rectangular Area, On The Bottom Surface Of The Horizontal Stabilizer, Will Be Left Open (Not Fabric Covered) For Assembly Access.**

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- **3/16 Diam. Hole Thru Tubes**

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- **Sleeve**

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RUDDER TUBING

RUDDER TRAILING EDGE TUBE,
3/8 x 0.035, ABOUT 80 IN. LONG

SLEEVE,
5/8 x 0.035
X 3 IN. LONG, 2 PLACES

RUDDER TORQUE TUBE,
3/4 x 0.035 x 43

VIEW C, SEE G4T2

VIEW B, SEE G4T2

VIEW A, SEE G4T2

RADIUS OF RUDDER CONTOUR CHANGES AT VERTICAL POINT

18-1/2 R

9 TYPICAL

26-1/2 R

30-1/2

43

45 REF.

27-1/4 REF.

COMPOSITE RIBS AS PER METHOD OF G4A7, 4 PLACES

RUDDER TRAILING EDGE TUBE, BEND TO SMOOTH ARC

RUDDER ASSEMBLY,
UNCOVERED, VIEWED FROM LEFT

G4T1 RUDDER

G4A4 ULTRALIGHT GLIDER

M. SANDLIN, JANUARY 24, 2007
1. The tensioning line is 7/64 "lightening rope" (same as control lines), about 6 feet long, secured to one harness ring with at least five half hitch knots.

2. Top wing cables (landing cables) are tensioned during assembly by drawing the harness rings together using a line through the king post line guide.

3. Multiple threadings of the tensioning line are used to draw rings together into final position (no cable slack, with 4 or 5 lines loaded).

4. Line is secured as a structural member using a minimum of five half hitch knots around the line bundle.
KING POST LINE GUIDE, P.V.C. PLASTIC PIPE, ABOUT .85 IN. I.D. (NOMINAL 3/4 IN. I.D.), 1-1/4 IN. LONG, ROUND & SMOOTH INNER EDGES TO REDUCE LINE STRESS & WEAR. PRESS INTO PLACE AND BOND WITH EPOXY OR FLEXIBLE ADHESIVE.

WELDED STEEL HARNESS RING, 1-1/4 O.D. X 3/16, 2 PLACES

TENSIONING LINE, 7/64 DIAM. "LIGHTENING ROPE" (CONTROL LINE), SEE G4W13

VIEW FROM ABOVE OF HARNESS RING & UPPER WING LANDING CABLE PAIRS

MAKE HOLE FOR TIGHT FIT TO LINE GUIDE TUBE, ABOUT 1.1 IN. DIAMETER. DRILL CIRCLE OF 1/8 IN. HOLES, PUNCH OUT CENTER, THEN FILE EDGES TO FIT.

KING POST PLATE, 1 3/4 X 1/8
ALUM. BAR, 2 1/4 IN. LONG, MAKE 2

KING POST LINE GUIDE BRACKET, 1 3/8 X 1/8 ALUM. BAR, 3 IN. LONG, MAKE 2

AN3-14A BOLT

AN3-16A BOLT, 2 PLACES
OVALIZE FAIRING TUBE TO SLIDE ONTO MAIN TUBE. USE PADDED VICE TO FORM TUBE SMOOTHLY.

Rear Post Main Tube, 3/4 X .035 X 45-1/2. With fairing tube, 1-1/8 X .035 X 45-1/2 (OVALIZED, SEE INSET)

Kingpost Assembly Viewed from Left

Front Post Main Tube,
3/4 X .035 X 46, With fairing tube,
1-1/8 X .035 X 46 (OVALIZED)

Rivets on opposite sides of the nose tube are offset 1 inch

Rivet, 1 each side, to center main tube in fairing tube, 4 places per post

Quick pin, 1/4 X 2-1/2. See G4A4 & G4A5,
1 front & 1 back

1/4 Diam. hole, 1/2 in. from end of tube, same for front post

Same area as at left, viewed from forward

G4W11 KING POST ASSEMBLY GOAT4 ULTRALIGHT GLIDER M. SANDLIN, JANUARY 16, 2007
AN3-12A BOLT, 3 PLACES

AN42B-10A EYEBOLT, 2 PLACES

HINGE BOLT, 2 PLACES, SEE G4T9

SLEEVE, 5/8 X .035 X 3, 2 PLACES

SLEEVE, 5/8 X .035 X 2, 2 PLACES

6 POP RIVETS FOR SLEEVE ATTACHMENT, 3 PLACES

SLEEVE, 7/8 X .035 X 2

1/2

1

1/2

VIEW A
FROM G4W8

VIEW B
FROM G4W8

VIEW C
FROM G4W8

VIEW D
FROM G4W7

LOWER COMPRESSION BRACE, 1/2 X .028 X 7-1/4 (LOWER), 13-1/4 (UPPER) TUBE. SET INTO POP RIVETS RAISED WITH SPACERS. THIS BRACE IS INTENDED TO PREVENT DISTORTION OF THE CABANE ASSEMBLY BY COVER FABRIC TENSION. MAKE 1 UPPER & 1 LOWER.

21-1/4 FROM LOWER END OF TUBE

3/8 R, 3 PLACES

3/16 DIAM. HOLE, 4 PLACES

CABANE FORWARD PLATE, 1-1/2 X 1/8 ALUM. BAR, 1-1/2 IN. LONG, MAKE 4

3/8 R, 4 PLACES

3/16 DIAM. HOLE, 4 PLACES

CABANE REAR PLATE, 1-3/4 X 1/8 ALUM. BAR, 1-3/4 IN. LONG, MAKE 4

19 FROM LOWER END OF TUBE, 34 FOR UPPER TUBE

G4W9
CABANE DETAIL 1

GOAT4 ULTRAIGHT GLIDER

M. SANDLIN, JANUARY 21, 2007
VIEW D, FROM G4W2

AN3-10A BOLT, 2 PLACES
AN3-24A BOLT

RIGHT WING FORWARD JOINING FIXTURE, ONE OF FORWARD PAIR, SPACED FORWARD 1/8 IN. Relative to LEFT HAND FIXTURE.

RIGHT WING REAR JOINING FIXTURE, ONE OF FORWARD PAIR, SPACED BACK ABOUT 1/8 IN. Relative to LEFT HAND FIXTURE, TO CLEAR LEFT HAND FIXTURE.

WING LEADING EDGE SPARS JOINED AT CENTER LINE, VIEWED FROM FORWARD, QUICK PIN INSERTED BUT PIN RETAINERS (ELASTIC LOOPS & LINE) NOT SHOWN.

VIEW E, FROM G4W2

AN3-12A BOLT, 2 PLACES
AN3-22A BOLT

RIGHT WING FRAME INBOARD FORWARD CORNER, SEEN FROM ABOVE

RIGHT WING FRAME INBOARD REAR CORNER, SEEN FROM ABOVE

RIGHT WING FORWARD JOINING FIXTURE, ONE OF REAR PAIR, SPACED FORWARD ABOUT 1/8 IN. Relative to LEFT HAND FIXTURE, TO CLEAR LEFT HAND FIXTURE.

RIGHT WING REAR JOINING FIXTURE, ONE OF REAR PAIR, SPACED BACK 1/8 IN. Relative to LEFT HAND FIXTURE.

G4W7
RIGHT WING JOINING ASSEMBLY

GOLDAN ULTRALIGHT GLIDER

M. SANDLIN, JANUARY 21, 2007
CABANE CENTER PLATE, 1-3/4 X 1/8
ALUM. BAR, 2-3/4 IN. LONG.
MAKE 4, SEE G4W9

1/4 R, BOTH ENDS
3/16 DIAM. HOLE. 3 PLACES

CABANE UPPER BRACKET, 1/8 X 1/2
ALUM. BAR, 2-1/2 IN. LONG.
MAKE 4, SEE G4W9

1/2 R, 3 PLACES
3/16 DIAM. HOLE
1/4 DIAM. HOLE. 2 PLACES

CABANE LOWER PLATE, 2 X 1/8
ALUM. BAR, 2 IN. LONG.
MAKE 4, SEE G4W9

G4W6
MIDFRAME STRUT ASSEMBLY

1/4 R, BOTH SIDES
3/16 DIAM. HOLE
1/8 DIAM. HOLE. 6 PLACES

1/2 TYPICAL

1/8 IN. HOLE
1/8 DIAM. HOLE.
6 PLACES

VIEW B, FROM G3W2
RIVET, 6 PLACES
COMPRESSION STRUT
CHANNEL, SEE INSET,
TYPICAL 4 PLACES
PER WING

SAME AREA
AS AT LEFT,
VIEWED
FROM INBOARD

SAME AREA
AS AT LEFT,
VIEWED
FROM INBOARD

1-1/2

1/8 IN. HOLE
1/8 DIAM. HOLE.
6 PLACES

G0AT4
ULTRALIGHT GLIDER
M. SANDLIN,
JULY 27, 2007
WING JOINING FIXTURE, FROM G2W2, 4 PLACES

AN3-6A BOLT, 4 PLACES

AN3-24A BOLT, 2 PLACES

WASHERS OR SPACERS AS REQUIRED, 8 PLACES

ROUND CORNERS OF JOINING FIXTURE TO ALLOW SOME FLUSH CONTACT TO INSIDE OF SLEEVE WALL, DO SAME FOR TRAILING EDGE FIXTURE

WING CENTER FIXTURE, FROM G2W2, 3 PLACES

CABANE HINGE EYEBOLT, AN42B-26A, 2 PLACES

SAME AREA AS IN VIEW (D) AT LEFT, SEEN FROM OUTBOARD (DOWN IS TO THE LEFT)

SAME AREA AS IN VIEW (D) AT LEFT, LEFT WING SEEN FROM FORWARD

COMPRESSION DOWEL, WOOD, 2 IN. LONG, 2 PLACES

AFT END OF INBOARD WING RIB IS SECURED BY FIXTURE BOLT, SEE G4S7

AN3-22A BOLT

AN3-24A BOLT

SAME AREA AS IN VIEW (F) AT LEFT, LEFT WING SEEN FROM AFT

WING TOP AFT CENTER FIXTURE, FROM G2W2

REAR CABANE HINGE EYEBOLT IS SPACED DOWN 1/8 IN. TO LEVEL CABANE ROTATION AXIS

SAME AREA AS IN VIEW (E) AT LEFT, SEEN FROM OUTBOARD (DOWN IS TO THE LEFT)

G4W5
WING INBOARD FRAME ASSEMBLY

G0A4 ULTRALIGHT GLIDER
M. SANDLIN, JANUARY 21, 2007
AILERON OUTBOARD PULLEY, MARINE PULLEY & QUICKLINK WITH 3/4 IN. DIAM. WASHER, 2 PLACES EACH WING

FORWARD OUTBOARD FLYING CABLE, 1/8 STAINLESS (ONLY THIS CABLE IS 1/8, ALL OTHERS ARE 3/32) 7 X 7, SEE G4A8

WING INTERNAL CABLE

FORWARD OUTBOARD LANDING CABLE, 3/32 STAINLESS 7 X 7, SEE G4A8

AILERON OR PANEL FORWARD HINGE EYEBOLT, AN42B-20A, 5 PLACES ON EACH WING, SEE SECTION VIEW ON G4W4

REAR OUTBOARD FLYING CABLE, 3/32 STAINLESS 7 X 7, SEE G4A8

REAR OUTBOARD LANDING CABLE, 3/32 STAINLESS 7 X 7, SEE G4A8

INTERNAL WING STRUTS ARE LOCATED BETWEEN THE SPAR TUBES SO AS TO LEAVE A GAP OF ABOUT 1/8 INCH AT EACH END.

SAME AREA AS IN VIEW (H) AT LEFT, SEEN FROM OUTBOARD (DOWN IS TO THE LEFT)

SAME AREA AS IN VIEW (A) AT LEFT, SEEN FROM OUTBOARD (DOWN IS TO THE LEFT)

AN3-26A BOLT

AN3-24A BOLT, 3 PLACES

AN3-12A BOLT, 2 PLACES

WASHERS OR SPACERS AS REQUIRED, 8 PLACES

WING INTERNAL CABLE

FORWARD OUTBOARD LANDING CABLE

COMPRESSION DOWEL, WOOD, FORM TO FIRM FIT, 3 IN. LONG, 2 PLACES

STRUCTURE FIXTURE, SEE G4W2, 4 PLACES

G4W3 WING OUTBOARD FRAME ASSEMBLY

GOA4 ULTRALIGHT GLIDER

M. SANDIN, JANUARY 20, 2007
INNER SLEEVE, 1-3/4 x .035 x 10
SLEEVE, 1-7/8 x .049 x 18
SLEEVE, 1-7/8 x .049 x 14
SLEEVE, 1-7/8 x .049 x 6
INBOARD FORWARD SPAR TUBE, 2 x .035 x 142-1/2
WING SPAR TUBING
SLEEVE, 1-5/8 x .035 x 18
SLEEVE, 1-5/8 x .035 x 6
SLEEVE, 1-5/8 x .035 x 14
SLEEVE, 1-5/8 x .035 x 6
INBOARD REAR SPAR TUBE, 1-3/4 x .035 x 142-1/2
OUTBOARD REAR SPAR TUBE, 1-3/4 x .035 x 142-1/2
OUTBOARD FORWARD SPAR TUBE, 2 x .035 x 66

INTERNAL STRUT, 3/4 x .035 x 41, 5 PLACES PER WING

NOTE: ALL OF THESE TUBES ARE 6061-T6 ALUMINUM SPECIFIED AS: DIAMETER x WALL THICKNESS x LENGTH, SEE G4A6

G4W1
WING TUBING
GOA4 ULTRALIGHT GLIDER
M. SANDLIN, JANUARY 20, 2007

SPAR & INTERNAL STRUT TUBING, LEFT WING, VIEWED FROM ABOVE, MAKE 2 WINGS