

Goat4

Ultralight Glider, Descriptive Drawings



California, US of A April 18, 2009

which describe the Goat4, an experimental ultralight glider which I have designed, built, and flown.

(download from the same website) are worth looking at for Goat4 possible upgrades, since the construction is similar and it is a later design. In addition, the Pig's boat seat, simplified nose structure, and control line standards may be of interest. Other possible upgrades might be suggested by the Pig's boat seat, simplified nose structure, and control line standards.

This document is intended to be a description of what I have done, not a set of plans, at least not in the sense of providing instructions or advice to any second person.

I give no technical advice, nor do I recommend building or flying any specific aircraft, nor do I represent myself as any kind of expert.

The files are in ".DFX" format, an Autocad file format, which can be viewed, printed, and edited with Computer Assisted Design (CAD) software. The .dxf files are intended for users who wish to closely examine and/or modify the design.

The files are as follows:

Goat4 Drawings

Aircraft

Drawings

Dimensions

Controls & Handles

Fasteners

Joinery & Fasteners

Structure

Steel Cables

Control Lines

Control Standards

Control Connector

Reference

Colors

Photos

Overview

Accelerometer

Accelerometer Detail

Assembly

Assembly Detail

er
er Detail 1
er Detail 2
er Detail 3
er Detail 4
er Lower Tube Detail
er Internal Struts
Tube
Tail Section
ok Connections
ilizer Attachment

sembly
d Frame Assembly
e Assembly
-Frame Assembly
t Assembly
ning Assembly
bly
1
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sembly
ail
Tensioning

s
/ Structure Overview

Control Arms
d
End Structure
nd Structure

Shell
Line Connection
Line Routing 1
Line Routing 2
Line Crossover Connection
Covering

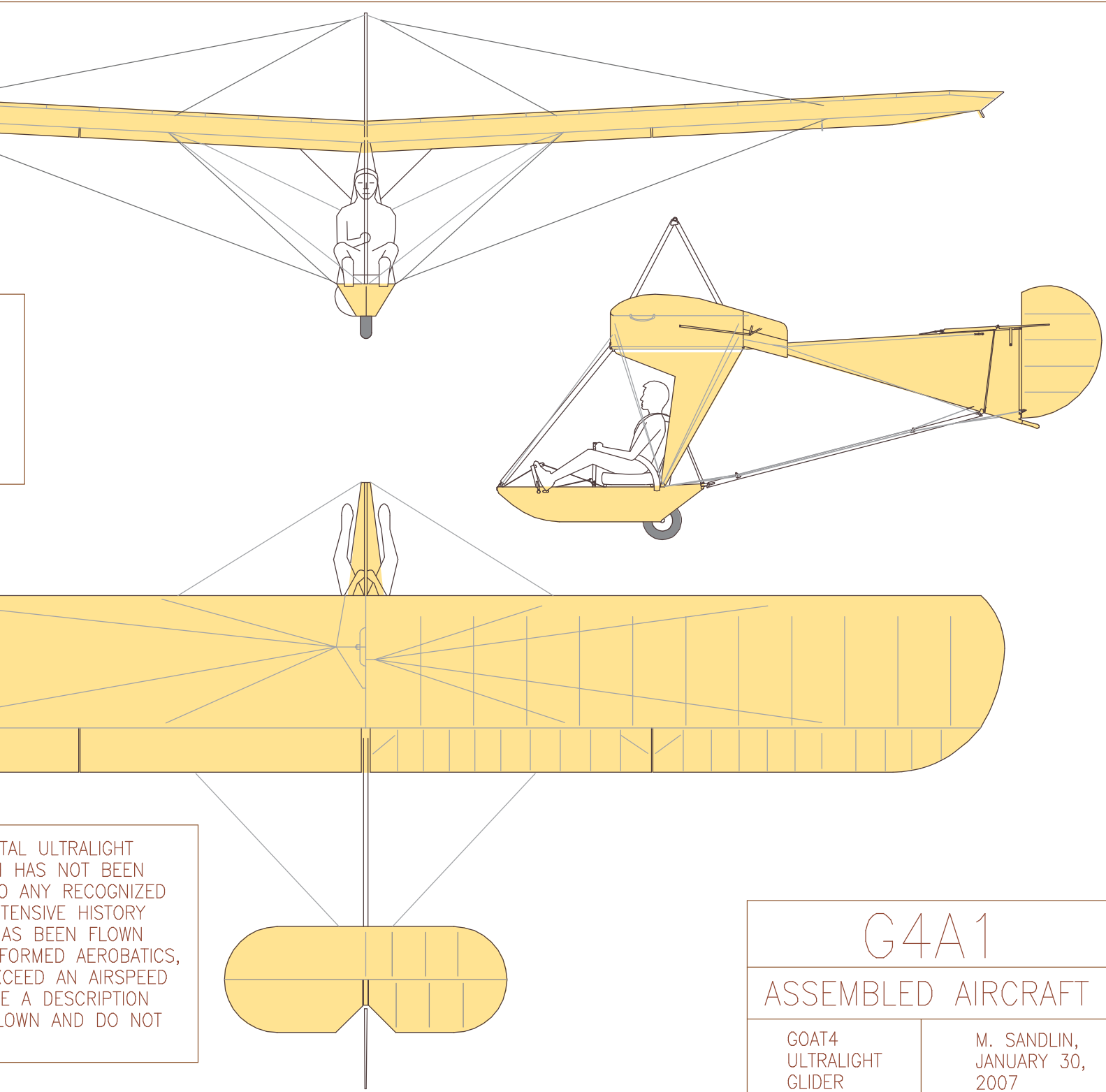
Top Frame
Detail
Structure

Lower Frame
e
Assembly
Assembly

Pedal Installation
Control Lines
Control Lines
Detail 1

Detail 2
Motor Control Lines
Parachute 1
Parachute 2

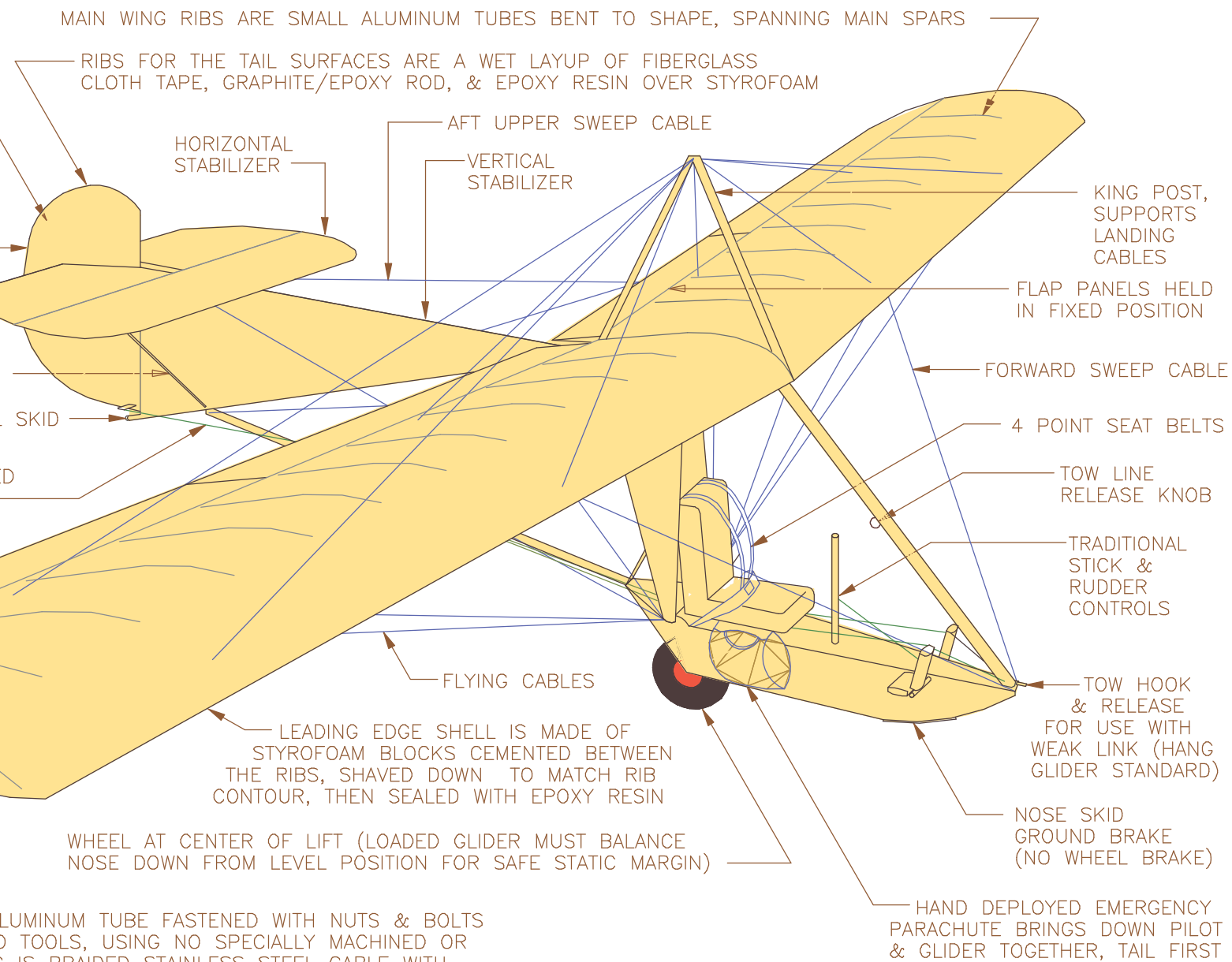
Goat4 drawings will be posted on my "Basic Ultralight Glider" Website. A drawing that is revised will have a later date than previous versions. Be included in subsequent (higher numbered) Zip files). Check the website for a revision of any downloaded drawing before accepting it as the



TAL ULTRALIGHT
 I HAS NOT BEEN
 O ANY RECOGNIZED
 TENSIVE HISTORY
 AS BEEN FLOWN
 FORMED AEROBATICS,
 CEED AN AIRSPEED
 E A DESCRIPTION
 LOWN AND DO NOT

G4A1	
ASSEMBLED AIRCRAFT	
GOAT4 ULTRALIGHT GLIDER	M. SANDLIN, JANUARY 30, 2007

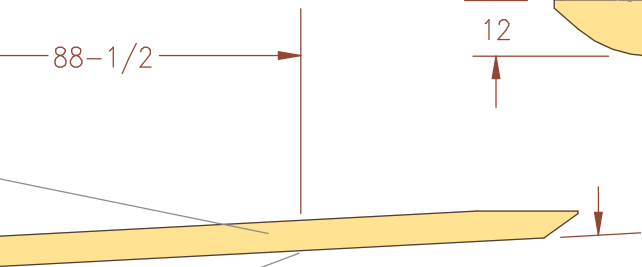
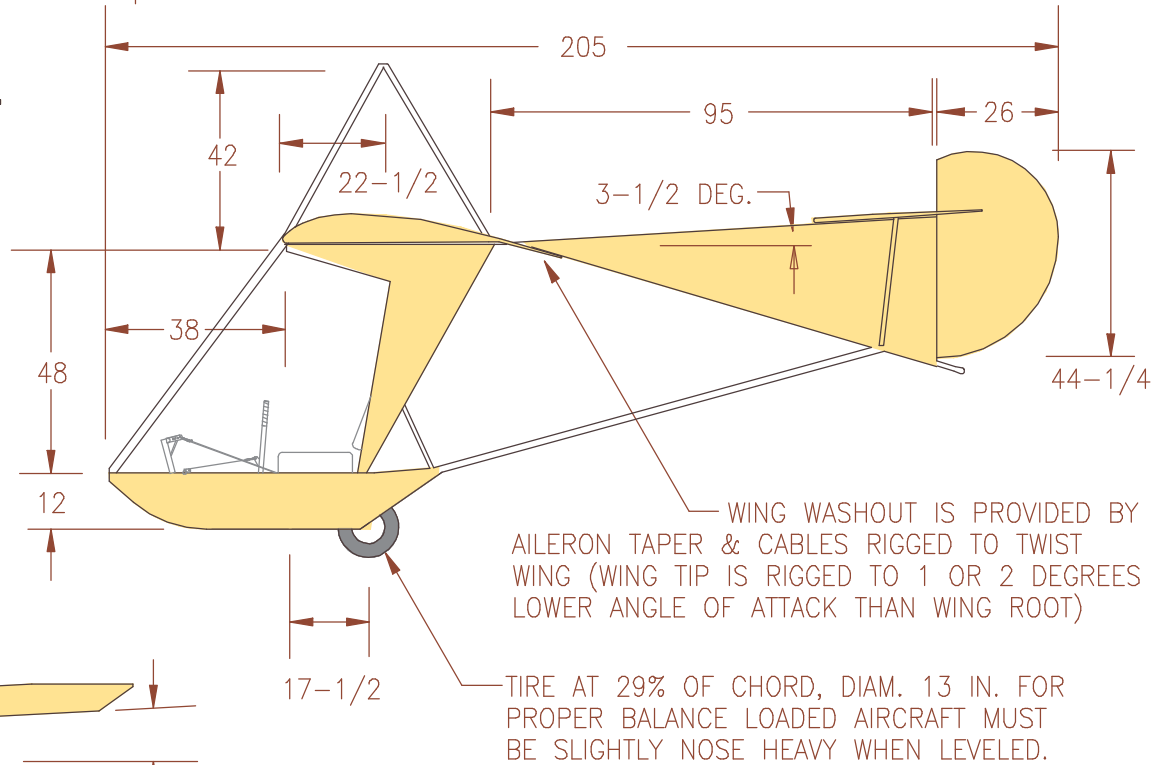
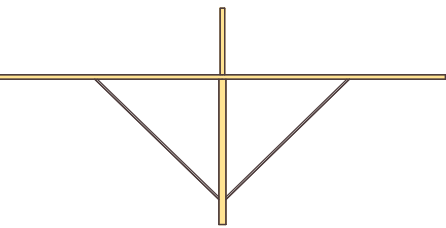
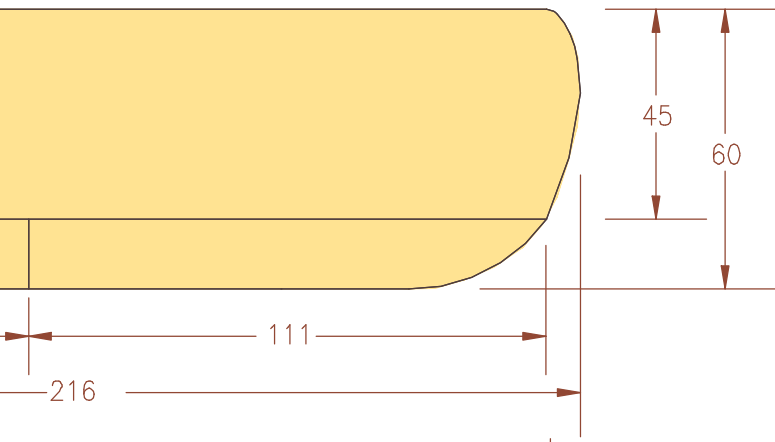
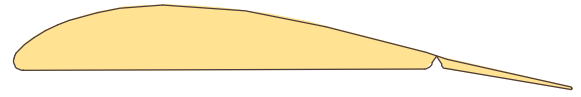
CONVENTIONAL AIRCRAFT PROCESS, BUT USING LIGHT, UNCERTIFIED CLOTH (POLYESTER). FABRIC PANELS ARE
 INTO THE FRAME, THEN SHRUNK TO CONTOUR WITH A CLOTHES IRON. FABRIC IS SEALED BY BRUSHING ON A
 RUSH OR BUTYRATE DOPE). SURFACES EXPOSED TO SUNLIGHT ARE PROTECTED BY ADDITIONAL COATS OF
 M PASTE (SILVERING). BRIGHT PAINT IS APPLIED OVER SILVERED SURFACES TO MAKE THE AIRCRAFT



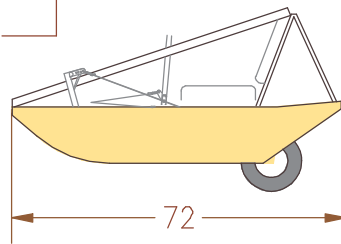
ALUMINUM TUBE FASTENED WITH NUTS & BOLTS
 TO TOOLS, USING NO SPECIALLY MACHINED OR
 IS BRAIDED STAINLESS STEEL CABLE WITH
 SLEEVES. FOR TRANSPORT, GOAT4 BREAKS
 HORIZONTAL TAIL PLANE, TAIL BOOM & RUDDER,
 & THE KING POST, WHICH IS FOLDED AND

G4A2	AIRCRAFT OVERVIEW	GOAT4 ULTRALIGHT GLIDER	M. SANDLIN, FEBRUARY 5, 2007
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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.



3 DEGREE DIHEDRAL ANGLE



G4A3

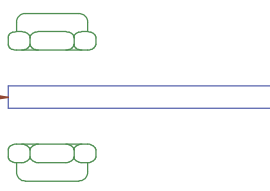
NOMINAL DIMENSIONS

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GLIDER

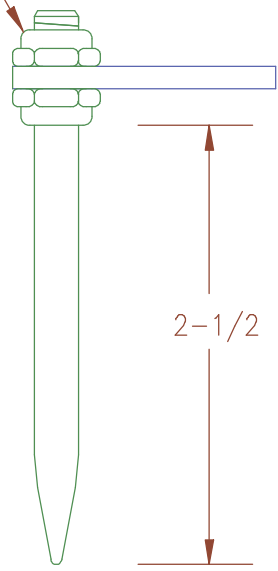
M. SANDLIN,
FEBRUARY 6,
2007

1/8 IN.
DIAL
INDICATOR

SECURE PIN HANDLE
WITH LOW PROFILE
ELASTIC STOP NUTS

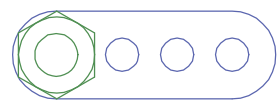


1/4 INCH DIAM. SHAFT QUICK
PIN (FROM AN4 BOLT), MAKE 9
(2 FOR WING JOINING, 2 FOR
THE KING POST, 1 FOR NOSE
TUBE, 2 FOR TAIL BOOMS,
2 FOR LOWER CABANE)



TAPER END

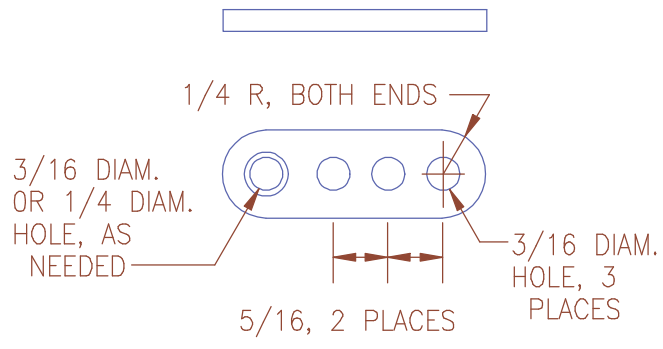
FABRICATION
SEQUENCE FOR
QUICK PINS



HEX HEAD



1/4 INCH DIAM. SHAFT QUICK
PIN (FROM AN-3 BOLT),
MAKE 9 (2 FOR SWEEP
POST, 2 FOR AILERONS)



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

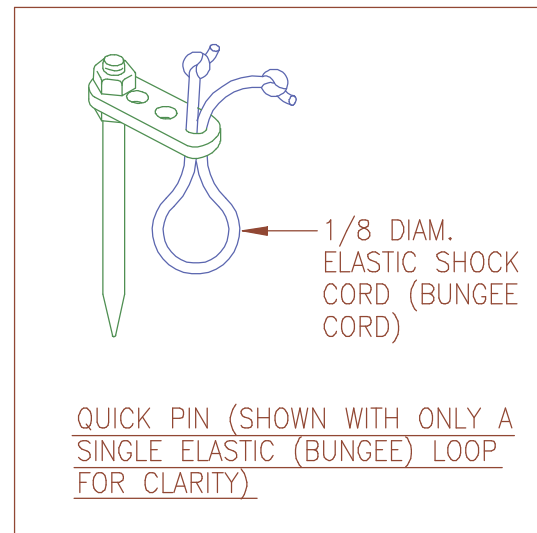
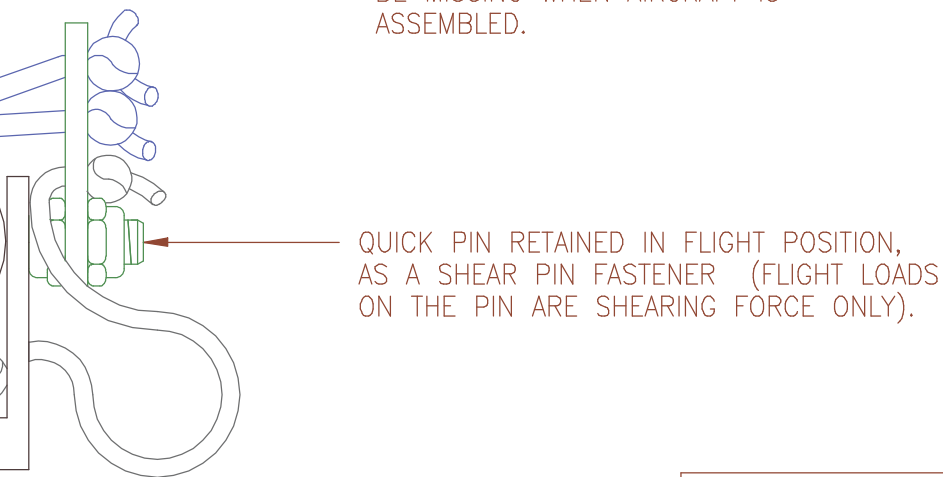
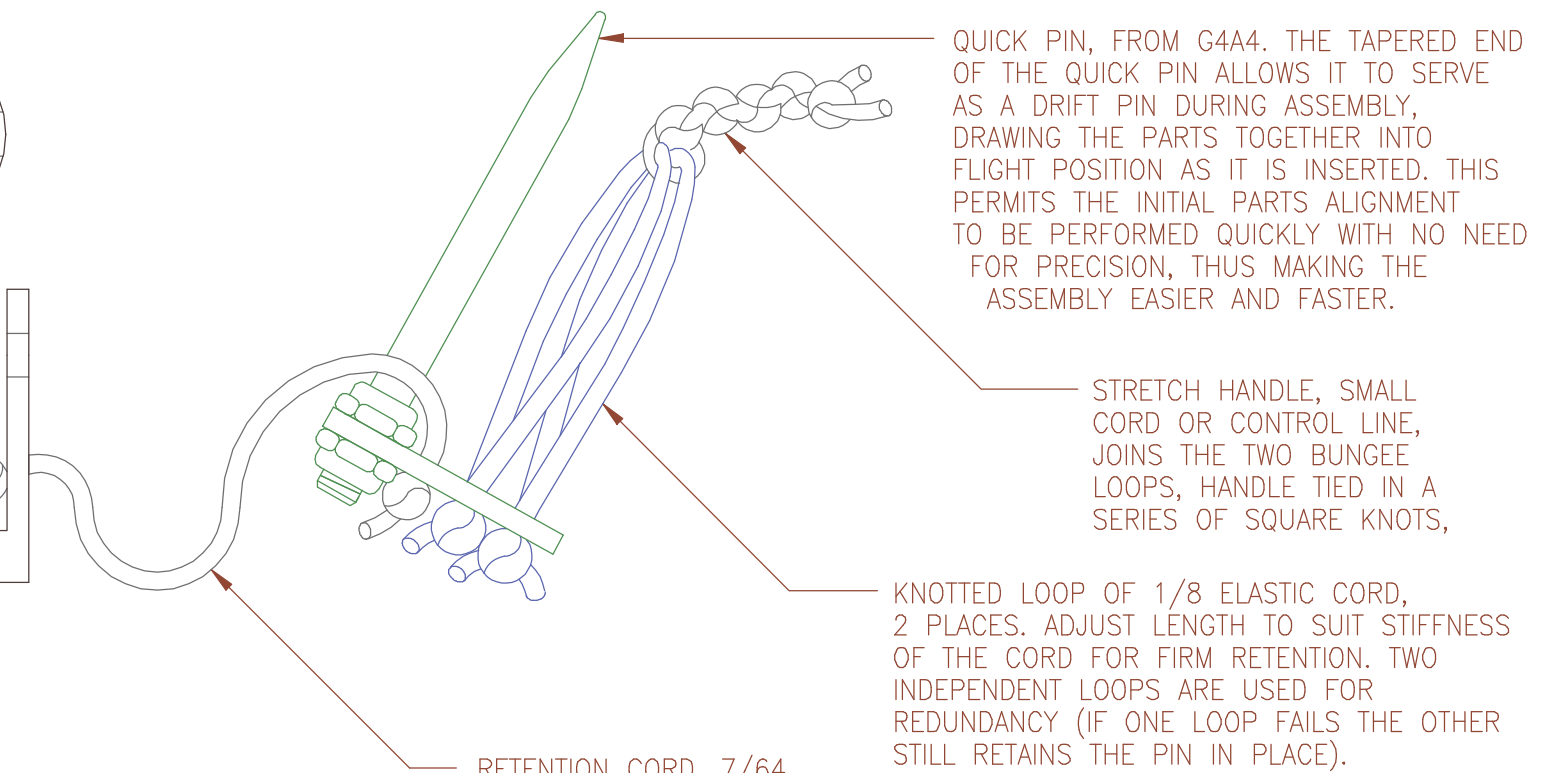
G4A4

QUICK PIN
SHAFTS &
HANDLES

GOAT4
ULTRALIGHT
GLIDER

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FEBRUARY 5,
2007

DESIGNED BY ME FOR MY PURPOSES, AND ARE EXPERIMENTAL AND
FASTENERS DO NOT REPRESENT THE CONTINUATION OF ANY
ADDITION OF FASTENER EVER USED ON ANY KIND OF AIRCRAFT.



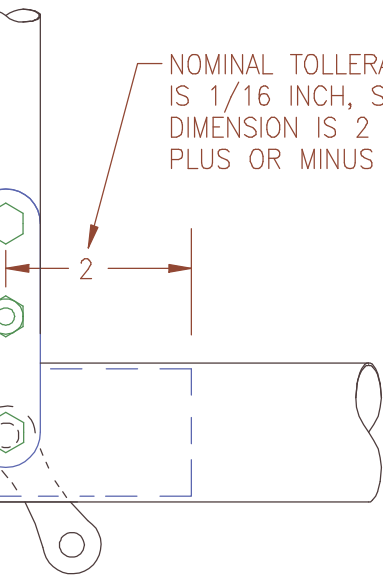
G4A5

QUICK PIN
RETAINERS

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FEBRUARY 7,
2007

HOLE EDGES MUST BE SMOOTH.
 FINISHED BY FILING OR DE-BURRING.



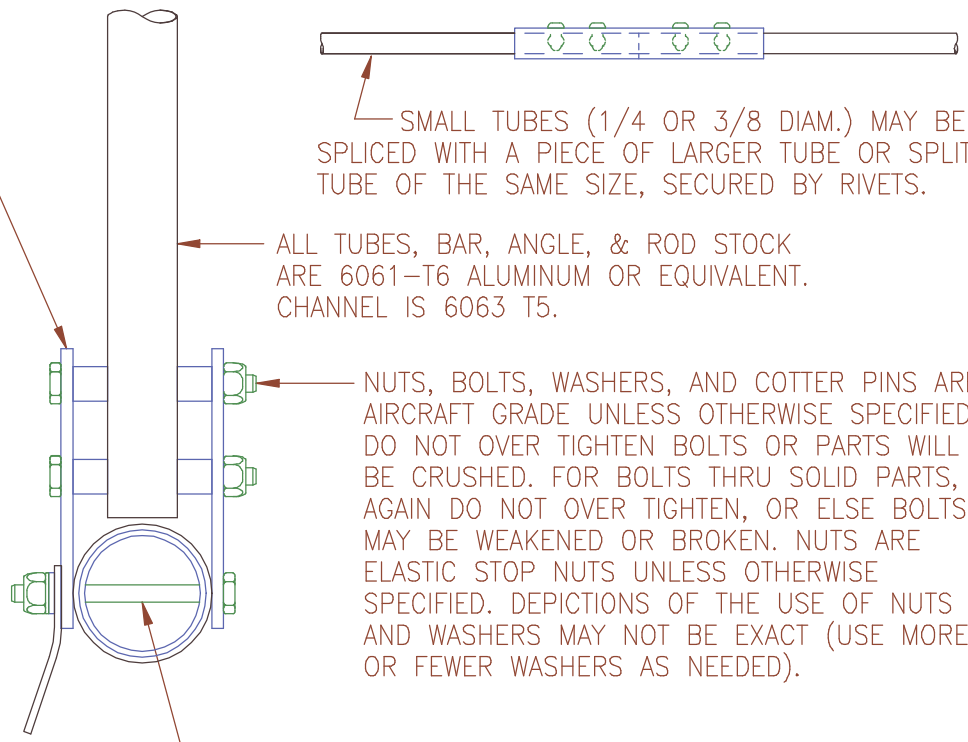
NOMINAL TOLLERANCE
 IS 1/16 INCH, SO THIS
 DIMENSION IS 2 INCHES
 PLUS OR MINUS 1/16 IN.

EDGES MUST BE SMOOTH. SLEEVES
 FINISHING THEM WITH LAYERS OF 10
 TO FILL THE GAP BETWEEN THE
 INTERNAL SLIDING FIT. TAPE PADDING
 FOR CLOSE TELESCOPING FIT IS ALREADY
 USED. OUTER TUBE IS .058 IN. THICK AND
 (NO TAPE PADDING IS USED).

RIVETS ARE 1/8 INCH CHERRY
 OR BSPS ALUMINUM BLIND RIVETS
 (STEEL MANDREL (HIGH QUALITY
 RIVETS). NOMINAL MINIMAL RIVET
 SPACING IS 1/2 INCH.

MINIMUM END RADIUS FOR
 ALUMINUM BAR OR STEEL
 SHOULD BE 3 THICKNESSES
 LARGER THAN MINIMUM
 (WHEN FEASIBLE)

TYPICAL METAL PARTS

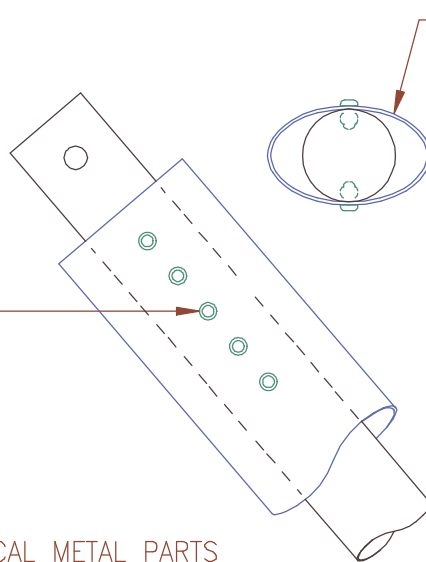


SMALL TUBES (1/4 OR 3/8 DIAM.) MAY BE
 SPLICED WITH A PIECE OF LARGER TUBE OR SPLIT
 TUBE OF THE SAME SIZE, SECURED BY RIVETS.

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 CREASED.

G4A6

METAL FABRICATION
 & FASTENERS

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 FEBRUARY 9,
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ALUMINUM TUBE SURFACES WHERE RESIN WILL BE APPLIED ARE LIGHTLY SANDED FOR CLEANING & ROUGHENING.

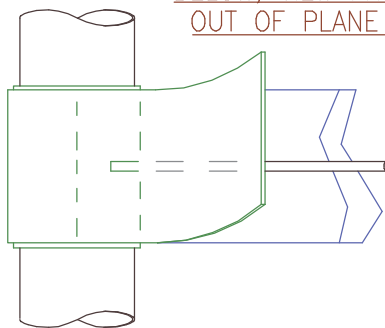
WET LAYUP OF WOVEN FIBERGLASS FABRIC TAPE & EPOXY RESIN IS APPLIED TO PRODUCE CONTINUOUS BANDS AROUND TUBES. LAYUPS MUST BE DONE AT ROOM TEMPERATURE OR WARMER, ELSE RESIN WILL NOT PENETRATE & BONDING WILL BE TOO WEAK

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

SCREWS ARE SCORED IN THE TOP AND BOTTOM OF RIB USING A FLAT EDGE SCREWDRIVER BLADE, TO ALLOW CARBON/EPOXY RODS TO BE EMBEDDED IN THE RIB. FILL OVER RODS WITH MICROSLURRY TO SEAL 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 FRAME TUBE. SAND LIGHTLY FOR SMOOTHING BEFORE APPLYING FABRIC.

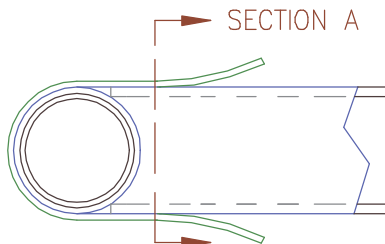
SAME AREA AS BELOW, VIEW FROM OUT OF PLANE



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

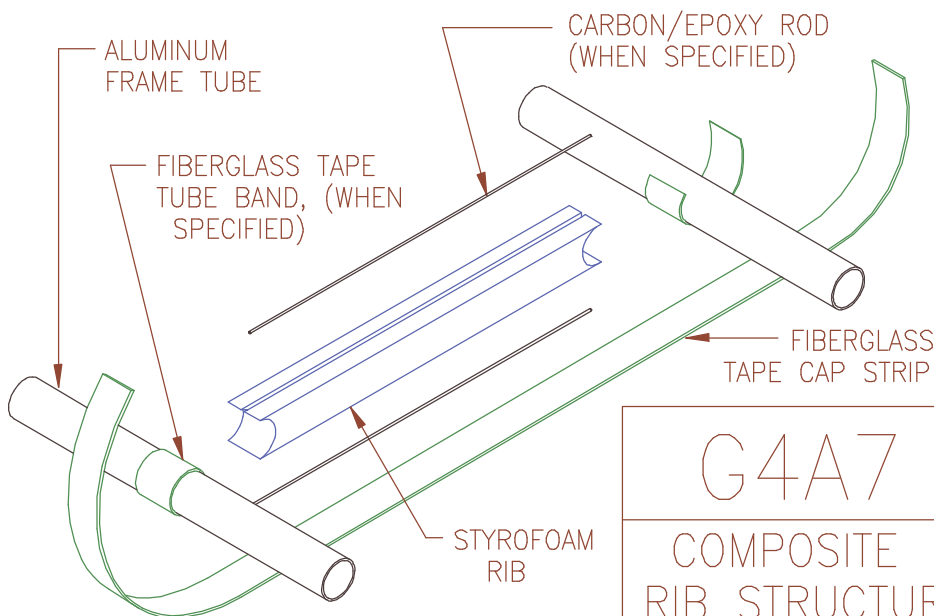
WOVEN FIBERGLASS FABRIC TAPE, 1 INCH WIDE, 8.7 OZ./SQYD., WET LAYUP WITH EPOXY RESIN

.063 INCH DIAM. CARBON/EPOXY ROD



SECTION A, FROM VIEW AT LEFT

GENERALIZED COMPOSITE RIB, VIEW ACROSS TUBE SECTION

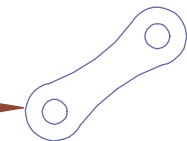


EXPLODED ISOMETRIC VIEW OF GENERALIZED COMPOSITE RIB

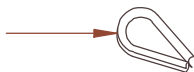
G4A7	
COMPOSITE RIB STRUCTURE	
GOAT4 ULTRALIGHT GLIDER	M. SANDLIN, FEBRUARY 9, 2007

ASSEMBLIES

GOAT4, "FIGURE 8", STAINLESS STEEL, 14 GAGE (MIN. THICKNESS). BEND AS REQUIRED BUT USE PRACTICAL BEND RADIUS



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



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



GOAT4 CABLE END LEFT PROTRUDING

IF CABLE HAS A VINYL OR NYLON COATING, STRIP OFF THE COATING IN THE AREAS TO BE SWAGED. (DO NOT SWAGE OVER ANY COATING, REMOVE IT FIRST). COATINGS ARE THICK, THEY CAN BE UP TO 1/8" THICK, WHICH CAN EASILY DOUBLE THE THICKNESS OF THE CABLE AND ARE HARD TO REMOVE. TO PROTECT THE CABLE AND TO PROTECT OTHER THINGS FROM THE SWAGING PROCESS, USE A SWAGING SLEEVE. GOAT4 CABLES. HANG GLIDERS USE COATED CABLES TO REDUCE DAMAGE TO THE EMERGENCY PARACHUTE BRIDLE AND TO PROTECT OTHER THINGS FROM EMERGENCY PARACHUTE DEPLOYMENT. GOAT4 DOES NOT USE COATED CABLES.

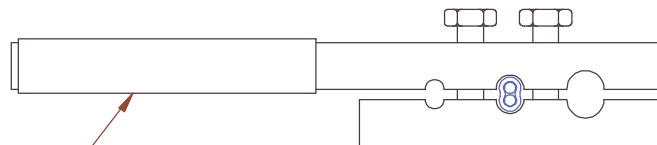
IF CABLE IS 7X7 STAINLESS STEEL, 3/32 INCH NOMINAL DIAMETER. IF THERE IS A BROKEN STRAND OR A SHARP AND PERMANENT BEND (KINK) IN THE CABLE, THE CABLE IS UNACCEPTABLE AND MUST BE REPLACED.

USE A SWAGING SLEEVE (GRADE HEAT SHRINK TUBE ("MARINE SHRINK") TO COVER SWAGING AND PROTRUDING CABLE END (OR WRAP WITH ELECTRICAL TAPE, OR COVER WITH FLEXIBLE ADHESIVE)

GOAT4 CABLES & CABLES MAY BE TENSIONED TO THE POINT OF ELIMINATING SLACK, BUT THERE IS ONLY SO MUCH TO BE GAINED BY ADDITIONAL TENSIONING BEYOND THAT.

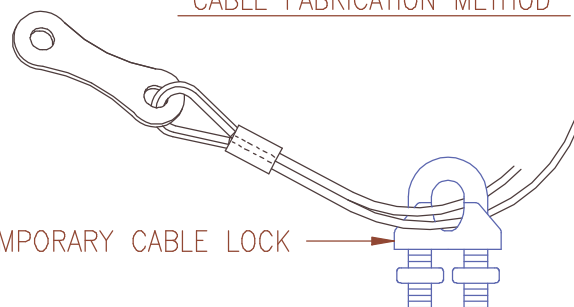
TENSIONING IS IN SOME PLACES MADE ADJUSTABLE BY PROVISION FOR THE ADDITION OR REMOVAL OF WASHERS ON THE RETAINING BOLT. THIS SETUP EXERTS A BENDING LOAD ON THE CABLE. ALSO FOR POTENTIALLY LARGE LOADS AN OVERSIZE BOLT IS USED. GOAT4 DOES NOT USE TURNBUCKLES FOR CABLE TENSIONING BECAUSE THEY ARE HEAVY AND COMPLEX TO ADJUST. STEEL CABLES ARE EXPECTED TO STRETCH IN SERVICE, SO IF THE RIGGING CHANGES OVER TIME IT IS RE-TENSIONED BY WASHER REMOVAL.

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

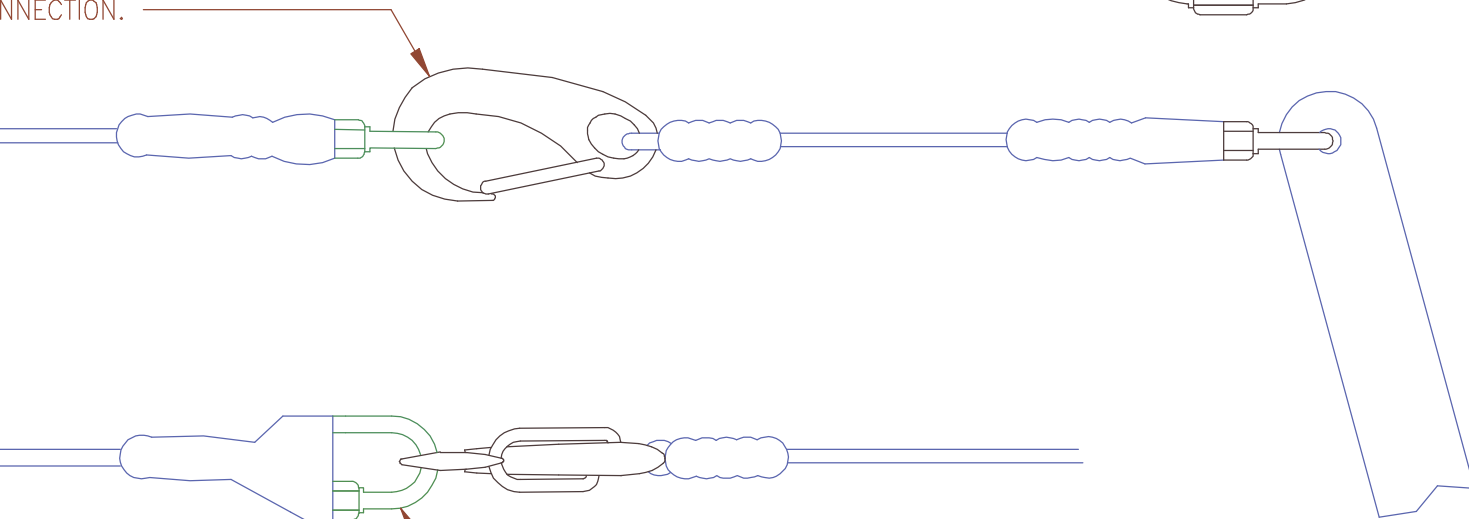
STANDARDS FOR STEEL CABLES

GOAT4
ULTRALIGHT
GLIDER

M. SANDLIN,
OCTOBER 14,
2007

HARDWARE.
 HOOKS SHOULD
 ALWAYS CHECKED
 INSPECTION BECAUSE
 OPEN AND FAIL TO
 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



PULLEY,
 SINGLE LOOP TOP
 (RONSTAN RF20101,
 OR SIMILAR (NOT
 PART # 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.

CONTROL LINES ARE SAMSON "LIGHTNING ROPE" BRAIDED LINE, (VECTRAN/DYNEEMA
 OR SIMILAR) 7/64 INCH NOMINAL DIAMETER. CUT-OFF ENDS CAN BE MELTED WITH A FLAME
 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.
 SHARP EDGE CONTACTS OR RUB POINTS ARE ALLOWED.

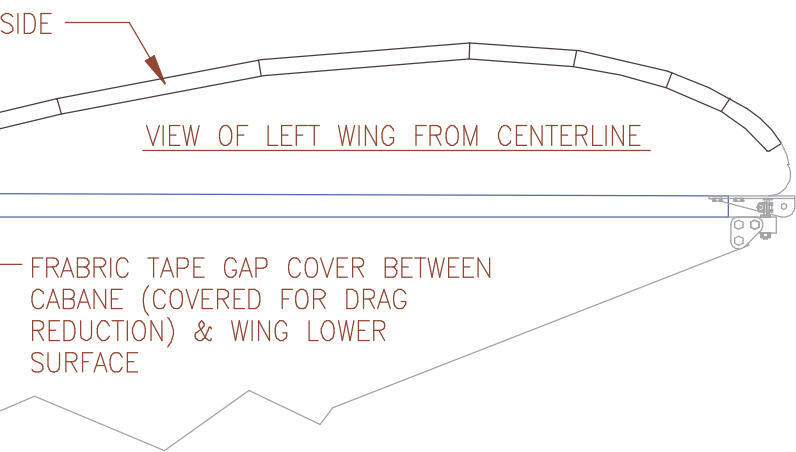
LINES & CABLES MAY BE TENSIONED TO THE POINT OF ELIMINATING SLACK, BUT THERE
 IS NOT USUALLY MUCH TO BE GAINED BY ADDITIONAL TENSIONING BEYOND THAT.

G4A9

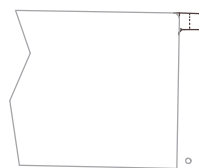
STANDARDS FOR
CONTROL LINES

GOAT4
ULTRALIGHT
GLIDER

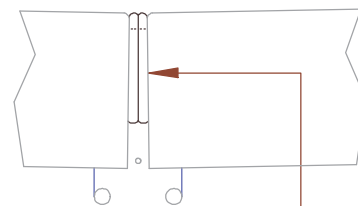
M. SANDLIN,
FEBRUARY 9,
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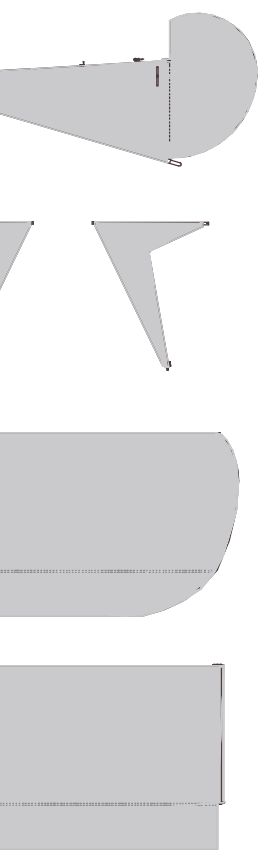
SECTION VIEW
OF WING END
FROM FORWARD



VIEW OF WING INBOARD ENDS
JOINED AT CENTERLINE, SEEN
FROM REAR



CENTERLINE KISS SEAL, FLEXIBLE FOAM WEATHER STRIPPING, APPLY TO WING INBOARD SURFACES ON BOTH SIDES TO GET LIGHT CONTACT WHEN WINGS ARE JOINED, COVER WITH FABRIC STRIPS.



ALL AIRCRAFT FABRIC COVERING MATERIALS AND PRACTICE ARE BASED ON CONVENTIONAL AIRCRAFT COVERING METHODS, NOMINALLY THE POLYFIBER (STITTS) 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 TAPES 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.

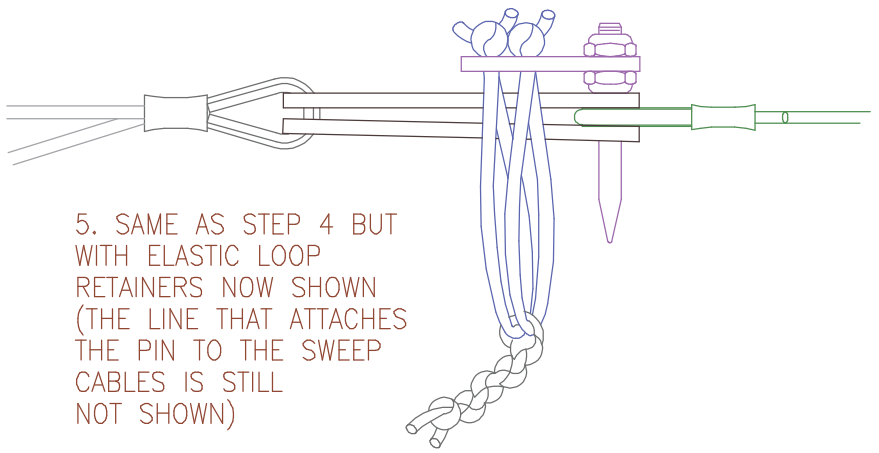
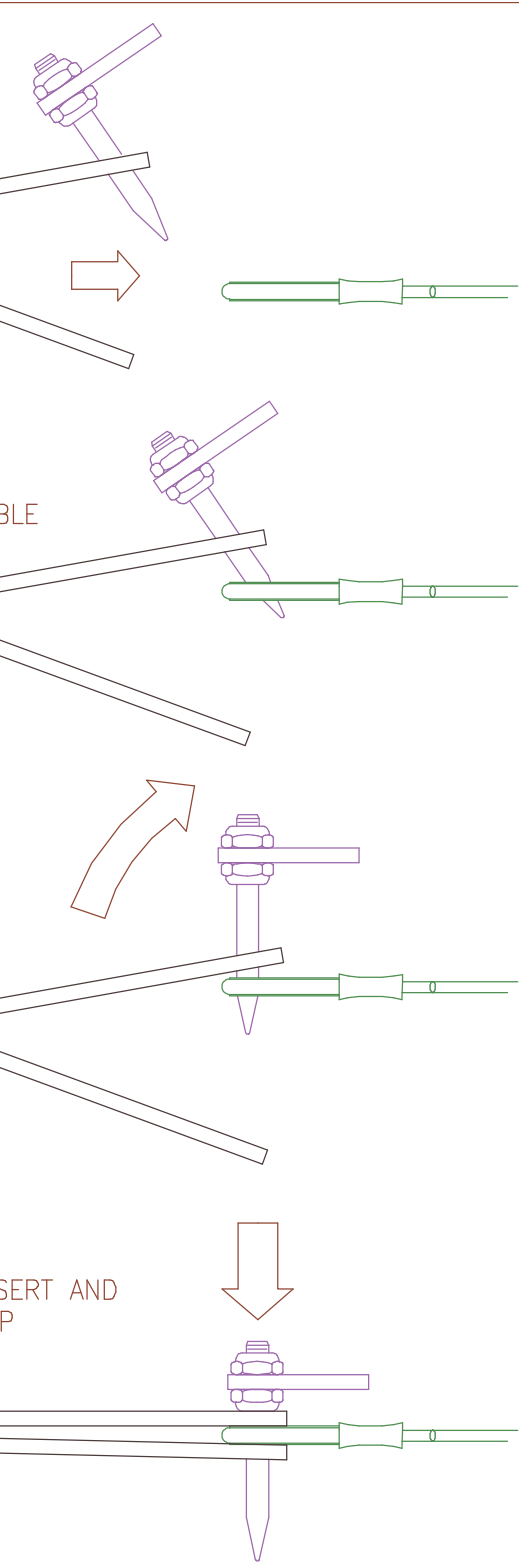
ALL FABRIC TREATMENTS WERE APPLIED BY BRUSH. NO SPRAY RIG WAS USED. ENAMEL SPRAY PAINT (FROM CANS) WAS APPLIED OVER SOME SILVERED AREAS TO CREATE LARGE PANELS OF BRIGHT COLOR TO MAKE THE AIRCRAFT MORE VISIBLE IN FLIGHT.

G4A10

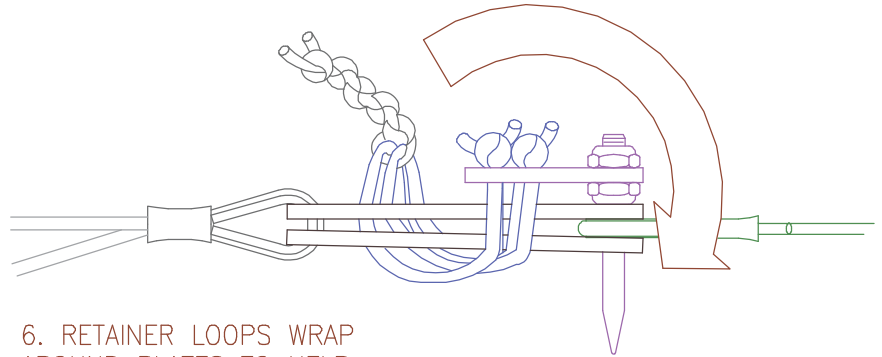
FABRIC COVERING
STANDARDS

GOAT4
ULTRALIGHT
GLIDER

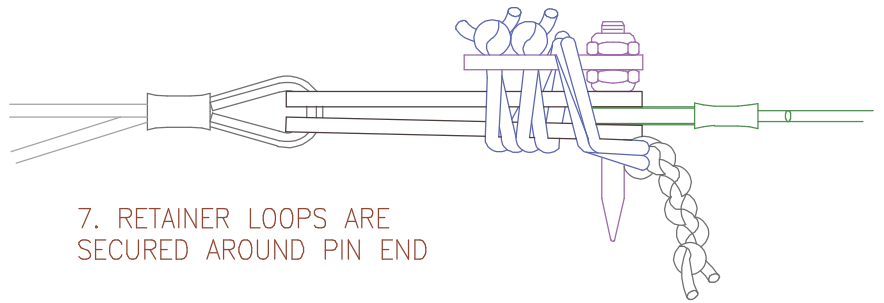
M. SANDLIN,
FEBRUARY 10,
2007



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

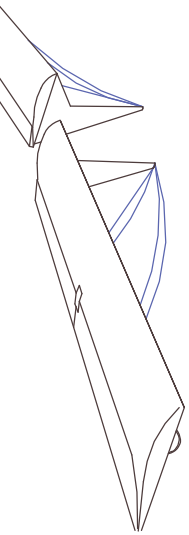
TENSIONING
CABLE
CONNECTOR

G4A11

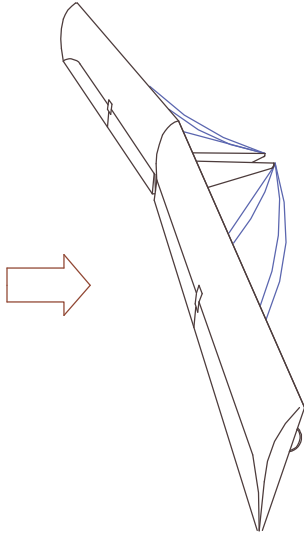
GOAT4
ULTRALIGHT
GLIDER

M. SANDLIN,
FEBRUARY 11,
2007

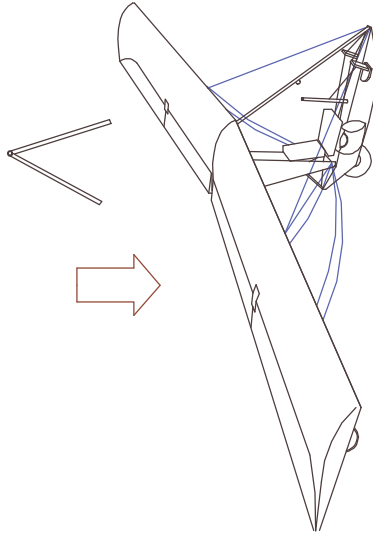
ABANE TO PROP
TRAILING EDGE



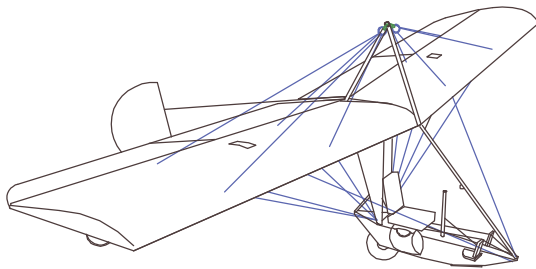
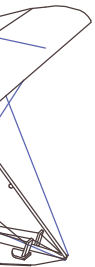
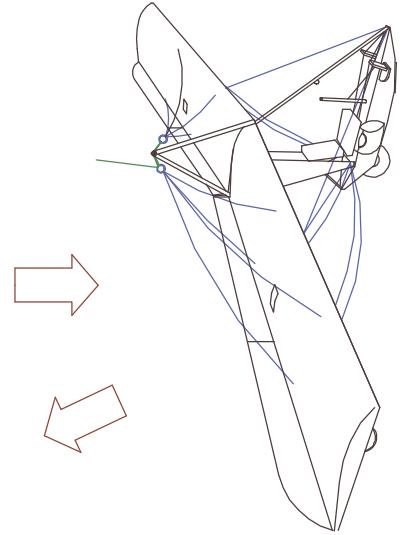
3. JOIN WING
PANELS (2 PINS)



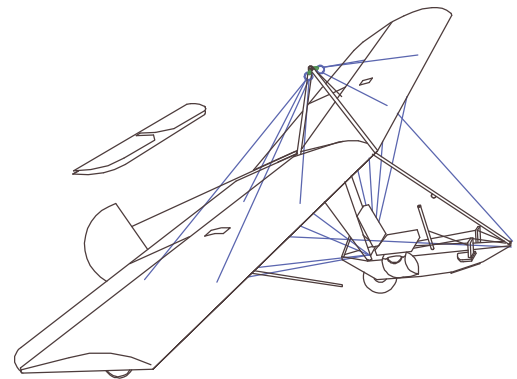
4. ATTACH NOSE SECTION
(3 PINS) & FORWARD
SWEEP CABLES (2 PINS)



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



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), ELEVATOR LINES (2 SNAPHOOKS),
& RUDDER LINES (2 SNAPHOOKS). DO
PREFLIGHT INSPECTION BEFORE FLYING.

G4A12

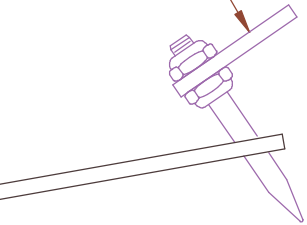
ASSEMBLY
SEQUENCE

GOAT4
ULTRALIGHT
GLIDER

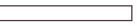
M. SANDLIN,
FEBRUARY 17,
2007

RS ARE USED FOR THE AFT SWEEP
 OR CONSISTS OF TWO PLATES
 US CABLE, WHICH BRANCHES INTO
 SWEEP CABLES. SEE G4A11 FOR THE

K PIN PER G3A4 & A5,
 X 1-1/4



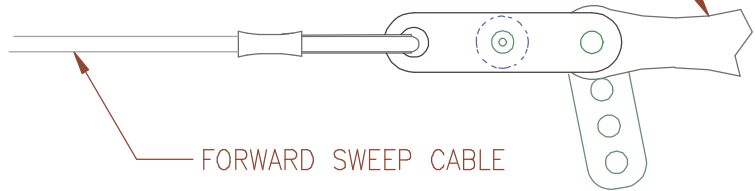
LE
 TE



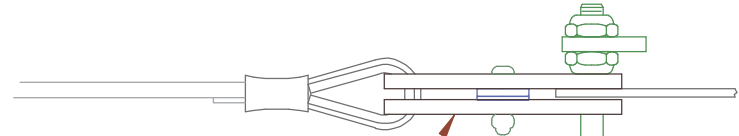
1/4 R,
 BOTH ENDS

CONNECTOR PLATE,
 BAR, 2 IN. LONG,
 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

3/16 DIAM.
 HOLE

1/4 DIAM.
 HOLE

1/4 R,
 BOTH ENDS



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

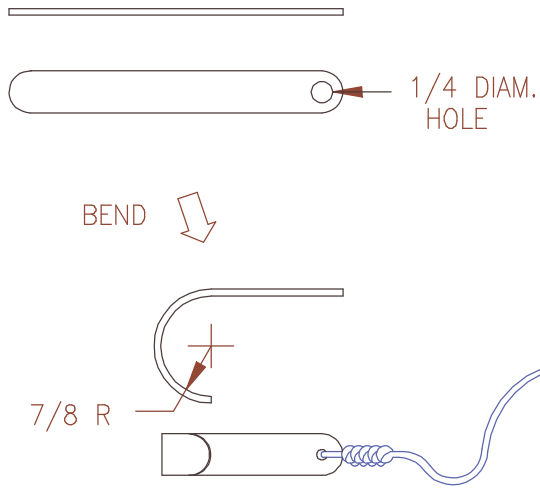
NON-TENSIONING CABLE CONNECTION
 (RIVETED CONNECTOR) MAKE 2

G4A13

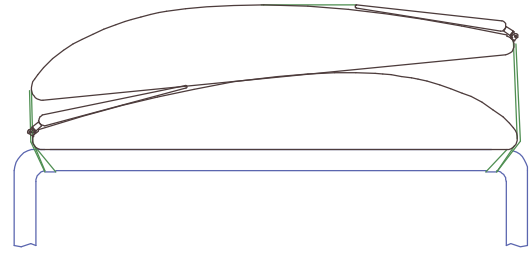
CABLE
 CONNECTORS

GOAT4
 ULTRALIGHT
 GLIDER

M. SANDLIN,
 FEBRUARY 11,
 2007

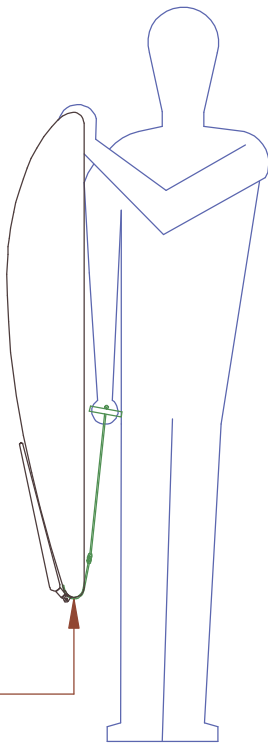


LIFT HOOK FOR WING CARRYING SLING,
3/4 X 18 X 5 ALUM. BAR



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

SLING
CARRY



ONE PERSON
G SLING. THE
THE AFT SPAR
NT NEAR THE

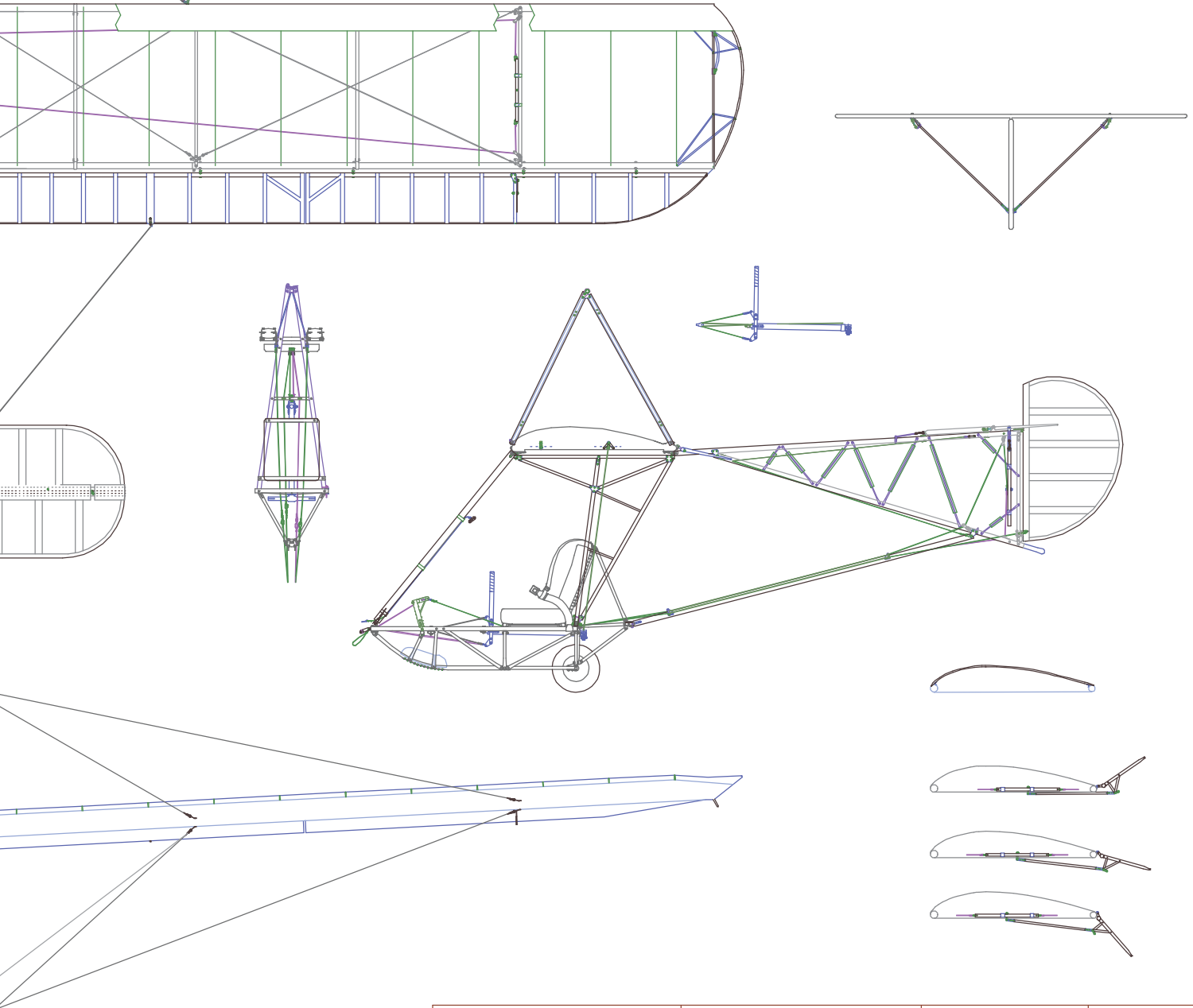
G4A14

TRANSPORT ITEMS

GOAT4
ULTRALIGHT
GLIDER

M. SANDLIN,
FEBRUARY 11,
2007

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).

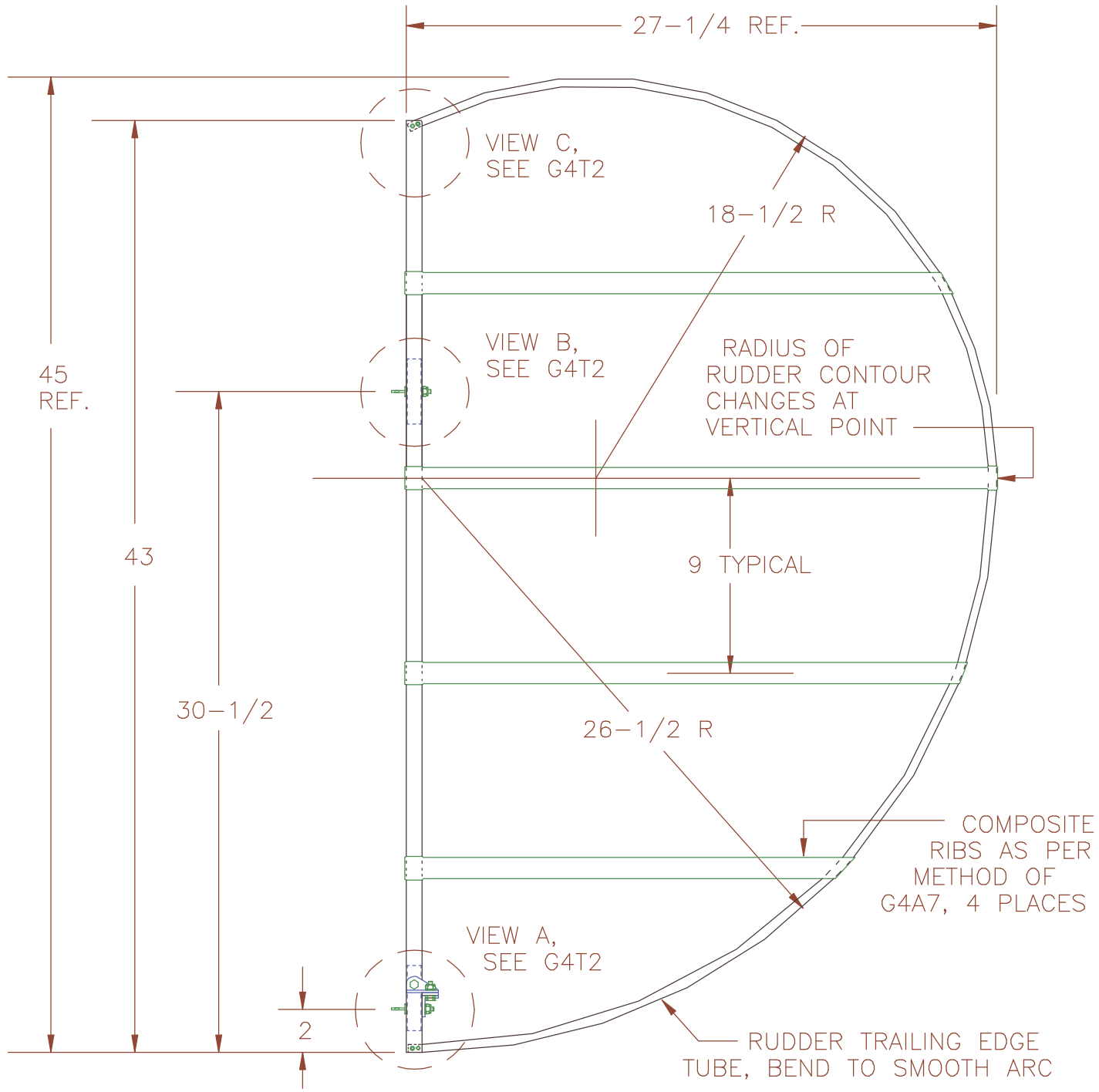


G4A15

REFERENCE
OVERVIEW

GOAT4
ULTRALIGHT
GLIDER

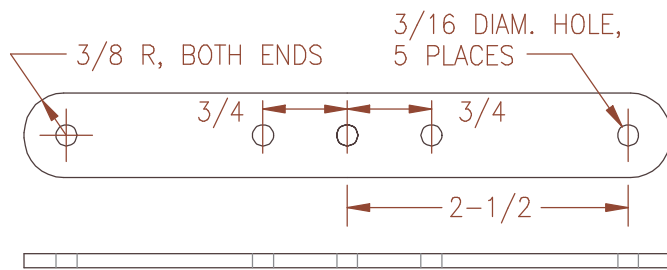
M. SANDLIN,
FEBRUARY 12,
2007



RUDDER ASSEMBLY,
UNCOVERED, VIEWED FROM LEFT

G4T1	RUDDER	GOAT4 ULTRALIGHT GLIDER	M. SANDLIN, JANUARY 24, 2007
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UPPER RUDDER
SEEN FROM ABOVE



RUDDER CONTROL HORN,
1/8 X 3/4 ALUM. BAR STOCK,
5-3/4 INCHES LONG

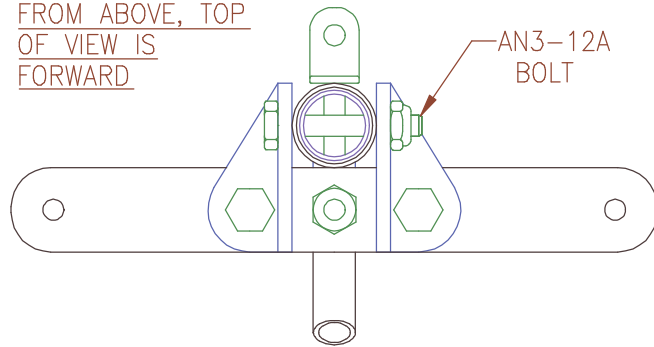
IVETS, BOTH
OF RUDDER
ING EDGE TUBE

T1

RUDDER
C, AN42B-12A

ADDED WITH P.V.C.
PER G4A6

RUDDER CONTROL
HORN AREA SEEN
FROM ABOVE, TOP
OF VIEW IS
FORWARD



T1

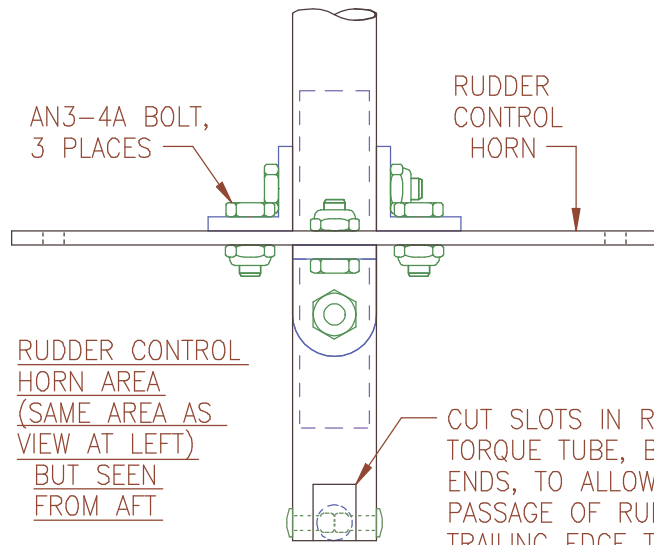
ANGLE,
S

ER RUDDER
LT, AN42B-12A

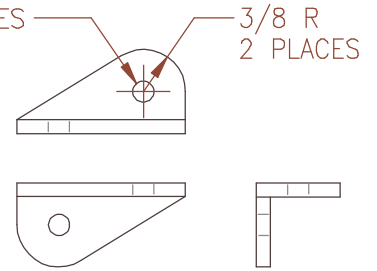
HORN ANGLE



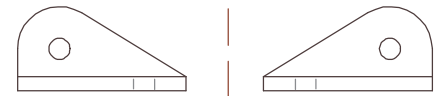
RUDDER CONTROL
HORN AREA
(SAME AREA AS
VIEW AT LEFT)
BUT SEEN
FROM AFT



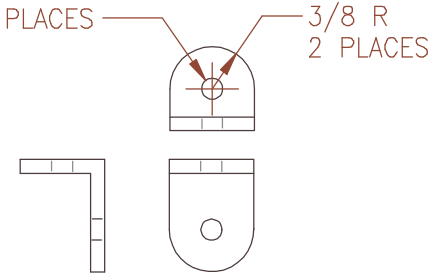
3/16 DIAM. HOLE
2 PLACES



OFFSET ANGLE,
1/8 X 3/4 X 3/4 ALUM. ANGLE,
1-1/2 IN. LONG, MAKE 2 PAIRS
OF MIRROR IMAGE PARTS FOR
A TOTAL OF 4 PARTS, SEE G4T13.



3/16 DIAM. HOLE
2 PLACES



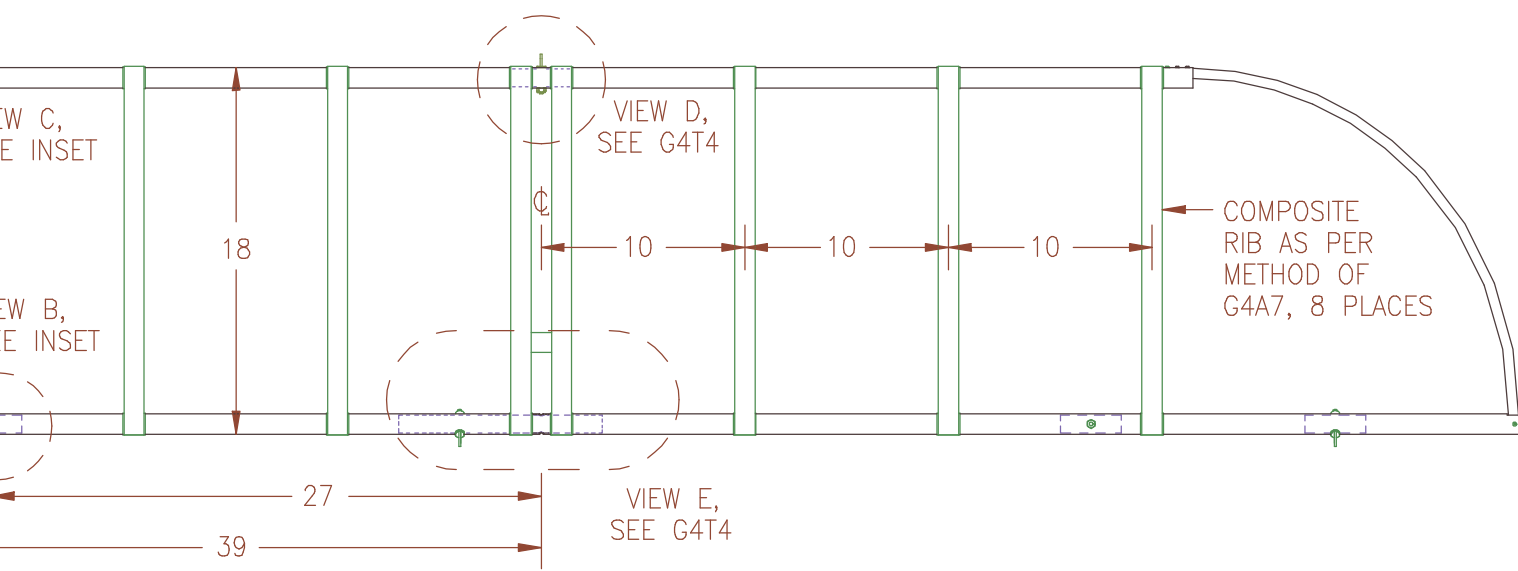
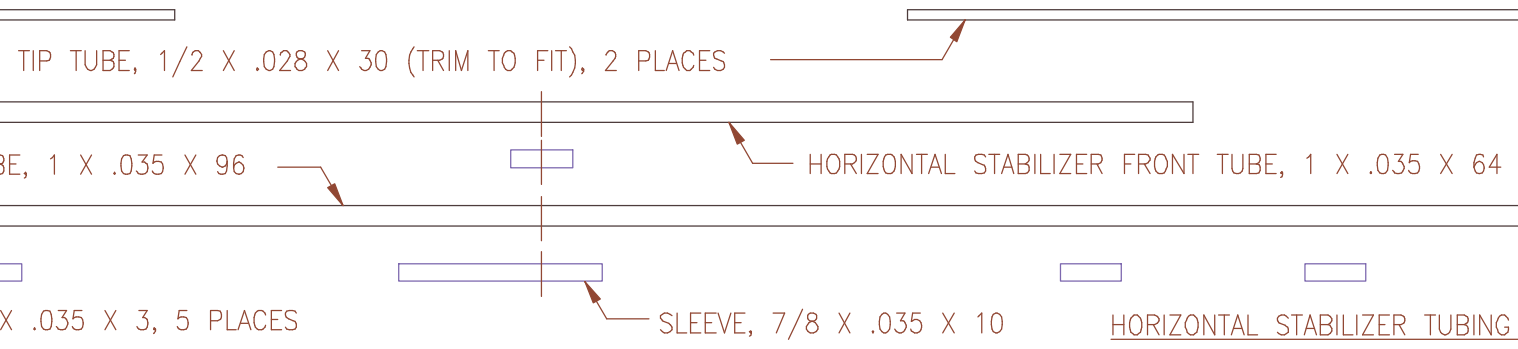
RUDDER HORN ANGLE,
1/8 X 3/4 X 1 ALUM.
ANGLE, 3/4 IN. LONG

G4T2

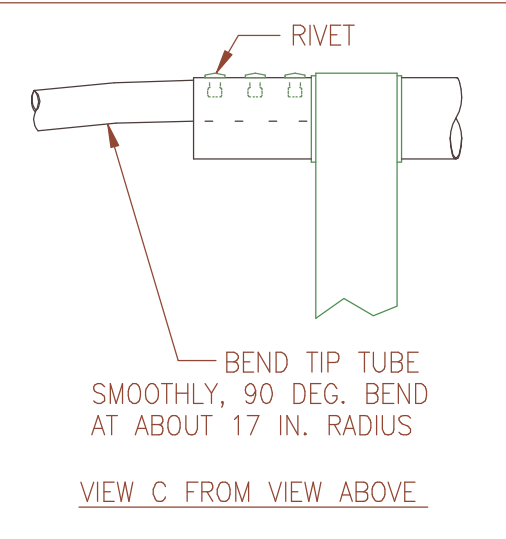
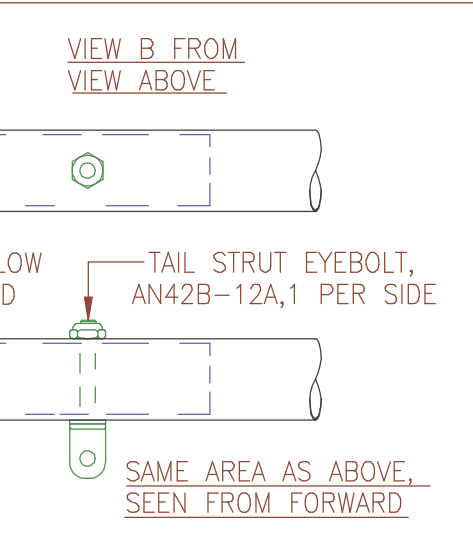
RUDDER HORN

GOAT4
ULTRALIGHT
GLIDER

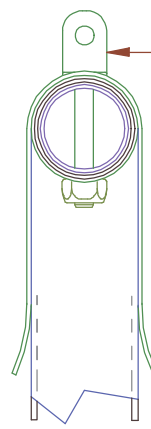
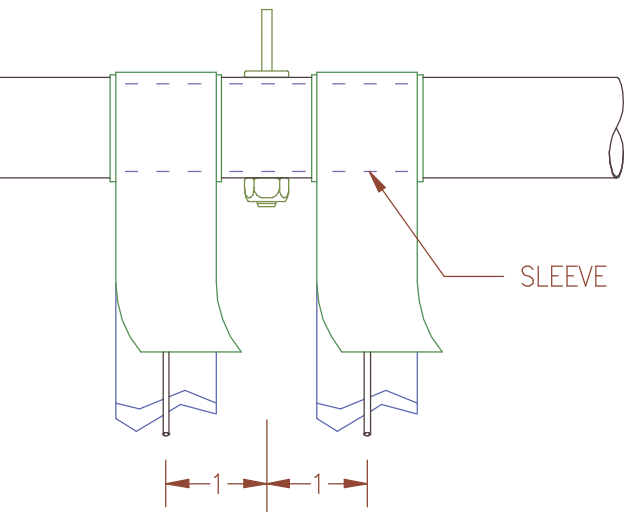
M. SANDLIN,
JANUARY 24,
2007



HORIZONTAL STABILIZER ASSEMBLY, UNCOVERED, VIEWED FROM ABOVE

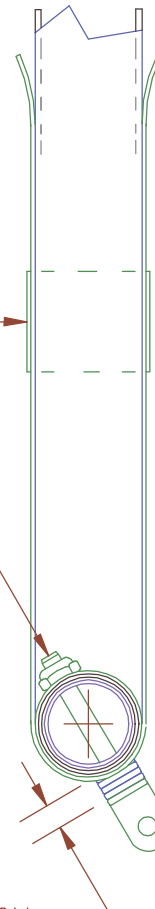
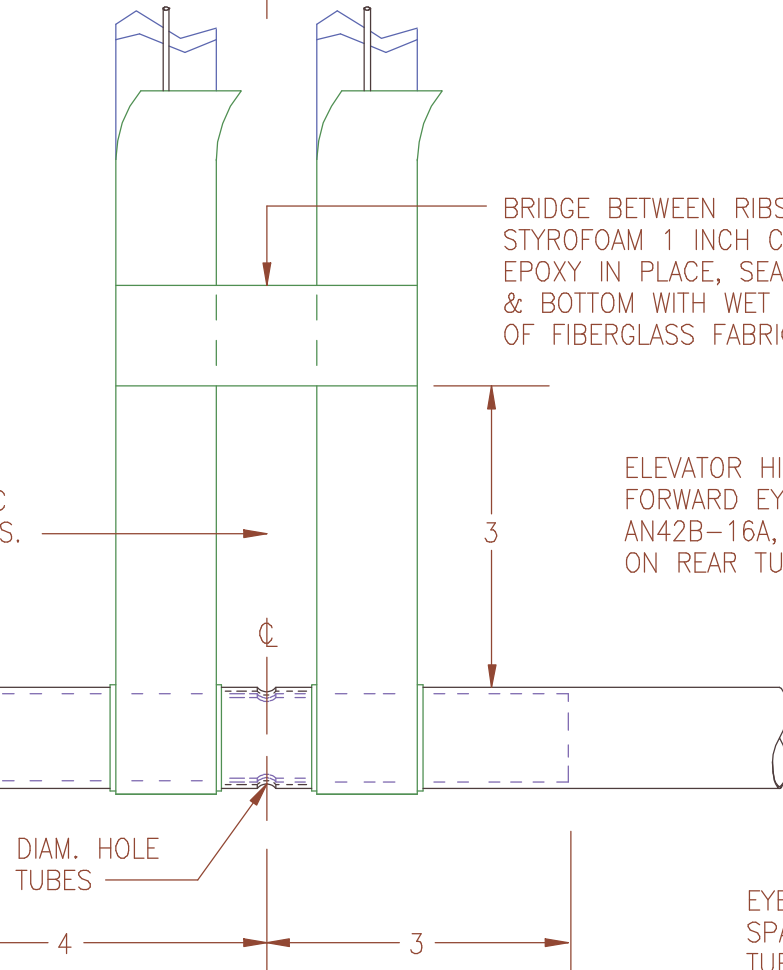


G4T3	
HORIZONTAL STABILIZER	
GOAT4 ULTRALIGHT GLIDER	M. SANDLIN, JANUARY 26, 2007



STABILIZER FORWARD EYEBOLT, AN42B-12A (SPACER WILL BE ADDED, SEE G4T9)

SAME AREA AS VIEW D, G4T3, BUT SEEN FROM LEFT



SAME AREA AS VIEW E, G4T3, BUT SEEN FROM LEFT

60 DEG., (13 MM. ON TUBE SURFACE)

EYEBOLT FLANGE SPACED OUT FROM TUBE 1/4 IN.

G4T4

HORIZONTAL STABILIZER DETAIL

GOAT4 ULTRALIGHT GLIDER

M. SANDLIN, JANUARY 26, 2007

5/8 X .035 X 3, 2 PLACES

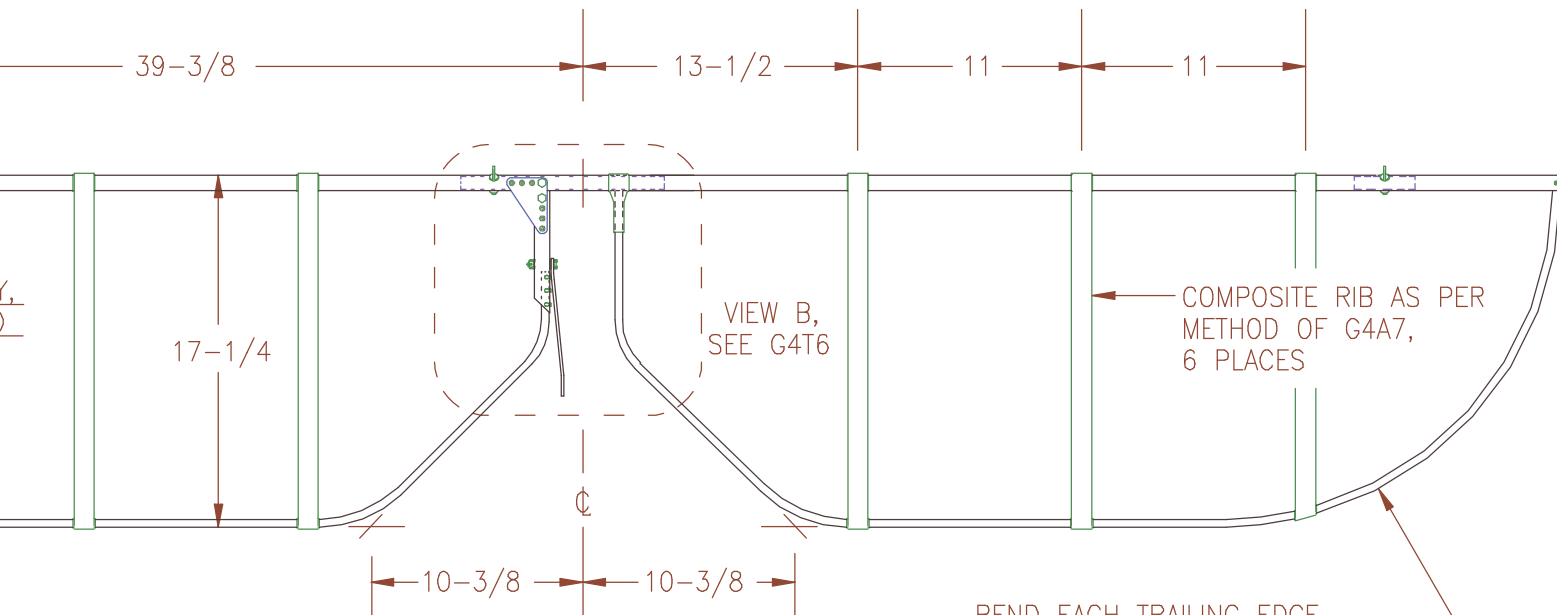


SLEEVE, 5/8 X .035 X 10

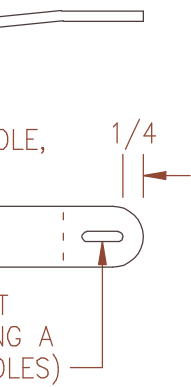


3/8 X .035 X 96

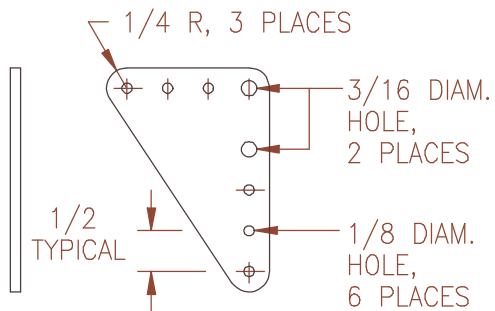
ELEVATOR TRAILING EDGE, 3/8 X .035 X ABOUT 70, 2 PLACES



BEND EACH TRAILING EDGE TUBE SMOOTHLY, MINIMUM 3 IN. RADIUS. OUTBOARD BEND RADIUS IS ABOUT 17 IN.



IN. LONG



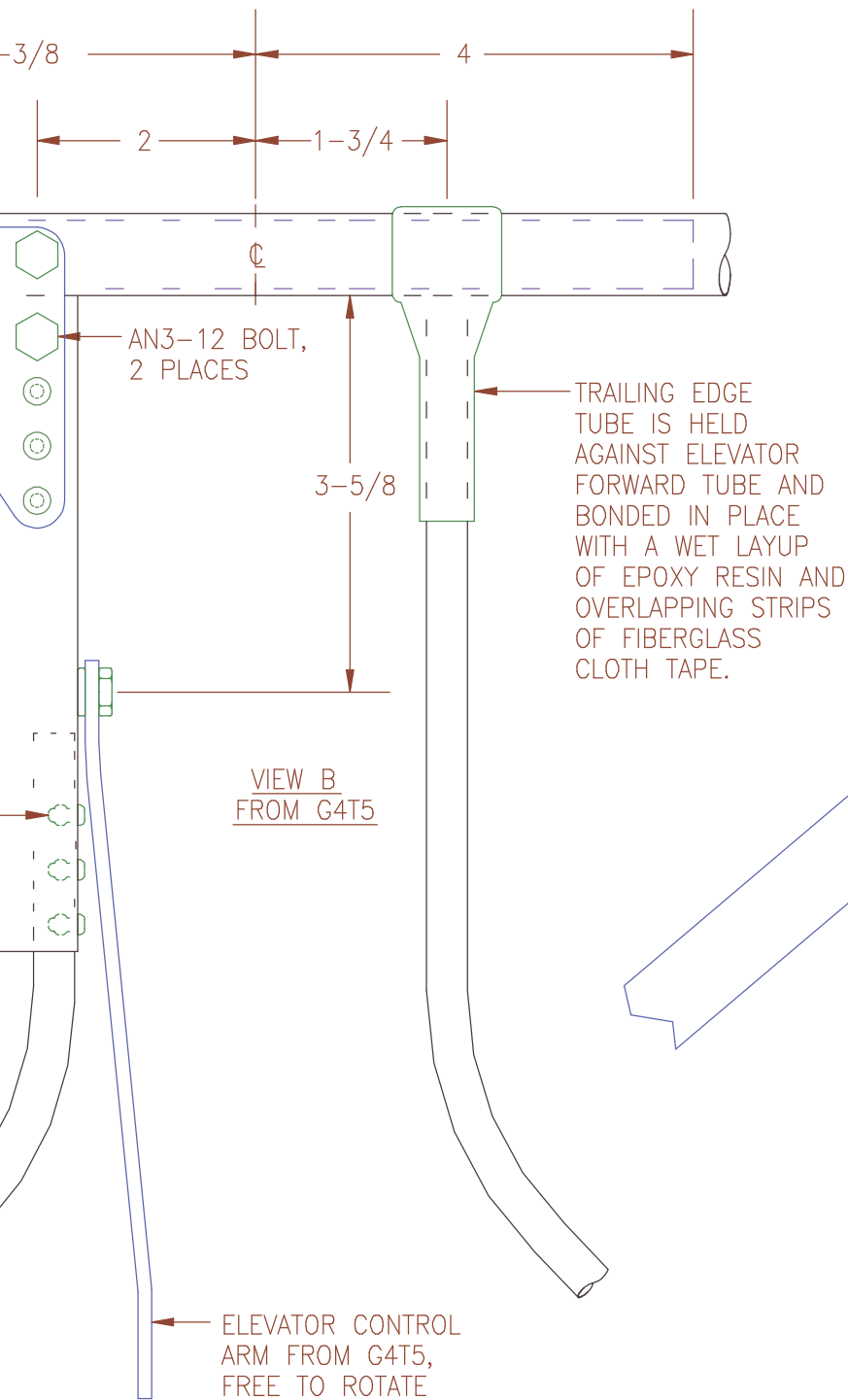
CONTROL BRACKET, 1/8 X 2 ALUM. BAR, 2-1/4 IN. LONG, MAKE 6

G4T5

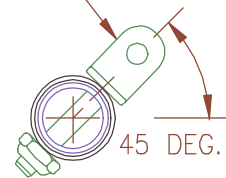
ELEVATOR

GOAT4
ULTRALIGHT
GLIDER

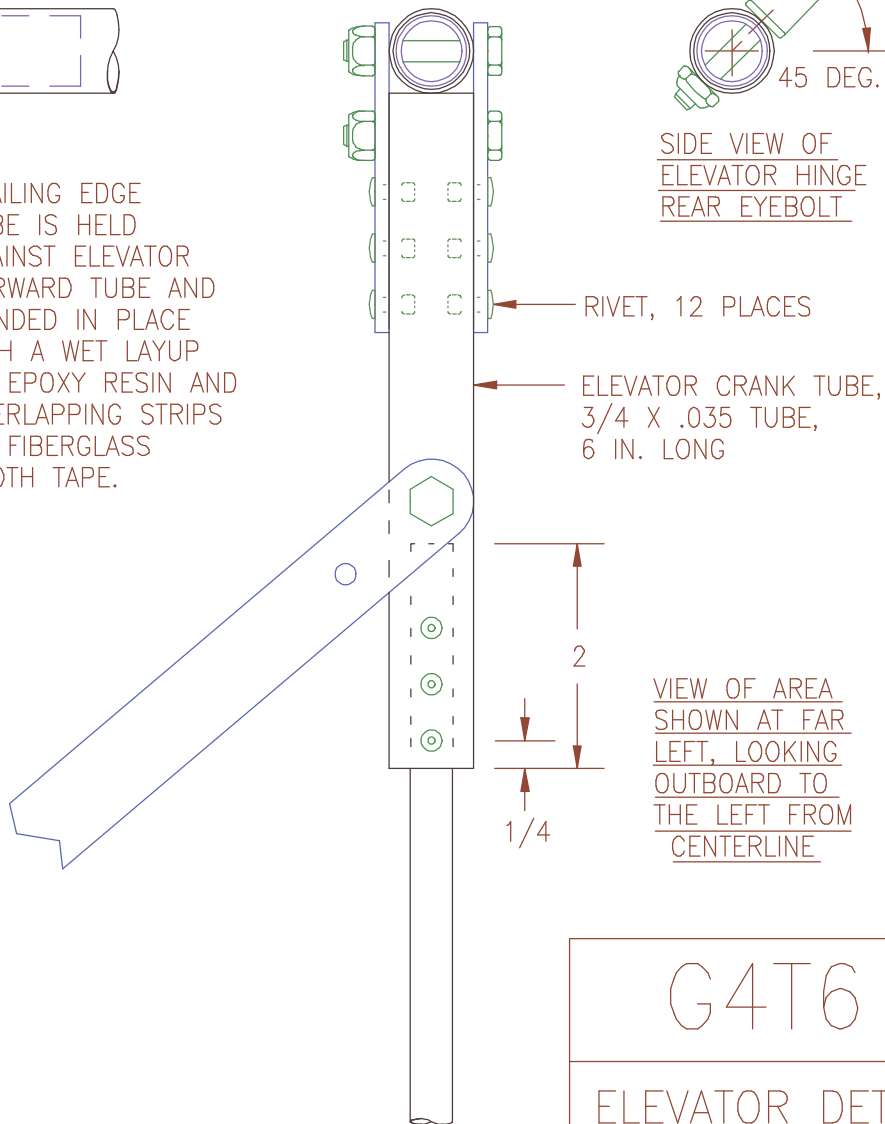
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JANUARY 26,
2007



ELEVATOR REAR HINGE EYEBOLT, AN42B-10A, 3 PLACES ON ELEVATOR FORWARD TUBE



SIDE VIEW OF ELEVATOR HINGE REAR EYEBOLT



G4T6	
ELEVATOR DETAIL	
GOAT4 ULTRALIGHT GLIDER	M. SANDLIN, JANUARY 26, 2007

VIEW B, SEE G4T8

TAPE IS APPLIED FROM THE HORIZONTAL STABILIZER TO THE ELEVATOR TO SEAL THEM IN THEM

HORIZONTAL TAIL ASSEMBLY, FABRIC COVERED, SEEN FROM ABOVE

FABRIC TAPE IS APPLIED OVER SUPPORTED FABRIC WITH OVERLAP ONTO UNSUPPORTED FABRIC TO REENFORCE EDGES WITH DOUBLE THICKNESS

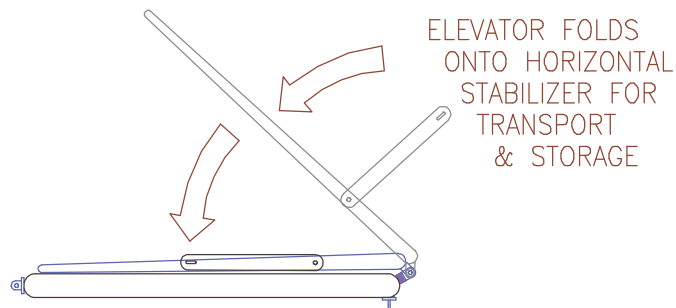
OFFSET EYEBOLTS

GAP COVER FABRIC TAPE, TYPICAL FOR ELVATOR & AILERONS, LEAVE SOME SLACK (NO SHRINKING). SHOWN FROM SIDE WITH EXAGGERATED THICKNESS



SAME AREA AS SHOWN AT LEFT, VIEWED FROM SIDE

BOLT, BOLT WITH 3 CASTLE NOTCHER PLACES PLANE



ELEVATOR FOLDS ONTO HORIZONTAL STABILIZER FOR TRANSPORT & STORAGE

HORIZONTAL TAIL ASSEMBLY SEEN FROM LEFT

G4T7

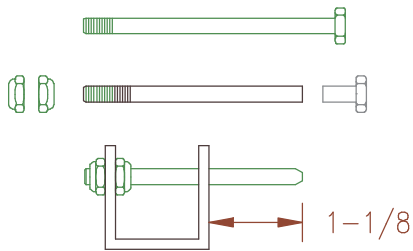
HORIZONTAL TAIL ASSEMBLY

GOAT4 ULTRALIGHT GLIDER

M. SANDLIN, JANUARY 26, 2007

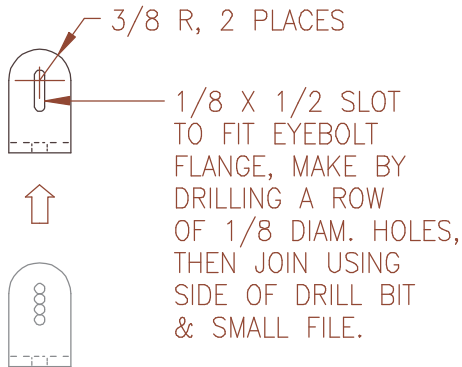
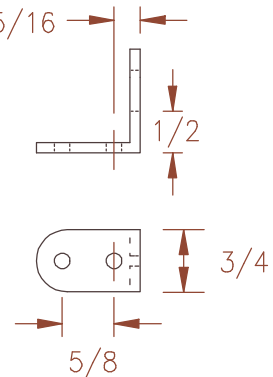
PLACES

HORIZONTAL STABILIZER AFT PIN ASSEMBLY



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.

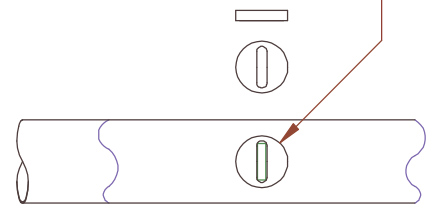
3/4



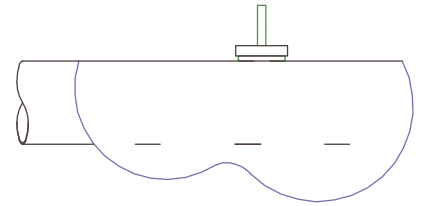
ANGLE, 1-1/4 X 1-1/4 X 1/8, ALUM. ANGLE

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.

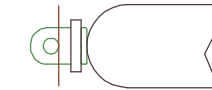
SAME AREA AS BELOW, VIEWED FROM FORWARD



VIEW B, FROM G4T7



1/8 NOMINAL

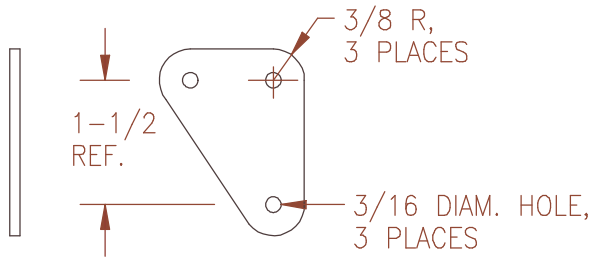


SAME AREA AS ABOVE, VIEWED FROM SIDE

ES

DIAM. HOLE, ES

UM. G4T9



VERTICAL STABILIZER LOWER JUNCTION PLATE, 1/8 X 1.75 ALUM. BAR, 2-1/4 IN. LONG, MAKE 2, SEE G4T9

G4T8

TAIL ASSEMBLY
DETAIL

GOAT4
ULTRALIGHT
GLIDER

M. SANDLIN,
JANUARY 26,
2007

VERTICAL STABILIZER UPPER TUBE, 1-1/4 X .035 X 94-5/8

SLEEVE, 1-1/8 X .058 X 18

SLEEVE, 1-1/8 X .058 X 6

SLEEVE, 1-1/8 X .058 X 14

VERTICAL STABILIZER MIDDLE TUBE, 1-1/4 X .035 X 88

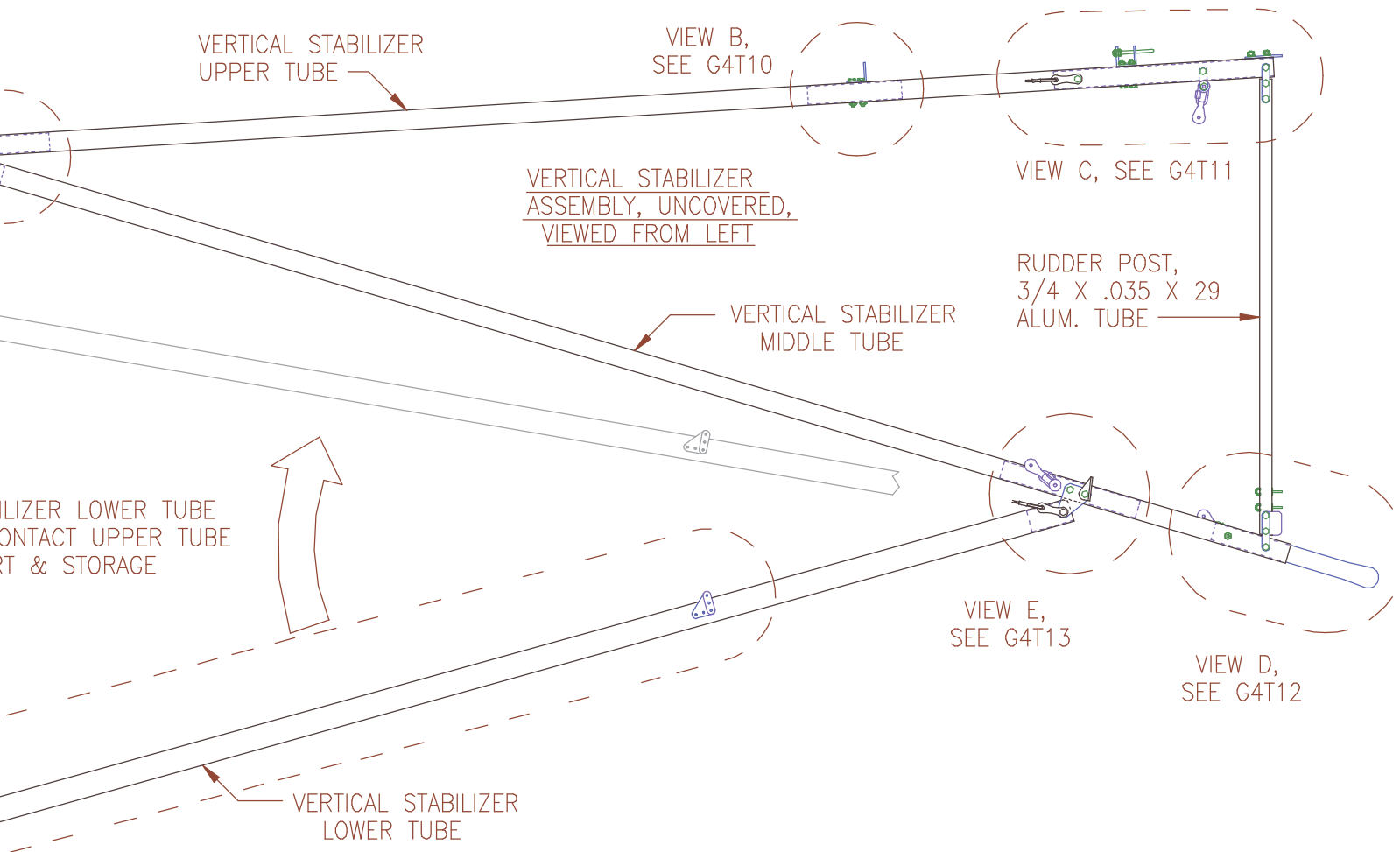
SLEEVE, 1-1/8 X .058 X 3

SLEEVE, 1-1/8 X .058 X 9

SLEEVE, 1-1/8 X .058 X 11

SLEEVE, 1-3/8 X .058 X 3

VERTICAL STABILIZER LOWER TUBE, 1-1/2 X .035 X 96



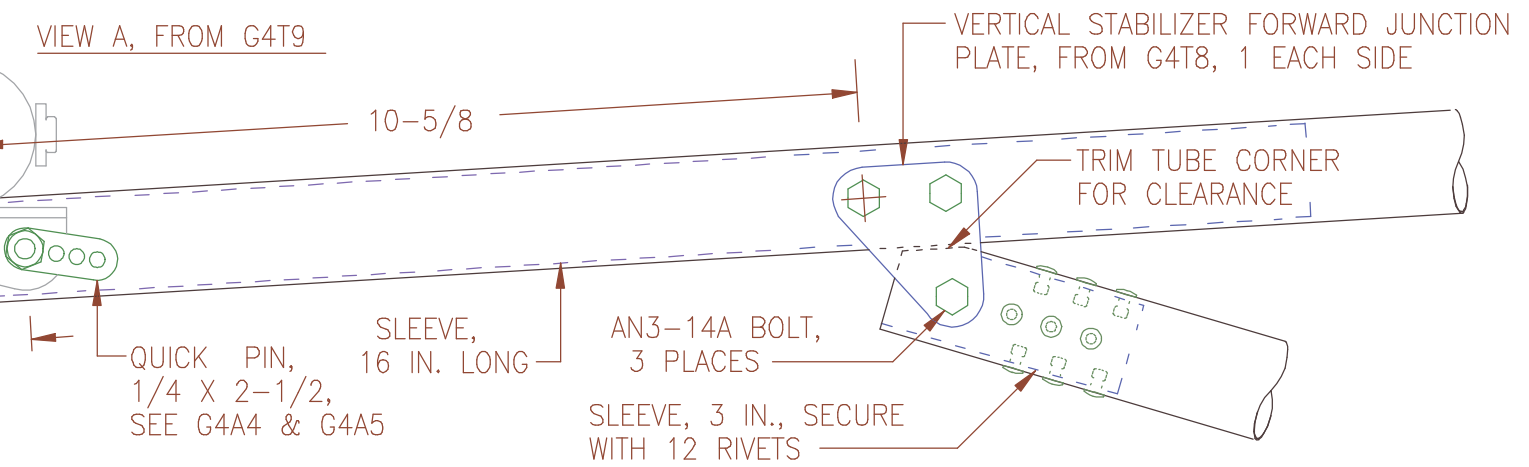
G4T9

VERTICAL STABILIZER

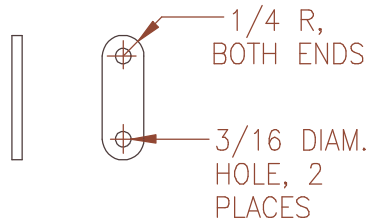
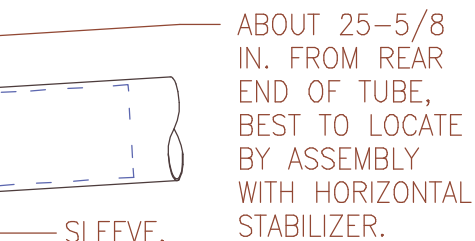
GOAT4 ULTRALIGHT GLIDER

M. SANDLIN, JANUARY 26, 2007

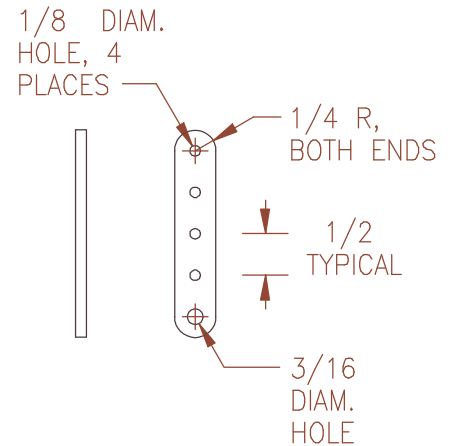
VIEW A, FROM G4T9



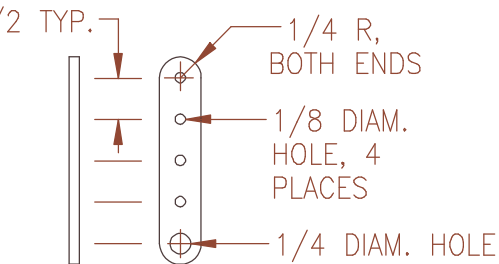
STABILIZER MOUNTING ANGLE, FROM G4T8



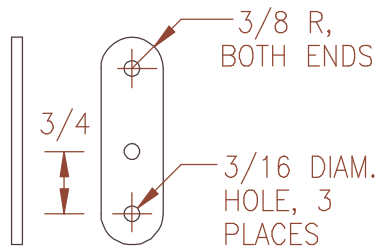
ELEVATOR PULLEY BRACKET
1/2 X 1/8 ALUM. BAR,
1-1/2 IN. LONG, SEE G4T11



STRUT END FITTING,
1/2 X 1/8 ALUM. BAR,
2-1/2 IN. LONG, MAKE 10,
SEE G4T19, G4S5



LOWER VERTICAL STABILIZER TUBE RIVET PLATE,
1/2 X 1/8 ALUM. BAR,
2-1/2 IN. LONG, MAKE 2,
SEE G4T11



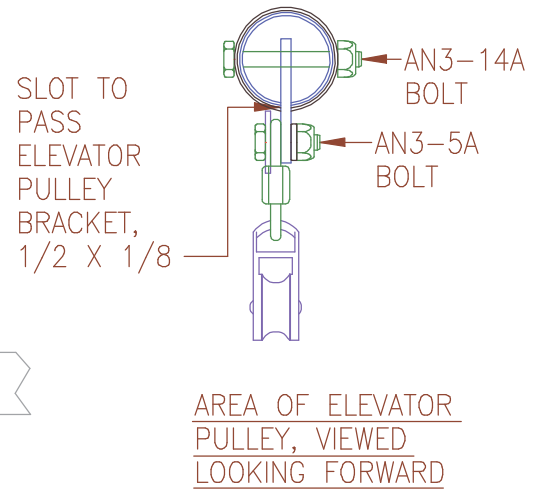
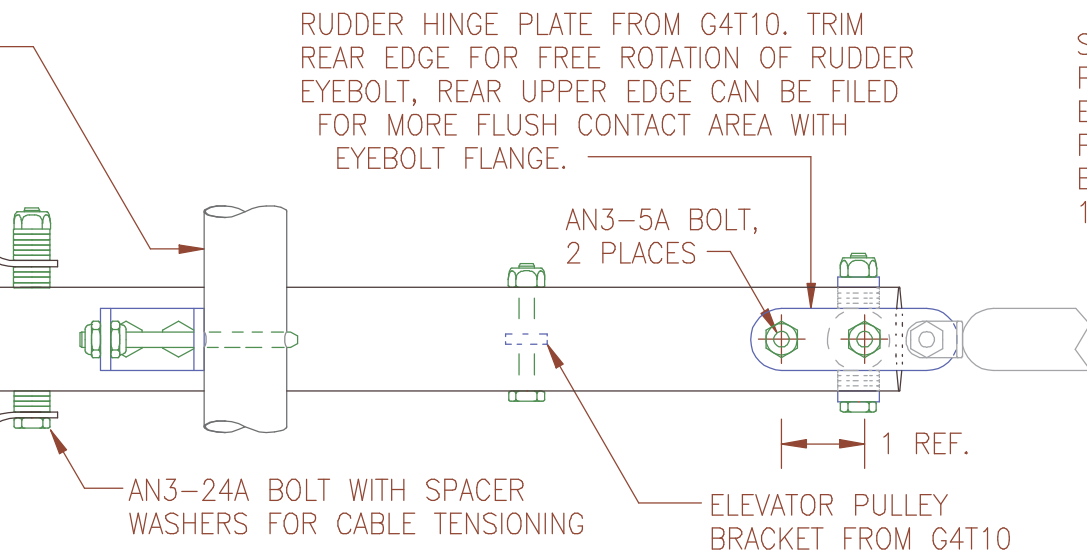
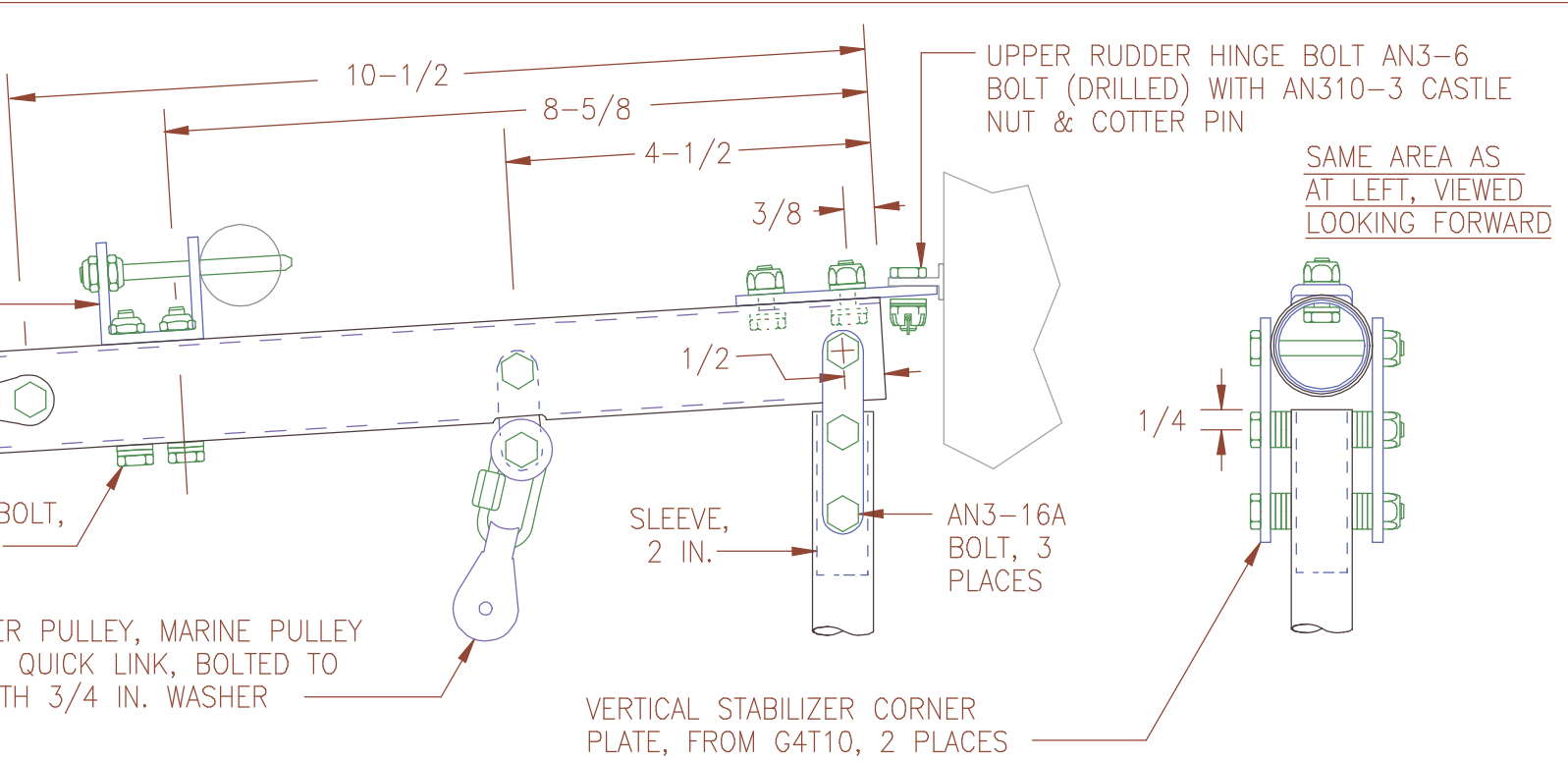
RUDDER HINGE PLATE,
3/4 X 1/8 ALUM. BAR,
2-1/2 IN. LONG,
SEE G4T11

G4T10

VERTICAL STABILIZER DETAIL 1

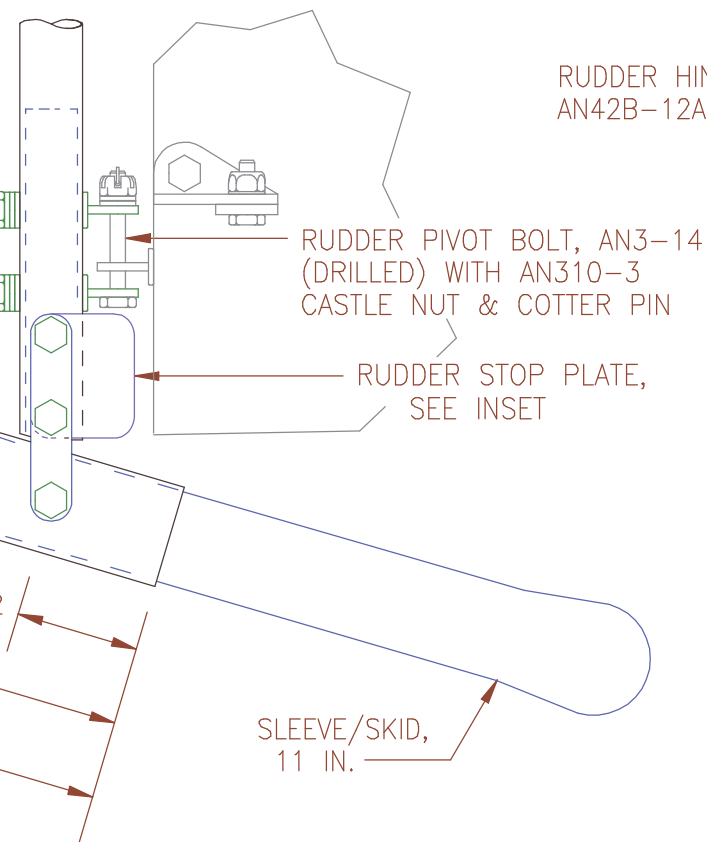
GOAT4
ULTRALIGHT
GLIDER

M. SANDLIN,
JANUARY 27,
2007

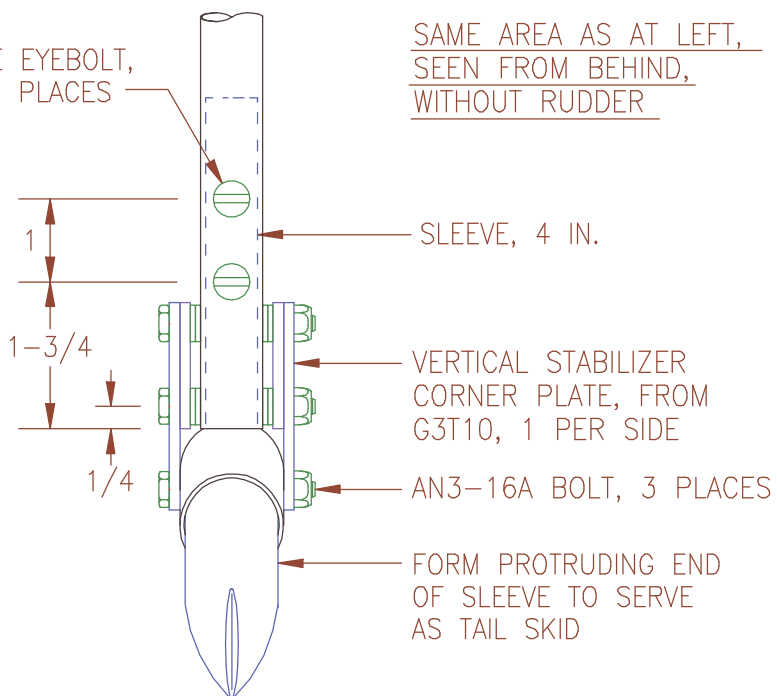


END OF UPPER CABLE OF LEFT TAIL
UPPER CABLE ASSEMBLY, SEE G4S14, G4T17

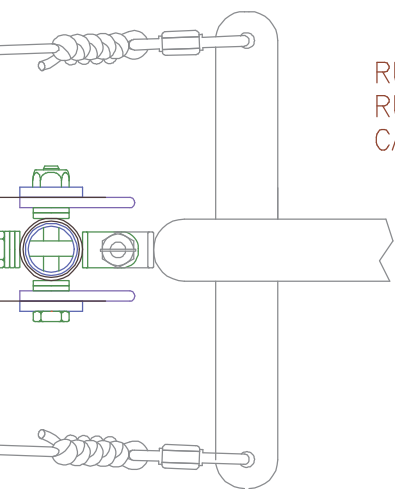
G4T11	VERTICAL STABILIZER DETAIL 2	GOAT4 ULTRALIGHT GLIDER	M. SANDLIN, JANUARY 27, 2007
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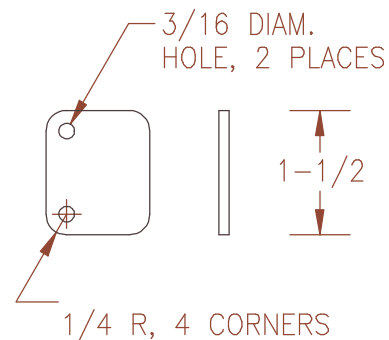
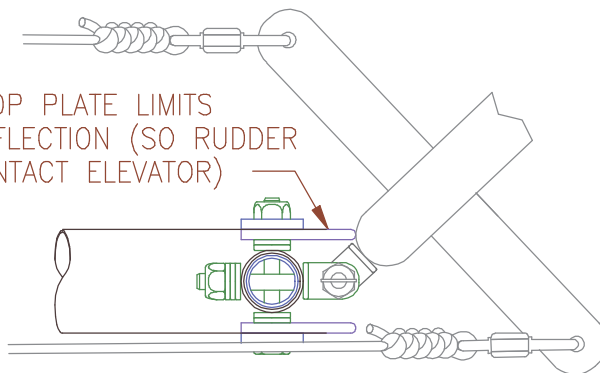
RUDDER HINGE EYEBOLT, AN42B-12A, 2 PLACES



SAME AREA AS AT LEFT, SEEN FROM BEHIND, WITHOUT RUDDER



RUDDER STOP PLATE LIMITS RUDDER DEFLECTION (SO RUDDER CANNOT CONTACT ELEVATOR)



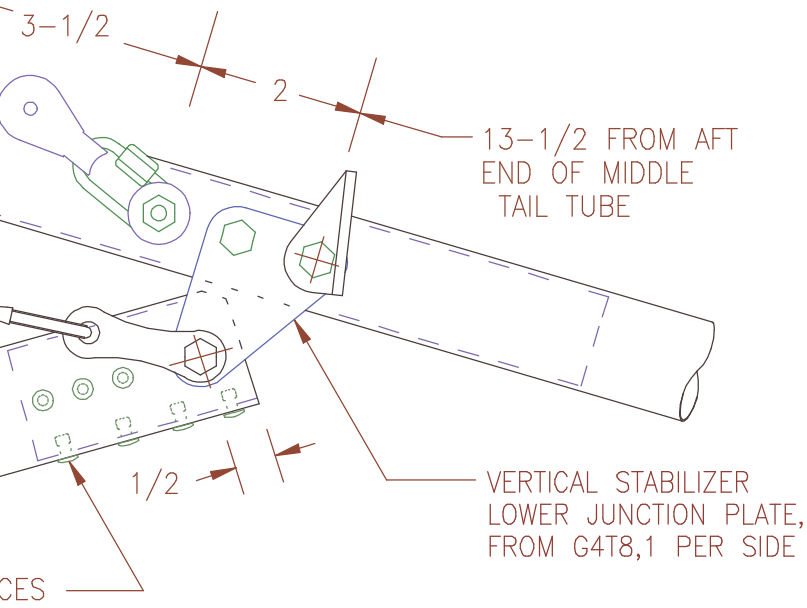
RUDDER STOP PLATE, 1/8 X 1-1/4 ALUM. BAR, MAKE 2

G4T12

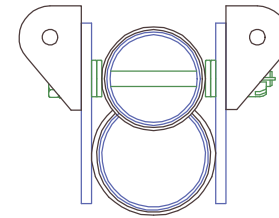
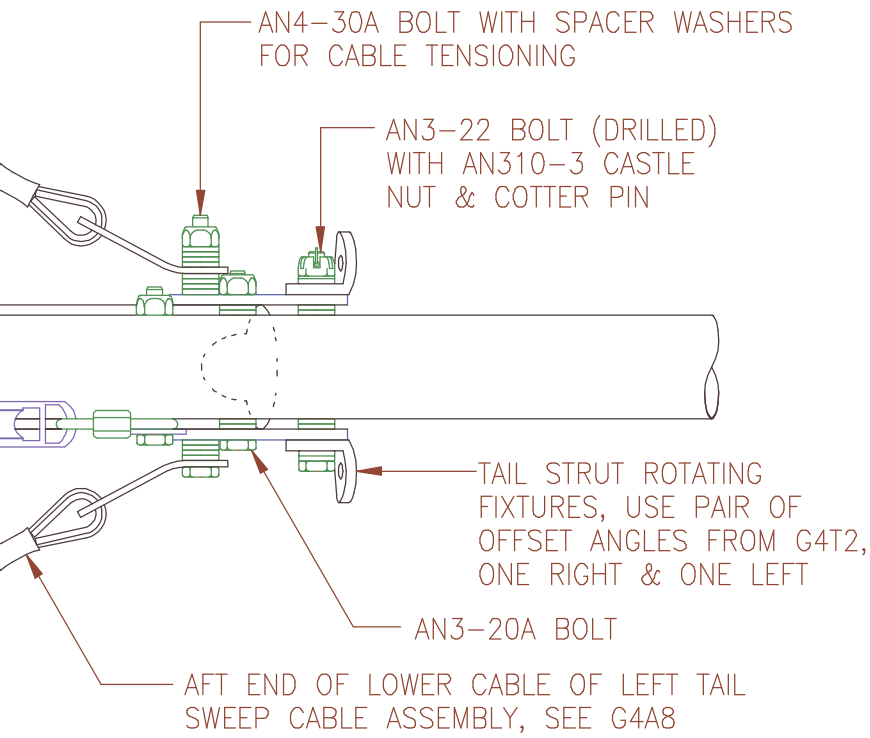
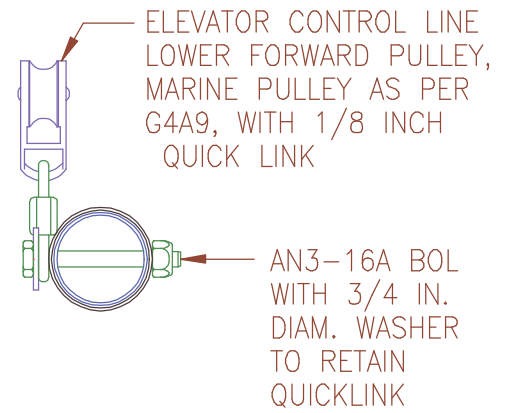
VERTICAL STABILIZER
DETAIL 3

GOAT4
ULTRALIGHT
GLIDER

M. SANDLIN,
JANUARY 27,
2007

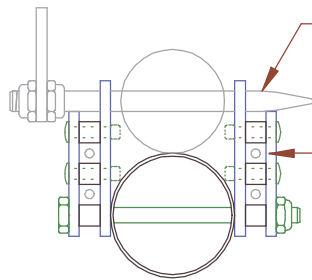


SECTION VIEW OF LOWER FORWARD ELEVATOR PULLEY, SEEN FROM BEHIND



SECTION VIEW OF TAIL STRUT ATTACHMENT & ROTATION FIXTURES, SEEN FROM BEHIND

G4T13	
VERTICAL STABILIZER DETAIL 4	
GOAT4 ULTRALIGHT GLIDER	M. SANDLIN, JANUARY 27, 2007



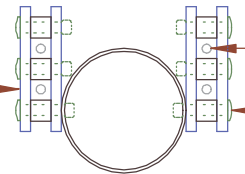
FOR TRANSPORT & STORAGE, LOWER TAIL TUBE LOCKS TO UPPER TUBE USING QUICK PIN, SAME PIN AS SHOWN ON G4T10

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

LINE GUIDE PLATE, SEE INSET, ENLARGE ONE END HOLE TO 3/16 DIAM., 1 PER SIDE

SAME VIEW AS BELOW

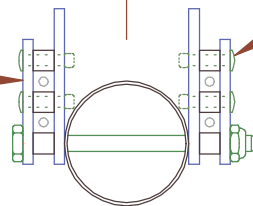
LINE GUIDE PLATE, SEE INSET, ONE PER SIDE



TYPICAL CONTROL LINE, ROUTED THRU LINE GUIDE

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

REAR LINE GUIDE AREA, SECTION VIEW

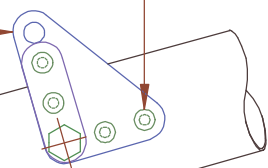


RIVET WITH TUBULAR SPACER, 1/4 X 1/4, 4 PER SIDE

AN3-26 BOLT WITH TUBULAR SPACERS, 1/4 X 1/4, ONE SPACER EACH SIDE

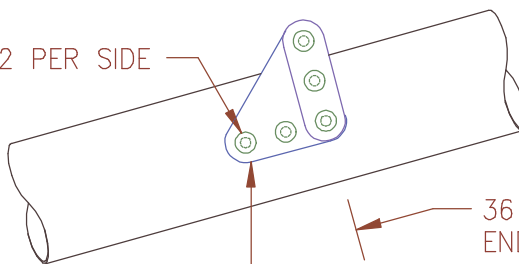
FORWARD LINE GUIDE AREA, SECTION VIEW

FORWARD LINE GUIDE BRACKET, SEE INSET, ONE PER SIDE



RIVET, 2 PER SIDE

RIVET, 2 PER SIDE



36 FROM AFT END OF TUBE

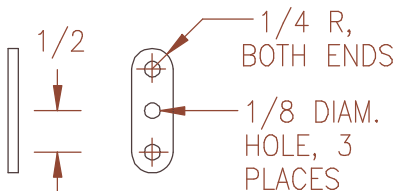
REAR LINE GUIDE BRACKET, SEE INSET, ONE PER SIDE

VIEW F FROM G4T9

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

RIVET, 4 PER SIDE

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.



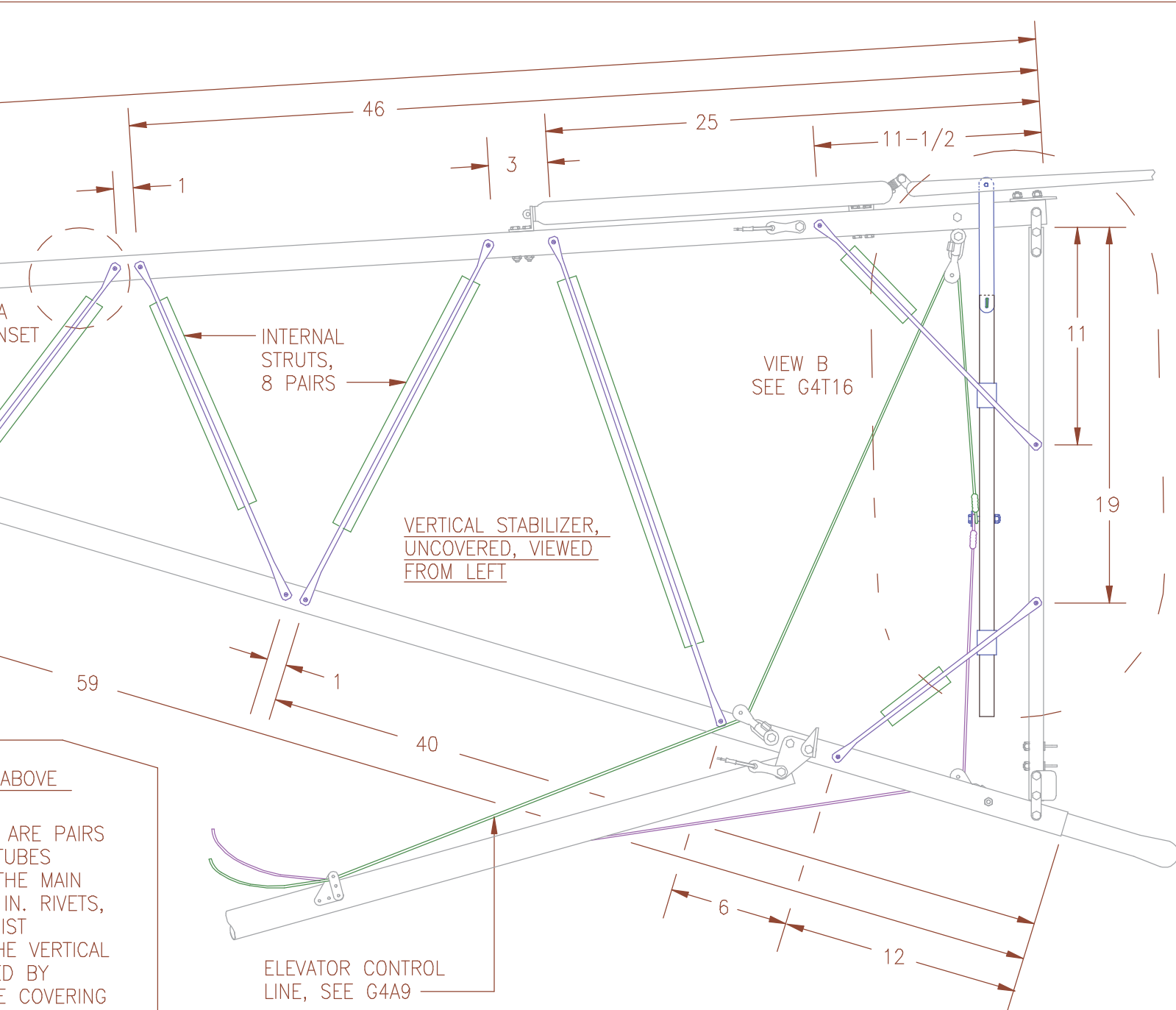
LINE GUIDE PLATE, 1/2 X 1/8 ALUM. BAR, 1-1/2 IN. LONG, MAKE 4

G4T14

VERTICAL STABILIZER LOWER TUBE DETAIL

GOAT4 ULTRALIGHT GLIDER

M. SANDLIN, JANUARY 27, 2007



ABOVE
 ARE PAIRS
 TUBES
 THE MAIN
 IN. RIVETS,
 LIST
 THE VERTICAL
 D BY
 E COVERING

, 1 X 1-1/4
 GTH AS
 BETWEEN
 KY RESIN

G4T15	VERTICAL STABILIZER INTERNAL STRUTS	GOAT4 ULTRALIGHT GLIDER	M. SANDLIN, JANUARY 27, 2007
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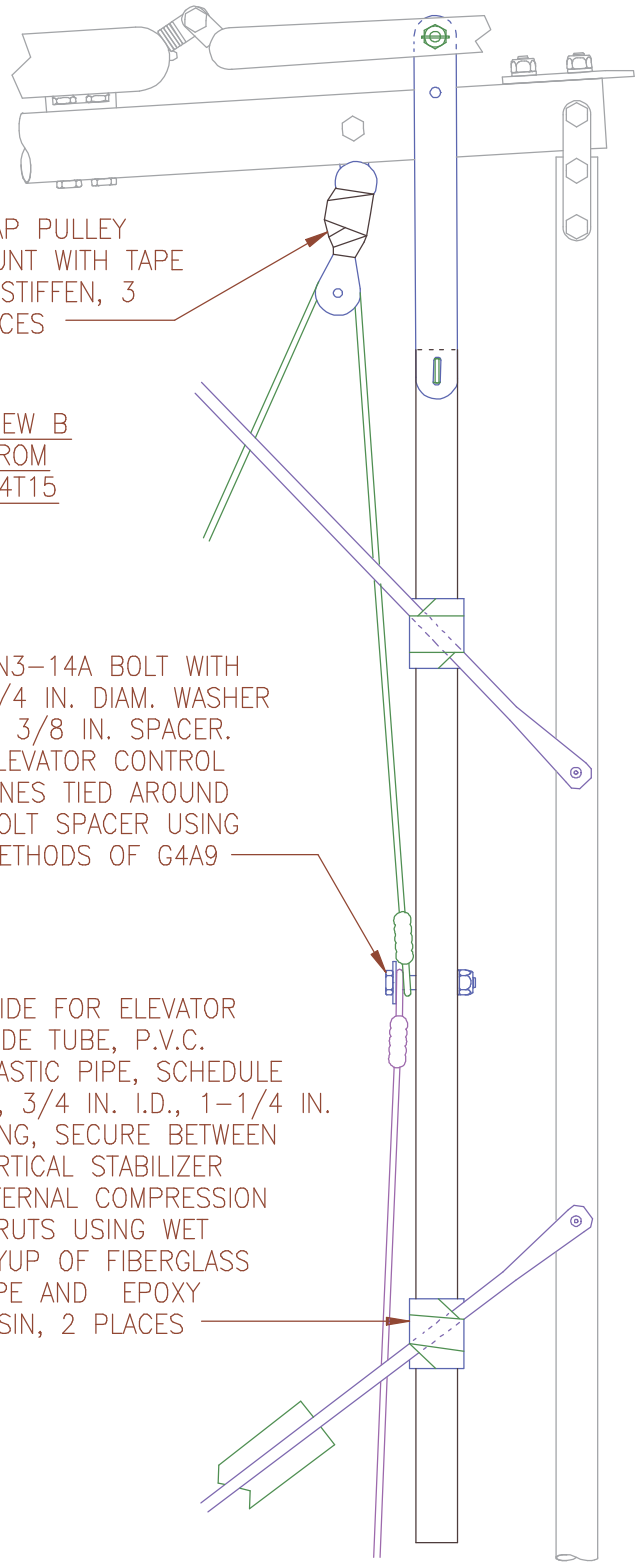
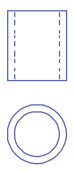
1-1/4

WRAP PULLEY
MOUNT WITH TAPE
TO STIFFEN, 3
PLACES

VIEW B
FROM
G4T15

AN3-14A BOLT WITH
3/4 IN. DIAM. WASHER
& 3/8 IN. SPACER.
ELEVATOR CONTROL
LINES TIED AROUND
BOLT SPACER USING
METHODS OF G4A9

GUIDE FOR ELEVATOR
SLIDE TUBE, P.V.C.
PLASTIC PIPE, SCHEDULE
40, 3/4 IN. I.D., 1-1/4 IN.
LONG, SECURE BETWEEN
VERTICAL STABILIZER
INTERNAL COMPRESSION
STRUTS USING WET
LAYUP OF FIBERGLASS
TAPE AND EPOXY
RESIN, 2 PLACES

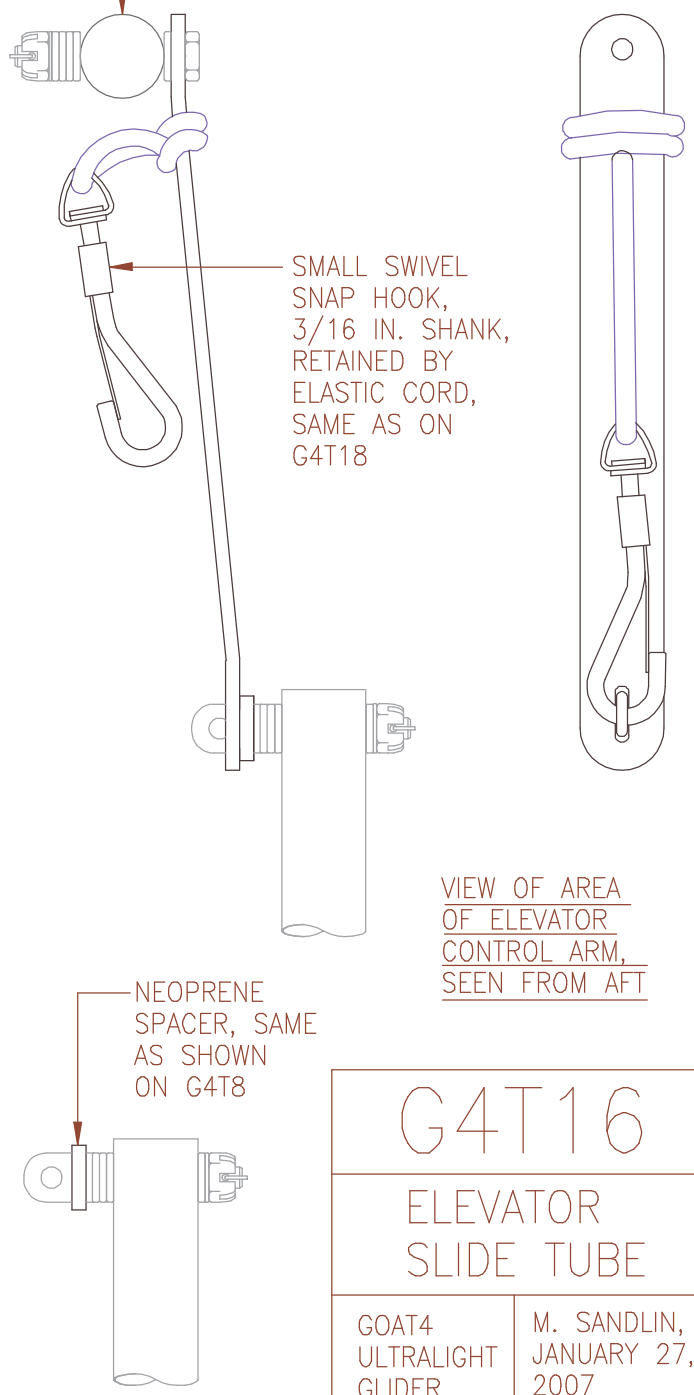


ELEVATOR CRANK TUBE,
PART OF ELEVATOR,
SEE G4T6

SMALL SWIVEL
SNAP HOOK,
3/16 IN. SHANK,
RETAINED BY
ELASTIC CORD,
SAME AS ON
G4T18

VIEW OF AREA
OF ELEVATOR
CONTROL ARM,
SEEN FROM AFT

NEOPRENE
SPACER, SAME
AS SHOWN
ON G4T8



G4T16

ELEVATOR
SLIDE TUBE

GOAT4
ULTRALIGHT
GLIDER

M. SANDLIN,
JANUARY 27,
2007

STABILIZER & RUDDER, FABRIC COVERED AND JOINED, VIEWED FROM LEFT

SWEEP CABLE
ASSEMBLY, 1 PER
SEE G4S10

VIEW A
SEE G4T18

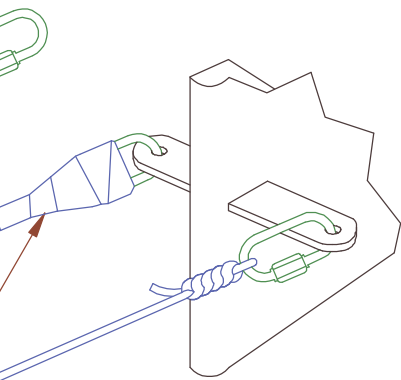
ELEVATOR SLIDE TUBE
EYEBOLT PROTRUDES
THRU 6 INCH SLOT
IN FABRIC

THE MAIN
RIBS WHERE
THE SURFACE
OF A RIB,
THE AREAS
SUBJECT

ELEVATOR CONTROL
LINES PASS THRU
SLOTS IN FABRIC,
BOTH SIDES

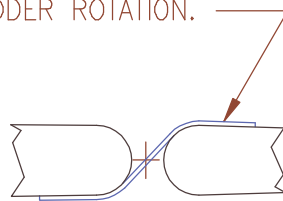
VIEW B
SEE INSET

RUDDER CONTROL LINES
PER G4A9, 1 LEFT & 1 RIGHT,



ISOMETRIC VIEW OF
AREA OF VIEW B ABOVE

"S" PATTERN GAP COVER (FABRIC TAPE)
PASSES THROUGH PANEL HINGE AXIS SO
IT IS NOT STRETCHED OR SLACKENED
BY RUDDER ROTATION.



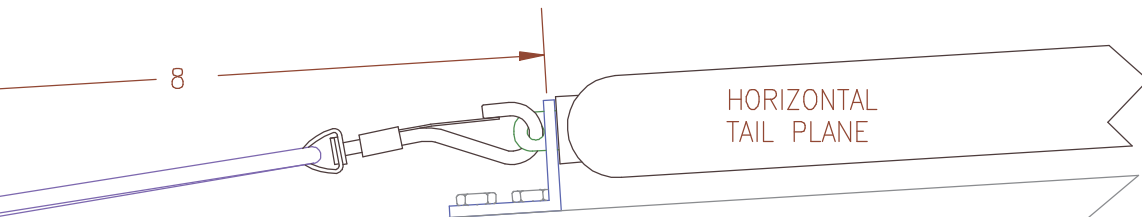
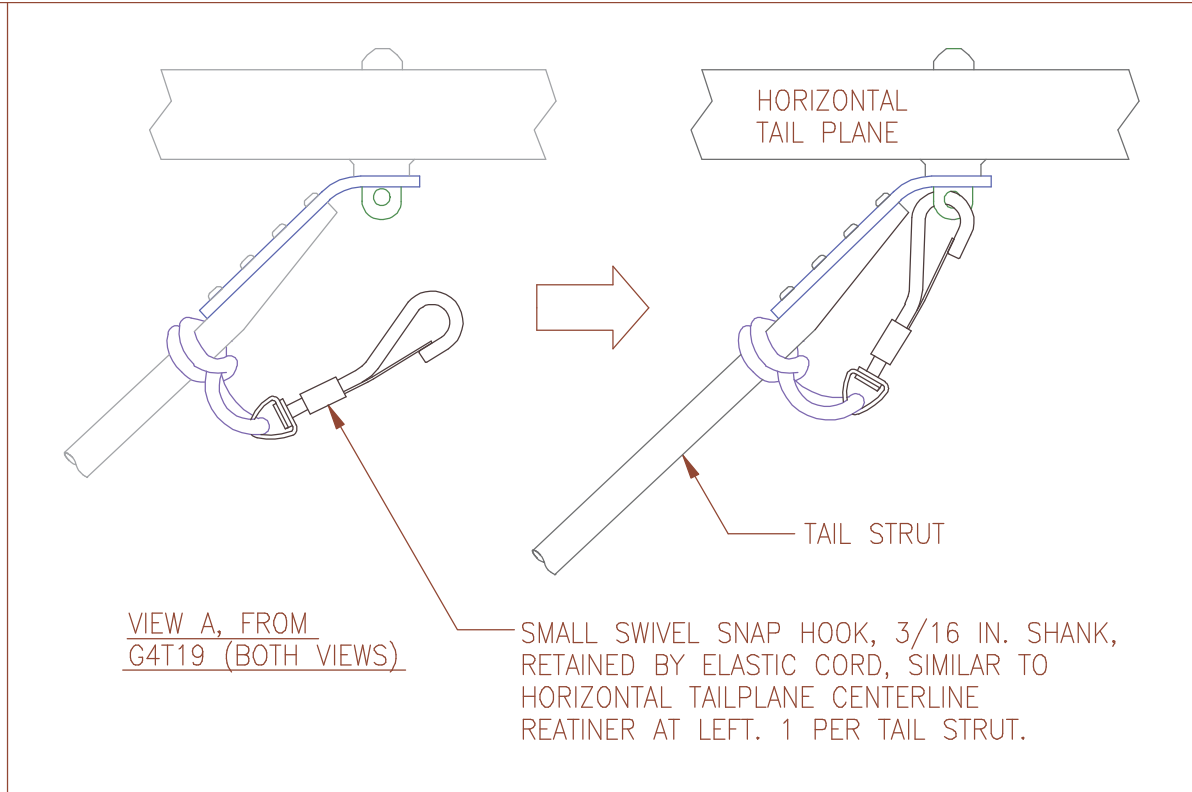
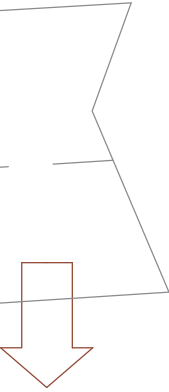
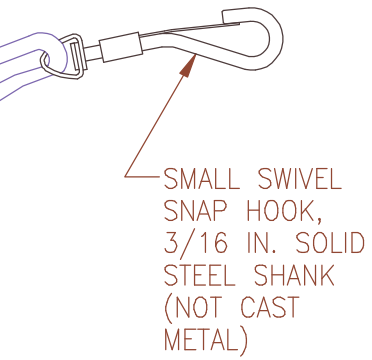
SECTION VIEW OF RUDDER ATTACHMENT
TO RUDDER POST, SEEN FROM ABOVE

G4T17

FABRIC COVERED
TAIL SECTION

GOAT4
ULTRALIGHT
GLIDER

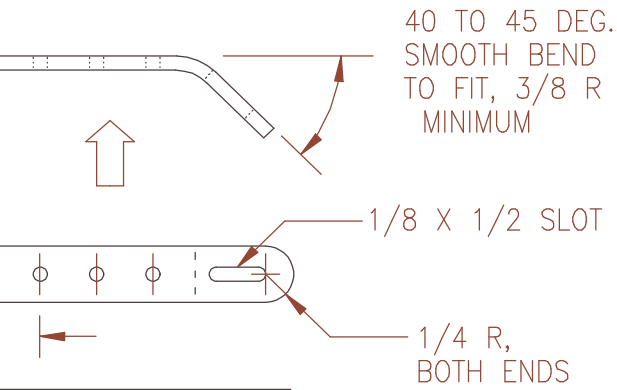
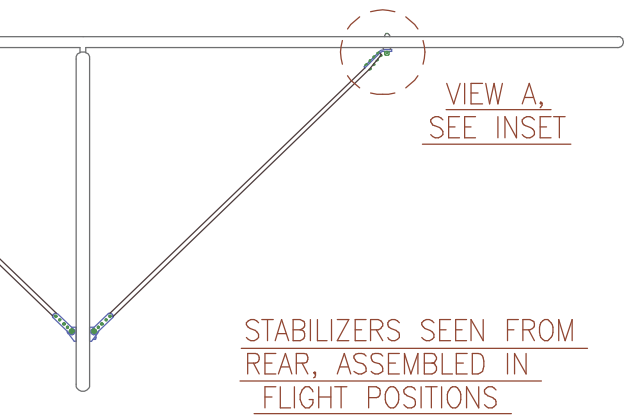
M. SANDLIN,
JANUARY 27,
2007



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



1/8 X 1/8 ALUM. BAR, 3 IN. LONG, MAKE 2

COPIES OF RIGHT TAIL STRUT, MAKE 1 RIGHT & 1 LEFT



TAIL STRUT TUBE, 3/8 X .035 X ABOUT 36-3/4

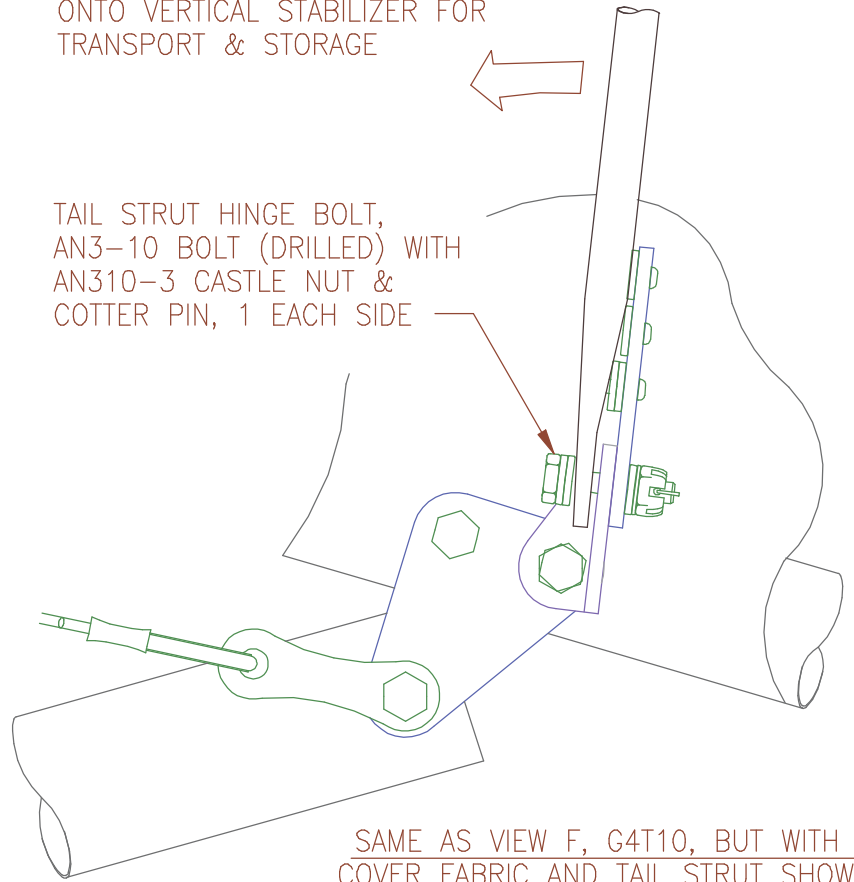


TAIL STRUT ASSEMBLY FITTING, SEE INSET, FASTEN WITH 1/8 RIVETS

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

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

G4T19

TAIL STRUTS

GOAT4
ULTRALIGHT
GLIDER

M. SANDLIN,
JANUARY 27,
2007

SAME VIEW AS
AT LOWER LEFT

ELVATOR 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)

TAIL STRUT FAIRING,
1/4 IN. Balsa wood
slat, width of slat
equals tube diameter,
secure to tube with
flexible adhesive or
epoxy, cover with
the usual aircraft
fabric, heat shrink
& seal.

RUDDER & AFT
TAIL SECTION VIEWED
FROM LEFT WITH VIEWS
OF HORIZONTAL TAIL
PLANE BEING INSTALLED

HORIZONTAL TAIL PLANE IS SET DOWN
AFT PIN, THEN SLID FORWARD
GAGE PIN & FRONT SLOT.

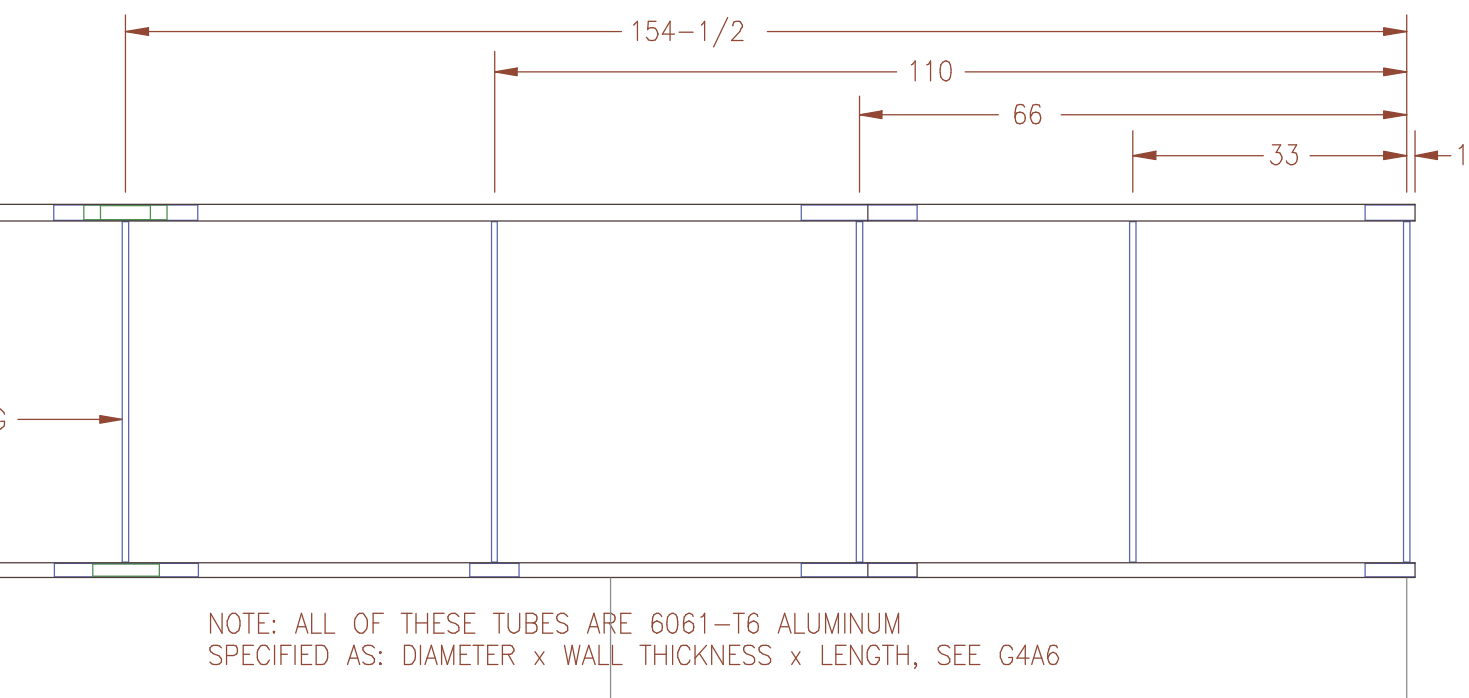
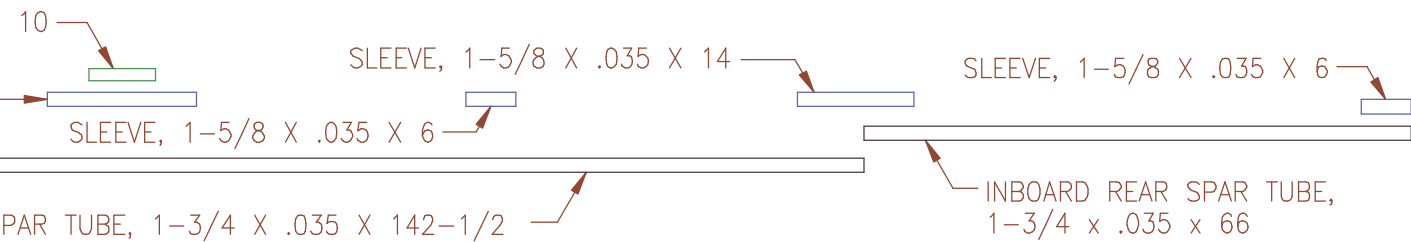
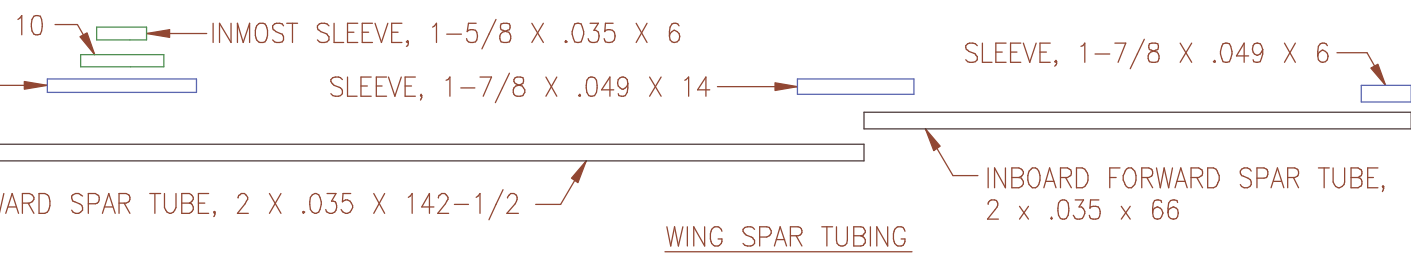
FORWARD
HORIZONTAL STABILIZER,
OUT END BUNGEE FASTENERS

G4T20

HORIZONTAL
STABILIZER
ATTACHMENT

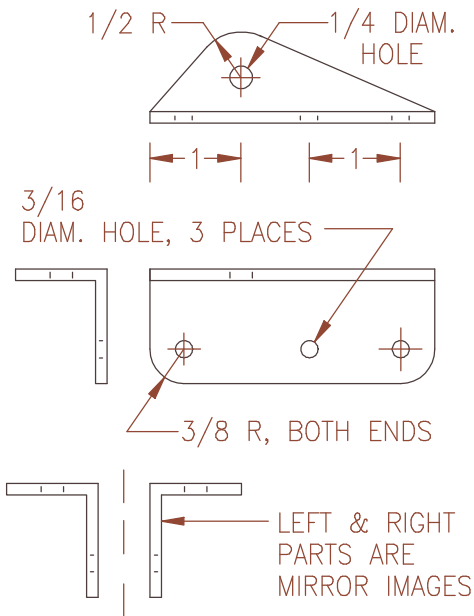
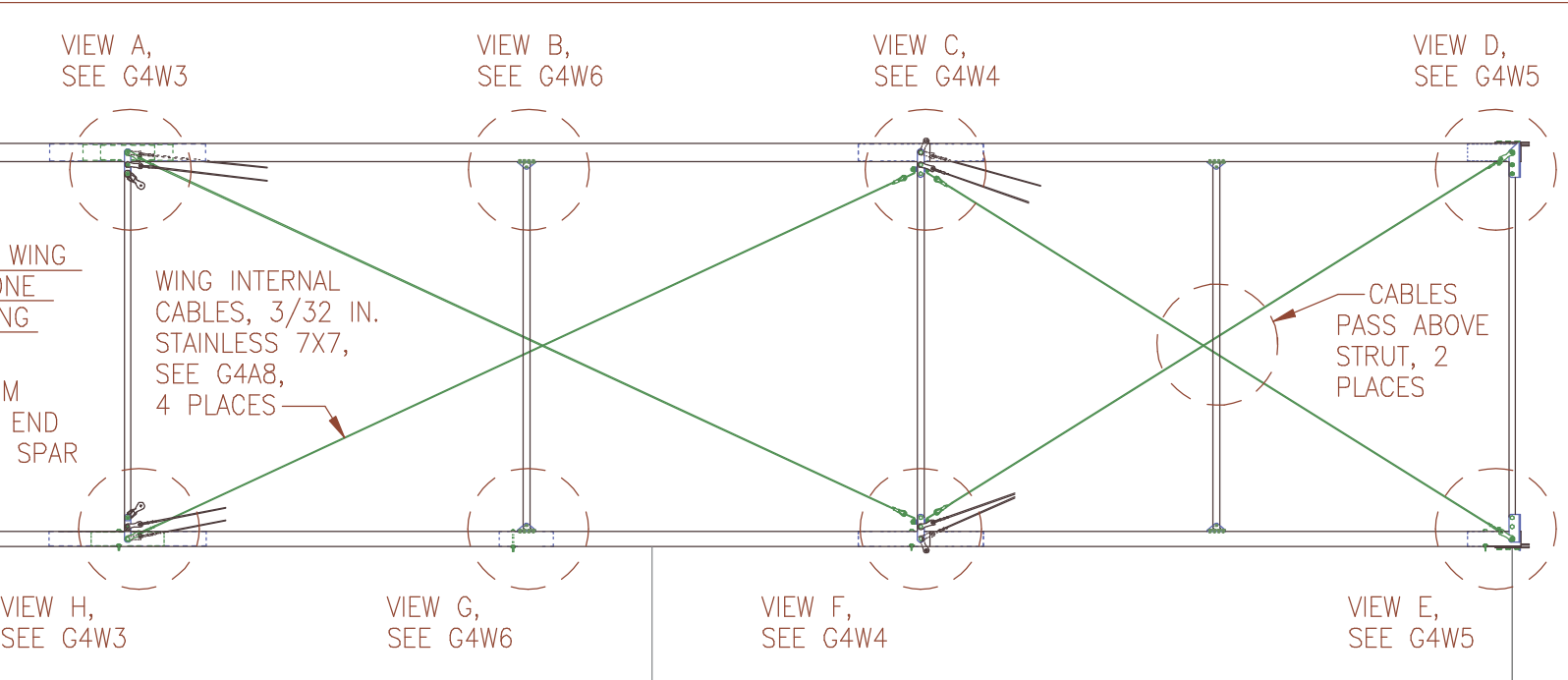
GOAT4
ULTRALIGHT
GLIDER

M. SANDLIN,
APRIL 18,
2009

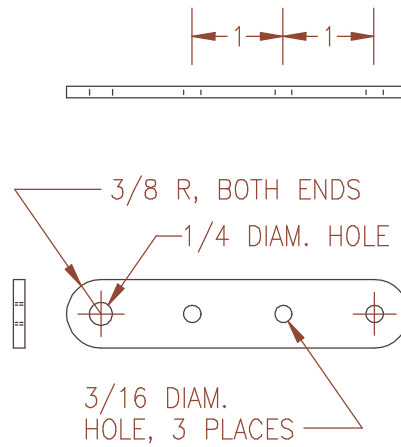


WING, LEFT WING,
WINGS

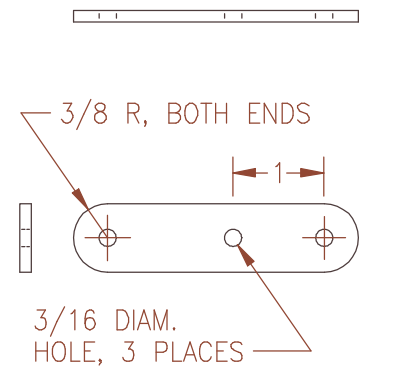
G4W1	WING TUBING	GOAT4 ULTRALIGHT GLIDER	M. SANDLIN, JANUARY 20, 2007
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WING TOP AFT CENTER FIXTURE,
1 X 1-1/4 X 1/8 AL. ANGLE,
3-1/8 IN. LONG, MAKE 1 LEFT
& 1 RIGHT

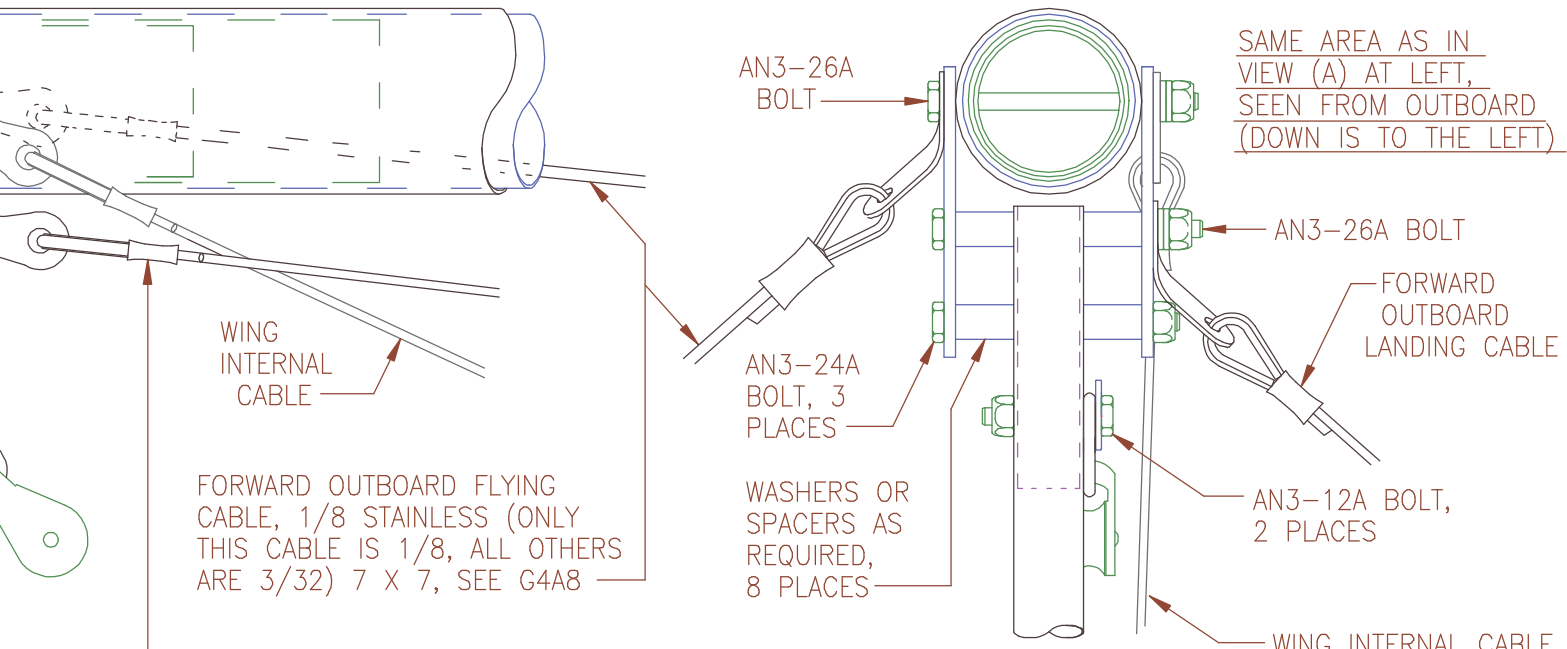


WING JOINING FIXTURE
1/8 X 3/4 AL. BAR STOCK,
3-3/4 IN. LONG, MAKE 8

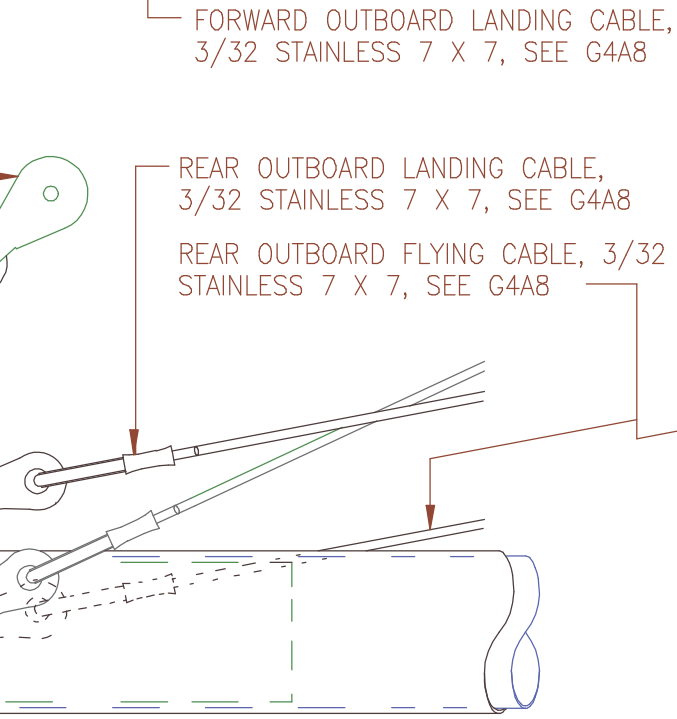


STRUT FIXTURE
1/8 X 3/4 AL. BAR STOCK,
3-1/8 IN. LONG, MAKE 16

G4W2	MAIN WING ASSEMBLY	GOAT4 ULTRALIGHT GLIDER	M. SANDLIN, JULY 27, 2007
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SAME AREA AS IN VIEW (A) AT LEFT, SEEN FROM OUTBOARD (DOWN IS TO THE LEFT)

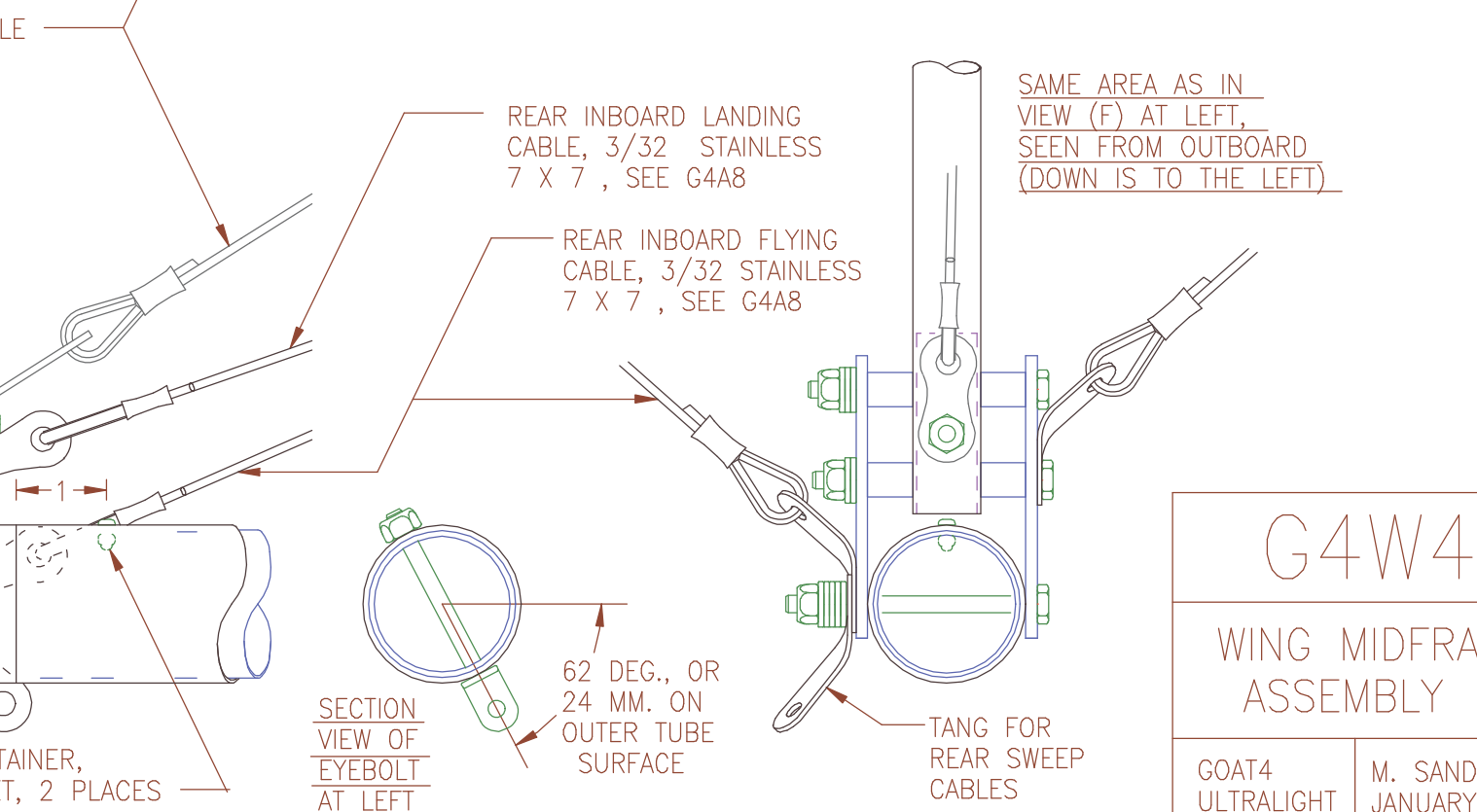
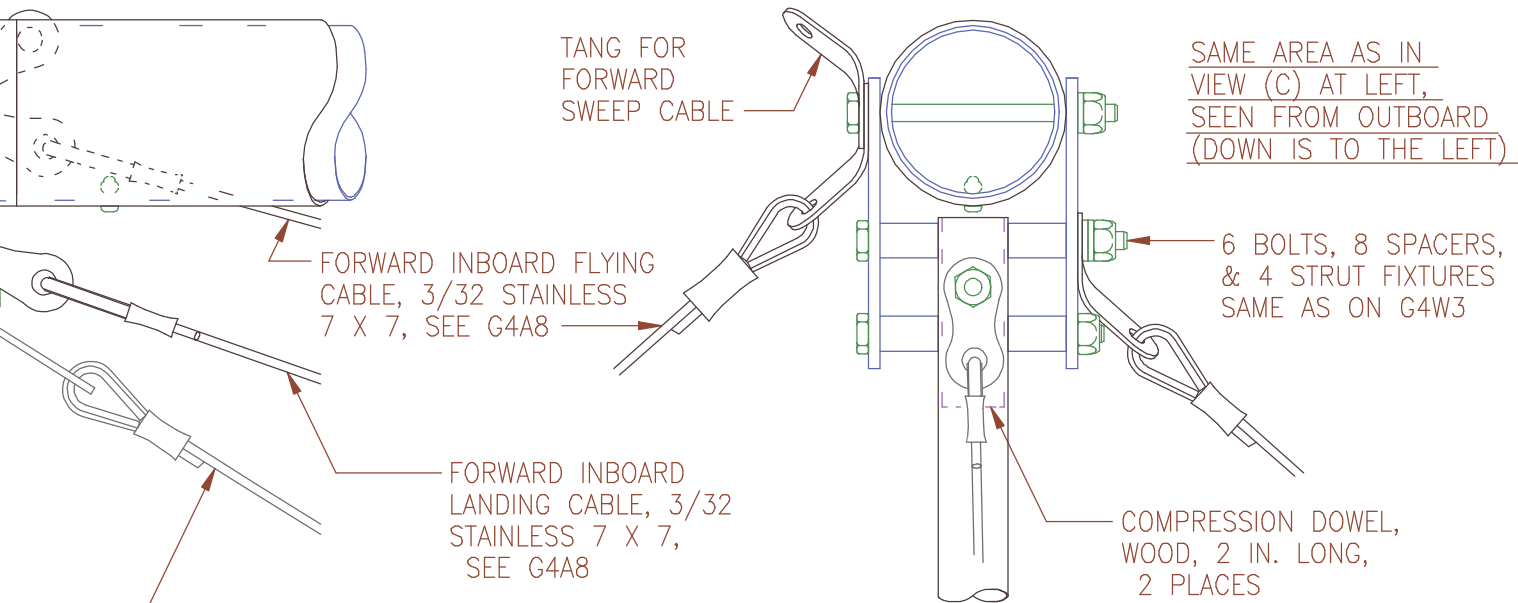


SAME AREA AS IN VIEW (H) AT LEFT, SEEN FROM OUTBOARD (DOWN IS TO THE LEFT)

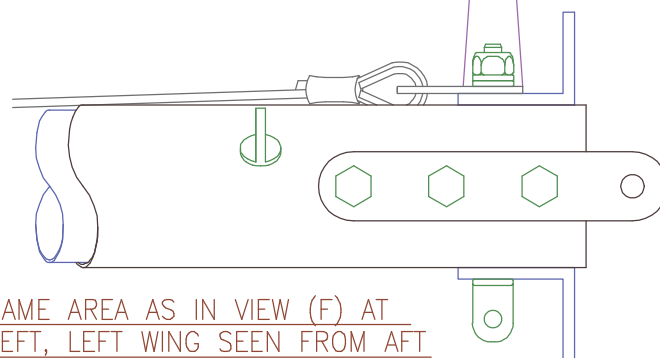
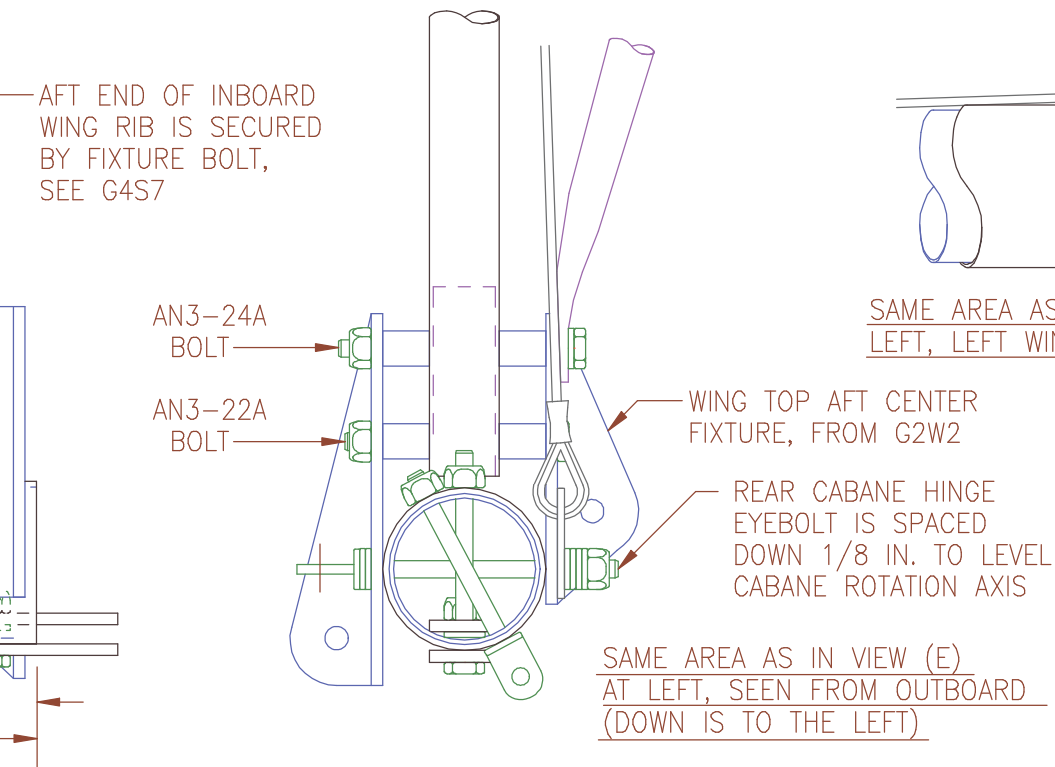
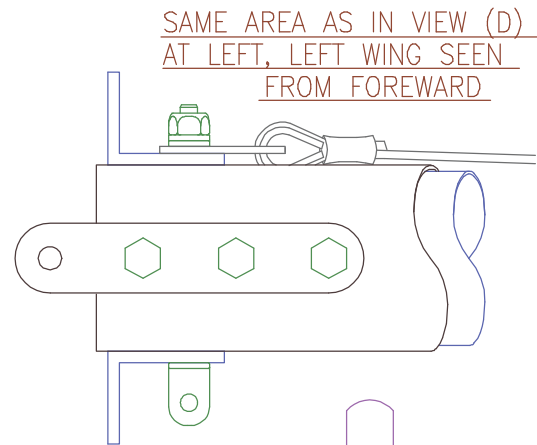
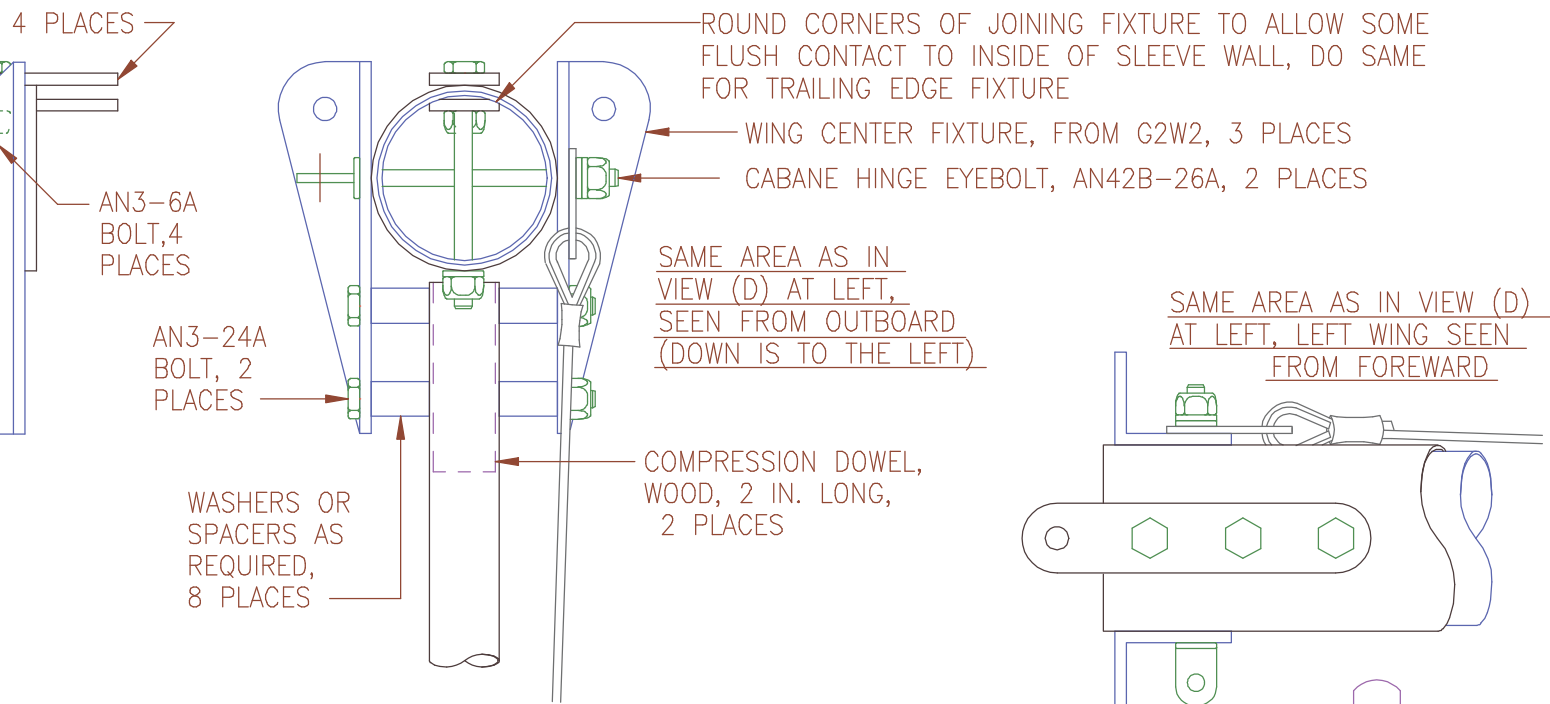
INTERNAL WING STRUTS ARE LOCATED BETWEEN THE SPAR TUBES SO AS TO LEAVE A GAP OF ABOUT 1/8 INCH AT EACH END.

HINGE EYEBOLT, AN42B-20A, SEE SECTION VIEW ON G4W4

G4W3	WING OUTBOARD FRAME ASSEMBLY	GOAT4 ULTRALIGHT GLIDER	M. SANDLIN, JANUARY 20, 2007
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<h1>G4W4</h1>	
<h2>WING MIDFRAME ASSEMBLY</h2>	
GOAT4 ULTRALIGHT GLIDER	M. SANDLIN, JANUARY 20, 2007



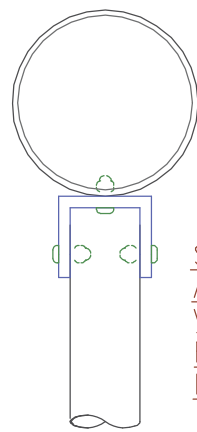
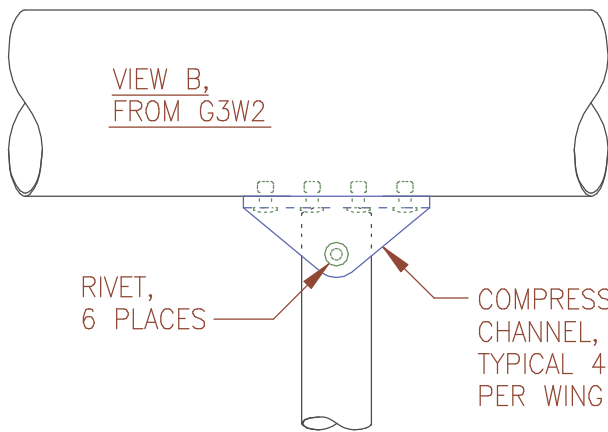
G4W5

WING INBOARD
FRAME ASSEMBLY

GOAT4
ULTRALIGHT
GLIDER

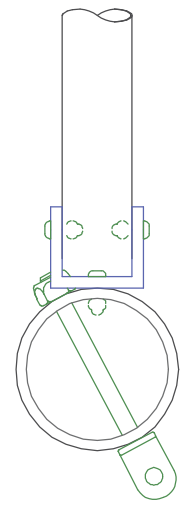
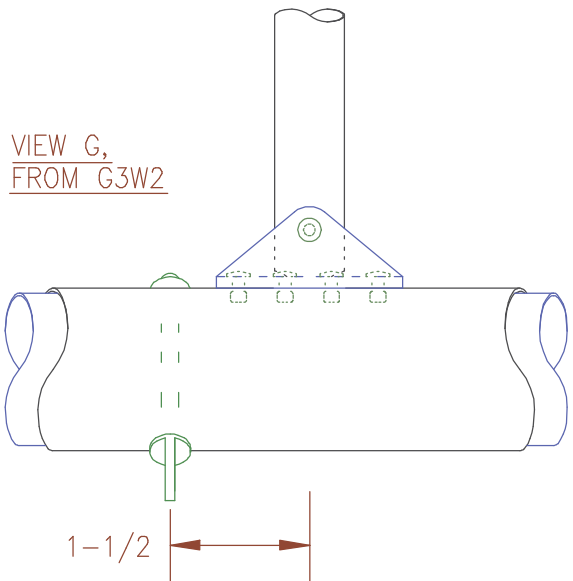
M. SANDLIN,
JANUARY 21,
2007

1/8



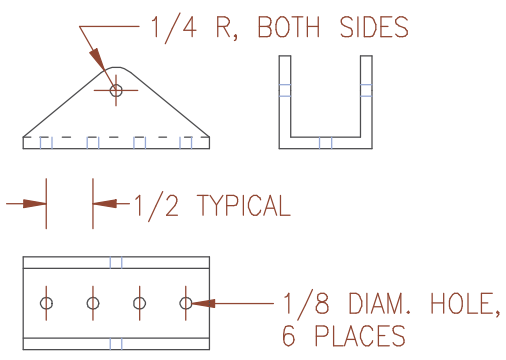
SAME AREA AS AT LEFT, VIEWED FROM INBOARD

2/4



SAME AREA AS AT LEFT, VIEWED FROM INBOARD

8



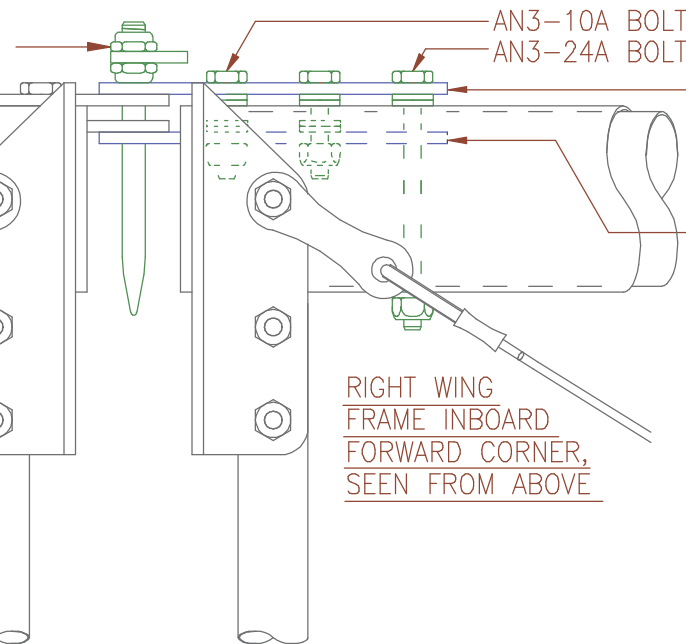
COMPRESSION STRUT CHANNEL, 7/8 X 1 X 1/8, 2 IN. LONG, MAKE 8

G4W6

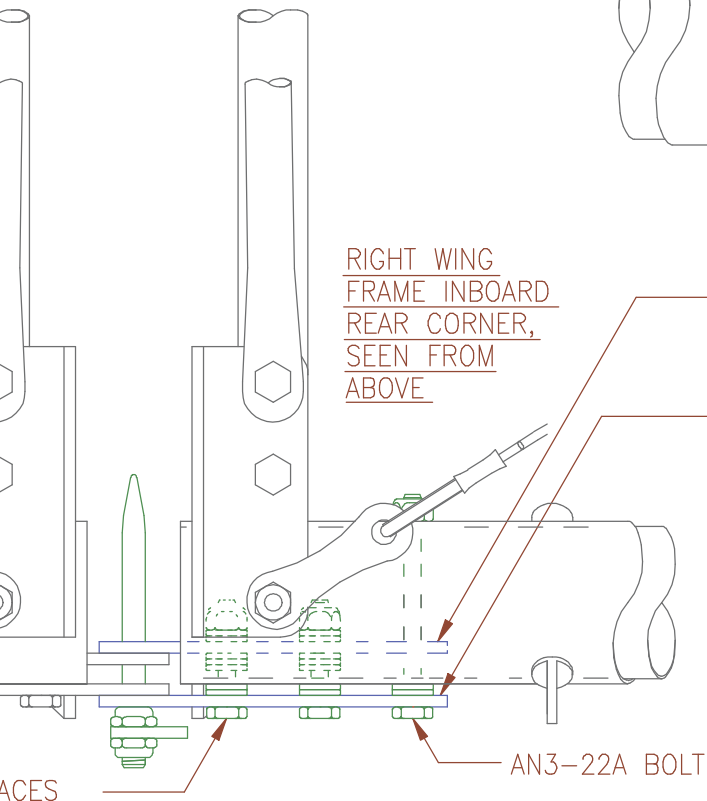
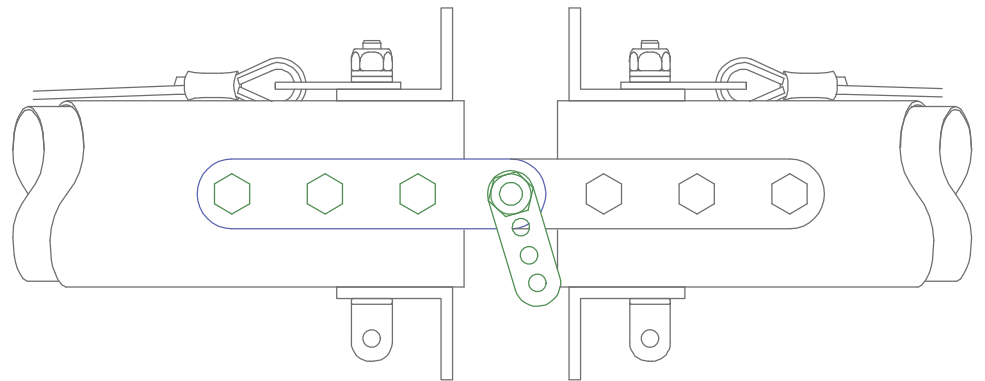
MIDFRAME STRUT ASSEMBLY

GOAT4
ULTRALIGHT
GLIDER

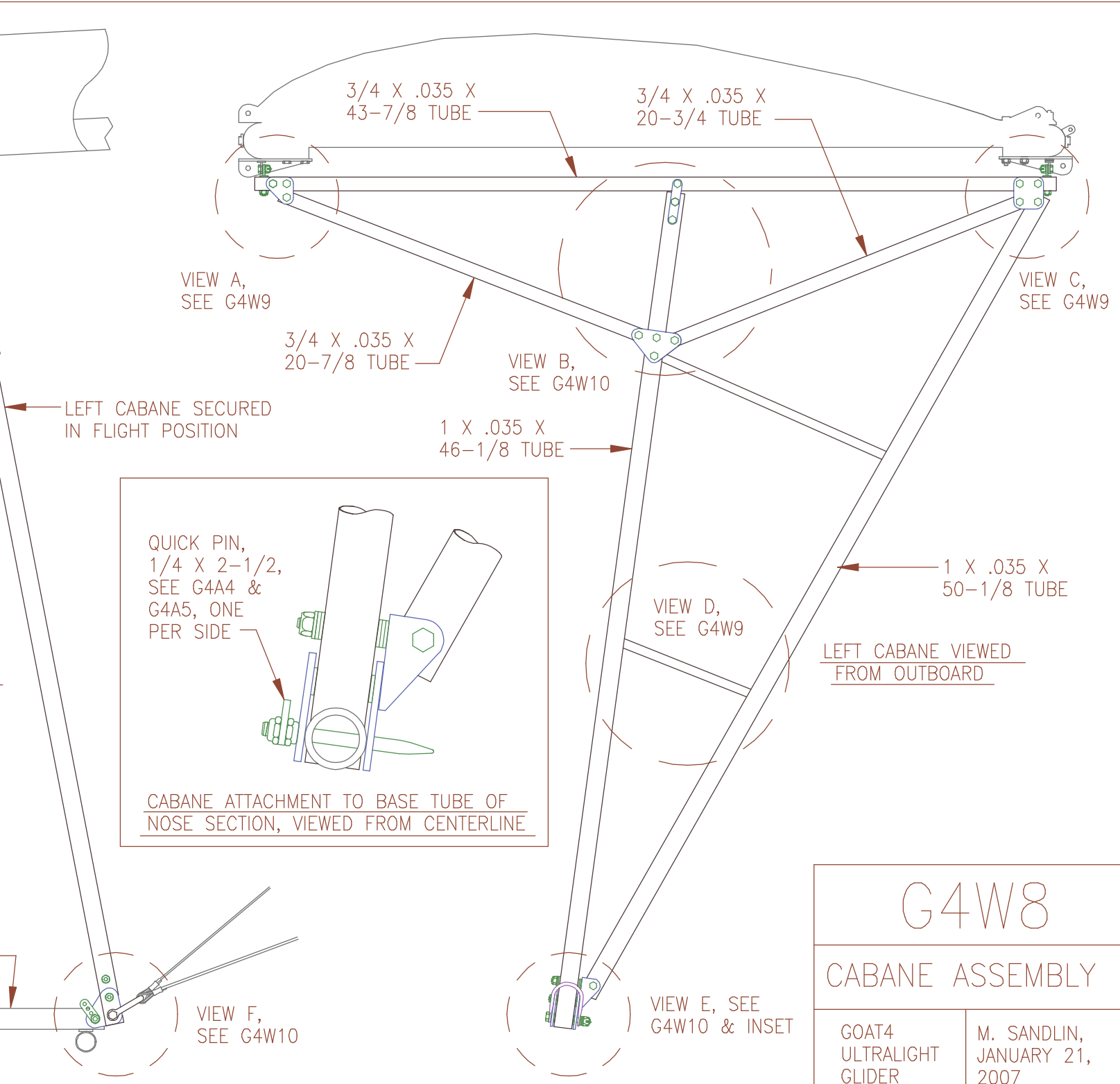
M. SANDLIN,
JULY 27,
2007



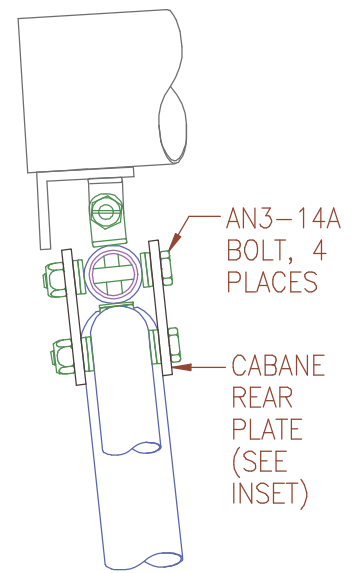
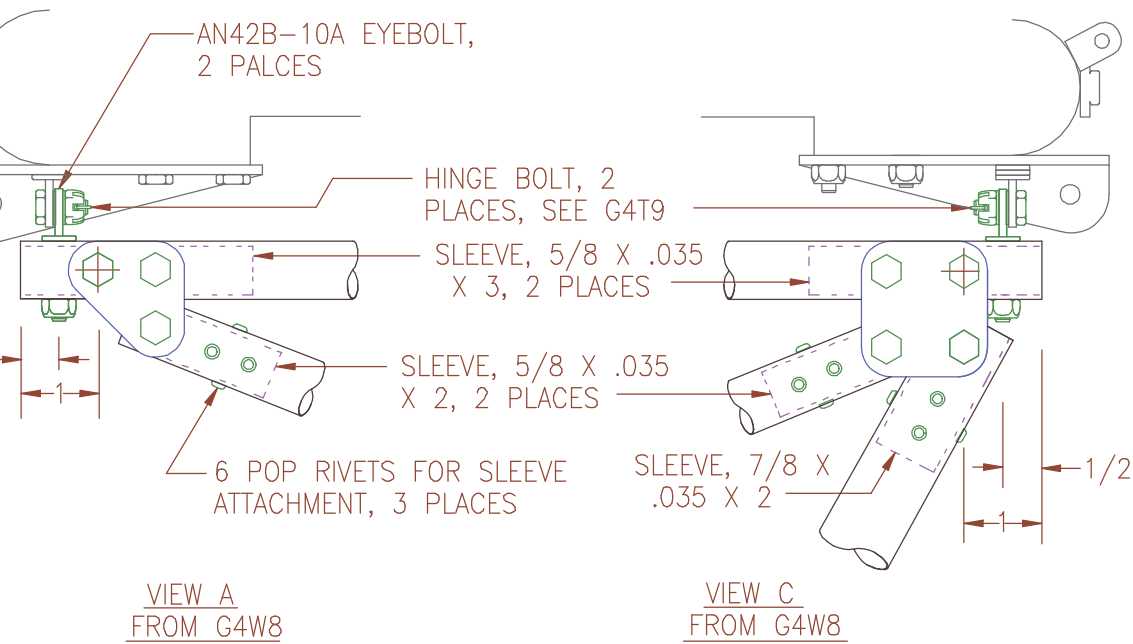
WING LEADING EDGE SPARS JOINED AT CENTER LINE,
VIEWED FROM FORWARD, QUICK PIN INSERTED BUT
PIN RETAINERS (ELASTIC LOOPS & LINE) NOT SHOWN



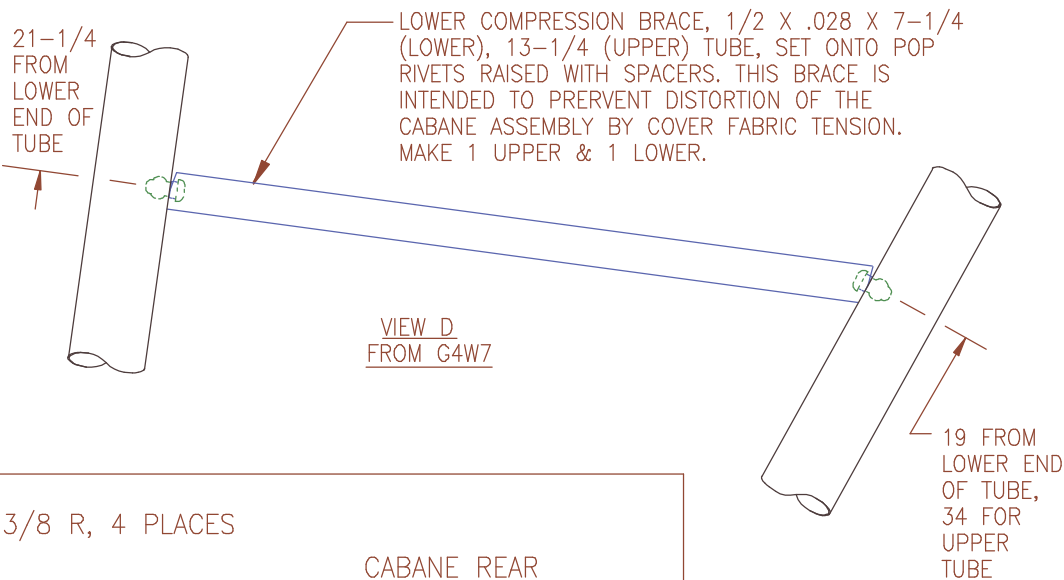
G4W7	
RIGHT WING JOINING ASSEMBLY	
GOAT4 ULTRALIGHT GLIDER	M. SANDLIN, JANUARY 21, 2007



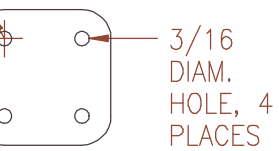
<h1>G4W8</h1>	
<h2>CABANE ASSEMBLY</h2>	
GOAT4 ULTRALIGHT GLIDER	M. SANDLIN, JANUARY 21, 2007



VIEW OF AREA AT LEFT, SEEN FROM FORWARD



3/8 R, 4 PLACES



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

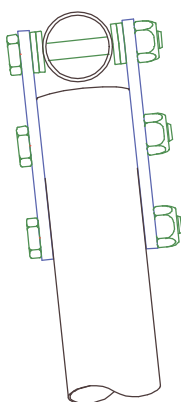
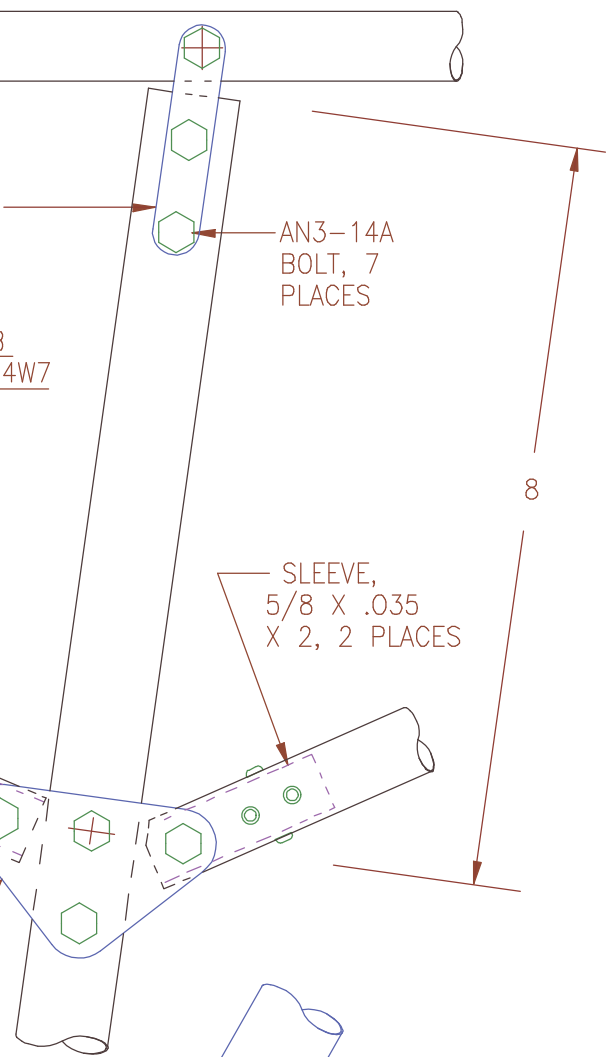
G4W9

CABANE DETAIL 1

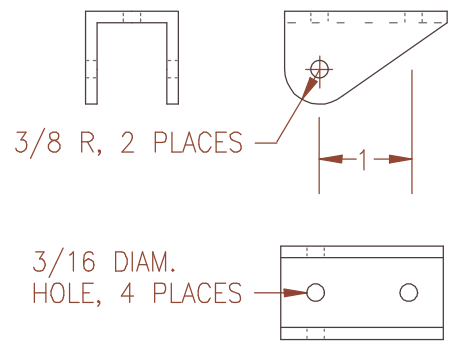
GOAT4
ULTRALIGHT
GLIDER

M. SANDLIN,
JANUARY 21,
2007

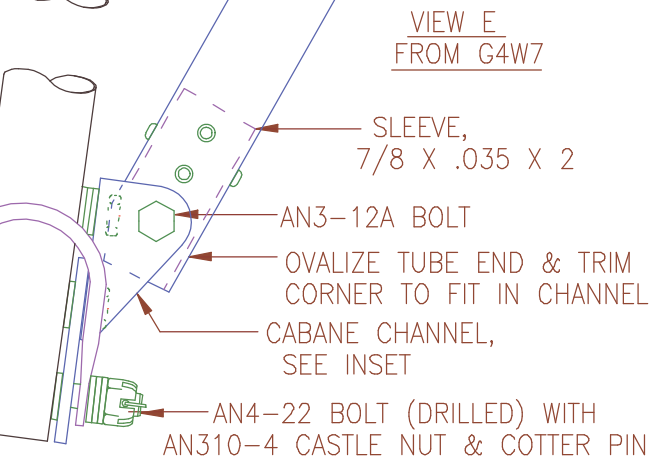
← 20-3/4 FROM AFT END OF TUBE



SECTION VIEW OF
CABANE UPPER
BRACKET, SEEN
FROM FORWARD

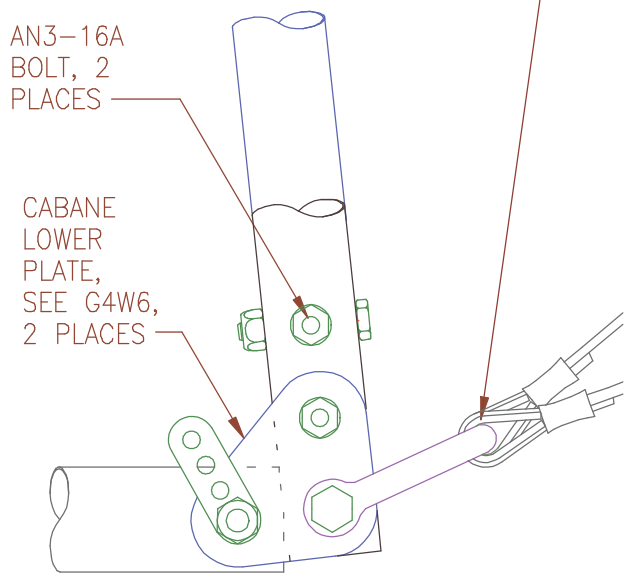


CABANE CHANNEL,
1 X 1 X 1/8 ALUM. CHANNEL,
1-3/4 IN. LONG, MAKE 2

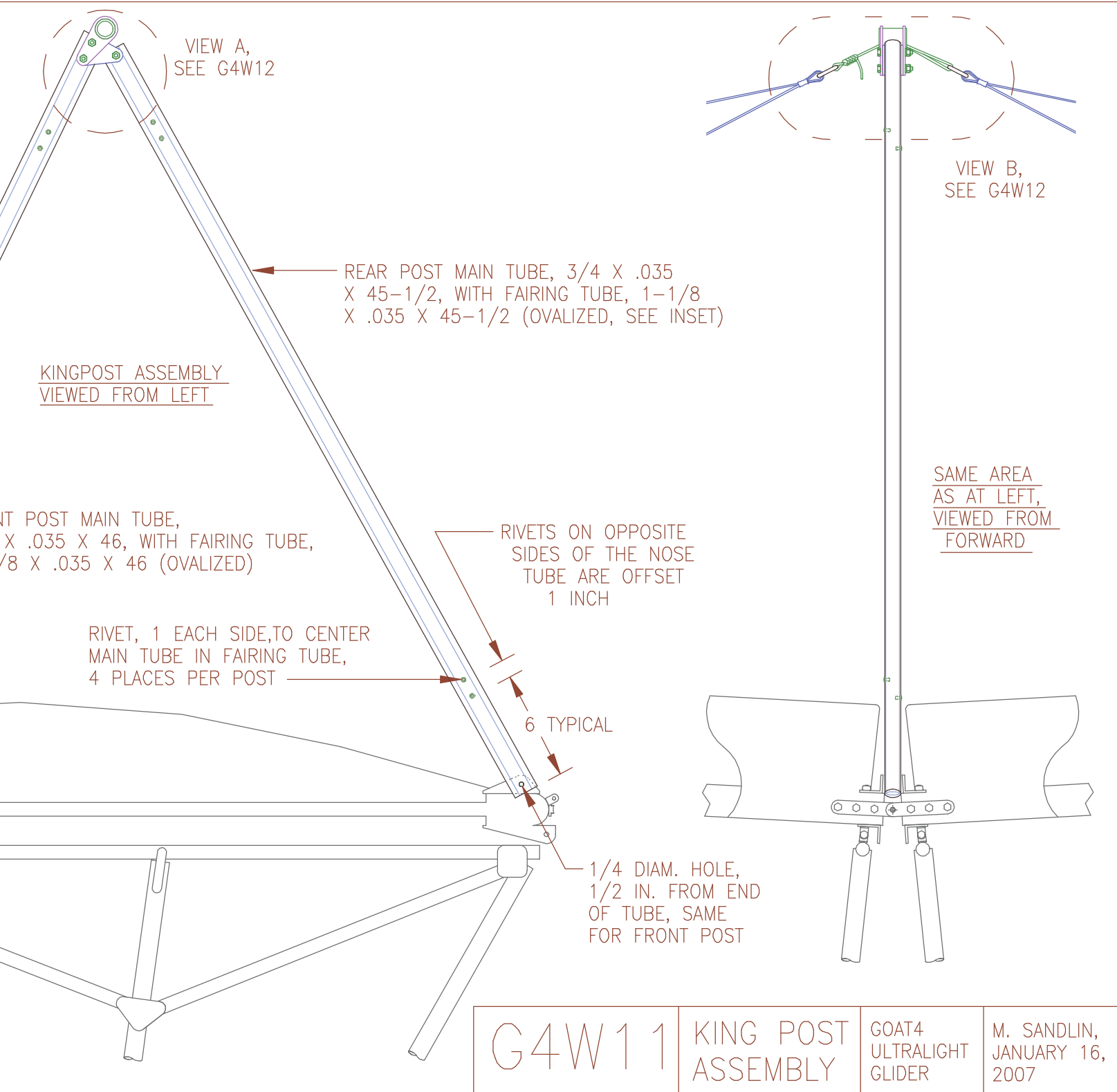


VIEW E
FROM G4W7

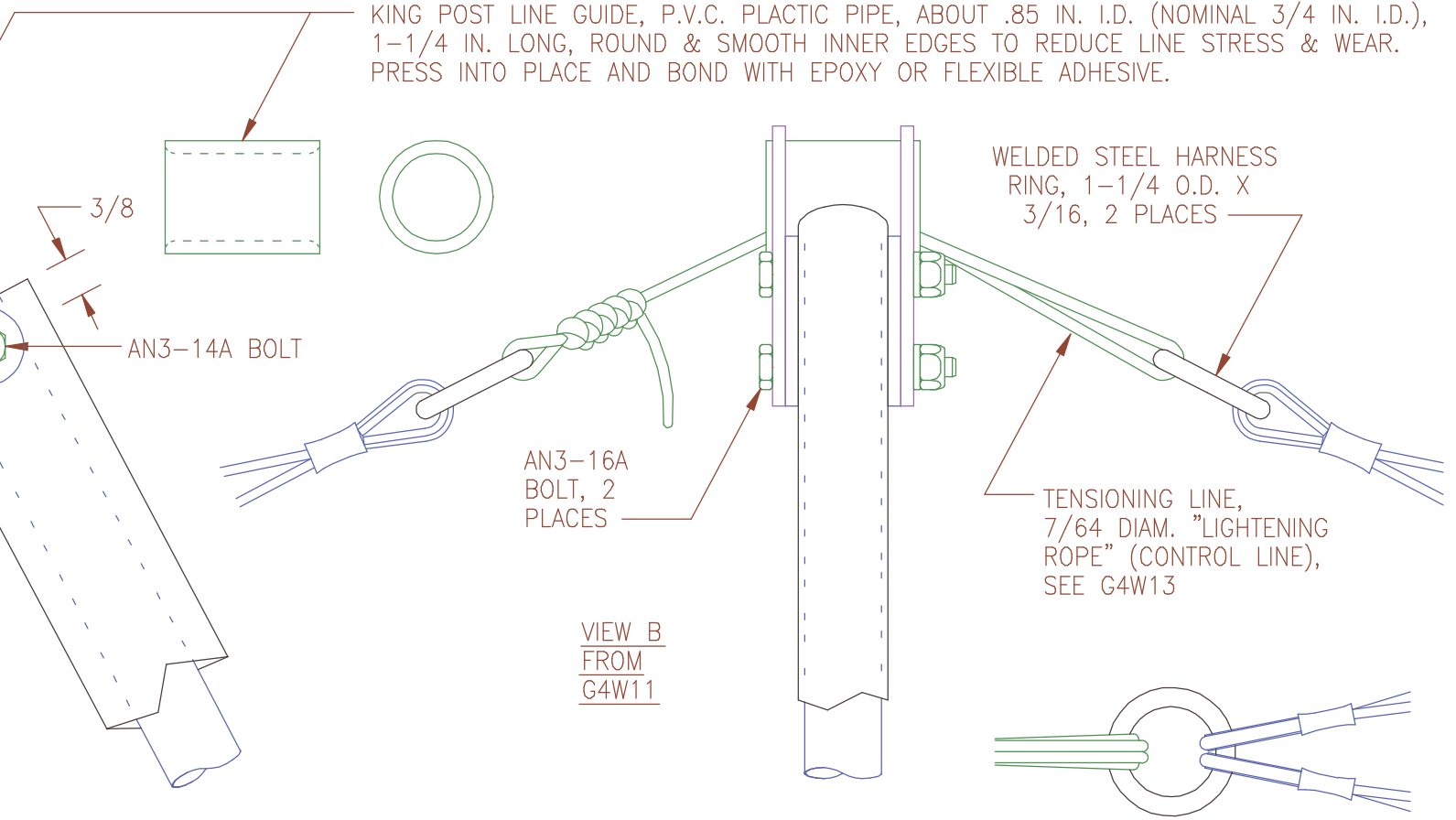
SAME AREA AS
VIEW (E) AT LEFT,
SEEN FROM FORWARD



G4W10
CABANE DETAIL 2
GOAT4 ULTRALIGHT GLIDER
M. SANDLIN, JANUARY 21, 2007



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.

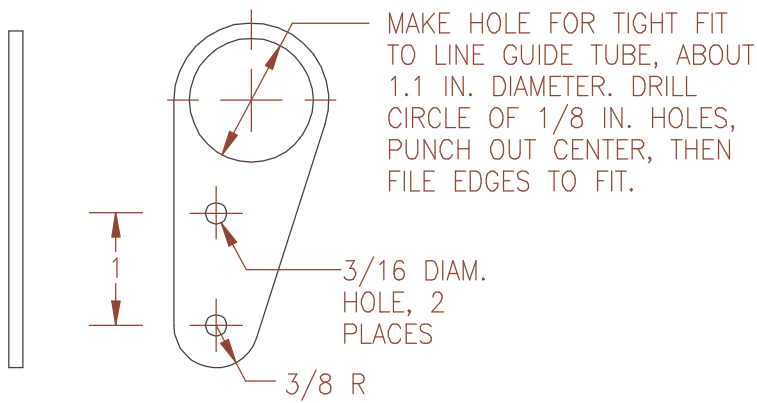


WELDED STEEL HARNESS RING, 1-1/4 O.D. X 3/16, 2 PLACES

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

VIEW B FROM G4W11

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.

3/16 DIAM. HOLE, 2 PLACES

3/8 R

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

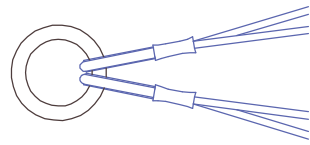
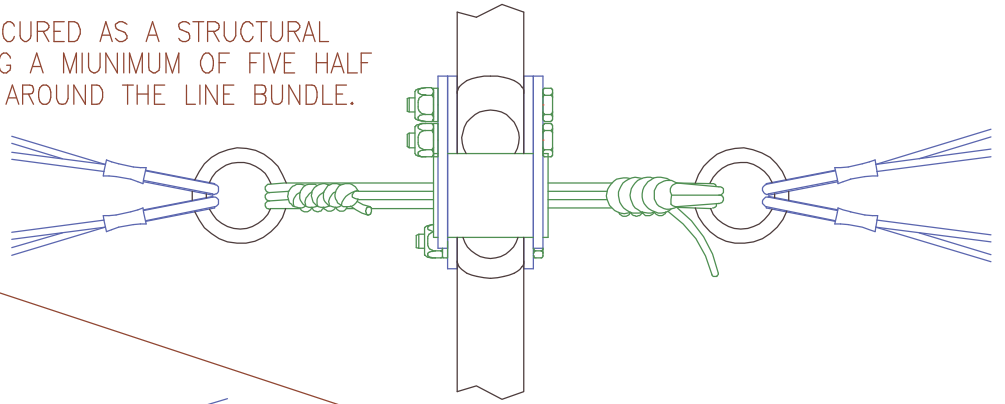
G4W12

KING POST DETAIL

GOAT4
ULTRALIGHT
GLIDER

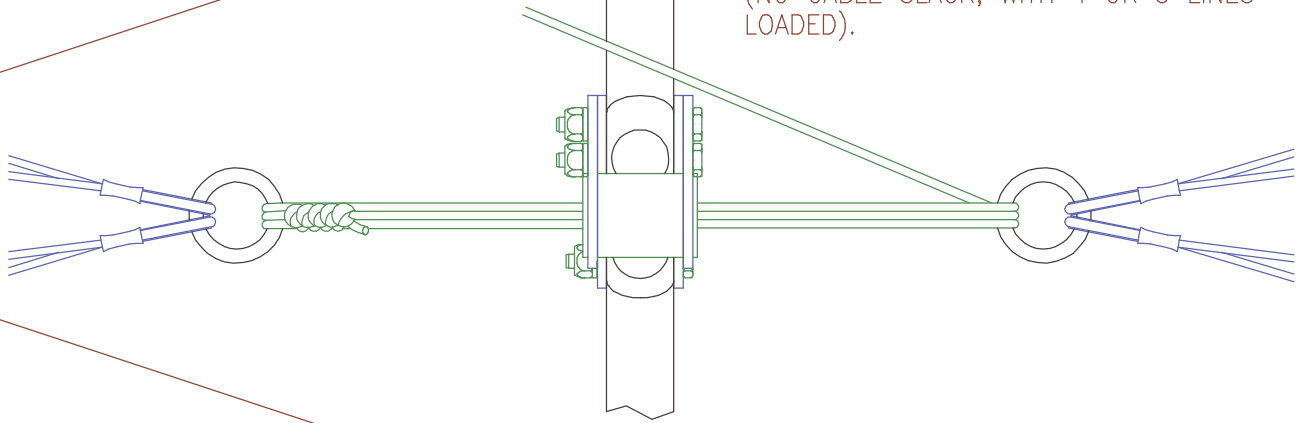
M. SANDLIN,
JANUARY 18,
2007

4. LINE IS SECURED AS A STRUCTURAL MEMBER USING A MIUNIMUM OF FIVE HALF HITCH KNOTS AROUND THE LINE BUNDLE.



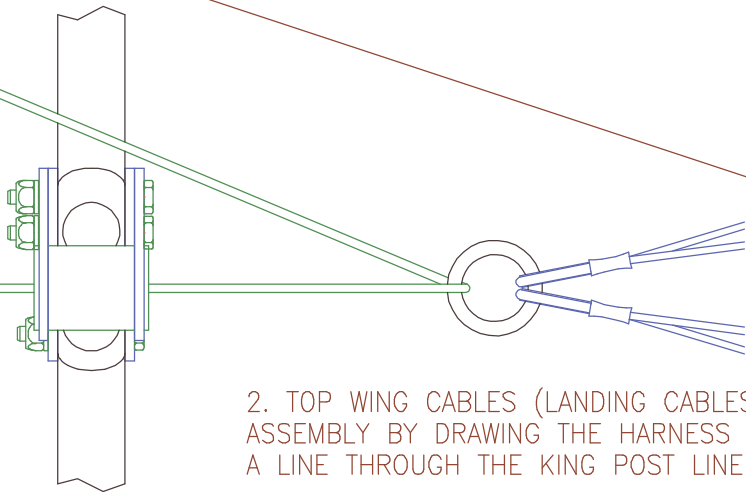
VIEWS OF THE TOP OF THE KING POST
SEEN FROM ABOVE, THE TOP OF THE
DRAWING IS AIRCRAFT FORWARD

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).



"LIGHTNING ROPE"
6 FEET

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.



G4W13

LANDING CABLE
TENSIONING

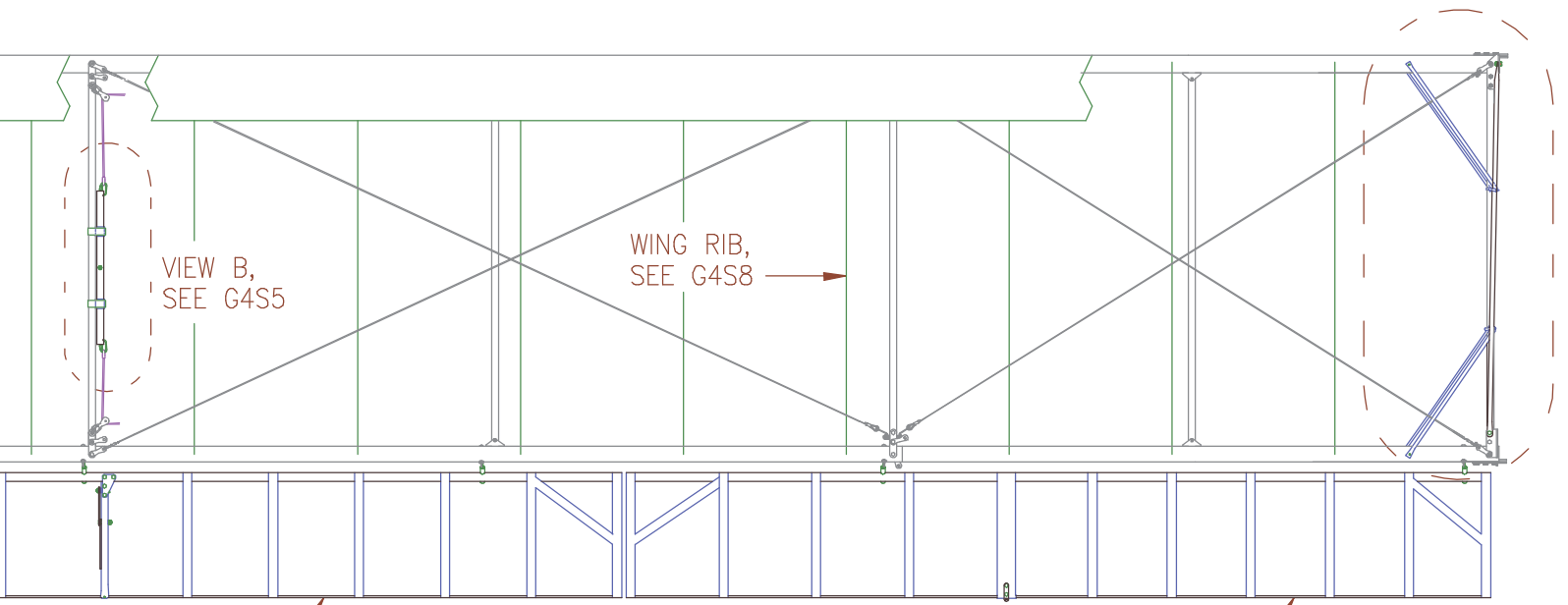
GOAT4
ULTRALIGHT
GLIDER

M. SANDLIN,
JANUARY 22,
2007

LEADING EDGE
CALL, SEE G4S9

LEFT WING VIEWED FROM ABOVE

VIEW C,
SEE G4S7

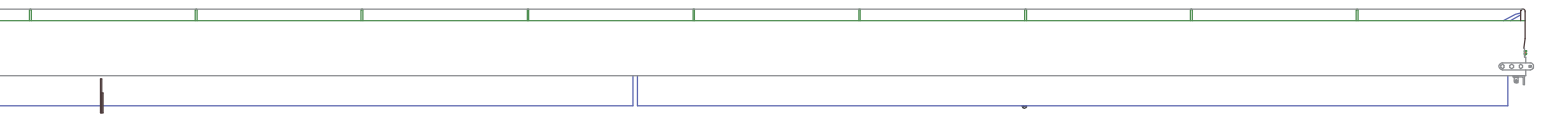


VIEW B,
SEE G4S5

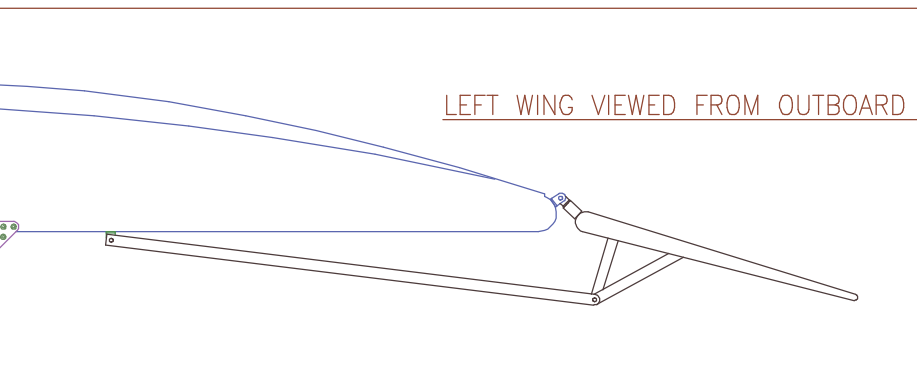
WING RIB,
SEE G4S8

AILERON, SEE G4S3

FLAP PANEL SEE G4S2



RIGHT WING VIEWED FROM AHEAD



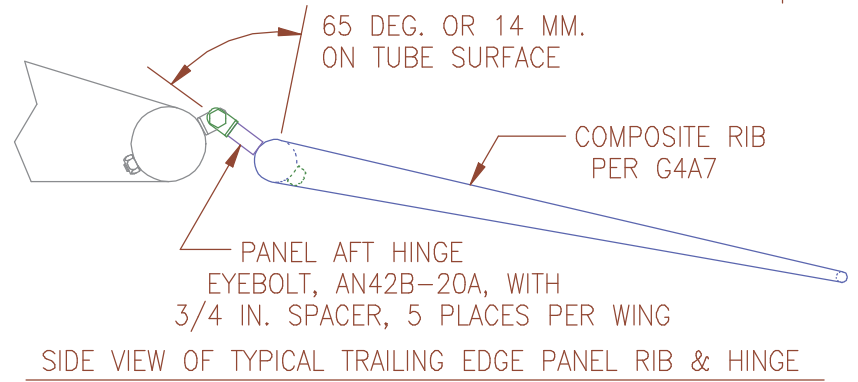
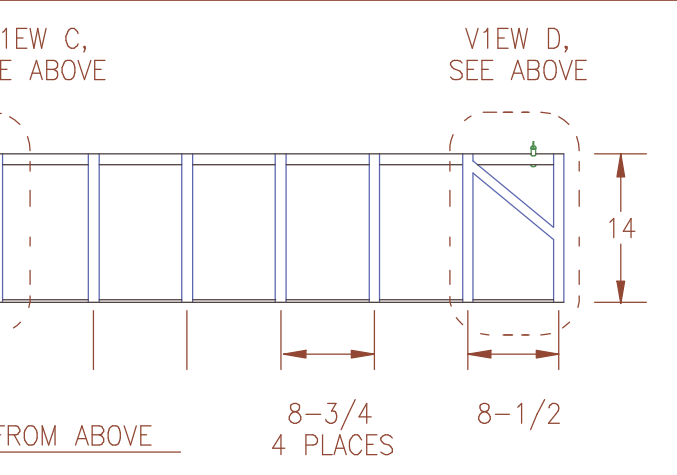
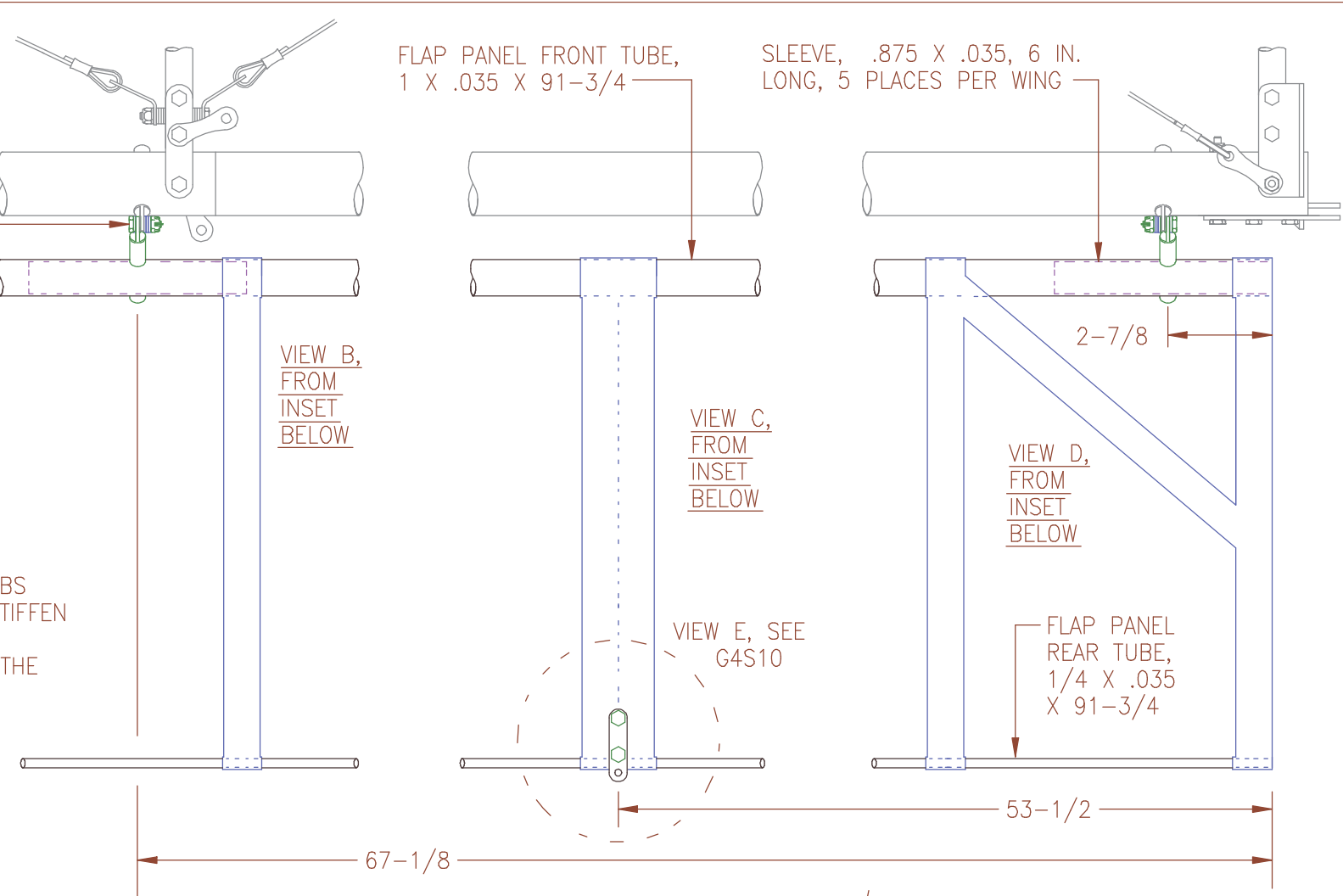
LEFT WING VIEWED FROM OUTBOARD

G4S1

WING SECONDARY STRUCTURE OVERVIEW

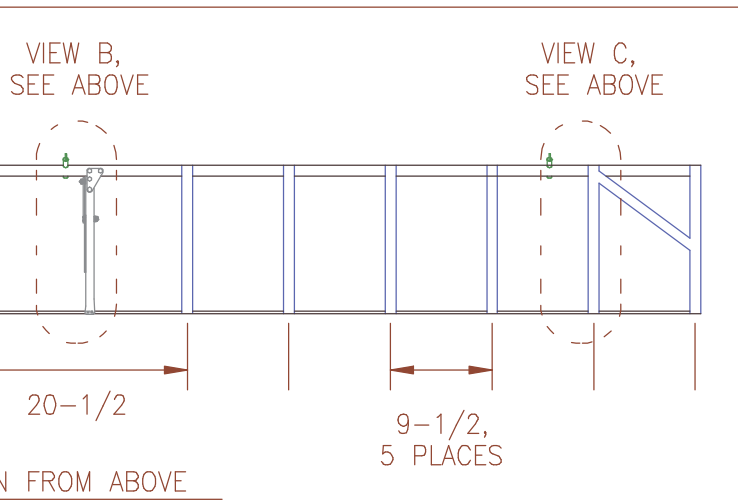
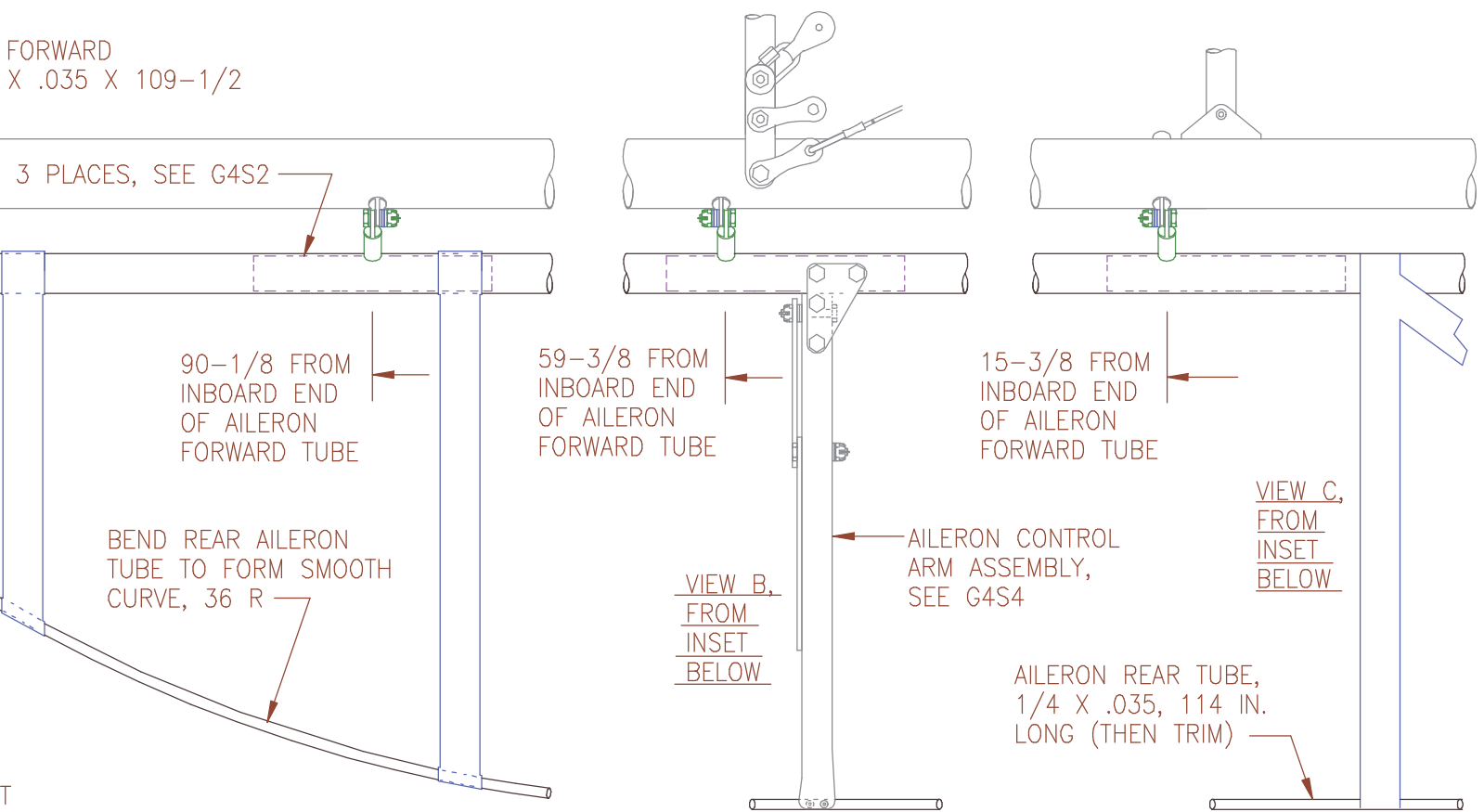
GOAT4
ULTRALIGHT
GLIDER

M. SANDLIN,
JULY 26,
2007

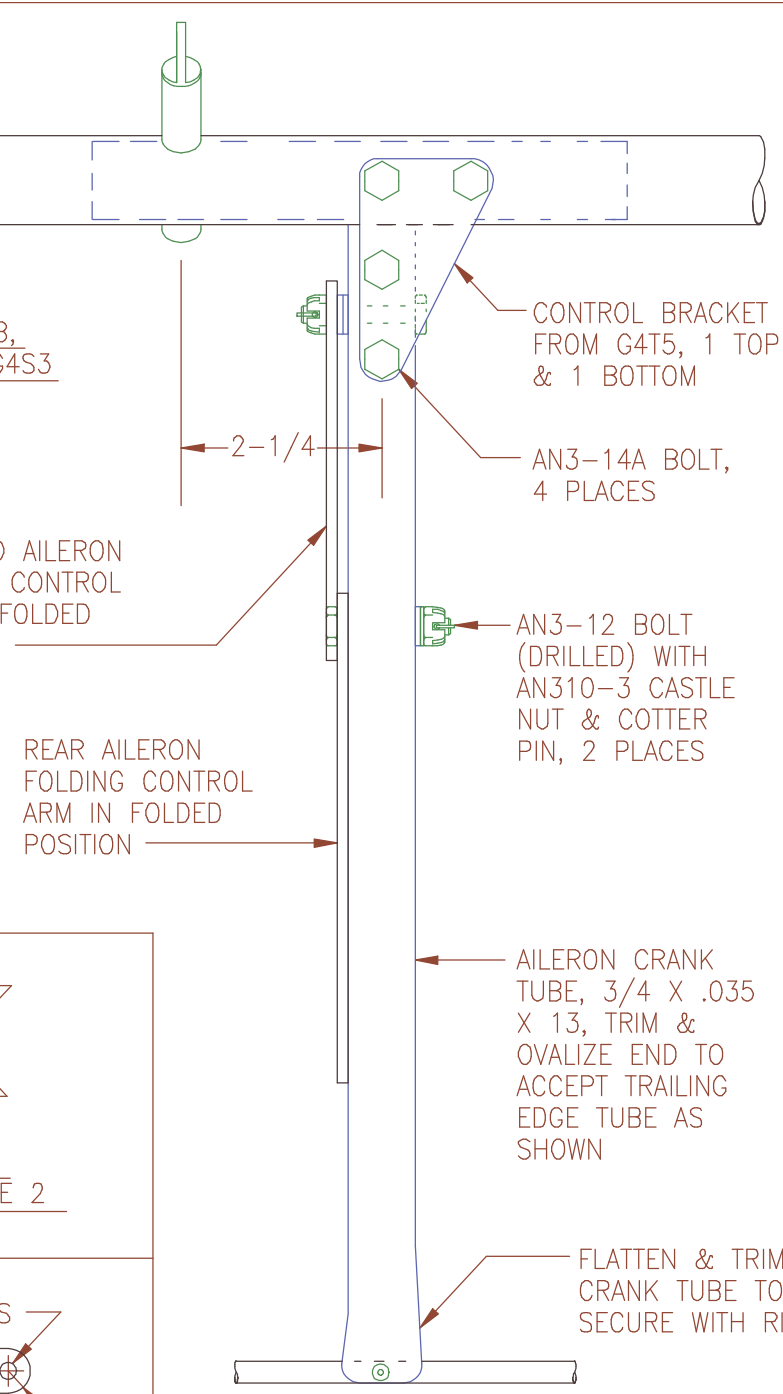


G4S2	FLAP PANEL	GOAT4 ULTRALIGHT GLIDER	M. SANDLIN, JANUARY 22, 2007
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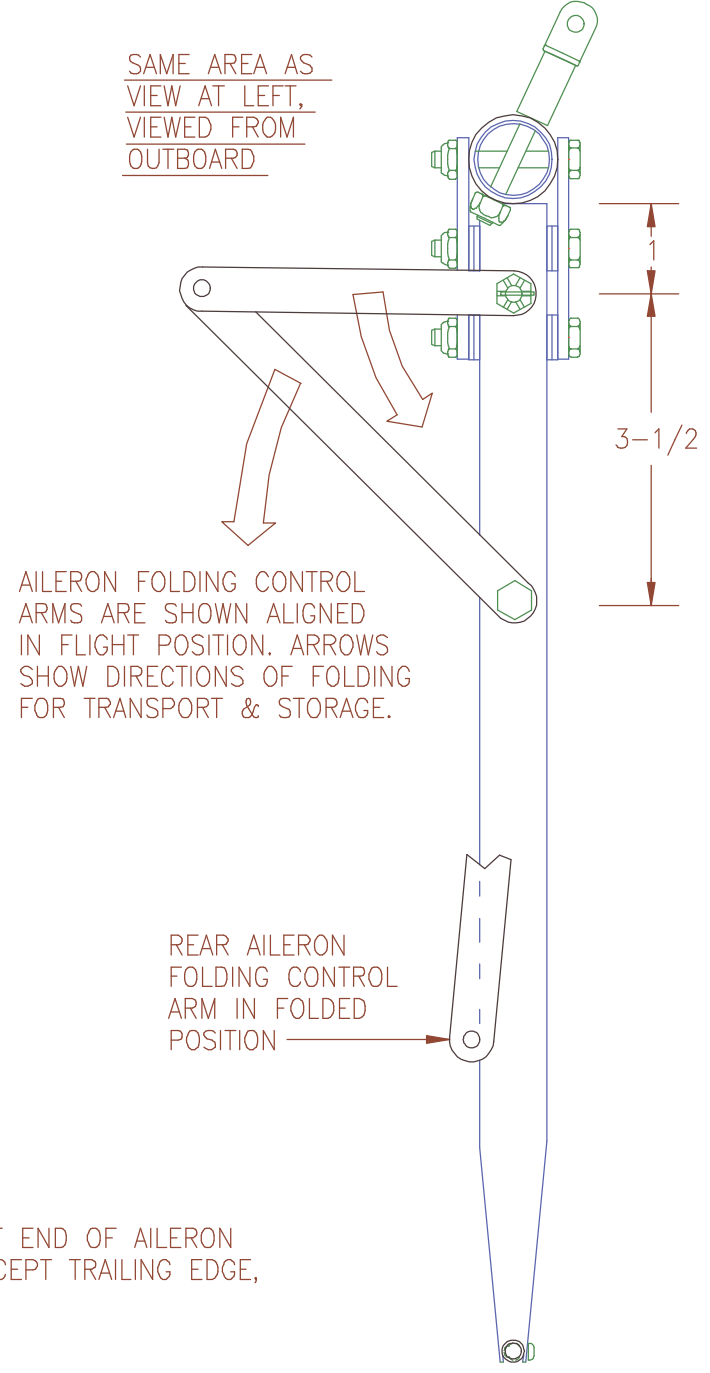
FORWARD
X .035 X 109-1/2



G4S3	AILERON PANEL	GOAT4 ULTRALIGHT GLIDER	M. SANDLIN, JULY 26, 2007
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SAME AREA AS VIEW AT LEFT, VIEWED FROM OUTBOARD



7

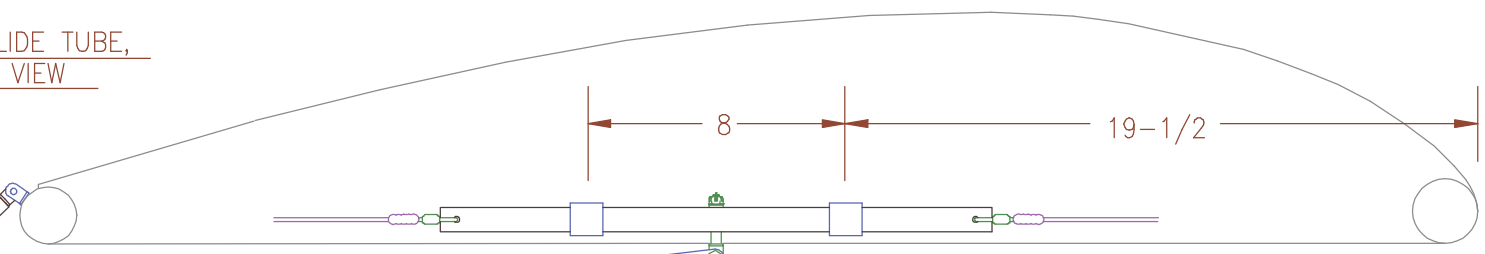
2

2

AKE 2

G4S4	AILERON FOLDING CONTROL ARMS	GOAT4 ULTRALIGHT GLIDER	M. SANDLIN, JANUARY 22, 2007
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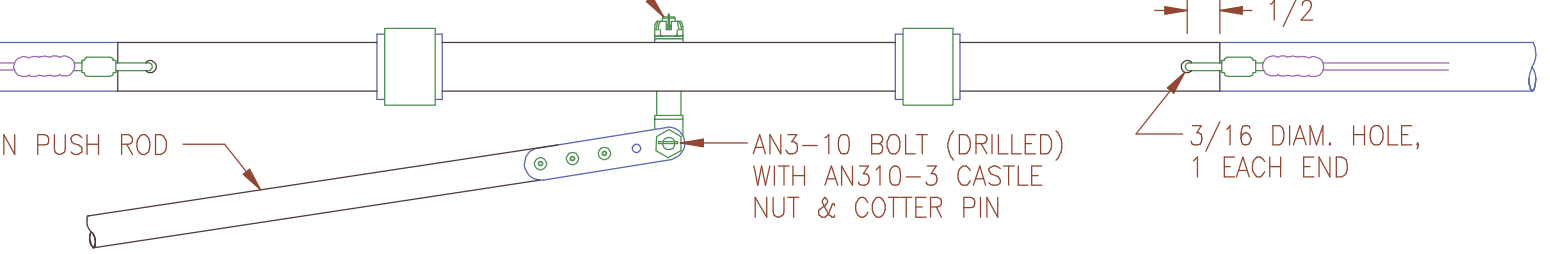
SLIDE TUBE,
VIEW



AILERON SLIDE TUBE IS FREE TO SLIDE FORE & AFT THROUGH PLASTIC BUSHINGS (GUIDES) BONDED ONTO COMPRESSION STRUT

EYEBOLT WITH AN310-3 CASTLE NUT & COTTER PIN ON SLIDE TUBE WITH 3/8 IN. SPACER

SAME AREA AS BELOW, VIEWED FROM INBOARD



AIN PUSH ROD

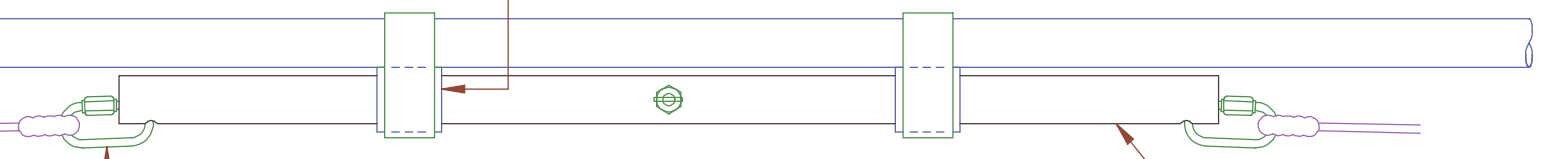
AN3-10 BOLT (DRILLED) WITH AN310-3 CASTLE NUT & COTTER PIN

1/2

3/16 DIAM. HOLE, 1 EACH END

FROM G4S1, ROTATED, RIGHT VIEW IS AIRCRAFT FORWARD

SLIDE ROD GUIDE, P.V.C. SCHD. 40 PLASTIC TUBE, 1 IN. LONG, 2 PLACES PER WING. USE WET LAYUP OF EPOXY RESIN AND FIBERGLASS CLOTH TAPE TO BOND ROD GUIDE TO COMPRESSION STRUT



ATOR
NG
ON

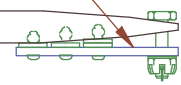
STRUT FITTING, FROM G4T10, ONE PER ROD END, ATTACH WITH 3 RIVETS EACH, USE WASHERS TO ESTABLISH GAP (1/4 IN. ON CONTROL ARM END, ABOUT 1/8 IN. ON EYEBOLT END).

AILERON SLIDE TUBE, 3/4 X .035 X 17 AL. TUBE

AILERON PUSH ROD, VIEWED FROM SIDE

AIN PUSH ROD, 1/2 X .035 AL. TUBE, 24 IN. LONG, FLATTEN ENDS DRILL END HOLES 3/16 DIAM., 23-1/2 HOLE TO HOLE

LEFT AILERON PUSH ROD, VIEWED FROM ABOVE



3/16 X 1-1/4, 1 PER AILERON, SEE G4A4, G4A5

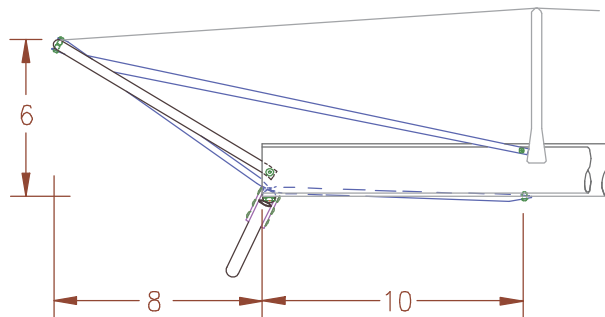
G4S5

AILERON
PUSH ROD

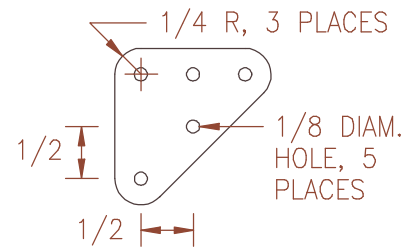
GOAT4
ULTRALIGHT
GLIDER

M. SANDLIN,
JANUARY 23,
2007

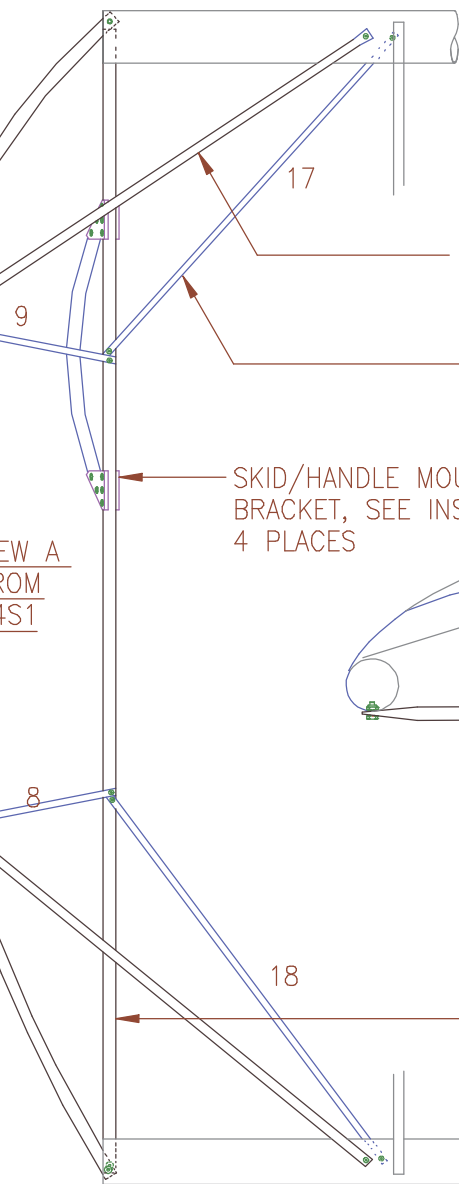
ABOUT 51 IN. LONG,
 ATTACH TO MAIN FRAME
 AT EACH END



SAME AREA AS VIEW BELOW,
 SEEN FROM BEHIND



SKID/HANDLE MOUNTING
 BRACKET, 1-1/2 X 1-1/2 X
 1/8 ALUM. BAR, MAKE 8

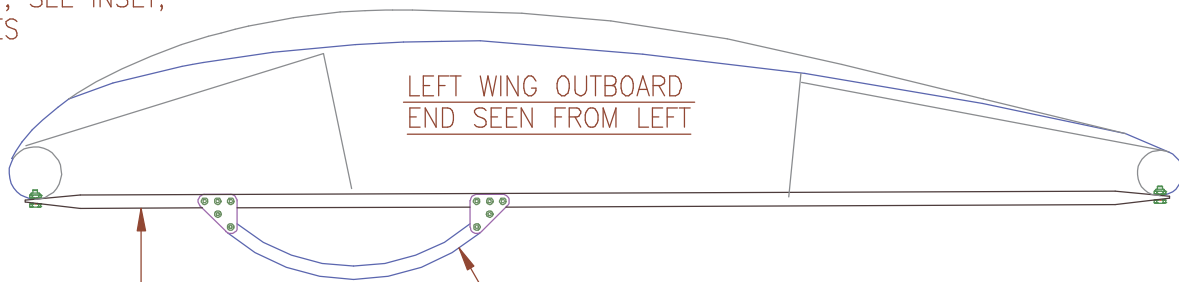


TIP RIB UPPER BRACE, 3/8 X .035 X 20, FLATTEN ENDS &
 SECURE TO OTHER TUBES WITH END RIVETS, 2 PLACES

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 A
 FROM
 FIG 1



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

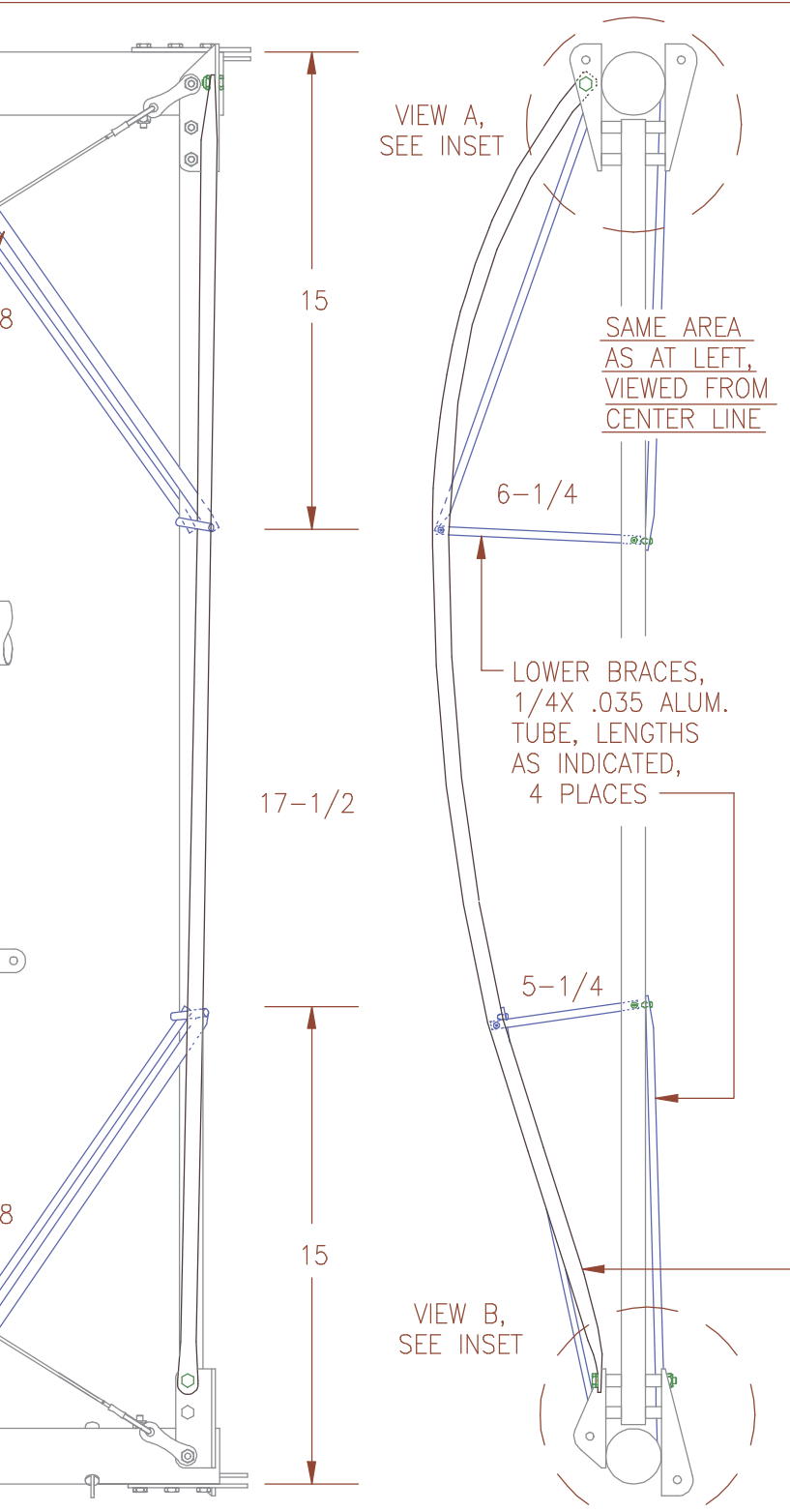
LOWER TIP RIB, 1/2 X .035,
 44 IN. LONG, FLATTEN ENDS &
 SECURE TO MAIN FRAME TUBES
 WITH AN3-4 BOLTS WITH BOLT
 HEADS DOWN TO SERVE AS
 WING TIP CORNER CLEATS

G4S6

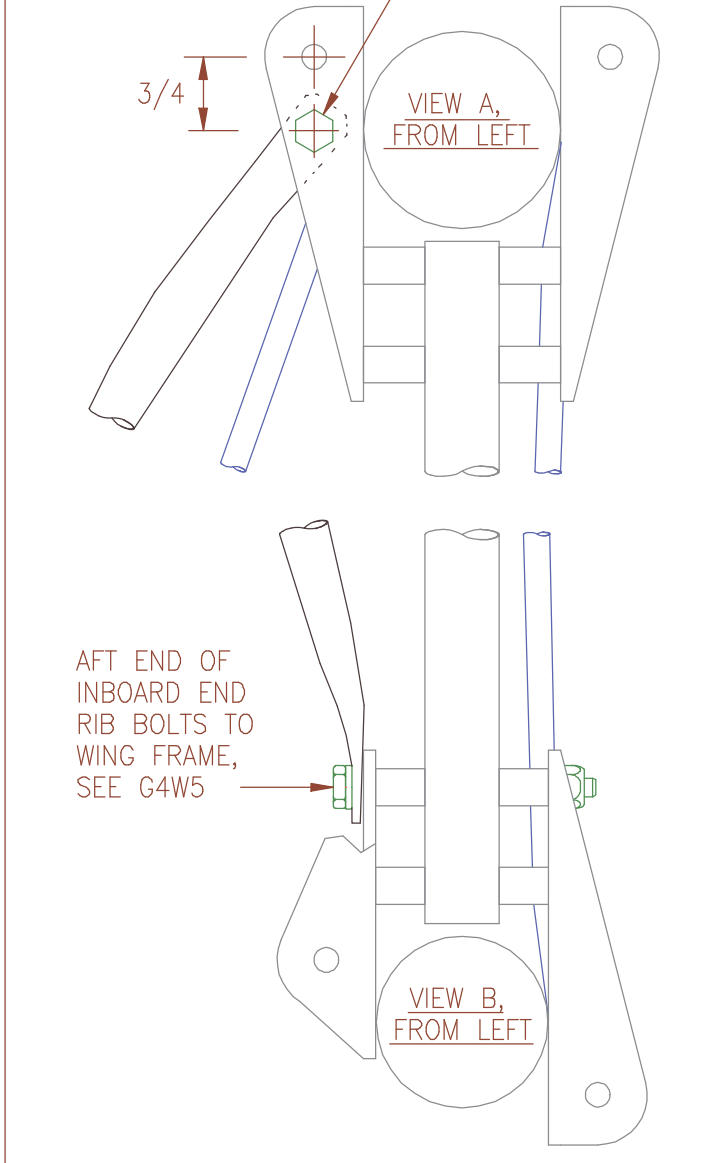
WING OUTBOARD
 END STRUCTURE

GOAT4
 ULTRALIGHT
 GLIDER

M. SANDLIN,
 JANUARY 16,
 2007

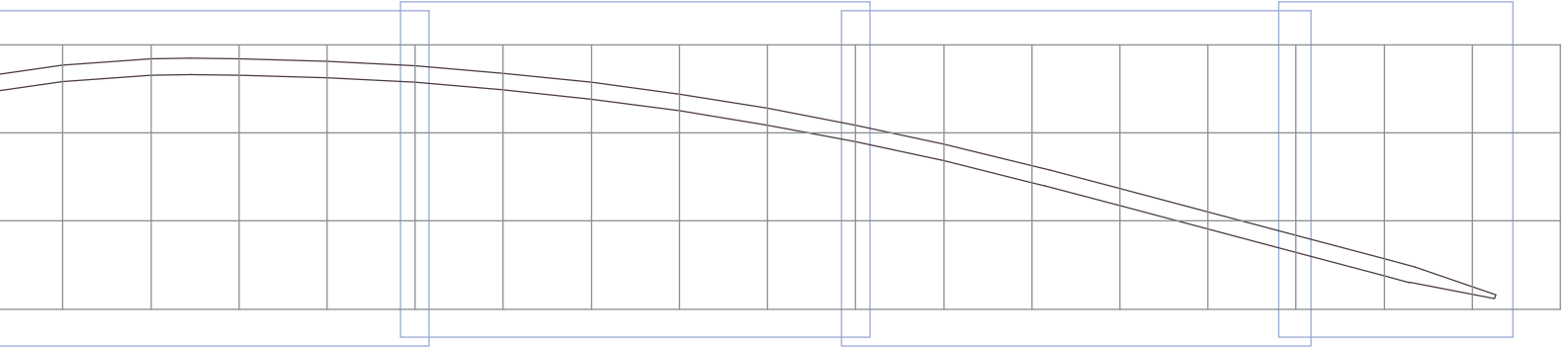


DRILL 3/16 DIAM. HOLE FOR AN3-4 BOLT

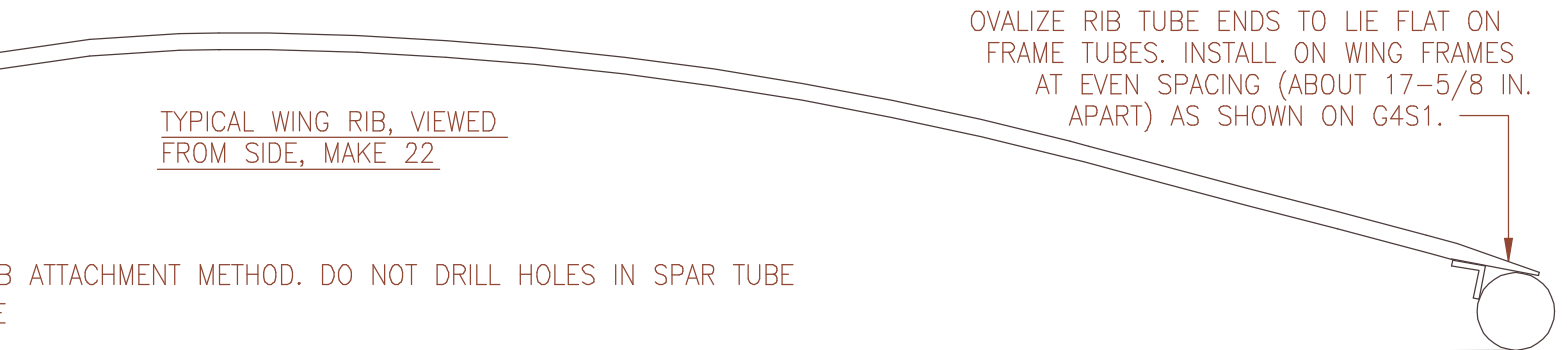


INBOARD END RIB, 1/2 X .028 X 47 ALUM. TUBE, BEND TO SAME CURVE AS TYPICAL RIB (SEE G4S8). OVALIZE & TRIM ENDS FOR ATTACHMENT.

<h1>G4S7</h1>	
<h2>WING INBOARD END STRUCTURE</h2>	
GOAT4 ULTRALIGHT GLIDER	M. SANDLIN, JANUARY 22, 2007



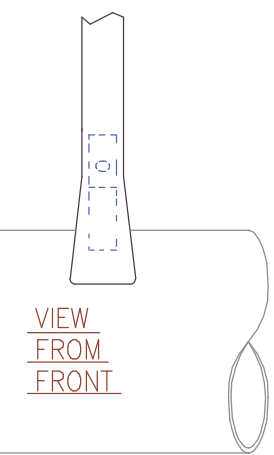
CUT IN 5 SHEETS OF LETTER SIZE PAPER AT FULL SCALE. SHEETS ARE COMBINED INTO A SINGLE FULL SIZE PATTERN TO THIS PATTERN AS THEY ARE FORMED BY HAND BENDING OR USE OF A VICE OR MANDREL.



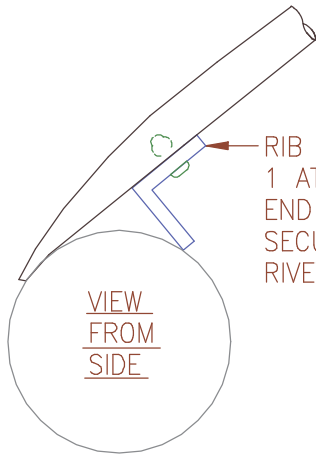
TYPICAL WING RIB, VIEWED FROM SIDE, MAKE 22

OVALIZE 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 G4S1.

ATTACHMENT METHOD. DO NOT DRILL HOLES IN SPAR TUBE

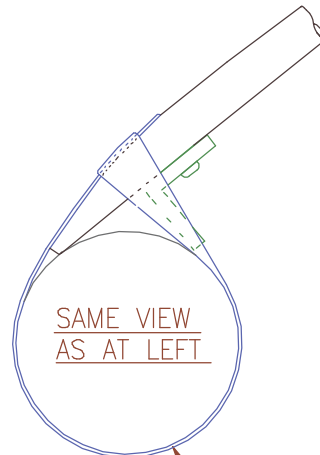


VIEW FROM FRONT



VIEW FROM SIDE

RIB STOP, 1 AT EACH END OF RIB, SECURE WITH RIVET



SAME VIEW AS AT LEFT

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 LAYER OF EPOXY, 44 PLACES.

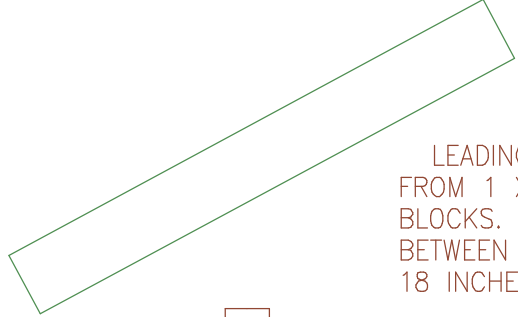
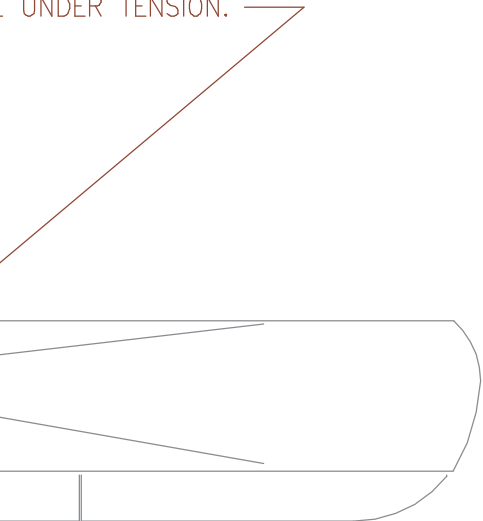
G4S8

WING RIBS

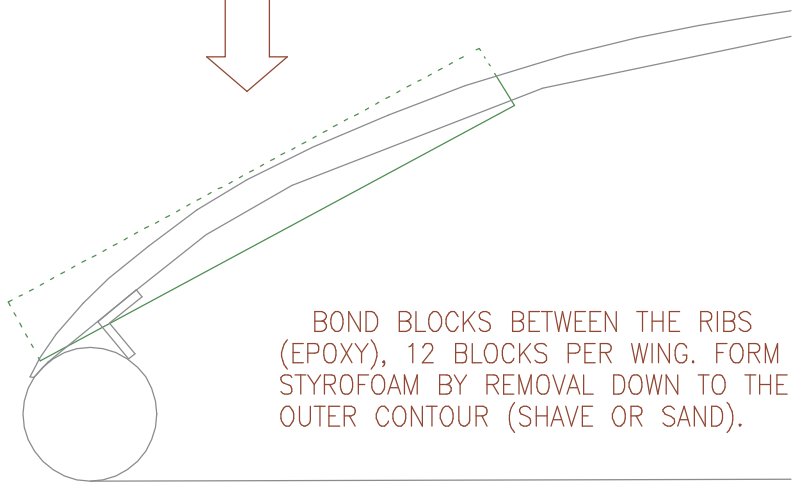
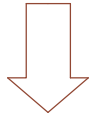
GOAT4
ULTRALIGHT
GLIDER

M. SANDLIN,
JANUARY 14,
2007

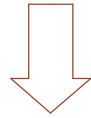
...BLES FIRST, THEN RIG THE
 ...SHOULD BE JUST AS
 ...BLES, OR MORE SO, WHEN
 ...ED ON THE GROUND. THIS
 ...ME INCREASE IN SWEEP
 ...N THE WING IS LIFTED AND
 ... UNDER TENSION.



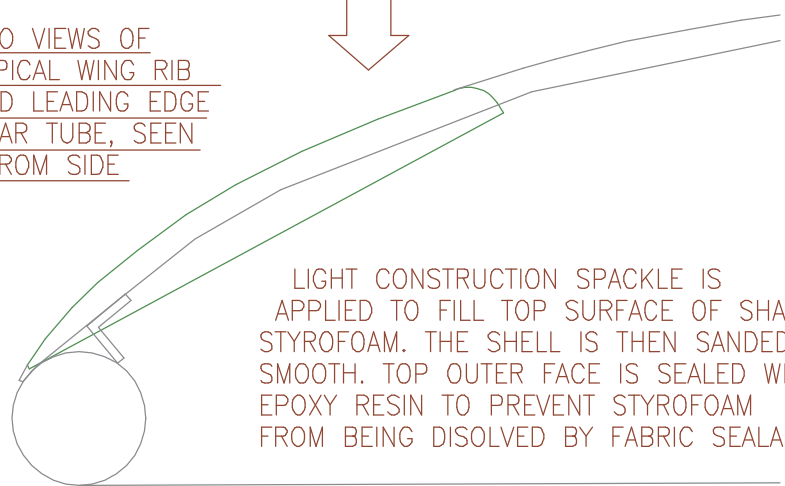
LEADING EDGE SHELL IS MADE FROM 1 X 8 INCH STYROFOAM BLOCKS. CUT LENGTH TO FIT BETWEEN RIBS, ABOUT 18 INCHES LONG.



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



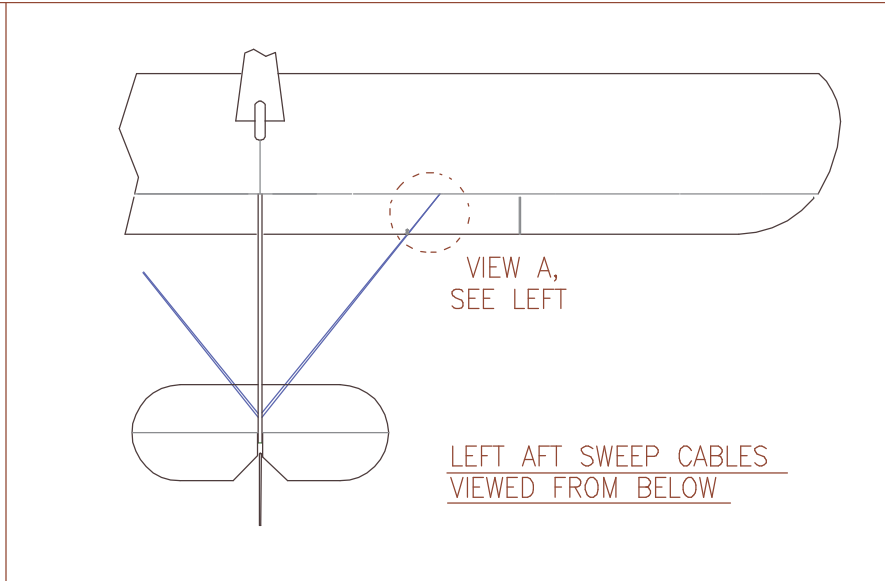
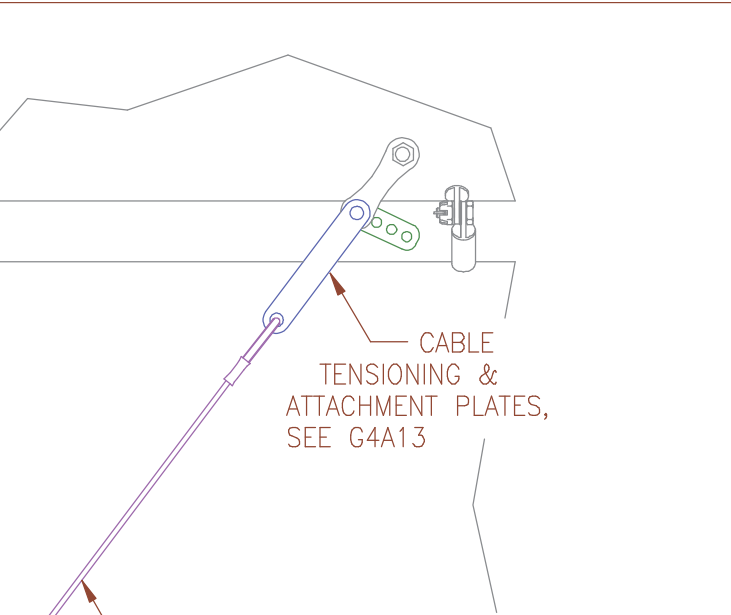
TWO VIEWS OF TYPICAL WING RIB AND LEADING EDGE SPAR TUBE, SEEN FROM SIDE



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.

LOW

G4S9	LEADING EDGE SHELL	GOAT4 ULTRALIGHT GLIDER	M. SANDLIN, MARCH 22, 2007
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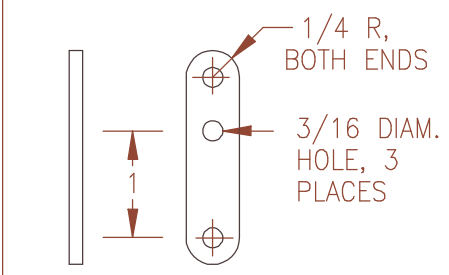


LEFT AFT SWEEP CABLES
VIEWED FROM BELOW

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 G4A5).

THE SWEEP CABLE ATTACHMENT STATION THE FLAP PANEL RIB IS 1/2" WIDE & HAS AN EXTRA LAYER OF FIBERGLASS TAPE

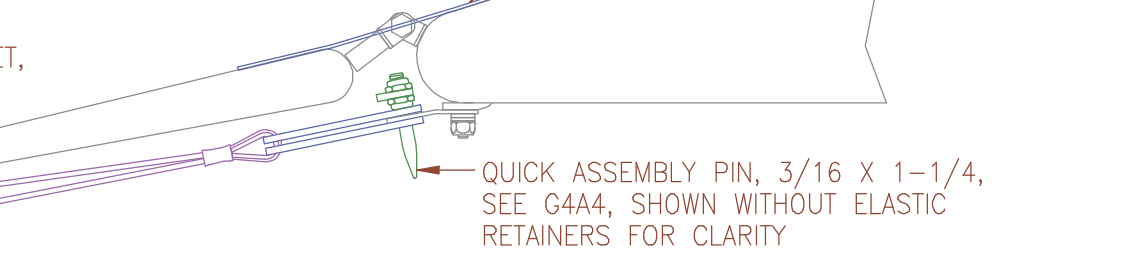
1/4" BOLT WITH 3/4" DIAM. WASHER, 2 PLACES



FLAP PANEL FLANGE,
1/2 X 1/8 ALUM. BAR,
2 IN. LONG, MAKE 2

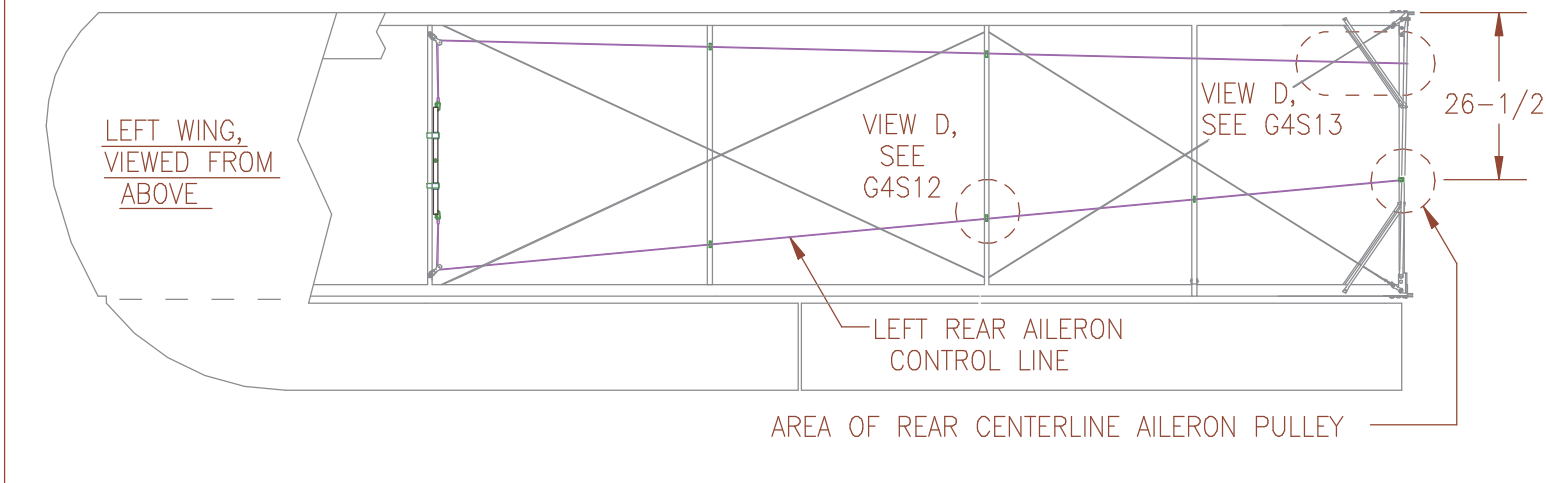
FABRIC GAP COVER, 6 IN. WIDE. APPLY FULL SPAN, PASSES THROUGH HINGE AXIS SO FABRIC TENSION DOES NOT CHANGE WHEN PANEL ROTATES, (THICKNESS EXAGGERATED), SEE G4S14

SAME AREA AS ABOVE,
SEEN FROM INBOARD

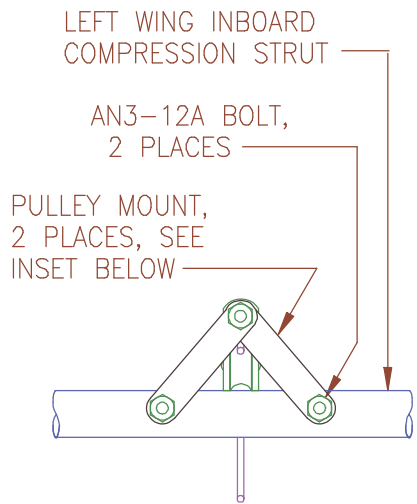


FLAP PANEL IS LOCKED IN FLIGHT POSITION BY A 1/8" QUICKLINK WHICH IS CLOSED OVER THE TWO AFT SWEEP CABLES DURING ASSEMBLY. THE QUICKLINK STAYS ON THE PANEL DURING TRANSPORT & STORAGE.

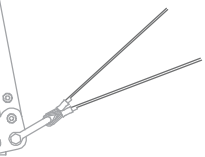
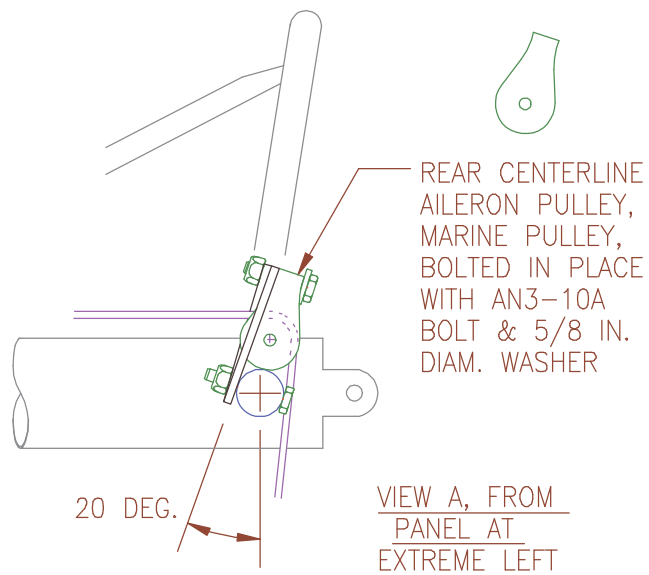
<h1>G4S10</h1>	
<h2>AFT SWEEP CABLE CONNECTION</h2>	
GOAT4 ULTRALIGHT GLIDER	M. SANDLIN, MAY 22, 2009



LEFT REAR AILERON CONTROL LINE

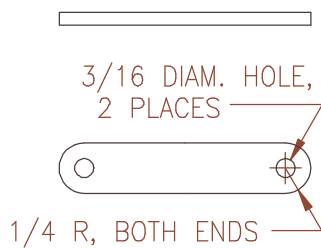


SAME AREA AS AT RIGHT, VIEWED FROM OUTBOARD



CENTERLINE AREA VIEWED FROM REAR

PULLEY MOUNT, 1/2 X 1/8 ALUM. BAR, 2-1/2 IN. LONG, MAKE 4



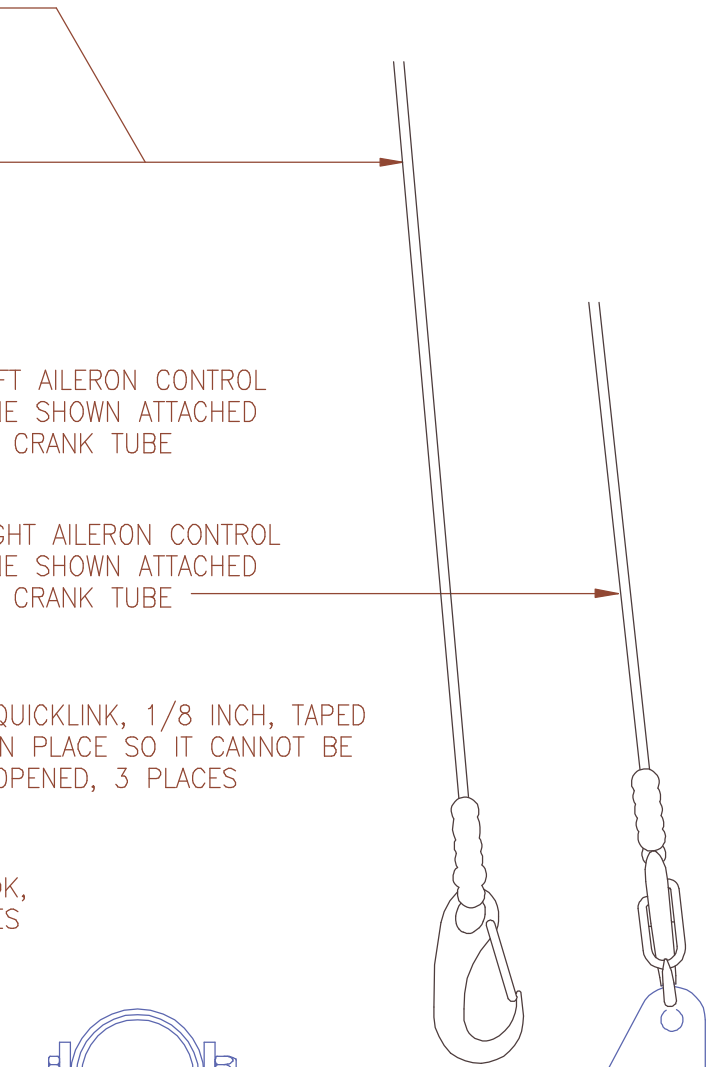
G4S11

AILERON CONTROL LINE ROUTING 1

GOAT4
ULTRALIGHT
GLIDER

M. SANDLIN,
JANUARY 23,
2007

IF THE AILERON CONTROL LINES COMING DOWN FROM THE CRANK TUBE HAVE REVERSED FASTENER PARITY (THE LEFT END WITH A HOOK, THE RIGHT END WITH A QUICKLINK) TO NOT BE CROSSED OVER WHEN THE GLIDER IS

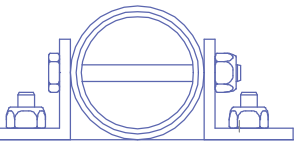


LEFT AILERON CONTROL LINE SHOWN ATTACHED TO LEFT CRANK TUBE

RIGHT AILERON CONTROL LINE SHOWN ATTACHED TO RIGHT CRANK TUBE

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

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

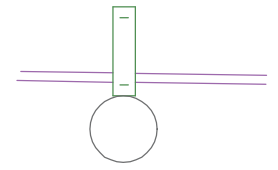
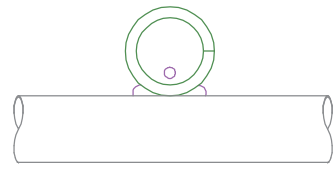


VIEW B, FROM G4S11

AILERON CRANK TUBE (PART OF NOSE SECTION)

SAME AREA AS BELOW, SEEN FROM OUTBOARD

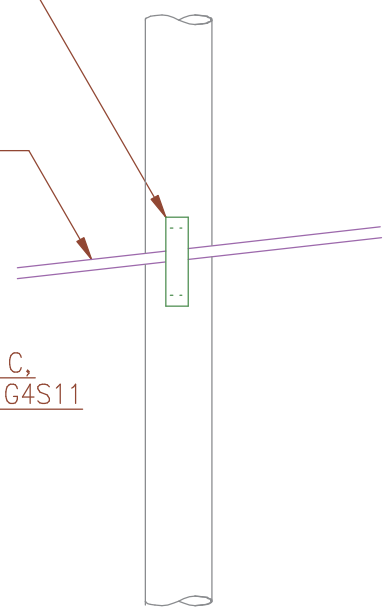
SAME AREA AS BELOW, SEEN FROM AHEAD



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

VIEW C, FROM G4S11

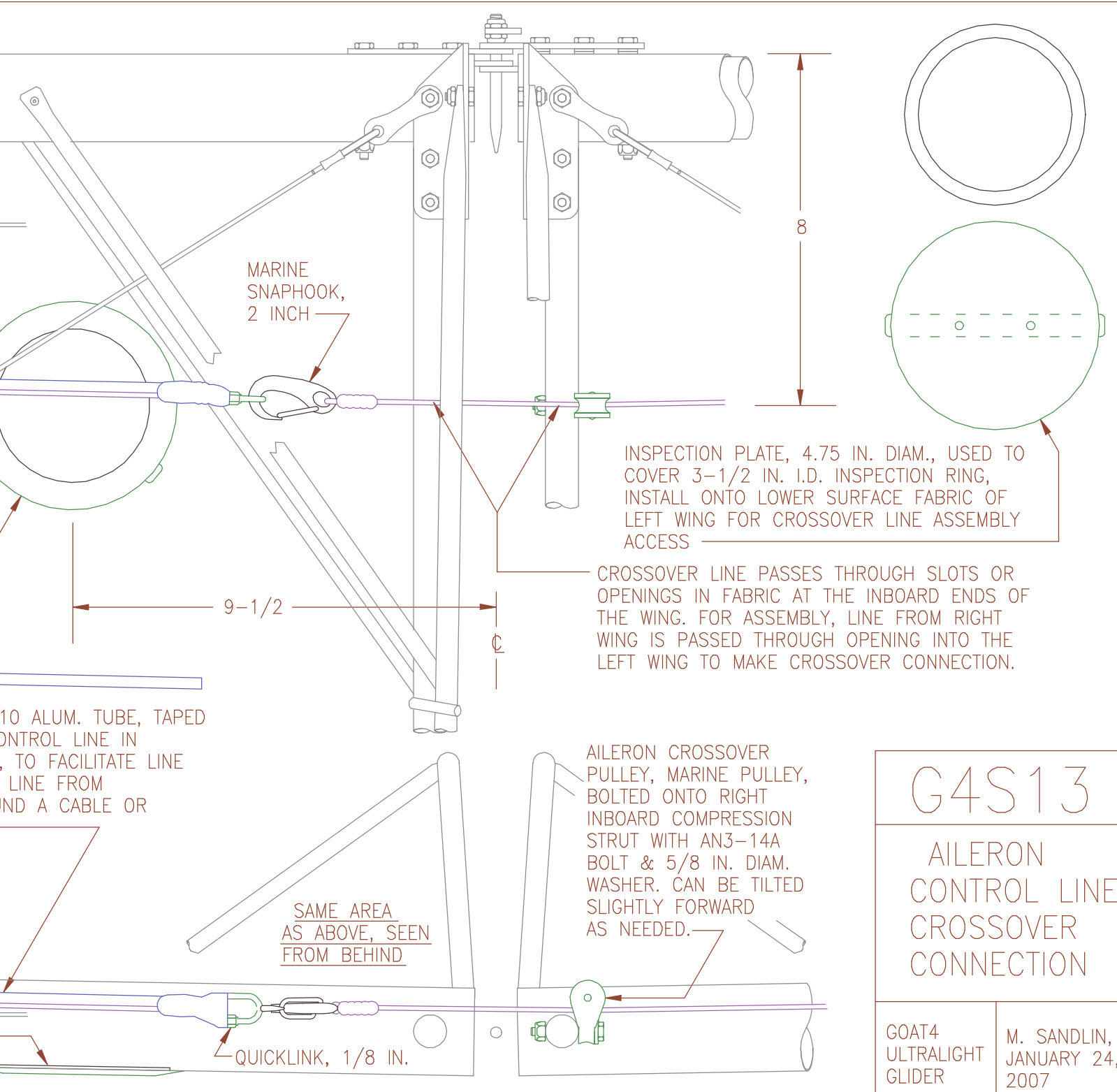


G4S12

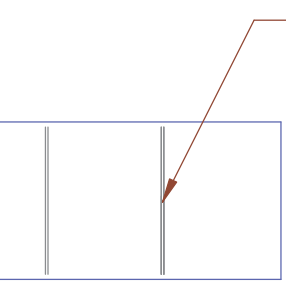
AILERON CONTROL LINE ROUTING 2

GOAT4
ULTRALIGHT
GLIDER

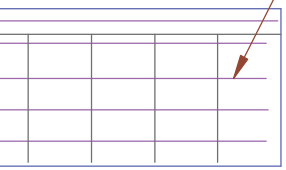
M. SANDLIN,
JANUARY 23,
2007



G4S13	
AILERON CONTROL LINE CROSSOVER CONNECTION	
GOAT4 ULTRALIGHT GLIDER	M. SANDLIN, JANUARY 24, 2007



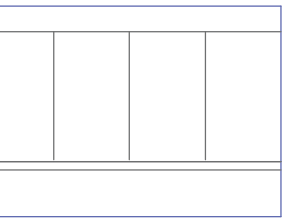
COVER COMPRESSION STRUTS WITH SPIRAL WRAP OF FABRIC TAPE, THEN COVER BOTTOM SURFACE WITH ONE LONG PANEL OF FABRIC. USE HAND STICHING TO ATTACH FABRIC TO STRUT WRAPPING, 4 STRUTS PER WING. APPLY TAPE OVER STICHING. REENFORCE & SLOT FABRIC WHERE CABLES, LINES, OR CONTROL RODS PASS THROUGH. LARGE HOLES MAY BE LEFT IN THE INBOARD END PANELS (IF ANY) FOR INSPECTION, LINE STOWAGE, PASS-THROUGH, ETC.



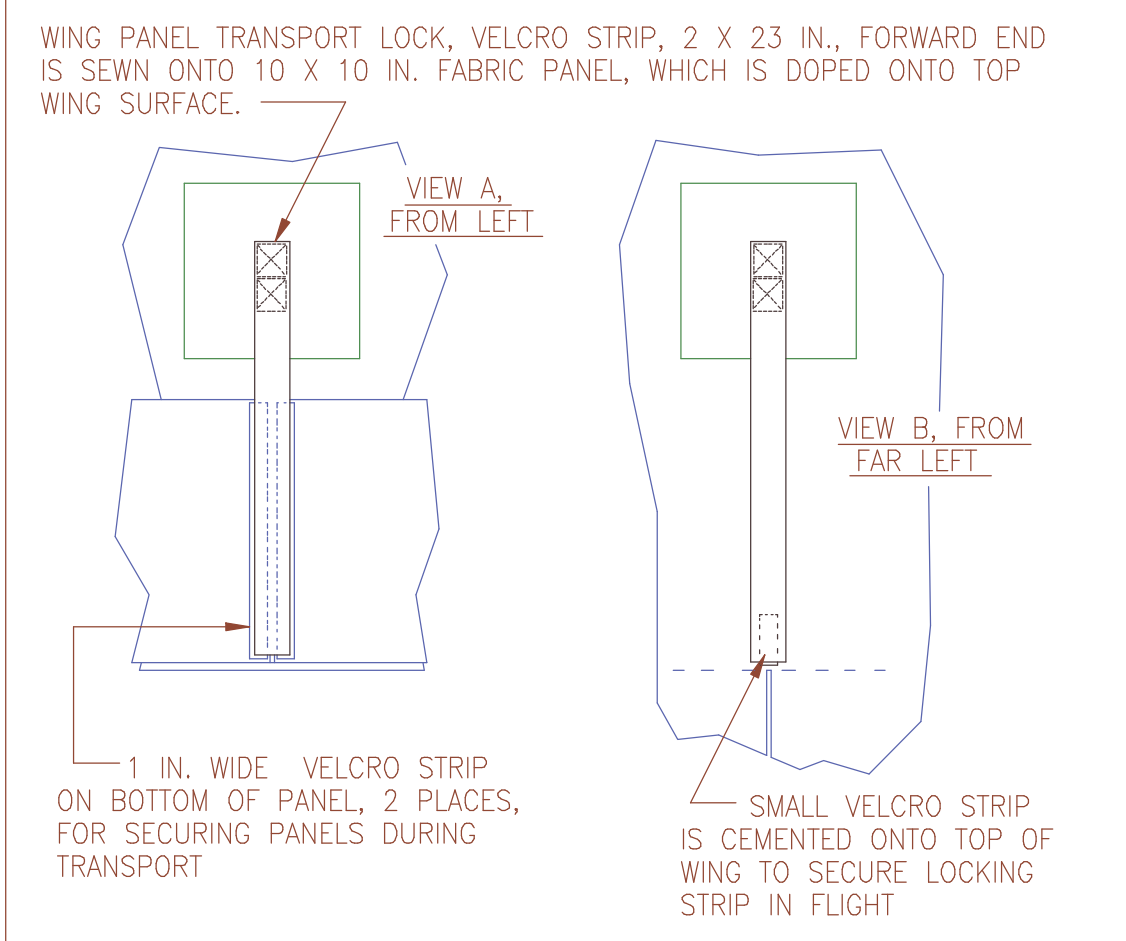
COVER TOP SURFACE WITH ONE LONG PANEL OF FABRIC. LEAVE 1 OR 2 INCHES OF CHORDWISE SLACK WHEN CEMENTING PANEL AT EDGES, RESULTING IN FULL SPAN WRINKLES AS SHOWN. THEN, HEAT SHRINK FABRIC TO REMOVE WRINKLES, RESULTING IN HIGH SPANWISE FABRIC TENSION WITH MINIMAL CHORDWISE TENSION, SO FINISHED CONTOUR CONFORMS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



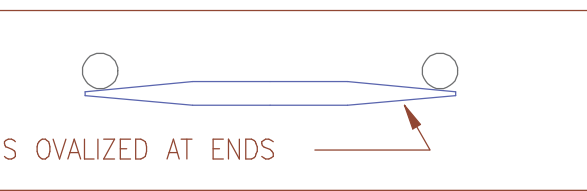
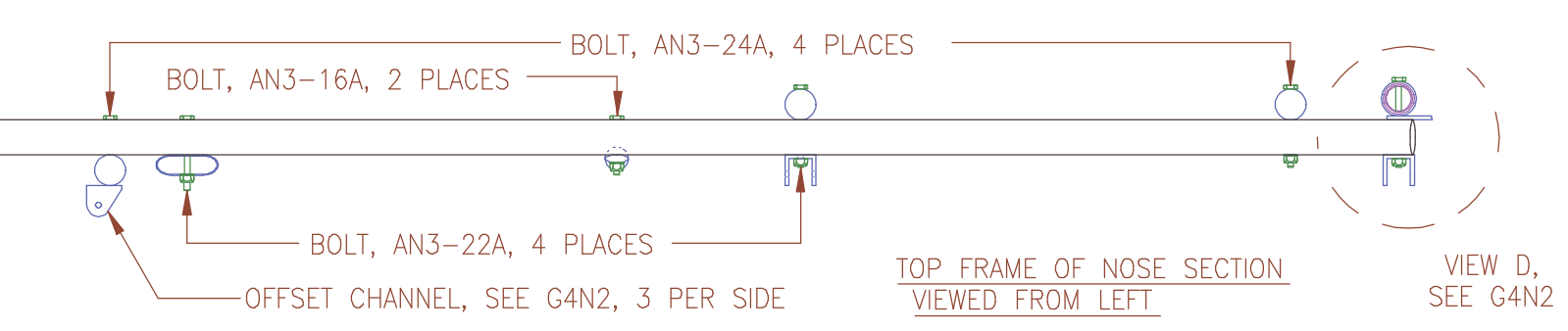
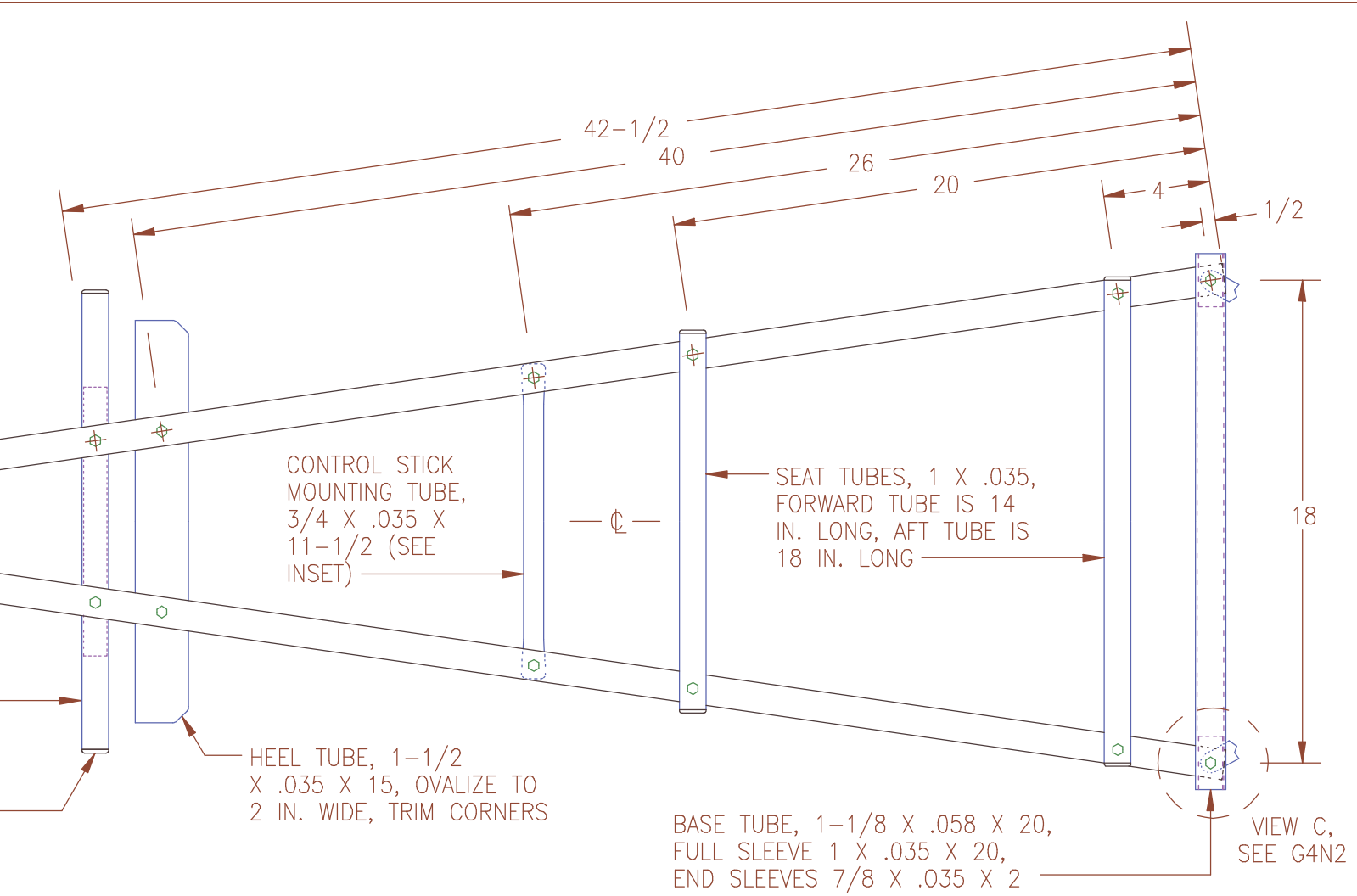
PANELS IN FOLDED POSITION



END SIDE OF LEFT WING



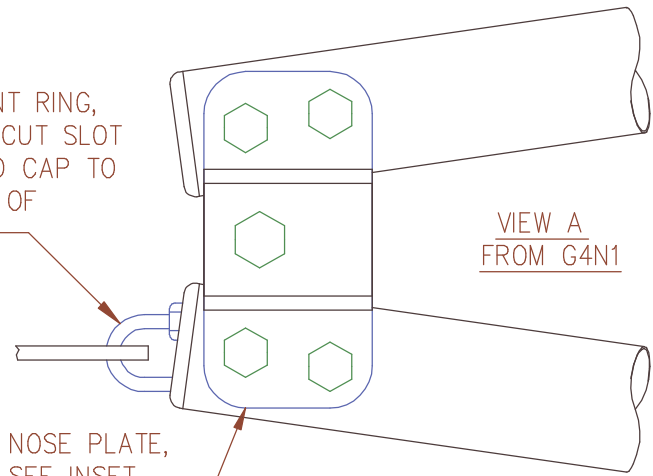
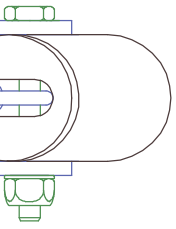
G4S14	WING FABRIC COVERING	GOAT4 ULTRALIGHT GLIDER	M. SANDLIN, JANUARY 24, 2007
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G4N1	NOSE SECTION TOP FRAME	GOAT4 ULTRALIGHT GLIDER	M. SANDLIN, JANUARY 28, 2007
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TOW LINE ATTACHMENT RING, USE 1/8 QUICKLINK. CUT SLOT IN PLASTIC TUBE END CAP TO ALLOW PROTRUSION OF QUICKLINK END.

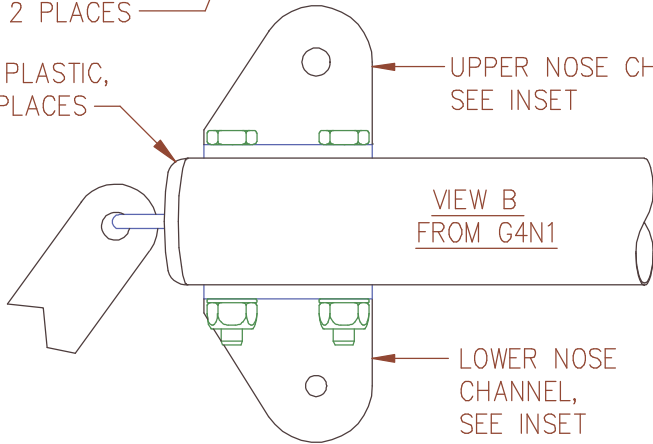
AWAY VIEW OF EA AT RIGHT



VIEW A FROM G4N1

NOSE PLATE, SEE INSET, 2 PLACES

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



VIEW B FROM G4N1

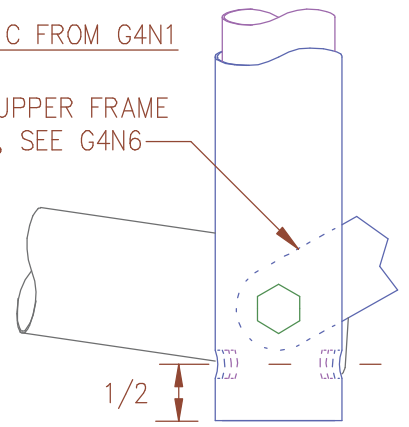
UPPER NOSE CHANNEL, SEE INSET

LOWER NOSE CHANNEL, SEE INSET

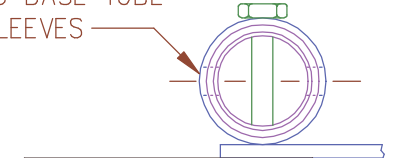
- BOLT, AN4-20A

VIEW C FROM G4N1

AFT UPPER FRAME TUBE, SEE G4N6



1/4 DIAM. HOLE THRU BASE TUBE & SLEEVES



VIEW D FROM G4N1

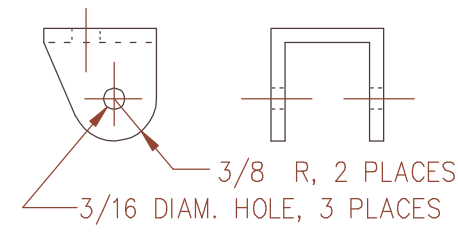
BOLT, AN3-26A, 1 EACH SIDE

R,
CES

AM.

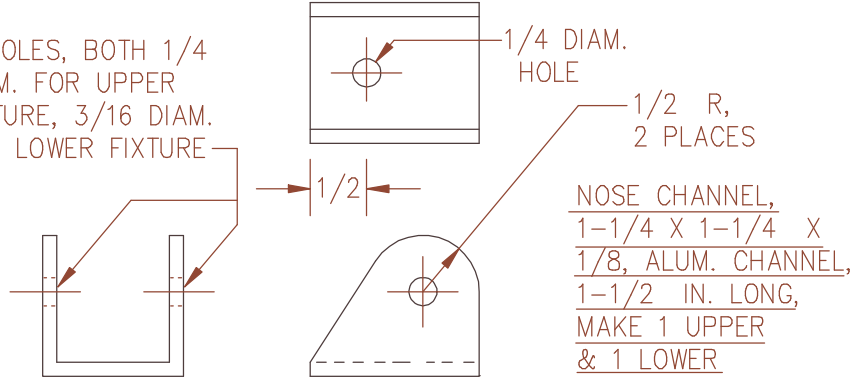
DIAM.

CES



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

2 HOLES, BOTH 1/4 DIAM. FOR UPPER FIXTURE, 3/16 DIAM. FOR LOWER FIXTURE



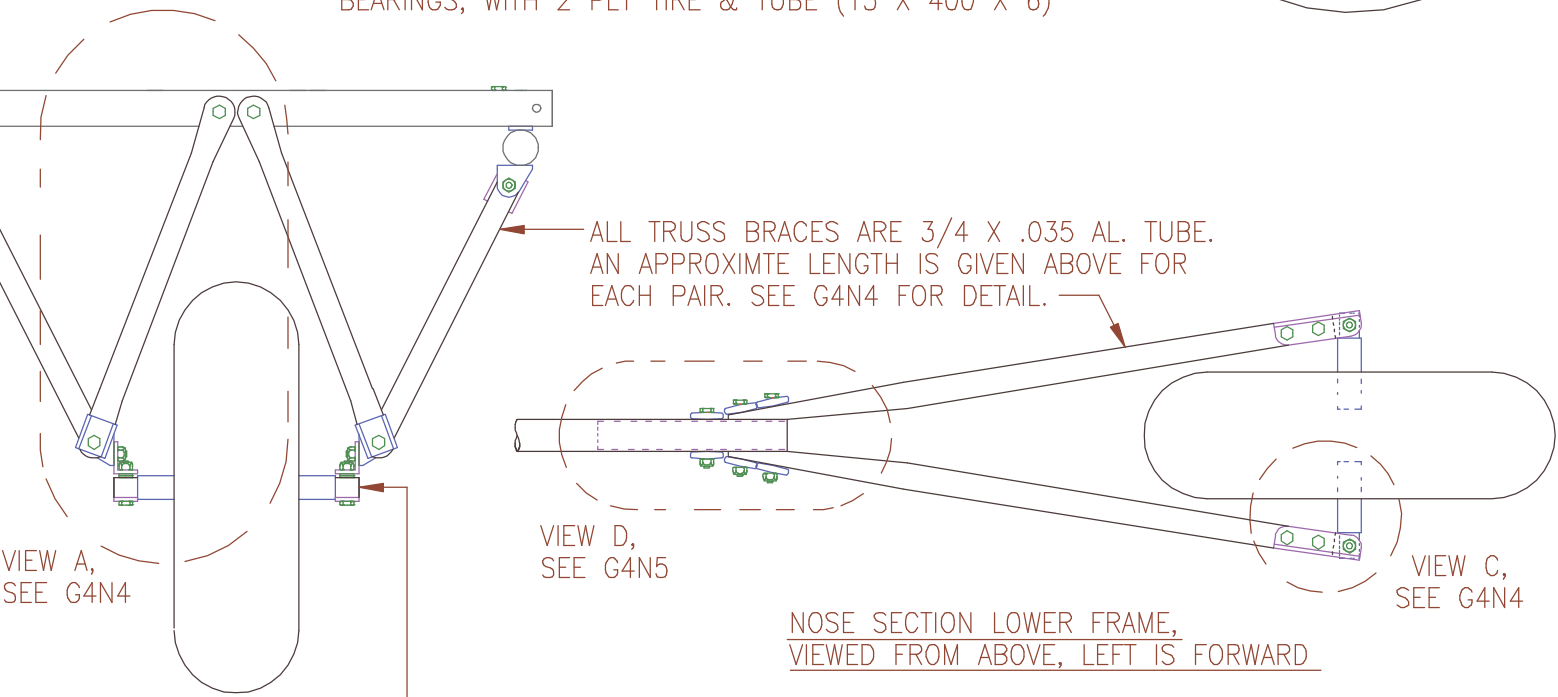
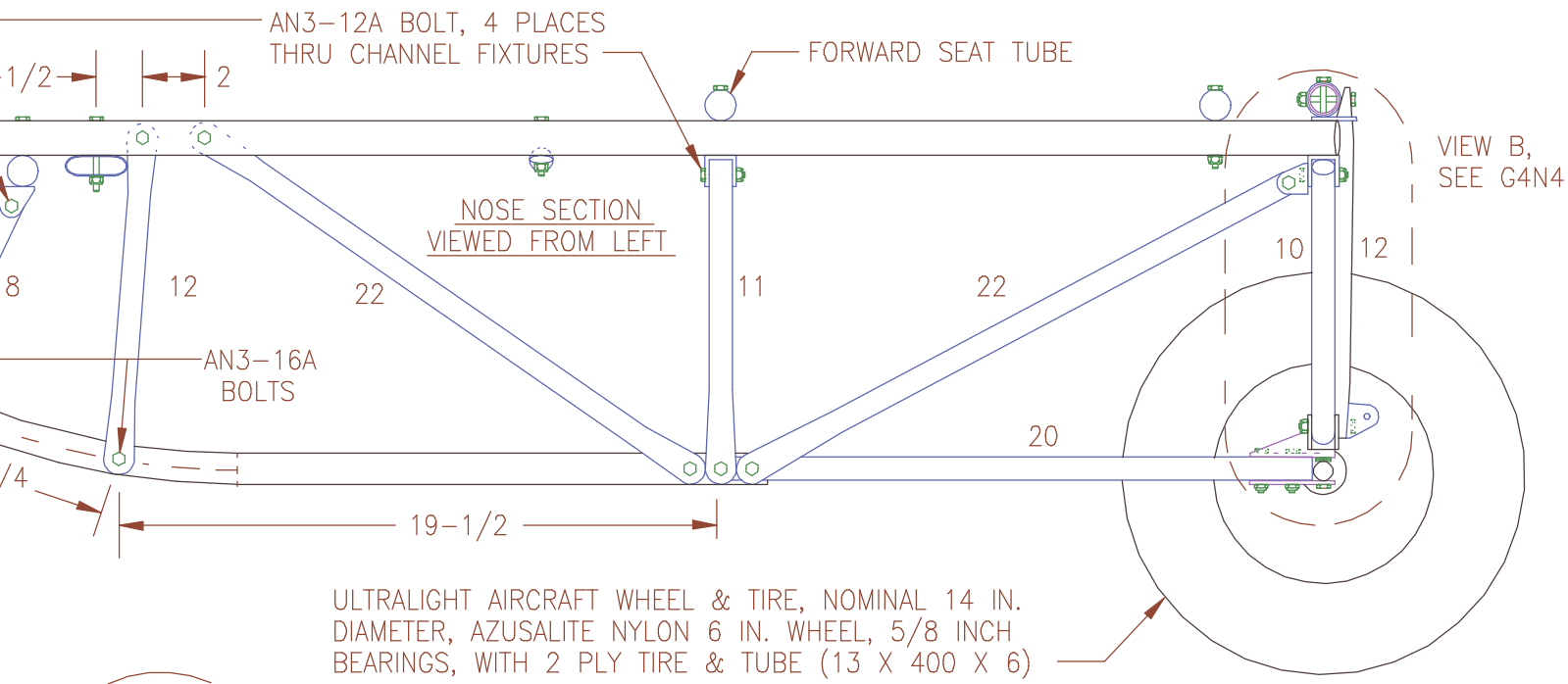
NOSE CHANNEL, 1-1/4 X 1-1/4 X 1/8, ALUM. CHANNEL, 1-1/2 IN. LONG, MAKE 1 UPPER & 1 LOWER

G4N2

NOSE SECTION DETAIL

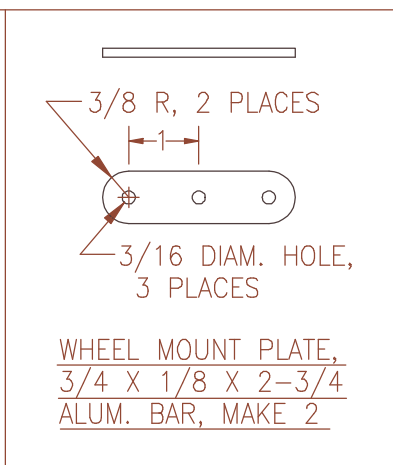
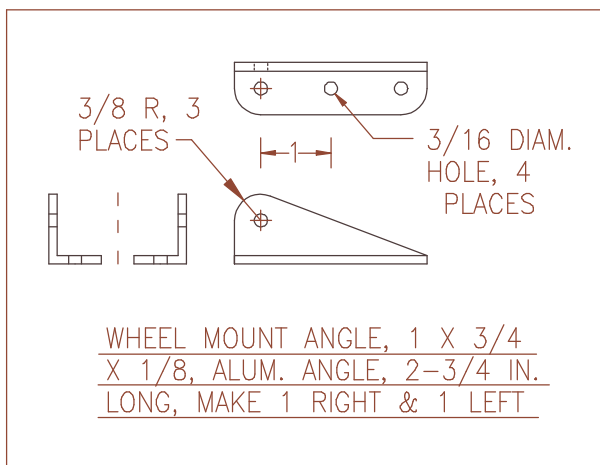
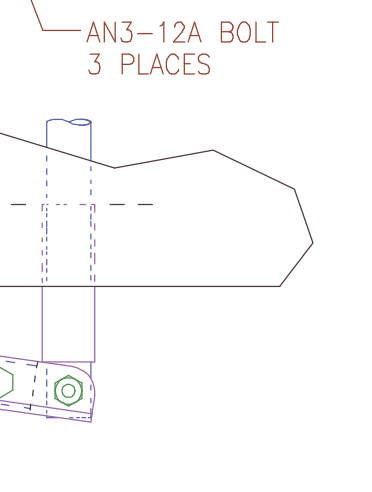
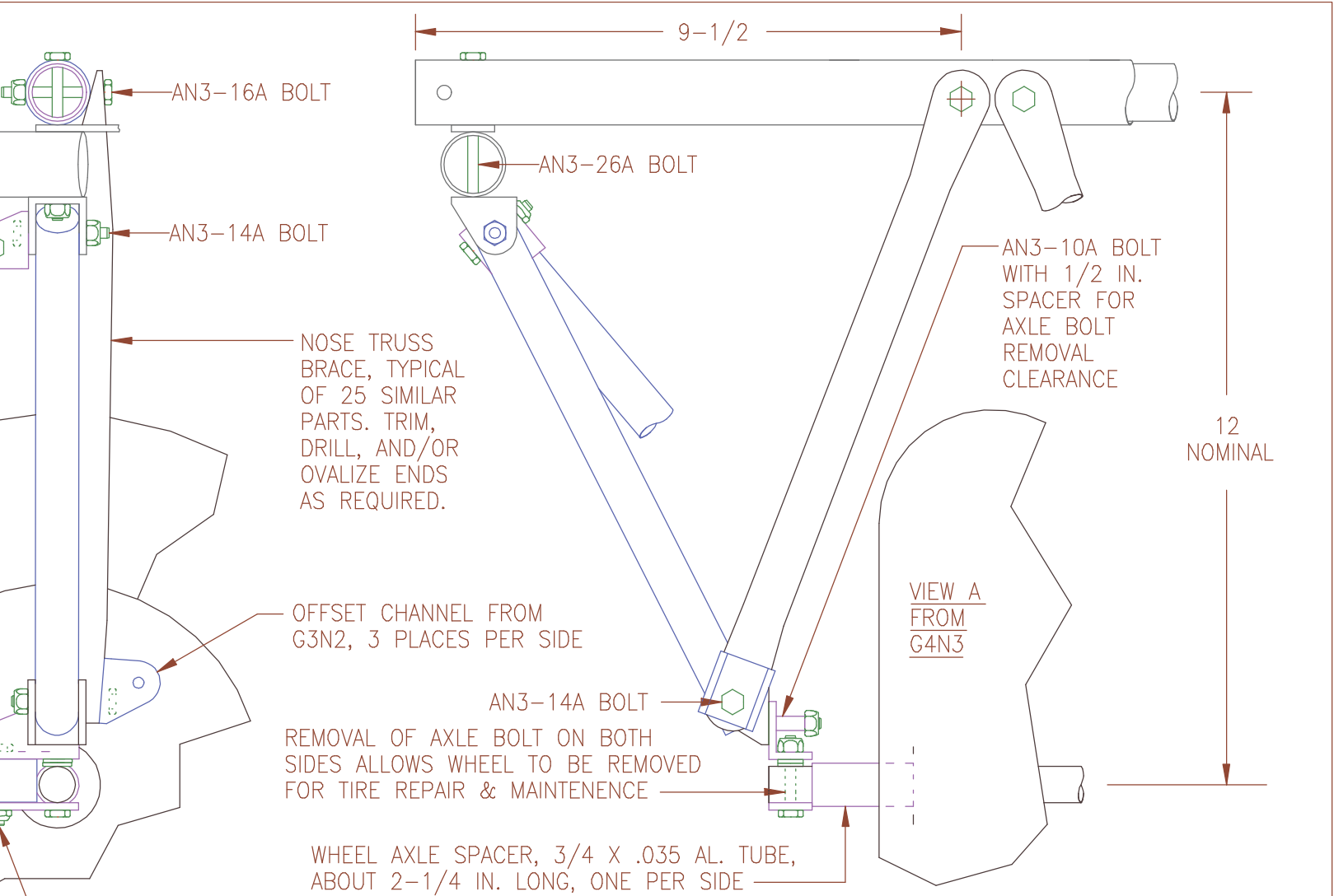
GOAT4 ULTRALIGHT GLIDER

M. SANDLIN, JANUARY 28, 2007

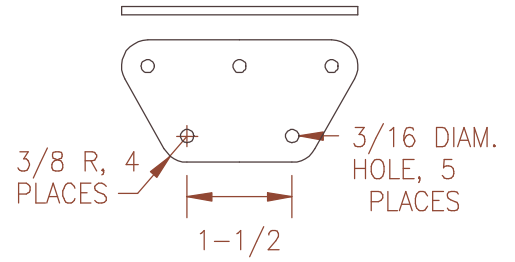
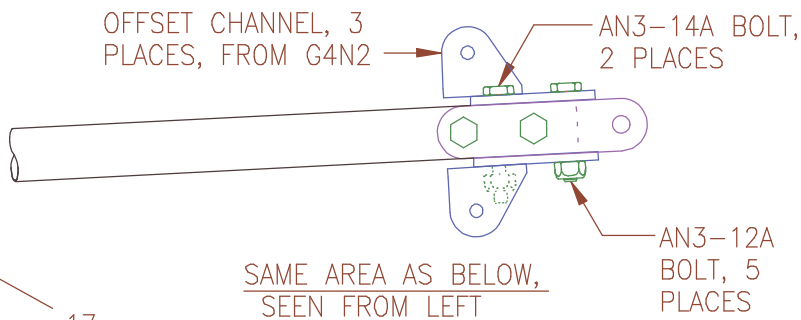


WHEEL AXLE, 5/8 DIAM. ALUM.
 SHOCK ROD, 7-3/4 IN. LONG

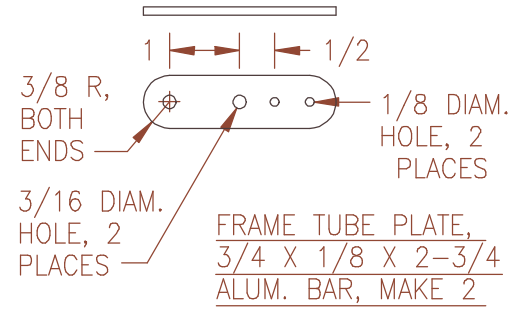
G4N3	FORWARD NOSE STRUCTURE	GOAT4 ULTRALIGHT GLIDER	M. SANDLIN, JANUARY 29, 2007
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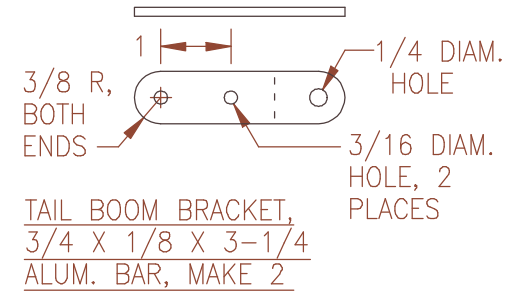
G4N4
WHEEL MOUNT
GOAT4 ULTRALIGHT GLIDER
M. SANDLIN, JANUARY 29, 2007



AFT NOSE PLATE,
1-3/4 X 1/8 ALUM. BAR,
3-3/8 IN. LONG, MAKE 2



FRAME TUBE PLATE,
3/4 X 1/8 X 2-3/4
ALUM. BAR, MAKE 2



TAIL BOOM BRACKET,
3/4 X 1/8 X 3-1/4
ALUM. BAR, MAKE 2

BOLT
, 2 PLACES

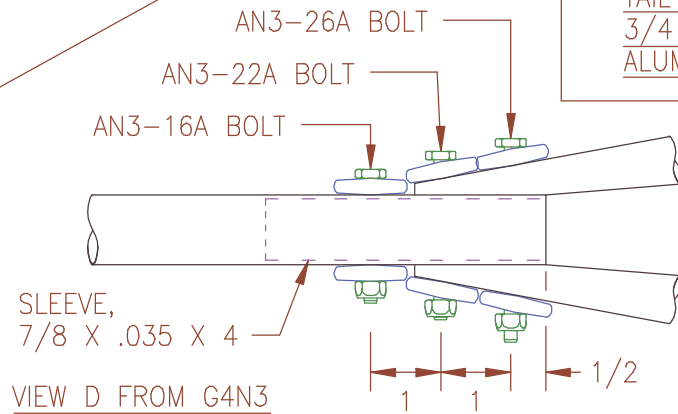
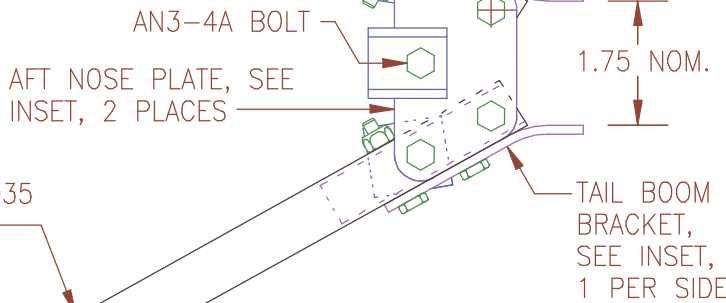
S BELOW,
LEFT

ME TUBE, 3/4 X .035
G4N2

OSE FRAME,
ABOVE

FRAME TUBE PLATE,
SEE INSET, INSERT
INTO OVALIZED END
OF AFT UPPER
FRAME TUBE

17

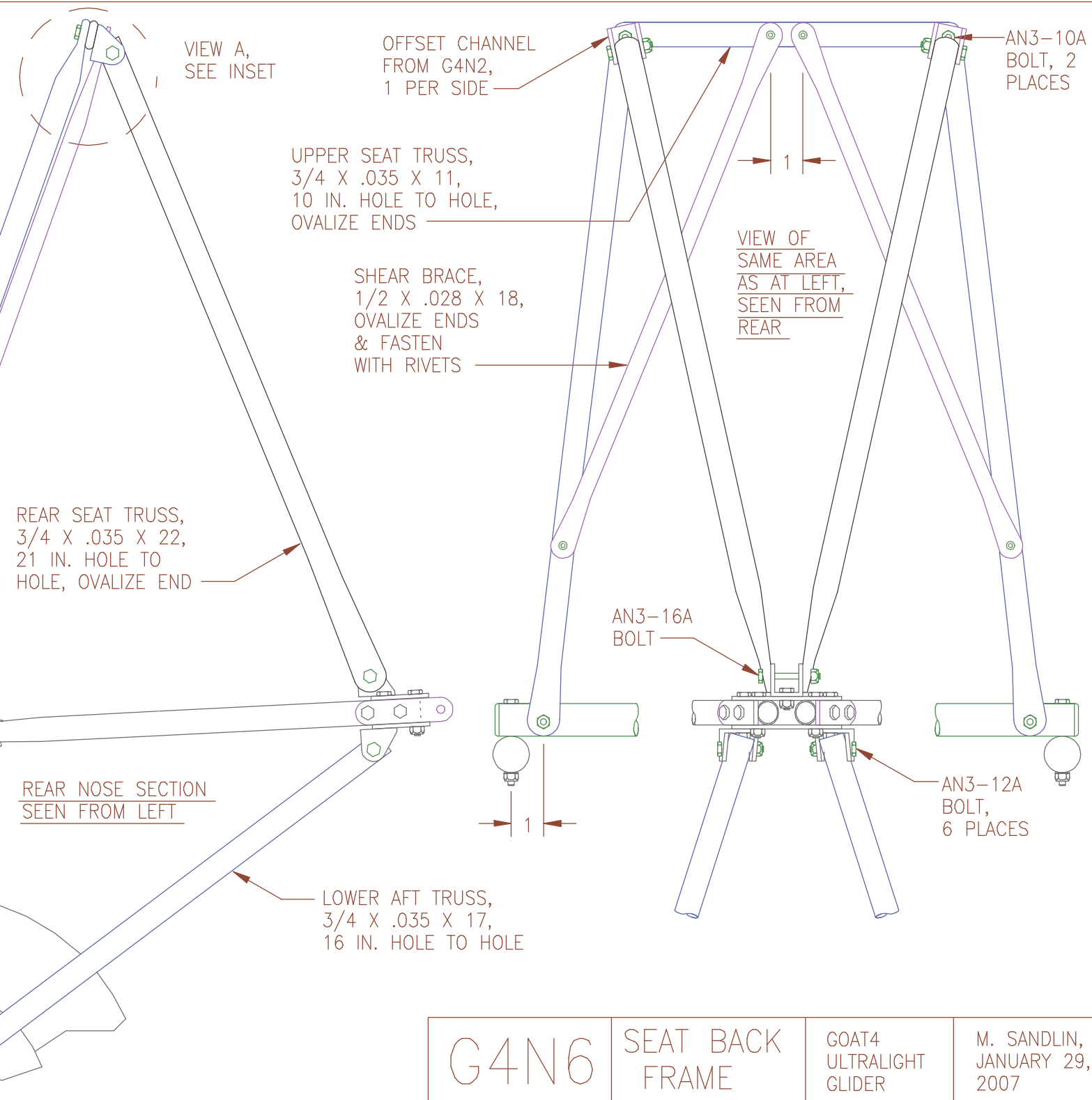


G4N5

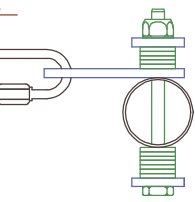
REAR NOSE
UPPER FRAME

GOAT4
ULTRALIGHT
GLIDER

M. SANDLIN,
MARCH 5 ,
2009



ATOR
IE
INK
L STICK
IEW, SEEN



END
STICK
E
TAPE
PLUG
ITH
D CAP.

K TUBE,
4

VATOR
NE
LINK

ORQUE TUBE
CONTROL STICK
XTURE,
EE INSET

ELEVATOR
DL LINE
QUICKLINK

OR CONTROL PLATE,
CES, FROM G4N8

CONTROL
STICK
ASSEMBLY
VIEWED
FROM
LEFT



CONTROL
STICK ROTATES
FORE & AFT FOR
ELEVATOR CONTROL

AN3-24A BOLT, 4 PLACES

AILERON TORQUE TUBE,
1-1/2 X .035 X 27

NYLON WASHER, 3/4 DIAM X 1/16 THICK, 4 PLACES

SMOOTH BEND
3/8 R MIN.

3/8 R,
BOTH
ENDS

1-1/2



3/16 DIAM. HOLE,
3 PLACES

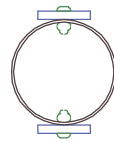
1/8 DIAM.
HOLE, 8
PLACES

3/4 3/4

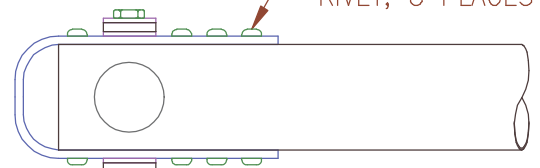


1/2 1/2

FORWARD END OF AILERON TORQUE TUBE SEEN FROM ABOVE,
WITH SECTION VIEW ACROSS TYPICAL RIVET PAIR



RIVET, 8 PLACES



1

CONTROL STICK AXIS BOLT,
AN3-26, DRILLED, WITH
AN310-3 CASTLE NUT &
COTTER PIN, WITH NYLON
WASHERS TO REDUCE
ROTATING FRICTION.

G4N7

CONTROL
STICK
ASSEMBLY

GOAT4
ULTRALIGHT
GLIDER

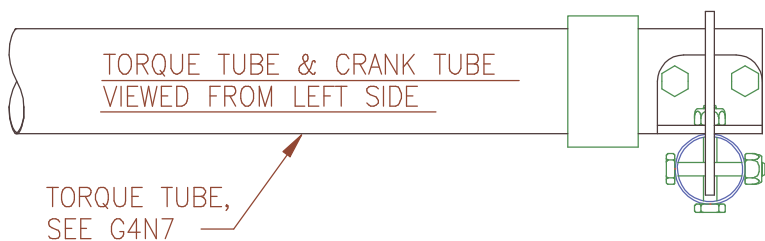
M. SANDLIN,
JANUARY 29,
2007

CONTROL STICK
PLATE, 3/4 X
1/8 X 6-3/4,
AL. BAR,
MAKE 2

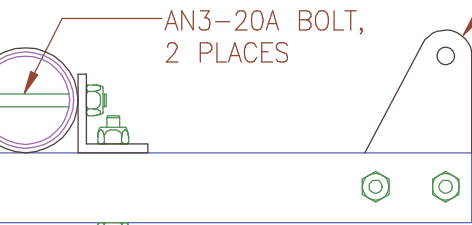
3/16 DIAM. HOLE, 5 PLACES

3/8 R, BOTH ENDS

1 2 1



TORQUE TUBE,
SEE G4N7



CRANK TUBE PLATE FOR AILERON
CONTROL LINE ATTACHMENT
PROTRUDES THRU SLOT, ONE
EACH SIDE

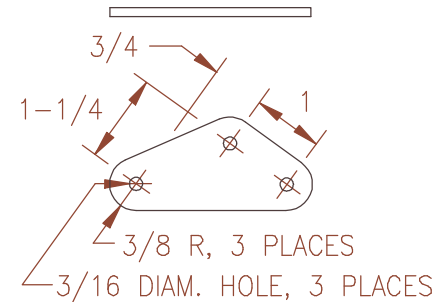
PLACES

CRANK TUBE, 1 X .035 X
12-3/4, ALUM. TUBE

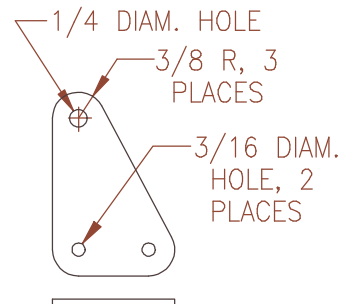
SLEEVE BEARING, 1-1/2 IN. (NOMINAL I.D.)
P.V.C. PLASTIC PIPE, 1 IN. LONG



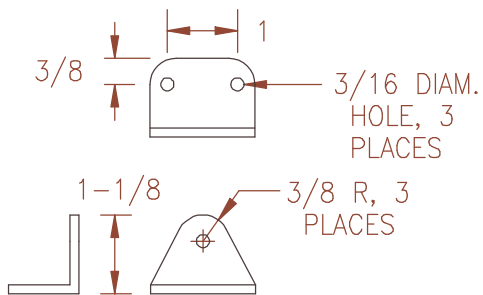
AN3-14A BOLT, 2 PLACES



ELEVATOR CONTROL PLATE,
CUT FROM 1-1/2 X 1/8 ALUM.
BAR, 3 IN. LONG, MAKE 2



CRANK TUBE PLATE,
1-3/4 X 1/8 ALUM. BAR,
2-5/8 IN. LONG, MAKE 2



CRANK TUBE ANGLE,
1 X 1-1/8 X 1/8 ALUM.
ANGLE, 1-1/2 IN. LONG, MAKE 2

G4N8

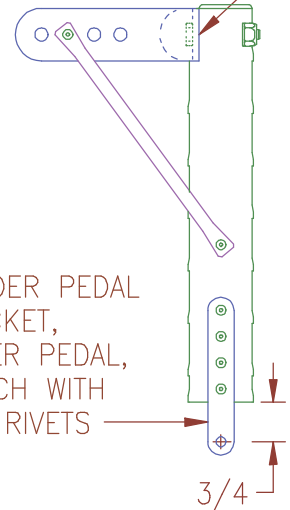
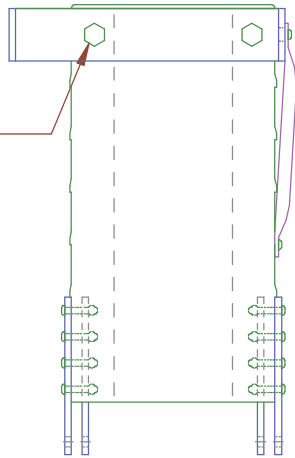
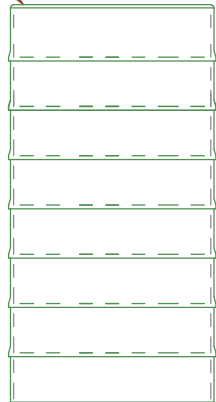
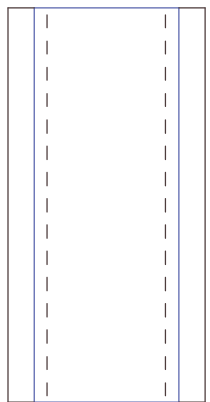
TORQUE TUBE ASSEMBLY

GOAT4
ULTRALIGHT
GLIDER

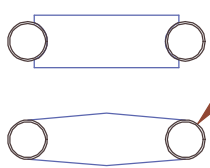
M. SANDLIN,
JANUARY 29,
2007

PIPE ENDS, WITH WET LAYUP OF 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



3-3/4

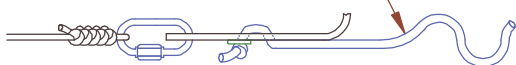


3/4 X .035 X 7-1/2 ALUM. TUBE, 2 PLACES PER PEDAL, EPOXY ONTO CORE, THEN SAND CORE TO SMOOTH CONTOUR

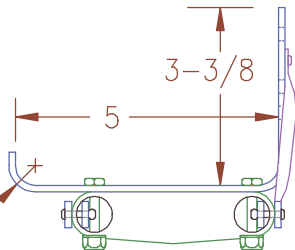
AN3-12A BOLT, 2 PER PEDAL

RUDDER PEDAL BRACKET, 4 PER PEDAL, ATTACH WITH 1/8 RIVETS

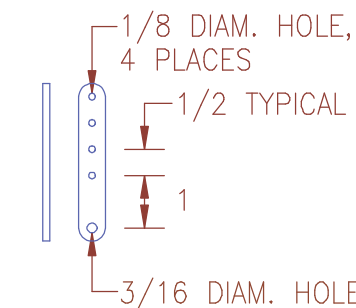
PEDAL RETURN



BEND 3/8 R MINIMUM BOTH SIDES

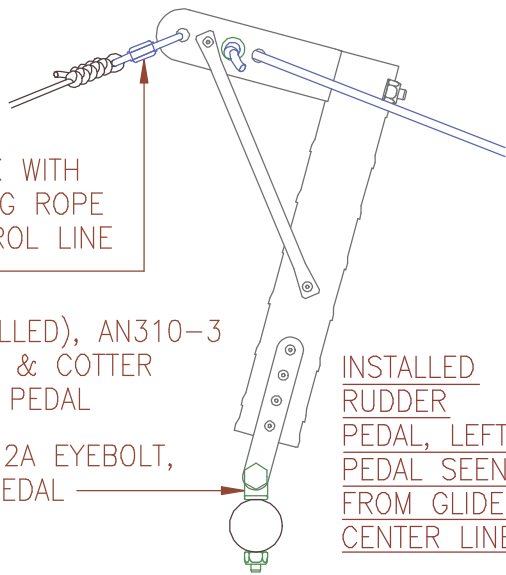


RUDDER PEDAL VIEWED FROM BELOW



RUDDER PEDAL BRACKET, 1/2 X 1/8 X 3 ALUM. BAR, MAKE 8

CLICKLINK WITH LIGHTNING ROPE CONTROL LINE G4A9

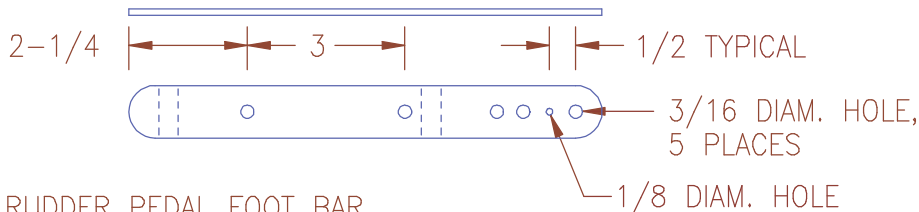


6 (DRILLED), AN310-3 NUT & COTTER PIN, 2 PER PEDAL

AN42B-12A EYEBOLT, 1 PER PEDAL

INSTALLED RUDDER PEDAL, LEFT PEDAL SEEN FROM GLIDER CENTER LINE

RUDDER PEDAL TUBE, FROM G4N1



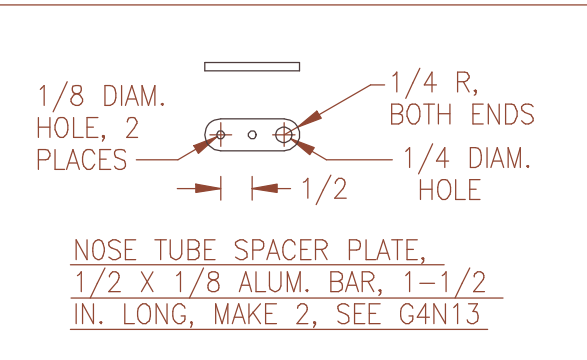
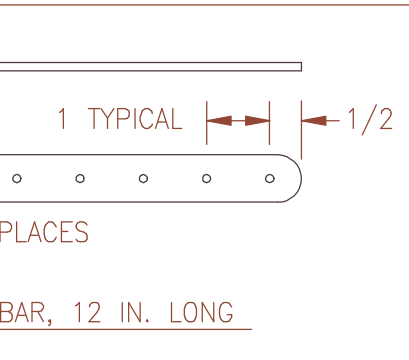
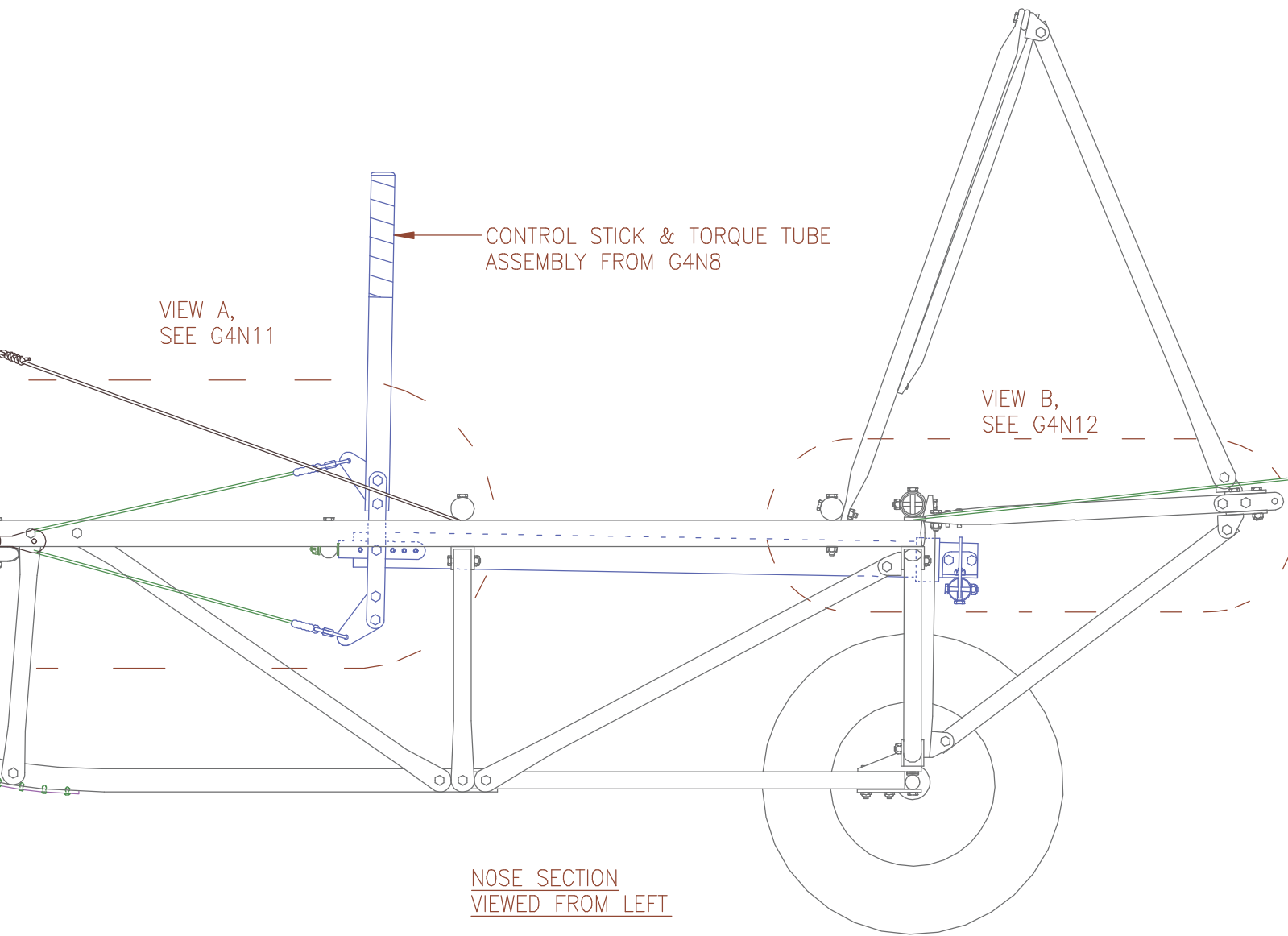
RUDDER PEDAL FOOT BAR, 3/4 X 1/8 X 9 ALUM. BAR, MAKE 2

G4N9

RUDDER PEDALS

GOAT4 ULTRALIGHT GLIDER

M. SANDLIN, JANUARY 29, 2007



G4N10

STICK & RUDDER
PEDAL INSTALLATION

GOAT4 ULTRALIGHT GLIDER	M. SANDLIN, JANUARY 29, 2007
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AN3-14 BOLT, DRILLED, WITH
AN310-3 CASTLE NUT & COTTER
PIN & 3 NYLON WASHERS

SAME AREA AS BELOW,
SEEN FROM ABOVE

5/8

2-1/2

LINE GUIDE,
SINGLE,
4 PLACES

3-1/2

TYPICAL LINE
GUIDE, VIEWED
FROM FORWARD

1/2

RUDDER CONTROL LINE, RIGHT
SIDE, SEE G4A9 FOR CONTROL
LINE SPECIFICATIONS

TUBE, 1/4 X .035 X 7/8, OVALIZE
TO 3/16 IN. THICK, SECURE WITH
RIVETS THRU 1/4 IN. SPACERS

LINE PULLEY, SINGLE BLOCK,
1/2 IN. DIAM WHEEL, SECURE WITH
AN3-14A BOLT WITH 3/4
IN. DIAM. WASHER, 2 PLACES

UPPER
ELEVATOR CONTROL LINE

LOWER ELEVATOR
CONTROL LINE

AN10, SEEN
ENTERLINE

G4N11

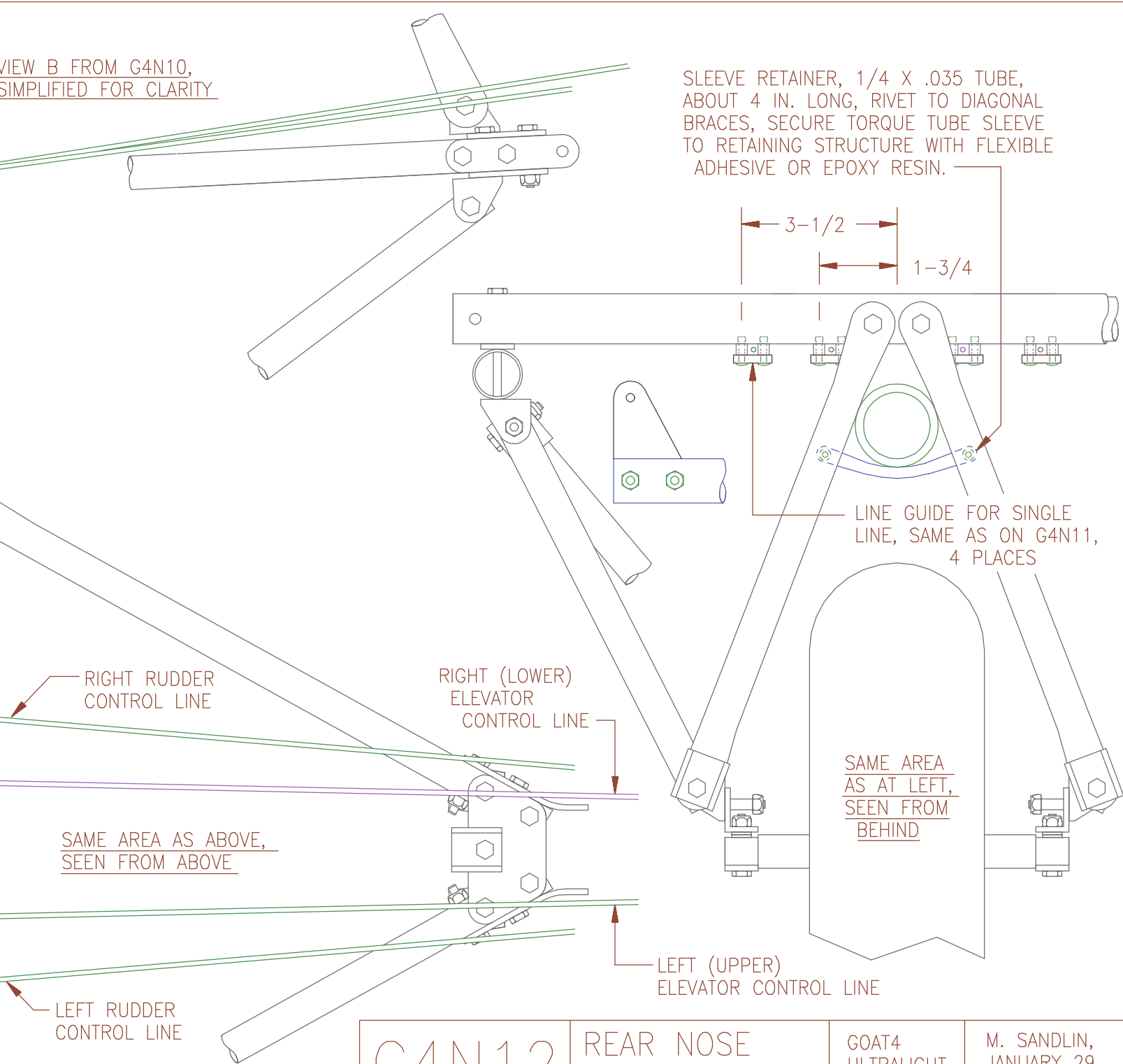
FORWARD
NOSE
CONTROL
LINES

GOAT4
ULTRALIGHT
GLIDER

M. SANDLIN,
JANUARY 29,
2007

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.



G4N12

REAR NOSE
CONTROL LINES

GOAT4
ULTRALIGHT
GLIDER

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JANUARY 29,
2007

1/2 BOTH ENDS

EXTERNAL SPACER, SEE G4N10, PER SIDE

INNER NOSE TUBE, 1 X .035 X 59-5/8

OUTER NOSE TUBE/FAIRING, 1-1/2 X .035 X 58 TUBE, OVALIZE TO FIT

NOSE SECTION BRACES, AFT OF RUDDER PEDALS, SEEN FROM FRONT

3,4

FORWARD HALF OF NOSE SECTION, UNCOVERED, VIEWED FROM LEFT

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 INFILIGHT TRIM

FOR FABRIC... FROM BRUSH... OF SKID PLATE. MAKE FROM... USING SAME CONSTRUCTION SHELLS.

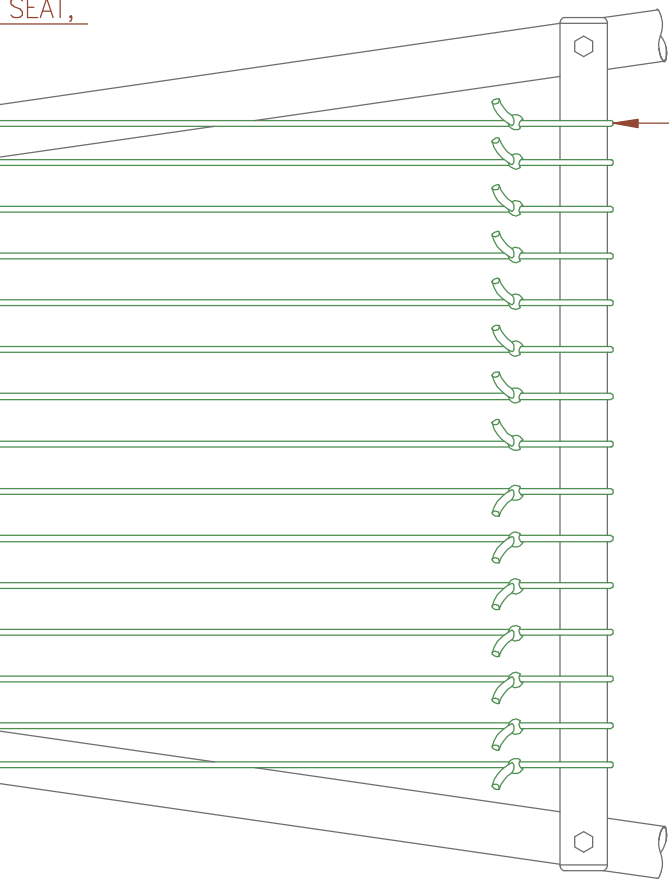
G4N13

NOSE SECTION DETAIL 1

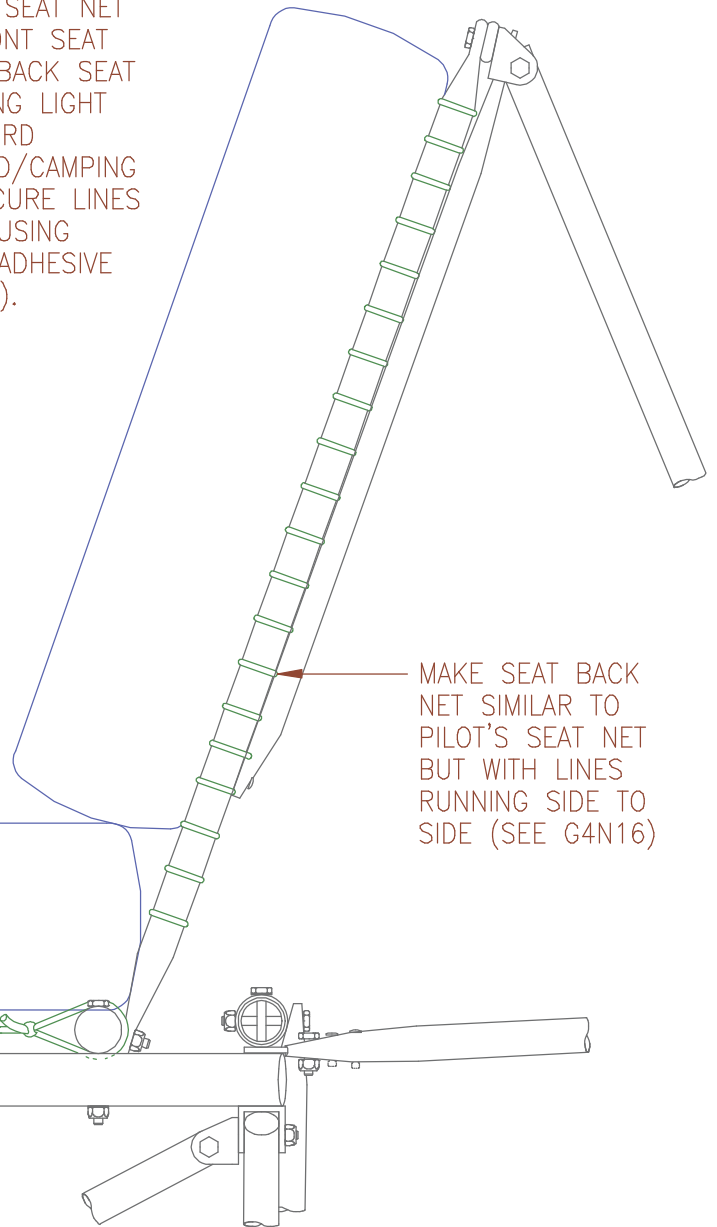
GOAT4
ULTRALIGHT
GLIDER

M. SANDLIN,
JANUARY 29,
2007

SEAT,

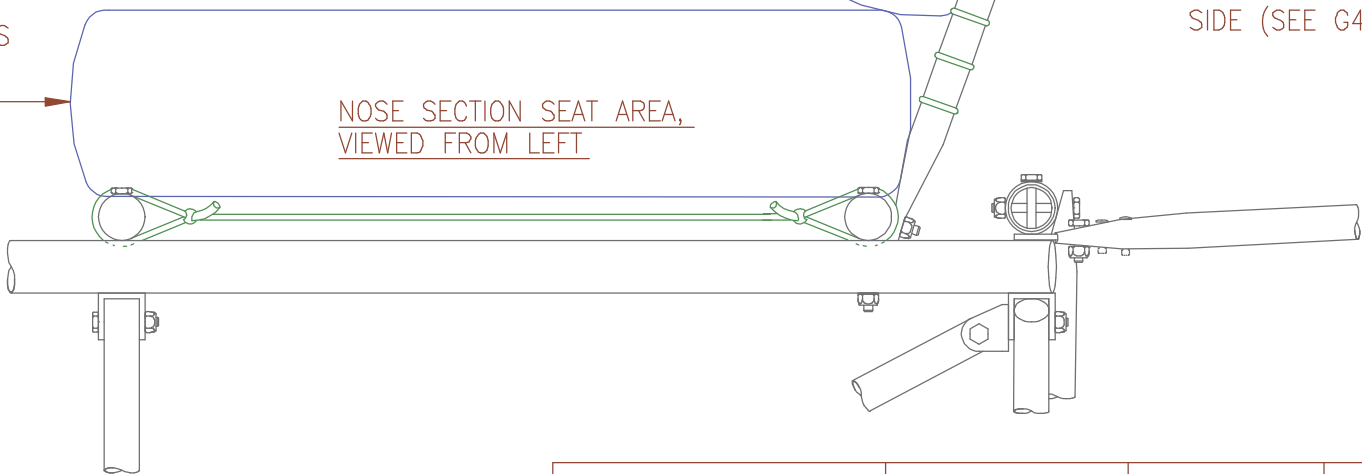


TIE PILOT SEAT NET FROM FRONT SEAT TUBE TO BACK SEAT TUBE USING LIGHT NYLON CORD (PARACORD/CAMPING LINE). SECURE LINES TO TUBE USING FLEXIBLE ADHESIVE (SHOEGOO).



MAKE SEAT BACK NET SIMILAR TO PILOT'S SEAT NET BUT WITH LINES RUNNING SIDE TO SIDE (SEE G4N16)

DAM
OUT
E PADS
NET



NOSE SECTION SEAT AREA,
VIEWED FROM LEFT

G4N14

SEATS &
PADS

GOAT4
ULTRALIGHT
GLIDER

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JANUARY 30,
2007

FOR PONY TAIL HAIR
S PASSED THROUGH AND
D PROVIDE A RETAINER
NE IS SLACK.

WITH STRAIGHTENED
ANK OF A LARGE FISH
D WITH CONTROL
("LIGHTNING ROPE")

E TOWLINE
NOT PART OF
HE TOW
D DURING
TOW LOOP
E TOW RING
LATE END
INSERTION
W PIN IS
E TOW LOOP
CAN
E.

TOW PLATE,
FROM G4N14

FORWARD SWEEP
CABLE, SEE G4N17

LINE GUIDE,
1/4 X .035 X 1
ALUM. TUBE, GLUED
& TAPED IN PLACE, 3
PLACES ON NOSE TUBE,
SEE G4N17

VIEW A FROM G4N13

SAME VIEW AS ABOVE

TOW LOOP, MADE FROM LIGHT LINE.

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.

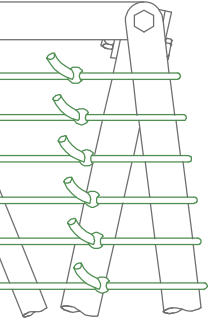
G4N15

TOW
RELEASE

GOAT4
ULTRALIGHT
GLIDER

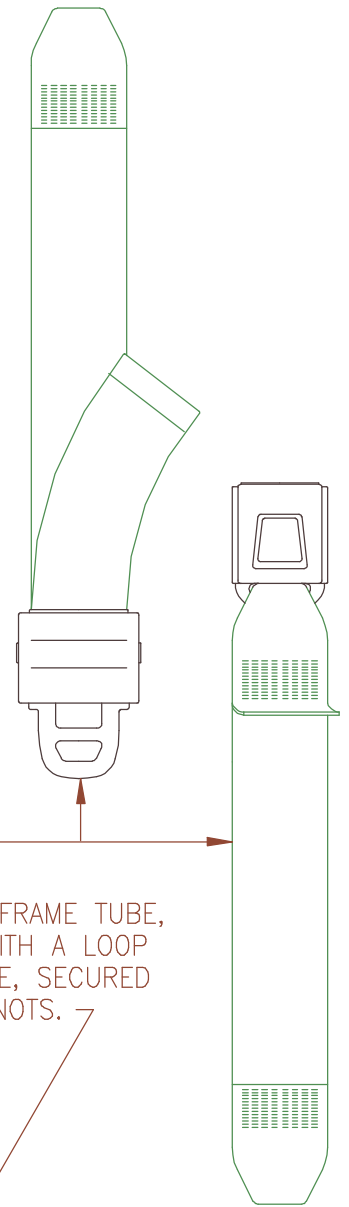
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UPPER PORTION OF
PILOT'S BACKREST
SEEN FROM FORWARD
(BACK SEAT PAD
NOT SHOWN)



← SHOULDER HARNESS, 1
INCH STRAP OR WEBBING
WITH 3 STAMPED STEEL
BUCKLE SLIDERS

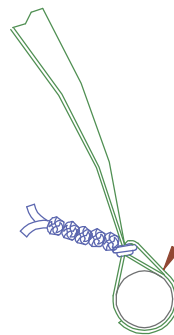
LAP BELTS ARE
AUTOMOTIVE SEAT
BELTS, AFTERMARKET
PUSH BUTTON TYPE,
METAL END BRACKETS
REMOVED



LAP BELT IS WRAPPED AROUND FRAME TUBE,
THEN TIED BACK ONTO ITSELF WITH A LOOP
OF 3 STRANDS OF CONTROL LINE, SECURED
WITH A SERIES OF 5 SQUARE KNOTS.

& 1 RIGHT

ATION SEAT AREA,
FROM LEFT



LAP BELT ATTACHMENT
SEEN FROM FORWARD

G4N16

SEAT BELTS

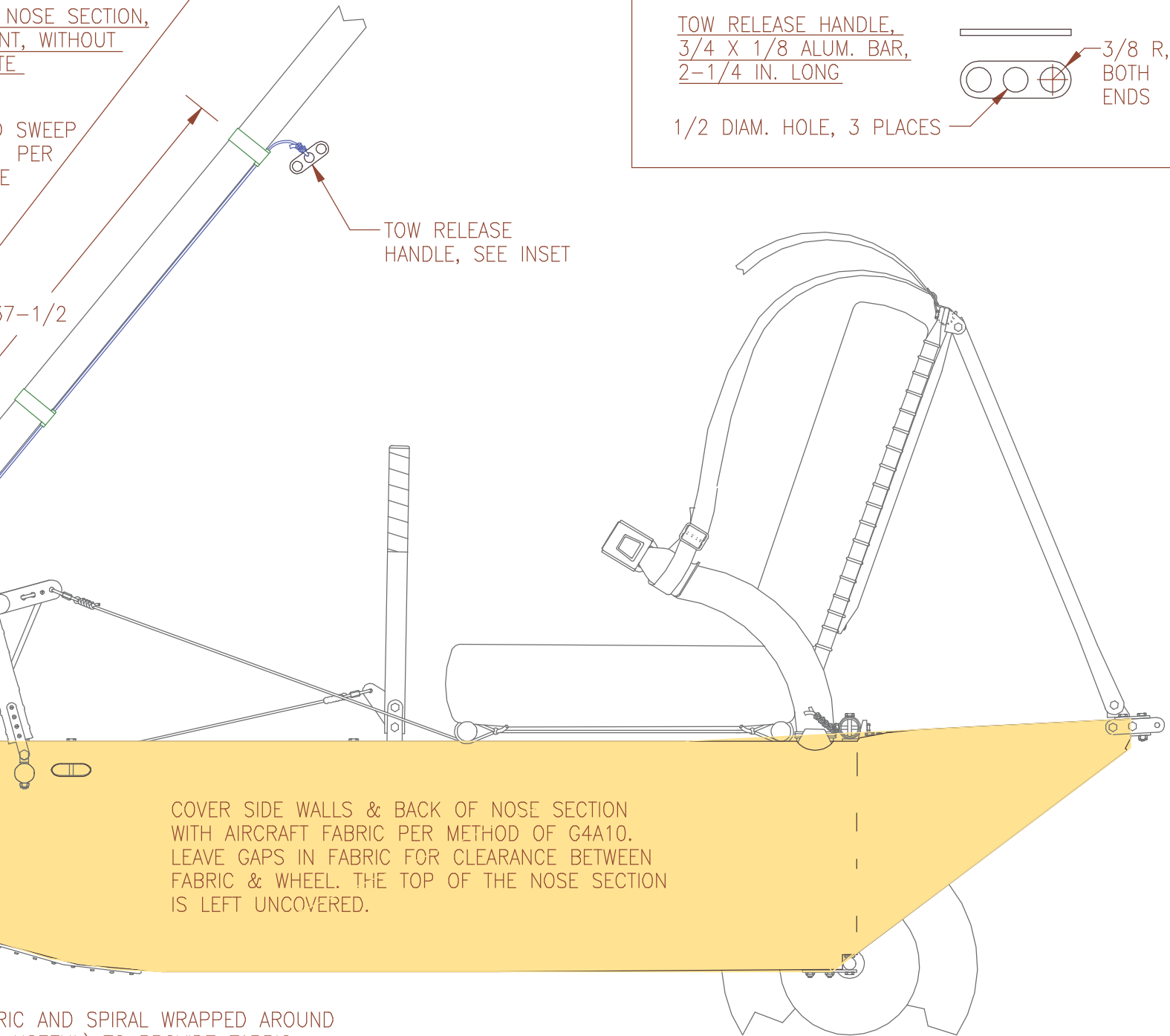
GOAT4
ULTRALIGHT
GLIDER

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NOSE SECTION,
NT, WITHOUT
TE

SWEEP
PER
E

7-1/2



TOW RELEASE HANDLE, SEE INSET

TOW RELEASE HANDLE,
3/4 X 1/8 ALUM. BAR,
2-1/4 IN. LONG

3/8 R,
BOTH
ENDS

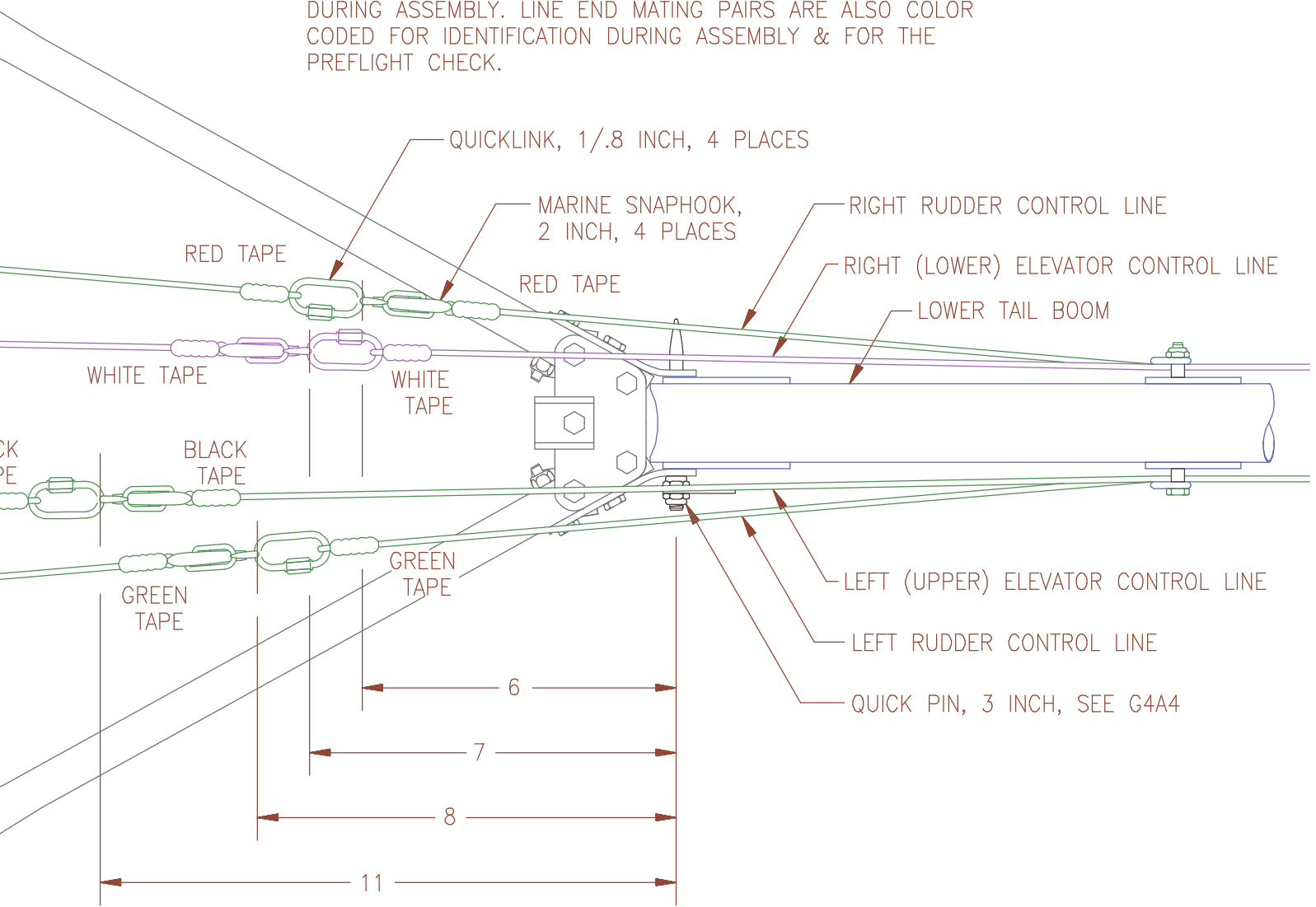
1/2 DIAM. HOLE, 3 PLACES

COVER SIDE WALLS & BACK OF NOSE SECTION
WITH AIRCRAFT FABRIC PER METHOD OF G4A10.
LEAVE GAPS IN FABRIC FOR CLEARANCE BETWEEN
FABRIC & WHEEL. THE TOP OF THE NOSE SECTION
IS LEFT UNCOVERED.

FABRIC AND SPIRAL WRAPPED AROUND
(USEFUL) TO PROVIDE FABRIC
OF THE SIDE WALL FABRIC.

G4N17	NOSE SECTION DETAIL 2	GOAT4 ULTRALIGHT GLIDER	M. SANDLIN, JANUARY 30, 2007
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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.



TO LOWER

G4N18	RUDDER & ELEVATOR CONTROL LINES	GOAT4 ULTRALIGHT GLIDER	M. SANDLIN, JANUARY 30, 2007
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SEWN WEBBING LOOP, ROCK CLIMBING TYPE,
LAP BELT LOOPS TO THE EMERGENCY

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

EMERGENCY PARACHUTE IN COVER BAG, SEE G4N20.
PARACHUTE COVER BAG IS TIED ONTO THE NOSE
SECTION FRAME, SOMETIMES THRU SLOTS IN THE
FABRIC USING SHORT LENGTHS OF LINE ATTACHED
TO SMALL WEBBING LOOPS ON THE CORNERS
OF THE BAG.

VIEW OF NOSE SECTION
SEEN FROM RIGHT

G4N19

EMERGENCY
PARACHUTE 1

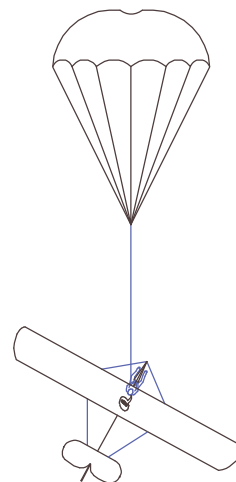
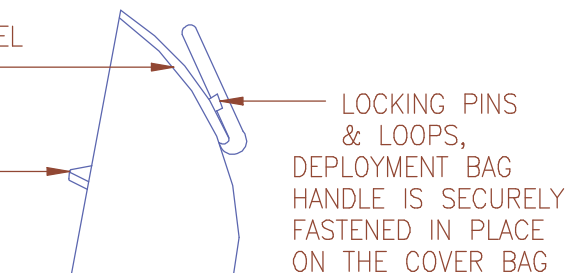
GOAT4
ULTRALIGHT
GLIDER

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THE SEAMS OF THE COVER BAG TOP PANEL
 HAVE BEEN UNDONE TO ALLOW THE TOP PANEL
 TO OPEN UPWARD

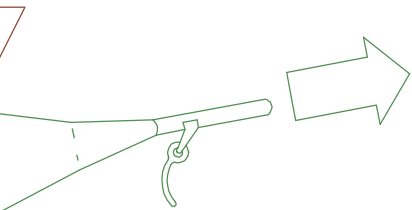
SEW EACH SMALL LOOPS TO COVER BAG
 TO TIE-ON TO NOSE SECTION

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

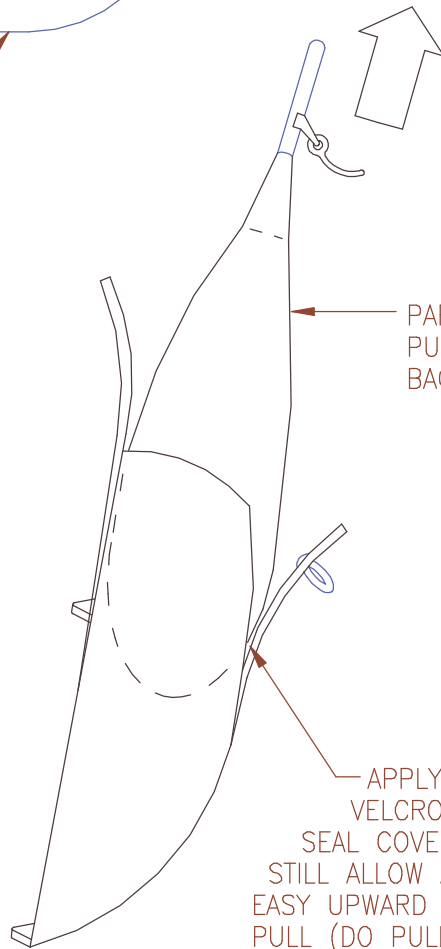


POSSIBLE EMERGENCY
 PARACHUTE DESCENT
 ATTITUDE. (THE INTENT
 IS THAT THE PILOT BE
 SHIELDED FROM GROUND
 CONTACT BY COLLAPSABLE
 STRUCTURE).

COVER BAG BEING PULLED FORWARD PRIOR



BUG4 OR GOAT EMERGENCY PARACHUTE SYSTEM, CHEST PACK
 HANDLE, ROUND CANOPY 22 GORE
 SYSTEM. USING THIS SYSTEM FOR
 EMERGENCY DEPLOYMENT REQUIRES THAT THE COVER
 BE MODIFIED TO ALLOW AN UPWARD DEPLOYMENT
 OF THE "OUTWARD FROM THE CHEST"
 SYSTEM WHICH IT WAS DESIGNED.



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

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