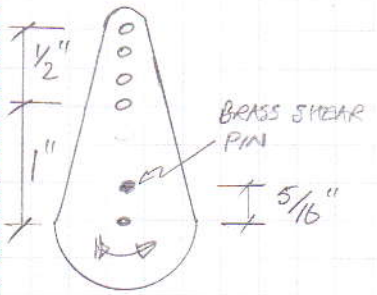
PROJECT EUROPA G-BXII

SUBJECT DIGI-TRAK AUTOPILOT INSTALLATION
— ULTIMATE LOAD ON SERVO LINKAGE

Calc sheet No.	rev
2	
Calculation by: DMcF	Date: 1/03
Checked by	Date
Approved by	Date

ULTIMATE LOAD ON SERVO HORN IS CONTROLLED BY 1/16" DIAMETER BRASS SHEAR PIN AT 5/16" RADIUS



SHEAR STRENGTH OF NAVAL BRASS = 44,000 psi

SHEAR STRENGTH OF 1/16" BRASS PIN

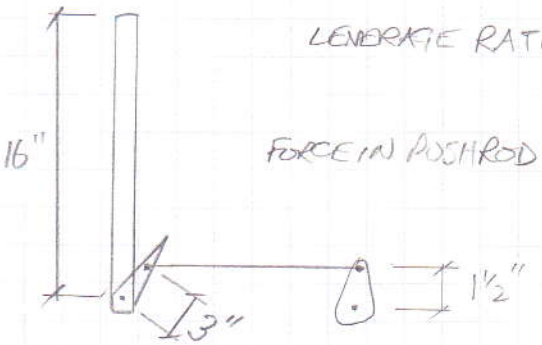
$= \frac{\pi \, 1/16^2}{4} \times 44{,}000 = 135$ lbs.

ULTIMATE TORQUE OF SERVO ARM:

135 lbs × 5/16" = 42 lbs.in

STICK FORCE REQUIRED TO OVERCOME SHEAR PIN:

Minimum:—



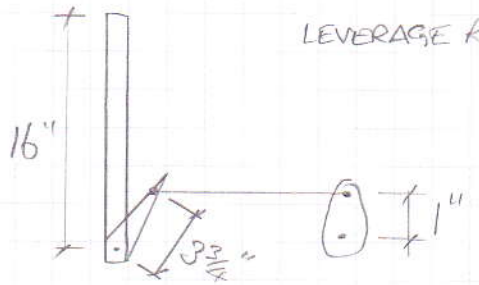
LEVERAGE RATIO = $\frac{16}{3} \times 1.5 = 8$

FORCE IN PUSHROD = $\frac{42 \text{ lbs.in}}{1\frac{1}{2}"} = 28$ lbs.

FORCE AT TOP OF STICK =

$\frac{42}{8} = 5.25$ lbs ✓OK

Maximum:—



LEVERAGE RATIO = $\frac{16}{3.75} \times 1 = 4.27$

FORCE IN PUSHROD = $\frac{42}{1} = 42$ lbs.

FORCE AT TOP OF STICK =

$\frac{42}{4.27} = 9.8$ lbs. ✓OK

DESIGN LIMIT STICK FORCE (JAR-VLA 397 (b)) = 30daN = 66 lbs ✓OK.