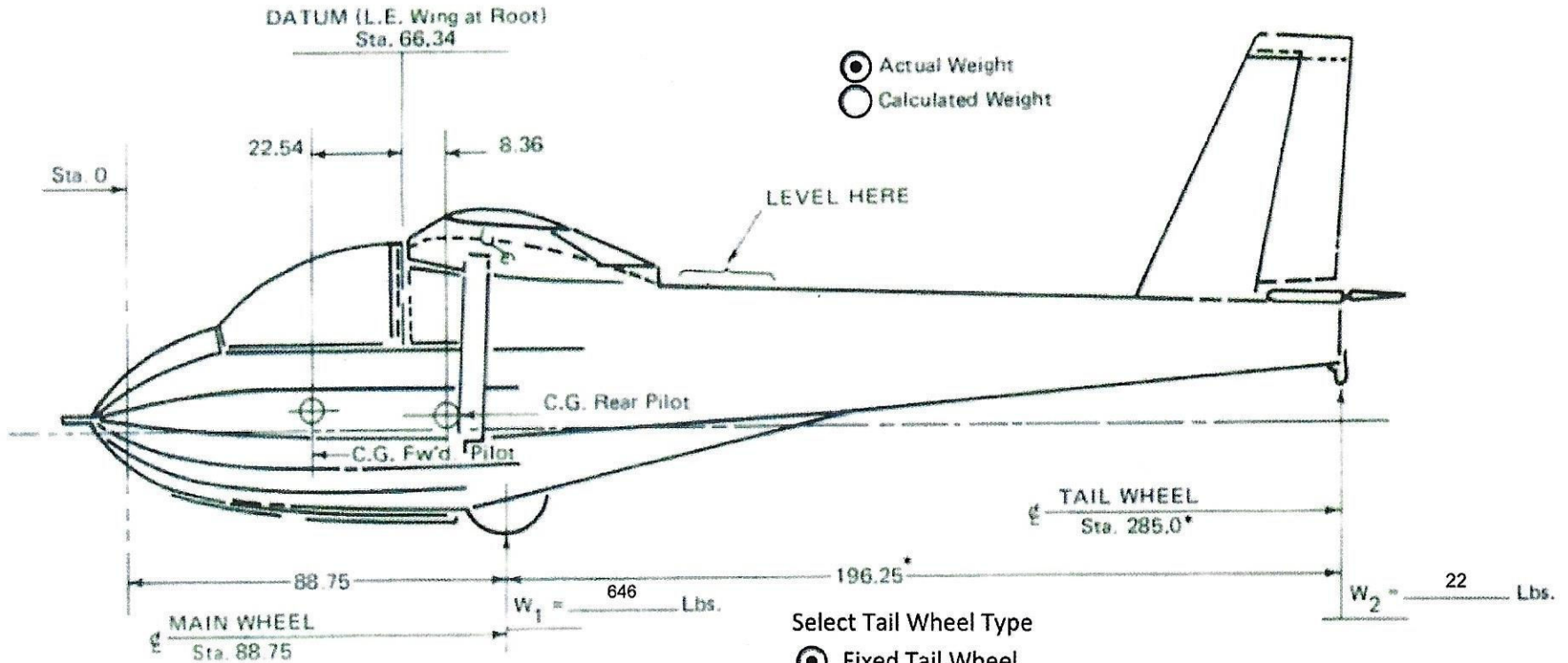




2-33 Weight & Balance

| | | | | | |
|------------|-----|----------|--------|------|---------|
| Serial No. | 450 | Reg. No. | N2750H | Date | 4/28/21 |
|------------|-----|----------|--------|------|---------|



Empty Weight: $W_E = W_1 + W_2 = 646 + 22 = 668$ lbs

C.G. Empty (Sta.): $CG_{EFT} = \frac{(W_2 \times 196.25 \text{ or } 207.08^*)}{W_E} + 88.75 = \left(\frac{22 \times 196.25}{668} \right) + 88.75 = \text{Sta. } 95.21$

Wing Panel Weights**:

| | |
|-----|----|
| 163 | LH |
| 161 | RH |

SHIP AS WEIGHED INCLUDES EQUIPMENT LISTED ON I-4427 Sht. 3

Notes: See Glider Data Sheet No. G2EA – Fwd Pilot C.G. at Sta. 43.80 – Rear Pilot C.G. at Sta. 74.70

CLASS II, UTILITY: C.G. Limits – Sta. 78.20 to Sta. 86.10 or 11.86" to 19.76" Aft Datum

* If aircraft is equipped with spring tail wheel the 196.25" dimension changes to 207.08" and tail wheel Sta. 285.0 becomes 295.8

**Wing weight must be a minimum of 155# and aircraft must have 33928 kit installed to be eligible for 1080# gross weight.



2-33 Weight & Balance

| | | | | | |
|------------|-----|----------|--------|------|---------|
| Serial No. | 450 | Reg. No. | N2750H | Date | 4/28/21 |
|------------|-----|----------|--------|------|---------|

C.G. Conditions – Aft Limit

Minimum Weight Pilot Solo (Front Seat):

$$= \frac{\text{Empty Wt. (C.G. Empty - 86.10)}}{42.30} = \frac{668 (95.21 - 86.10)}{42.30} = \underline{144} \text{ lbs}$$

Minimum Weight Rear Pilot (Assuming 100# Fwd Pilot):

$$= \frac{\text{Empty Wt. (C.G. Empty - 86.10)}}{11.40} - 372 = \frac{668 (95.21 - 86.10)}{11.40} - 372 = \underline{162} \text{ lbs}$$

C.G. Conditions – Forward Limit

Maximum Weight Pilot Solo (Front Seat):

$$= \frac{\text{Empty Wt. (C.G. Empty - 78.20)}}{34.40} = \frac{668 (95.21 - 78.20)}{34.40} = \underline{330} \text{ lbs}$$

Maximum Weight Rear Pilot (Assuming 220# Fwd Pilot):

Select Gross Weight*

- 1040# Gross Weight
 1080# Gross Weight

Step #1 = $\frac{\text{Empty Wt. (C.G. Empty - 78.20)}}{3.50} - 2162$

$$= \frac{668 (95.21 - 78.20)}{3.50} - 2162 = \underline{1,085} \text{ lbs}$$

Step #2 = Gross Weight* - (Empty Weight + 220)

$$= 1,080 (668 + 220) = \underline{192} \text{ lbs}$$

Use Lower Weight From Step 1 or Step 2 for Max. Rear Pilot Weight.

*** 1040# or 1080# Maximum Gross Weight**

| | | | |
|--------------|--|-------|---------|
| Prepared By: | | Date: | 4/28/21 |
| Checked By: | | Date: | 4/28/21 |



2-33 Weight & Balance

| | | | | | |
|------------|-----|----------|--------|------|---------|
| Serial No. | 450 | Reg. No. | N2750H | Date | 4/28/21 |
|------------|-----|----------|--------|------|---------|

The Empty Weight As Listed on Page 1 Includes the Following Equipment

| Item No. | Equipment Installed | Weight | Sta. | Moment |
|----------|--------------------------------------------------|--------|------|--------|
| 1. | Airspeed Indicator, Altimeter & Mechanical Vario | | | |
| 2. | Wing Tip Wheels | | | |
| 3. | Removable Ballast Box | | | |



Calculated Weight and Balance
(33011 Removable Ballast)

| | | |
|----------------------|------------------|---------------------------|
| Model No. : SGS 2-33 | Serial No. : 450 | Registration No. : N2750H |
|----------------------|------------------|---------------------------|

| | Weight [lb.] (W1) | Station [in.] | Moment [in·lb] (M1) |
|----------------------------------------------|-------------------|---------------|---------------------|
| Empty Weight (from Wt. & Bal. dated 4/28/21) | 668 | 95.21 | 63,600.28 |

Note: Weight × Station = Moment

| Optional Equipment Added: | Weight [lb.] (W2) | Station [in.] | Moment [in·lb] (M2) |
|----------------------------------------------|-------------------|---------------|---------------------|
| a. P/N 33011, Removable Ballast Installation | 19.50 | 13.05 | 254.48 |

Note: 33011, Removable Ballast Installation, shown in figure 1.



Figure 1: 33011, Removable Ballast Installation

Select Gross Weight*

- 1040# Gross Weight
- 1080# Gross Weight

| Station [in.] (S1) | |
|------------------------------------|------------------------------------------------------------------|
| $\frac{(M1 + M2)}{(W1 + W2)} = S1$ | $\frac{(63,600.28 + 254.48)}{(668 + 19.50)} = 92.88 \text{ in.}$ |

| Max. Weight Aft Pilot With 220 lb. Forward Pilot | |
|------------------------------------------------------------|----------------------------------------------------|
| $Max. \text{Gross Wt.} - ((W1 + W2) + 220)$ | $1,080 - ((668 + 19.50) + 220) = 173 \text{ lbs.}$ |
| *1040# or 1080# Maximum Gross Weight (Select Above) | |

| Min. Weight Aft Pilot With 100 lb. Forward Pilot | |
|-----------------------------------------------------|---------------------------------------------------------------------------------------|
| $\frac{(W1 + W2) \times (S1 - 86.10)}{11.40} - 372$ | $\frac{(668 + 19.50) \times (92.88 - 86.10)}{11.40} - 372$ $= 37 \text{ lbs.}$ |

| Min. Weight Forward Pilot – Solo | |
|-----------------------------------------------|-------------------------------------------------------------------------|
| $\frac{(W1 + W2) \times (S1 - 86.10)}{42.30}$ | $\frac{(668 + 19.50) \times (92.88 - 86.10)}{42.30} = 110 \text{ lbs.}$ |

Note: The above minimum and maximum pilot weights are valid ONLY when the removable ballast weight is in place.

Calculated by: [Signature] Date: 4/28/21

Checked by: [Signature] Date: 28 April 21

2-33 Weight & Balance Calculations

Empty Weight CG

| Location | Weight | Arm | Moment |
|----------------|--------|-------|----------|
| Empty Aircraft | 668 | 95.21 | 63600.28 |

Minimum front seat solo - 144 lbs

Forward Limit - 78.20" aft of datum

Max Forward - per placards

| Location | Weight | Arm | Moment |
|----------------|-------------|--------------|-----------------|
| Empty Aircraft | 668 | 95.21 | 63600.28 |
| Front Seat | 220 | 43.80 | 9636.00 |
| Rear Seat | 192 | 74.70 | 14342.40 |
| Totals | 1080 | 81.09 | 87578.68 |

Max Forward - one person in front

| Location | Weight | Arm | Moment |
|----------------|------------|--------------|-----------------|
| Empty Aircraft | 668 | 95.21 | 63600.28 |
| Front Seat | 330 | 43.80 | 14454.00 |
| Rear Seat | | 74.70 | 0.00 |
| Totals | 998 | 78.21 | 78054.28 |

Rearward Limit - 86.10" aft of datum

Max Rearward - per placards

| Location | Weight | Arm | Moment |
|----------------|------------|--------------|-----------------|
| Empty Aircraft | 668 | 95.21 | 63600.28 |
| Front Seat | 100 | 43.80 | 4380.00 |
| Rear Seat | 162 | 74.70 | 12101.40 |
| Totals | 930 | 86.11 | 80081.68 |

Max Rearward - one person in front

| Location | Weight | Arm | Moment |
|----------------|------------|--------------|-----------------|
| Empty Aircraft | 668 | 95.21 | 63600.28 |
| Front Seat | 144 | 43.80 | 6307.20 |
| Rear Seat | | 74.70 | 0.00 |
| Totals | 812 | 86.09 | 69907.48 |

Gross Weight Limit - 1040 lbs

Max Gross Loading - heavy person in front

| Location | Weight | Arm | Moment |
|----------------|-------------|--------------|-----------------|
| Empty Aircraft | 668 | 95.21 | 63600.28 |
| Front Seat | 321 | 43.80 | 14059.80 |
| Rear Seat | 91 | 74.70 | 6797.70 |
| Totals | 1080 | 78.20 | 84457.78 |

Max Gross Loading - heavy person in rear

| Location | Weight | Arm | Moment |
|----------------|-------------|--------------|-----------------|
| Empty Aircraft | 668 | 95.21 | 63600.28 |
| Front Seat | 45 | 43.80 | 1971.00 |
| Rear Seat | 367 | 74.70 | 27414.90 |
| Totals | 1080 | 86.10 | 92986.18 |

With Ballast Installed

Max Forward - ballast installed

| Location | Weight | Arm | Moment |
|----------------|--------------|--------------|-----------------|
| Empty Aircraft | 668 | 95.21 | 63600.28 |
| Front Seat | 295 | 43.80 | 12921.00 |
| Rear Seat | | 74.70 | 0.00 |
| Ballast | 19.5 | 13.05 | 254.48 |
| Totals | 982.5 | 78.14 | 76775.76 |

Max Rearward - ballast installed

| Location | Weight | Arm | Moment |
|----------------|--------------|--------------|-----------------|
| Empty Aircraft | 668 | 95.21 | 63600.28 |
| Front Seat | 110 | 43.80 | 4818.00 |
| Rear Seat | | 74.70 | 0.00 |
| Ballast | 19.5 | 13.05 | 254.48 |
| Totals | 797.5 | 86.11 | 68672.76 |

Max Forward - per placards

| Location | Weight | Arm | Moment |
|----------------|---------------|--------------|-----------------|
| Empty Aircraft | 668 | 95.21 | 63600.28 |
| Front Seat | 220 | 43.80 | 9636.00 |
| Rear Seat | 173 | 74.70 | 12923.10 |
| Ballast | 19.5 | 13.05 | 254.48 |
| Totals | 1080.5 | 79.98 | 86413.86 |

Max Rearward - per placards

| Location | Weight | Arm | Moment |
|----------------|--------------|--------------|-----------------|
| Empty Aircraft | 668 | 95.21 | 63600.28 |
| Front Seat | 100 | 43.80 | 4380.00 |
| Rear Seat | 37 | 74.70 | 2763.90 |
| Ballast | 19.5 | 13.05 | 254.48 |
| Totals | 824.5 | 86.11 | 70998.66 |

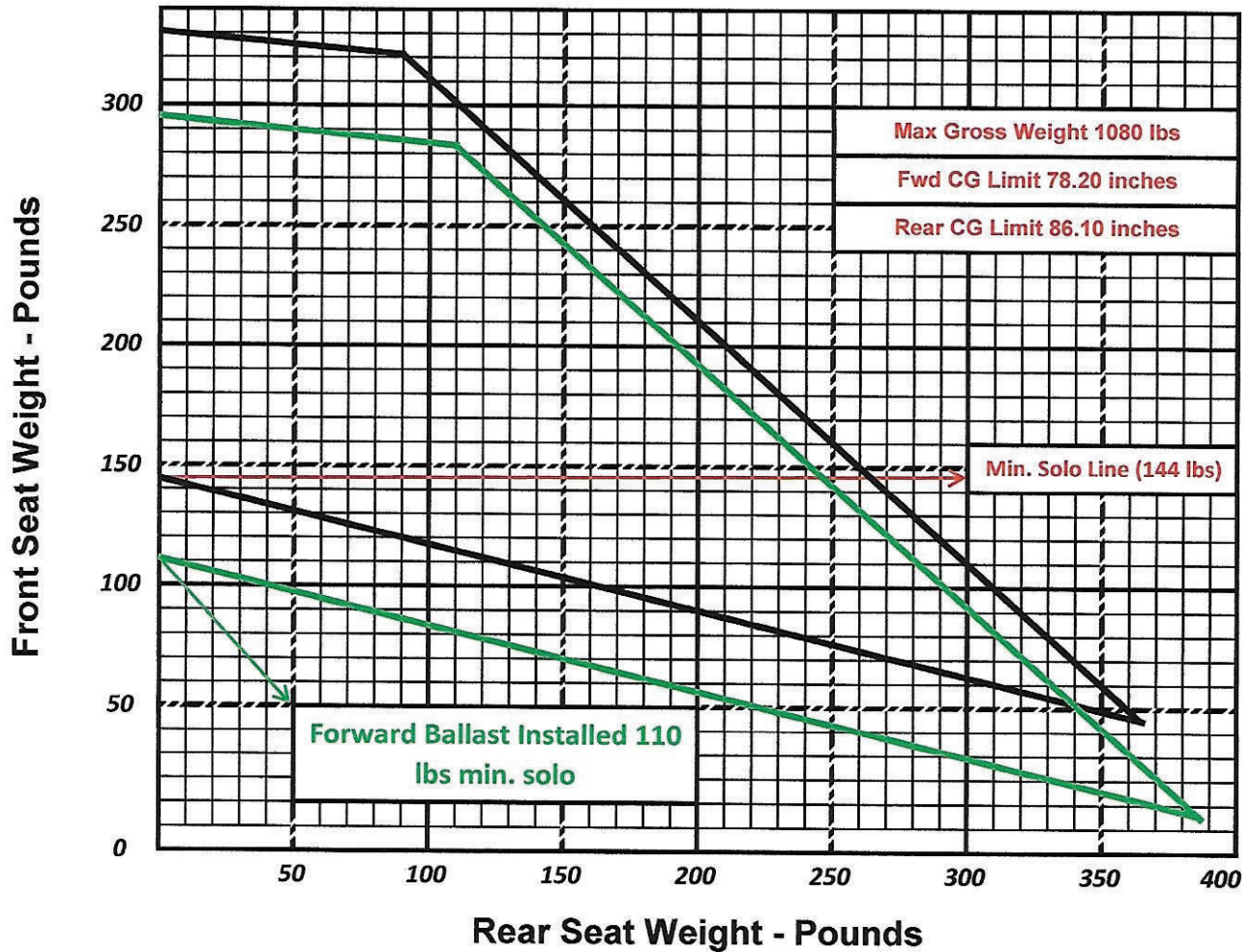
Max Gross - w/ballast, heavy person in front

| Location | Weight | Arm | Moment |
|----------------|---------------|--------------|-----------------|
| Empty Aircraft | 668 | 95.21 | 63600.28 |
| Front Seat | 282 | 43.80 | 12351.60 |
| Rear Seat | 111 | 74.70 | 8291.70 |
| Ballast | 19.5 | 13.05 | 254.48 |
| Totals | 1080.5 | 78.20 | 84498.06 |

Max Gross - w/ballast, heavy person in rear

| Location | Weight | Arm | Moment |
|----------------|---------------|--------------|-----------------|
| Empty Aircraft | 668 | 95.21 | 63600.28 |
| Front Seat | 6 | 43.80 | 262.80 |
| Rear Seat | 387 | 74.70 | 28908.90 |
| Ballast | 19.5 | 13.05 | 254.48 |
| Totals | 1080.5 | 86.10 | 93026.46 |

N2750H CG Envelope



| N2750H CG Calculation Form | | | | | |
|-----------------------------------|--------|---|-------|---|-----------|
| Location | Weight | X | Arm | = | Moment |
| N2750H Empty Weight | 668 | | 95.21 | | 63,600.28 |
| Front Seat | | X | 43.80 | = | |
| Rear Seat | | X | 74.70 | = | |
| Forward Ballast (19.5 lbs) | | X | 13.05 | = | |
| Totals | | X | | = | |

| | | |
|---------------------------------------------------|--------------|----------------------------|
| <i>Max Forward Limit =</i> | 78.20 | <i>Inches aft of Datum</i> |
| <i>Max Rearward Limit =</i> | 86.10 | <i>Inches aft of Datum</i> |
| <i>Max Gross Weight =</i> | 1080 | <i>Pounds</i> |
| | | |
| <i>Minimum Front Seat Solo =</i> | 144 | <i>Pounds</i> |
| <i>Min Solo with 19.5 lbs ballast installed =</i> | 110 | <i>Pounds</i> |