Skyline Soaring
ASK-21 Cockpit Guide

N341KS

KFRR (Front Royal)	123.0 / wx 121.850	KOKV (Winchester)	122.975 / wx 124.85
FBO: 540-635-5370	AWOS: 540-635-5377	KLUA (Luray)	122.8 / wx 118.275
Skyline Ground	123.3	8W2 (New Market)	122.8 / wx 118.175
Potomac Approach	120.45	KSHD (Shenandoah)	123.0 / wx 124.925

Before Takeoff Checklists

A BB CCCC DDD E

- A - Altimeter
- B - Ballast
- B - Belts
- C - Controls, Flaps, Trim
- C - Comm
- C - Connect Towrope
- C - Canopy
- D - Dolly
- D - Dive Brakes
- D - Direction of Wind
- E - Emergency Plan

or

CB SWIFTT CCBE

- C - Controls
- B - Ballast
- S - Straps
- W - Winds
- I - Instruments
- F - Flaps
- T - Trim
- T - Tail Dolly
- C - Connect Towrope
- C - Canopy
- B - Brakes
- E - Emergency Plan

Final Check – Canopies, Spoilers, Dolly

Before Landing

FUSTALL

- F - Flaps
- U - Undercarriage
- S - Speed
- T - Trim
- A - Airbrakes
- L - Lookout
- L - Landing

	Dual / Solo
Stall	39 / 36
Stall Spoilers	42 / 38
Min Sink	42 / 38
Rec Apch (POH)	49+
Best L/D	50 / 48
Pattern	55+
Aero Tow	97
Maneuver	97
Rough Air	108
Never Exceed	151
G Limits @Vm	+6.5 / -4.0
G Limits @Vne	+5.3 / -3.0
Pilot Wt	154-242F,0-242R,470T
Max XW	N/A
Flight in Precip	+5 kts

Speed to Fly (Dual):

Sink (K)	0	1	2	3	4	5
Airspeed	50	59	68	73	78	84
Glider Sink	1.5	1.9	2.3	2.7	3.2	3.8
Total Sink	1.5	2.9	4.2	5.7	7.2	8.8
Glide Ratio	33	21	16	13	11	9

Speed to Fly (Solo):

Sink (K)	0	1	2	3	4	5
Airspeed	48	54	59	65	73	78
Glider Sink	1.4	1.7	2.0	2.4	3.1	3.7
Total Sink	1.4	2.7	4.0	5.4	7.1	8.7
Glide Ratio	33	20	15	12	10	9

Min Sink Speed by Bank Angle: (Dual / Solo)

0 deg	15 deg	30 deg	45 deg	60 deg
42/37	43/38	45/40	50/44	59/52

Never Exceed Speed (Vne) by Altitude:

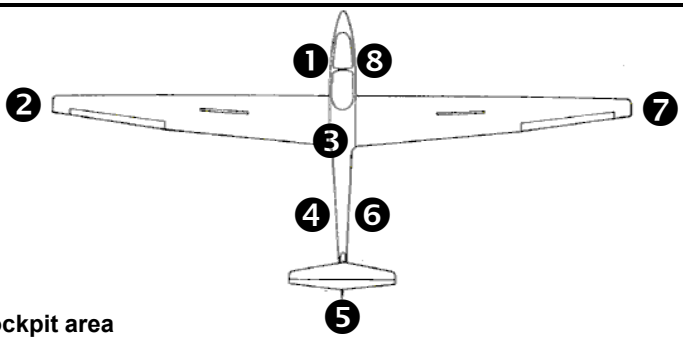
SL	5 K	10 K	15 K	20 K
151	151	144	132	121

25 July 2025

Skyline Soaring
ASK-21 Cockpit Guide

N341KS

Daily Inspection / Pre-Flight Checklist



1 – Cockpit area
- Canopy condition, latches operable, main pins secured, vents & rails
- Ballast removed from seat and bolt-in positions, or set for flight
- Battery secure, radio and instruments operable
- Main spar pins in place and secured, hydraulic reservoir level OK
- Check for foreign bodies or loose items
- Documents in place (AROW), land-out tool bag in right wing root
- Flight controls free, clear, proper movement against load
- Rudder S-tubes proper and tight fit, adjust mechanism functions
- Release mechanisms engage, release, cables return, pivot arm free
- Nose tire 28 psi, main tire 38 psi, wheel brake engages and effective

2 – Left wing
- Upper and lower surfaces free of damage, no fore/aft play
- Aileron condition, full travel, pushrod connected
- Airbrake condition, travel, fit, and locking; box clear

3 – Inspection port
- Ailerons and airbrakes connected and secured with spring clips
- Check for foreign bodies

4 – Fuselage
- Check for damage, especially bottom
- Static ports, TE/venturi tube clear

5 – Tail
- Tailplane properly assembled and secured, pushrod connected, clip
- Rudder properly assembled and secured, cables connected
- Tail wheel 36 psi

6 – Fuselage: same as (4)

7 – Right Wing: same as (2)

8 – Cockpit area/Nose: complete exterior inspection, pitot tube clear

Front Seat Ballast:

# Lead Disks	Min Pilot Wt	# Lead Disks	Min Pilot Wt	# Lead Disks	Min Pilot Wt
0	154.3	5	140.5	10	126.8
1	151.6	6	137.8	11	124.0
2	148.8	7	135.0	12	121.2
3	146.6	8	132.3		
4	143.3	9	129.5		

25 July 2025

Skyline Soaring
ASK-21 Cockpit Guide

N341KS

Rigging / Derigging Checklist

Rigging the ASK 21 can be carried out by four persons without mechanical assistance, and by three persons with the use of a fuselage stand or wing support. The assembly tool bag should always be kept in the right wing root storage area when assembled, and in the rear seat when disassembled.

Prior to rigging, clean and grease all pins, bolts, bushings and control systems connections.

1 – Set up the fuselage and hold it horizontal.

2 – Plug the spar fork of the left wing into the fuselage, aligning the fuselage lift pins in the wing root receivers, and place a wing support under the wing end.

3 – Offer up the right wing and align the main pin fittings.

4 – Press in the main pins and secure. Never insert the rear wing attachment pins prior to the main pins.

5 – Press in the rear wing attachment pins; unscrew the T-tool and check that the safety locks are engaged.

6 – Connect and lock the aileron control linkages in the fuselage behind the spar tunnel. You must be able to touch the ball pivot by feeling through the slot in the socket. Check the proper engagement of the safety lock by pushing it on to close.

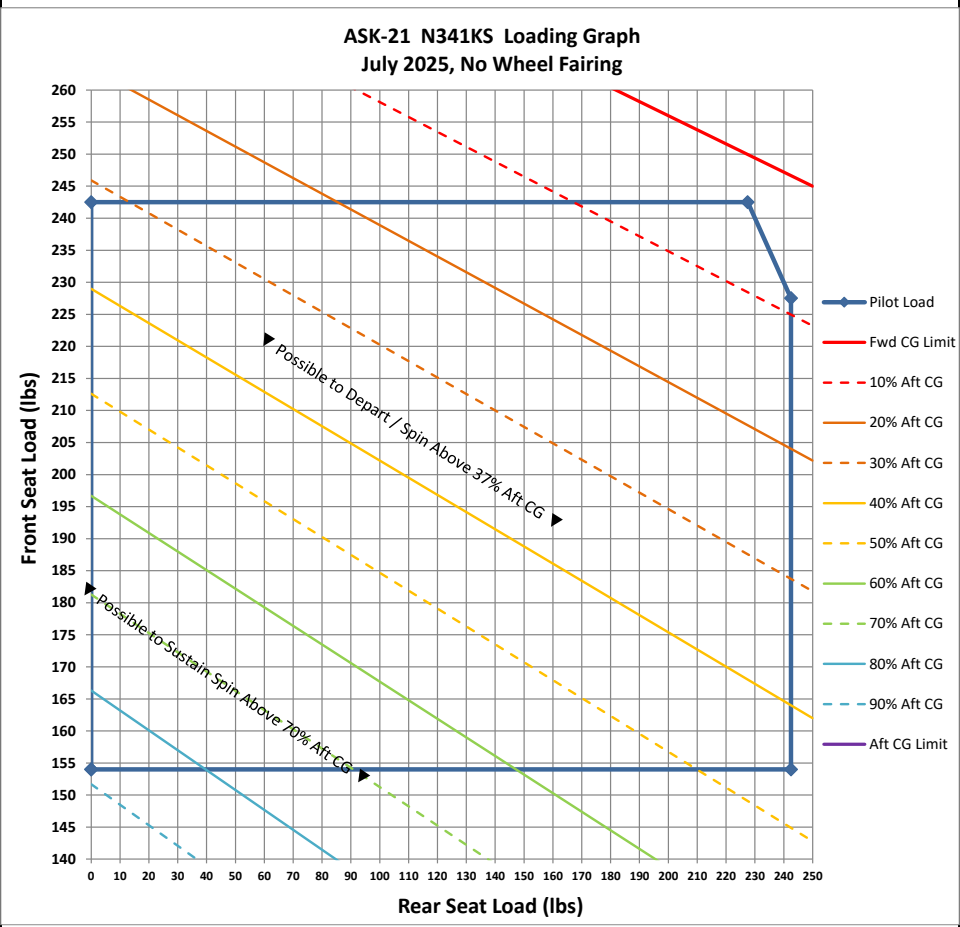
7 – Connect and lock the airbrake control linkages in the fuselage behind the spar tunnel.

8 – The tailplane is fitted onto the fin from the front. Engage the roller bearing into the elevator pushrod slot, drop the mounting brace into the front edge of the vertical tunnel, then seat the lift and alignment pins by pushing the elevator aft. Screw in the Allen bolt at the leading edge until tightly seated and the spring-loaded safety pin snaps into the castellated screw head.

9 – Tape wing roots, rudder/elevator seam, and elevator attach point.

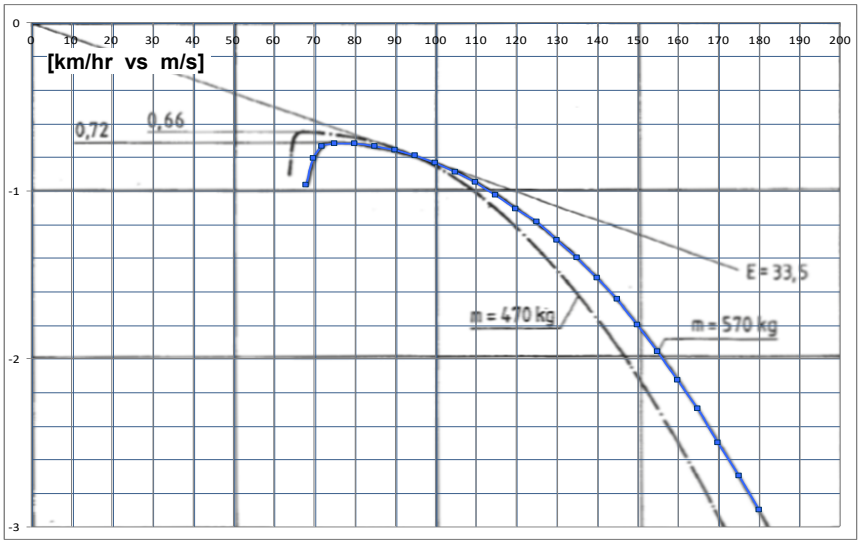
10 – Conduct a thorough preflight inspection and Positive Control Check.

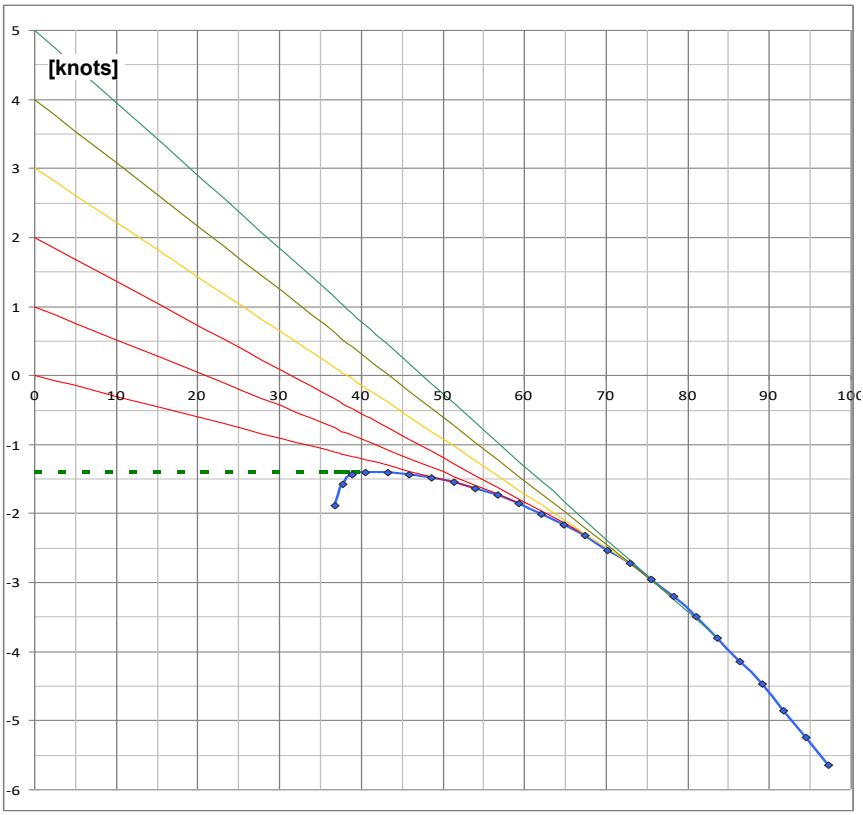
De-rigging is carried out in the reverse sequence to that of rigging. It must be taken care that the rear wing attachment pins have to be removed prior to the main pins. Remember to disconnect batteries!



July 2025 Weight and Balance
Empty Weight = 852.8 lbs
Empty Moment = 24,773.1 in-lbs
Empty CG = 29.0 in

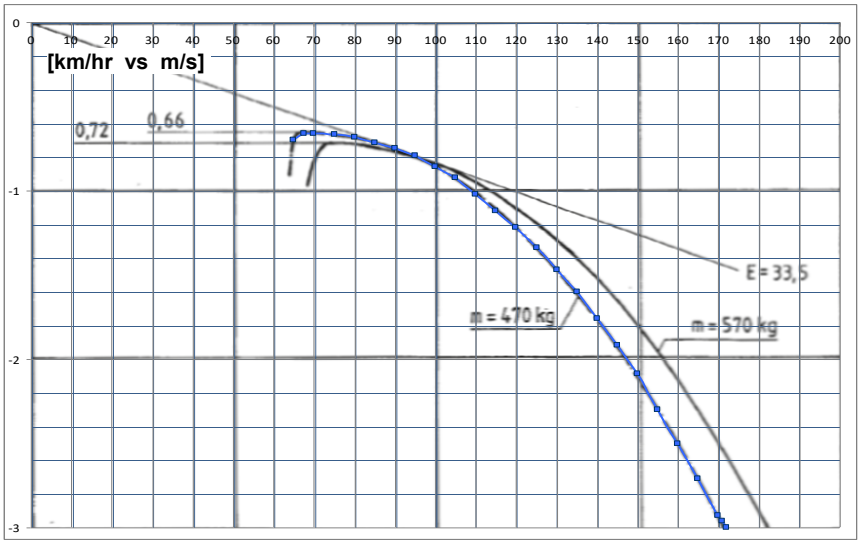
ASK-21 Polar, Dual

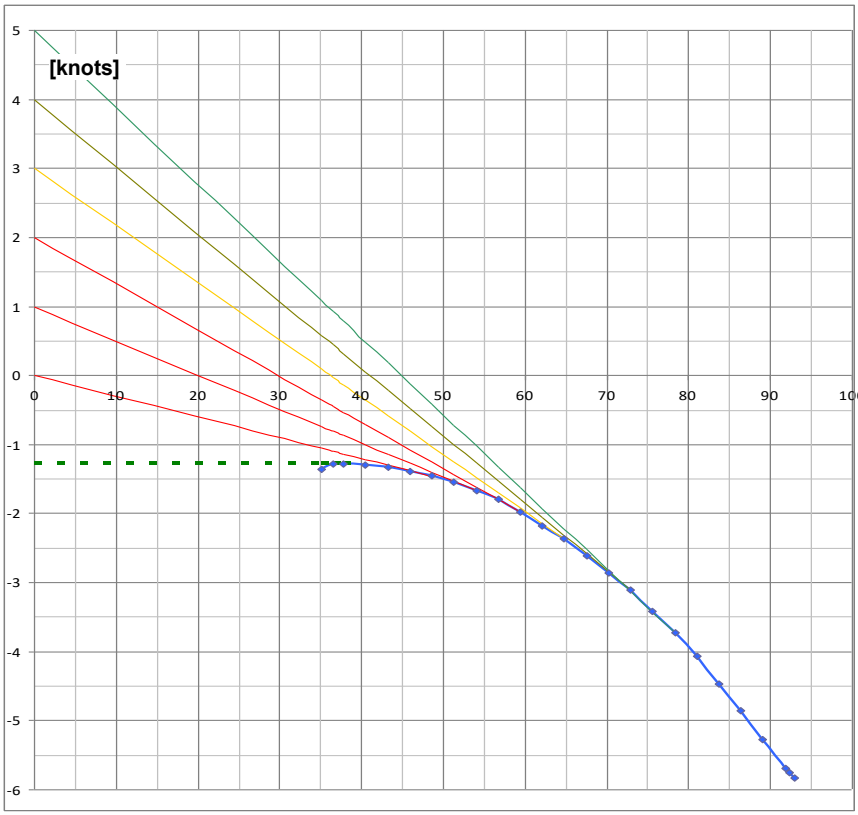




25 July 2025

ASK-21 Polar, Solo





25 July 2025

Skyline Soaring
ASK-21 Cockpit Guide

N321K

KFRR (Front Royal)	123.0 / wx 121.850	KOKV (Winchester)	122.975 / wx 124.85
FBO: 540-635-5370	AWOS: 540-635-5377	KLUA (Luray)	122.8 / wx 118.275
Skyline Ground	123.3	8W2 (New Market)	122.8 / wx 118.175
Potomac Approach	120.45	KSHD (Shenandoah)	123.0 / wx 124.925

Before Takeoff Checklists

A BB CCCC DDD E

A - Altimeter

B - Ballast (incl tail)
B - Belts

C - Controls, Flaps, Trim
C - Comm
C - Connect Towrope
C - Canopy

D - Dolly
D - Dive Brakes
D - Direction of Wind

E - Emergency Plan

or

CB SWIFTT CCBE

C - Controls
B - Ballast (incl tail)

S - Straps
W - Winds
I - Instruments
F - Flaps
T - Trim
T - Tail Dolly

C - Connect Towrope
C - Canopy
B - Brakes
E - Emergency Plan

Final Check – Canopies, Spoilers, Dolly

Before Landing

FUSTALL

F - Flaps
U - Undercarriage
S - Speed
T - Trim
A - Airbrakes
L - Lookout
L - Landing

	Dual / Solo
Stall	39 / 36
Stall Spoilers	42 / 38
Min Sink	42 / 38
Rec Apch (POH)	49+
Best L/D	50 / 48
Pattern	55+
Aero Tow	97
Maneuver	97
Rough Air	108
Never Exceed	151
G Limits @Vm	+6.5 / -4.0
G Limits @Vne	+5.3 / -3.0
Pilot Wt	154-242F,0-242R,460T
Max XW	N/A
Flight in Precip	+5 kts

Speed to Fly (Dual):

Sink (K)	0	1	2	3	4	5
Airspeed	50	59	68	73	78	84
Glider Sink	1.5	1.9	2.2	2.7	3.2	3.8
Total Sink	1.5	2.9	4.2	5.7	7.2	8.8
Glide Ratio	33	21	16	13	11	9

Speed to Fly (Solo):

Sink (K)	0	1	2	3	4	5
Airspeed	48	54	59	65	73	78
Glider Sink	1.4	1.7	2.0	2.4	3.1	3.7
Total Sink	1.4	2.7	4.0	5.4	7.1	8.7
Glide Ratio	33	20	15	12	10	9

Min Sink Speed by Bank Angle: (Dual / Solo)

0 deg	15 deg	30 deg	45 deg	60 deg
42/37	43/38	45/40	50/44	59/52

Never Exceed Speed (Vne) by Altitude:

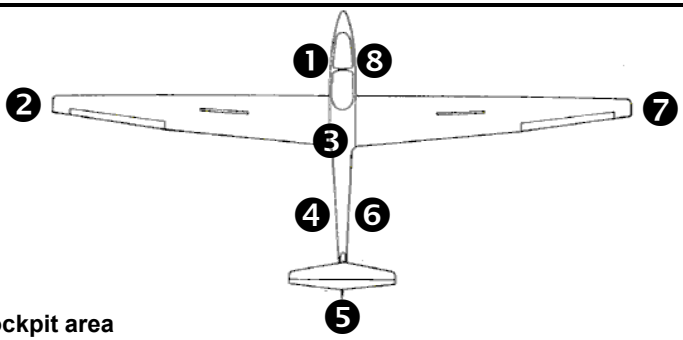
SL	5 K	10 K	15 K	20 K
151	151	144	132	121

25 July 2025

Skyline Soaring
ASK-21 Cockpit Guide

N321K

Daily Inspection / Pre-Flight Checklist



1 – Cockpit area
- Canopy condition, latches operable, main pins secured, vents & rails
- Ballast removed from seat and bolt-in positions, or set for flight
- Battery secure, radio and instruments operable
- Main spar pins in place and secured, hydraulic reservoir level OK
- Check for foreign bodies or loose items
- Documents in place (AROW), land-out tool bag in right wing root
- Flight controls free, clear, proper movement against load
- Rudder S-tubes proper and tight fit, adjust mechanism functions
- Release mechanisms engage, release, cables return, pivot arm free
- Nose tire 28 psi, main tire 38 psi, wheel brake engages and effective

2 – Left wing
- Upper and lower surfaces free of damage, no fore/aft play
- Aileron condition, full travel, pushrod connected
- Airbrake condition, travel, fit, and locking; box clear

3 – Inspection port
- Ailerons and airbrakes connected and secured with spring clips
- Check for foreign bodies

4 – Fuselage
- Check for damage, especially bottom
- Static ports, TE/venturi tube clear

5 – Tail
- Tailplane properly assembled and secured, pushrod connected, clip
- Rudder properly assembled and secured, cables connected
- Tail wheel 36 psi

6 – Fuselage: same as (4)

7 – Right Wing: same as (2)

8 – Cockpit area/Nose: complete exterior inspection, pitot tube clear

Front Seat Ballast:

# Lead Disks	Min Pilot Wt	# Lead Disks	Min Pilot Wt	# Lead Disks	Min Pilot Wt
0	154.3	5	140.5	10	126.8
1	151.6	6	137.8	11	124.0
2	148.8	7	135.0	12	121.2
3	146.6	8	132.3		
4	143.3	9	129.5		

25 July 2025

Skyline Soaring
ASK-21 Cockpit Guide

N321K

Rigging / Derigging Checklist

Rigging the ASK 21 can be carried out by four persons without mechanical assistance, and by three persons with the use of a fuselage stand or wing support. The assembly tool bag should always be kept in the right wing root storage area when assembled, and in the rear seat when disassembled.

Prior to rigging, clean and grease all pins, bolts, bushings and control systems connections.

1 – Set up the fuselage and hold it horizontal.

2 – Plug the spar fork of the left wing into the fuselage, aligning the fuselage lift pins in the wing root receivers, and place a wing support under the wing end.

3 – Offer up the right wing and align the main pin fittings.

4 – Press in the main pins and secure. Never insert the rear wing attachment pins prior to the main pins.

5 – Press in the rear wing attachment pins; unscrew the T-tool and check that the safety locks are engaged.

6 – Connect and lock the aileron control linkages in the fuselage behind the spar tunnel. You must be able to touch the ball pivot by feeling through the slot in the socket. Check the proper engagement of the safety lock by pushing it on to close.

7 – Connect and lock the airbrake control linkages in the fuselage behind the spar tunnel.

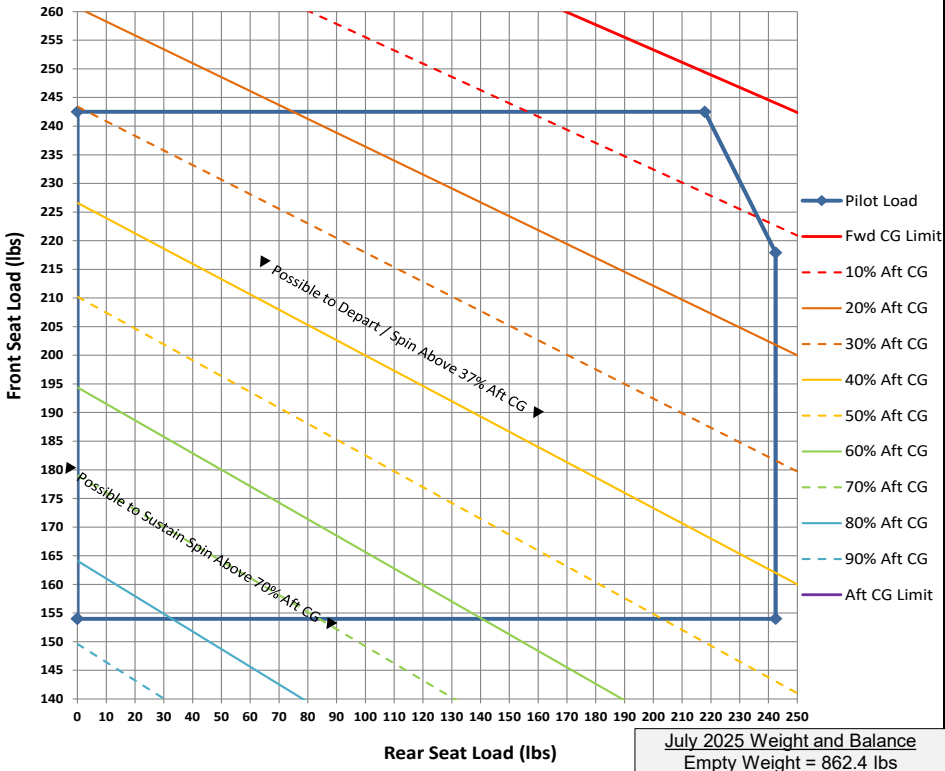
8 – The tailplane is fitted onto the fin from the front. Engage the roller bearing into the elevator pushrod slot, drop the mounting brace into the front edge of the vertical tunnel, then seat the lift and alignment pins by pushing the elevator aft. Screw in the Allen bolt at the leading edge until tightly seated and the spring-loaded safety pin snaps into the castellated screw head.

9 – Tape wing roots, rudder/elevator seam, and elevator attach point.

10 – Conduct a thorough preflight inspection and Positive Control Check.

De-rigging is carried out in the reverse sequence to that of rigging. It must be taken care that the rear wing attachment pins have to be removed prior to the main pins. Remember to disconnect batteries!

ASK-21 N321K Loading Graph
July 2025 - No Spin Weights, No Wheel Fairing



July 2025 Weight and Balance
Empty Weight = 862.4 lbs
Empty Moment = 24,870.3 in-lbs
Empty CG = 28.84 in

N321K Spin training CG goal ~ 16 in (~ 73%)

Nbr Disks for 73%	Rear Seat Weight																			
	154	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240	242
Front Seat Wt 154	4	4	4	5	5	5	5	6	6	6	6	6	7	7	7	7	8	8	8
160	5	5	5	6	6	6	6	6	7	7	7	7	8	8	8	8	8	9	9
165	6	6	6	6	7	7	7	7	7	8	8	8	8	9	9	9	9	9	10
170	6	7	7	7	7	8	8	8	8	8	9	9	9	9	10	10	10	10	10
175	7	7	8	8	8	8	8	9	9	9	9	10	10	10	10	10	11	11	11
180	8	8	8	9	9	9	9	9	10	10	10	10	11	11	11	11	11	12	12
185	9	9	9	9	10	10	10	10	10	11	11	11	11	12	12	12	12	12	12
190	9	10	10	10	10	10	11	11	11	11	12	12	12	12	12	72%	71%	70%	70%
195	10	10	11	11	11	11	11	12	12	12	12	72%	71%	71%	70%	69%	68%	11•64	10•60
200	11	11	11	12	12	12	12	12	72%	71%	70%	69%	69%	68%	67%	66%	11•62	9•54	8•50
205	12	12	12	12	72%	72%	71%	70%	69%	68%	68%	67%	66%	65%	65%	11•60	9•52	6•41	5•37
210	12	72%	71%	70%	70%	69%	68%	67%	66%	66%	65%	64%	63%	63%	11•58	9•51	6•39	4•31	3•28
215	70%	69%	69%	68%	67%	66%	65%	65%	64%	63%	62%	62%	61%	11•57	9•49	6•37	4•30	2•22	1•18
220	68%	67%	66%	65%	64%	63%	63%	62%	61%	60%	60%	59%	11•55	9•47	6•36	4•28	2•20	OW	OW
225	65%	64%	63%	62%	62%	61%	60%	59%	59%	58%	57%	11•53	9•45	6•34	4•26	2•18	OW	OW	OW
230	62%	61%	60%	60%	59%	58%	58%	57%	56%	55%	11•51	9•43	6•32	4•24	2•16	OW	OW	OW	OW
235	60%	59%	58%	57%	56%	56%	55%	54%	54%	11•49	9•41	6•30	4•22	2•14	OW	OW	OW	OW	OW
240	57%	56%	55%	55%	54%	53%	52%	52%	11•47	9•40	6•28	4•20	2•13	OW	OW	OW	OW	OW	OW
242	56%	55%	54%	53%	53%	52%	51%	51%	10•43	8•35	5•24	3•16	1•8	OW	OW	OW	OW	OW	OW

Provided as cross-check of spin weight configuration only. Spin training flights will only be conducted with an instructor, with specific CG calculation based on weigh-in.

Green integer is number of spin weights to reach 16" / 73% aft CG

Gray percentage is the aft CG with all 12 weights if less than 73% target for spin training

Red integer, a dot, and red percentage shows the max allowable number of weights and resulting cg

Red "OW" means that pilot weight combination with no weights at all is above max allowable flying weight

25 July 2025

Skyline Soaring
ASK-21 Spin Facts

N321K

Spin Quiz Discussion Guide

1) **What are the spin recovery steps? Recite from memory!**
   - **Full opposite rudder, neutral aileron**
   - **Pause**
   - **Ease stick forward (release back pressure)**
   - **Neutral rudder**
   - **Recover from dive**

2) **Approximate altitude loss per turn in a spin is 200 ± 50 ft**

3) **Approximate altitude loss during recovery is 260 ft**

4) **Failure to pause between rudder & stick forward will delay recovery**

5) **The amount of time to pause is approximately ½ turn**

6) **Full forward stick may delay or prevent recovery**

7) **Do not use spoilers during recovery, G limit with spoilers out is +3.5**

8) **Both pilots must weigh in and calculate CG and spin weight configuration not to exceed allowable max gross weight, CG position not aft of 16" or 73% of allowable aft CG, For this flight, pilot weights are _____ and _____ , the number of weights installed is _____ .**

9) **At KFRR, minimum altitude to initiate recovery is 2500' AGL (~3200' MSL over valley near airfield)**

10) **Ailerons and elevator control gaps must be sealed (taped)**

11) **When spin weights are not installed, the nut and safety clip must be on the front cockpit instrument panel stud**

12) **Normal spin entry is accomplished from 10 deg nose high, full rudder 2 knots above stall speed, hold full rudder and aft stick, neutral aileron**

13) **What is the difference between a spin and a spiral dive?**

14) **Have you read the entire text of the POH including TN4b, syllabus item 3h including references, Ops Manual par 3.17, and watched spin video clips?**

15) **What are the spin recovery steps? (again!)**

Skyline Soaring Club, Inc.	Skyline Soaring ASK-21 Spin Guide	N321K

Spin Checklist

Preflight

- Spin weights calculated, installed
- Check aileron and elevator gaps taped
- Remove land-out kit and any unneeded items
- Check batteries securely locked down
- Tow pilot brief – 4000' min, 5000' recommended, dropoff point (Pawnee preferred)

Before Spins

- Slow flight to stall and recovery
- Nose-high stall, note stall airspeed, recovery
- HASSLL checks
  - Height (suitable for planned maneuvers)
  - Aircraft (vents closed, g-meters reset)
  - Straps (secure and tight)
  - Security (all loose items stowed, zippers closed)
  - Location (terrain below, distance from field)
  - Lookout (clear airspace, optional radio call)

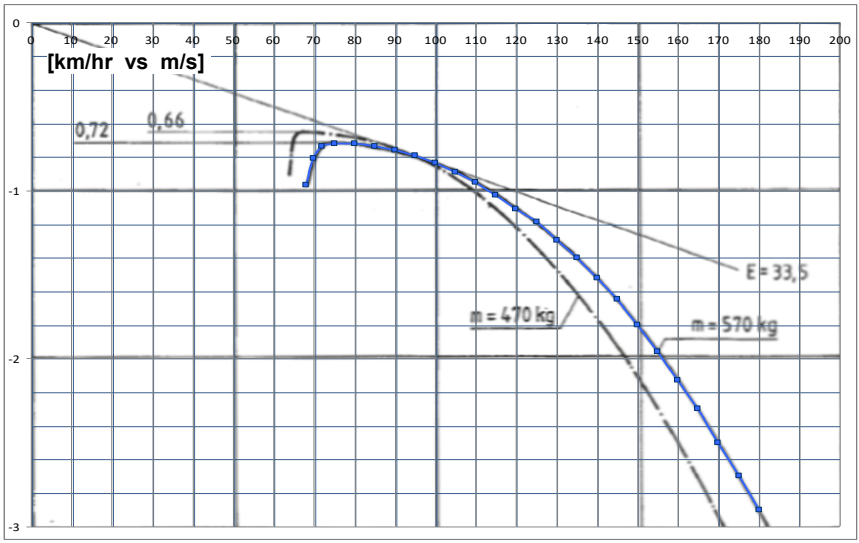
Spin

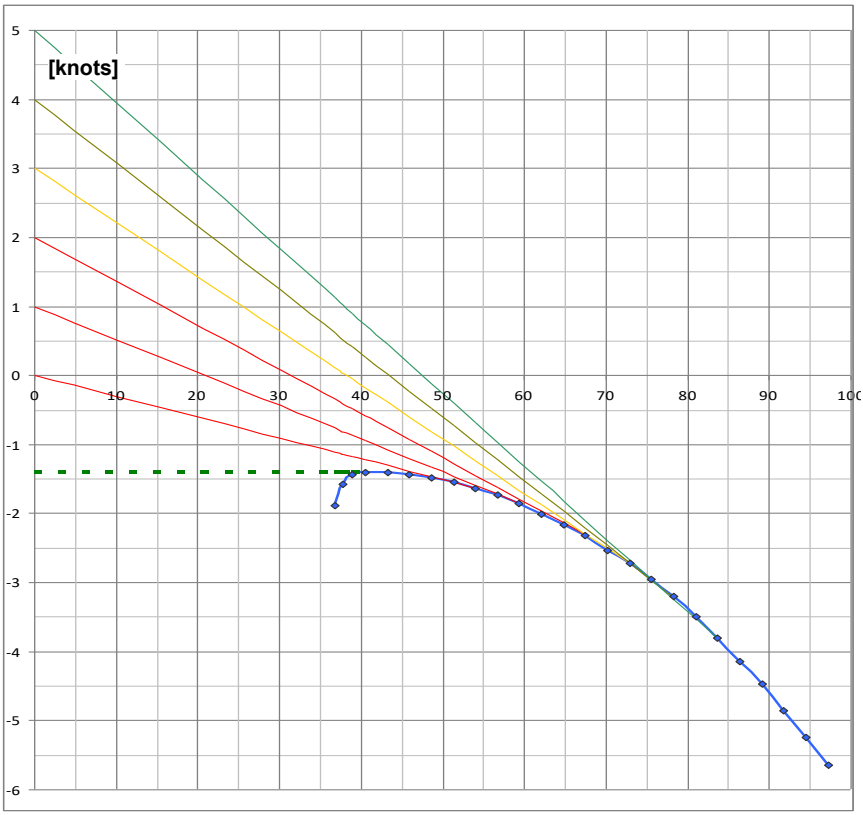
- Confirm planned entry, # turns, recovery altitude
- Recite spin recovery procedure
- Execute, recover, check g-meters
- Debrief
- Next maneuver

Post Flight

- Spin weights removed, nut/clip stored, holes taped
- Post flight inspection, especially control surfaces

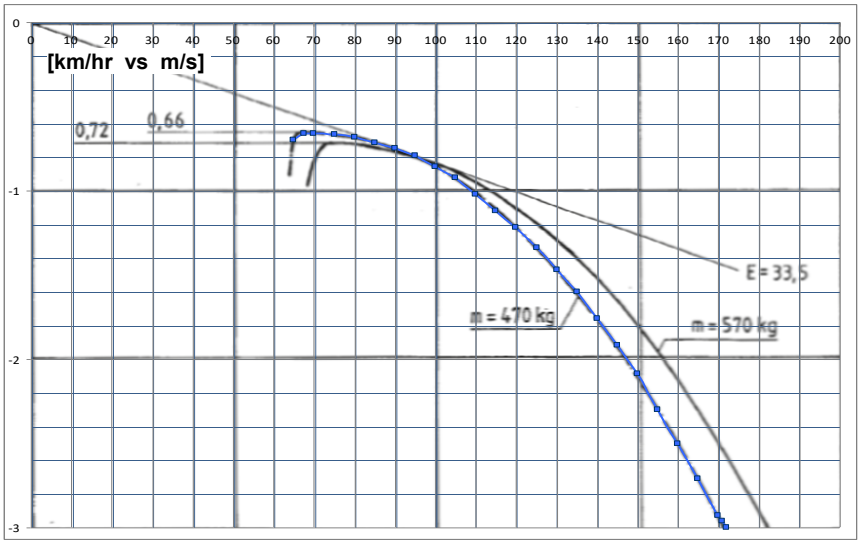
ASK-21 Polar, Dual

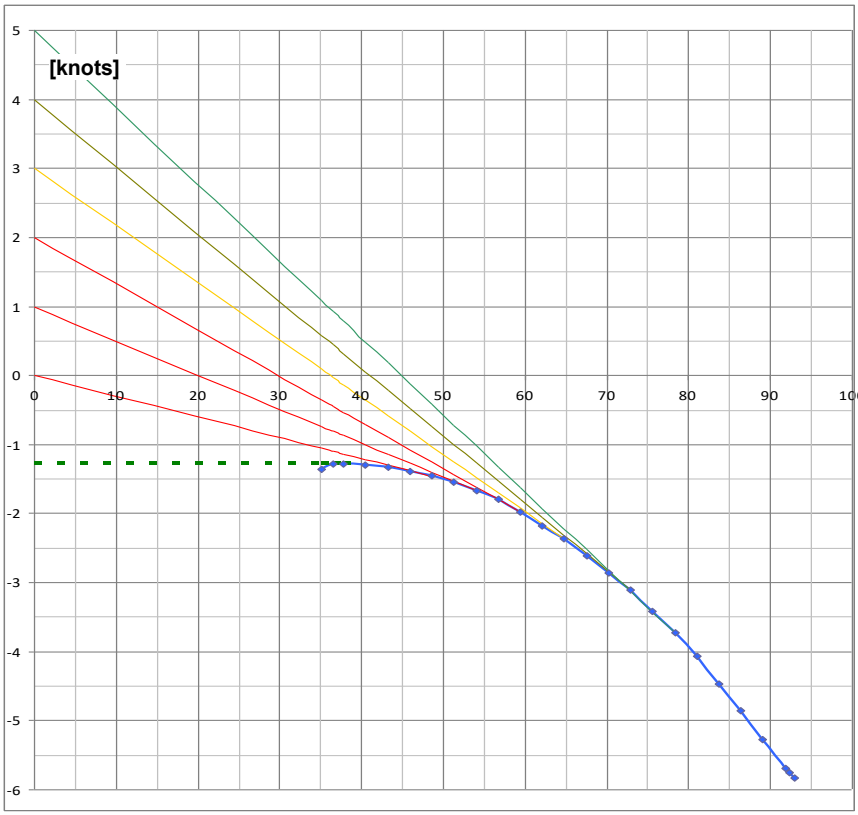




25 July 2025

ASK-21 Polar, Solo





25 July 2025

Skyline Soaring
DiscusCS Cockpit Guide

N520RJ (9Y)

KFRR (Front Royal)	123.0 / wx 121.850	KOKV (Winchester)	122.975 / wx 124.85
FBO: 540-635-5370	AWOS: 540-635-5377	KLUA (Luray)	122.8 / wx 118.275
Skyline Ground	123.3	8W2 (New Market)	122.8 / wx 118.175
Potomac Approach	120.45	KSHD (Shenandoah)	123.0 / wx 124.925

Before Takeoff Checklists

A BB CCCC DDD E

- A - Altimeter
- B - Ballast
- B - Belts
- C - Controls, Flaps, Trim
- C - Comm
- C - Connect Towrope
- C - Canopy
- D - Dolly
- D - Dive Brakes
- D - Direction of Wind
- E - Emergency Plan

or CB SWIFTT CCBE

- C - Controls
- B - Ballast
- S - Straps
- W - Winds
- I - Instruments
- F - Flaps
- T - Trim
- T - Tail Dolly
- C - Connect Towrope
- C - Canopy
- B - Brakes
- E - Emergency Plan

Final Check – Canopy, Spoilers, Dolly

Before Landing

FUBSTALL

- F - Flaps
- U - Undercarriage
- B - Ballast
- S - Speed
- T - Trim
- A - Airbrakes
- L - Lookout
- L - Landing

Stall	31-34 kts
Stall Heavy	45-48 kts
Min Sink	42 kts
Final Appch	51+ kts
Final Heavy	62+ kts
Best L/D	54 kts
Pattern	55+ kts
Max Aero Tow	97 kts
Maneuvering	108 kts
Never Exceed	135 kts
G Limits @Va	+5.3~-2.65
G Limits @Vne	+4.0~-1.5
Pilot + Chute Wt	162-242
SSC recommended min	174
Max Tested XW	11 kts

Speed to Fly (knots): *[no water ballast]*

Sink (K)	0	1	2	3	4	5
Airspeed	54	58	68	75	85	85
Glider Sink	1.2	1.3	2.0	2.3	2.9	2.9
Total Sink	1.2	2.3	4.0	5.3	6.9	7.9
Glide Ratio	43	24	18	14	12	11

Min Sink Speed by Bank Angle:

0 deg	15 deg	30 deg	45 deg	60 deg
43	44	46	51	61

Never Exceed Speed (Vne) by Altitude:

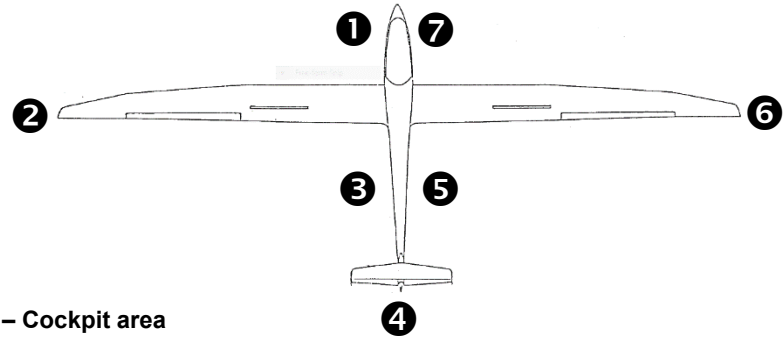
10K	15 K	20 K	25 K	30 K
135	133	123	113	104

25 July 2025

Skyline Soaring
DiscusCS Cockpit Guide

N520RJ (9Y)

Daily Inspection / Pre-Flight Checklist



1 – Cockpit area
- Canopy condition, latches operable
- Spar Pin Installed
- Oxygen Pressure Checked
- Battery secure, radio and instruments operable
- Seat back adjusted and secured
- Check for foreign bodies or loose items
- Documents in place
- Flight controls free, clear, proper movement against load
- Release mechanisms engage, release, cables return
- Main tire 50 psi, wheel brake engages and effective

2 – Left wing
- Upper and lower surfaces free of damage, no fore/aft play
- Aileron condition, full travel
- Airbrake condition, travel, fit, and locking
- Winglet Secure

3 – Fuselage
- Check for damage, especially bottom
- Static ports (front and rear)

4 – Tail
- Tailplane properly assembled and secure, taped
- Total Energy Probe Installed
- Rudder properly assembled and secured, cables connected
- Tail wheel 28 psi

5 – Fuselage: same as (3)

6 – Right Wing: same as (2)

7 – Cockpit area: complete exterior inspection

Skyline Soaring Club, Inc.	Skyline Soaring DiscusCS Cockpit Guide	N520RJ (9Y)

Rigging / Derigging Checklist

Setup Prep
- Trailer in location where assembly will not block other aircraft
- Trailer chocked, brake on, clamshell open, aft door down in contact
- Pull ramp out, fold center rail into place
- Tail boom unlashed , lifting strap available
- Wing dolly and wing stand assembled and ready
- Wipe clean and grease all wing and fuselage attach fittings &control fittings

Position Fuselage
- Roll fuselage out until tail wheel is at end of ramp
- Use lifting strap, lift tail boom, roll out until fuselage dolly at end of ramp
- Open canopy, remove rigging tool, screw into vertical tail assembly hole
- Confirm spoilers are closed but unlocked, dump valve closed (forward)
- Clean and lubricate main spar pin
- Remove strap securing fuselage to dolly

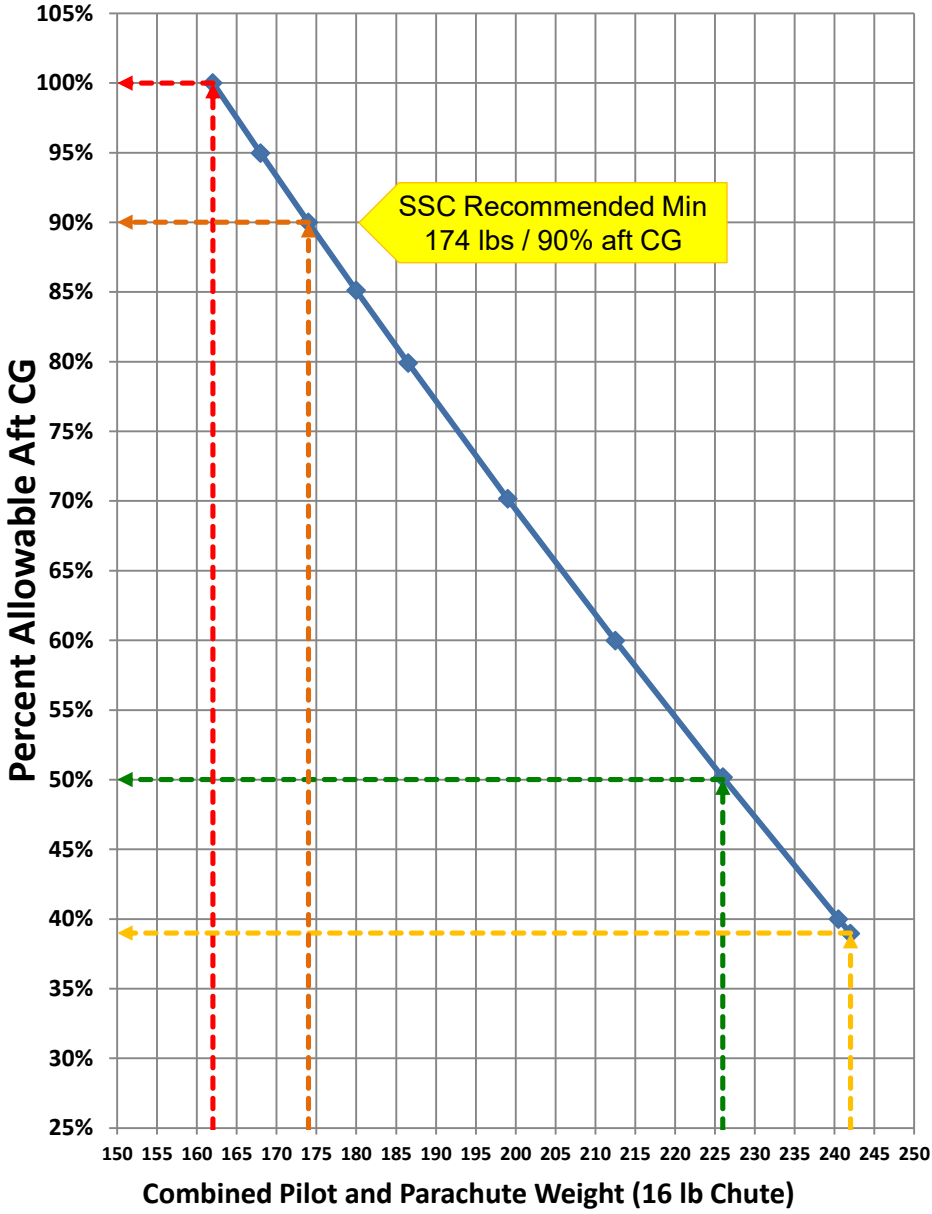
Mate Wings to Fuselage
- Position wing dolly parallel to fuselage at trailing edge of left wing fairing
- Lift and walk left wing out until it can be lowered into wing dolly
- Bend in leading edge of wing (fill port) should be just outside dolly cradle
- Position wing so spar lines up with hole, rotate cradle level, insert spar end
- Clean & lubricate both sides of fittings – 2 lift pins, spar end pins, main pin hole
- Align wing and push into place, insert main spar pin 1”, handle towards left
- Put wing stand under left wing, reposition dolly and repeat for right wing
- When both wings are seated, insert main spar pin fully, safety clip end

Attach Horizontal Stabilizer
- Clean and lubricate all fittings
- Insert aft edge of horizontal stabilizer against elevator control pins
- Pull on rigging tool, press down on leading edge until pin seats
- Remove rigging tool
- Install TE probe

Landing Gear
- Ensure fuselage dolly clear of gear door
- Crank ramp jackscrews to raise fuselage dolly enough for gear to extend
- Actuate landing gear handle to full forward position, confirm down & locked
- Remove tail stand and wing dollies or stands
- Lower ramp and fuselage dolly until weight is supported on gear

Final Prep
- Remove original wingtips, replace with winglet tips using rigging tool.
- Tape wing roots, wing tips, horizontal tail and tool hole
- Ensure parachute is in cockpit, rigging tool in side pocket
- Check required paperwork in cockpit
- Install and secure charged batteries, confirm radio and variometer work
- Lower ramp until weight is entirely on gear, roll glider clear
- Put equipment and ramp back in trailer and secure trailer
- Independent final assembly check – spar pin and clip, batteries secure, flight controls connected, canopy locks, release functional, brake functional
- Positive Control Check completed
- Canopy in place and properly secured

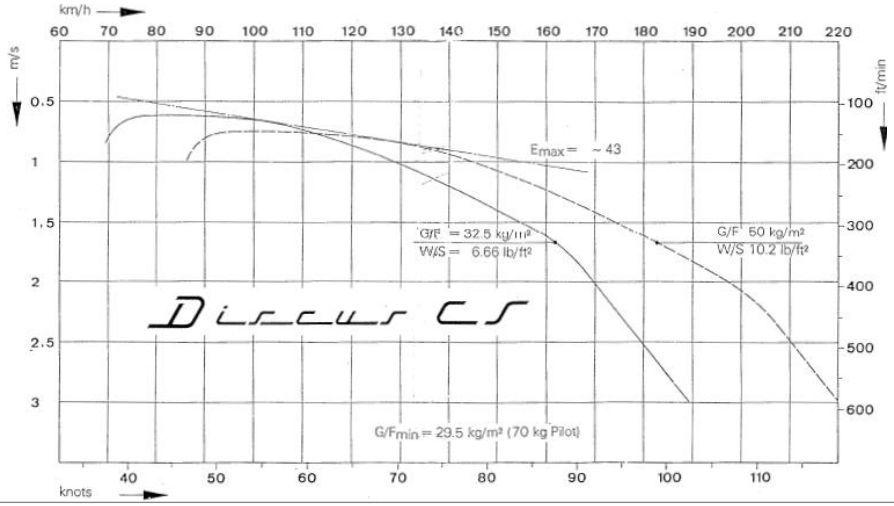
Discus CS N520RJ Loading Graph (19 May 2021)
With Oxygen Bottle, No Wing or Tail Water Ballast

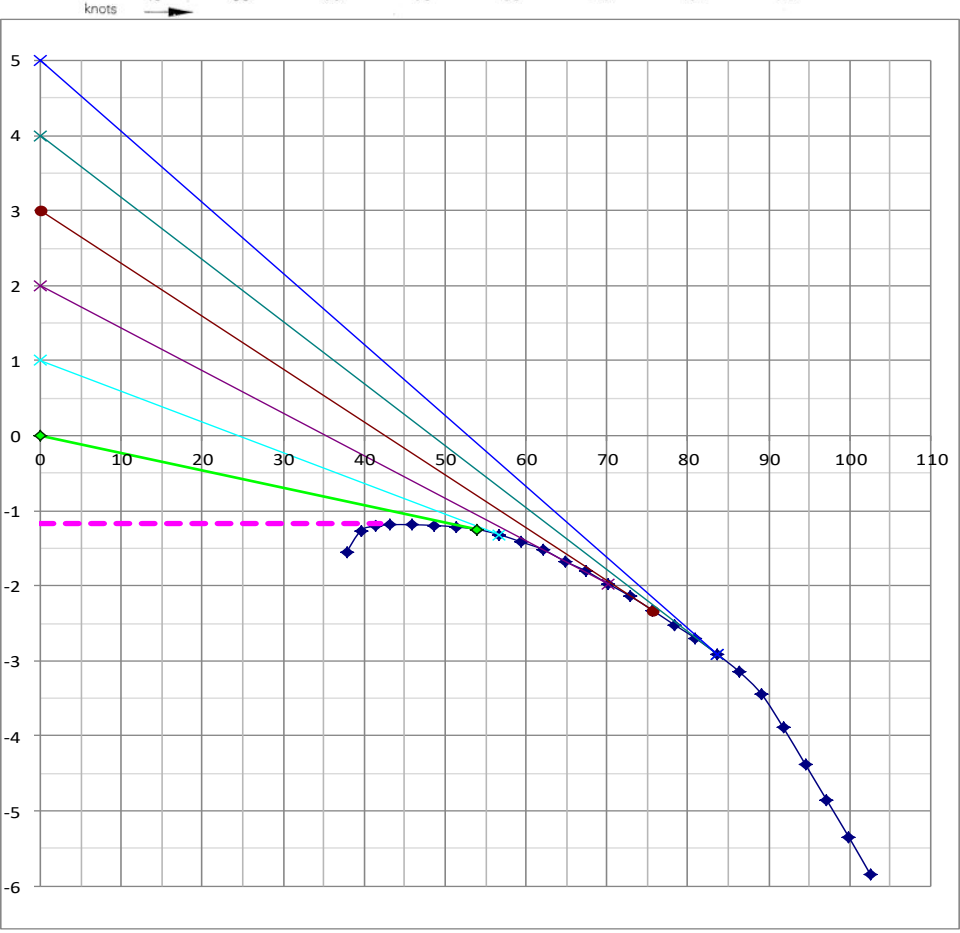


May 2021 Weight and Balance
Empty Weight = 554 lbs
Empty Moment = 14,148.0 in-lbs
Empty CG = 25.5 in

25 July 2025

Discus CS Polar (no ballast)





25 July 2025

Skyline Soaring
DiscusCS Cockpit Guide

N325AD (FW)

KFRR (Front Royal)	123.0 / wx 121.850	KOKV (Winchester)	122.975 / wx 124.85
FBO: 540-635-5370	AWOS: 540-635-5377	KLUA (Luray)	122.8 / wx 118.275
Skyline Ground	123.3	8W2 (New Market)	122.8 / wx 118.175
Potomac Approach	120.45	KSHD (Shenandoah)	123.0 / wx 124.925

Before Takeoff Checklists

A BB CCCC DDD E

- A - Altimeter
- B - Ballast
- B - Belts
- C - Controls, Flaps, Trim
- C - Comm
- C - Connect Towrope
- C - Canopy
- D - Dolly
- D - Dive Brakes
- D - Direction of Wind
- E - Emergency Plan

or CB SWIFTT CCBE

- C - Controls
- B - Ballast
- S - Straps
- W - Winds
- I - Instruments
- F - Flaps
- T - Trim
- T - Tail Dolly
- C - Connect Towrope
- C - Canopy
- B - Brakes
- E - Emergency Plan

Final Check – Canopy, Spoilers, Dolly

Before Landing

FUBSTALL

- F - Flaps
- U - Undercarriage
- B - Ballast
- S - Speed
- T - Trim
- A - Airbrakes
- L - Lookout
- L - Landing

Stall	31-34 kts
Stall Heavy	45-48 kts
Min Sink	42 kts
Final Appch	51+ kts
Final Heavy	62+ kts
Best L/D	54 kts
Pattern	55+ kts
Max Aero Tow	97 kts
Maneuvering	108 kts
Never Exceed	135 kts
G Limits @Va	+5.3~-2.65
G Limits @Vne	+4.0~-1.5
Pilot + Chute Wt	154-242

See loading chart for ballast

Max Tested XW 11 kts

Speed to Fly (knots): *[no water ballast]*

Sink (K)	0	1	2	3	4	5
Airspeed	54	58	68	75	85	85
Glider Sink	1.2	1.3	2.0	2.3	2.9	2.9
Total Sink	1.2	2.3	4.0	5.3	6.9	7.9
Glide Ratio	43	24	18	14	12	11

Min Sink Speed by Bank Angle:

0 deg	15 deg	30 deg	45 deg	60 deg
43	44	46	51	61

Never Exceed Speed (Vne) by Altitude:

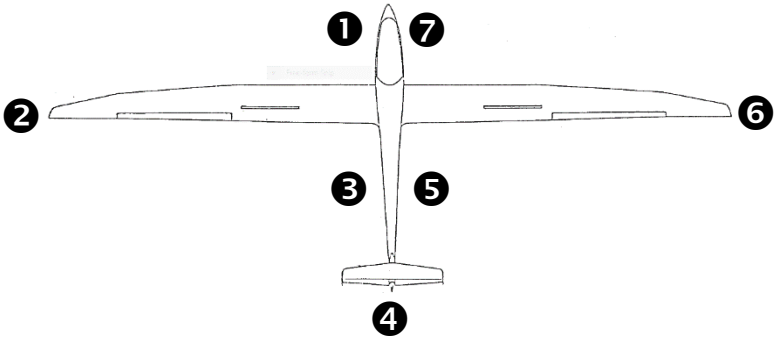
10K	15 K	20 K	25 K	30 K
135	133	123	113	104

25 July 2025

Skyline Soaring
DiscusCS Cockpit Guide

N325AD (FW)

Daily Inspection / Pre-Flight Checklist



1 – Cockpit area
- Canopy condition, latches operable
- Spar Pin Installed
- Oxygen Pressure Checked
- Battery secure, radio and instruments operable
- Seat back adjusted and secured
- Ballast plates proper and secured
- Check for foreign bodies or loose items
- Documents in place
- Flight controls free, clear, proper movement against load
- Release mechanisms engage, release, cables return
- Main tire 50 psi, wheel brake engages and effective

2 – Left wing
- Upper and lower surfaces free of damage, no fore/aft play
- Aileron condition, full travel
- Airbrake condition, travel, fit, and locking
- Winglet Secure

3 – Fuselage
- Check for damage, especially bottom
- Static ports (front and rear)

4 – Tail
- Tailplane properly assembled and secure, taped
- Total Energy Probe Installed
- Rudder properly assembled and secured, cables connected
- Tail wheel 28 psi

5 – Fuselage: same as (3)

6 – Right Wing: same as (2)

7 – Cockpit area: complete exterior inspection

Skyline Soaring DiscusCS Cockpit Guide

N325AD (FW)

Rigging / Derigging Checklist

Setup Prep
- Trailer in location where assembly will not block other aircraft
- Trailer chocked, brake on, clamshell open, aft door down in contact
- Pull ramp out, fold center rail into place, fit tail ramp extension
- Tail boom unlashed
- Wing dolly and wing stand assembled and ready
- Wipe clean and grease all wing and fuselage attach fittings &control fittings

Position Fuselage
- Roll fuselage out until tail wheel on ground and fuselage dolly at end of ramp
- Remove tail wheel ramp
- Open canopy, remove rigging tool, screw into vertical tail assembly hole
- Confirm spoilers are closed but unlocked, dump valve closed (forward)
- Clean and lubricate main spar pin
- Remove strap securing fuselage to dolly

Mate Wings to Fuselage
- Position wing dolly parallel to fuselage at trailing edge of left wing fairing
- Lift and walk left wing out until it can be lowered into wing dolly
- Bend in leading edge of wing (fill port) should be just outside dolly cradle
- Position wing so spar lines up with hole, rotate cradle level, insert spar end
- Clean & lubricate both sides of fittings – 2 lift pins, spar end pins, main pin hole
- Align wing and push into place, insert main spar pin 1”, handle towards left
- Put wing stand under left wing, reposition dolly and repeat for right wing
- When both wings are seated, insert main spar pin fully, safety clip end

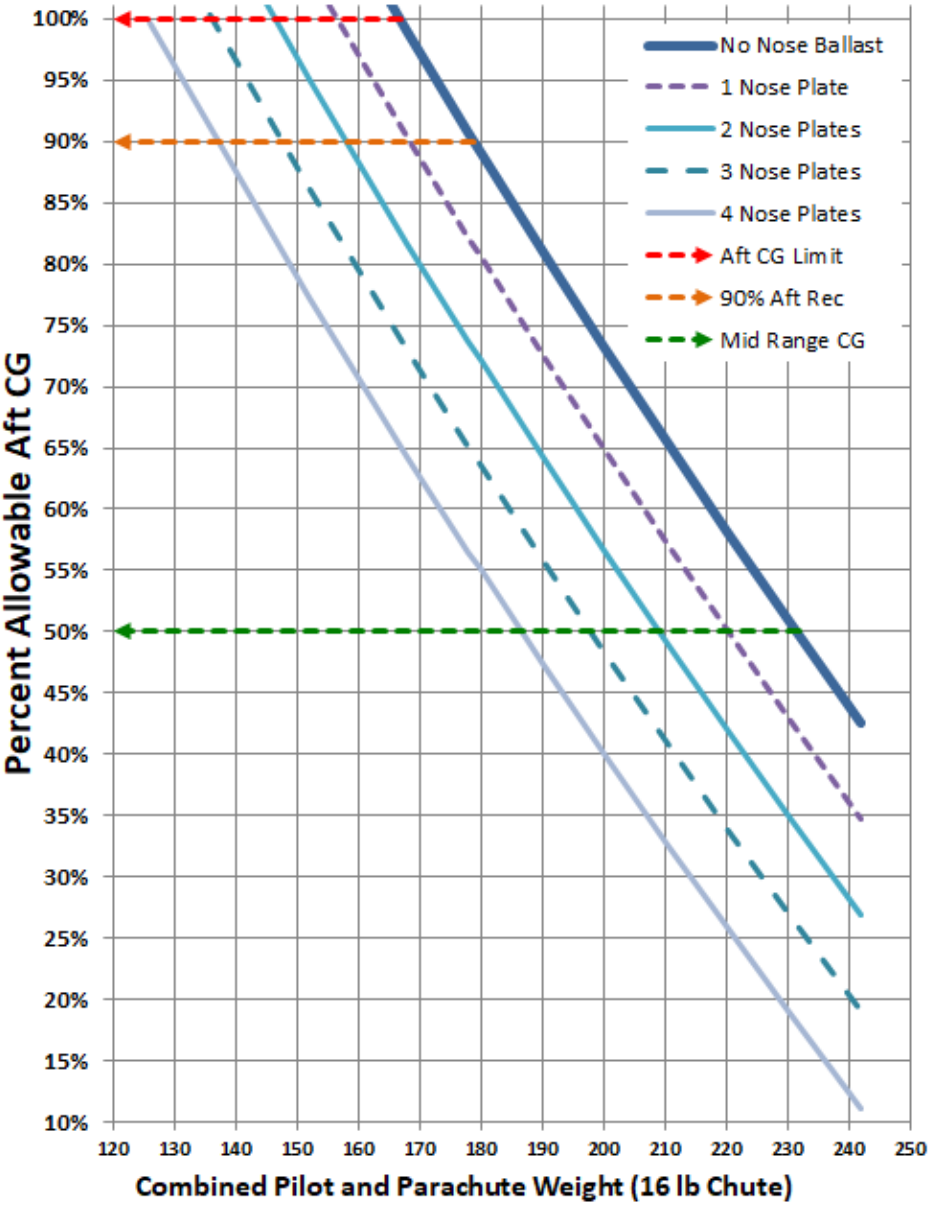
Attach Horizontal Stabilizer
- Clean and lubricate all fittings
- Insert aft edge of horizontal stabilizer against elevator control pins
- Pull on rigging tool, press down on leading edge until pin seats
- Remove rigging tool
- Install TE probe and pitot head

Landing Gear
- Ensure fuselage dolly clear of gear door
- Crank ramp jackscrews to raise fuselage dolly enough for gear to extend
- Actuate landing gear handle to full forward position, confirm down & locked
- Remove tail stand and wing dollies or stands
- Lower ramp and fuselage dolly until weight is supported on gear

Final Prep
- Remove original wingtips, replace with winglet tips using rigging tool.
- Tape wing roots, wing tips, horizontal tail and tool hole
- Ensure parachute is in cockpit, rigging tool in side pocket
- Check required paperwork in cockpit
- Install and secure charged batteries, confirm radio and variometer work
- Lower ramp until weight is entirely on gear, roll glider clear
- Put equipment and ramp back in trailer and secure trailer
- Independent final assembly check – spar pin and clip, batteries secure, flight controls connected, canopy locks, release functional, brake functional
- Positive Control Check completed
- Canopy in place and properly secured

Discus CS N325AD Loading Graph (11 Oct 2023)

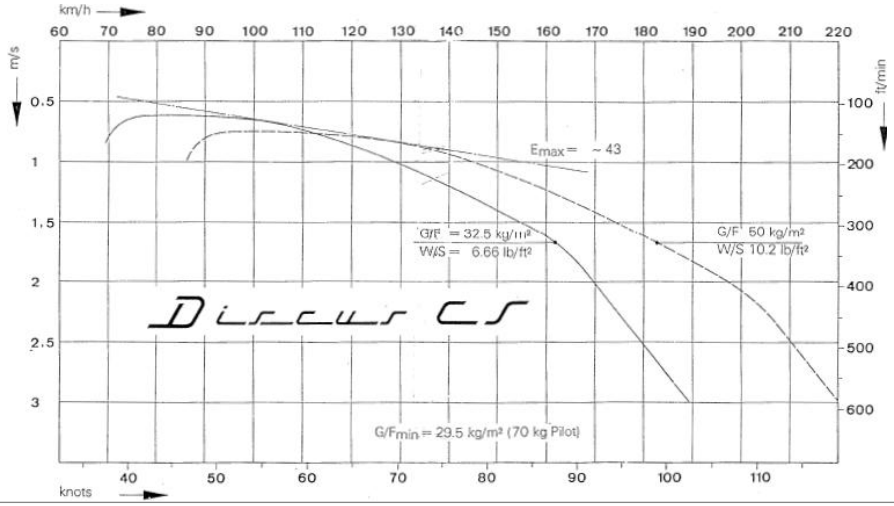
No Oxygen Bottle, No Water Ballast

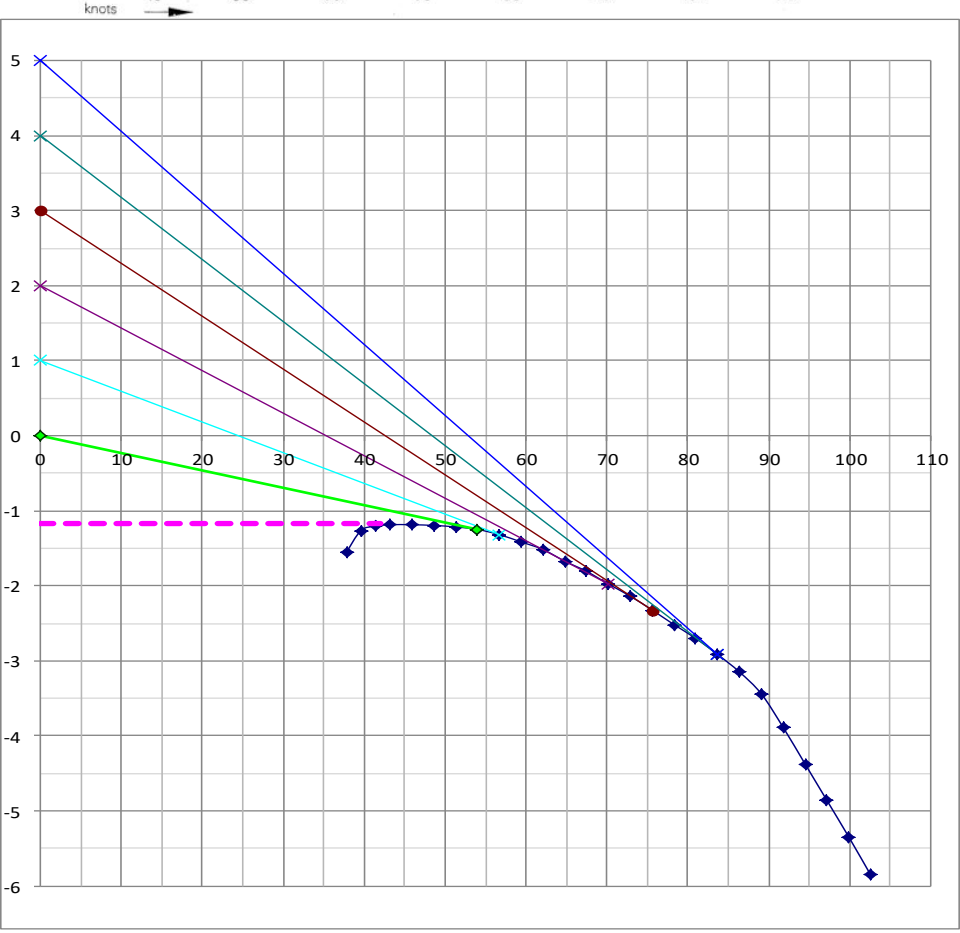


Oct 2023 Weight and Balance
Empty Weight = 554.0 lbs
Empty Moment = 14,308.0 in-lbs
Empty CG = 25.8 in

25 July 2025

Discus CS Polar (no ballast)





25 July 2025

Skyline Soaring
PW-5 Cockpit Guide

N505CC

KFRR (Front Royal)	123.0 / wx 121.850	KOKV (Winchester)	122.975 / wx 124.85
FBO: 540-635-5370	AWOS: 540-635-5377	KLUA (Luray)	122.8 / wx 118.275
Skyline Ground	123.3	8W2 (New Market)	122.8 / wx 118.175
Potomac Approach	120.45	KSHD (Shenandoah)	123.0 / wx 124.925

Before Takeoff Checklists

A BB CCCC DDD E

- A - Altimeter
- B - Ballast
- B - Belts
- C - Controls, Flaps, Trim
- C - Comm
- C - Connect Towrope
- C - Canopy
- D - Dolly
- D - Dive Brakes
- D - Direction of Wind
- E - Emergency Plan

or

CB SWIFTT CCBE

- C - Controls
- B - Ballast
- S - Straps
- W - Winds
- I - Instruments
- F - Flaps
- T - Trim
- T - Tail Dolly
- C - Connect Towrope
- C - Canopy
- B - Brakes
- E - Emergency Plan

Final Check – Canopy, Spoilers

Before Landing

FUSTALL

- F - Flaps
- U - Undercarriage
- S - Speed
- T - Trim
- A - Airbrakes
- L - Lookout
- L - Landing

Stall	26-36 kts
Min Sink	43 kts
Final Appch	51+ kts
Best L/D	48 kts
Pattern	55+ kts
Max Winch	65 kts
Max Aero Tow	81 kts
Maneuvering	81 kts
Never Exceed	121 kts
G Limits @Va	+5.3~-2.65
G Limits @Vne	+4.0~-1.5
Pilot Weight	130-223 lb
(see loading chart)	
Max Crosswind	12 kts

Speed to Fly (knots): *[no water ballast]*

Sink (K)	0	1	2	3	4	5
Airspeed	48	55	60	65	68	70
Glider Sink	1.5	1.9	2.1	2.5	2.7	2.9
Total Sink	1.5	1.9	4.1	5.5	6.7	7.9
Glide Ratio	32	19	14	12	10	9

Min Sink Speed by Bank Angle:

0 deg	15 deg	30 deg	45 deg	60 deg
43	44	46	51	61

Never Exceed Speed (Vne) by Altitude:

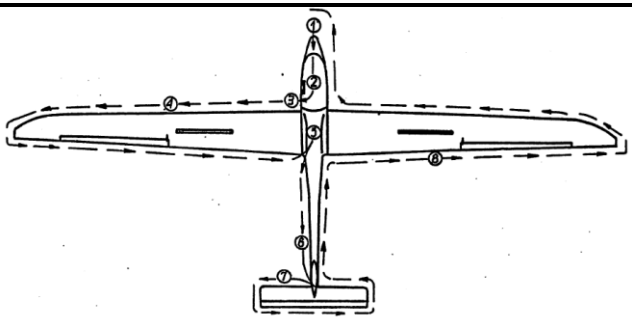
SL	10 K	15 K	20 K	25 K
121	121	112	103	94

25 July 2025

Skyline Soaring
PW-5 Cockpit Guide

N505CC

Daily Inspection / Pre-Flight Checklist



1 – Front fuselage condition, pressure ports clear

2 – Cockpit area

- **Canopy condition, latches operable**
- **Wing connection bolts inserted and secured**
- **Instruments condition and connections**
- **Check controls – elevator, rudder, aileron - deflection, play, friction**
- **Check air brake – full extension and locks closed**
- **Check trim operations**
- **Check operation of front and CG hooks**
- **Cable end connections for release, pedal adjust, canopy jettison**
- **Remove unsecured items**
- **Safety belts, back rest, cushions**

3 – Pneumatics and wheels – pressure, movement, brake, shocks

- **50 psi main, 30 psi nose wheel**

4 – Wings

- **Check condition top and bottom, leading and trailing edges**
- **Aileron surfaces, suspension, play, deflection, friction**
- **Airbrake condition, play, extension, retraction, cap fit**

5 – Check control connections – ailerons and airbrakes, then tape cover

6 – Rear fuselage

- **Fuselage condition, especially bottom and tail skid**
- **Rudder and fabric condition, upper hinge and cable fitting secure**

7 – Tailplane fitting, securing, surface condition

- **Elevator condition, deflection, play, friction**

8– Right Wing: same as (4)

Skyline Soaring
PW-5 Cockpit Guide

N505CC

Rigging / Derigging Checklist

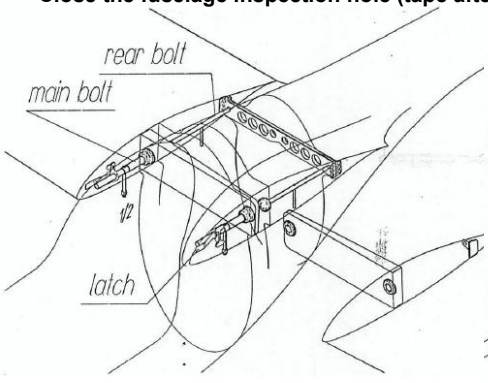
Setup Prep
- Trailer in location where assembly will not block other aircraft
- Trailer chocked, brake on, door open, jack stands in place
- Tail boom unlashed , lifting strap available
- Wing stand assembled and ready
- Wipe clean and grease all wing and fuselage attach fittings &control fittings

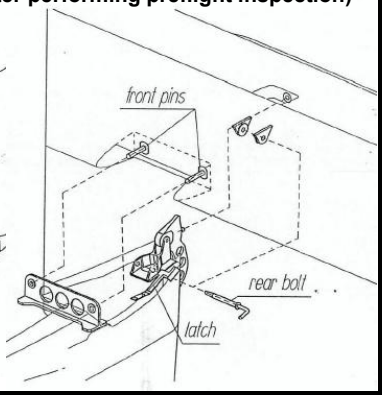
Position Fuselage
- Position fuselage in support cradle
- Open canopy
- Put airbrake cockpit lever full aft
- Open fuselage inspection hatch

Mate Wings to Fuselage
- Position right wing so spar lines up with hole, insert spar end
- Fit together wing and fuselage fittings
- Insert right-hand main bolt to ½ location (bolt lever locate in grip)
- Insert left-hand main bolt to ½ location
- Insert right rear bolt to stop
- Caution – Bolts shall be inserted by hand only, no tools allowed
- Support right wing tip on wing stand
- Position left wing, insert spar end, fit together wing and fuselage fittings
- Insert rear bolt to stop
- Insert left-hand main bolt to stop and secure with latch
- Insert right-hand main bolt to stop and secure with latch
- Connect control systems of ailerons and airbrakes

Rig the Tailplane
- Deflect rudder full right
- Fit tailplane to fuselage, engage front pints in fuselage fittings
- Insert rear bolt, by depressing latch, pull and release pin, secure latch

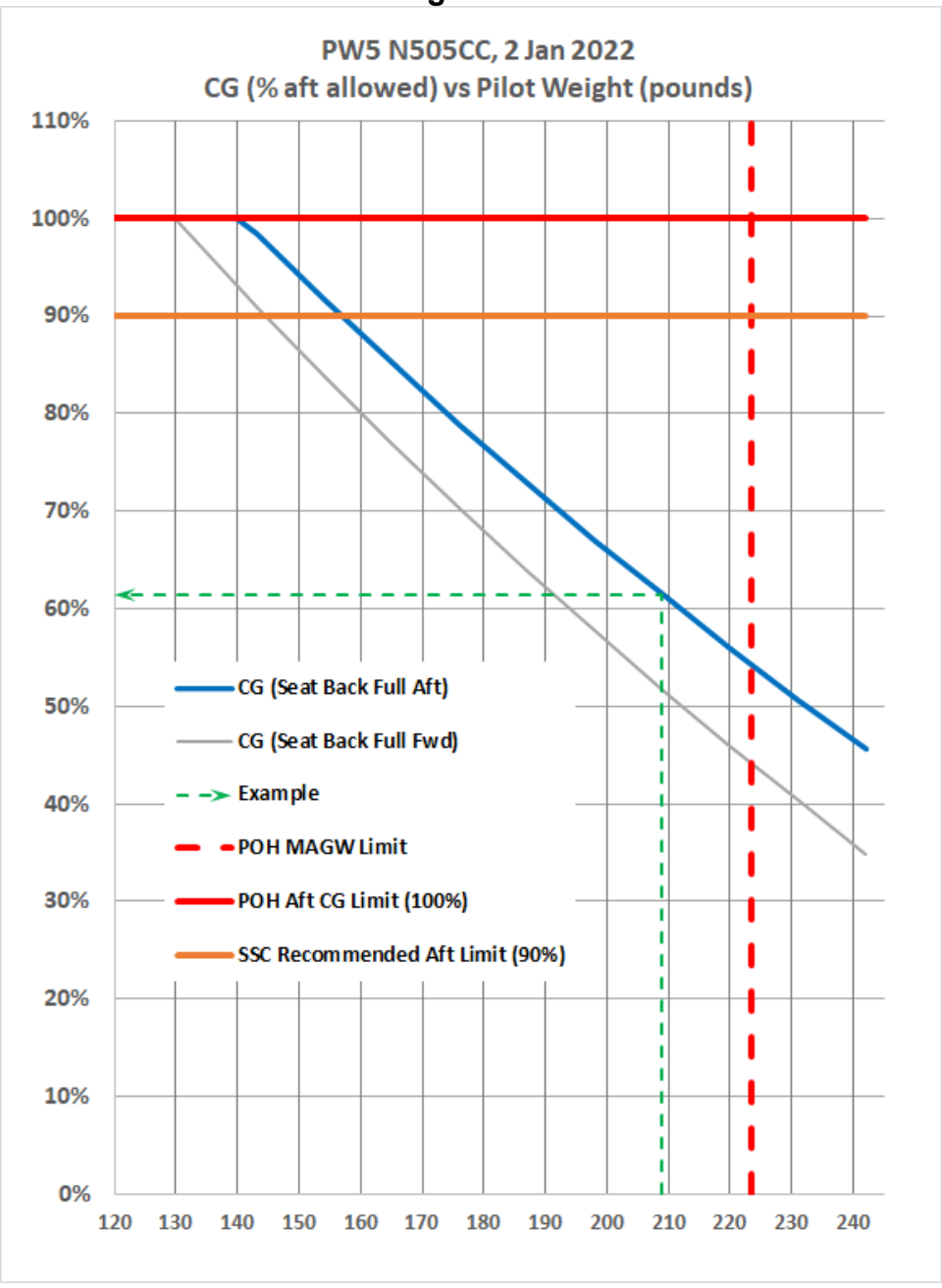
Final Checks
- Ensure main spar bolts are secured and latched
- Ensure rear bolt of tailplane is latched
- Check integrity of all control connections
- Close the fuselage inspection hole (tape after performing preflight inspection)





25 July 2025

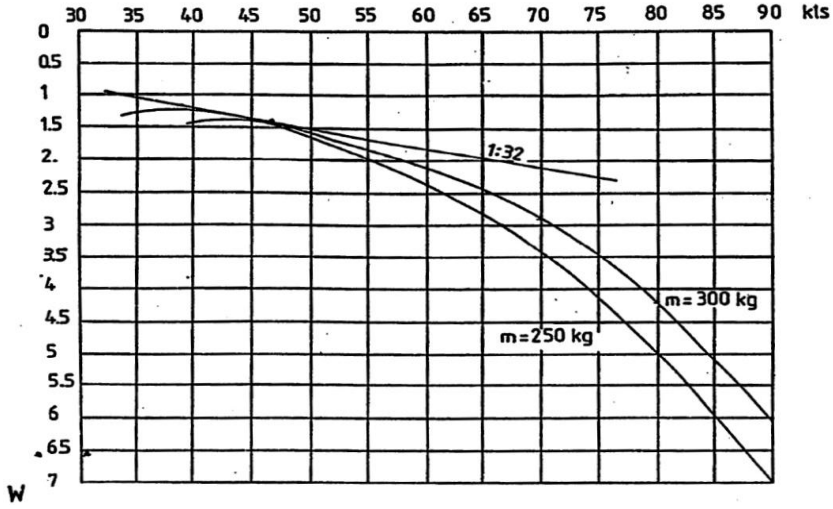
PW-5 Weight and Balance

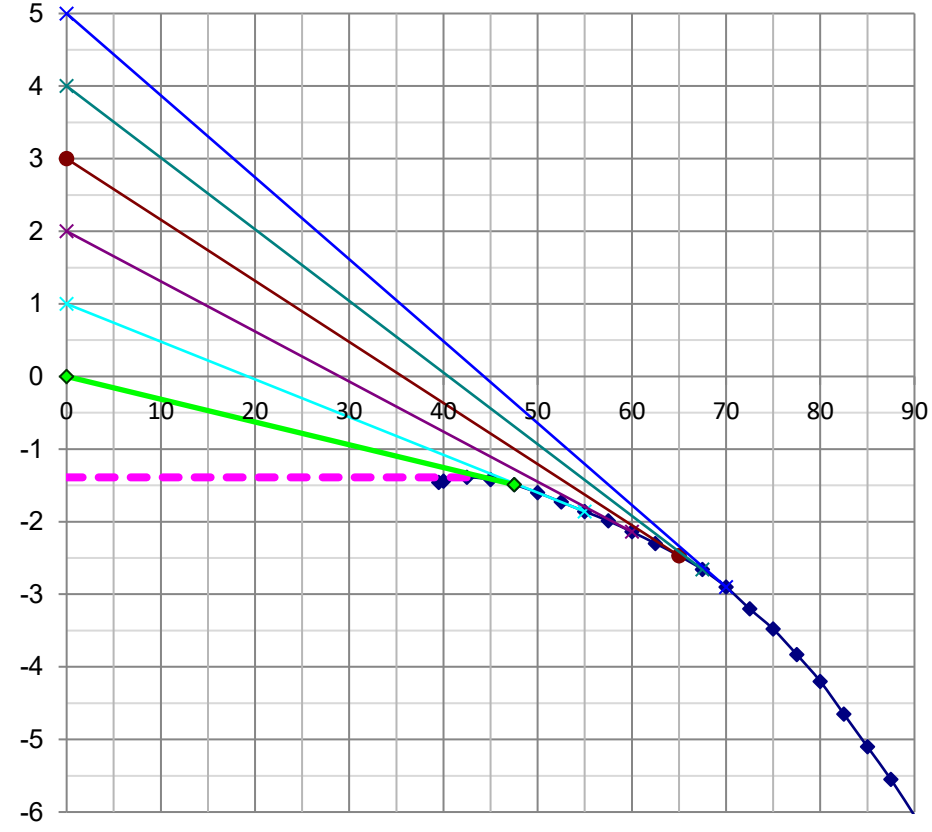


Jan 2022 Weight and Balance
Empty Weight = 437.5 lbs
Empty Moment = 10,594.0 in-lbs
Empty CG = 24.2 in

25 July 2025

PW-5 Polar





25 July 2025

Skyline Soaring
SGS 1-36 Cockpit Guide

N3617B

KFRR (Front Royal)	123.0 / wx 121.850	KOKV (Winchester)	122.975 / wx 124.85
FBO: 540-635-5370	AWOS: 540-635-5377	KLUA (Luray)	122.8 / wx 118.275
Skyline Ground	123.3	8W2 (New Market)	122.8 / wx 118.175
Potomac Approach	120.45	KSHD (Shenandoah)	123.0 / wx 124.925

Before Takeoff Checklists

A BB CCCC DDD E

- A - Altimeter
- B - Ballast
- B - Belts
- C - Controls, Flaps, Trim
- C - Comm
- C - Connect Towrope
- C - Canopy
- D - Dolly
- D - Dive Brakes
- D - Direction of Wind
- E - Emergency Plan

or

CB SWIFTT CCBE

- C - Controls
- B - Ballast
- S - Straps
- W - Winds
- I - Instruments
- F - Flaps
- T - Trim
- T - Tail Dolly
- C - Connect Towrope
- C - Canopy
- B - Brakes
- E - Emergency Plan

Final Check – Canopy, Spoilers

Before Landing

FUSTALL

- F - Flaps
- U - Undercarriage
- S - Speed
- T - Trim
- A - Airbrakes
- L - Lookout
- L - Landing

Stall	35
Stall Spoilers	39
Min Sink	43
Best L/D	53
Rec Apch (POH)	55+
Pattern	55+
Maneuver	64
Aero Tow	98
Rough Air	108
Never Exceed	121
G Limits	+5.33 / -2.67
Pilot Wt (lbs)	154 – 213

(Recommend seat ballast to 170 min)

Max XW (dem) 15 mph (13 kt)

Speed to Fly (mph):

Sink (fpmx100)	0	1	2	3	4	5
Airspeed	53	62	68	74	78	82
Glider Sink	1.5	1.8	2.1	2.5	2.8	3.1
Total Sink	1.5	2.8	4.1	5.5	6.8	8.1
Glide Ratio	31	19	15	12	10	9

Min Sink Speed by Bank Angle:

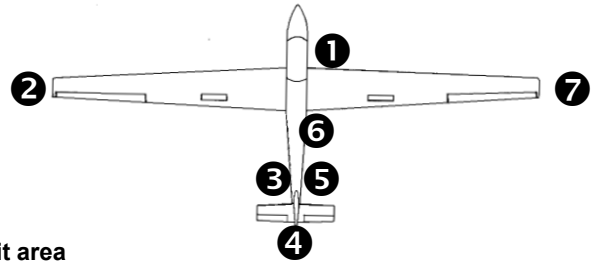
0 deg	15 deg	30 deg	45 deg	60 deg
43	44	46	51	61

25 July 2025

Skyline Soaring
SGS 1-36 Cockpit Guide

N3617B

Daily Inspection / Pre-Flight Checklist



1 – Cockpit area
- Canopy condition, latches operable, hinge conditon
- Flight controls free, clear, proper movement against load
- Rudder pedal adjustment
- Seat adjustment
- Instruments, radio, lines, pitot-static openings, static line drain
- Seat belt and shoulder harness
- Ballast removed from seat, or set for flight
- Check for foreign bodies or loose items
- Documents in place
- Release hook and linkage
- Wing pins – main spar and aft carry-thru
- Aileron control attachment, fuselage to wing
- Dive brake attachment
- Tire condition and inflation (31 psi)
- Wheel and brake operation
- Nose skid attachment and condition
- General condition exterior surfaces

2 – Left wing
- Upper and lower surfaces free of damage, no fore/aft play
- Aileron and hinge condition, full travel, pushrod connected
- Dive brake condition, travel, fit, and locking
- Tip wheel and spring

3 – Fuselage
- General condition of surfaces

4 – Tail
- Horizontal tail surface attachment, elevator hinges, pushrod, fabric
- Rudder hinges and fabric
- Inspection plate – ruder and elevator control linkages
- Tail wheel conditon
- Total energy probe

5 – Fuselage: same as (3)

6 – Inspection port:
- Battery secure and connected, latches secure

7 – Right Wing: same as (2)

Skyline Soaring
SGS 1-36 Cockpit Guide

N3617B

Rigging / Derigging Checklist

1 – Before placing the right wing on the fuselage, check that there is no dirt or grit on either spar butt or in the fuselage main or rear carry-thru fittings. The main and rear wing pin holes should also be clean as they are intended to have a close-tolerance fit. Light grease should be used to lubricate the contacting parts and pins.

2 – Support the fuselage in a normal upright position with the canopy removed.

3 – Wings should be conveniently located on the ground, or on racks, on their respective sides of the fuselage. Assembly hardware should be placed near its point of use. The dive brake control lever in the cockpit must be in its forward position and locked in order for the dive brake slip-fittings to engage automatically.

4 – Check to make sure the four captive 3/8" L-shaped pins (2 for the rear carry-thru and one each upper side of the fuselage at the U-shaped hoke fitting) are completely disengaged by pulling the pins forward against the pin stops.

5 – The right wing is to be installed first. Have one person level the fuselage, standing on the right side. One person should have the leading edge of the wing root, one on the trailing edge of the wing root, one at the wingtip.

6 – The spar butt is raised to clear the fuselage. Lower the wing into the yoke fitting, and from the wingtip push inboard. Engage the rear, then the forward L-shaped alignment pins. Use caution not to get fingers caught between the wing and fuselage.

7 – After engagement of the alignment pins, safety each by turning the L-shaped handle portion to the vertical position. Lower the hinged plate over the end of the handle and install safety pin through the bolt provided in the handle end.

8 – The right wing top should be held or supported in a nearly level position while the left wing is installed in the manner described above.

9 – Install the two main wing pins. A slight rocking at the wing tip will aid in inserting each pin. Safety both main pins with the large safety pins. The two aileron pushrods are attached to the aileron idler horn by clevis pins, and are then saftied with safety pins.

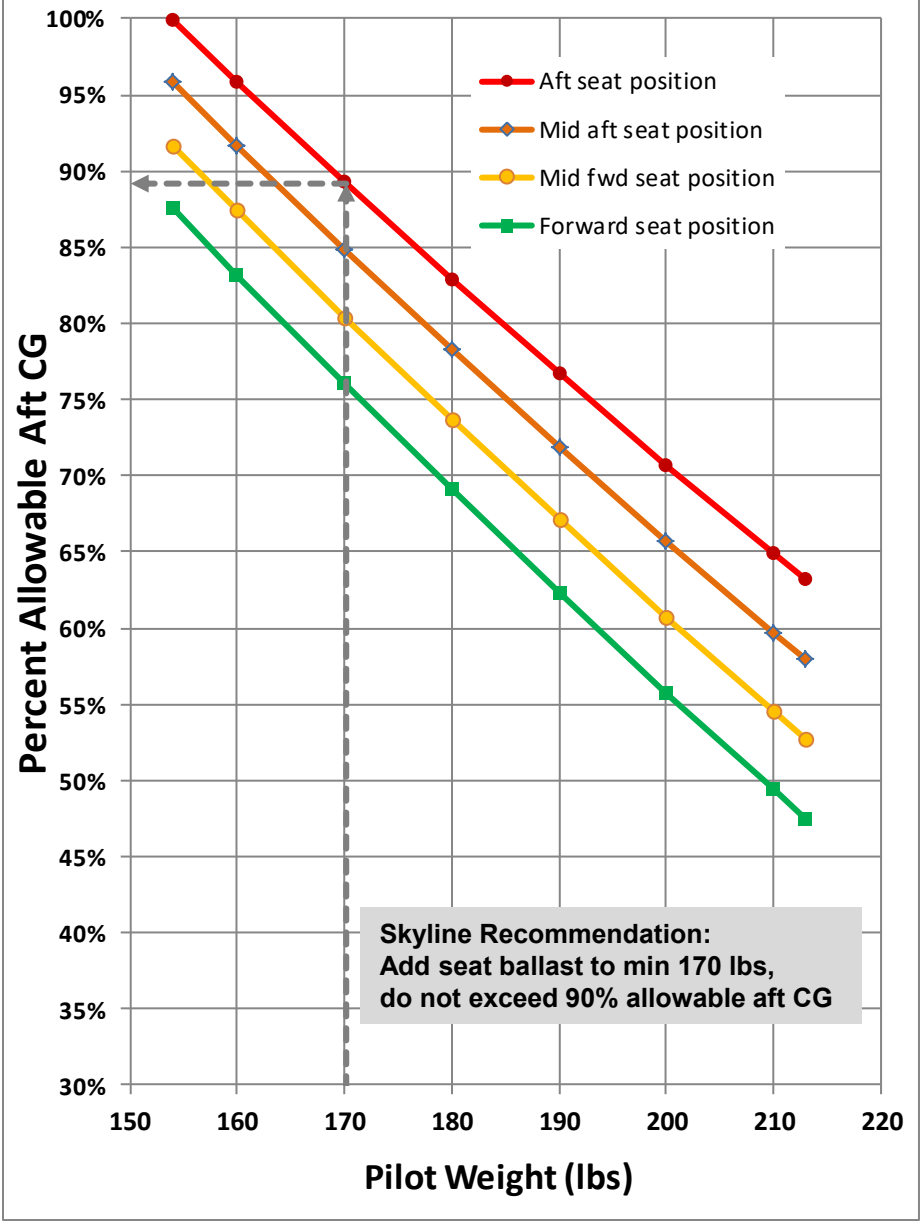
10 – Check operation of dive brake doors and aileron control system.

11 – Before placing the horizontal stabilizer on the fuselage torque tube, check to make sure all bearing surface are free of dirt or grit. Each elevator attaches to the fin by sliding over the trunnions at the the top of the fin, ensure the elevator engages the bayonets on the elevator control horn. Push the lock-pin handle aft to secure the eye and the clevis fittings, and rotate the handle down. Insert safety pin down into the barrel aft of the locking pin. Close the spring-loaded access door in the upper surface of the stabilizer fairing.

12 – Complete a thorough preflight and Positive Control Check.

Degrigging is accomplished in reverse.

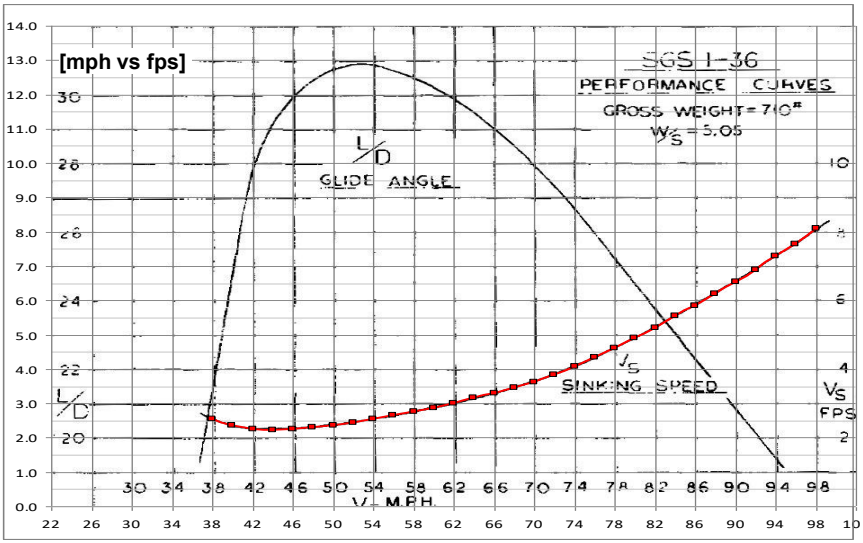
SGS 1-36 Sprite N3617B Loading Graph (12 May 2016)

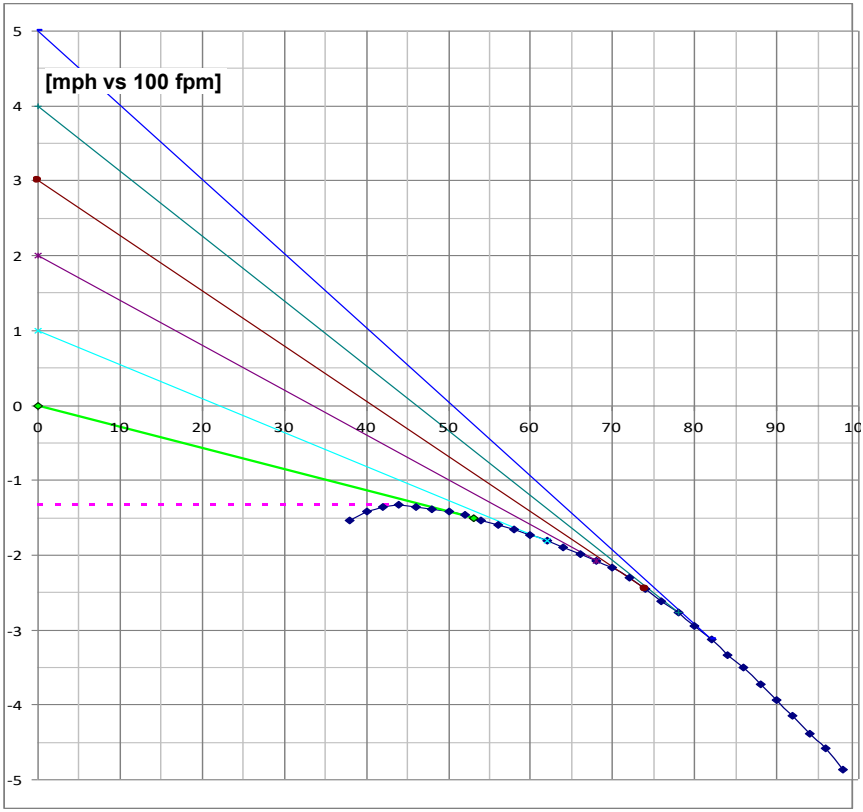


May 2016 Weight and Balance
Empty Weight = 437.5 lbs
Empty Moment = 45,065.8 in-lbs
Empty CG = 90.6 in

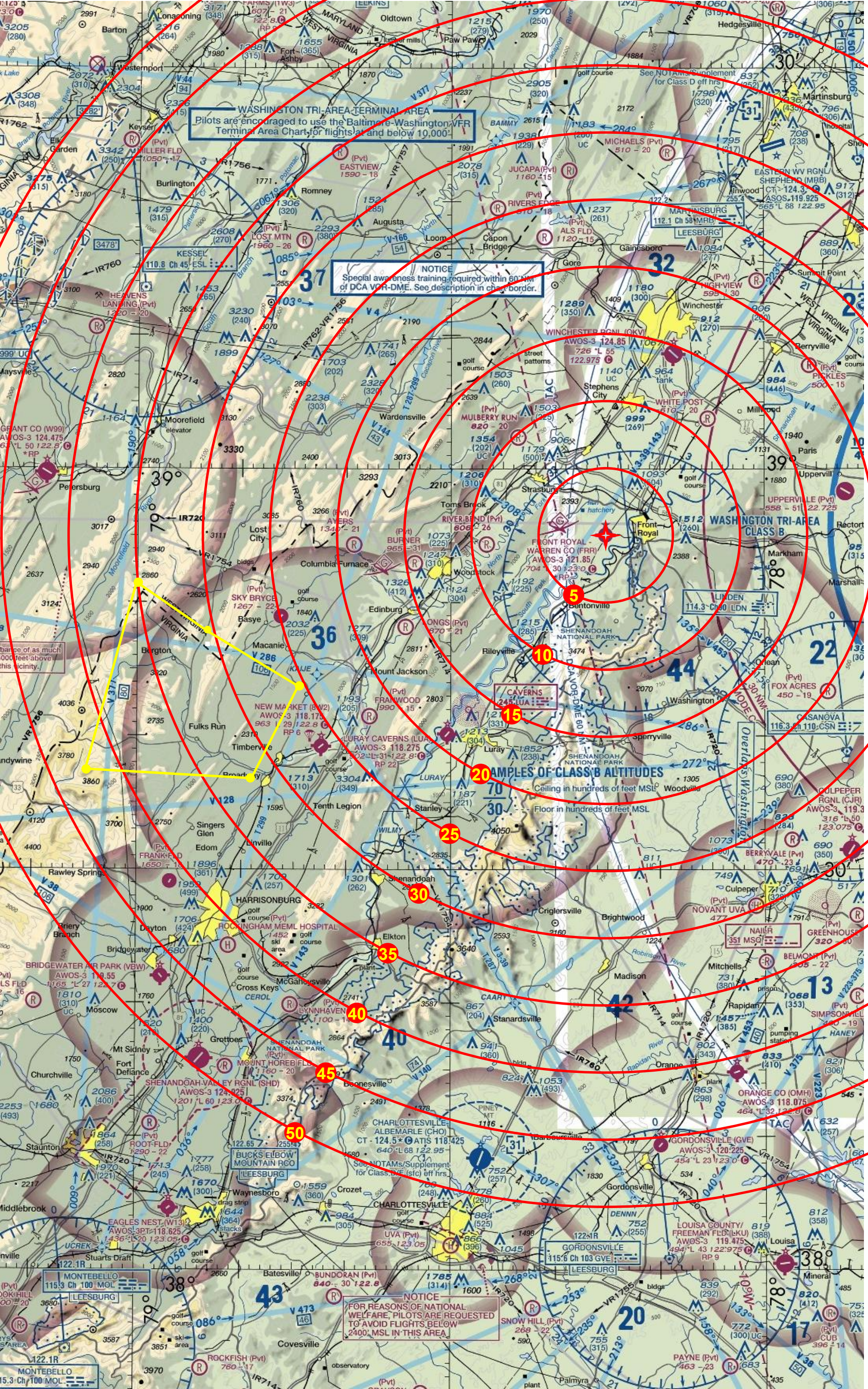
25 July 2025

SGS 1-36 Sprite Polar





25 July 2025


WASHINGTON TRI-AREA TERMINAL AREA
Pilots are encouraged to use the Baltimore-Washington VFR Terminal Area Chart for flights at and below 10,000'
NOTICE
Special awareness training required within 60 NM of DCA VOR-DME. See description in chart border.
WASHINGTON TRI-AREA CLASS B
EXAMPLES OF CLASS B ALTITUDES
Ceiling in hundreds of feet MSL
Floor in hundreds of feet MSL
NOTICE
FOR REASONS OF NATIONAL WELFARE, PILOTS ARE REQUESTED TO AVOID FLIGHTS BELOW 2400' MSL IN THIS AREA
FRONT ROYAL-WARREN CO (FRR)
WINCHESTER RGNL (OKV)
NEW MARKET (8W2)
LURAY CAVERNS (LUA)
SHENANDOAH VALLEY RGNL (SHD)
CHARLOTTESVILLE-ALBEMARLE (CHO)
GORDONSVILLE (GVE)
ORANGE CO (OMH)
LOUISA COUNTY/FREEMAN FLD (LKU)
CULPEPER RGNL (CJR)
EASTERN WV RGNL/SHEPHERD (MRB)
BRIDGEWATER AIR PARK (VBW)
EAGLES NEST (W13)
GRANT CO (W99)
SHENANDOAH NATIONAL PARK
HARRISONBURG
CHARLOTTESVILLE
Winchester
Front Royal
Luray
Staunton
Woodstock
Strasburg
Petersburg
Moorefield
Elkton
Shenandoah
Waynesboro
Culpeper
Orange
Gordonsville
Madison
Sperryville
Martinsburg
Berryville
Stephens City
New Market
Timberville
Broadway
Edinburg
Mount Jackson
LINDEN 114.3 Ch 90 LDN
MONTEBELLO 115.3 Ch 100 MOL
GORDONSVILLE 115.6 Ch 103 GVE
CASANOVA 116.3 Ch 110 CSN
KESSEL 110.8 Ch 45 ESL
MARTINSBURG 112.1 Ch 58 MRB
5
10
15
20
25
30
35
40
45
50

NAME	ICAO	LAT	LON	BRG	MH	NM	COD	ALT	FREQ	RWY	SFC	LEN	WID
Front Royal 540-635-3570	KFRR	38:55.050N	078:15.200W	000	000	0.0	A	704	123.000 w121.850	10/28	A	3007	75
River Bend	VA58	38:54.367N	078:26.667W	266	276	8.9	P	820		06/24	G	2650	60
Mulberry Run	VA17	39:02.150N	078:23.533W	318	328	9.6	P	606		06/24	G	2000	75
White Post	3VA7	39:03.750N	078:05.483W	041	051	11.5	P	610		04/22	G	2000	75
Hepner	4VA4	38:56.083N	078:32.400W	275	285	13.4	P	1150		07/25	G	2000	75
Burner	VG55	38:52.917N	078:33.467W	262	272	14.4	P	965		03/21	G	3100	100
Winchester	KOKV	39:08.617N	078:08.667W	020	030	14.5	A	726	122.975 w124.850	14/32	A	5498	100
Ayers	VA93	38:54.300N	078:39.283W	268	278	18.8	P	1340		01/19	G	2100	100
Luray Caverns	KLUA	38:40.017N	078:30.033W	218	228	19.0	A	903	122.800 w118.275	04/22	A	3125	75
High View Farm	61VA	39:14.117N	078:00.717W	030	040	22.1	P	595		03/21	G	3000	150
Franwood Farms	9VA4	38:41.450N	078:37.767W	232	242	22.2	P	990		03/21	G	1550	90
Al's Field	48VA	39:17.433N	078:21.050W	349	359	22.8	P	1120		03/21	G	1500	50
Timber Ridge Airpark	VA46	39:17.767N	078:21.733W	347	357	23.3	P	1024		09/27	D	2700	80
Sky Bryce	VG18	38:48.950N	078:46.217W	256	266	24.9	P	1263		05/23	A	2240	50
River's Edge Farm	38WV	39:19.517N	078:25.533W	342	352	25.7	P	810		06/24	G	1800	50
New Market	8W2	38:39.367N	078:42.517W	234	244	26.4	A	963	122.800 w118.175	06/24	A	2920	60
Hidden River	89VA	38:31.333N	078:31.450W	208	218	26.9	P	780		11/29	G	1500	40
Jucapa Farms	9VG9	39:22.333N	078:18.267W	355	005	27.4	P	1160		16/34	G	1500	70
Michaels Farms	WV17	39:23.600N	078:09.350W	009	019	28.9	P	510		01/19	G	2000	60
Lost Mountain	WV06	39:17.100N	078:44.300W	314	324	31.6	P	1960		02/20	G	2650	50
Martinsburg	KMRB	39:24.117N	077:59.083W	023	033	31.6	A	565	124.300 w119.925	08/26	A	7815	150
Belmont Farm	88VA	38:22.450N	077:59.517W	159	169	34.8	P	305		04/22	G	2200	50
Joe's Creek	2VG3	38:32.917N	078:52.267W	233	243	36.4	P	1350		05/23	G	1400	75
Orange County VA	KOMH	38:14.833N	078:02.733W	166	176	41.4	A	465	122.800 w118.075	08/26	A	3200	75
Bridgewater Air Park	KVBW	38:22.000N	078:57.617W	225	235	46.8	A	1165	122.700	15/33	A	2745	60
Shenandoah Valley	KSHD	38:15.833N	078:53.783W	218	228	49.5	A	1201	123.000 w124.925	05/23	A	6002	150