

MINNESOTA SOARING CLUB 2022 SAFETY QUIZ



What a Century Means to Soaring

In the early 1920s the Association of the German Model and Gliding Clubs established the first soaring badges. To earn an A badge a pilot had to:

- A. Solo
- B. Fly for 30 seconds
- C. Fly 300 meters after launch
- D. All of the above
- E. B or C
- F. B and C



1922 A Fokker Glider being towed to the flight line

- 1) Which class of airspace is directly above Stanton Airport (KSYN) beginning at ground level, and to what height above ground level (AGL) does this airspace extend?
 - a. Class “C” (Charley); 2100 AGL
 - b. Class “D” (Delta); 2300 AGL
 - c. Class “E” (Echo); 4500 AGL
 - d. Class “G” (Golf); 1200 AGL

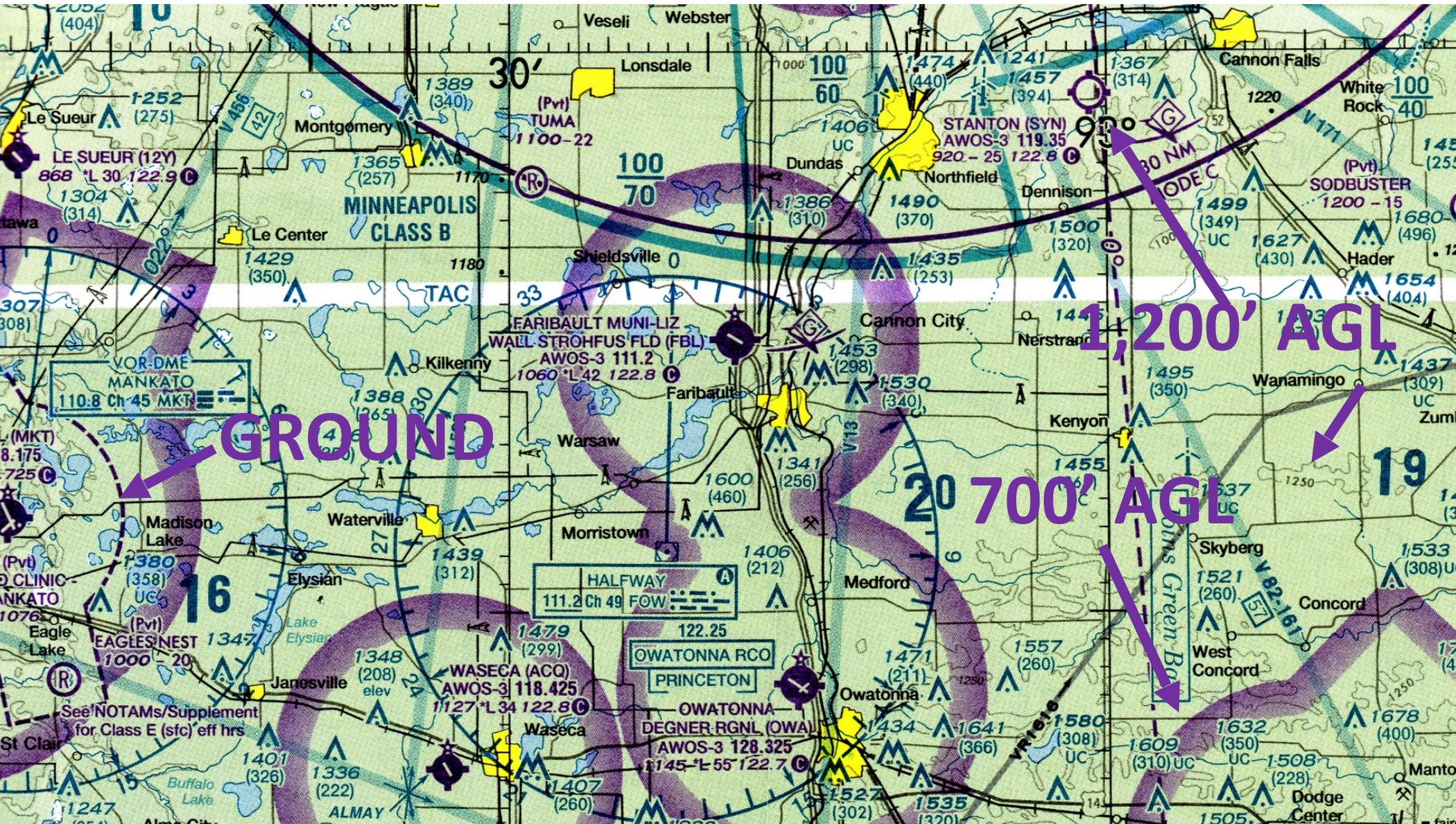


CTC MINNEAPOLIS
APP ON 134.7

FARMINGTON
115.7 Ch 104 FGT

STANTON (SYN)
AWOS-3 119.35
920 - 25 122.8

RED WING RGNL (RGK)
AWOS-3 119.25
778 L 50 123.05



GROUND

1,200' AGL

700' AGL

2) Describe the procedure for entering the traffic pattern when landing a glider at KSYN.



1. Max altitude 1,720' MSL
2. Clear left for aircraft on long downwind
3. Clear for aircraft on crosswind
4. Announce entry on CTAF 122.8
5. Enter dog-leg

3. Are there any times that you would not follow this procedure? If so, when?

§ 91.3 Responsibility and authority of the pilot in command.

(a) The pilot in command of an aircraft is directly responsible for, and is the final authority as to, the operation of that aircraft.

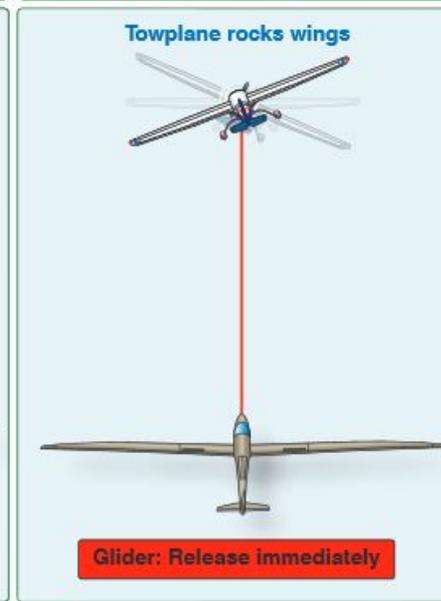
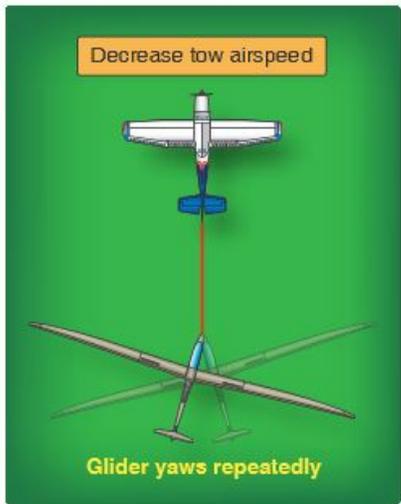
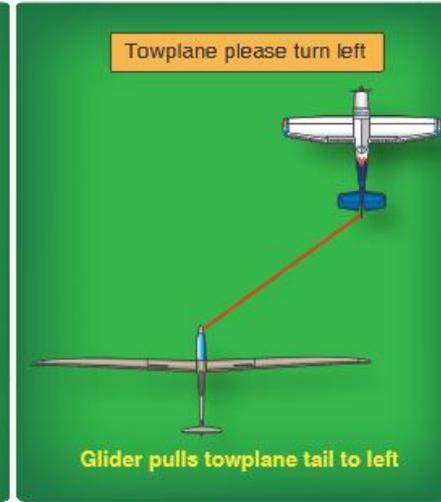
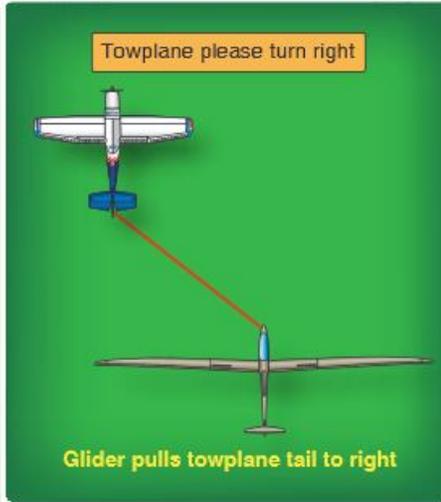
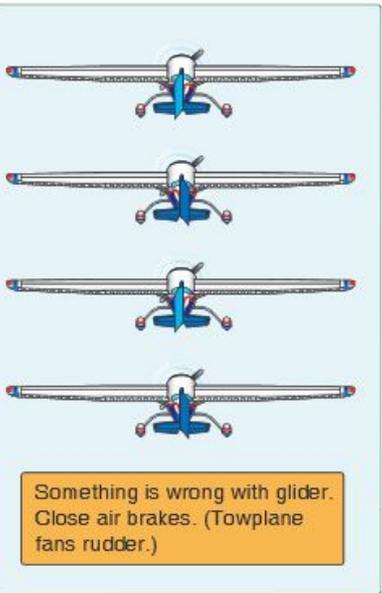
(b) In an in-flight emergency requiring immediate action, the pilot in command may deviate from any rule of this part to the extent required to meet that emergency.

§ 91.113 Right-of-way rules: Except water operations.

(b) General. When weather conditions permit, regardless of whether an operation is conducted under instrument flight rules or visual flight rules, vigilance shall be maintained by each person operating an aircraft so as to see and avoid other aircraft.

4) While on tow, the tow plane yaws back and forth.
What is the tow pilot signaling?

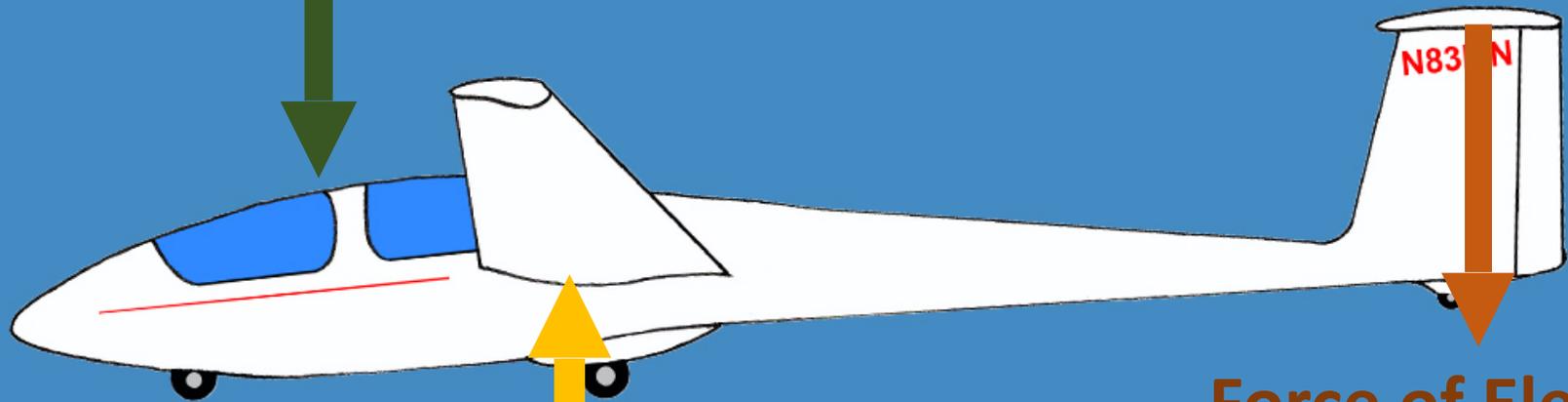
- a. Release immediately
- b. The tow plane cannot release
- c. Your spoilers are open



- 5) Which glider would be able to be flown with less drag if they both weighed the same?
- a. With the CG located near the forward limit
 - b. With the CG located near the aft limit

6. Why?

Center of Gravity



Force of Elevator

Center of Lift

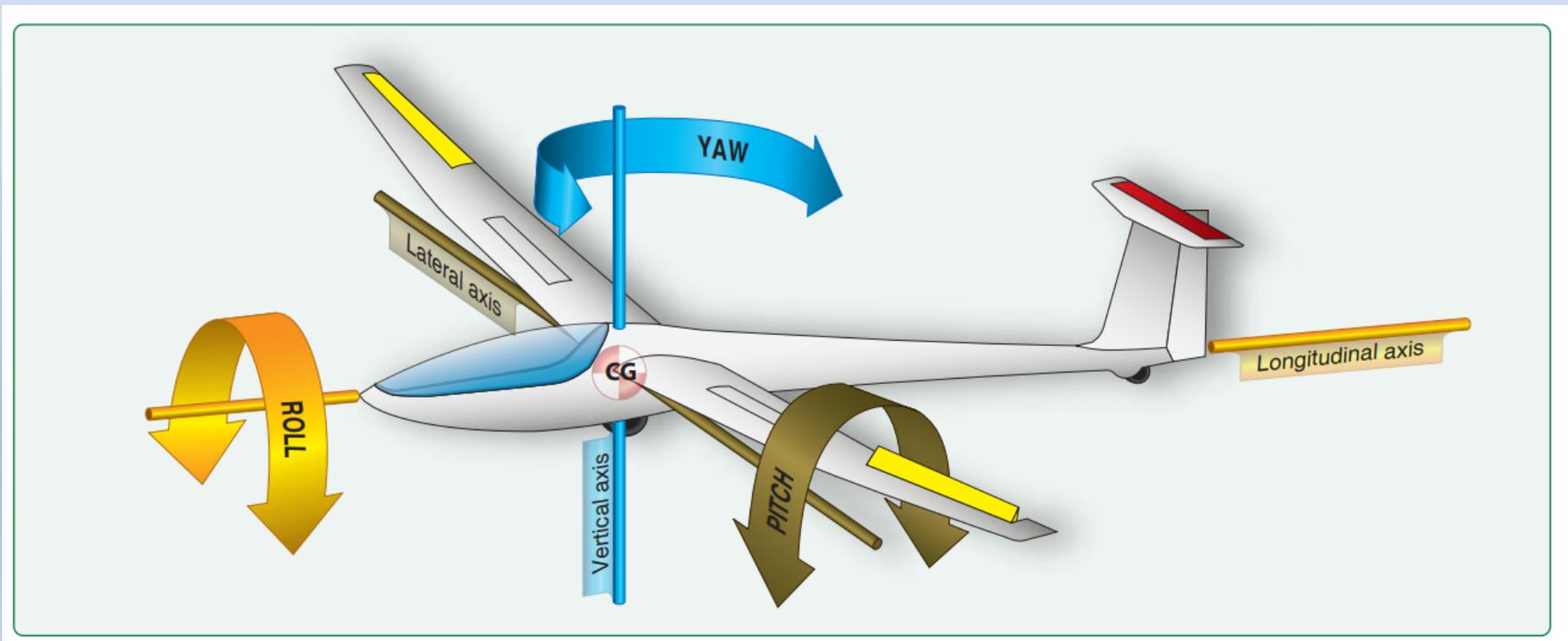
7) Which glider would be more pitch sensitive?

a. With the CG located near the forward limit

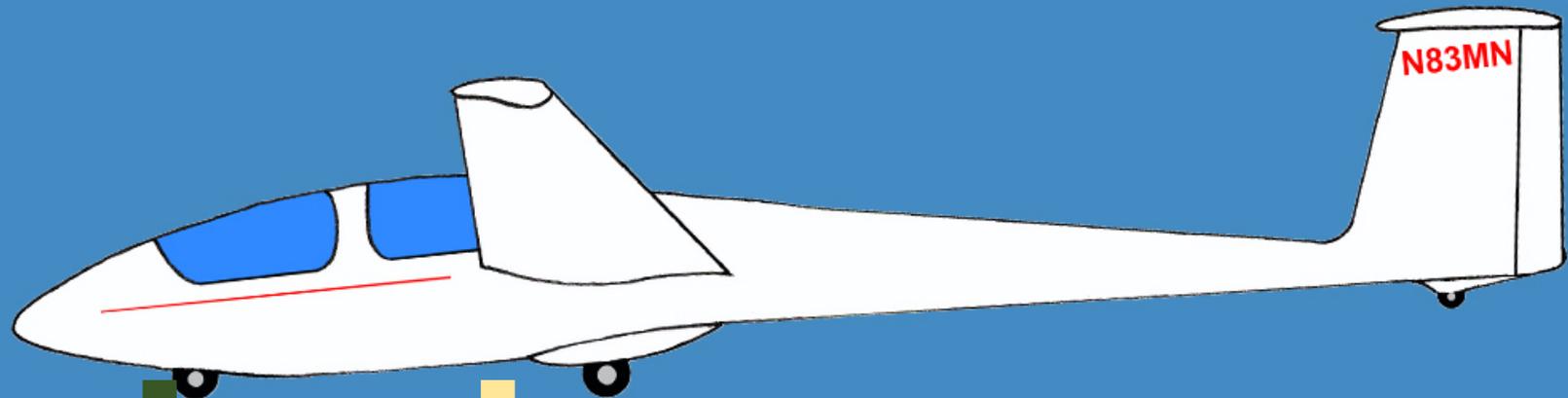
b. With the CG located near the aft limit

Let's define "pitch sensitive."

As used in the U.S. it means: Small stick movements result in changes in pitch attitude. Resulting in greater tendency towards pilot-induced-oscillations.



Therefore, the answer is: b. With the CG located near the aft limit



CG near the datum point results in neutral stability



Forward CG results in glider wanting to return to nose down flight

8) The MSC Pawnee towplane is a much more powerful towplane than the MSC Super Cub towplane. Imagine that you are launching behind the Pawnee on a good soaring day. When compared to Super Cub aerotow launches, what will be different about your imminent Pawnee aerotow launch with regard to:

- Initial acceleration?
- Takeoff roll distance?
- Initial rate of climb?
- Aerotow PTT (Premature Termination of the Tow) emergency planning?

Initial Acceleration

Chief Tow Pilot Ron Houle is teaching tow pilots to move the Pawnee's throttle forward on a count of "one-one-thousand, two-one-thousand." This less-than-full acceleration will be faster than usual take-offs behind the Super Cub.

However, should a Pawnee tow pilot advance the throttle rapidly, expect the glider to be jerked forward and accelerate very quickly. You may be pulled forward beyond the ability of your flight controls to counter the tow rope's force.

Therefore:

1. Never launch with anything in front of your roll out area.
2. Have your hand close to the yellow tow-release knob and be prepared to release.
3. Keep the glider rolling straight behind the tow plane, especially when there is a cross wind.

Takeoff Roll Distance

The Pawnee towplane's horsepower advantage over the Super Cub means that the glider ground roll to takeoff will be noticeably shorter than it is when launching behind a Super Cub.

Whether a Super Cub or a Pawnee is launching your glider, simply set the takeoff pitch attitude during ground roll and allow the glider to lift off when it is ready to fly. Then maintain both lateral position and vertical position behind the towplane during climb out.

Initial Rate of Climb

The still-air climb rate behind the Pawnee is about 600 feet/minute, as opposed to 400 feet/minute behind the Super Cub.

400 fpm to 3,000' takes 7.5 minutes.

600 fpm to 3,000' takes 5 minutes

Everything happens faster—50% faster.

Lift & Sink on Tow

What about air mass lift and sink after release from aerotow? Good question! Take a peek at the following comparisons.

If you release when your glider's (accurate) variometer indicates 600 FPM rate of climb, you will be in

zero sink if towed by the SuperCub
200 FPM DOWN (!) if towed by the Pawnee

If you release when your glider's variometer indicates 700 FPM rate of climb, you will be in

100 FPM UP if towed by the SuperCub
100 FPM DOWN (!) if towed by the Pawnee

If you release when your glider's variometer indicates 800 FPM rate of climb, you will be in

200 FPM UP if towed by the SuperCub
zero sink (!) if towed by the Pawnee

Further, you won't cover as much "ground" on tow behind the Pawnee, and will have less chance to get to sample the lift and sink.

Aerotow PTT (Premature Termination of the Tow) emergency planning

Near the ground: You will be airborne earlier, and therefore if you abort just after lift off you will have more runway to land on, but you will also have more airspeed to bleed off. Move the stick forward, ease airbrakes out, and land normally. (Fortunately, you remembered to assure nothing is in front of you before take off.)

For all of the remaining PTTs expect that your nose will be higher behind the Pawnee than behind the Super Cub, and should the rope break the glider will decelerate more rapidly due to its nose-high attitude. Therefore, a prompt smooth forward movement of the stick is necessary if there is a PTT.

Up to 300': you will be near the runway and should you turn 180° you will probably overshoot the runway on landing. Land ahead, giving yourself the option to turn up to 90°.

300' to 500': if wind speed and direction allows. 1. Move the stick forward and continue flying away from the airport. 2. Turn for a downwind landing (if a downwind landing can be safely executed) around 250' indicated (remember there will be a lag in the altimeter setting) and then execute a normal downwind landing.

500' to 800': You will be closer to the runway than behind the Super Cub and a cross wind landing should be easy to execute.

Above 800': Here too you will be closer to the runway than behind the Super Cub and therefore a turn to do an abbreviated landing on the operational runway will usually be a good choice.

9) How do you fly to minimize the chances of a stall or spin in the pattern?

1. Before takeoff assure that your CG is within limits.
2. If you are a low-hour pilot, consider having a minimum front seat weight of 170 pounds (in all three club gliders).
3. When doing the FUSTALL checklist pick a landing airspeed that anticipates headwind, gusts, sink and lift, and airbrake/spoiler use. Remember the club's minimum landing speed for the Owl is 60 knots!
4. Keep altitude in reserve for unexpected occurrences (sink, gusting headwinds, other aircraft in the pattern, etc....)
5. Keep airspeed up.
6. Bank no less than 30°, with 45° preferable.
7. Keep the yaw string straight in all turns—especially avoid a skid.

Skidding Left Turn



10. What are the indications that a spin is imminent?

1. Nose high (above the horizon).
2. Slow airspeed.
3. Quiet flight.
4. More play in the controls, as well as controls needing larger movements to effect flight change.
5. Bank angle is less than 15° .
6. Skidding turn.

HOWEVER: A glider can stall or spin at any airspeed and pitch attitude.

11. How do you recover from a spin?

1. Push opposite rudder to stop autogyration. Note: the Owl's huge rudder requires some muscle to push it over in a spin.
2. As the autogyration stops ease rudder to neutral and move the stick forward.
3. Once the glider is flying (the stall is broken) pull out of the dive with smooth movements, being careful not to jerk the stick to the stop as you are likely to be over maneuvering speed.

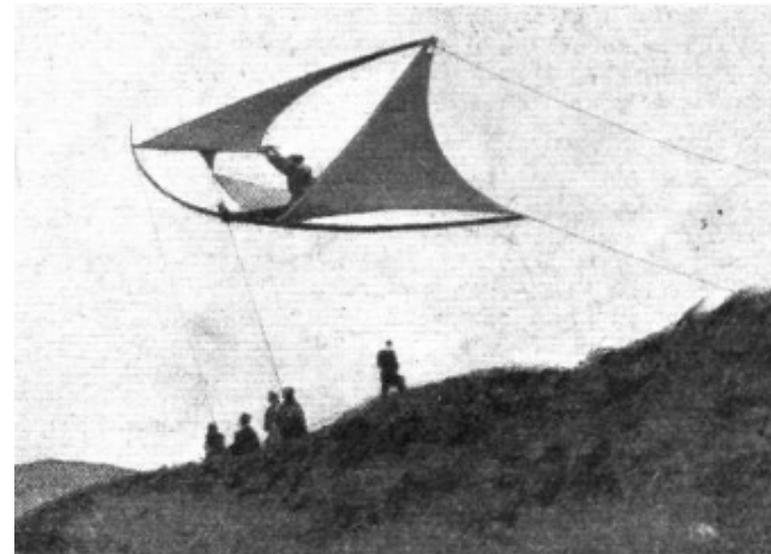
12. What is the optimum procedure for clearing before turning?

1. Look as far back as you can in the intended direction of turn.
2. Focus on something on the horizon.
3. Hold the head steady for one-one-thousand, two-one-thousand.
4. Look back over the nose and commence the turn.

Intermission Question

The original B badge required (pick all that apply):

- a. Two flights of 45 seconds in a straight line.
- b. One flight of 60 seconds in a S-pattern.
- c. One flight of 3 minutes.
- d. A 500-meter flight.

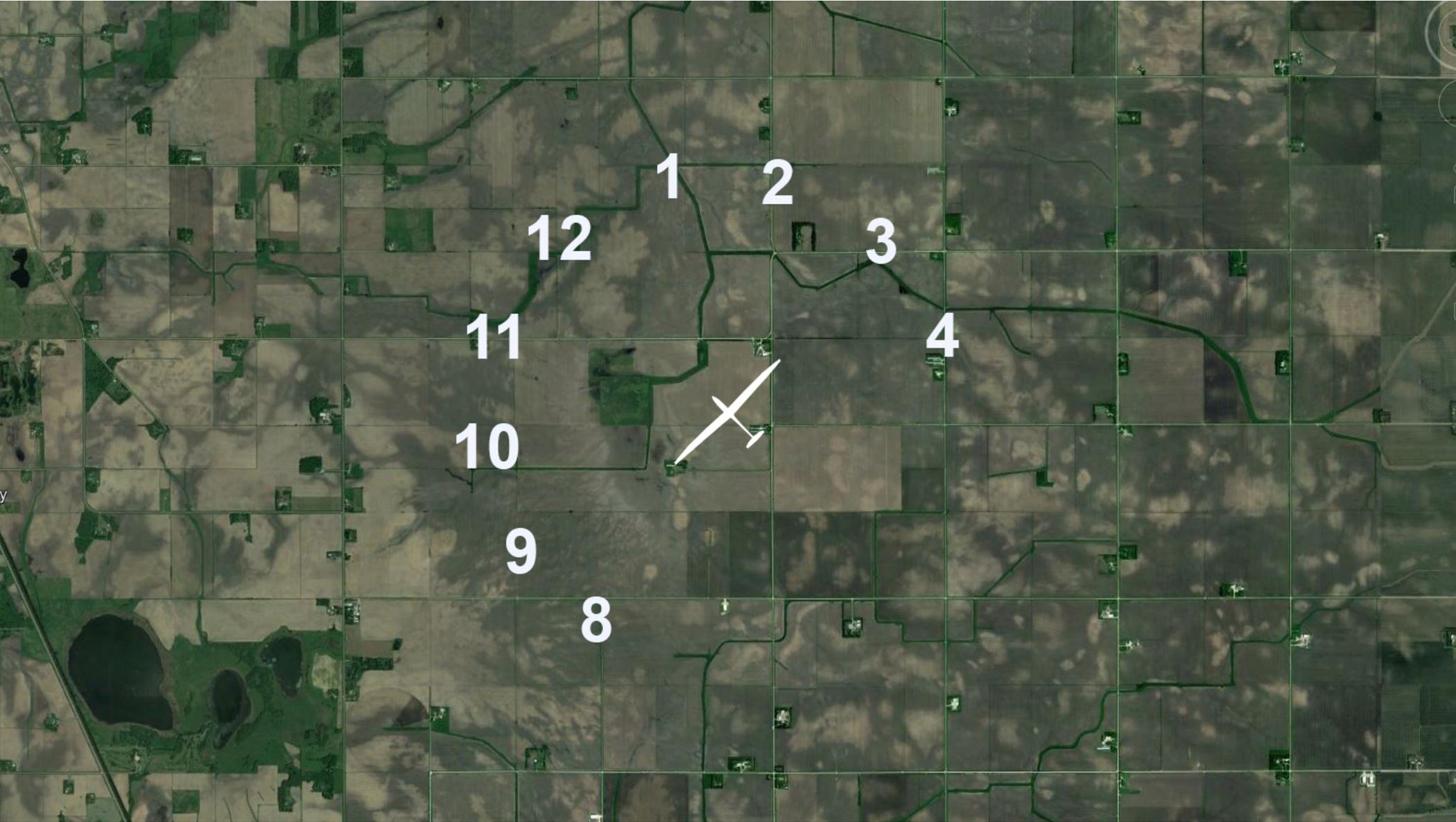


13. How often and how should airspace be cleared when flying straight and level?

Clear the airspace every 4 to 5 miles (4 to 5 minutes) when flying straight and level.

Start by turning the head to 8 o'clock position, focus on something on the horizon, and hold the head steady for two seconds.

Repeat this process in one-hour increments until the 4 o'clock position is scanned. Look below left and right, and then above. This scan takes about 30 seconds.



14. What are the procedures for maximum safety when flying with other gliders in a thermal?

1. Thermal in the same direction as the other gliders.
2. Enter on the opposite side of the thermal from the other glider to help the other pilot see you.
3. Keep the other glider in sight as you thermal.
4. Communicate on the radio 123.3 if possible, though remember to keep one radio on CTAF 122.8 when 10 miles or less from KSYN.
5. Do not fly into the other glider's blind spot.
6. Keep your airspeed fast enough so as not to stall or spin.

15. Describe the characteristics of zero-G flight and the recovery.

Zero G

	Stall	Zero-G
Initial Attitude	Nose High	Nose May be High
Noise	Loud	Quiet
Controls	Controls Feel Mushy	Controls Feel Mushy
G's	One G	Zero G
Moving Stick Forward	Recovers	Maintains Zero-G
Recovery	Move Stick Forward	Hold or Pull Back Stick

16. You enter the pattern after a long and successful day of soaring and find an ultralight midway through downwind. How high is the ultralight likely to be? What speed is the ultralight likely to be traveling? How do you proceed?

400' altitude
35 knot airspeed



Consider:

1. You are behind and above a high-wing aircraft and therefore the pilot is unlikely to see you—though the pilot may have heard your radio transmission.
2. You will be gaining on the ultralight at around 25 knots and given the difference in airspeed you are likely to catch up with the ultralight before touchdown.
3. The ultralight pilot may have a very short roll out or may land long—so you cannot assume that any portion of the runway will be clear for your touchdown.

Therefore:

1. If you establish radio communication ask the ultralight pilot to go around.
2. If you cannot establish radio communication assume the pilot does not know you are in the pattern, and therefore you must land on an alternate runway—presumably, the cross runway.

17. What is the frequency for Stanton's AWOS3? Given this recording from AWOS:

“Stanton airfield automated weather observation one-six-four-one zulu. Weather: wind two-two-zero at one-six; visibility one-zero; ceiling five-thousand broken; temperature minus two Celsius dew point minus niner; altimeter two niner seven four.”

- A. What day and hour (CST) was the observation made?
- B. What is wind speed and direction?
- C. What is the visibility?
- D. What should your altimeter be set at?

1. Trick question. There is no date on AWOS. The time is 11:41 a.m. CST.
2. Wind is from 220° at 6 knots.
3. Visibility is 10 miles.
4. Set your altimeter at 29.74”.

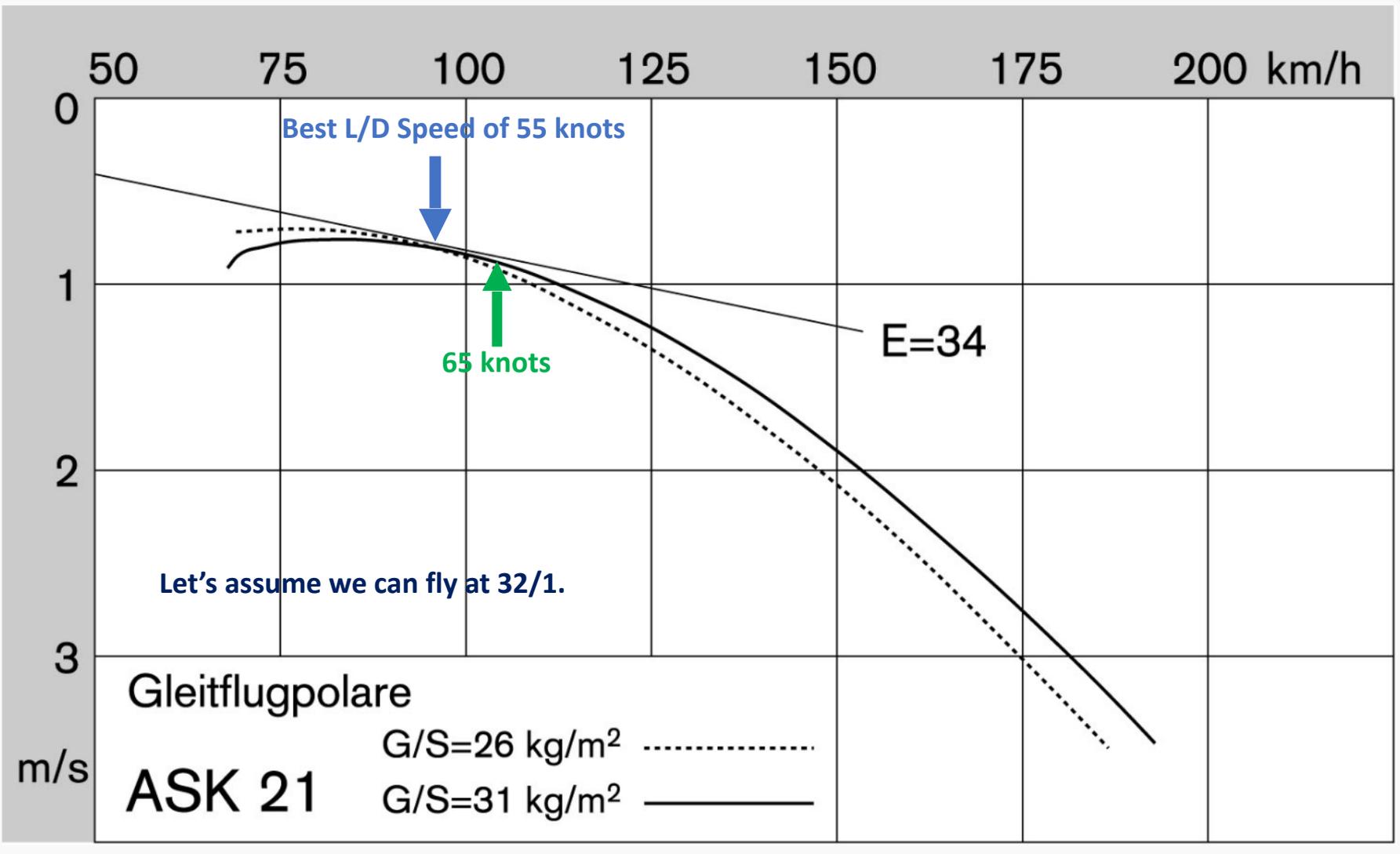
18. You were unsuccessfully thermalling at 2,900' AGL above Cannon Falls. The lift disappears. You tune into AWOS and are informed that wind is three-two-zero at one-five gusting to two-zero." What will your L/D over the ground be if you immediately fly towards KSYN? How will you proceed from this point to end of roll out?

Let's assume you're flying the K-21.

Things to consider:

The gust speed on the ground is likely to be the airspeed at 3,000' AGL, which is 20 knots.

Therefore the best speed to fly (best L/D of 55 knots + half the wind speed) is 65 knots.



You will progress towards the airport at 45 knots (65 knots airspeed minus 20 knot headwind). Which will result in an L/D over the ground of 22/1.

$$\frac{65}{45} = \frac{32}{x}$$

At 22/1 the ASK21 will lose 240' for every mile traveled.

Cannon Falls is 6 miles from KSYN, and this means, if everything goes well, that will be 1,440' lost getting to the airport.

$$2,900' \text{ AGL} - 1,440' = 1,460'$$

660' of altitude to spare for a pattern entry of 800' AGL if everything goes well—which will buy the an extra mile to maneuver to the standard entry point for a landing on 36.

However, prudence dictates that a safety margin be built into the calculations. The gliding books suggest to cut the L/D in half (17/1),. Therefore, the prudent L/D gets reduced to 17/1.

At 17/1 the glider loses 311' for every mile traveled.

$6 \times 311 = 1,866'$ altitude lost getting to the airport

$2,900' \text{ AGL} - 1,866' = 1,034'$



In the six minutes as you transit to the airport consider possibilities:

1. Best to land on 36, the active runway, to do so fly over the ridge to avoid entering pattern box & maximize separation for aircraft taking off.
2. A crosswind entry into 36 may be advisable.
3. Until 36 is assured, leave open possible landing on 27, base or final entry.
4. If unsure where you will land, announce this on CTAF. Then complete your landing checklist early.

Fly in a direction that avoids Lake Byllesby and leaves options.

Because the wind is coming from 320°, a landing on Runway 36 is preferred, but not required. If low consider entering 36 on the crosswind leg. Avoid flying over Lake Byllesby which is more likely to have sink. Fly in a direction that leaves options available.

With the limited additional altitude available with the safety calculation, it would be prudent to have alternatives thought out during the flight from Cannon Falls to the airport:

1. Entering on base for abbreviated pattern for 27 (either right hand or left hand patterns).
2. A straight-in landing on final for 27.

There may be scant time to act when close to the airport, so while flying towards the airport listen to the radio, scan the airspace, and make a radio call—something like:

“Stanton air. Glider eight three Mike November, three miles east of the airport at two thousand four hundred attempting to reach the normal entry point for landing on 36, but may need to enter on base or final for 27, will advise.”

If you land on runway 27 stop short of 36, which will be the active runway.

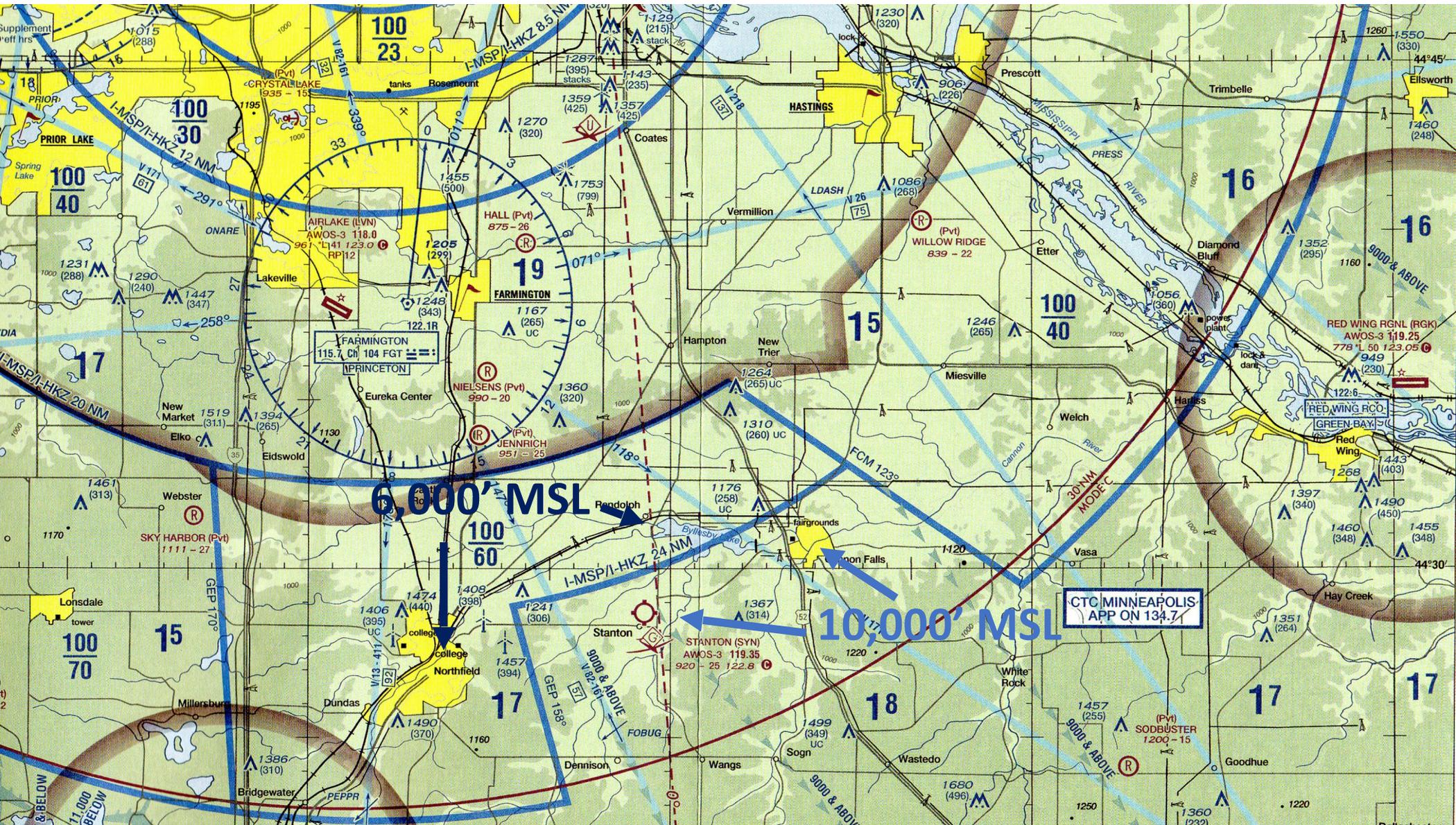
19. The Pawnee is a significantly more powerful tow plane, capable of better handling the tugs of the glider, than was the Super Cub. What do you do if at 200' AGL you momentarily climb so high that you lose sight of the Pawnee?

RELEASE IMMEDIATELY!



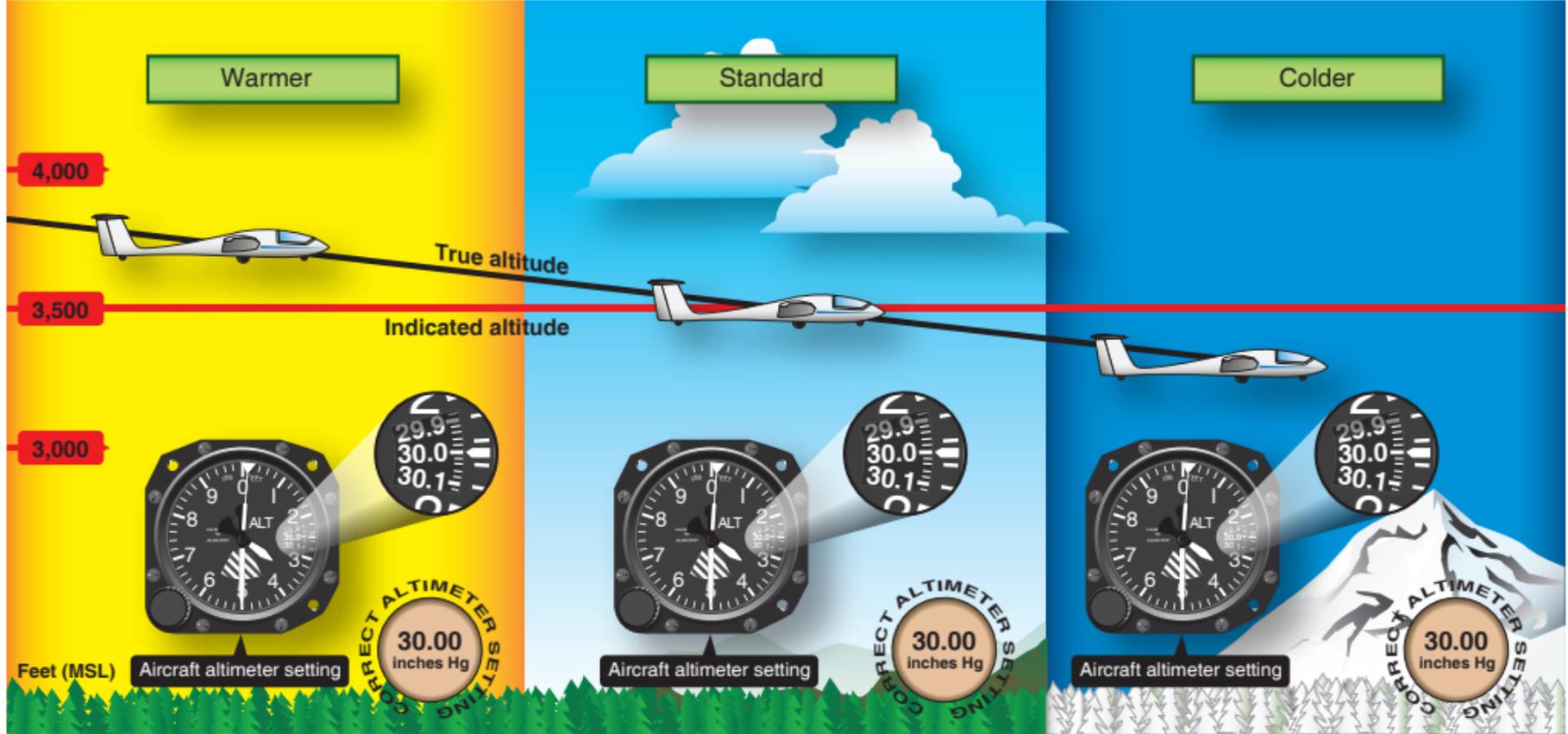
20. The MSC gliders are now equipped with ADS-B Out, which will broadcast the position and altitude of the glider and this transit will be recorded. To assure that no MSC pilot violates Class B airspace, what are the maximum permissible altitudes for flight above:

- a. Stanton Airport
- b. Cannon Falls
- c. The north-west edge of Lake Byllesby
- d. Northfield



21. Altimeters have errors, including pressure altitude errors of about 2% per 1,000'. What are your maximum indicated altitude ceiling to assure you do not climb into Class B airspace?





Rising air pressure will place the glider higher than indicated altitude.

“From low to high or cold to warm your higher in the sky.”

Prudence requires a 200' buffer, so a maximum of 5,800' MSL indicated is recommended when the Class B airspace begins at 6,000'.

22. How do you proceed if you lose sight of the tow plane after release?

Glider Airspace At Release

Tow Plane Airspace At Release

Tow Flight Path at Release

DIRECTION TO FLY IF VISUAL CONTACT IS LOST SHORTLY AFTER RELEASE

Glider's Airspace At Release



Tow Flight Path at Release



Tow Plane Airspace At Release

23. The last two years, between Covid and the down time for the rehabilitation and repairs of the K-21 and the Owl, have resulted in many pilots flying less. We start the 2022 season with a tow plane which flies differently, arguably significantly differently, than the Super Cub. Your first flight of the season will be a First Flight With An Instructor (FFWAI). The attached MSC FFWAI 2022 Checklist is a tool to maximize the clubs' safety by alerting your flight instructor to how to make you the safest pilot possible. How will you use this checklist?

24. You're the FOO. As you are preparing to tow the gliders from the hangar. AWOS reports "wind three-zero-zero at one-six gusting to two-two." The TAF is for wind to shift to 35018G24 at 18Z.

When you give your morning briefing:

- a. What runway do you chose for launching?
- b. What directions do you give to the wing walkers?
- c. How do you direct the wing runner to scan the airspace before launch?
- d. How will you scan the airspace as gliders launch and land?

Things to Consider

A gusting wind is riskier than a steady wind because it can slap control surfaces, slam canopies down, and spin gliders on the ground.

What is the maximum wind speed at which the risk of harm to people and property is greater than the benefit of continued operations?

How do you instruct aircraft be moved and used at what air speeds?

Whether you chose runway 36 or runway 27, you risk having aircraft land perpendicular to your active runway.

Which Runway?

Using runway 36 will give a 60° crosswind at first. While using runway 27 will give a 30° crosswind. Given the strength of the wind it would be advisable to start on runway 27.

By noon runway 36 would be preferable, however, the wind speed (should the forecast become accurate) is on the edge of safe operations. Therefore, monitor AWOS, and have a cease operations wind speed.

Directions to Wing Walkers

At minimum assure that wing walkers are on the upwind wing.

Ideally have two wing walkers.

Be mindful of wind gusts slapping canopies closed. Have a wing walker hold a canopy anytime it is open.

Also consider what happens to the rudder, elevator, and ailerons when the glider turns and the wind gusts. Possibly have a pilot on the controls to prevent damage to the control surfaces.

Directions to Wing Runner

Anticipate that some pilots land based on the forecast, so have them scan both the active runway (27) and runway 36.

Anticipate that the crosswind might cause the glider to roll slightly to the right and have them clear that portion of the runway before signaling to start the tow.

In addition: make sure the upwind wing is slightly lowered, glance back to make sure that left rudder input is established, and offer to help the pilot point the nose slightly to the left.

Extra Credit Question

To earn a C badge in 1922 the pilot had to (pick all that apply):

1. Fly 700 meters from the launch point.
2. Stay aloft for 5 minutes.
3. Gain 100 meters altitude.
4. All of the above.

<https://www.youtube.com/watch?v=6TOMflf2mPU>





Should we establish a dress code for flights at the airport?

Member Qualification Card

Minnesota Soaring Club						20
MEMBER QUALIFICATION CARD						
Glider	Solo	X/C	Back Seat	Rig	Daily Inspect	Tow Pilot
ASK21 N83MN						CFIG
OWL N92MN						Safety Lecture
JR N511SN						BFR Due
						Check Flight
Name:						

MARCH 2022

Sun	Mon	Tue	Wed	Thu	Fri	Sat	
27	28	1	2	3	4	5	
6	7	8	9	10	11	12	
13	14	15	16	17	18	19	
20	21	22	23	24	25	26	
27	28	29	7 p.m. Flight Review Ground School	30	31	1 2 p.m. Safety Quiz Make-up	2