

Questions to test your knowledge of areas on the Practical Test:

CERTIFICATES AND DOCUMENTS

1. What is the primary privilege that the private glider pilot certificate will give you that a student certificate does not allow? FAR 61.89(a)(1):

2. What must you do to keep this privilege current? FAR 61.57(a)(1): _____
3. What is the main limitation of a Private Pilot Certificate? FAR 61.113(a): _____
4. What must you do to keep your Certificate in force? FAR 61.56(c)(1)(2): _____
5. If you do not have a medical certificate, what must you not know or not have reason to know to be legal to fly a glider? FAR 61.53(b):

5. What must your personal pilot logbook show for you to qualify for the practical test?
 1. FAR 61.103(f)(2): _____
 2. (Licensed power pilots only) FAR 61.109(f)(2): _____
 3. (Student pilots only) FAR 61.109(f)(1) _____
7. Do you need to have an FCC station license and Operators Permit? _____
8. Where in the 2-33 glider would you look for the glider Airworthiness and Registration certificates?

9. If you could not find either or both, what would it mean to you as pilot of the glider? (FAR 91.203(a)(1) and (2)):

0. Where in the 2-33 glider would you find some of the glider's operating limitations? _____
 1. What kind of limitations would they be? 1. _____ 2. _____
 2. Where would you find more operating limitations of the glider? _____
 3. Is there an equipment list for the 2-33 glider? _____
 4. Where will you find the actual weight and balance data measured on the actual glider you will fly for the test?

 5. Where will you find the primary maintenance requirements for the glider you will fly for the test? _____
 5. What are the primary maintenance requirements?
 1. FAR 91.409(a)(1): _____
 2. FAR 91.409(b): _____
 7. What glider records will show that the maintenance requirements have been complied with? _____
 8. What will the glider maintenance records tell you? _____

OBTAINING WEATHER INFORMATION

9. How will you obtain the weather information required for the practical test? (SFM 4-17,18): _____
0. What types of weather reports and forecasts should you obtain? (SFM 4-20,21):
 1. _____ 2. _____
 3. _____ 4. _____
 5. _____ 6. _____

FLIGHT INSTRUMENTS AND ASSOCIATED SYSTEMS

40. What are the two types of in-flight compass errors? (SFM 3-3):

1. _____ 2. _____

41. Describe what the compass does when you turn away from a north heading: (SFM 3-3): _____

42. Describe what the compass does when you speed up while on an east or west heading: (SFM 3-3): _____

43. What is the purpose of the inclinometer? (SFM 3-5): _____

44. While in a turn, you note that the yaw string is deflected toward the low wing. What is the glider doing? _____

45. How does the airspeed indicator work? (SFM 3-6): _____

46. Which way will the altimeter needle move if the barometric pressure drops? _____

47. How does a mechanical variometer work? (SFM 3-9): _____

48. What does a total energy compensator do for a variometer? (SFM 3-10,11): _____

49. How does a venturi-type total energy compensator function? (SFM 3-11): _____

50. When flying to a VOR, you see the needle deflected to the right. Which side of your selected course are you on? (SFM 8-15): _____

DETERMINING PERFORMANCE AND LIMITATIONS

51. What great hazard would exist if you flew your glider with the center of gravity located behind the rear limit? (SFM 1-14): _____

52. What would be the effect on landing speed if the C.G. of your glider were ahead of the forward C.G. limit? _____

53. What is the beneficial effect on glider performance of increasing the wing loading? (SFM 2-3,4): _____

54. What is the negative effect on glider performance of increasing the wing loading? _____

55. What would you notice in landing the 2-33 glider at an airport with a high density altitude? (SFM 2-2): _____

56. Why does a headwind result in a steeper glide angle relative to the ground? (SFM 2-2): _____

REFERRING TO THE 2-33 FLIGHT MANUAL:

57. Using the chart on page 1-15: In still air, at max gross weight and 70 mph, what is the 2-33's glide ratio? _____

58. In the same conditions, what is its sink rate in fpm? _____

59. Using the chart on page 1-10: What would be the g-load on the wing if you stalled the 2-33 at 60 mph? _____

Using the same chart, what would be the g-load on the wing if you hit a gust equal to the positive gust load factor at 90 mph (no control deflection)?

Using the chart on page 1-14: Would a 2-33 be within c.g. limits with a front seat weight of 250# and a rear seat weight of 215#?

Would it be within gross weight limits?

Using the form on page 1-12: Compute the c.g. location with a front seat weight of 190# and a rear seat weight of 130# (no ballast):

Is this within c.g. limits?

Is this in front of or behind the leading edge of the wing?

List the kinds, and speeds in mph, of the performance speeds shown in the 2-33 flight manual:

- 1. _____ speed: solo _____ dual _____
- 2. _____ speed: solo _____ dual _____
- 3. _____ speed: solo _____ dual _____
- 4. _____ speed: solo _____ dual _____
- 5. _____ speed: solo _____ dual _____

FLIGHT PREPARATION AND PLANNING

How do you determine if your sectional chart is current?

On the current Los Angeles sectional chart, what two lines cross at Lat 32°50', Lon 115°22'?

- 1. _____
- 2. _____

When on a true heading of 0° at this point, what is your magnetic heading? (SFM 8-4):

List the classes of airspace in the national airspace system and the limitations they place on VFR glider flights:

- 1. _____ Limitations _____
- 2. _____ Limitations _____
- 3. _____ Limitations _____
- 4. _____ Limitations _____
- 5. _____ Limitations _____
- 6. _____ Limitations _____

Identify the classes of airspace at March AFB (Lat 33°53', Lon 117°15') that are encountered from the surface to 61,000':

- 1. _____ 2. _____
- 3. _____ 4. _____

At what altitudes above March AFB would you not be required to have a Mode-C transponder? (FAR 91.215 (b) (5) (i)):

What is the upper limit of class D airspace at Palm Springs Regional Airport?

What is the lower limit?

What is the floor of class E airspace above Hemet-Ryan Airport?

What class of airspace does the chart show at the surface of Thermal Airport? (Lat 33°38', Lon 116°9')

What type of flight is prohibited in a federal airway? (FAR 91.303(d)):

What is the floor of Class E airspace where there is no blue or magenta shading on the chart? (FAR 71.71(a)):

What is required for flight through a restricted area? (FAR 91.133(a)):

What radial would you fly from Thermal Vortac to Bermuda Dunes Airport?

CONSTRUCTING A FLIGHT PROFILE FOR A 2-33 GLIDER:

1. Use nautical miles.
2. Use "speed-to-fly" when flying against the wind. Use best-glide-speed when flying with the wind.
3. Use the "L/D dual" (max gross weight) curve on page 1-15 of the 2-33 manual to obtain the glide ratio in the air at your airspeed.
4. Calculate the glide ratio over the ground.
5. To allow for sink, use a safety factor of 70%.
6. When flying against the wind, allow a minimum of 1500' clearance over the terrain for safety;
when flying with the wind, 500' is sufficient.

SAMPLE PROBLEM:

81. You will fly from Agua Caliente Springs Airport (Lat 32°57', Long 116°17') to Bermuda Dunes Airport (Lat 33° 44', Lon 116°17'). Your wind is 30 mph from 180°. How high is the "go-ahead" point, and how far from Agua Caliente Springs Airport is it?

STEP-BY-STEP SOLUTION:

If you can not reach the required altitude and distance, you must return to Agua Caliente Springs Airport.

Will you be flying with or against the wind on your return? _____

What airspeed will you fly? _____

What is the glide ratio of the 2-33 in the air at that speed? _____

What glide ratio over the ground might you obtain? _____

(glide ratio over the ground equals (groundspeed divided by airspeed) times glide ratio in the air).

What is the safe glide ratio you can use on your flight profile? _____

(multiply the glide ratio over the ground by the safety factor of 70%).

What minimum altitude must you have at Agua Caliente if you return? _____

At your "safe" glide ratio, how many feet of altitude would you lose in the last ten nautical miles of return to Agua Caliente? _____

(ten miles times 6000 feet per mile equals 60000 feet: divide this by the "safe" glide ratio to obtain the number of feet of altitude lost).

What must your altitude be at ten nautical miles out from Agua Caliente? _____

On your flight profile, mark the minimum altitude at Agua Caliente, and the required altitude ten nautical miles out.

Draw a line between these two points and extend it upwards towards the middle of the flight profile.

If you do attain your required altitude and distance, you will proceed to Bermuda Dunes.

What is the distance to Bermuda Dunes? _____

Draw a vertical line on your flight profile showing the location of Bermuda Dunes.

Will you be flying with or against the wind? _____

What airspeed will you fly? _____

What is the glide ratio of the 2-33 in the air at that speed? _____

What glide ratio over the ground might you obtain? _____

What is the safe glide ratio you can use on your flight profile? _____

What minimum altitude must you have on arrival at Bermuda Dunes? _____

At your "safe" glide ratio, how many feet of altitude will you lose in the last ten nautical miles to Bermuda Dunes? _____

What must your altitude be at ten nautical miles out from Bermuda dunes? _____

On your flight profile, mark the minimum altitude at Bermuda Dunes, and the required altitude ten nautical miles out.

Draw a line between these two points, and extend it upwards towards the middle of the flight profile.

Extend both lines until they cross. Where they cross is your trial "go-ahead" point.

STEP-BY-STEP SOLUTION--continued

Now you must check for terrain clearance of the line to Agua Caliente:

Your course line passes over high ground north of Agua Caliente. How high is it? _____

How far is it from Agua Caliente? _____ Does your flight profile clear it? _____

How high must you be above it to be safe? _____ (remember the wind!)

On the flight profile, mark the minimum altitude required above this high ground and draw a line from this point upwards towards the middle of the graph, parallel to the original flight profile line, until the new line crosses the line from Bermuda Dunes. **This is the second trial "go-ahead" point.**

Now check for terrain clearance of the line to Bermuda Dunes:

Your course line passes over high ground south of Bermuda Dunes. How high is it? _____

How far is it from Bermuda Dunes? _____ Does your flight profile clear it? _____

How high must you be above it to be safe? _____ (remember the wind!)

On the flight profile, mark the minimum altitude required above this high ground and draw a line from this point upwards towards the middle of the graph, parallel to the original flight profile line, until the new line crosses the line from Agua Caliente. **Where these lines cross is the required "go-ahead" point.**

How far from Agua Caliente Airport is your "go-ahead" point? _____ How high is it? _____

82. What prominent check points would you select to keep track of your progress along your course?

1. _____
2. _____
3. _____

83. What appropriate available landing areas exist along your course?

1. _____
2. _____
3. _____

84. Are you **required** to contact Air Traffic Control anywhere along your route? _____

EQUIPMENT

85. What equipment is essential for flight at high altitudes? _____ Over long distances? _____

Over varying terrain? _____ In changing climatic conditions? _____

86. What are the main components of an oxygen system? (SFM 10-2):

1. _____
2. _____
3. _____

87. What are the three types of oxygen systems in common use, and the altitudes they are good to (SFM 10-2,3,4):

1. _____ altitude _____
2. _____ altitude _____
3. _____ altitude _____

88. What is the acronym for the inspection of glider oxygen systems? (SFM 10-5,6): _____ What do the letters stand for?

- 89. What is the FAR requirement for parachute inspections? (FAR 91.307(a)(1)(2)(i)): _____
- 90. How can you tell when a parachute was last inspected? (SFM 10-6): _____

AEROMEDICAL FACTORS

- 91. What are the symptoms, effects, and corrective actions of hypoxia? (SFM 5-4): _____
- 92. What could be the worst effect of hypoxia? _____
- 93. What are the symptoms, effects, and corrective actions of hyperventilation? (SFM 5-5): _____
- 94. What could be the worst effect of hyperventilation? _____
- 95. What are the symptoms, effects, and corrective actions of middle ear and sinus problems? (SFM 5-7): _____
- 96. What could be the worst effect of middle ear and sinus problems? (SFM 5-8) _____
- 97. What are the symptoms, effects, and corrective actions of spatial disorientation? (SFM 5-8,9,10): _____
- 98. Of motion sickness? (SFM 5-12): _____
- 99. Of dehydration? (SFM 5-14): _____
- 100. Of carbon monoxide poisoning? _____
- 101. How do drugs and alcohol affect the safety of your flying? (SFM 5-12,13,14): _____
- 102. What is the minimum recommended time between scuba diving and flying? (SFM 5-7): _____
- 103. What might happen if the diver does not wait for the minimum time? (SFM 5-7): _____

SPINS

- 104. What must take place before a glider will spin? _____
- 105. What must take place before a glider will stop spinning? _____
- 106. What are the steps for normal spin recovery? 1. _____
- 2. _____
- 3. _____ 4. _____ 5. _____
- 107. Suppose you are in a spin, and do steps #1, #2, and #3 above, and the rotation does not stop. What must you do?

 Why? _____
- 108. What is the effect of c.g. position on spin recovery? _____
- 109. If you fly a glider with less than the placarded minimum weight in the cockpit, where is the c.g.?

- 110. If the c.g. position is behind the rear limit authorized for your glider, and you spin it, what might occur?

"Do-It-Yourself" Soaring Thermal Forecast™

(Hemet Special)

Step 1 - Obtain a local sounding by either of the following methods;

a. Before 10 AM call a Flight Service Station (800) 992-7433 and ask for winds and temperature aloft forecasts up through 12,000 feet for Ontario before 1800 Zulu. Temperatures are in degrees Centigrade (C)

b. Ask jump pilot to note temperatures aloft at 4000, 6000 and 8000 feet. Ask for temperatures to be read in degrees Fahrenheit (F) because this increases the accuracy by almost 2:1. Note: This is the most accurate sounding but often the first jump does not occur until after 11 AM, missing trigger. Can be used as check of method a.

Step 2 - Plot the local temperature - altitude lapse rate using the data obtained in Step 1. Note with the FSS data a straight line between 9000 and 6000 feet must be extrapolated to the Hemet trigger elevation (4000 feet MSL).

Step 3 - Draw a line parallel to the adiabat from the intersection of the extended lapse rate at 4000 feet MSL down to the Hemet field elevation at 1500 feet MSL and read off ground temperature below in degrees F. This is the forecast trigger temperature.

Step 4 - If you have a method for forecasting maximum surface temperature use it, if not, the following method works reasonably well. Fill in the Min/Max Temp Forecast box with temperatures forecast for Beaumont and Riverside in the morning LA Times. Use the highest maximum plus 1 degree F and the lowest minimum minus 1 degree F for the representative Hemet estimate. Note: If a cloudy day is suspected multiply (max-min) by 225 to estimate cloud base AGL as shown.

Step 5 - Draw a line vertically up from the forecast Hemet maximum surface temperature, from Step 4, to the Hemet field elevation. Draw another line from that intersection parallel with the adiabat up until it intersects with the plotted temperature-altitude lapse rate from Step 2 and read maximum predicted flight altitude to the right and thermal strength (lift) to the left. Fill in the "SOARING FORECAST" form at the bottom of the page and go have a predictably happy soaring day.

Step 6 - After flying note day's results in the "Actual" spaces at the bottom of the page for future improvements or subjective modifications to this method of forecasting.

REFERENCE:

This Hemet Special form is extracted from the following paper which also includes methods for forecasting trigger time and maximum surface temperature/time;

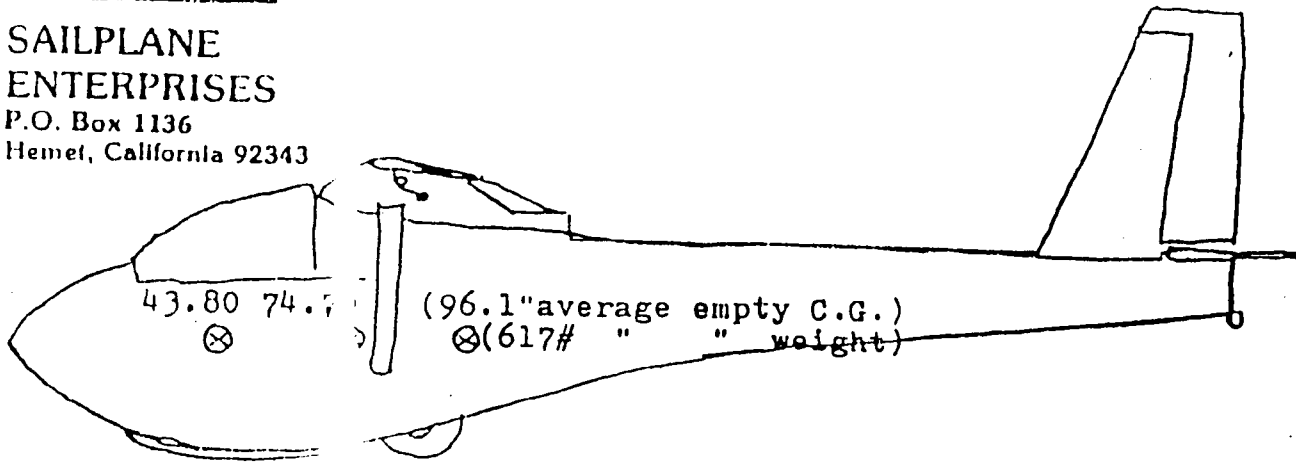
"Do-It-Yourself" Soaring Thermal Forecasting, by Russell O. Pearson. Presented at the XXII Congress of the International Scientific and Technical Organization for Soaring Flight OSTIV, Uvalde, Texas - August 1991. Published in "TECHNICAL SOARING" October 1991, Volume 15, Number 4.



**SAILPLANE
ENTERPRISES**

P.O. Box 1136
Hemet, California 92343

(12)



	Weight	Arm	Limits:
N17898 Empty weight = 615# @ 97.04"			Center of Gravity limits:
N17904			Sta. 78.20 to 86.10
N2028T	617	95.77	Gross Weight limit: 1040#
N2032T	613	96.45	

	Weight	x Arm =	Moment
Glider E. W...	_____	_____	_____
Forward Pilot.	_____	<u>43.80</u>	_____
Rear Pilot....	_____	<u>74.70</u>	_____
S.A.C. ballast	<u>26#*</u>	<u>14.75*</u>	<u>383.5"4*</u>

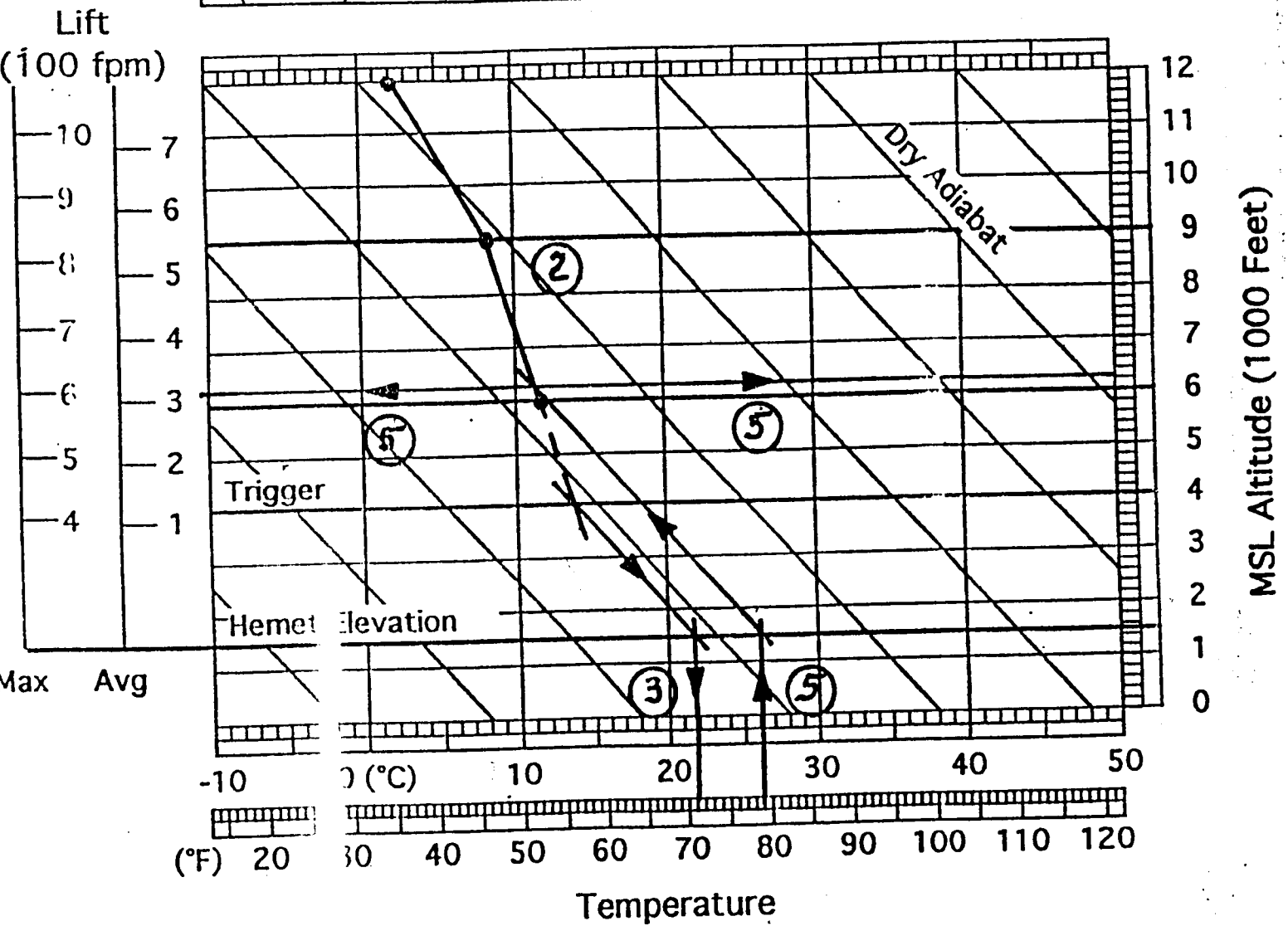
*Optional, figure it in if you plan to carry it on your flight.

"Do-It-Yourself" Soaring Thermal Forecast™

Date: 5/12/93	FSS Forecast (800) 992-7433			
By: RUSS PEARSON	Altitude MSL (Ft.)	Wind		Temp.
Area: Hemet		Direction	Speed	
Min/Max Temp Forecast	3000	320	15	-
Beaumont = 60/78	6000	210	17	+11
Riverside = 60/72	9000	180	35	+8
Hemet (est.) = 59/79	12000	180	43	+2
Cloud Base AGL (max-min)x225 = 4500				

④

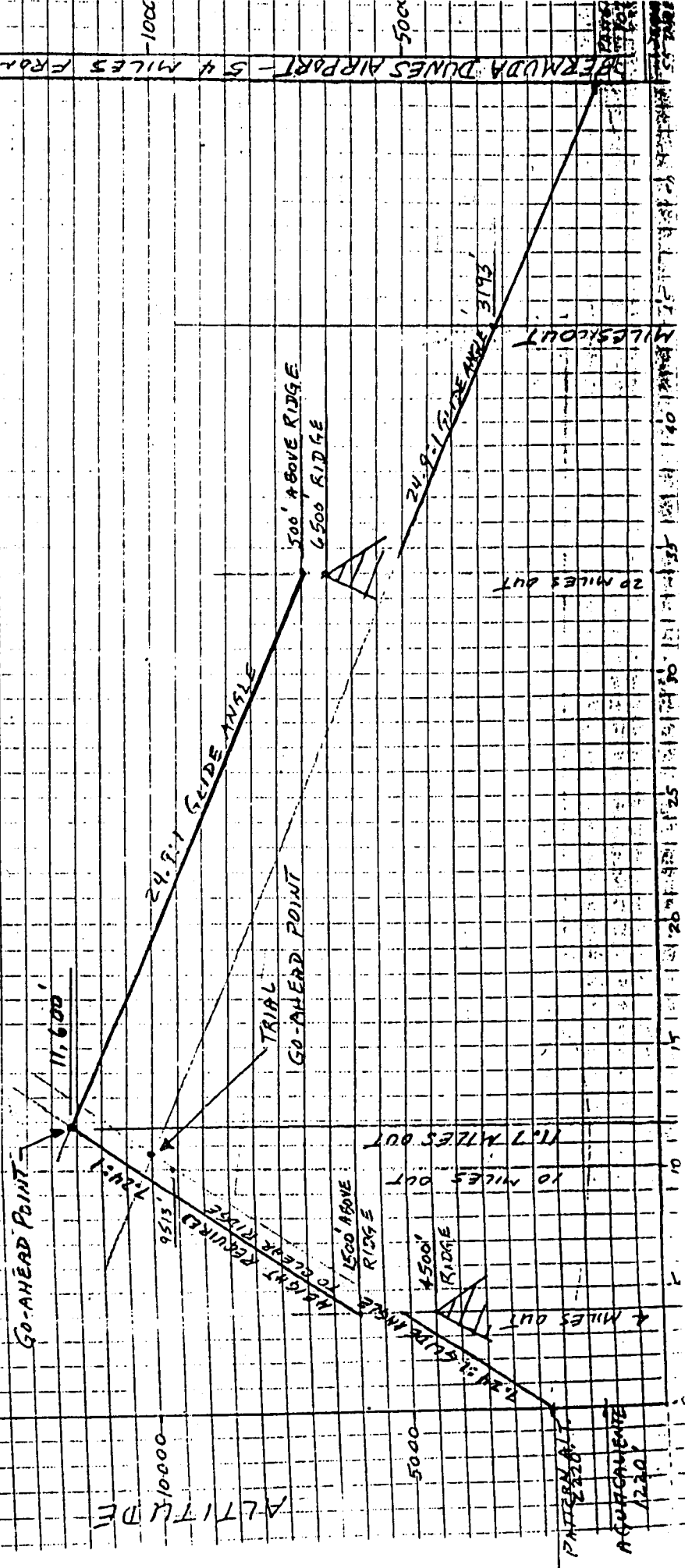
①



SOARING FORECAST ⑤				
	Ground (°F)	MSL Altitude	Lift (FPM)	Clouds AGL
③ Trigger	71	4000		
⑤ Hi Forecast	79	6200	300-600	4500
⑥ Actual	79	6400	400-600	NONE

WIND → 30 MPH

NOTE: THIS EXAMPLE USED STATUTE MILES
THE SAME PROBLEM REQUIRES
THE USE OF NAUTICAL MILES.



BERMUDA DUNES AIRPORT - 54 MILES FROM ASUA CALVENTE

200

150

100

500

20000

15000

ALTITUDE

10000

5000

PARSONS BLT

ASUA CALVENTE

12300'

4 MILES OUT

10 MILES OUT

11.7 MILES OUT

GO-AHEAD POINT

11.6

11,600'

TRIAL

9513'

11.7

24.2:1 GUIDE ANGLE

GO-AHEAD POINT

500' ABOVE RIDGE

6500' RIDGE

24.9:1 GUIDE ANGLE 3193'

20 MILES OUT

MILES OUT

MILES OUT

20 MILES OUT

20 MILES OUT

20 MILES OUT

20 MILES OUT

20 MILES OUT

20 MILES OUT

20 MILES OUT

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