Part Time Pilot

Cross-Country Planning Guide

Over 420 students and counting…

Part Time Pilot Online Ground School has yet to have a student fail their FAA Written Exam. What makes Part Time Pilot students so successful?

Part Time Pilot students don't just learn to memorize test questions and answers. Yes… we have 100s and 100s of FAA Written Questions that you will practice with. But we teach you the 1st Principle fundamentals of each concept so that **no matter what the FAA throws at you… you will be ready.**

Learning the 1st principle, core fundamentals of your ground school content is the easiest and most affordable way to pass your Private Pilot exams

This guide is a taste of how we do this in the Part Time Pilot Online Ground School. We took a concept that a lot of students struggle with and made it available for free. Enjoy!

Plotting your Cross-country Course:

After you have performed the weight and balance for your aircraft, your next step creating your cross-country plan should be to plot your course. I have found the following steps helpful in performing this:

1. **Draw straight line course from departure airport to destination airport**
    - In this example we will be plotting a cross-country from Gillespie Field (KSEE) to Apple Valley (KAPV) in southern California
2. **Determine Checkpoints**
    - After we have drawn the straight line course we will follow it and keep our eyes out for terrain and airspaces that we may want to avoid.
    - We will determine a # of checkpoints anywhere from ~10 to ~20 nm from one checkpoint to the next that are easy to distinguish from the air and take use in the most direct and risk free route as possible
3. **Determine True Courses, Magnetic Courses and Distances to each checkpoint**
    - Use your chart and plotter to determine the distances and true courses to each checkpoint
    - For the KSEE to KAPV example we will need the Los Angeles sectional chart

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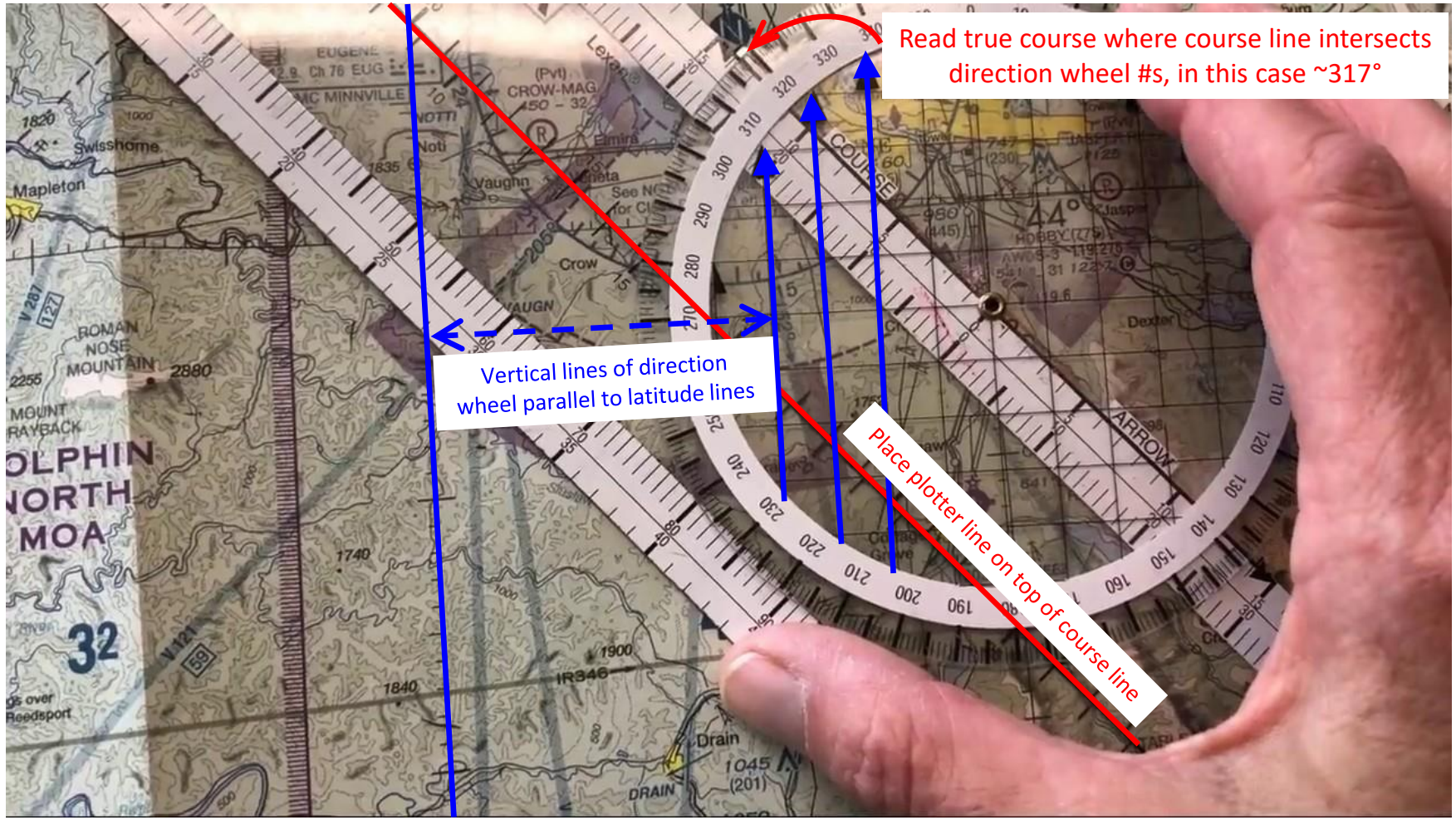
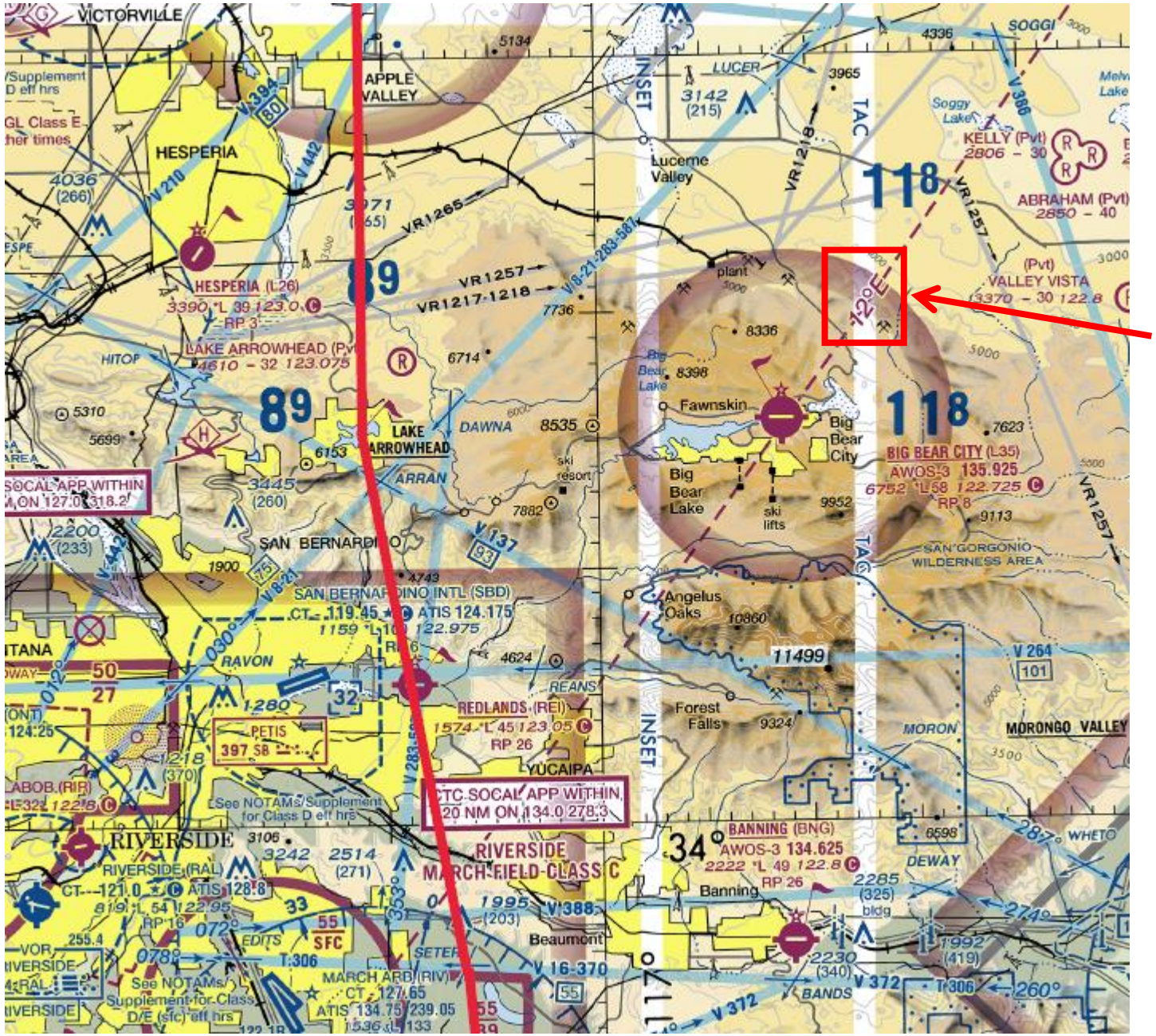


*I showed how to do this in a live lesson not too long ago that you can access in the Online Ground School Downloads and Video Vault BONUS course.

Checkpoint	Altitude	Distance (nm)	Distance Total (nm)	True Course °	Var -E +W	Mag Course °
KSEE	-	-	-	-	-	-
Lake Jennings				070		
KRNM				353		
Pauma Valley (Pvt)				346		
Skinner Resevoir				348		
SETER (X)				355		
Lake Arrowhead				353		
KAPV				000		



The closest Isogonic lines to our route tell us the magnetic variation correction factor:

East is least (subtract) & West is best (add)

Here we have 12 deg East so we subtract 12 from all our true courses

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Checkpoint	Altitude	Distance (nm)	Distance Total (nm)	True Course °	Var -E +W	Mag Course °
KSEE	-	-	-	-	-	-
Lake Jennings				070	-12	058
KRNM				353	-12	341
Pauma Valley (Pvt)				346	-12	334
Skinner Resevoir				348	-12	336
SETER (X)				355	-12	343
Lake Arrowhead				353	-12	341
KAPV				000	-12	348

How to convert from True Course to Magnetic Course:

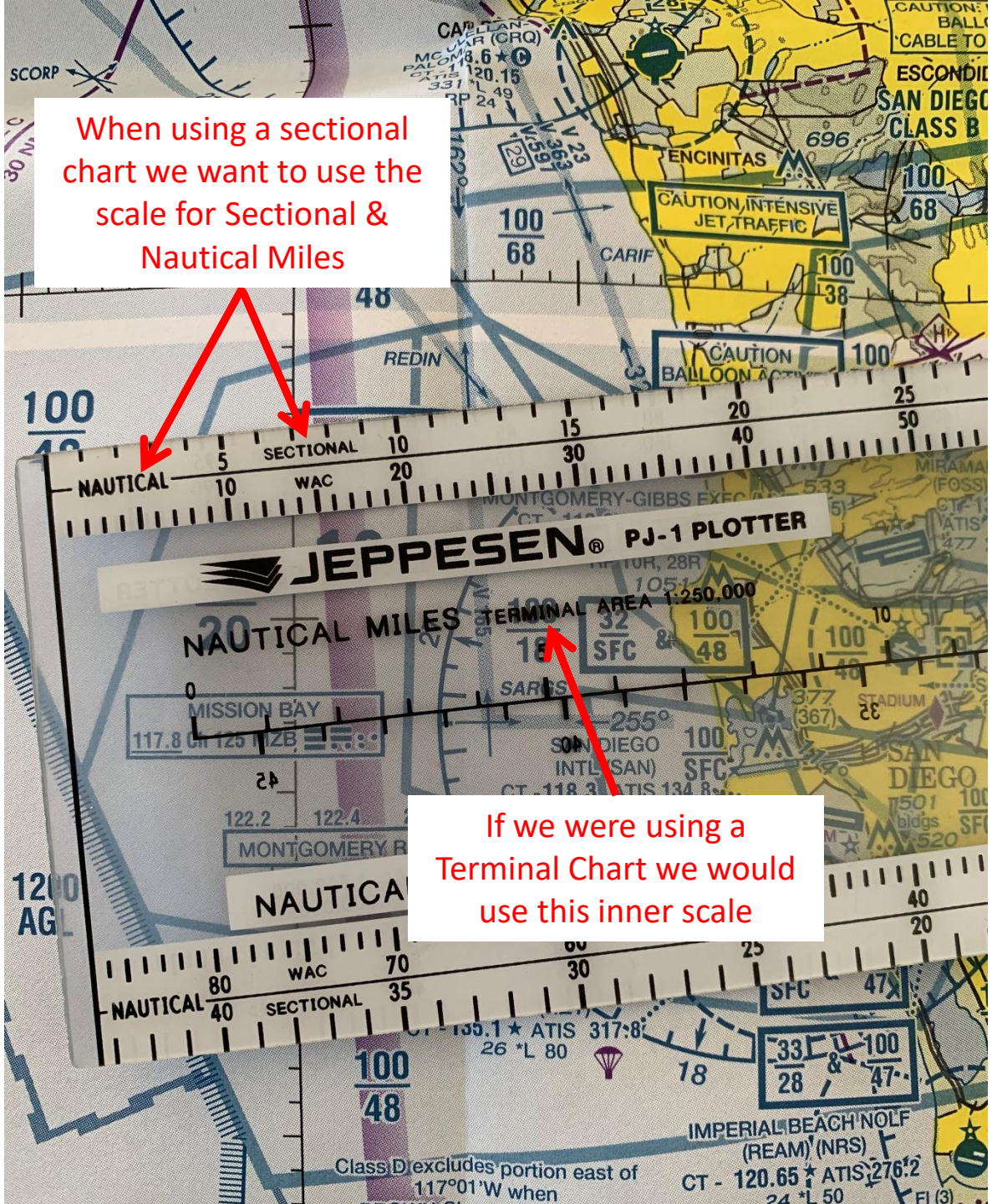
True → Corrected for variation → **Magnetic**

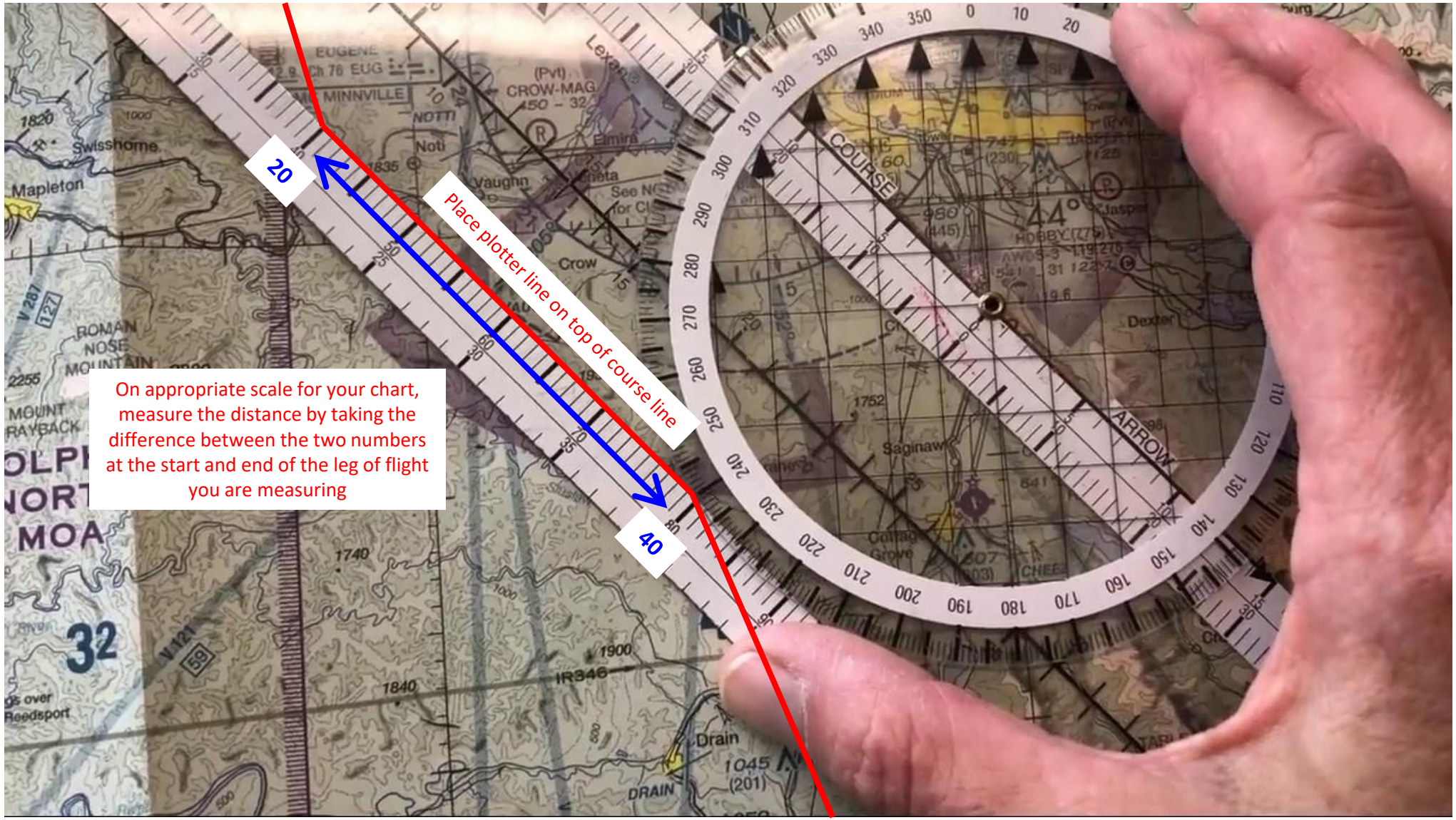
Course → Corrected for winds → **Heading**

True Course + Magnetic Variation = Magnetic Course

**This is where we encounter magnetic variation. But do you understand the other Magnetic Dip Errors such as Deviation or Magnetic Dip? Our Online Ground School videos break these concepts down and use animations for those visual learners*

***ALERT:** These scales on your plotter **wont actually work** for the FAA Written exam. They work for plotting on actual aeronautical charts only. We explain why as well as how to correct for this in the [Online Ground School]*





Checkpoint	Altitude	Distance (nm)	Distance Total (nm)	True Course °	Var -E +W	Mag Course °
KSEE	-	-	-	-	-	-
Lake Jennings		5	5	070	-12	058
KRNM		11	16	353	-12	341
Pauma Valley (Pvt)		17	33	346	-12	334
Skinner Resevoir		17	50	348	-12	336
SETER (X)		19	69	355	-12	343
Lake Arrowhead		21	90	353	-12	341
KAPV		20	110	000	-12	348

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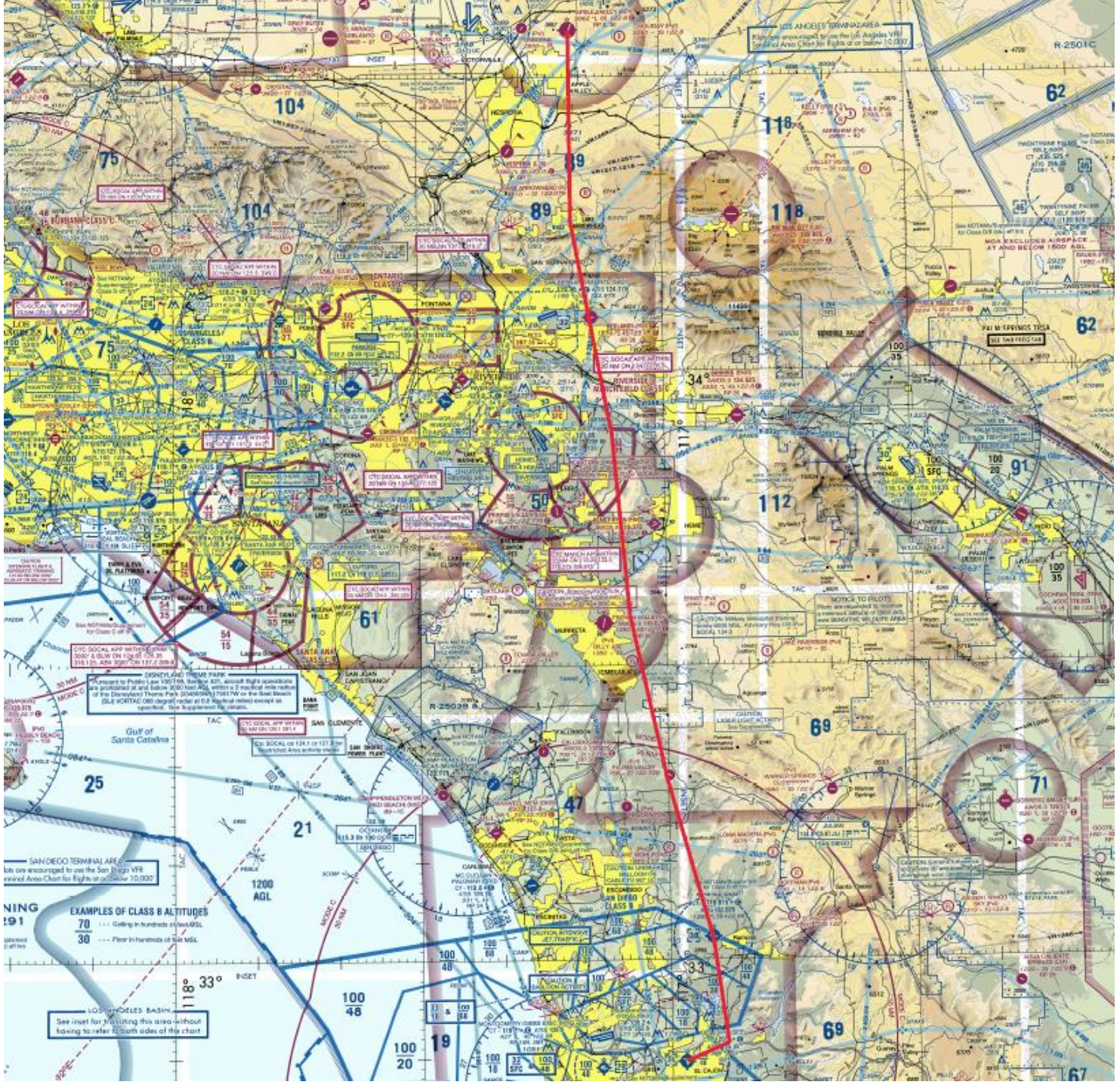
    - We will determine a # of checkpoints anywhere from ~10 to ~20 nm from one checkpoint to the next that are easy to distinguish from the air and take use in the most direct and risk free route as possible
3. **Determine True Courses, Magnetic Courses and Distances to each checkpoint**
    - Use your chart and plotter to determine the distances and true courses to each checkpoint
    - For the KSEE to KAPV example we will need the Los Angeles sectional chart
4. **Determine Cruise Altitude**
    - Using your newly drawn route with checkpoints, determine the safest and economic cruise altitude to fly at



Choose a cruise altitude that meets the following criteria:

- Avoids airspace you want to avoid
- Avoids terrain
- Obeys Hemispherical Rule
- Is efficient & safe

Climb to hemispherical cruise altitude that also clears well above terrain:

For magnetic courses 0-179 deg = Odd + 500’

For magnetic courses 180-359 deg = Even + 500’

Remain below Class B until KRNM Checkpoint (< 3800’)

Checkpoint	Altitude	Distance (nm)	Distance Total (nm)	True Course °	Var -E +W	Mag Course °
KSEE	*388’*	-	-	-	-	-
Lake Jennings	*Climb & stay below 3800’*	5	5	070	-12	058
KRNM	*Climb & stay below 3800’*	11	16	353	-12	341
Pauma Valley (Pvt)	*Climb to 8500’*	17	33	346	-12	334
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KAPV	*Descend to Pattern Altitude*	20	110	000	-12	348

**Get an excel & pdf printable version of these cross-country planning tables in the Online Ground School*

CROSS-COUNTRY PLANNING TIP:

Once you have determined your checkpoints and distances, it is best to perform an estimation of the total fuel you will need for your journey. **Doing this now can save a lot of pain and headache.**

Imagine spending hours on planning a cross country flight plan, making all those corrections only to find out you will not have enough fuel to make it the whole way and you need to make a fuel stop. Now you have to add a diversion and fuel stop in your plan. This will change everything after that checkpoint such that you will have to redo all your calculations!

In the Part Time Pilot Online Ground School we teach you step by step how to do this very quickly and easily to get a conservative fuel estimation that you can use to just if you need a fuel stop before going any further in your planning.

This is also a great time to perform the weight and balance for your aircraft because depending on the passengers and baggage you want to bring, it may dictate how much fuel you can bring and you will want to know this sooner rather than later.

CALCULATING WEIGHT & BALANCE:

As mentioned in the previous slide it is a good time to perform the weight and balance calculation for your aircraft at this point to get an idea of the amount of fuel you can bring.

What happens if your weight and balance calculation tells you that you are too heavy and can't bring enough fuel? But at the same time your fuel estimation tells you that you need more then what your weight and balance will allow?

Or what if after you land you plan to remove or add a passenger, how does that effect the calculation? And even more importantly, how does that effect the stability and control of the aircraft?

These are the types of questions that the examiner is going to ask you about Weight and Balance when he/she quizzes you on the cross-country plan you made for your checkride.

If you want to be able to answer these questions and please the examiner you need to be able to understand the fundamental 1st principles of weight and balance theory and the procedure for calculation weight and balance. This is why in the Part Time Pilot Online Ground School we have a lesson JUST on the theory. Then, we have a lesson on the step by step procedure. Finally, we have a 3rd lesson with nothing but examples to answer those "what if" questions you'll get from your examiner and so that your understanding of the concept fully clicks inside your head.

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Checkpoint	Altitude	Distance (nm)	Distance Total (nm)	True Course °	Var -E +W	Mag Course °	Wind True °	Wind Speed	Temperature
KSEE	*388'*	-	-	-	-	-			
Lake Jennir						058			
KRNM						041			
Pauma Vall (Pvt)						034			
Skinner Rese						036			
SETER (X)						043			
Lake Arrowhead	8500'	21	90	353	-12	341			
KAPV	*Descend to Pattern Altitude*	20	110	000	-12	348			

- Next, we need to gather some information on Winds and Temperature for the Cruise portion of our flight (8500').
- Everything we have done prior to this can be done far in advance of your actual flight if you wanted to
  - But from here on out we will use atmospheric data in our calculations… which must be current.
  - So the rest of our planning needs to be done the day of or the night before

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www.aviationweather.gov

Aviation Weather Center: AWC

Aviation Weather Center Homepage provides comprehensive user-friendly **aviation weather** Text products and graphics.

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Radar
Radar image - NWS Mosaic - RCM - Forecasts - Plot - ...

TAFs
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Winds/Temps
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More results from aviationweather.gov »

- Google “aviation weather” or go to aviationweather.gov and search for Winds/Temps link
- Or click here on Google Search

- Click on the reporting center (red dots) that is closest to the middle of your route
- For us, our route is between SAN and ONT

Click on map to access text data for each region

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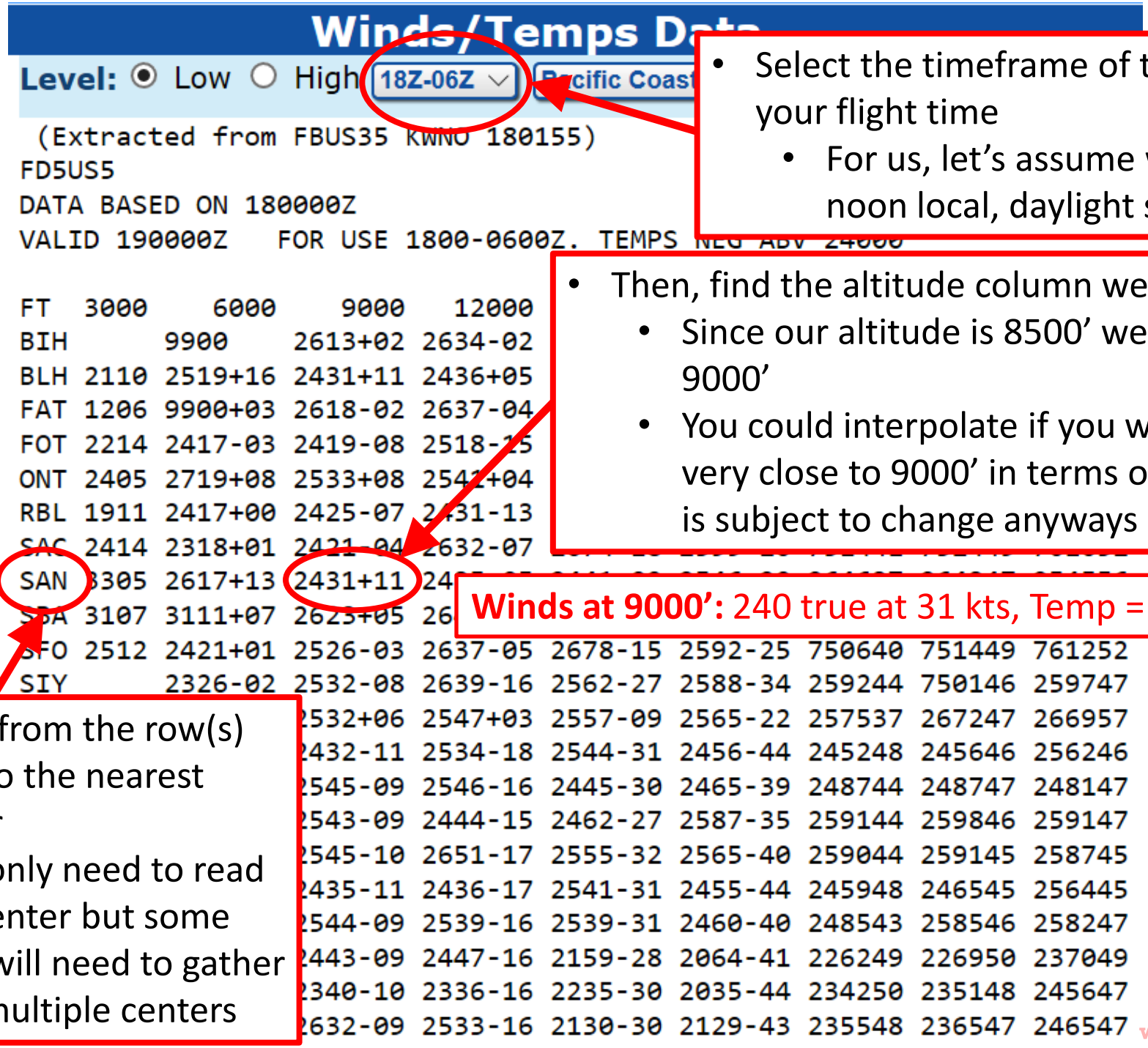
Watch [YouTube Video]



- Select the timeframe of the forecast that covers your flight time
  - For us, let's assume we are taking off at noon local, daylight savings time (San Diego)

- Then, find the altitude column we need data for
  - Since our altitude is 8500' we are between 6000' & 9000'
  - You could interpolate if you wanted to. But 8500' is very close to 9000' in terms of a wind forecast that is subject to change anyways

Winds at 9000': 240 true at 31 kts, Temp = 11 deg C

- Next, read data from the row(s) corresponding to the nearest reporting center
  - For us, we only need to read from one center but some flights you will need to gather data from multiple centers

Checkpoint	Altitude	Distance (nm)	Distance Total (nm)	True Course °	Var -E +W	Mag Course °	Wind True °	Wind Speed	Temperature
KSEE	*388’*	-	-	-	-	-			
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INTERPOLATION:

We will not cover interpolating in this free guide but it is something that you will need to understand how to do. FAA Written exam questions will require the skill of being able to interpolate between sets of data.

In the Part Time Pilot Online Ground School we have a lesson just for this subject of interpolation.

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Total Distance to Climb

- Before we determine the fuel, time and distance to climb to each of our checkpoints in our climb phase of flight… We need to determine the **total distance it will take to climb from takeoff altitude to cruise altitude.**
- This will tell us the distance it takes to reach our top of climb.
  - Then, we can move a checkpoint to this exact spot.
  - This **helps makes calculations much easier** because we do not have to calculate ½ a leg of flight as climb and the other ½ as cruise.
  - This also helps us while flying because we know that **once we reach this checkpoint that we should be at or very near our cruise altitude.**

Gather Information

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- We are taking off from KSEE which has an **airport elevation** of 388’ and we are climbing to **cruise altitude** of 8500’
  - Takeoff Elevation: **388’**
  - Cruise Altitude: **8500’**
- In order to use our Fuel, Time, Distance to Climb chart we will also need the expected **altimeter setting at our takeoff airport**, the **ground temperature at our takeoff airport**, and **the temperature aloft at our cruise altitude**.
- For this example let’s assume the following values:
  - Altimeter Setting at takeoff airport: **29.80” of Hg**
    - Gathered from nearest METAR/TAF
  - Ground Temperature at takeoff airport: **17 ° C**
    - Gathered from METAR/TAF or Local Area Forecast
  - Temperature Aloft at cruise altitude: **11° C**
    - Gathered from Winds Aloft data at 9000’

Convert Elevation to Pressure Altitude

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- We are almost ready to use our Fuel, Time, Distance to Climb chart but first we need to convert our takeoff airport elevation into a Pressure Altitude.
  - To convert our elevation to pressure altitude:

Pressure Altitude = Elevation (ft) + 1000*(29.92” – Altimeter Setting (“ Hg))

Or

Pressure Altitude = 388’ + 1000*(29.92” – 29.80”) = 508’

Fuel, Time, Distance to Climb

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- We are now ready to use our Fuel, Time, Distance to Climb chart from our approved POH/AFM for our aircraft using the information we have gathered:
  - Takeoff Pressure Altitude: **508'**
  - Cruise Pressure Altitude: **8500'**
  - Ground Temperature at takeoff airport: **17 ° C**
  - Temperature Aloft at cruise altitude: **11° C**
- To use the chart we will have to find values at both altitudes and then find the difference between the values. This difference will be the fuel, time and distance needed to travel from one altitude to the other.
  - **Step #1:** Find fuel, time, distance values at 508' and 17° C
  - **Step #2:** Find fuel, time, distance values at 8500' and 11° C
  - **Step #3:** Subtract values from Step #1 from values in Step #2 to find the fuel, time and distance needed to climb from 508' to 8500'

Step #1

PA-28-161

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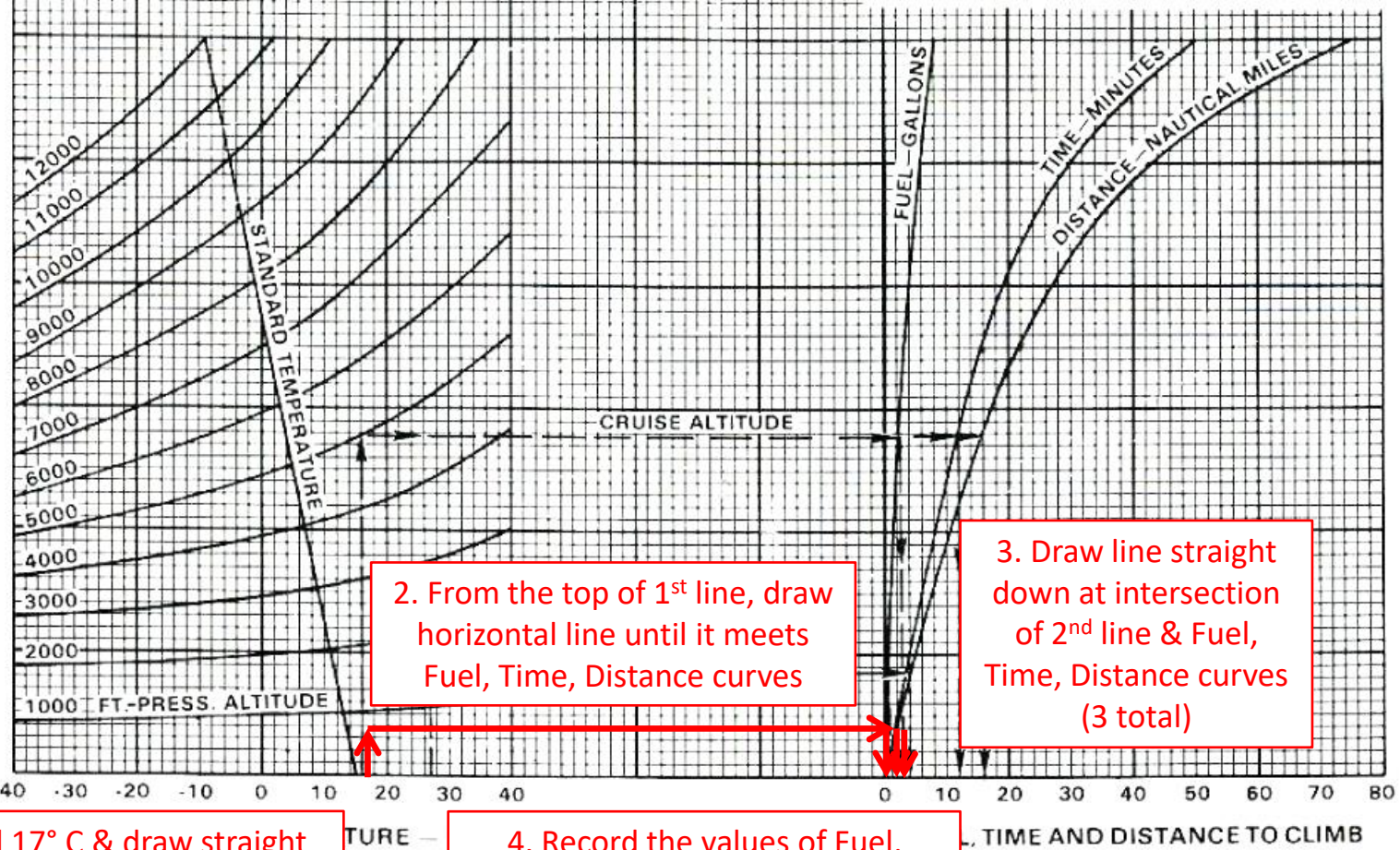
FUEL, TIME AND DISTANCE TO CLIMB

ASSOCIATED CONDITIONS:
WEIGHT 2440 LBS., FLAPS 0°, FULL THROTTLE
MIXTURE — LEANED PER LYCOMING INSTRUCTIONS
79 KIAS, NO WIND

Example:
Departure airport pressure altitude: 1500 ft.
Departure airport temperature: 27°C
Cruise pressure altitude: 5000 ft.
Cruise OAT: 16°C
Time to climb (12 min. minus 3 min.): 9 min.
Distance to climb (16; miles minus 4 miles): 12 nautical miles
Fuel to climb (3 gal. minus 1 gal.): 2 gal.



FUEL, TIME AND DISTANCE TO CLIMB
Figure 5-19

1. Find 17° C & draw straight line up to the P alt. of 508'

2. From the top of 1st line, draw horizontal line until it meets Fuel, Time, Distance curves

3. Draw line straight down at intersection of 2nd line & Fuel, Time, Distance curves (3 total)

4. Record the values of Fuel, Time, Distance from where the 3 lines meet the bottom axis

*This chart is from a PA-28-161 Cherokee Warrior aircraft. The FAA uses similar charts that look slightly different. The Online Ground School uses both charts so that you get practice with both

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Step #1 Results

- **Step #1:** Find fuel, time, distance values at 508’ and 17° C
  - Fuel value: 0.4 Gallons
  - Time value: 1.5 Minutes
  - Distance value: 1.5 NM

Step #2

PA-28-161

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FUEL, TIME AND DISTANCE TO CLIMB

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WEIGHT 2440 LBS., FLAPS 0°, FULL THROTTLE
MIXTURE — LEANED PER LYCOMING INSTRUCTIONS
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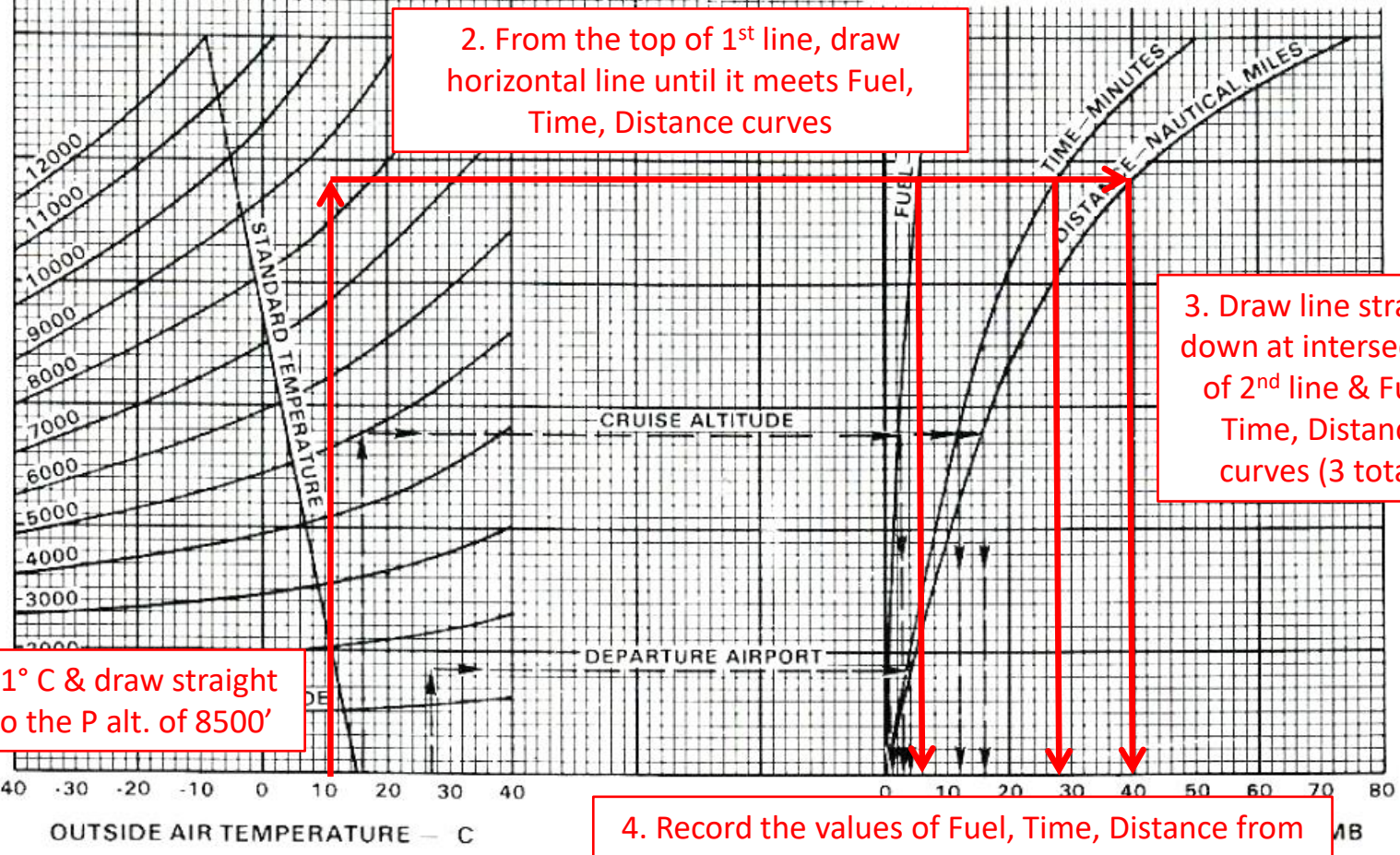

2. From the top of 1st line, draw horizontal line until it meets Fuel, Time, Distance curves

3. Draw line straight down at intersection of 2nd line & Fuel, Time, Distance curves (3 total)

1. Find 11° C & draw straight line up to the P alt. of 8500'

4. Record the values of Fuel, Time, Distance from where the 3 lines meet the bottom axis

FUEL, TIME AND DISTANCE TO CLIMB
Figure 5-19

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Step #2 Results

- **Step #2:** Find fuel, time, distance values at 7500’ and 12° C
  - Fuel value: 6 Gallons
  - Time value: 28 Minutes
  - Distance value: 40 NM

Step #3

- **Step #3:** Subtract values from Step #1 from values in Step #2 to find the fuel, time and distance needed to climb from 508’ to 7500’
  - Fuel: 6 – 0.4 = **5.6 Gallons**
  - Time: 28 – 1.5 = **26.5 Minutes**
  - Distance: 40 – 1.5 = **38.5 NM**
- We now know that it will take us a total distance of 38.5 NM to reach our top of climb
- We can now adjust our checkpoints so that a checkpoint is 38.5 NM away from our starting point.

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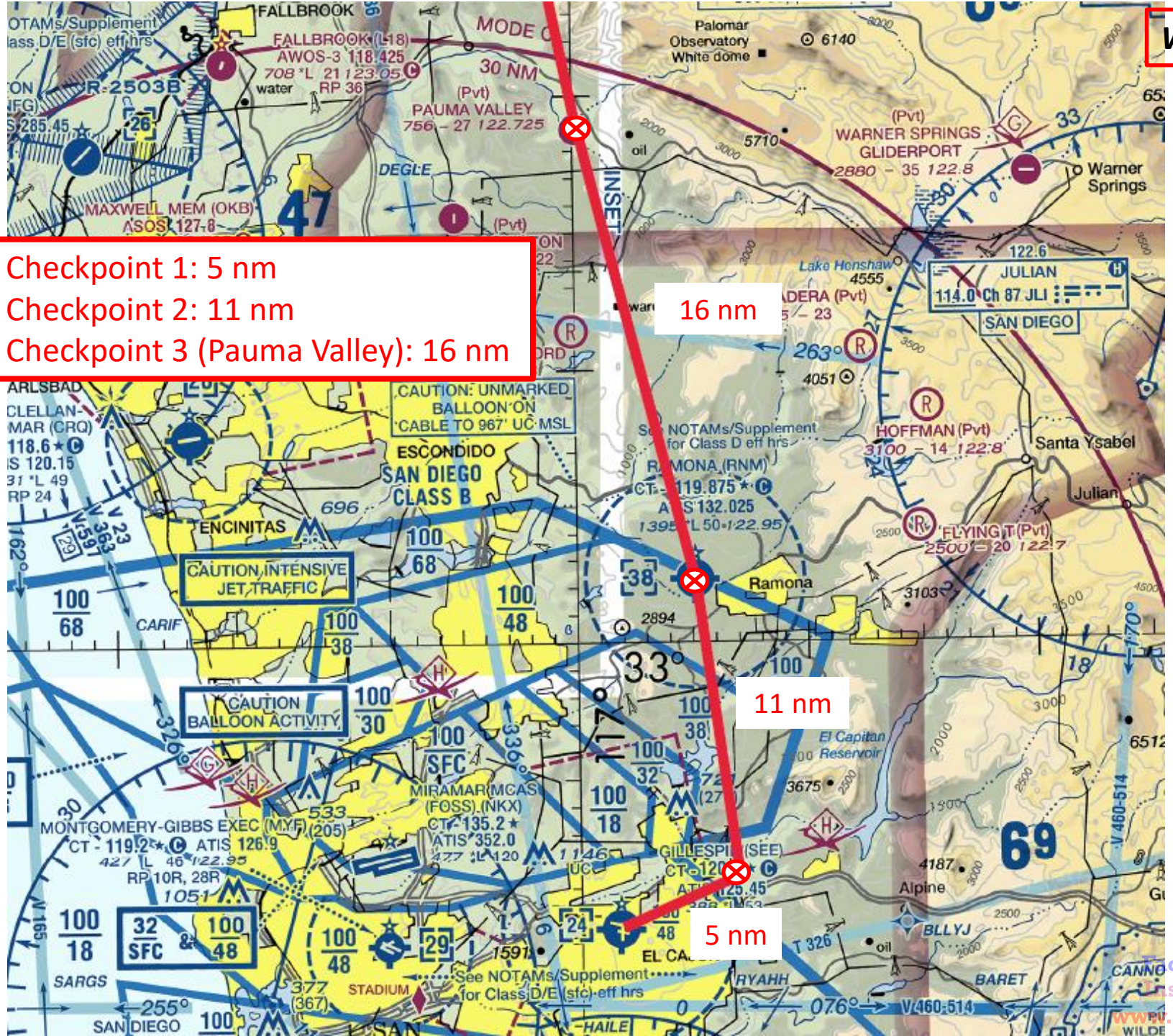
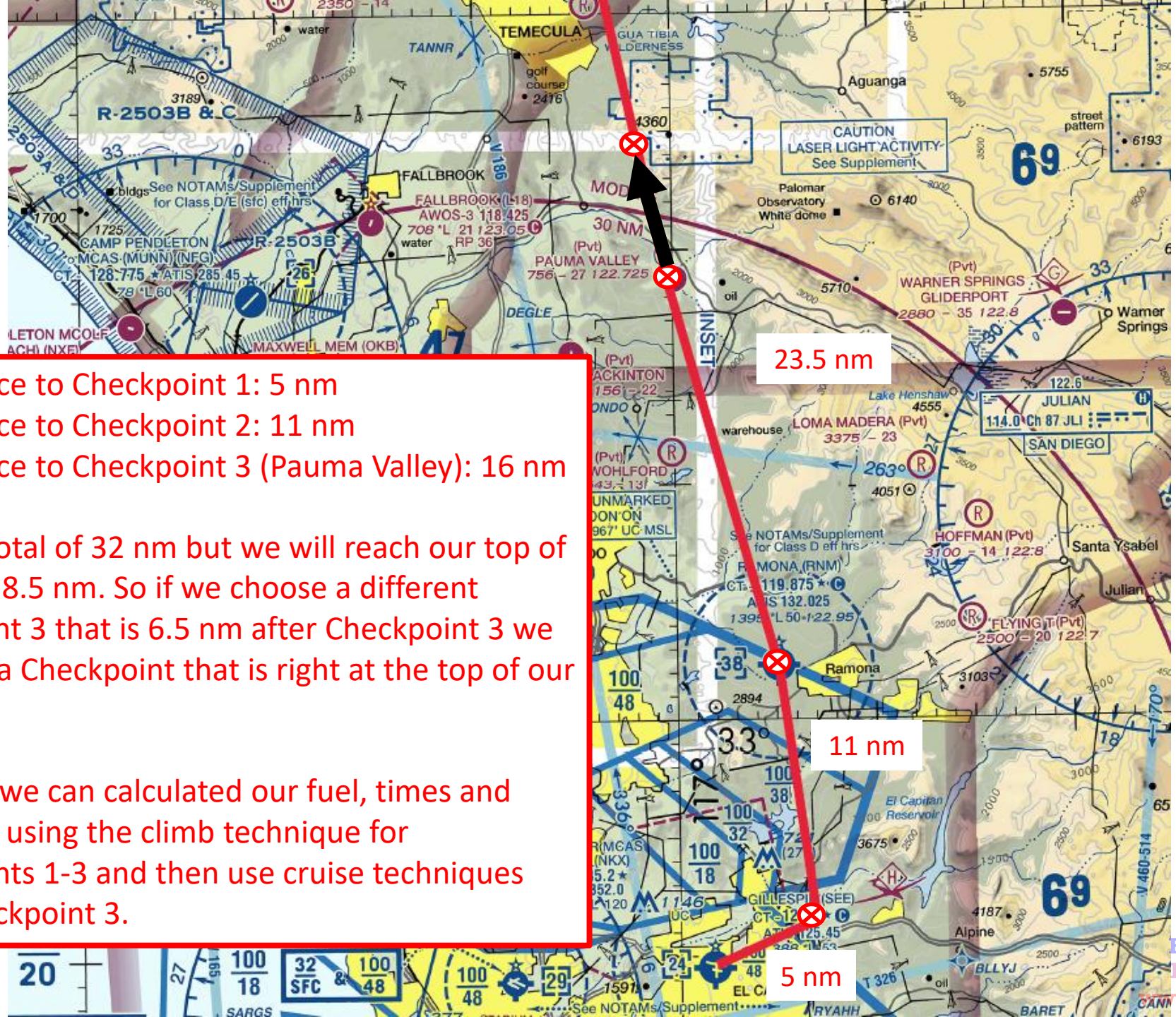
- Distance to Checkpoint 1: 5 nm
- Distance to Checkpoint 2: 11 nm
- Distance to Checkpoint 3 (Pauma Valley): 16 nm





- Distance to Checkpoint 1: 5 nm
- Distance to Checkpoint 2: 11 nm
- Distance to Checkpoint 3 (Pauma Valley): 16 nm

This is a total of 32 nm but we will reach our top of climb at 38.5 nm. So if we choose a different Checkpoint 3 that is 6.5 nm after Checkpoint 3 we can have a Checkpoint that is right at the top of our climb.

This way, we can calculated our fuel, times and airspeeds using the climb technique for Checkpoints 1-3 and then use cruise techniques after Checkpoint 3.

Checkpoint	Altitude	Distance (nm)	Distance Total (nm)	True Course °	Var -E +W	Mag Course °	Wind True °	Wind Speed	Temperature	Fuel (gal)
KSEE	*508'*	-	-	-	-	-			17	*Takeoff & taxi*
Lake Jennings	*Climb & stay below 3800'*	5	5	070	-12	058				-
KRNM	*Climb & stay below 3800'*	11	16	353	-12	341				-
Mtn Peak *(JLI 285)*	*Climb to 8500'*	~~16~~ 22.5	38.5	346	-12	334				*5.6*
Skinner Reservoir	8500'	~~17~~ 11.5	50	348	-12	336	240	31	11	
SETER (X)	8500'	19	69	355	-12	343	240	31	11	
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DETERMINING THE ALTITUDE & FUEL WE REACH AT EACH CLIMB CHECKPOINT:

What do we put for our Altitude or Fuel under the Lake Jennings, KRNM and JLI 285 radial?

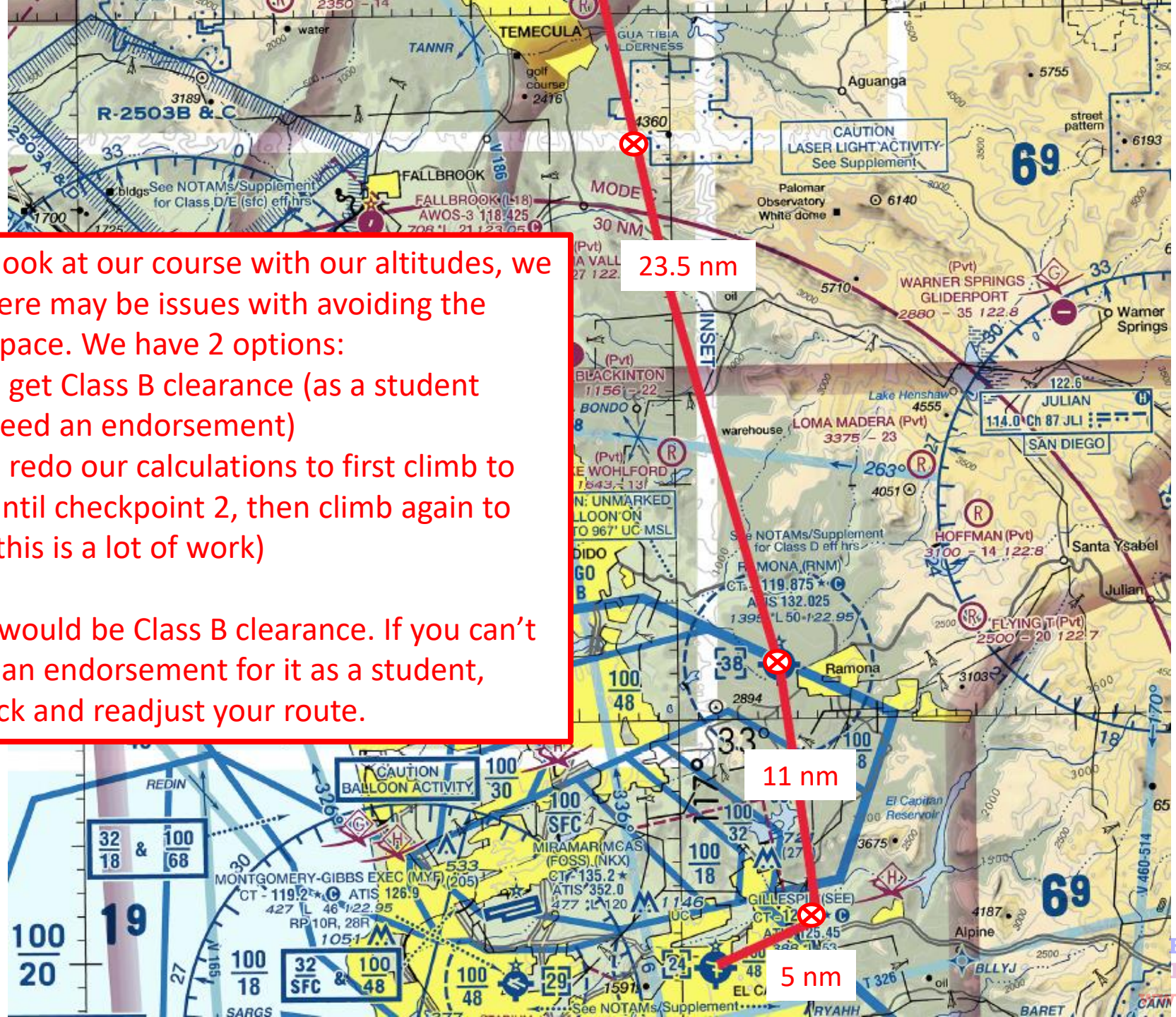
How do we figure this out? Do we need to figure this out?

I personally, think this information is very valuable. Especially with the route like the one we are taking where the first couple checkpoints are underneath a Class B airspace.

To do this there is an estimation method and there is a more exact method using the performance charts. We explain both in our Bonus Cross-Country Planning eBook that is a free download when you enroll in the Online Ground School.

For the sake of being brief, I have included the exact altitudes & fuels at each checkpoint by using the exact method as discussed above

Checkpoint	Altitude	Distance (nm)	Distance Total (nm)
KSEE	*508'*	-	-
Lake Jennings	*Climb & stay below 3800'*	5	5
KRNM	*Climb & stay below 3800'*	11	16
Mtn Peak *(JLI 285)*	*Climb to 8500'*	~~16~~ 22.5	38.5
Skinner Reservoir	8500'	~~17~~ 11.5	50
SETER (X)	8500'	19	69
Lake Arrowhead	8500'	21	90
KAPV	*Descend to Pattern Altitude*	20	110


Now if we look at our course with our altitudes, we see that there may be issues with avoiding the Class B airspace. We have 2 options:
1. We can get Class B clearance (as a student you'll need an endorsement)
2. We can redo our calculations to first climb to 3500' until checkpoint 2, then climb again to 8500' (this is a lot of work)
My choice would be Class B clearance. If you can't get that or an endorsement for it as a student, then go back and readjust your route.
23.5 nm
11 nm
5 nm
TEMECULA
FALLBROOK
R-2503B &C
CAUTION LASER LIGHT ACTIVITY See Supplement
Aguanga
Palomar Observatory White dome
WARNER SPRINGS GLIDERPORT
Warner Springs
JULIAN
SAN DIEGO
LOMA MADERA (Pvt)
HOFFMAN (Pvt)
Santa Ysabel
Julian
Ramona
FLYING T (Pvt)
CAUTION BALLOON ACTIVITY
MONTGOMERY-GIBBS EXEC (MYF)
MIRAMAR(MCAS) (FOSS) (NKX)
Alpine
Facebook: @part.time.pilot1
Instagram: @part.time.pilot
www.YouTube.com/PartTimePilot

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Total Distance to Descend

- Before we determine the fuel, time and distance to descend to each of our checkpoints in our descent phase of flight… We need to determine the **total distance it will take to descend from cruise altitude to Landing Traffic Pattern Altitude.**
- This will tell us the distance we need to descend.
  - Which will tell us which checkpoint we should start our descent at
  - We will be using the same techniques to calculate fuel and time for descent as we do for cruise so it's not as important that we have a checkpoint exactly at the right point so that our descent is perfectly timed (like we had for climb).

Gather Information

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- We are descending from a **cruise altitude** of 8500’ to an airport traffic pattern 1000’ above it’s elevation of 3062’
  - Cruise Altitude: **8500’ MSL**
  - Airport Elevation: **3062’ MSL** (in terms of standard atmosphere)
  - Airport Traffic Pattern: **1000’ AGL**
- In order to use our Fuel, Time, Distance to Descend chart we will also need the expected **altimeter setting at our landing airport**, the **ground temperature at our landing airport**, and **the temperature aloft at our cruise altitude**. Let’ assume:
  - Altimeter Setting at landing airport: **30.02” of Hg**
    - Gathered from nearest METAR/TAF
  - Ground Temperature at landing airport: **25 ° C**
    - Gathered from METAR/TAF or Local Area Forecast
  - Temperature Aloft at cruise altitude: **11° C**
    - Gathered from Winds Aloft data at 9000’

Convert Elevation to Pressure Altitude

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- We are almost ready to use our Fuel, Time, Distance to Descend chart but first we need to convert our landing airport elevation into a Pressure Altitude.
  - To convert our elevation to pressure altitude:

Pressure Altitude = Elevation (ft) + 1000*(29.92” – Altimeter Setting (“ Hg)

Or

Pressure Altitude = 3062’ + 1000*(29.92” – 30.02”) = 2962’

  - Now we can add the 1000’ AGL traffic pattern to get the pressure altitude we are going to descend to:

Final Pressure Altitude = 2962’ + 1000’ = 3962’

Fuel, Time, Distance to Descend

Watch YouTube Video

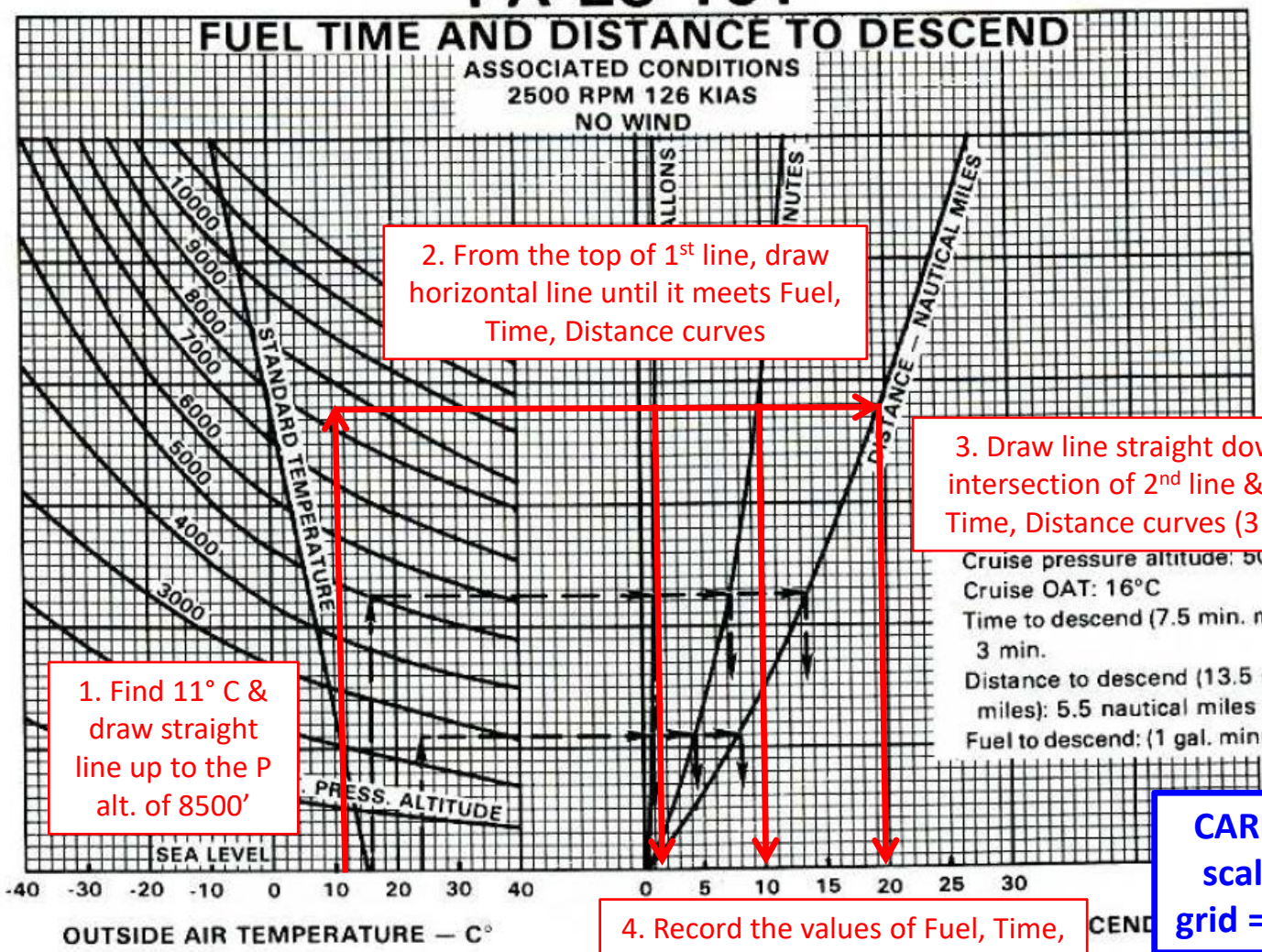
- We are now ready to use our Fuel, Time, Distance to Descend chart from our approved POH/AFM for our aircraft using the information we have gathered:
  - Cruise Pressure Altitude: **8500'**
  - Final Pressure Altitude: **3962'**
  - Ground Temperature at landing airport: **25 ° C**
  - Temperature Aloft at cruise altitude: **11° C**
- To use the chart we will have to find values at both altitudes and then find the difference between the values. This difference will be the fuel, time and distance needed to travel from one altitude to the other.
  - **Step #1:** Find fuel, time, distance values at 8500' and 11° C
  - **Step #2:** Find fuel, time, distance values at 3962' and 25° C
  - **Step #3:** Subtract values from Step #2 from values in Step #1 to find the fuel, time and distance needed to descend from 8500' to 3962'

Watch YouTube Video

Step #1

PA-28-161

FUEL TIME AND DISTANCE TO DESCEND



2. From the top of 1st line, draw horizontal line until it meets Fuel, Time, Distance curves

3. Draw line straight down at intersection of 2nd line & Fuel, Time, Distance curves (3 total)

1. Find 11° C & draw straight line up to the P alt. of 8500'

4. Record the values of Fuel, Time, Distance from where the 3 lines meet the bottom axis

Cruise pressure altitude: 5000 ft.
Cruise OAT: 16°C
Time to descend (7.5 min. minus 4.5 min.): 3 min.
Distance to descend (13.5 miles minus 8 miles): 5.5 nautical miles
Fuel to descend: (1 gal. minus .5 gal.): 5 gal.

CAREFUL… This scale has each grid = 1 and not 2

FUEL, TIME AND DISTANCE TO DESCEND
Figure 5-31

Watch YouTube Video

Step #1 Results

- **Step #1:** Find fuel, time, distance values at 8500’ and 11° C
  - Fuel value: 1.5 Gallons
  - Time value: 10 Minutes
  - Distance value: 19.5 NM

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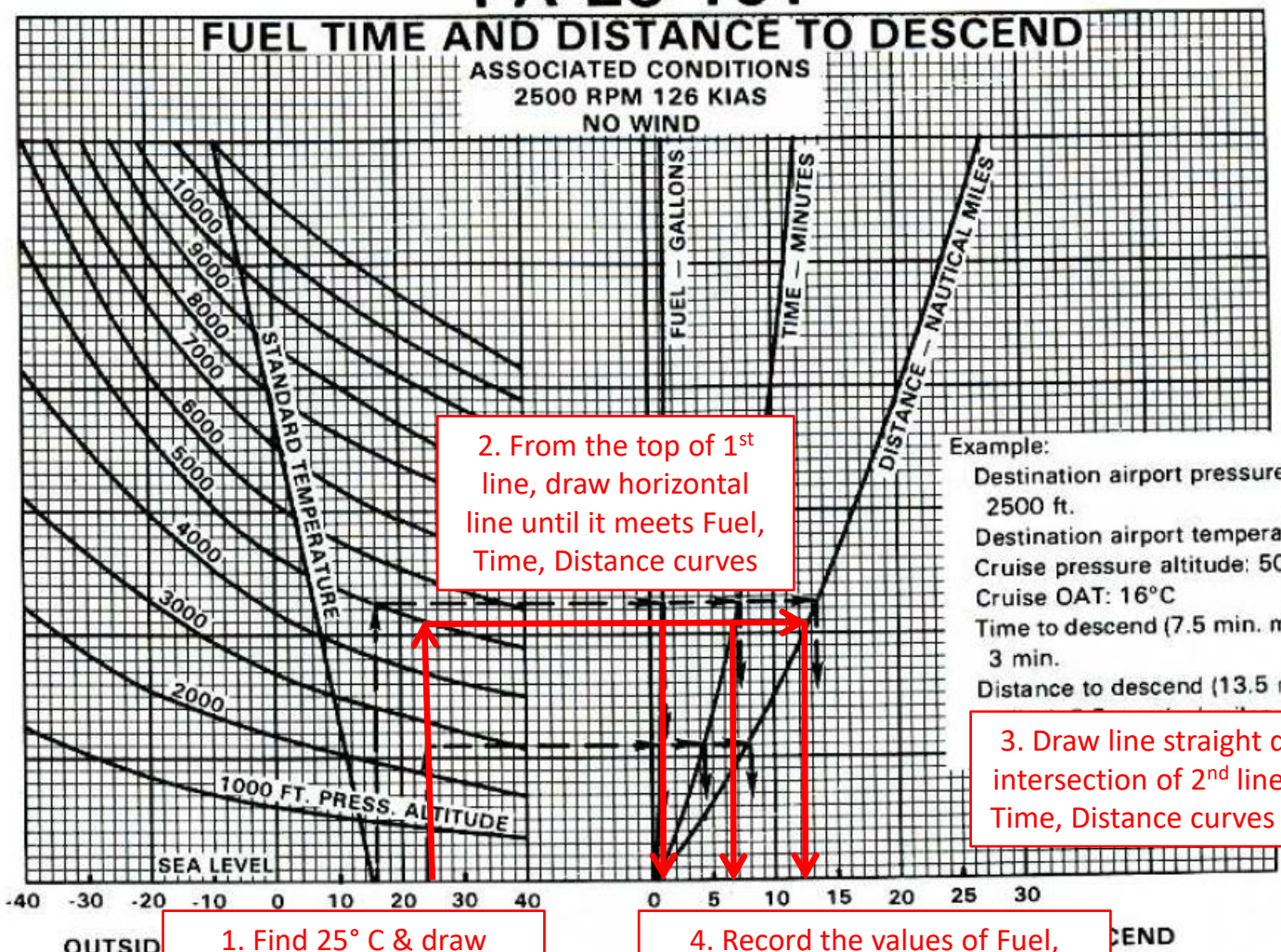
Step #2

PA-28-161

FUEL TIME AND DISTANCE TO DESCEND



Example:
Destination airport pressure altitude: 2500 ft.
Destination airport temperature: 24°C
Cruise pressure altitude: 5000 ft.
Cruise OAT: 16°C
Time to descend (7.5 min. minus 4.5 min.): 3 min.
Distance to descend (13.5 miles minus 8
gal.

2. From the top of 1st line, draw horizontal line until it meets Fuel, Time, Distance curves

3. Draw line straight down at intersection of 2nd line & Fuel, Time, Distance curves (3 total)

1. Find 25° C & draw straight line up to the P alt. of 3962'

4. Record the values of Fuel, Time, Distance from where the 3 lines meet the bottom axis

FUEL, TIME AND DISTANCE TO DESCEND
Figure 5-31

Watch YouTube Video

Step #2 Results

- **Step #2:** Find fuel, time, distance values at 3962’ and 25° C
  - Fuel value: 1 Gallons
  - Time value: 6.5 Minutes
  - Distance value: 12 NM

Step #3

- **Step #3:** Subtract values from Step #1 from values in Step #2 to find the fuel, time and distance needed to descend from 7500’ to 3962’
  - Fuel: 1.5 - 1 = **0.5 Gallons**
  - Time: 10 – 6.5 = **3.5 Minutes**
  - Distance: 19.5 – 12 = **7.5 NM**
- We now know that it will take us a total distance of 7.5 NM to descend to our traffic pattern altitude

Watch YouTube Video

Checkpoint	Altitude	Distance (nm)	Distance Total (nm)	True Course °	Var -E +W	Mag Course °	Wind True °	Wind Speed	Temperature	Fuel (gal)
KSEE	508’	-	-	-	-	-			17	Takeoff & taxi
Lake Jennings	2400’	5	5	070	-12	058				0.6
KRNM	5300’	11	16	353	-12	341				1.5
Mtn Peak *(JLI 285)*	8500’	22.5	38.							3.5
Skinner Resevoir	8500’	11.5	50				0	31	11	
SETER (X)	8500’	19	69	355	-12	343	240	31	11	
Lake Arrowhead	8500’	21	90	353	-12	341	240	31	11	
KAPV	*3962’*	20	110	000	-12	348				

Now if we look at our plan we see that we will have plenty of distance (20 nm) to descend from our last checkpoint when we clear high terrain at Lake Arrowhead

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Facebook: @part.time.pilot1
Instagram: @part.time.pilot
www.YouTube.com/PartTimePilot

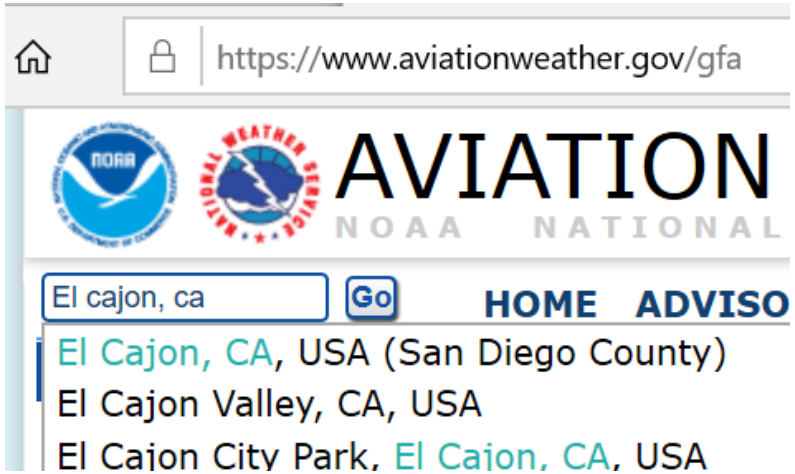
Checkpoint	Altitude	Distance (nm)	Distance Total (nm)	True Course °	Var -E +W	Mag Course °	Wind True °	Wind Speed	Temperature	Fuel (gal)
KSEE	508’	-	-	-	-	-	?	?	17	Takeoff & taxi
Lake Jennings	2400’	5	5	070	-12	058	?	?	?	0.6
KRNM	5300’						?	?	?	1.5
Mtn Peak *(JLI 285)*	8500’						?	?	?	3.5
Skinner Resevoir	8500’						240	31	11	
SETER (X)	8500’						240	31	11	
Lake Arrowhead	8500’						240	31	11	
KAPV	3962’	20	110	000	-12	348	?	?	25	

Now that we know all our altitudes we can get accurate Wind and Temperature Data from interpolating data from Wind Aloft tables as we did for our Cruise winds & temps

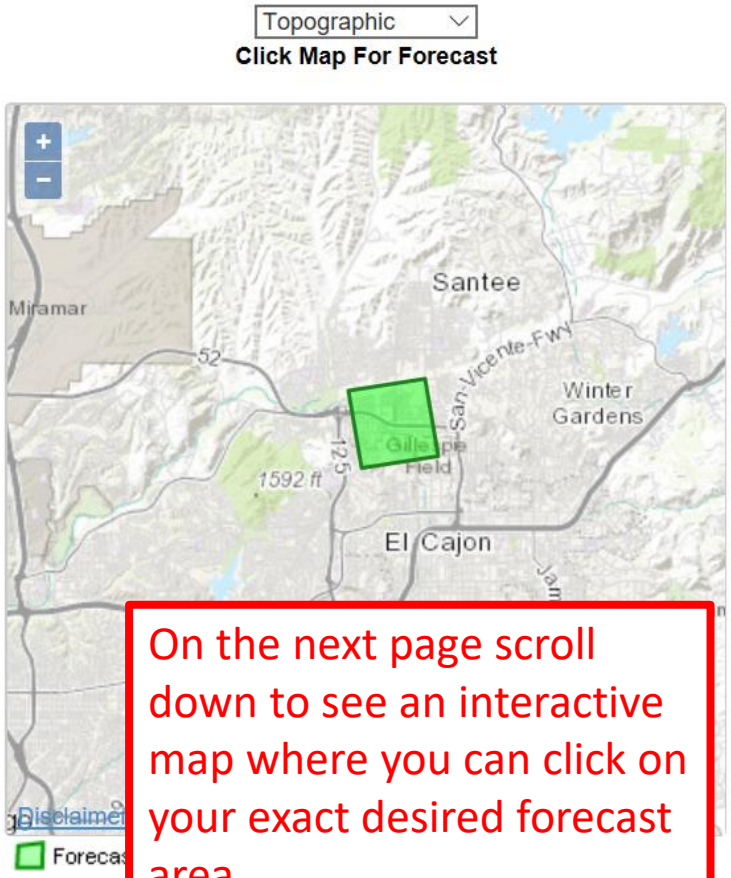
We can also get the wind & temperature data at the takeoff and landing airports using airport TAFs

If our airports don’t have a TAF. We can use local area forecasts

**This is another reason why it helps to know the exact altitudes you expect to be at for each checkpoint during your climb so that you know what winds and temperatures you can expect there.*



On the top left of Aviationweather.gov is a local area search bar where you can search the nearest city to your airports



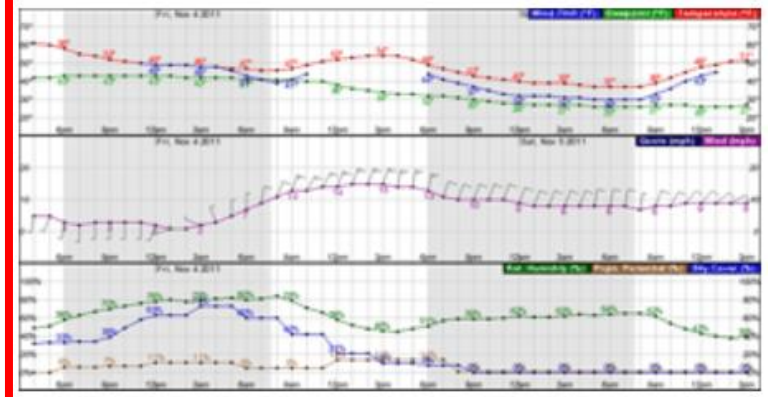
On the next page scroll down to see an interactive map where you can click on your exact desired forecast area

Additional Resources

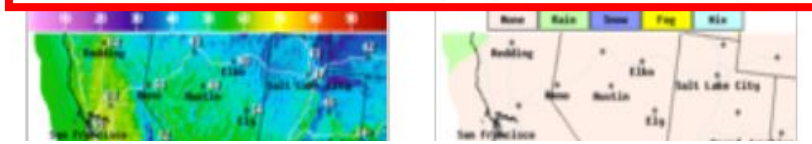
Radar & Satellite Image

Link to Satellite Data

Hourly Weather Forecast

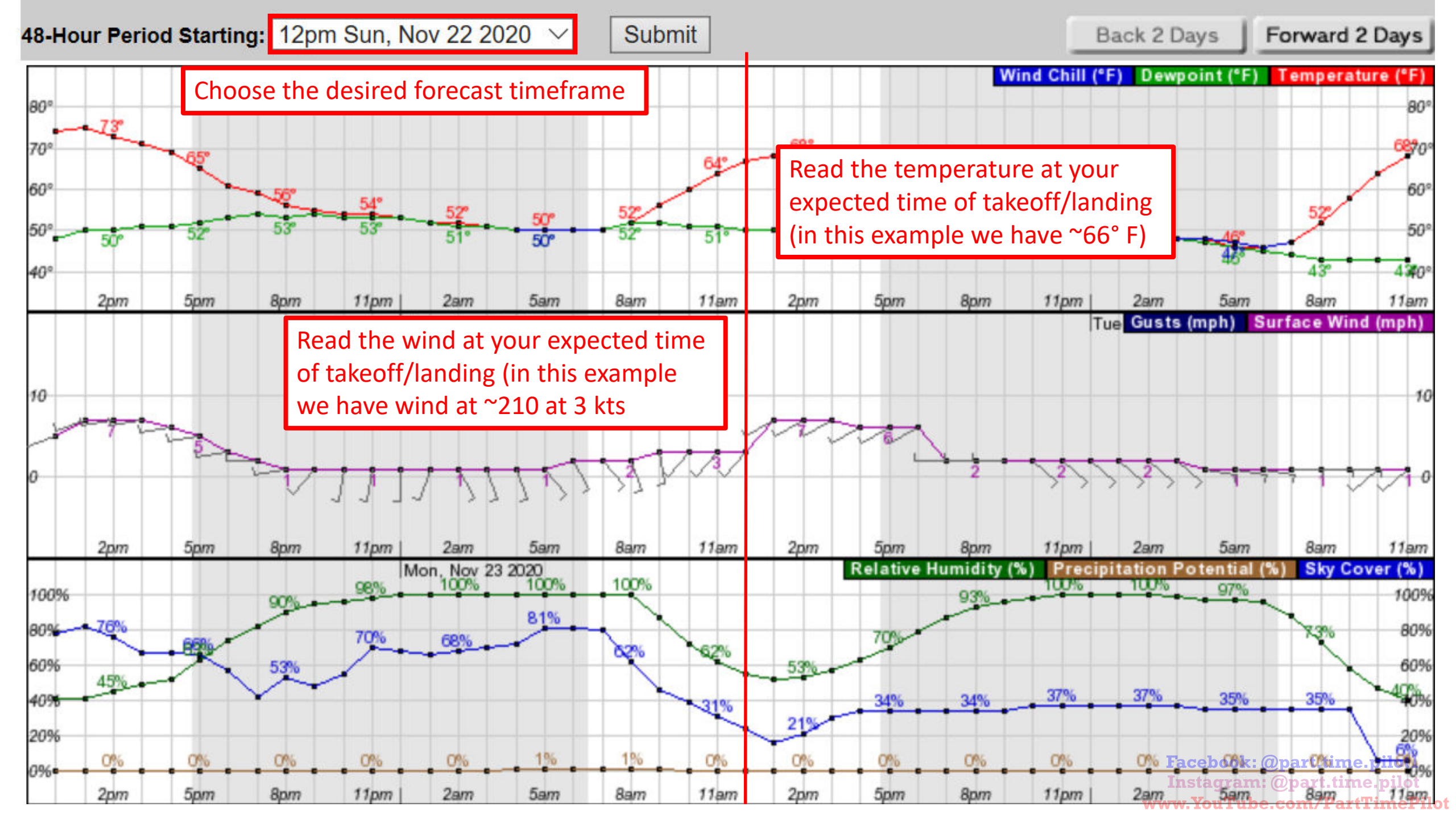


National Digital Forecast Database



With the desired forecast area chosen on the map, scroll down and on the right side of the page under “Additional Resources” is the option to look at “Hourly Weather Forecast”.

Click on it


48-Hour Period Starting:
12pm Sun, Nov 22 2020
Submit
Back 2 Days
Forward 2 Days
Choose the desired forecast timeframe
Read the temperature at your expected time of takeoff/landing (in this example we have ~66° F)
Read the wind at your expected time of takeoff/landing (in this example we have wind at ~210 at 3 kts
Wind Chill (°F)
Dewpoint (°F)
Temperature (°F)
Gusts (mph)
Surface Wind (mph)
Relative Humidity (%)
Precipitation Potential (%)
Sky Cover (%)
Tue
Mon, Nov 23 2020
2pm
5pm
8pm
11pm
2am
5am
8am
11am
Facebook: @part.time.pilot
Instagram: @part.time.pilot
www.YouTube.com/PartTimePilot

Checkpoint	Altitude	Distance (nm)	Distance Total (nm)	True Course °	Var -E +W	Mag Course °	Wind True °	Wind Speed	Temperature	Fuel (gal)
KSEE	508’	-	-	-	-	-	210	3	17	Takeoff & taxi
Lake Jennings	2400’	5	5	070	-12	058	290	4	16	0.6
KRNM	5300’	11	16	353	-12	341	255	20	14	1.5
Mtn Peak *(JLI 285)*	8500’	22.5	38.5	346	-12	334	240	31	11	3.5
Skinner Resevoir	8500’	11.5	50	348	-12	336	240	31	11	
SETER (X)	8500’	19	69	355	-12	343	240	31	11	
Lake Arrowhead	8500’	21	90	353	-12	341	240	31	11	
KAPV	3962’	20	110	000	-12	348	195	9	25	

Checkpoint	Altitude	Distance (nm)	Distance Total (nm)	True Course °	Var -E +W	Mag Course °	Wind True °	Wind Speed	Temperature	WCA °	Mag. Heading °	TAS	Ground Speed	IAS	RPM	Power Setting	Fuel (gal)
KSEE	508’	-	-	-	-	-	210	3	17	-	-	-	-	-	-	-	Takeoff & taxi
Lake Jennings	2400’	5	5	070	-12	058								79	-	-	0.6
KRNM	5300’	11	16	353	-12	341								79	-	-	1.5
Mtn Peak *(JLI 285)*	8500’	22.5	38.5	346	-12	334								79	-	-	3.5
Skinner Resevoir	8500’	11.5	50	348	-12	336								-	2500		
SETER (X)	8500’	19	69	355	-12	343								-	2500		
Lake Arrowhead	8500’	21	90	353	-12	341								-	2500		
KAPV	3962’	20	110	000	-12	348								-			

When we are in Climb, we always target an IAS (best angle of climb or best rate of climb)

For the aircraft I fly (Cherokee Warrior) Best Rate of Climb (Vy) is 79 kias

When we are in Cruise, we usually don’t target an AS but more so an RPM (~2500)

When we are in Cruise, we usually don’t target an AS but more so an RPM (~2500)

And in descent we usually pull back power (2300 RPM)

True Airspeed from Indicated Airspeed during Climb

Watch YouTube Video

- Let's calculate our True Airspeeds
  - For Climb we will calculate TAS from Indicated Airspeed. To do this, we will assume Indicated Airspeed = Calibrated Airspeed
  - For Cruise & Descent we will use a targeted RPM to find our Power Setting and we will then use our Power Setting to find our TAS

True Airspeed from Indicated Airspeed during Climb

Watch YouTube Video

- To convert IAS to TAS in Climb we need to use our E6B
  - To Lake Jennings:
    - IAS = **79 kias**
    - Altitude = between 508’ & 2400’ or ~**1500’**
    - Temperature = between 17° C & 16° C or **16° C**
  - To KRNM:
    - IAS = **79 kias**
    - Altitude = between 2400’ & 5300’ or **~4000’**
    - Temperature = between 16° C & 14° C or **15° C**
  - To Mtn Peak:
    - IAS = **79 kias**
    - Altitude = between 5300’ & 8500’ or ~**7000’**
    - Temperature = between 14° C & 11° C or **13° C**

The reason we are using Altitudes & Temperatures between the checkpoint we are traveling to and our previous checkpoint is because we want a TAS that best represents our travel between those checkpoints.

So we choose the middle point and use those numbers in our calculations

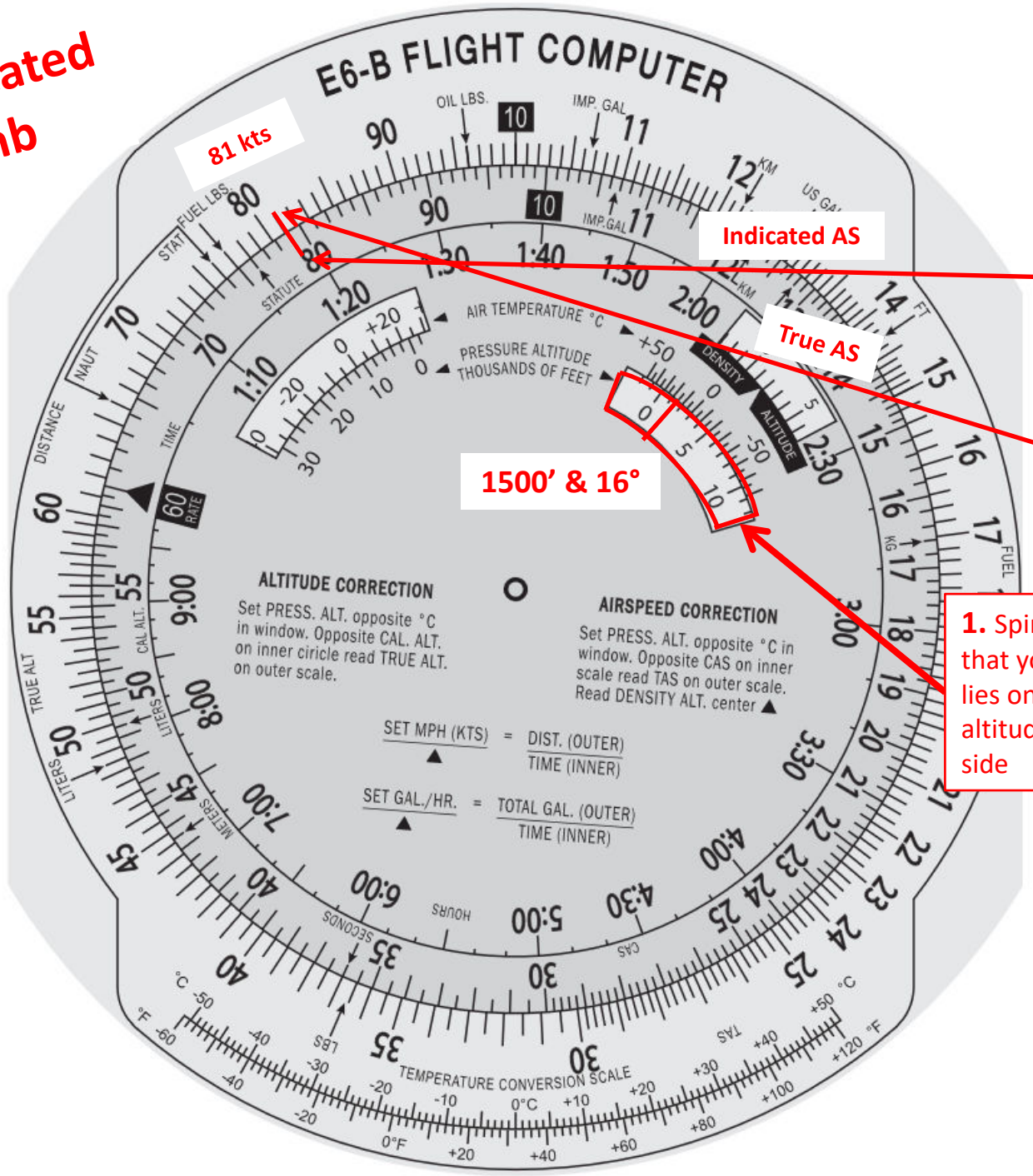
True Airspeed from Indicated Airspeed during Climb

To Lake Jennings Checkpoint Example

- IAS: 79 kias
- Altitude: 1500’
- Temperature 16° C

TAS = 81 kts

**Don’t like the whiz wheel? Keep making mistakes? We have full step by step example videos of how to make ALL calculations with both the manual whiz wheel AND an Electronic E6B inside the Online Ground School*



2. Read True Airspeed over Calibrated Airspeed (Indicated Airspeed) on the 2 outer most scales on the E6B.

Find your Indicated Airspeed on the outer most scale on the white wheel (for #s > 99 assume it is in 10s of knots. Example 11 = 110 kts)

Read the True Airspeed that lines up with this Indicated Airspeed on the outer most scale (in black)

1. Spin the wheel of the E6B so that your expected air temperature lies on top of your expected altitude in the window on the right side

Watch YouTube Video

Watch YouTube Video

Checkpoint	Altitude	Distance (nm)	Distance Total (nm)	True Course °	Var -E +W	Mag Course °	Wind True °	Wind Speed	Temperature	WCA °	Mag. Heading °	TAS	Ground Speed	IAS	RPM	Power Setting	Fuel (gal)
KSEE	508’	-	-	-	-	-	210	3	17	-	-	-	-	-	-	-	Takeoff & taxi
Lake Jennings	2400’	5	5	070	-12	058	290	4	16			81		79	-	-	0.6
KRNM	5300’	11	16	353	-12	341	255	20	14			85		79	-	-	1.5
Mtn Peak *(JLI 285)*	8500’	22.5	38.5	346	-12	334	240	31	11			89		79	-	-	3.5
Skinner Resevoir	8500’	11.5	50	348	-12	336	240	31	11					-	2500		
SETER (X)	8500’	19	69	355	-12	343	240	31	11					-	2500		
Lake Arrowhead	8500’	21	90	353	-12	341	240	31	11					-	2500		
KAPV	3962’	20	110	000	-12	348	195	9	25					-	2300		

True Airspeed from Engine Power % & Cruise Performance Charts

When I am in cruise flight I do not target an indicated altitude to fly but instead target an RPM. Therefore, to find the True Airspeed during cruise we can't just use our E6B to convert from an indicated airspeed like we can in climb. Instead we need to use *performance charts.*

- **Step #1:** One of the inputs we will need for our Cruise Performance chart is the Engine Power Setting % we plan to target while flying. This changes with atmospheric conditions. Therefore, we need to use our Engine Performance chart and our target RPM to get Engine Power Setting %.
- **Step #2:** Once we have an Engine Power Setting % according to our target RPM at each checkpoint we can use this power setting to find a true airspeed on our Cruise Performance chart

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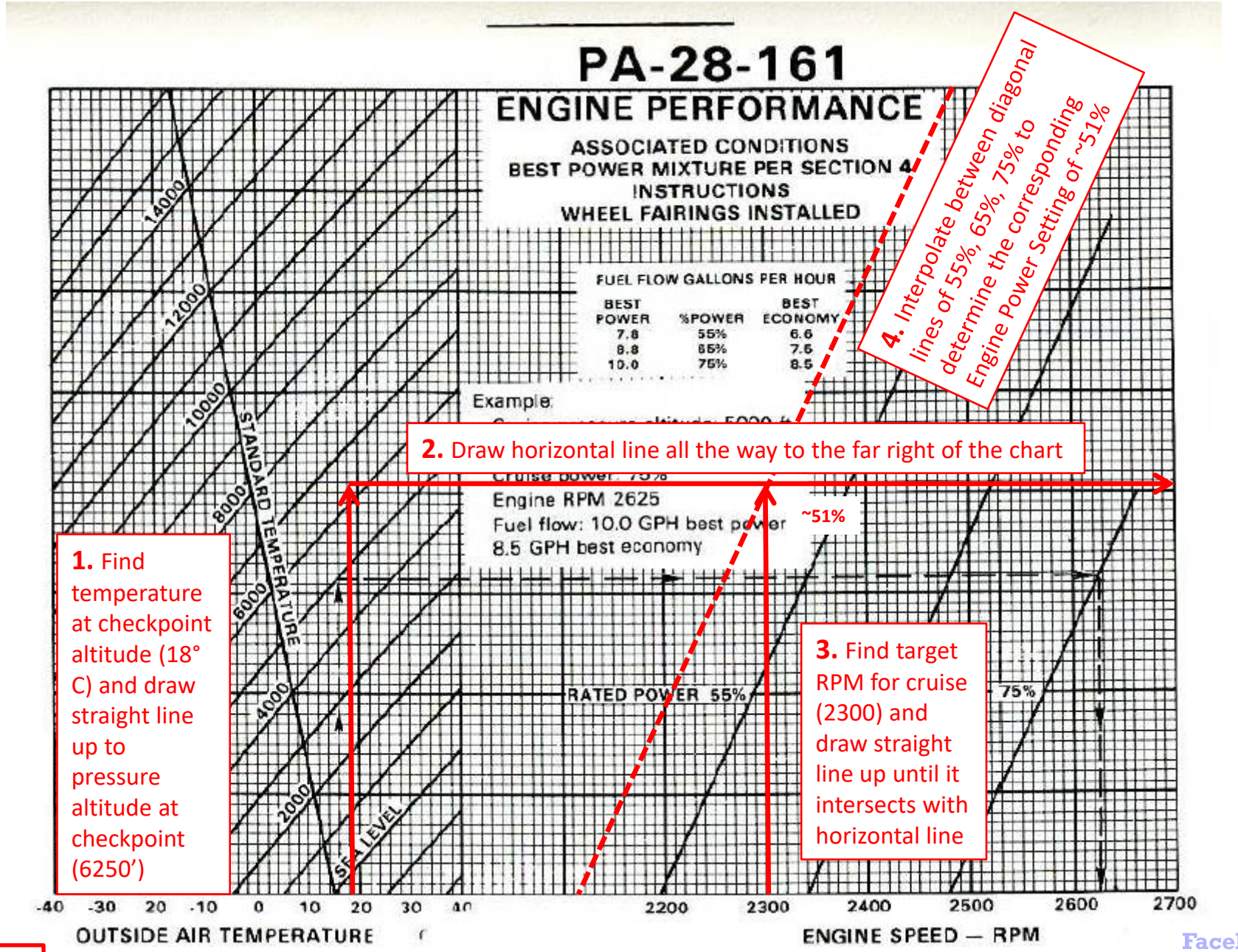
True Airspeed from Engine Power % & Cruise Performance Charts

- To Skinner Resevoir:
  - Target RPM: **2500**
  - Temperature: **11° C**
  - Altitude: **8500’**
- To Seter:
  - Target RPM: **2500**
  - Temperature: **11° C**
  - Altitude: **8500’**
- To Lake Arrowhead:
  - Target RPM: **2500**
  - Temperature: **11° C**
  - Altitude: **8500’**
- To KAPV:
  - Target RPM: **2300**
  - Temperature: between 11° C and 25° C or **18° C**
  - Altitude: between 8500’ and 3962’ or **~6250’**

Watch YouTube Video

Step #1
- For descent checkpoint



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Checkpoint	Altitude	Distance (nm)	Distance Total (nm)	True Course °	Var -E +W	Mag Course °	Wind True °	Wind Speed	Temperature	WCA °	Mag. Heading °	TAS	Ground Speed	IAS	RPM	Power Setting %	Fuel (gal)
KSEE	508’	-	-	-	-	-	210	3	17	-	-	-	-	-	-	-	Takeoff & taxi
Lake Jennings	2400’	5	5	070	-12	058	290	4	16			81		79	-	-	0.6
KRNM	5300’	11	16	353	-12	341	255	20	14			85		79	-	-	1.5
Mtn Peak *(JLI 285)*	8500’	22.5	38.5	346	-12	334	240	31	11			89		79	-	-	3.5
Skinner Resevoir	8500’	11.5	50	348	-12	336	240	31	11					-	2500	61	
SETER (X)	8500’	19	69	355	-12	343	240	31	11					-	2500	61	
Lake Arrowhead	8500’	21	90	353	-12	341	240	31	11					-	2500	61	
KAPV	3962’	20	110	000	-12	348	195	9	25					-	2300	51	

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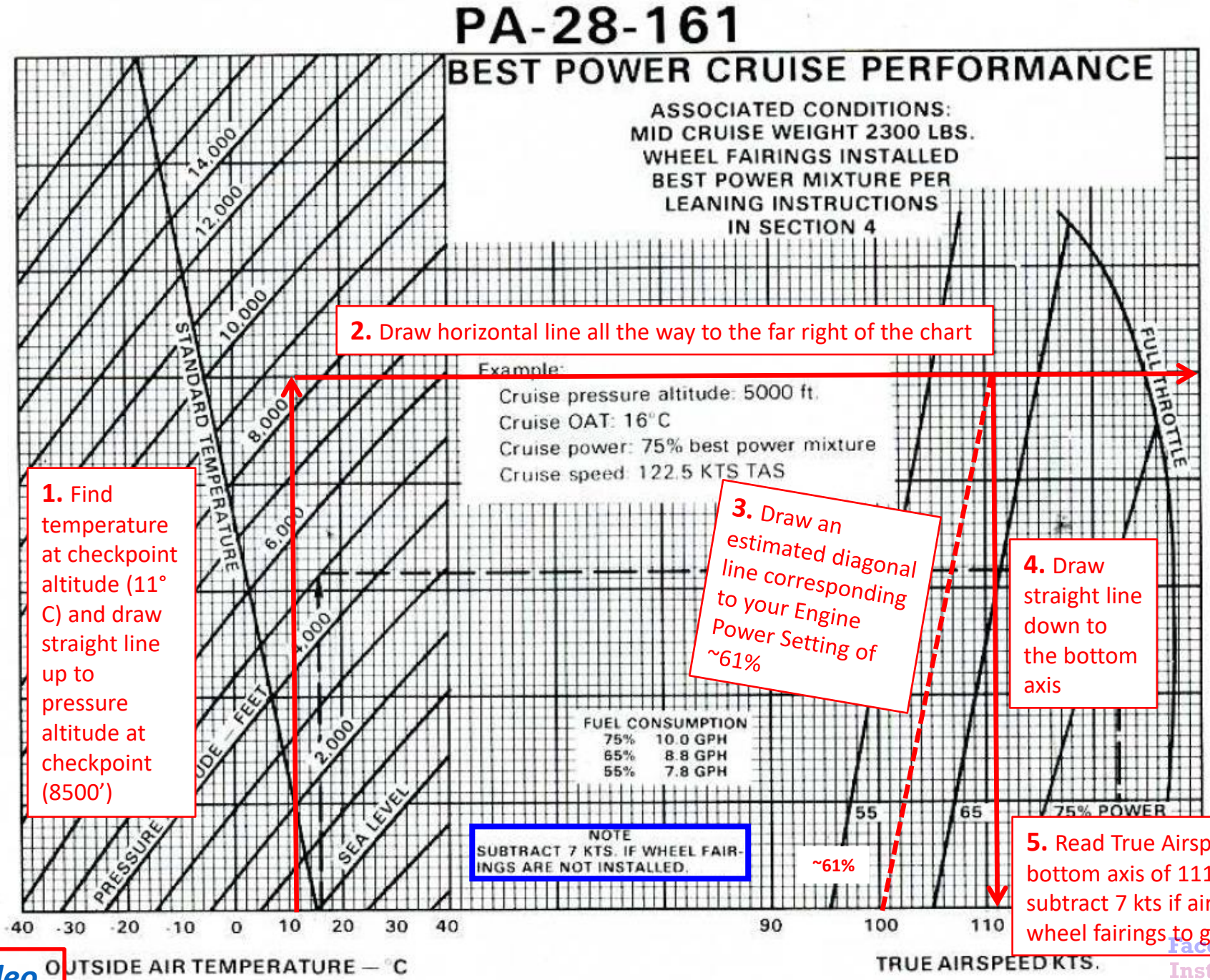
Step #2
- For all 3 cruise checkpoints



1. Find temperature at checkpoint altitude (11° C) and draw straight line up to pressure altitude at checkpoint (8500')

2. Draw horizontal line all the way to the far right of the chart

3. Draw an estimated diagonal line corresponding to your Engine Power Setting of ~61%

4. Draw straight line down to the bottom axis

5. Read True Airspeed off bottom axis of 111 kts then subtract 7 kts if aircraft has no wheel fairings to get 104 kts

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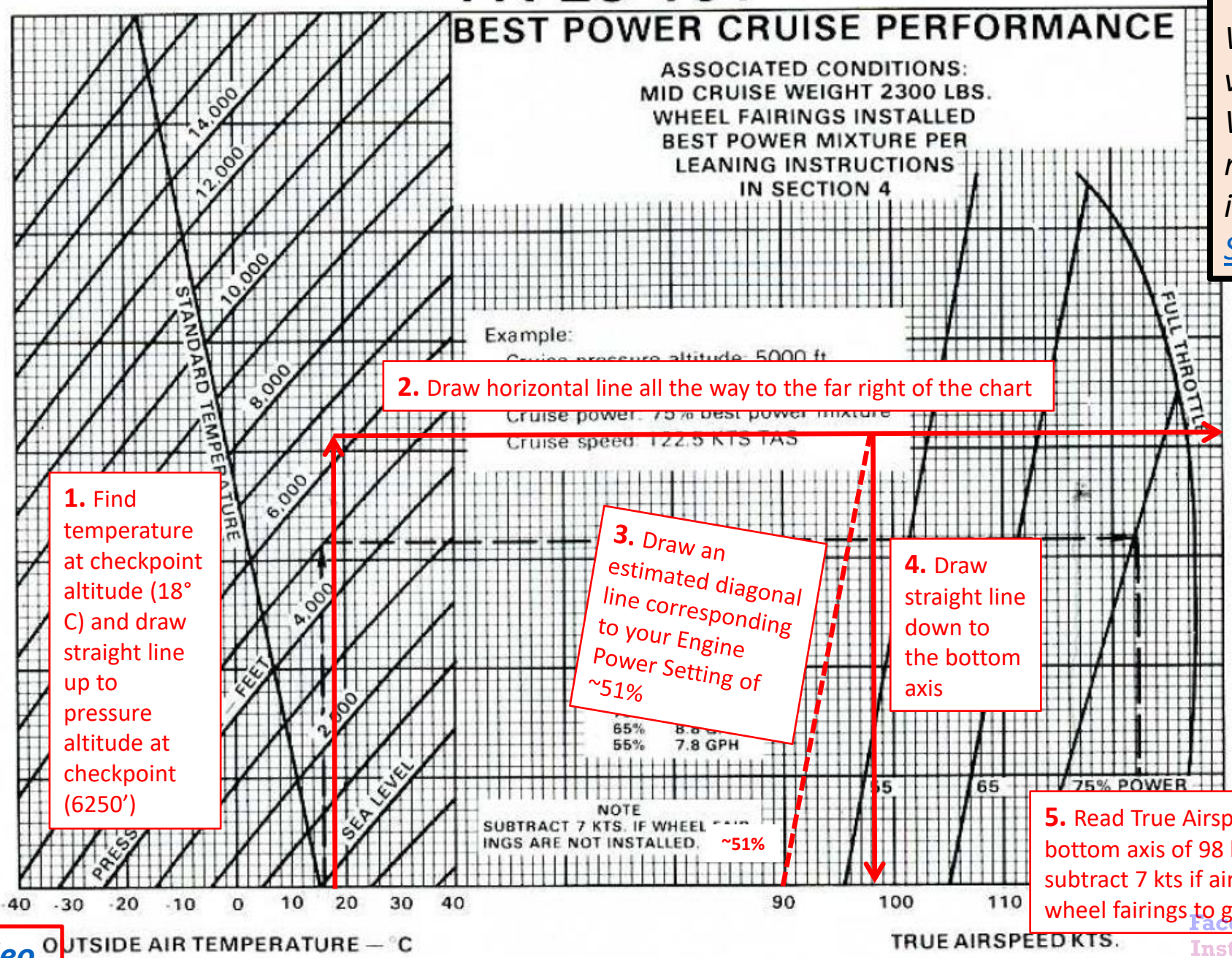
Step #2
- For descent checkpoint

PA-28-161



2. Draw horizontal line all the way to the far right of the chart

1. Find temperature at checkpoint altitude (18° C) and draw straight line up to pressure altitude at checkpoint (6250')

3. Draw an estimated diagonal line corresponding to your Engine Power Setting of ~51%

4. Draw straight line down to the bottom axis

5. Read True Airspeed off bottom axis of 98 kts then subtract 7 kts if aircraft has no wheel fairings to get 91 kts

***ALERT:** The FAA Written uses a table version of this chart. We show you how to navigate that table in the Online Ground School*

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Checkpoint	Altitude	Distance (nm)	Distance Total (nm)	True Course °	Var -E +W	Mag Course °	Wind True °	Wind Speed	Temperature	WCA °	Mag. Heading °	TAS	Ground Speed	IAS	RPM	Power Setting %	Fuel (gal)
KSEE	508’	-	-	-	-	-	210	3	17	-	-	-	-	-	-	-	Takeoff & taxi
Lake Jennings	2400’	5	5	070	-12	058	290	4	16			81		79	-	-	0.6
KRNM	5300’	11	16	353	-12	341	255	20	14			85		79	-	-	1.5
Mtn Peak *(JLI 285)*	8500’	22.5	38.5	346	-12	334	240	31	11			89		79	-	-	3.5
Skinner Resevoir	8500’	11.5	50	348	-12	336	240	31	11			104		-	2500	61	
SETER (X)	8500’	19	69	355	-12	343	240	31	11			104		-	2500	61	
Lake Arrowhead	8500’	21	90	353	-12	341	240	31	11			104		-	2500	61	
KAPV	3962’	20	110	000	-12	348	195	9	25			91		-	2300	51	

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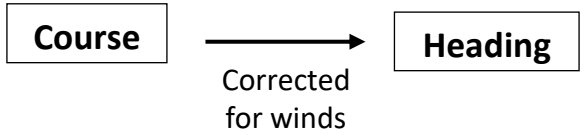
Wind Correction and Ground Speed

Watch YouTube Video

We now have our TAS for each checkpoint as well as our Magnetic Course for each checkpoint. Finally, we have to convert these to Ground Speed and Magnetic Heading. This is where we incorporate the winds:

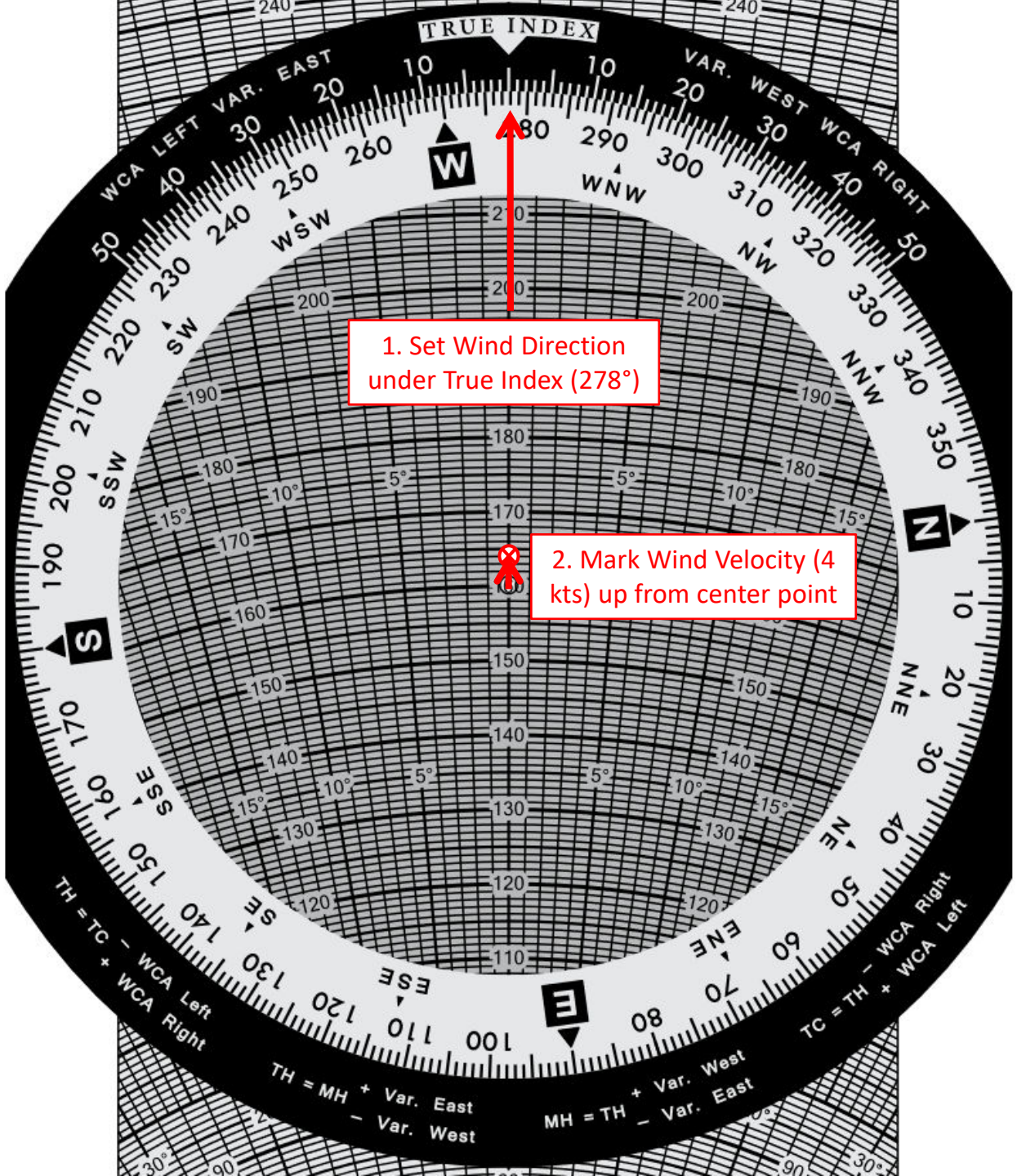


You can use true course or magnetic course as long as you use matching winds. I am going to use magnetic winds and magnetic course so this means since I got my wind info by reading them from a winds aloft chart that they are in terms of true and need to be converted to magnetic. To do this I use the formula Winds Magnetic = Winds True + Isogonic for each Checkpoints wind data:

- Lake Jennings: 290 @ 4 kts → **278 @ 4 kts**
- KRNM: 255 @ 20 kts → **243 @ 20 kts**
- Power Lines: 240 @ 31 kts → **228 @ 31 kts**
- Skinner Reservoir: 240 @ 31 kts → **228 @ 31 kts**
- SETER: 240 @ 31 kts → **228 @ 31 kts**
- Lake Arrowhead: 240 @ 31 kts → **228 @ 31 kts**
- KAPV: 195 @ 9 kts → **183 @ 9 kts**

To Lake Jennings Checkpoint Example

- TAS: 81 kts
- Wind (Magnetic): 278 @ 4 kts
- Magnetic Course: 058



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To Lake Jennings Checkpoint Example

- TAS: 81 kts
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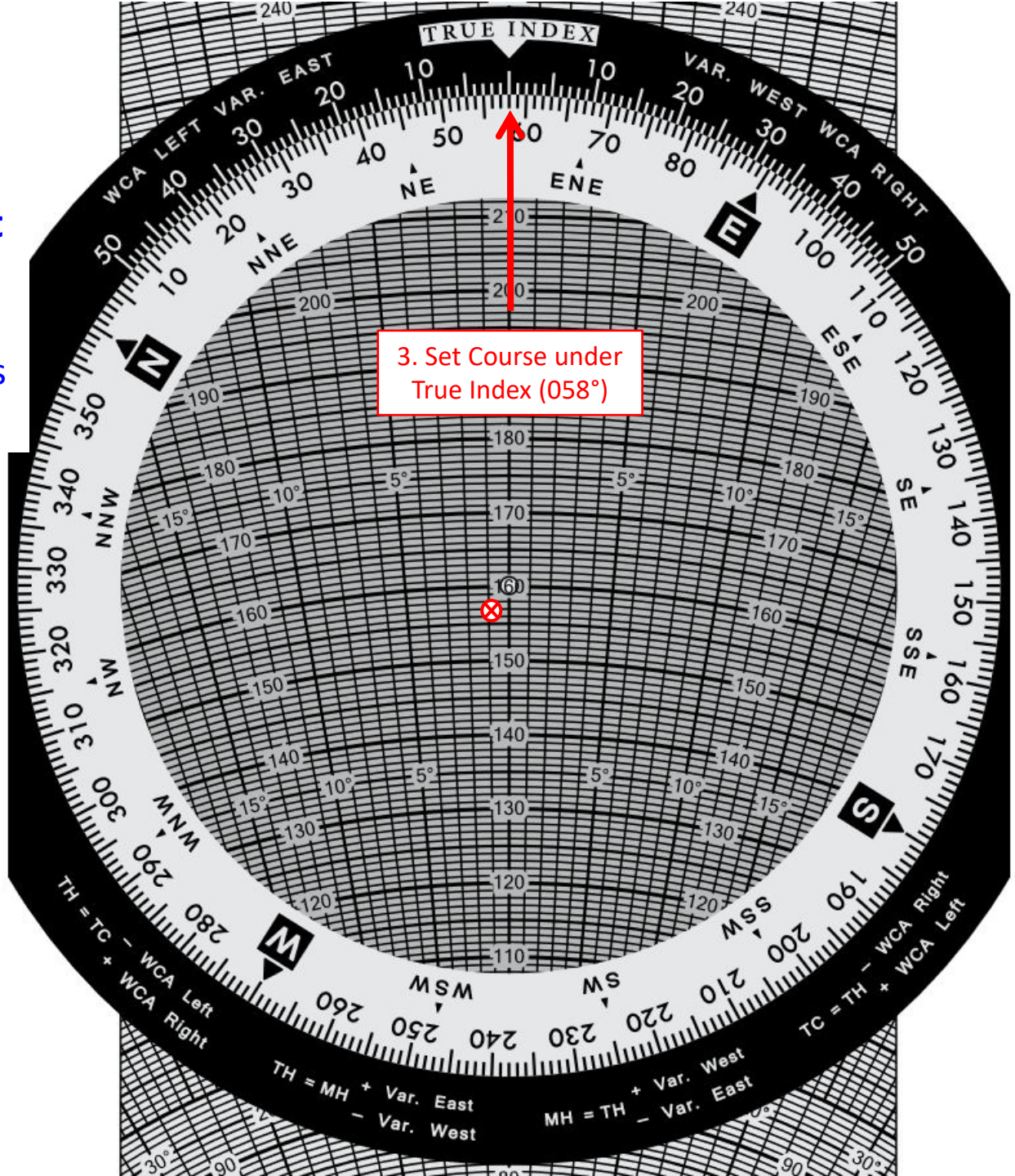
- Magnetic Course: 058



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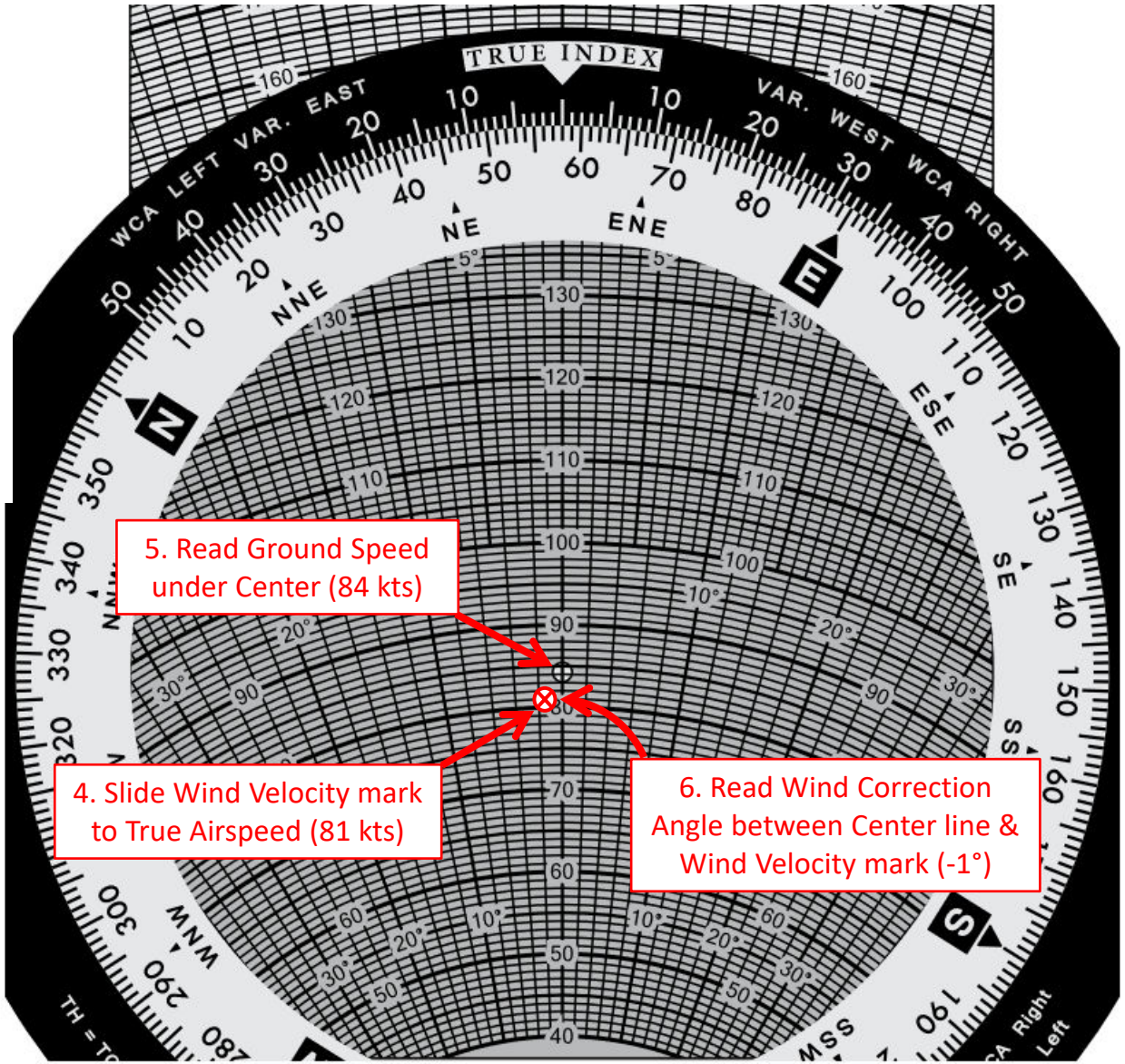
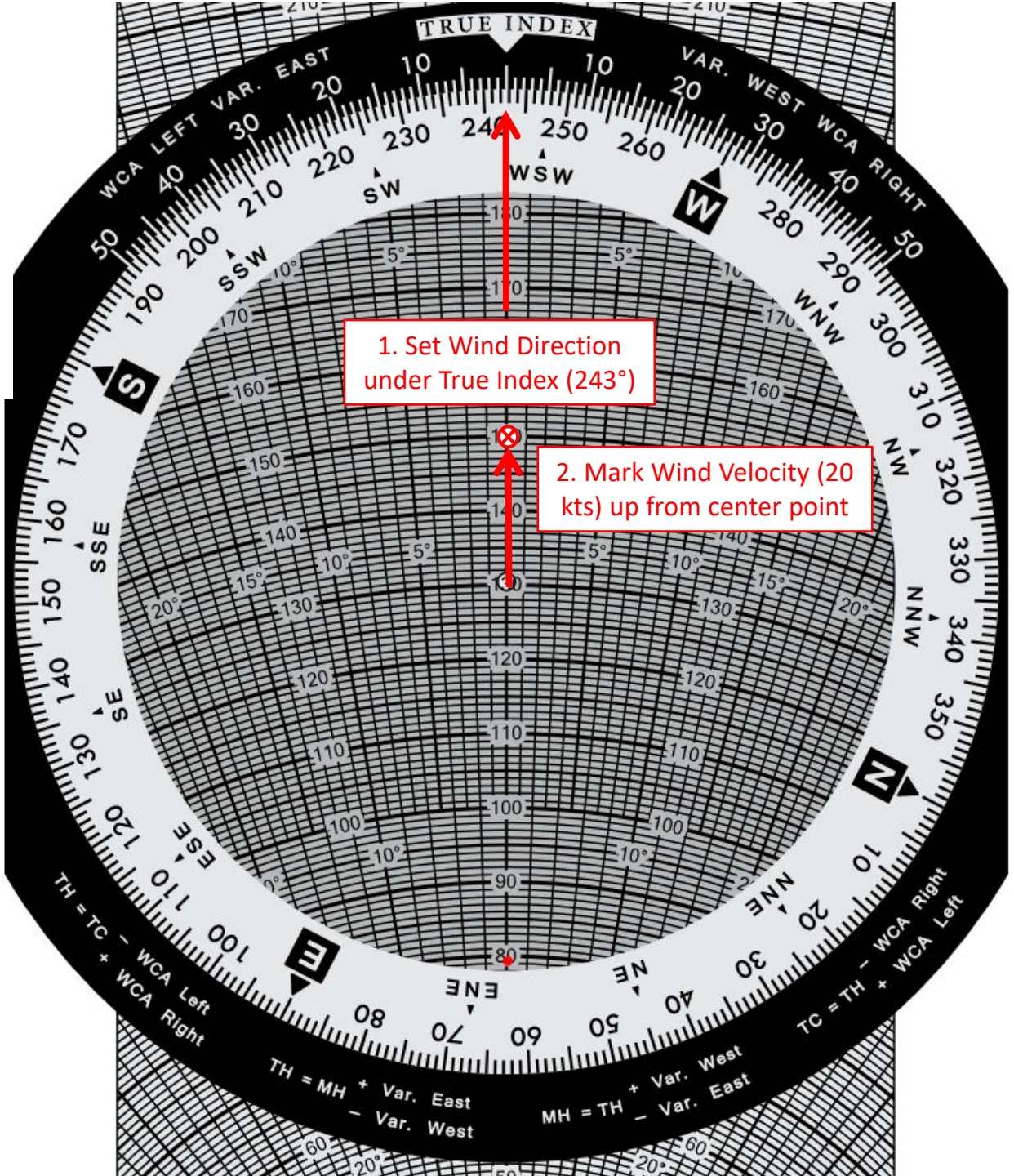
To Lake Jennings Checkpoint Example

- TAS: 81 kts
- Wind (Magnetic): 278 @ 4 kts
- Magnetic Course: 058



To KRNM Checkpoint Example

- TAS: 85 kts
- Wind (Magnetic): 243 @ 20 kts
- Magnetic Course: 341

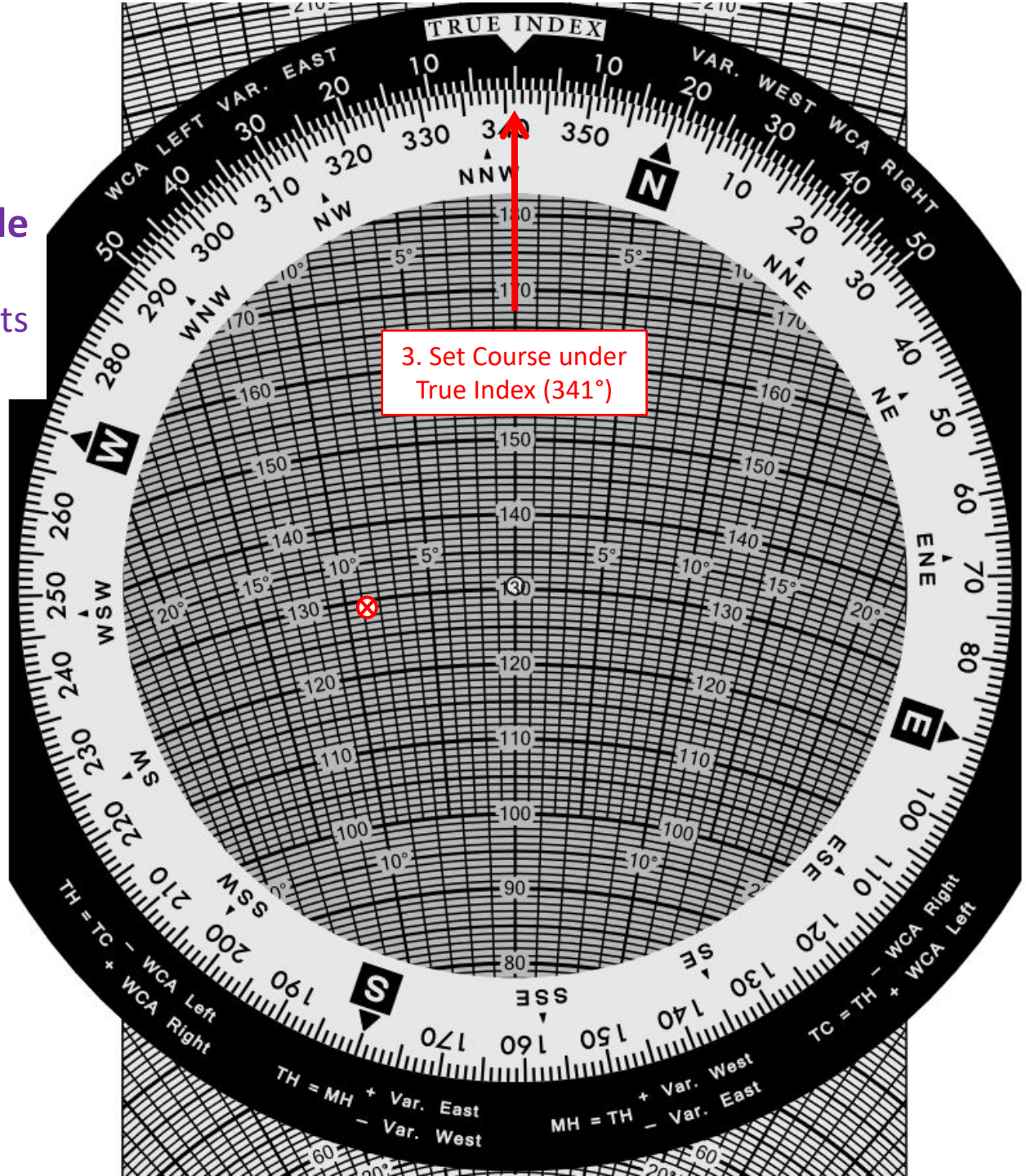


Watch [YouTube Video]

**Again, even the wind side of the whiz wheel can be done with an [Electronic E6B] which we show you step by step how to solve in the [Online Ground School]*

To KRNM Checkpoint Example

- TAS: 85 kts
- Wind (Magnetic): 243 @ 20 kts
- Magnetic Course: 341



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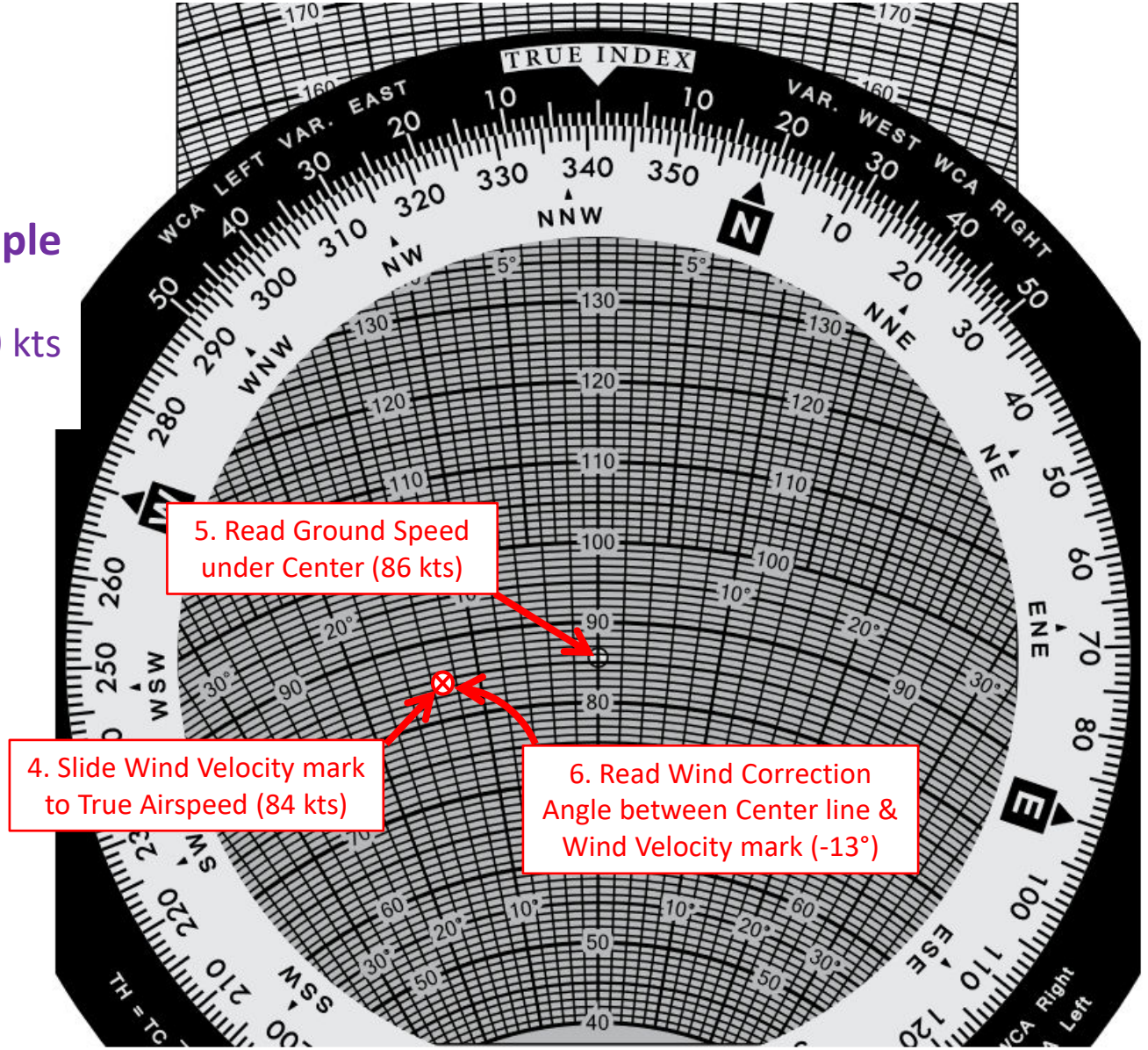
To KRNM Checkpoint Example

- TAS: 85 kts
- Wind (Magnetic): 243 @ 20 kts
- Magnetic Course: 341



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Checkpoint	Altitude	Distance (nm)	Distance Total (nm)	True Course °	Var -E +W	Mag Course °	Wind True °	Wind Speed	Temperature	WCA °	Mag. Heading °	TAS	Ground Speed	IAS	RPM	Power Setting %	Fuel (gal)
KSEE	508’	-	-	-	-	-	210	3	17	-	-	-	-	-	-	-	Takeoff & taxi
Lake Jennings	2400’	5	5	070	-12	058	290	4	16	-1		81	84	79	-	-	0.6
KRNM	5300’	11	16	353	-12	341	255	20	14	-13		85	86	79	-	-	1.5
Mtn Peak *(JLI 285)*	8500’	22.5	38.5	346	-12	334	240	31	11	-20		89	87	79	-	-	3.5
Skinner Resevoir	8500’	11.5	50	348	-12	336	240	31	11	-16		104	110	-	2500	61	
SETER (X)	8500’	19	69	355	-12	343	240	31	11	-16		104	113	-	2500	61	
Lake Arrowhead	8500’	21	90	353	-12	341	240	31	11	-16		104	112	-	2500	61	
KAPV	3962’	20	110	000	-12	348	195	9	25	-1		91	100	-	2300	51	

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Checkpoint	Altitude	Distance (nm)	Distance Total (nm)	True Course °	Var -E +W	Mag Course °	Wind True °	Wind Speed	Temperature	WCA °	Mag. Heading °	TAS	Ground Speed	IAS	RPM	Power Setting %	Fuel (gal)
KSEE	508’	-	-	-	-	-	210	3	17	-	-	-	-	-	-	-	Takeoff & taxi
Lake J						058	290	4	16	-1	057	81	84	79	-	-	0.6
						341	255	20	14	-13	328	85	86	79	-	-	1.5
N (						334	240	31	11	-20	314	89	87	79	-	-	3.5
Skinner Resevoir	8500’	11.5	50	348	-12	336	240	31	11	-16	320	104	110	-	2500	61	
SETER (X)	8500’	19	69	355	-12	343	240	31	11	-16	327	104	113	-	2500	61	
Lake Arrowhead	8500’	21	90	353	-12	341	240	31	11	-16	325	104	112	-	2500	61	
KAPV	3962’	20	110	000	-12	348	195	9	25	-1	347	91	100	-	2300	51	

Magnetic Heading

To get our Magnetic Headings… We just need to add our Magnetic Courses with our Wind Correction Angles

Watch YouTube Video

Checkpoint	Altitude	Distance (nm)	Distance Total (nm)	Time (min)	Time Total (min)	True Course °	Var -E +W	Mag Course °	Wind True °	Wind Speed	Temperature	WCA °	Mag. Heading °	TAS	Ground Speed	IAS	RPM	Power Setting %	Fuel (gal)
KSEE	508’	-	-	-	-	-	-	-	210	3	17	-	-	-	-	-	-	-	Takeoff & taxi
Lake Jennings	2400’	5	5	3.6	3.6										84	79	-	-	0.6
KRNM	5300’	11	16	7.7	11.3										86	79	-	-	1.5
Mtn Peak *(JLI 285)*	8500’	22.5	38.5	15.5	26.8										87	79	-	-	3.5
Skinner Resevoir	8500’	11.5	50	6.3	33.1										110	-	2500	61	
SETER (X)	8500’	19	69	10.1	43.2	355	-12	343	240	31	11	-16	327	104	113	-	2500	61	
Lake Arrowhead	8500’	21	90	11.3	54.5	353	-12	341	240	31	11	-16	325	104	112	-	2500	61	
KAPV	3962’	20	110	12	66.5	000	-12	348	195	9	25	-1	347	91	100	-	2300	51	

Time

Time (hr) = Distance (nm) / Ground Speed (nm/hr)

Time (min) = 60 (min/hr)*Distance (nm) / Ground Speed (nm/hr)

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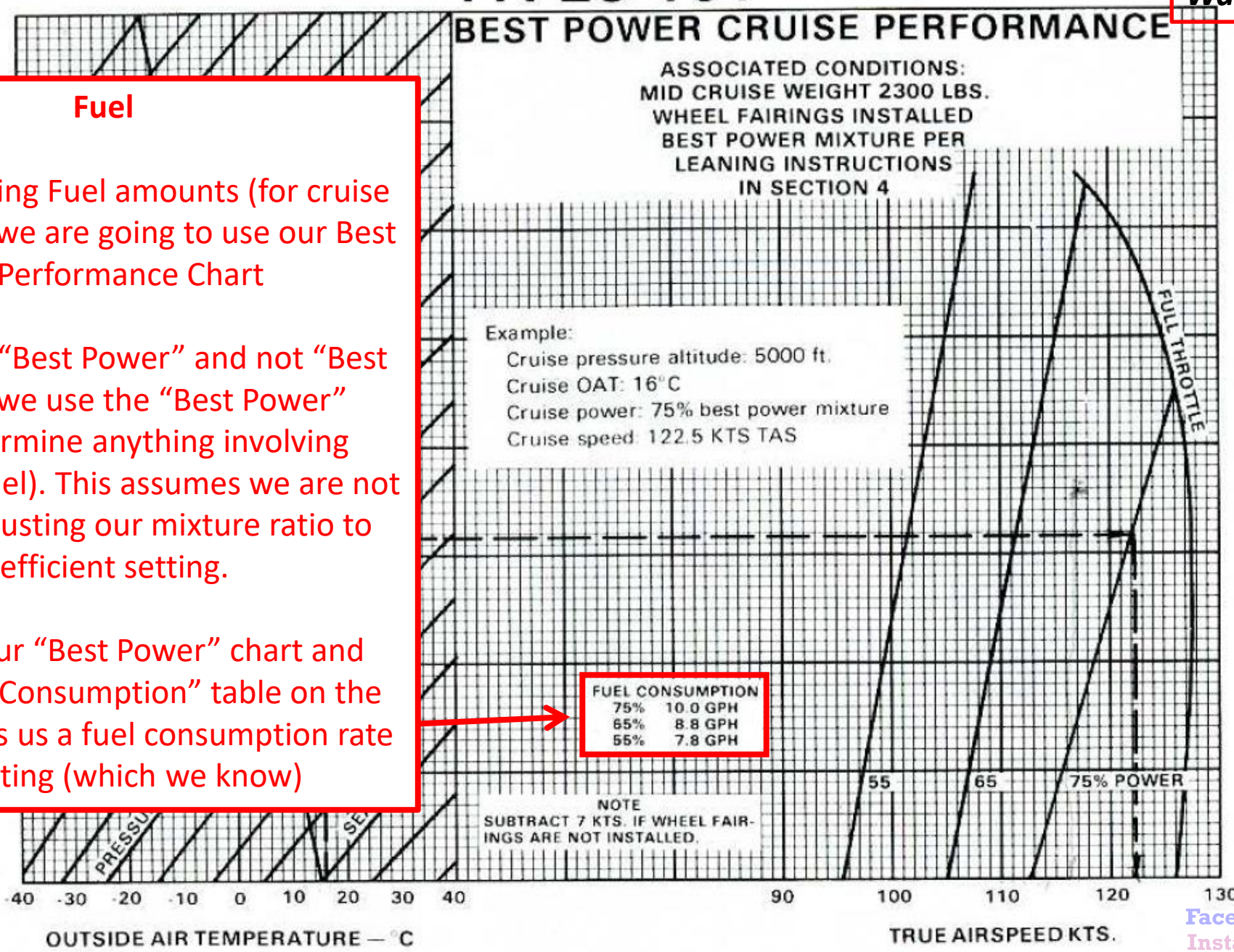
Fuel

To get remaining Fuel amounts (for cruise and descent) we are going to use our Best Power Cruise Performance Chart

We are flying “Best Power” and not “Best Economy” so we use the “Best Power” charts to determine anything involving the engine (fuel). This assumes we are not constantly adjusting our mixture ratio to the most fuel efficient setting.

So we go to our “Best Power” chart and use the “Fuel Consumption” table on the chart that tells us a fuel consumption rate per power setting (which we know)



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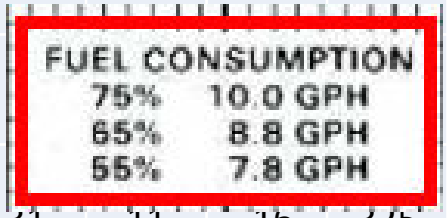
Checkpoint	Altitude	Distance (nm)	Distance Total (nm)	Time (min)	Time Total (min)	True Course °	Var -E +W	Mag Course °	Wind True °	Wind Speed	Temperature	WCA °	Mag. Heading °	TAS	Ground Speed	IAS	RPM	Power Setting %	GPH	Fuel (gal)
KSEE	508’	-	-	-	-	-	-	-	210	3	17	-	-	-	-	-	-	-	-	Takeoff & taxi
Lake Jennings	2400’	5	5	3.6	3.6	070	-1										-	-	-	0.6
KRNM	5300’	11	16	7.7	11.3	353	-1										-	-	-	1.5
Mtn Peak *(JLI 285)*	8500’	22.5	38.5	15.5	26.8	346	-1										-	-	-	3.5
Skinner Resevoir	8500’	11.5	50	6.3	33.1	348	-12	336	240	31	11	-16	320	104	110	-	2500	61	8.4	0.8
SETER (X)	8500’	19	69	10.1	43.2	355	-12	343	240					104	113	-	2500	61	8.4	1.4
Lake Arrowhead	8500’	21	90	11.3	54.5	353	-12	341	240	31	11	-16	325	104	112	-	2500	61	8.4	1.6
KAPV	3962’	20	110	12	66.5	000	-12	348	195	9	25	-1	347	91	100	-	2300	51	7.5	1.5

Fuel

Gal/hour * Time (hours) = # of Gallons

Gal/hour * Time (min) / 60 (min/hr) = # of Gallons



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Checkpoint	Altitude	Distance (nm)	Distance Total (nm)	Time (min)	Time Total (min)	True Course °	Var -E +W	Mag Course °	Wind True °	Wind Speed	Temperature	WCA °	Mag. Heading °	TAS	Ground Speed	IAS	RPM	Power Setting %	GPH	Fuel (gal)
KSEE	508’														-	-	-	-	-	Takeoff & taxi
Lake Jennings	2400’														84	79	-	-	-	0.6
KRNM	5300’	1													86	79	-	-	-	1.5
Mtn Peak *(JLI 285)*	8500’	2													87	79	-	-	-	3.5
Skinner Resevoir	8500’	1													110	-	2500	61	8.4	0.8
SETER (X)	8500’	1													113		2500	61	8.4	1.4
Lake Arrowhead	8500’	2													112					
KAPV	3962’	2													100	-	2300	51	7.5	

Total Fuel = Fuel from each Checkpoint + Takeoff & Taxi Fuel + Approach & Landing Fuel + Reserves Fuel

If we add up our checkpoints = 0.6 + 1.5 + 3.5 + 0.8 + 1.4 + 1.6 + 1.5 = **10.9 gallons**

For takeoff and taxi fuel we look this up in our POH. The manufacturer will tell us what to estimate for an average taxi, runup and takeoff. For us = **1.2 gallons**

We need to account for approach and landing. It is always good to be conservative with fuel and what if we end up waiting to land in a pattern for a good bit of time? I always estimate .25 hr (15 min) of cruise fuel consumption which is **2.2 gallons**

We will be flying in the day so our reserves is ½ hr of fuel at a cruise fuel consumption rate of 8.8 GPH or 8.8*0.5 = **4.4 gallons**

Total Fuel = 10.9 + 1.2 + 2.2 + 4.4 = **18.7 gallons**

This compares to the 23 gallons we estimated

IF YOU DON'T LIKE DOING MATH:

If you aren't a fan of math and want absolutely nothing to do with the equations for fuel and time then there is another way!!

You can use your E6B in a very simple process that is actually explained on the E6B! But if that doesn't make sense to you and if you're like me and like to see examples visually… then we have broken down the process to determine fuel and time with the E6B step by step in the Online Ground School.

Watch YouTube Video

Takeoff and Landing Distances

- The first thing we need to do is determine which performance charts you need to use for calculating your takeoff and landing distances
  - The chart you need will change based off whether you plan to use flaps or not and whether or not you need to clear a 50 ft obstacle
- The procedure to determine the distances are the exact same once the correct chart is selected

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- **0° Flaps Takeoff Ground Roll**
  - This chart is used to determine the distance needed on the ground to be able to reach lift off while using no flaps (no obstacle clearance)
- **0° Flaps Takeoff Performance**
  - This chart is used to determine the distance needed to be able to lift off from the ground and reach above 50 ft of altitude while using no flaps (50 ft obstacle clearance)
- **25° Flaps Takeoff Ground Roll**
  - This chart is used to determine the distance needed on the ground to be able to reach lift off while using 2 notches of 25° of flaps (no obstacle clearance)
- **25° Flaps Takeoff Performance**
  - This chart is used to determine the distance needed to be able to lift off from the ground and reach above 50 ft of altitude while using no flaps (50 ft obstacle clearance)
- **Landing Distance**
  - This chart is used to determine the distance needed to touch-down and come to a full stop over a 50 ft obstacle on a paved, level and dry runway, using maximum braking and full flaps (obstacle clearance)
- **Landing Ground Roll Distance**
  - This chart is used to determine the distance needed to touch-down and come to a full stop on a paved, level and dry runway, using maximum braking and full flaps (no obstacle clearance)

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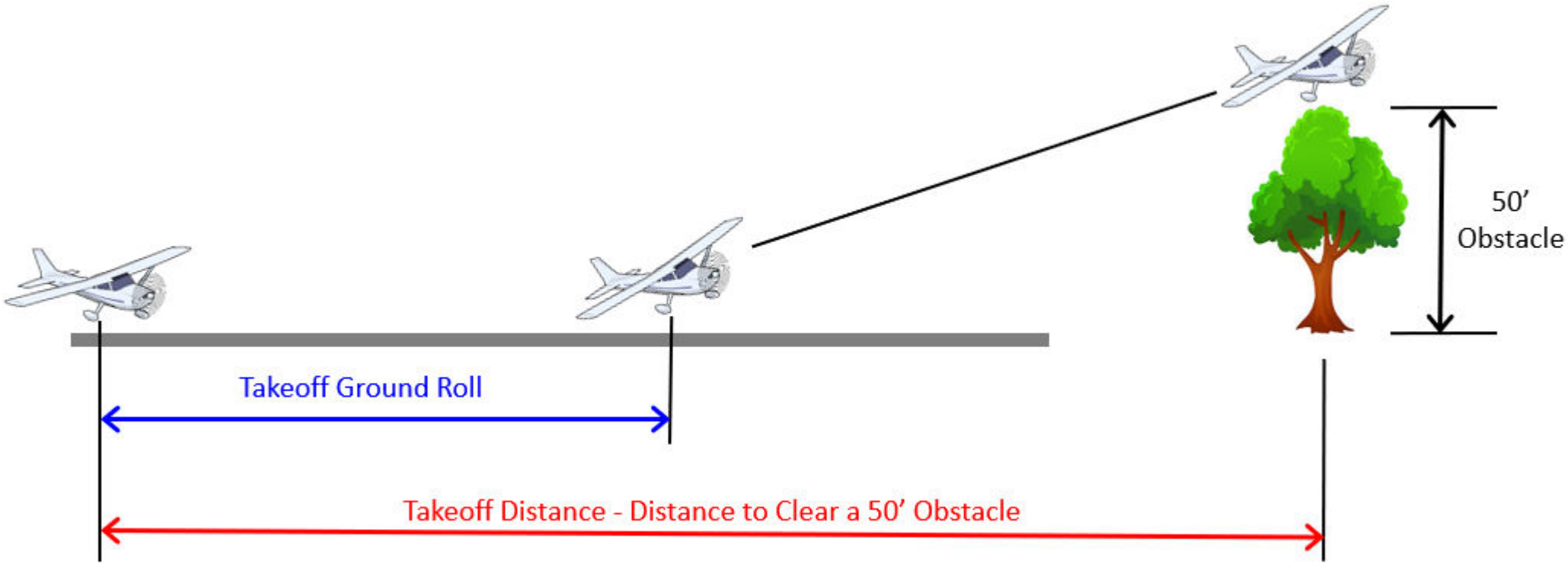

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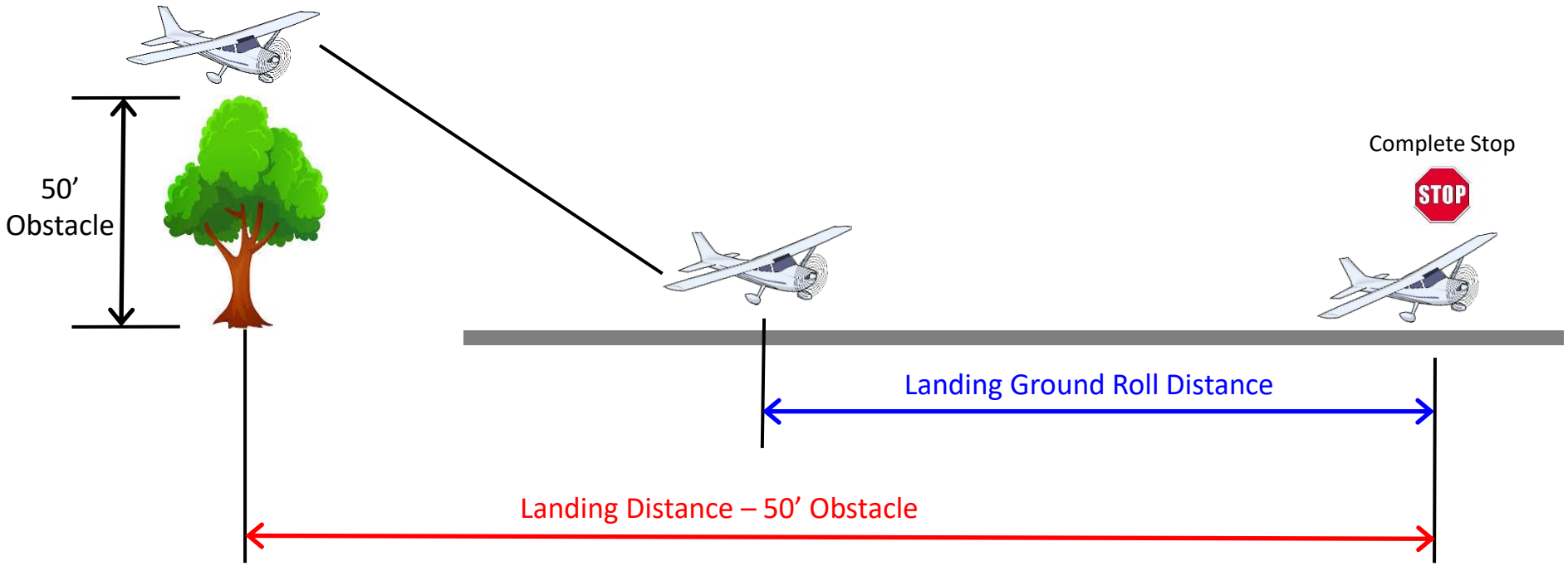

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To make sure there are no obstacles we will need to avoid, we need to check the AFD for each airport

Look for reference of obstacles on the RWY info, Map and the Airport Remarks

In our case, there are no obstacles we need to avoid, so we will be using the 0° Flaps Takeoff Ground Roll chart for takeoff and the Landing Ground Roll Distance chart for landing.

APPLE VALLEY (APV)(KAPV) 3 N UTC–8(–7DT) N34°34.52′ W117°11.17′

LOS ANGELES
H–4I, L–4H, 7C
IAP

3062 B TPA—See Remarks NOTAM FILE RAL

RWY 18–36: H6498X150 (ASPH) S–70, D–90, 2D–150 MIRL
1.5% up N

RWY 18: PAPI(P2L)—GA 3.5° TCH 49′. Hill.

RWY 36: PAPI(P2L)—GA 3.0° TCH 40′. Thld dsplcd 597′. Rgt tfc.

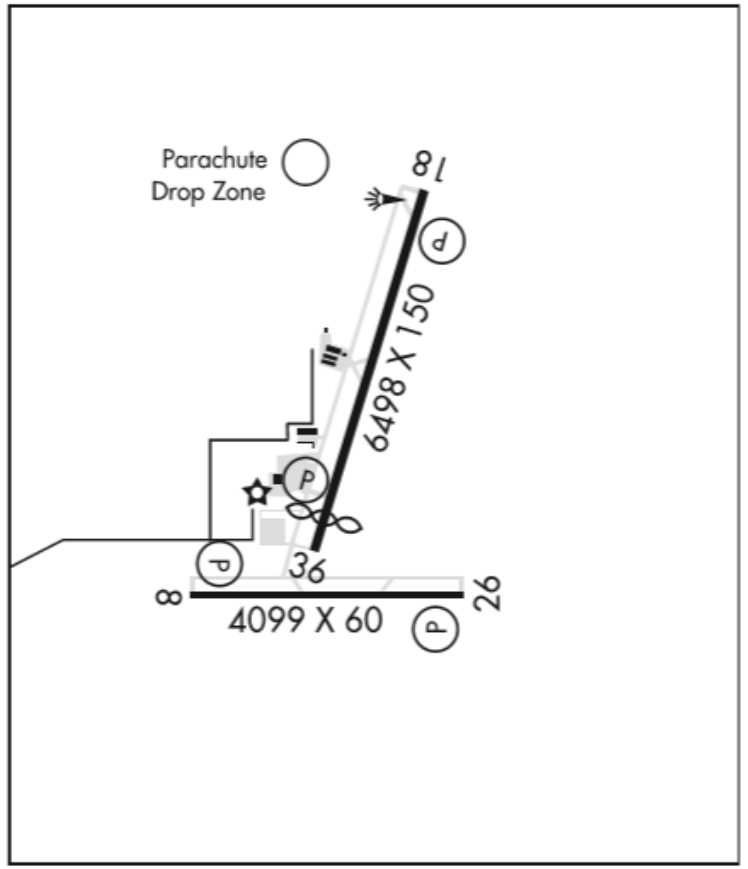
RWY 08–26: H4099X60 (ASPH) S–40, D–60, 2D–100 0.4% up E

RWY 08: PAPI(P2L)—GA 3.0° TCH 38′. P–line. Rgt tfc.

RWY 26: PAPI(P2L)—GA 3.0° TCH 47′.

SERVICE: S4 **FUEL** 100LL, JET A

AIRPORT REMARKS: Attended 1600–0100Z‡. Parachute Jumping. Fuel avbl 24 hrs call (760) 617–7599. Aerobatic training northeast area of arpt. Rwy 08–26 CLOSED to acft over 12,500 pounds without PPR from arpt manager, call 760–247–2371. Rwy 08–26 CLOSED to ngt ops due to rapidly rising terrain east and west of rwy, west to 3890′ within 1.5 NM and east to 3910′ within 1.7 NM. Rwy 18–36 on apch to Rwy 36 cross Rwy 08–26. TPA—Rwy 18–36 4062(1000), Rwy 08–26 3862(800).



AIRPORT MANAGER: 760-247-2371

COMMUNICATIONS: **CTAF/AUNICOM** 122.8

BARSTOW RCO 122.3 (RIVERSIDE RADIO)

Ⓡ **JOSHUA APP/DEP CON** 124.55

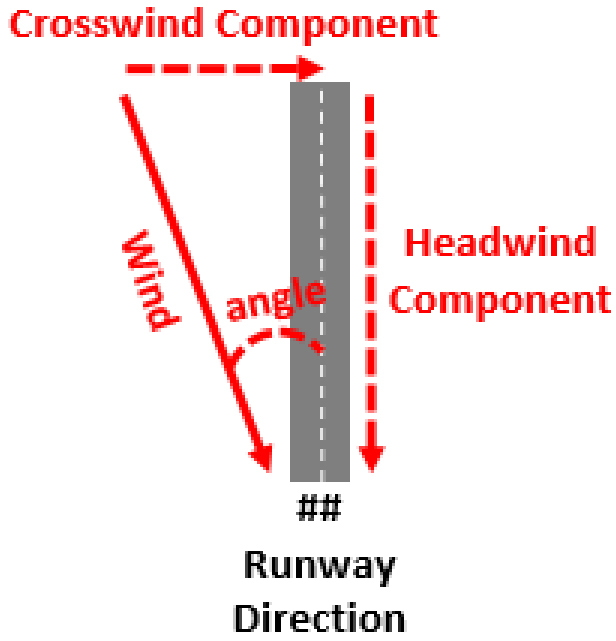
RADIO AIDS TO NAVIGATION: NOTAM FILE DAG.

DAGGETT (L) VORTACW 113.2 DAG Chan 79 N34°57.75′ W116°34.69′ 218° 38.0 NM to fld. 1760/15E.

COMM/NAV/WEATHER REMARKS: Automated UNICOM–3 clicks advisory, 4 clicks radio check.

- **The next thing we need to do is gather all the information we will need to use the charts:**
  - Aircraft takeoff weight
  - Forecasted surface winds
  - Runway elevation
  - Runway direction
  - Forecasted surface temperature
  - Forecasted altimeter setting
- **Then, we can use some of this information to calculate a Headwind/Tailwind component**
  - Use runway direction and forecasted winds to calculate headwind/tailwind

$$Headwind\ or\ Tailwind\ = Wind\ Speed * \cos(angle\ between\ runway\ and\ wind)$$



*Trigonometry!!! Hate math? Get an Electronic E6B and we will show you how to use it in the Online Ground School

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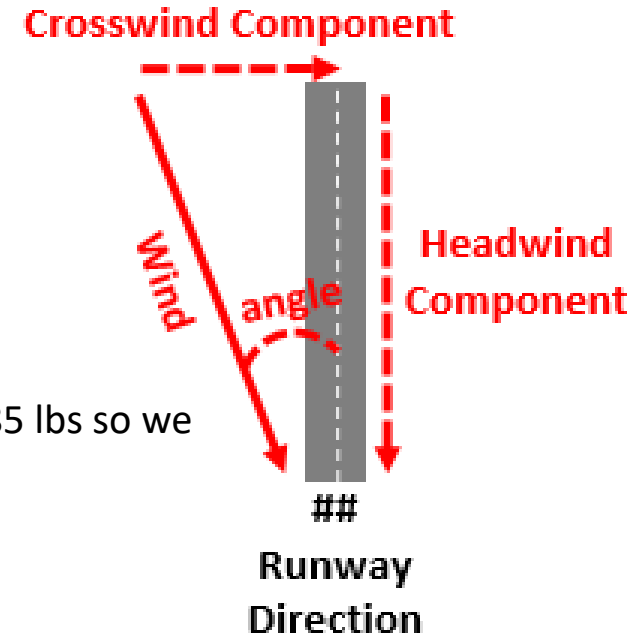
- **Takeoff:**
  - Aircraft takeoff weight: **Assume 2100 lbs**
  - Forecasted surface winds: **210 @ 3 kts**
  - Runway Pressure Altitude: **508'**
  - Runway direction: **270°**
  - Forecasted surface temperature: **17° C**

$$Headwind\ or\ Tailwind\ = Wind\ Speed * \cos(angle\ between\ runway\ and\ wind)$$

3 kts * cos(270° - 210°) = **1.5 kts Headwind**



- **Landing:**
  - Aircraft landing weight - We estimate using 14.1 gal (not including reserves). At 6 lbs/gal this is 85 lbs so we can assume a landing weight of: 2100 – 85 **= 2015 lbs**
  - Forecasted surface winds: **195 @ 9 kts**
  - Runway Pressure Altitude: **3962'**
  - Runway direction: **180°**
  - Forecasted surface temperature: **25° C**

$$Headwind\ or\ Tailwind\ = Wind\ Speed * \cos(angle\ between\ runway\ and\ wind)$$

9 kts * cos(195° - 180°) = **8.7 kts Headwind**

Takeoff Distance

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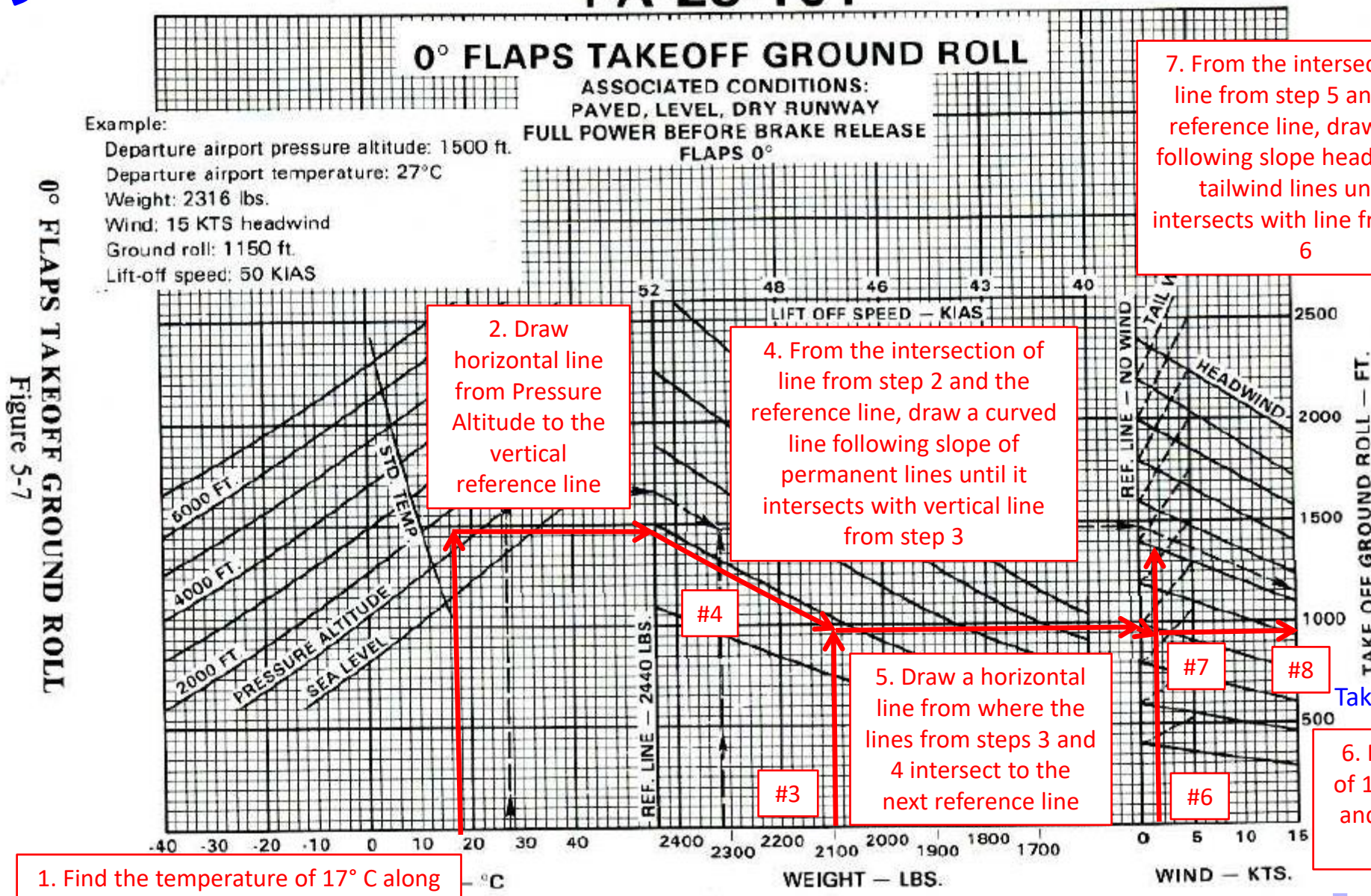

0° FLAPS TAKEOFF GROUND ROLL
Figure 5-7

1. Find the temperature of 17° C along the bottom axis and draw vertical line up to the Pressure Altitude of 508’

2. Draw horizontal line from Pressure Altitude to the vertical reference line

3. Find aircraft’s takeoff weight of 210 lbs on weight axis and draw vertical line up

4. From the intersection of line from step 2 and the reference line, draw a curved line following slope of permanent lines until it intersects with vertical line from step 3

5. Draw a horizontal line from where the lines from steps 3 and 4 intersect to the next reference line

6. Find the headwind of 1.5 on the wind axis and draw vertical line up

7. From the intersection of line from step 5 and next reference line, draw a line following slope headwind or tailwind lines until it intersects with line from step 6

8. At intersection of lines from step 6 and 7 draw horizontal line to end of chart and read off takeoff ground roll distance of ~950’

Takeoff Ground Roll = **950’**

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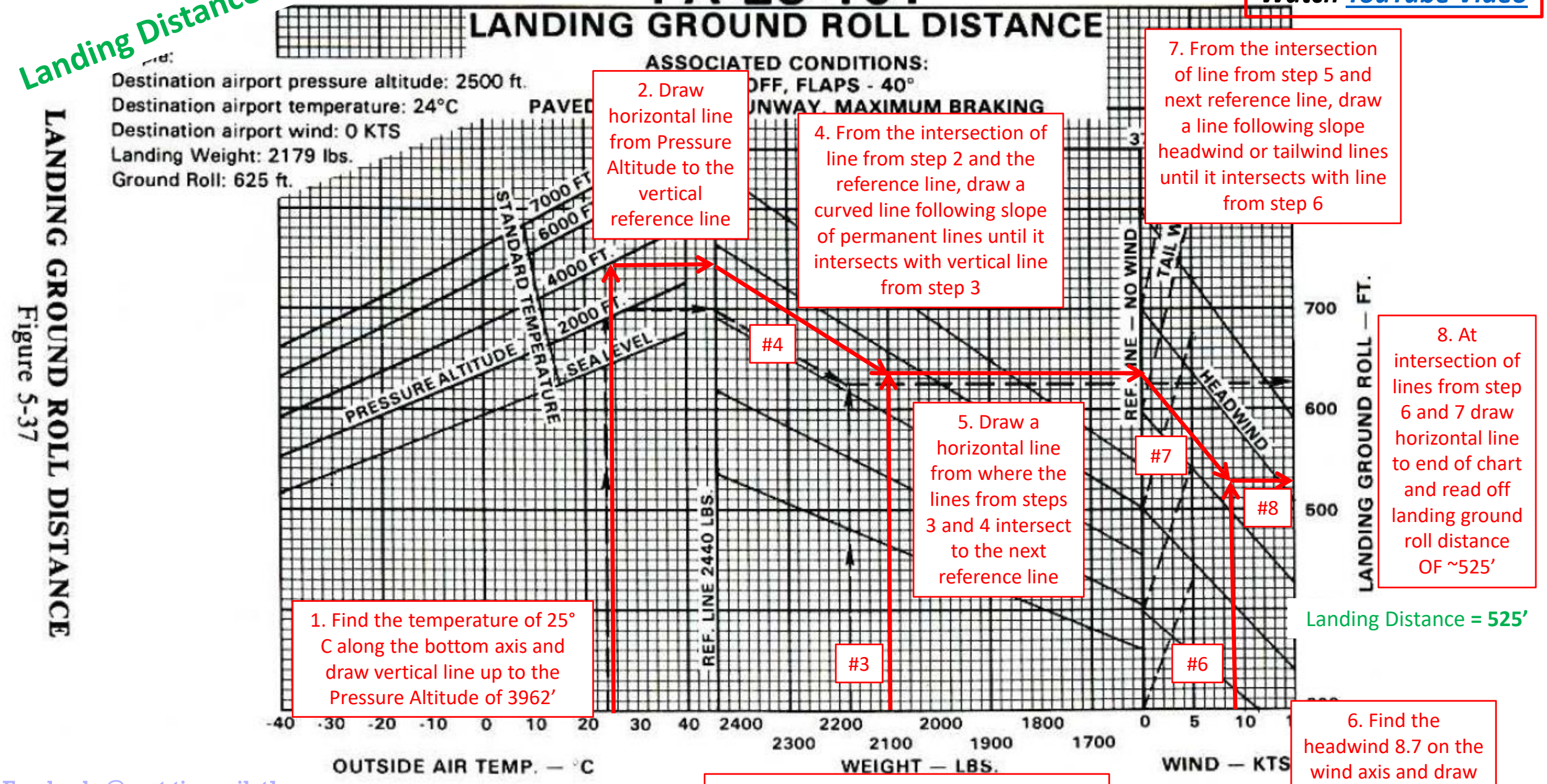
Landing Distance



LANDING GROUND ROLL DISTANCE
Figure 5-37

1. Find the temperature of 25° C along the bottom axis and draw vertical line up to the Pressure Altitude of 3962'

2. Draw horizontal line from Pressure Altitude to the vertical reference line

3. Find aircraft's landing weight of 2013 lbs on weight axis and draw vertical line up

4. From the intersection of line from step 2 and the reference line, draw a curved line following slope of permanent lines until it intersects with vertical line from step 3

5. Draw a horizontal line from where the lines from steps 3 and 4 intersect to the next reference line

6. Find the headwind 8.7 on the wind axis and draw vertical line up

7. From the intersection of line from step 5 and next reference line, draw a line following slope headwind or tailwind lines until it intersects with line from step 6

8. At intersection of lines from step 6 and 7 draw horizontal line to end of chart and read off landing ground roll distance OF ~525'

Landing Distance = **525'**

HOW DOES THE DENSITY OF THE AIR EFFECT YOUR TAKEOFF & LANDING DISTANCE?

If I were a betting man I would bet a good amount of money that during your Checkride oral exam your examiner gives you some situation in your flight plan where you are taking off or landing from an airport that is either high altitude, in hot temperature, or in high humidity.

Why is this? Because all of those things decrease the density of air in the atmosphere which **INCREASES** the density altitude. And you should know, if you don't already, that a decrease in density in the air means a decrease in performance of your aircraft.

That means longer takeoff and landing distances which means you might not have enough runway available at smaller airports. This is **BIG** deal and why the examiner is going to try and test you to see if you understand the consequences.

In the Online Ground School we talk about the effects of density altitude, explain why things like temperature, humidity and altitude effect it so much **AND** we give real life examples to show you **HOW MUCH** of an effect it actually has on things like your takeoff and landing distances.

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Checkpoint	Altitude	Distance (nm)	Distance Total (nm)	Time (min)	Time Total (min)	True Course °	Var -E +W	Mag Course °	Wind True °	Wind Speed	Temperature	WCA °	Mag. Heading °	TAS	Ground Speed	IAS	RPM	Power Setting %	GPH	Fuel (gal)
KSEE	508’	-	-	-	-	-	-	-	210	3	17	-	-	-	-	-	-	-	-	Takeoff & taxi
Lake Jennings	2400’	5	5	3.6	3.6	070	-12	058	290	4	16	-1	057	81	84	79	-	-	-	0.6
KRNM	5300’	11	16	7.7	11.3	353	-12	341	255	20	14	-13	328	85	86	79	-	-	-	1.5
Mtn Peak *(JLI 285)*	8500’	22.5	38.5	15.5	26.8	346	-12	334	240	31	11	-20	314	89	87	79	-	-	-	3.5
Skinner Resevoir	8500’	11.5	50	6.3	33.1	348	-12	336	240	31	11	-16	320	104	110	-	2500	61	8.4	0.8
SETER (X)	8500’	19	69	10.1	43.2	355	-12	343	240	31	11	-16	327	104	113	-	2500	61	8.4	1.4
Lake Arrowhead	8500’	21	90	11.3	54.5	353	-12	341	240	31	11	-16	325	104	112	-	2500	61	8.4	1.6
KAPV	3962’	20	110	12	66.5	000	-12	348	195	9	25	-1	347	91	100	-	2300	51	7.5	1.5

Total Fuel = **18.7 gallons**

Takeoff Ground Roll = **950’**

Landing Distance = **525’**

Hey guys, it's Nick here and I am going to be honest with you for a second…
Studying the ground school content kinda SUCKS. *I mean, it's A LOT of content and some of it, if not taught well, can be extremely boring. There were many times during my studies for ground knowledge that I would fall asleep after trying to read the same FAR over and over and over again just to figure out what the heck it was actually saying. But the truth is that…*

You are NOT going to become a pilot if you don't understand the fundamental 1st principles of your ground knowledge.

Think about it, even if you memorize enough FAA Written questions to pass the exam do you really think that is going to be enough to perform a solo cross-country flight or to pass your checkride oral and practical exam? ***The answer is NO!*** *Of course it isn't and if you take the path of just studying enough to pass the exam it is only going to hurt you more. You are just going to end up getting further down the road and paying much more money before you hit the wall and fail.*
So if you are putting your ground school on the back burner *and thinking you can do it later or you can just get by with a bunch of practice tests, then…*

You're costing yourself $1000s

And if you're like most student pilots who come to me asking for help then chances are you didn't know this. I didn't know this when I was training and it cost me… a lot.
But if this is you then that's okay! *Because when you realize this fact you will be able to take complete control of your ground and flight training by using…* **1st Principles Thinking to understand the fundamentals of your ground school content**

THE RIGHT GROUND SCHOOL DOESN'T JUST GIVE YOU THE CONTENT & PRACTICE TESTS QUESTIONS, IT ALSO:

- Explains confusing legal FARs in simple, plain English
- Works well for students with ANY level of experience & math skills
- Explains concept topics in easy to understand step-by-step procedures
- Provides you with multiple examples so that there are NO surprises
- Has an instructor & community to get your questions asked 24/7
- Allows you to download content to study anywhere, no matter the internet connection

Imagine for just a moment…

…that you had access to a ground school that made studying easy

…imagine being done with your ground school content and ACTUALLY understanding it at a fundamental level

…you could be passing your FAA Written Exam and already prepared for Checkride in AS LITTLE AS 1 MONTH!

And you get to feel that feeling of accomplishment and relief that the overwhelming amount of content you had to learn is done. It's DONE! You never have to go through that again… well you'll have to review it from time to time and a good pilot is always learning but you get what I am saying.

Wouldn't that be nice?

Well, you don't have to imagine any longer. Because… it's here

Introducing…

THE PART TIME PILOT ONLINE GROUND SCHOOL

See what's included:

Online Ground School

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- ✓ FAA Written Exam Endorsement
- ✓ FAA Written Practice Tests & Answer Explanations
- ✓ Practice Test report & analysis
- ✓ Private Facebook group community
- ✓ Access to video & audio lesson library
- ✓ 100% money-back guarantee
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- ✓ Study Guide pdf
- ✓ Cross-Country Planning eBook
- ✓ Cross-Country Planning checklist
- ✓ Subject Area checklist
- ✓ Eligible for $1000 scholarship

Click here to take an inside tour

Every single student that has gone through our ground school has passed their FAA Written exam on the very 1st try. See what these students said about the course…

BR

blake riedel

1 review US

★★★★★

Feb 14, 2022

Great Program

Nick is a great guy who supports his students. What amazed me about part time pilot is that Nick actually took the time to look over my answers, and ask if I needed any help with anything. He also gave me some extra practice tests at my request to help me continue to study hard for the exam. Overall, great program, and super fun and easy to complete!

Brenna Mitra

1 review US

★★★★★

Oct 20, 2021

I learned so much from this instructor

I learned so much from this instructor. He always comes out with new content and is easy to communicate with if I need help. Passed my test. Thank you

JH

Justin Heath

1 review US

★★★★★

Feb 11, 2022

Great PPL ground school course for busy, independent learners!

I decided on this course due to it being self-paced and reasonably priced. I have been impressed with the course content, customer service, and the Facebook group! I highly recommend this course for preparation for the FAA written exam. I am always excited to continue on through the course and am looking forward to taking and passing my written in the near future!

JK

Jason Kish

1 review · US

★★★★★ Jan 3, 2023

From 9 to 90!

I had no prior experience with aviation. On the practice test I literally got a 9%. It was the lowest score anyone had gotten. I now have been getting high 80s and 90s on the tests. I'm not saying that its been easy. But Nick walked me gently through the program. He kept in constant contact as I felt defeated and lifted me up and celebrated when I began mastering the material. I'm thankful I chose his program.

Date of experience: January 02, 2023

BP

Brendan Patilla

1 review · US

★★★★★ Jan 19, 2023

Online Ground School

The value of the information provided is unbeatable! By far the best option for an online ground school!

Date of experience: January 18, 2023

JW

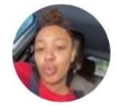
Jared Walton

1 review · US

★★★★★ Jan 9, 2023

Price stood out first, content sold it

Price stood out first, this is what drew me in. Then I really liked how the videos were available on youtube and I could see what was going to be included in the course, and as I watched the videos my ultimate selling point was on the background knowledge you include from an engineering degree. I gain such a better understanding with an equation and graphical analysis provided that models what is happening. Someone with a really thorough understanding can go through the how and why behind something as if it were simple and make it easy for a learner to follow and I was able to find that in these videos. From what I saw, many other prep programs are focused on memorization for specific FAA question segments and this program is focused in providing true educational groundwork.
If you are just getting started, watch several of the videos and see if this will match your learning style, for example watch the videos on lift and drag. The equations aren't part of the FAA written but help you actually understand how to fly safely and efficiently.



Kyndal Anne Silver

1 review · US

★★★★★ Dec 19, 2022

BUY THIS COURSE

I bought this Ground School after watching Nick's YouTube video that compared Part Time Pilot with other ground schools. I was skeptical at first, and did my own research on popular ground schools.

Part Time Pilot is the truth! I am so glad I didn't waste my time or money on another school!
My favorite thing about the school is the explanations for missed questions. I love that I don't have to do extra work of going back to find out why I missed a question.

Nick has provided us (the students) with so many resources: facebook group, study hacks, videos, podcasts, live lessons, study groups and that's only a few! BUY THIS COURSE YOU WILL NOT REGRET!!

Date of experience: December 18, 2022

DA

Donovan Amritt

1 review · US

★★★★★ Feb 5, 2022

All material provided as part of course...

All material provided as part of course work was on the PPL exam

SH

Spenser Haynie

1 review · US

★★★★★ Oct 20, 2021

Choosing Part Time Pilot was my best decision!

Choosing Part Time Pilot was my best decision! I finished the ground school over 2 months and got a 93% on my written exam. Course was great

LB

Lucia Beaulieu

1 review · US

★★★★★ Oct 20, 2021

Great course for passing the written!

This course helped me pass the written exam and I felt as prepared as possible. The test questions were super helpful and provided me with a really solid foundation for what I could expect on the test itself. The layout and format was setup for ease of use for someone such as myself.

JG

Jim Gabel

1 review · US

★★★★★ Jan 5, 2022

Self study type? This is the course!

So where do I begin. Let me catch your attention with the fact that I started this journey 31 years ago. Recently I decided it was time for a career change. I will not bore you with the details, but I will tell you that I had passed the FAA written twice in the past. Today I passed it again. and I feel that I did it because of Part Time Pilot and Nick!! This course is PERFECT if you are a "self-study" person like myself. THANK YOU Nick for putting together a great online program!! More posts soon as I progress from old guy to Commercial!! Maybe Nick will throw out a few of my "help me remember's" he liked in my written responses.

THE SIMPLE, EASY TO UNDERSTAND STEP BY STEP PROCEDURES & EXAMPLE-DRIVEN GROUND SCHOOL THAT MAKES PASSING YOUR EXAMS A BREEZE…

OR YOUR MONEY BACK!

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