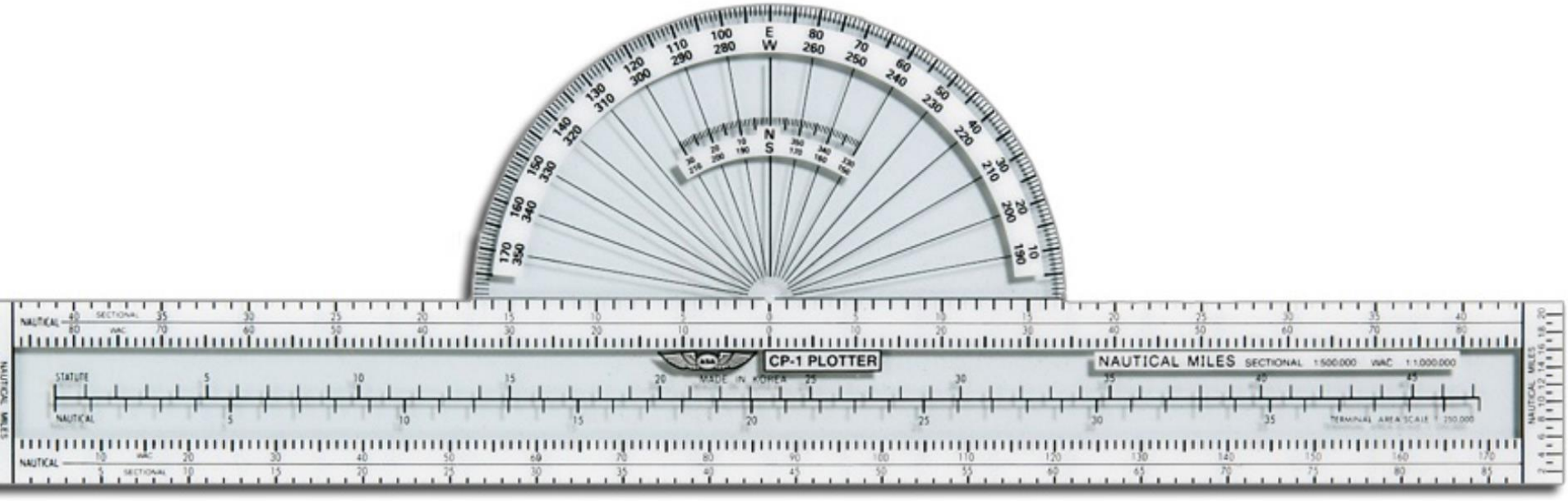
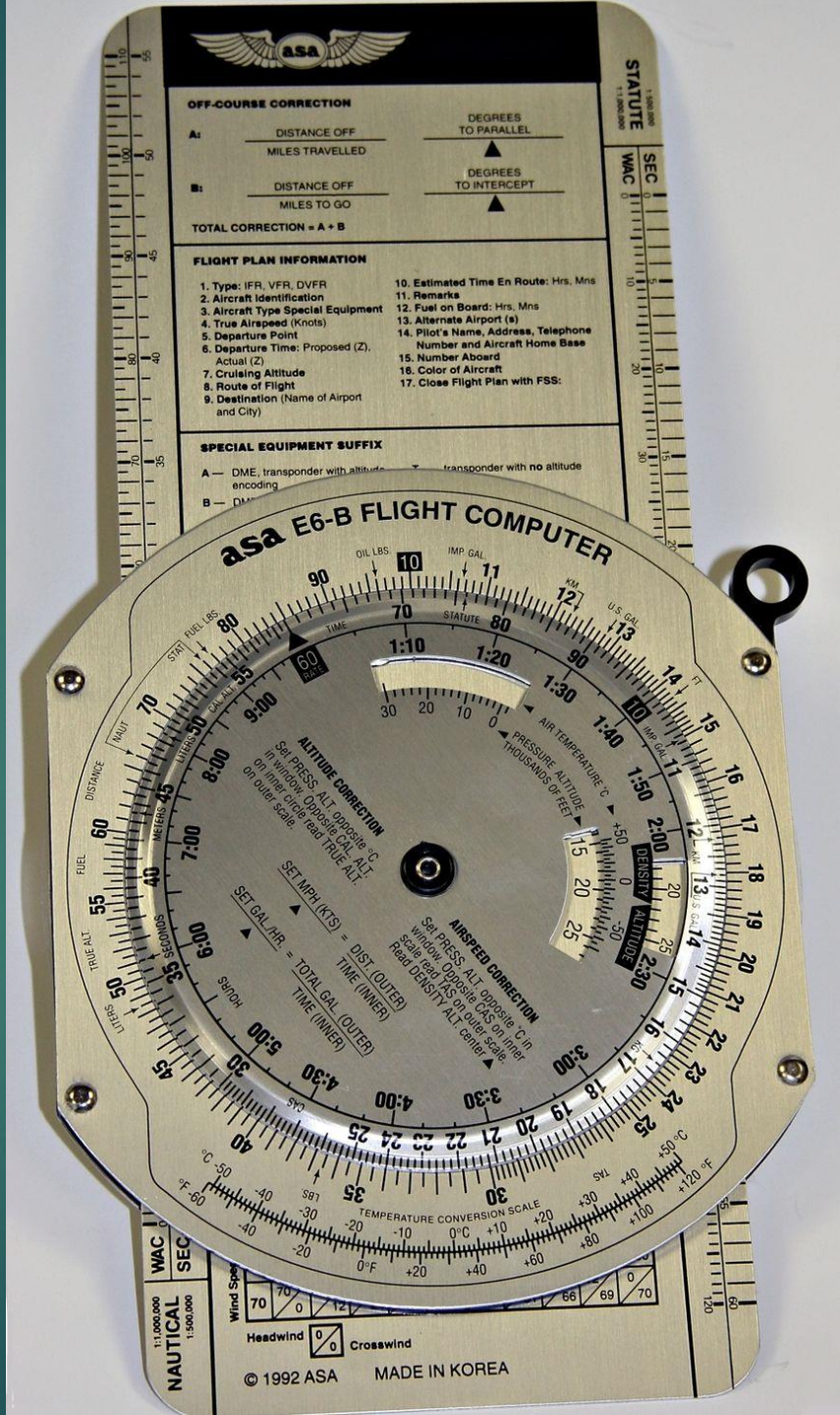
Flight Planning Tools

- Determine true course with sectional and plotter
- Determine true heading with wind-side E6B
- Convert to magnetic heading
- Calculate and record ground speed and time en route on a navlog

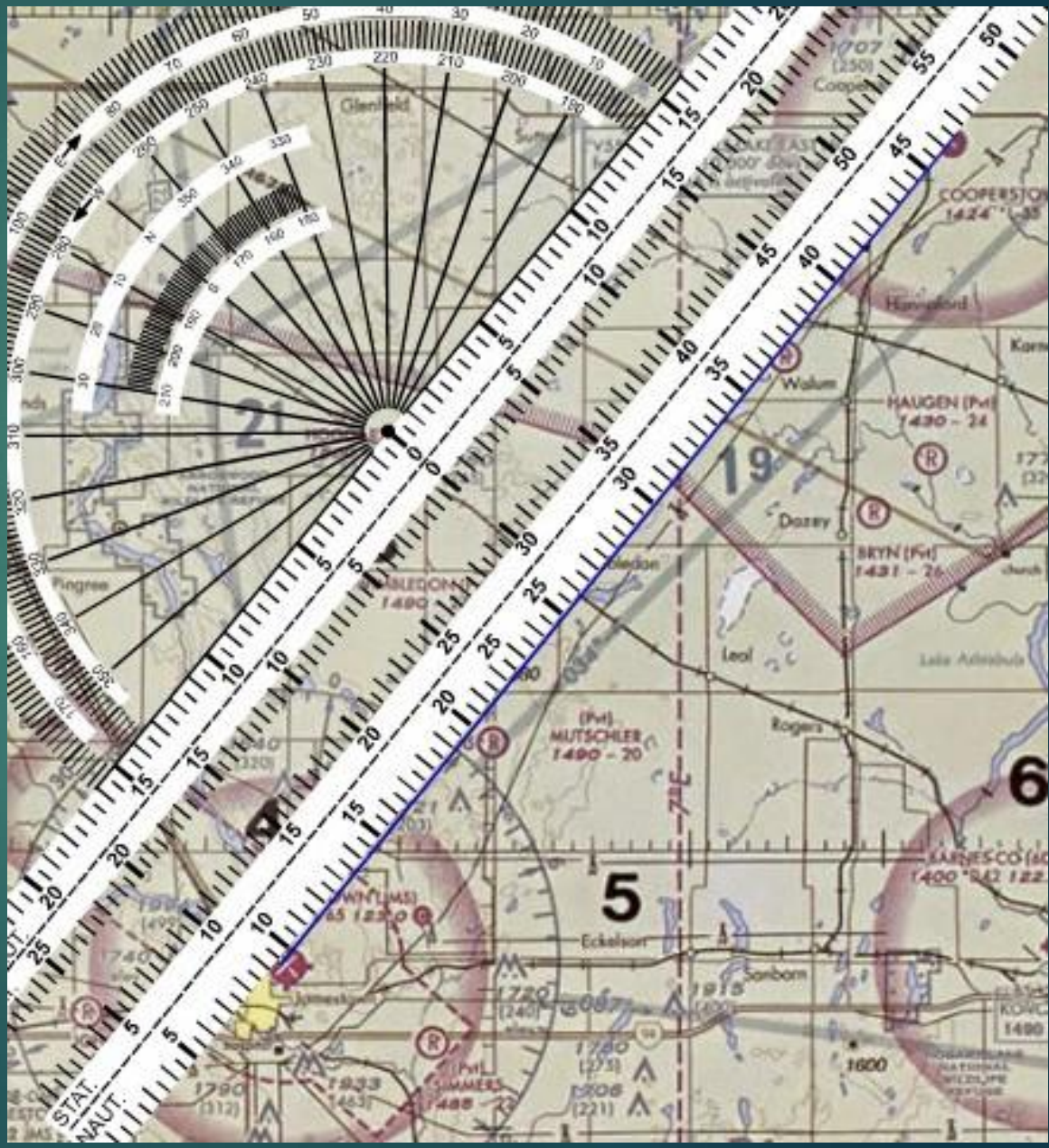
Typical fixed plotter



E6B Flight Computer



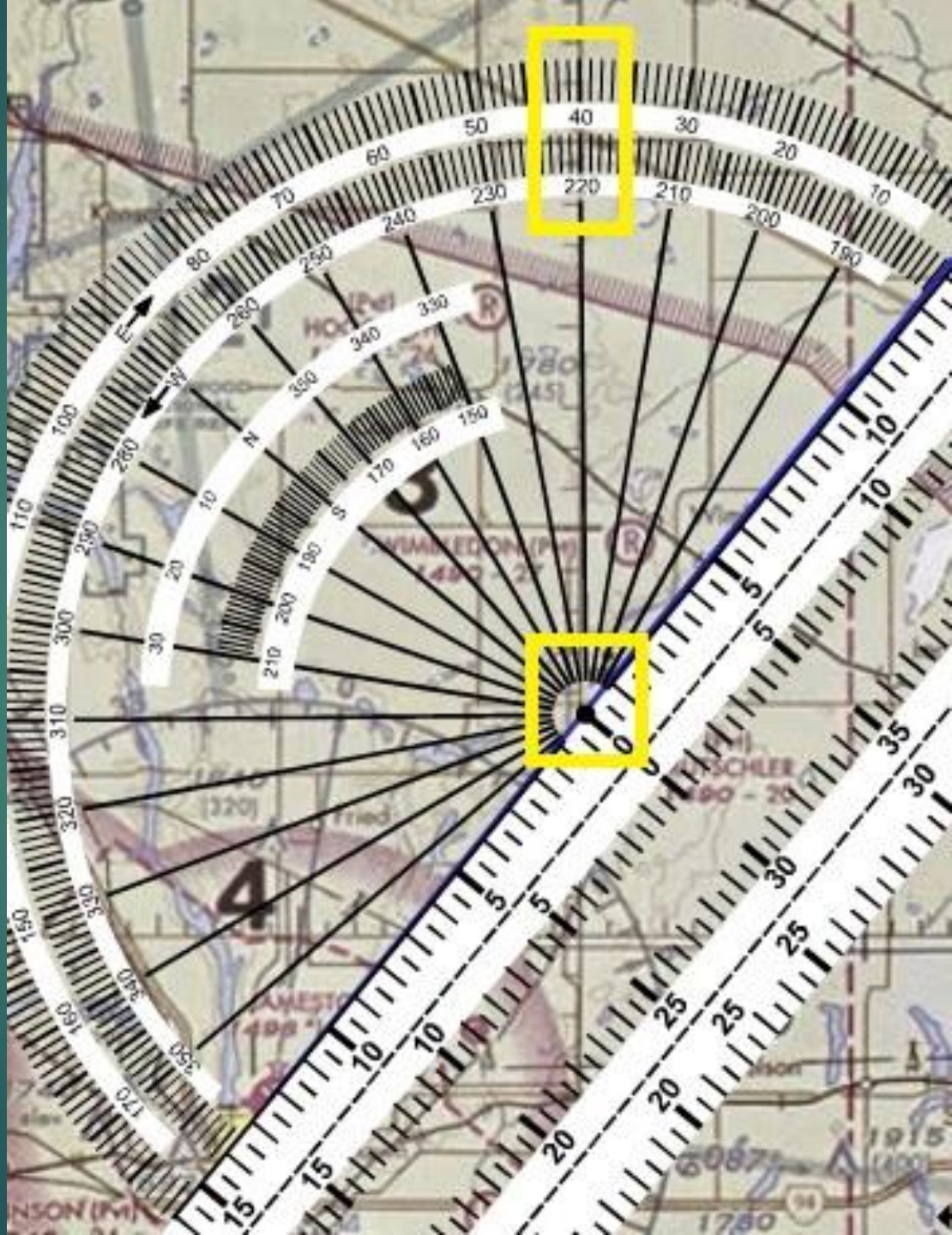
Sectional and Plotter



Measure distance along line

Center hole on a line of longitude that intersects your course.

Read <u>true course</u> from protractor.



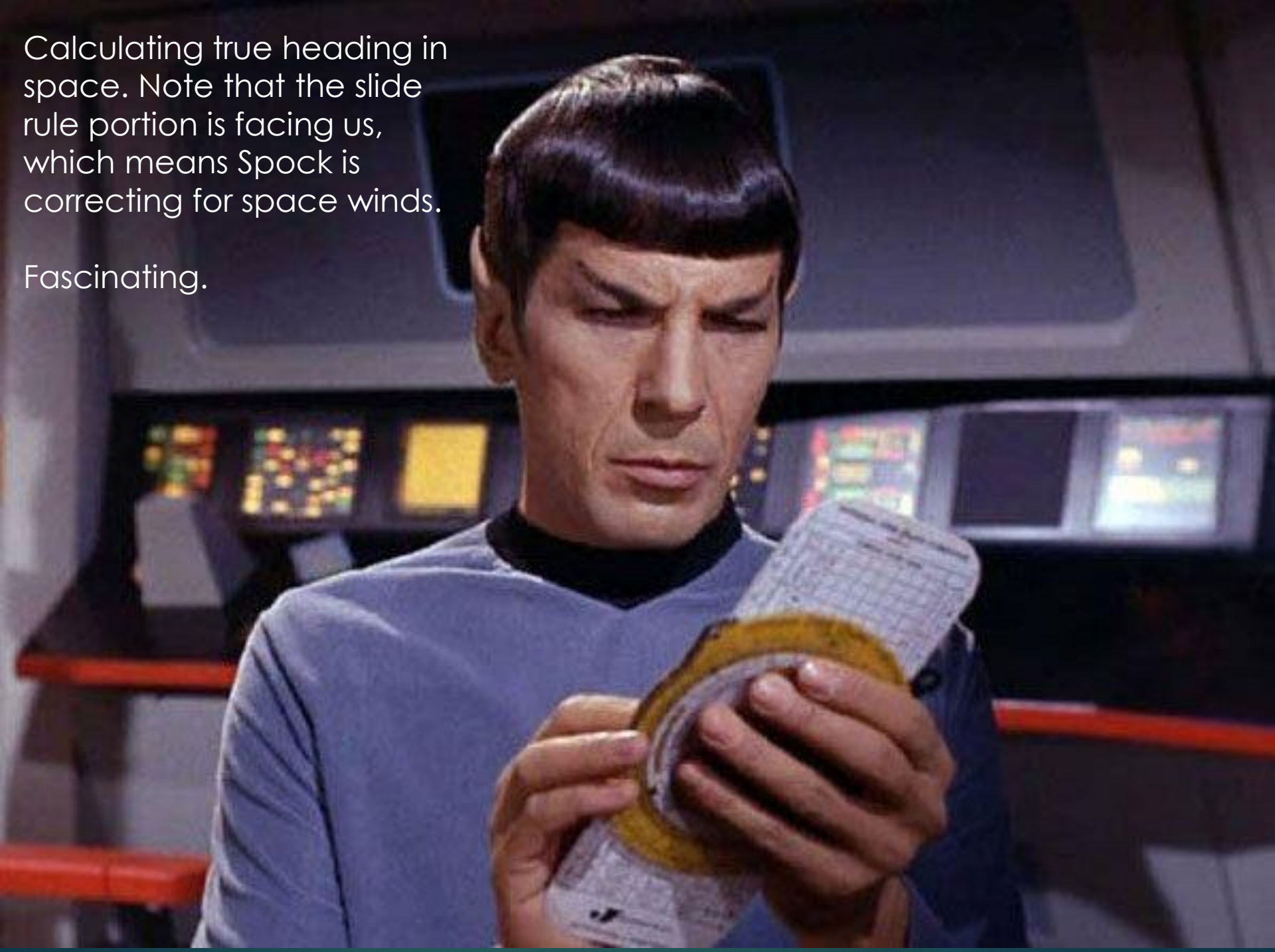
Another example:
ESN – RJD – W29

Another example:
ESN – RJD – W29

Calculating true heading

Calculating true heading

- True heading is true course (determined from sectional and plotter) corrected for wind
- It is calculated using the wind side of an E6B


Calculating true heading in space. Note that the slide rule portion is facing us, which means Spock is correcting for space winds.
Fascinating.

Fun with Your E6B

True Heading and Ground Speed

Check winds aloft forecast: wind = 20 kt from 210°

Our aircraft's cruise airspeed is 110kt

Leg	True Course	True Heading	Indicated Airspeed	Ground speed
ESN – RJD	044			
RJD – W29	272			

True Heading and Ground Speed

Check winds aloft forecast: wind = 20 kt from 210°

Our aircraft's cruise airspeed is 110kt

Leg	True Course	True Heading	Indicated Airspeed	Ground speed
ESN – RJD	044	046	110	130
RJD – W29	272			

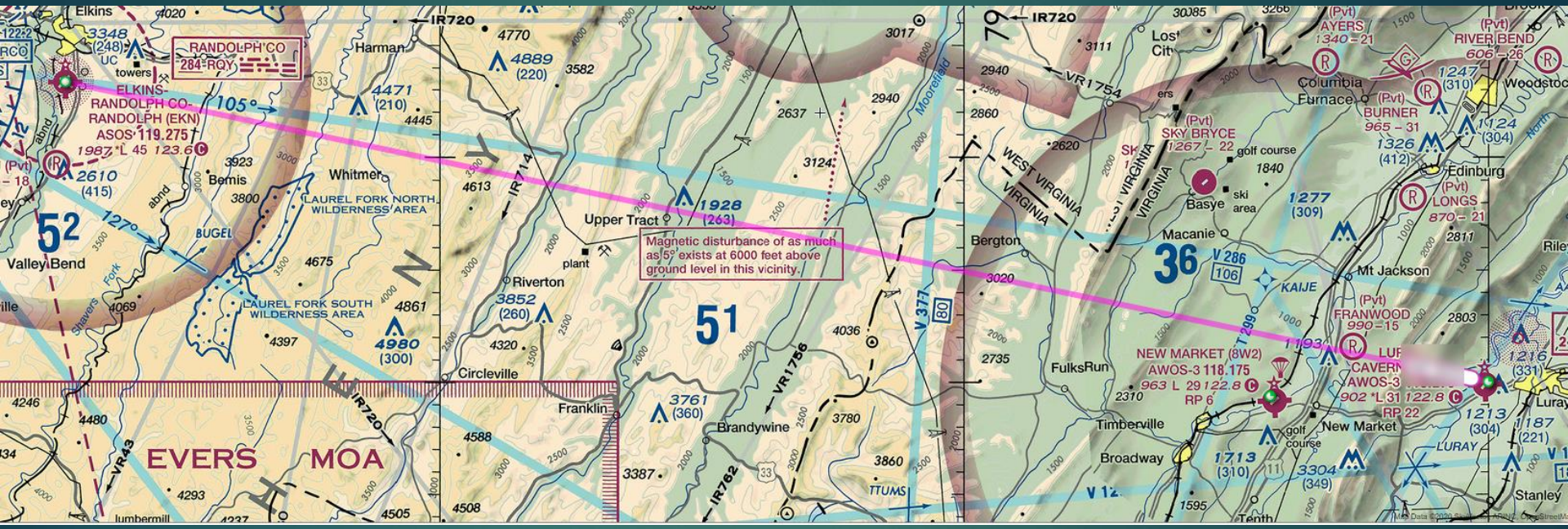
True Heading and Ground Speed

Check winds aloft forecast: wind = 20 kt from 210°

Our aircraft's cruise airspeed is 110kt

Leg	True Course	True Heading	Indicated Airspeed	Ground speed
ESN – RJD	044	046	110	130
RJD – W29	272	262	110	98

Creating a NavLog



Creating a NavLog

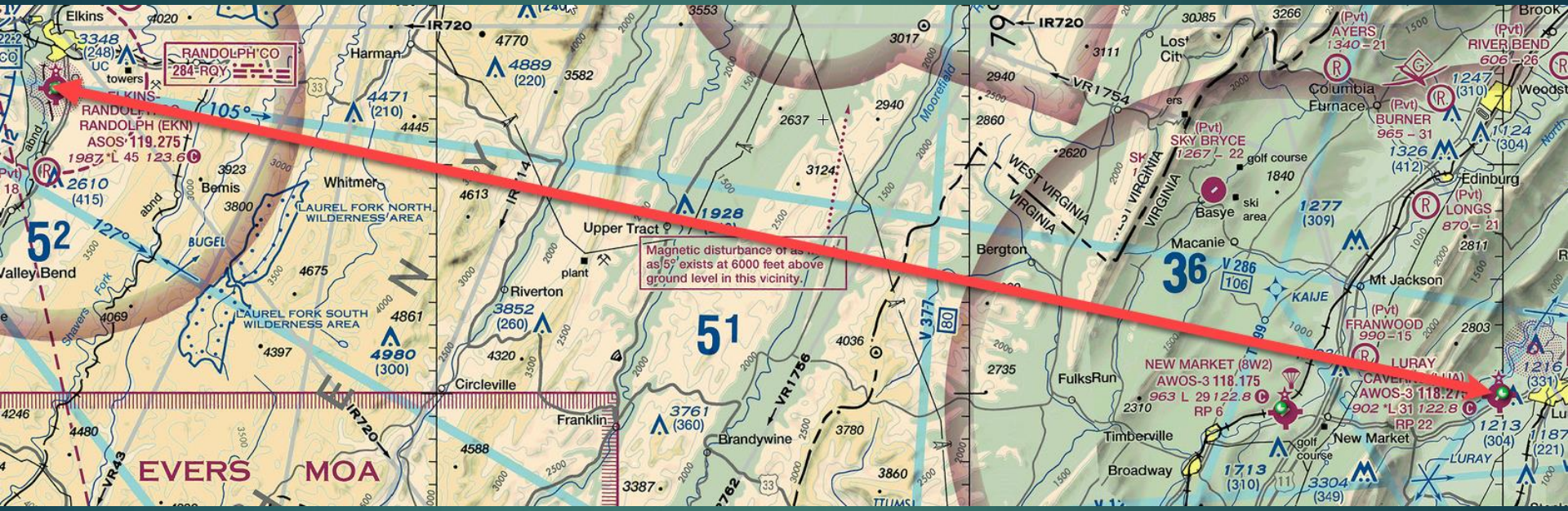
VFR NAVIGATION LOG

Aircraft Registration		Date of flight		Pilot in command	

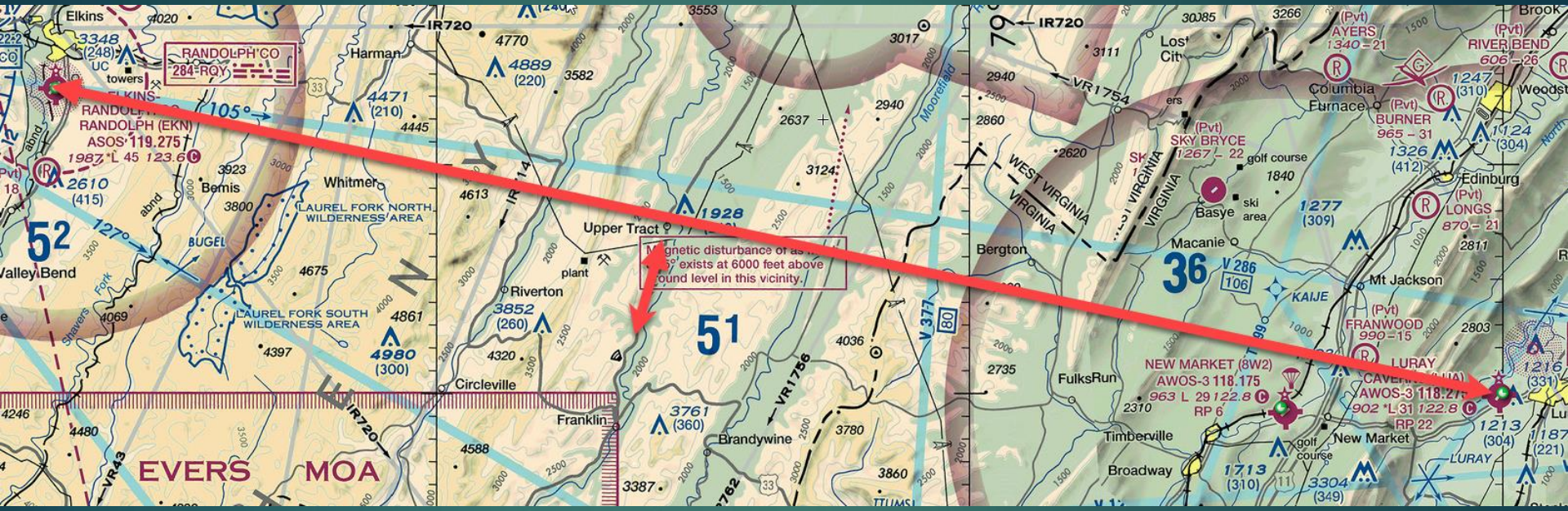
Note:

Check Points (fixes)	Navaid / Ident / Freq		Course (Route)	Altitude	Wind Dir. / Vel. / Temp	CAS / TAS	TC / -L / +R WCA	TH / -E / +W Var.	MH / Dev.	CH	Dist / Leg. / Rem.	GS Est. / Est. / Act.	Time off ETE / ETA / ATE / ATA	GPH Fuel / Rem
		\ /												
		\ /												
		\ /												
		\ /												
		\												

Creating a NavLog



Creating a NavLog



Creating a NavLog

VFR NAVIGATION LOG

Aircraft Registration		Date of flight		Pilot in command	

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Luray															
Upper Tract															
Elkins															

What altitude to fly?

- Avoid terrain/obstructions
- Fly the prescribed VFR default altitude.

FAR 91.159

- Each person operating an aircraft under VFR in level cruising flight more than 3,000 feet AGL shall maintain the appropriate altitude prescribed below, unless otherwise authorized by ATC.
- On a magnetic course of 0° through 179° any odd thousand foot MSL altitude + 500 feet (3,500, 5,500, 7,500…)
- On a magnetic course of 180° through 359°, any even thousand foot MSL altitude + 500 feet (4,500, 6,500, 8,500…)

Memory aid:

- East is odd
- But West is even odder
- (IFR traffic is typically assigned the 1000s altitudes, i.e. eastbound IFR flies 5000, 7000, 9000 MSL and westbound flies 6000, 8000, 10000)

Creating a NavLog

VFR NAVIGATION LOG

Aircraft Registration		Date of flight		Pilot in command	

Note:

Check Points (fixes)	Navaid / Ident / Freq		Course (Route)	Altitude	Wind Dir. / Vel. / Temp	CAS / TAS	TC / -L / +R WCA	TH / -E / +W Var.	MH / Dev.	CH	Dist / Leg. / Rem.	GS / Est. / Est. / Act.	Time off / ETE / ATE	ETA / ATA	GPH / Fuel / Rem
Luray															
Upper Tract															
Elkins															

Creating a NavLog

Check Point (fixes)	Navaid Ident Freq		Course (Route)	Altitude	Wind Dir. Vel. Temp	CAS TAS	TC -L / +R WCA	TH -E / +W Var.	MH Dev.	CH	Dist Leg. Rem.	GS Est. Est. Act.	Time off ETE ETA ATE ATA	GPH Fuel Rem
Luray														
		\ /		3000	210 25	110								
Upper Tract														
		\ /		3000	210 25	110								
Elkins														
		\ /												
		\												

Creating a NavLog

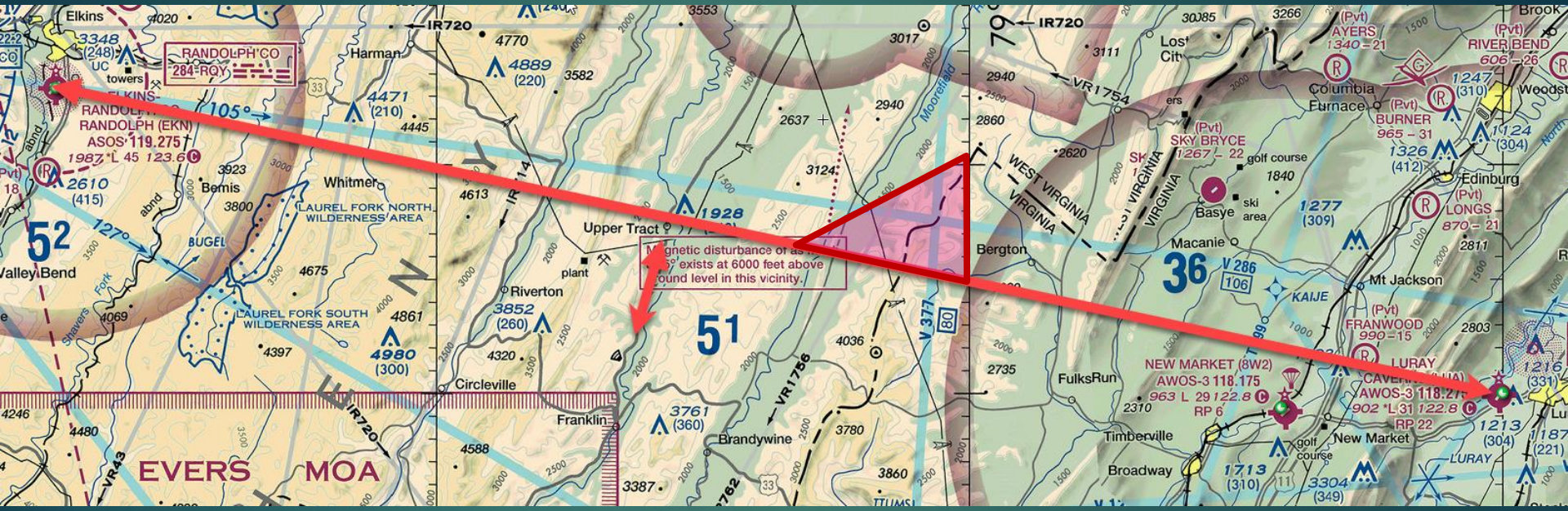
VFR NAVIGATION LOG

Aircraft Registration		Date of flight		Pilot in command	

Note:

Check Points (fixes)	Navaid Ident / Freq	Course (Route)	Altitude	Wind Dir. / Vel. / Temp	CAS / TAS	TC / -L / +R WCA	TH / -E / +W Var.	MH / Dev.	CH	Dist Leg / Rem.	GS Est. / Est. / Act.	Time off ETE / ETA / ATE / ATA	GPH Fuel / Rem
Luray													
			3000	210 / 25	110								
Upper Tract													
			3000	210 / 25	110								
Elkins													

Creating a NavLog



Creating a NavLog

Check Point (fixes)	Navaid Ident Freq		Course (Route)	Altitude	Wind Dir. Vel. Temp	CAS TAS	TC -L / +R WCA	TH -E / +W Var.	MH Dev.	CH	Dist Leg. Rem.	GS Est. Est. Act.	Time off ETE ETA ATE ATA	GPH Fuel Rem
							283					Est.		
Luray														
		\		3000	210 25	110								
Upper Tract		/												
		\		3000	210 25	110								
Elkins		/												
		\												
		/												
		\												

Creating a NavLog

Check Point (fixes)	Navaid Ident Freq		Course (Route)	Altitude	Wind Dir. Vel. Temp	CAS TAS	TC -L / +R WCA	TH -E / +W Var.	MH Dev.	CH	Dist Leg. Rem.	GS Est. Est. Act.	Time off ETE ETA ATE ATA	GPH Fuel Rem
Luray							283							
		\ /		3000	210 25	110								
Upper Tract														
		\ /		3000	210 25	110								
Elkins														
		\ /												
		\												

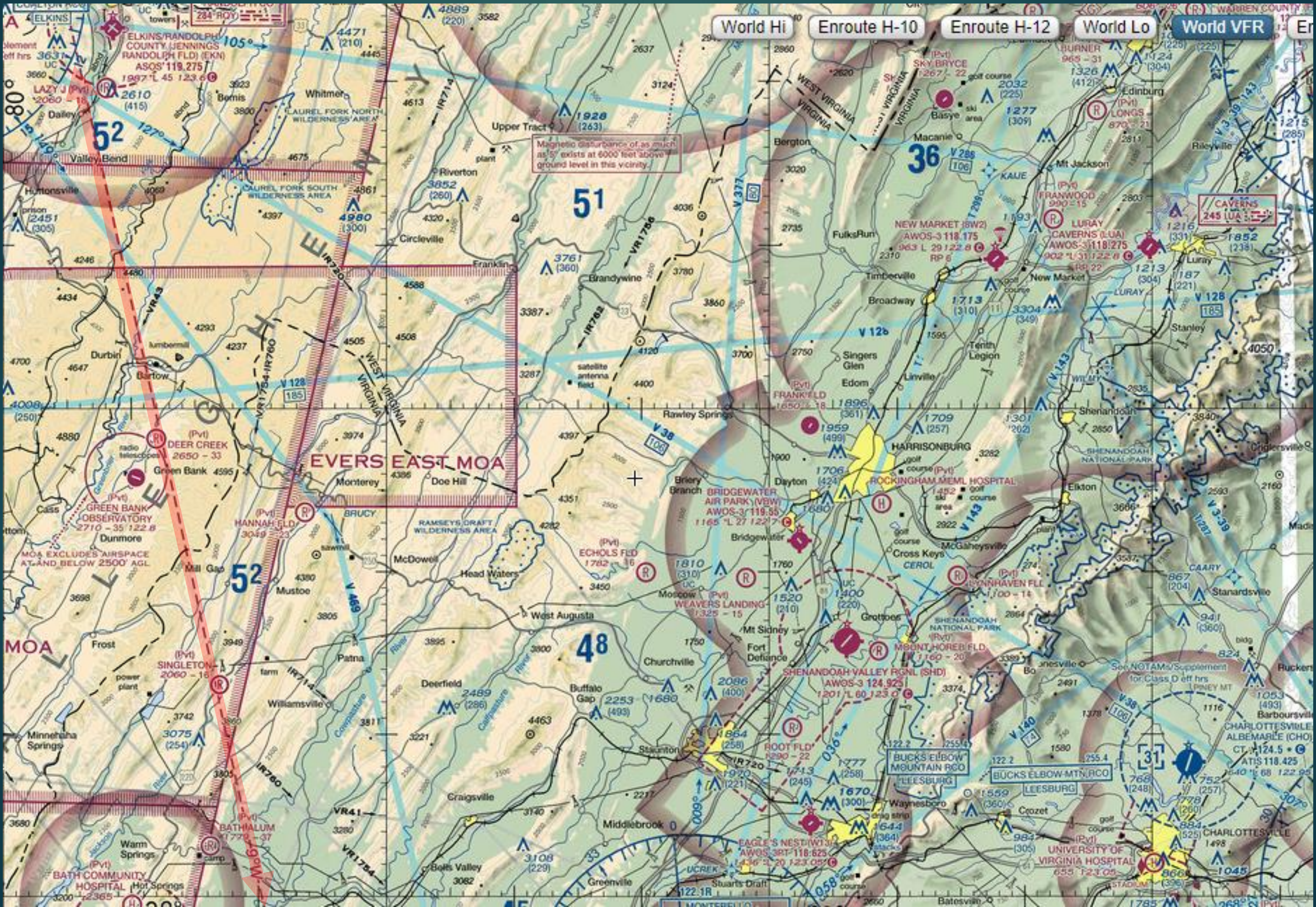
Creating a NavLog

Check Point (fixes)	Navaid Ident / Freq		Course (Route)	Altitude	Wind Dir. / Vel. / Temp	CAS / TAS	TC / -L / +R / WCA	TH / -E / +W / Var.	MH / Dev.	CH	Dist Leg / Rem.	GS Est. / Est. / Act.	Time off ETE / ETA / ATE / ATA	GPH Fuel / Rem
							283	271				Est.		
Luray		\ /		3000	210 / 25	110	-12							
Upper Tract		\ /		3000	210 / 25	110	271							
Elkins		\ /												
		\												

Creating a NavLog

Check Point (fixes)	Navaid Ident / Freq		Course (Route)	Altitude	Wind Dir. / Vel. / Temp	CAS / TAS	TC / -L / +R / WCA	TH / -E / +W / Var.	MH / Dev.	CH	Dist Leg / Rem.	GS Est. / Est. / Act.	Time off E T E / A T E	Time off E T A / A T A	GPH Fuel / Rem
							283	271				Est.			
Luray															
		\ /		3000	210 / 25	110	-12								
Upper Tract							271								
		\ /		3000	210 / 25	110									
Elkins															
		\ /													
		\													

Magnetic Variation



Creating a NavLog

Check Point (fixes)	Navaid Ident / Freq		Course (Route)	Altitude	Wind Dir. / Vel. / Temp	CAS / TAS	TC / -L / +R WCA	TH / -E / +W Var.	MH / Dev.	CH	Dist Leg. / Rem.	GS Est. / Est. / Act.	Time off ETE / ETA / ATE / ATA	GPH Fuel / Rem
							283	271	280			Est.		
Luray		\ /		3000	210 / 25	110	-12	9W						
Upper Tract		\ /					271	280						
		\ /		3000	210 / 25	110								
Elkins		\ /												
		\ /												
		\												

Creating a NavLog

Check Point (fixes)	Navaid Ident / Freq		Course (Route)	Altitude	Wind Dir. / Vel. / Temp	CAS / TAS	TC / -L / +R / WCA	TH / -E / +W / Var.	MH / Dev.	CH	Dist Leg / Rem.	GS Est. / Est. / Act.	Time off E T E / A T E	Time off E T A / A T A	GPH Fuel / Rem
							283	271	280			Est.			
Luray															
		\ /		3000	210 / 25	110	-12	9W							
Upper Tract							271	280							
		\ /		3000	210 / 25	110									
Elkins															
		\ /													
		\													

Creating a NavLog

Check Point (fixes)	Navaid Ident / Freq		Course (Route)	Altitude	Wind Dir. / Vel. / Temp	CAS / TAS	TC / -L / +R WCA	TH / -E / +W Var.	MH / Dev.	CH	Dist Leg / Rem.	GS Est. / Est. / Act.	Time off ETE / ETA / ATE / ATA	GPH Fuel / Rem
							283	271	280			Est.		
Luray														
		\ /		3000	210 / 25	110	-12	9W	-1	279				
Upper Tract							271	280	279					
		\ /		3000	210 / 25	110								
Elkins														
		\ /												
		\												

Creating a NavLog

Check Point (fixes)	Navaid Ident / Freq		Course (Route)	Altitude	Wind Dir. / Vel. / Temp	CAS / TAS	TC / -L / +R WCA	TH / -E / +W Var.	MH / Dev.	CH	Dist Leg / Rem.	GS Est. / Est. / Act.	Time off ETE / ETA / ATE / ATA	GPH Fuel / Rem
							283	271	280			Est.		
Luray														
		\ /		3000	210 / 25	110	-12	9W	-1	279				
Upper Tract							271	280	279					
		\ /		3000	210 / 25	110								
Elkins														
		\ /												
		\												

Creating a NavLog: Distance

Check Points (fixes)	Navaid Ident / Freq		Course (Route)	Altitude	Wind Dir. / Vel. / Temp	CAS / TAS	TC / -L / +R / WCA	TH / -E / +W / Var.	MH / Dev.	CH	Dist / Leg / Rem.	GS Est. / Act.	Time off ETE / ATE	Time off ETA / ATA	GPH Fuel / Rem
							283	271	280		65	Est.			
Luray					210 / 25	110	-12	9W	-1	279	38				
		\ /		3000			271	280	279		27				
Upper Tract															
		\ /		3000	210 / 25	110					27				
Elkins											0				
		\ /													
		\													

Creating a NavLog: Ground Speed

Check Points (fixes)	Navaid Ident / Freq		Course (Route)	Altitude	Wind Dir. / Vel. / Temp	CAS / TAS	TC / -L / +R / WCA	TH / -E / +W / Var.	MH / Dev.	CH	Dist / Leg / Rem.	GS Est. / Act.	Time off ETE / ATE	ETA / ATA	GPH Fuel / Rem
							283	271	280		65	Est.			
Luray															
		\ /		3000	210 / 25	110	-12	9W	-1	279	38	100			
Upper Tract							271	280	279		27				
		\ /		3000	210 / 25	110					27				
Elkins											0				
		\ /													
		\													

Creating a NavLog: Time En Route

Check Points (fixes)	Navaid Ident	Navaid Freq		Course (Route)	Altitude	Wind Dir.	Wind Vel.	Wind Temp	CAS	TAS	TC	-L / +R WCA	TH	-E / +W Var.	MH	Dev.	CH	Dist Leg.	Dist Rem.	GS Est.	GS Act.	Time off ETE	Time off ETA	Time off ATE	Time off ATA	GPH Fuel	GPH Rem
											283		271		280			65		Est.						
Luray																											
			\ /		3000	210	25		110		-12		9W		-1		279	38		100						
Upper Tract											271		280		279			27								
			\ /		3000	210	25		110									27								
Elkins																		0								
			\ /																							
			\																							

Creating a NavLog: Time En Route

Check Points (fixes)	Navaid Ident / Freq		Course (Route)	Altitude	Wind Dir. / Vel. / Temp	CAS / TAS	TC / -L / +R / WCA	TH / -E / +W / Var.	MH / Dev.	CH	Dist / Leg. / Rem.	GS Est. / Act.	Time off ETE / ATE	ETA / ATA	GPH Fuel / Rem
							283	271	280		65	Est.			
Luray															
				3000	210 / 25	110	-12	9W	-1	279	38	100	23		
Upper Tract							271	280	279		27				
				3000	210 / 25	110					27				
Elkins											0				

Light Gun Signals

Used at towered fields when radio communication is lost

Color and Type of Signal	Movement of Vehicles, Equipment and Personnel	Aircraft on the Ground	Aircraft in Flight
Steady green	Cleared to cross, proceed or go	Cleared for takeoff	Cleared to land
Flashing green	Not applicable	Cleared for taxi	Return for landing (to be followed by steady green at the proper time)
Steady red	Stop	Stop	Give way to other aircraft and continue circling
Flashing red	Clear the taxiway/runway	Taxi clear of the runway in use	Airport unsafe, do not land
Flashing white	Return to starting point on airport	Return to starting point on airport	Not applicable
Alternating red and green	Exercise extreme caution!!!!	Exercise extreme caution!!!!	Exercise extreme caution!!!!

Phonetic Alphabet

Letter	Code word	Pronunciation
A	**Alfa**	**AL** FAH
B	**Bravo**	**BRAH** VOH
C	**Charlie**	**CHAR** LEE
D	**Delta**	**DELL** TAH
E	**Echo**	**ECK** OH
F	**Foxtrot**	**FOKS** TROT
G	**Golf**	GOLF
H	**Hotel**	HOH **TELL**
I	**India**	**IN** DEE AH
J	**Juliett**	**JEW** LEE **ETT**
K	**Kilo**	**KEY** LOH
L	**Lima**	**LEE** MAH
M	**Mike**	MIKE
N	**November**	NO **VEM** BER
O	**Oscar**	**OSS** CAH
P	**Papa**	PAH **PAH**
Q	**Quebec**	KEH **BECK**
R	**Romeo**	**ROW** ME OH
S	**Sierra**	SEE **AIR** AH
T	**Tango**	**TANG** GO
U	**Uniform**	**YOU** NEE FORM
V	**Victor**	**VIK** TAH
W	**Whiskey**	**WISS** KEY
X	**X-ray**	**ECKS** RAY
Y	**Yankee**	**YANG** KEY
Z	**Zulu**	**ZOO** LOO

Digit	Code word	Pronunciation
0	Zero	ZE RO
1	One	WUN
2	Two	TOO
3	Three	TREE
4	Four	**FOW** ER
5	Five	FIFE
6	Six	SIX
7	Seven	**SEV** EN
8	Eight	AIT
9	Nine	**NIN** ER