

CROSS COUNTRY (X/C) PLANNING

PREPARATION PHASE

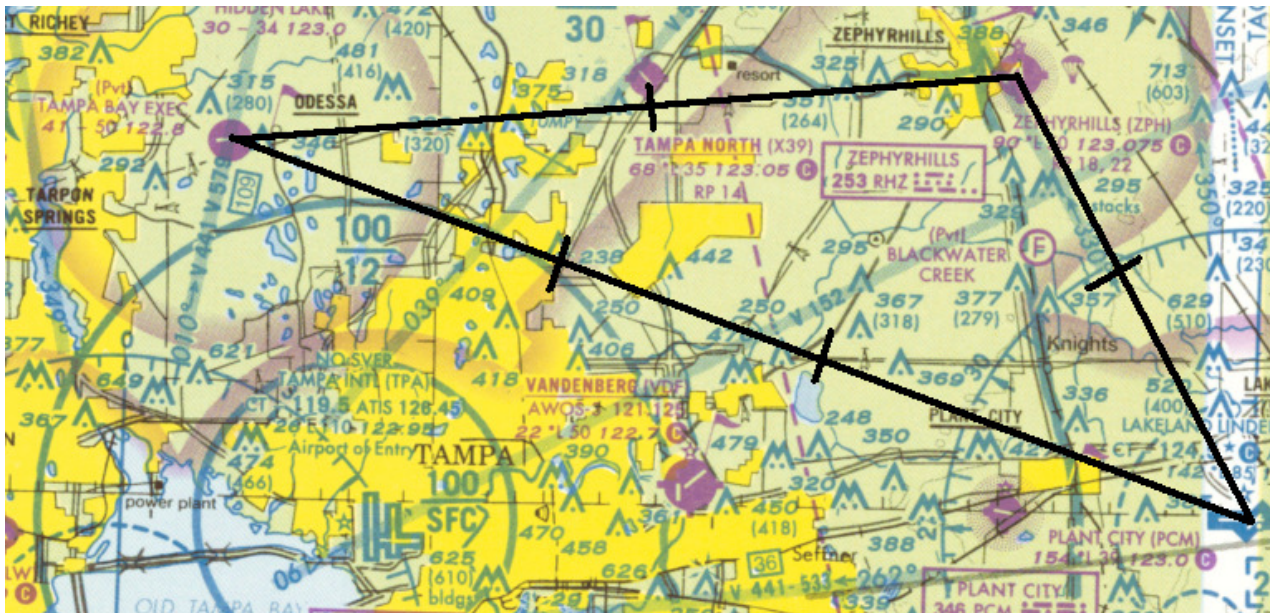
- Secure current charts (Sectionals, TACs), EB6, pencils, aircraft deviation card information from aircraft, POH for aircraft performance information, and Navigation Log.
- View and mentally evaluate the route on sectional to determine general direction and altitudes you are likely to fly (odd/even 1000's +500)
- View weather information (DUATS, NWS, AOPA) on computer, and/or call FSS to get a forecast of the time period you are planning the flight to appraise if is safe and legal.

CROSS COUNTRY (X/C) PLANNING

SETUP PHASE

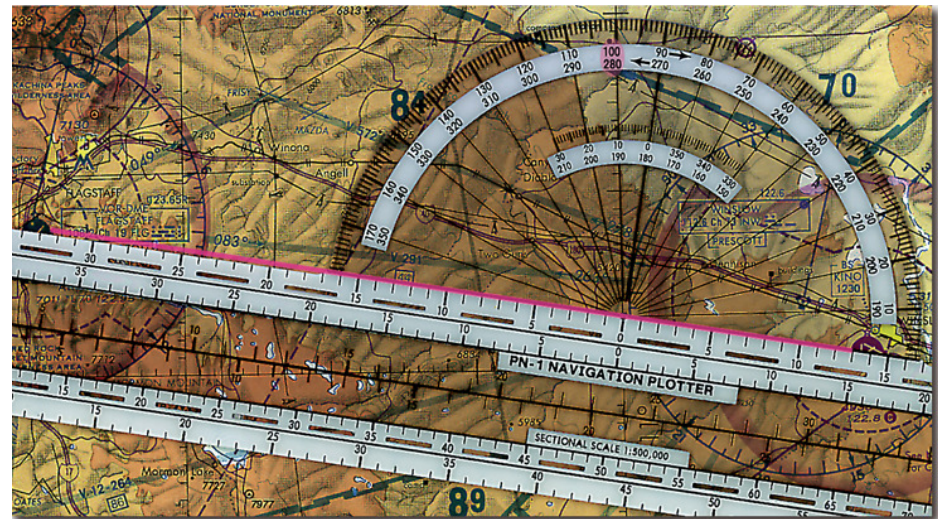
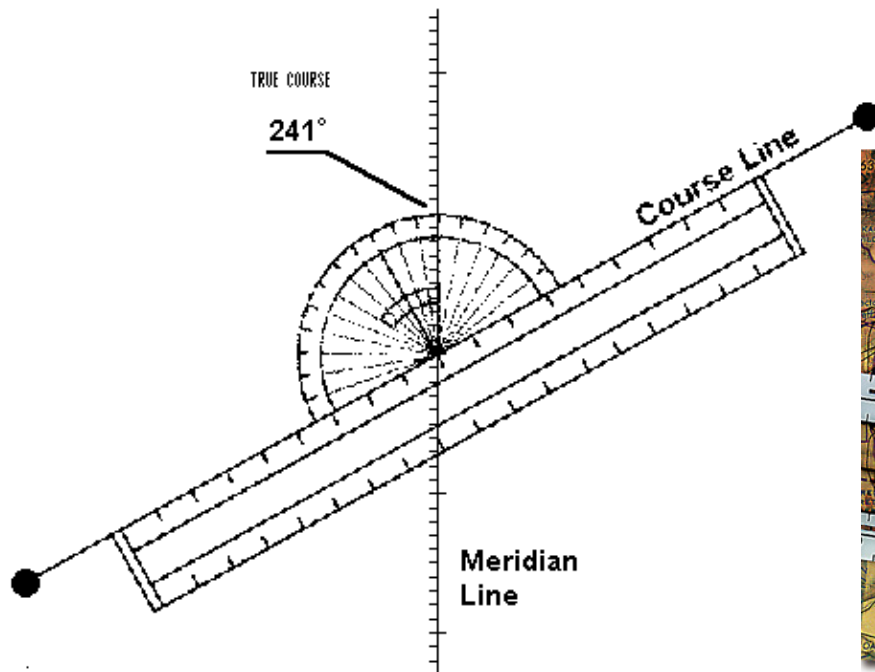
Determine True Course (TC) and Distances.

- Draw a line using a plotter and pencil (airport center to airport center, or airport to checkpoint, checkpoint to checkpoint, checkpoint to airport)
- Mark checkpoints perpendicular to the TC.



CROSS COUNTRY (X/C) PLANNING

- Determine TC using Plotter. Set midpoint of plotter on line and slide it until the grommet is centered on a meridian (latitude) line. Use some logic (and directional arrow on plotter) to read the correct scale for TC, then record for the entire flight, leg or until there is a change in course. Record TC.



- Measure Distances. Total, leg, and segment. All segments should equate to total distance. Record Distances for each segment, leg and trip distance on navigation log.

NAVIGATION LOG																						
Aircraft Number		Alt	Route																			
Check Points (fixes)	VOR Ident	Course (flow)	Altitude	Wind			CAS TAS	TC -L +R WCA	TH -E +W Var.	MH +/- Dev.	CH	Dist. Leg	GS Est.	Time Off			GPH Fuel Rem.	Airport & ATIS Advisories				
				Dir.	Vel.	Temp.								ETE	ETA	ATIS Code		Callng & Vtblty	Wind	Altimeter	Approach	Runway
												Departure		Destination								
												ATIS		ATIS								
												Gnd		Aph								
												Tower		Tower								
												Dep.		Gnd								
												CTAF		CTAF								
												FSS		FSS								
												UNICOM		UNICOM								
												Field Elev.		Field Elev.								
Totals												Block In		Log Time								
Block Out																						

Prepare on Navigation Log (In Jewel Box)

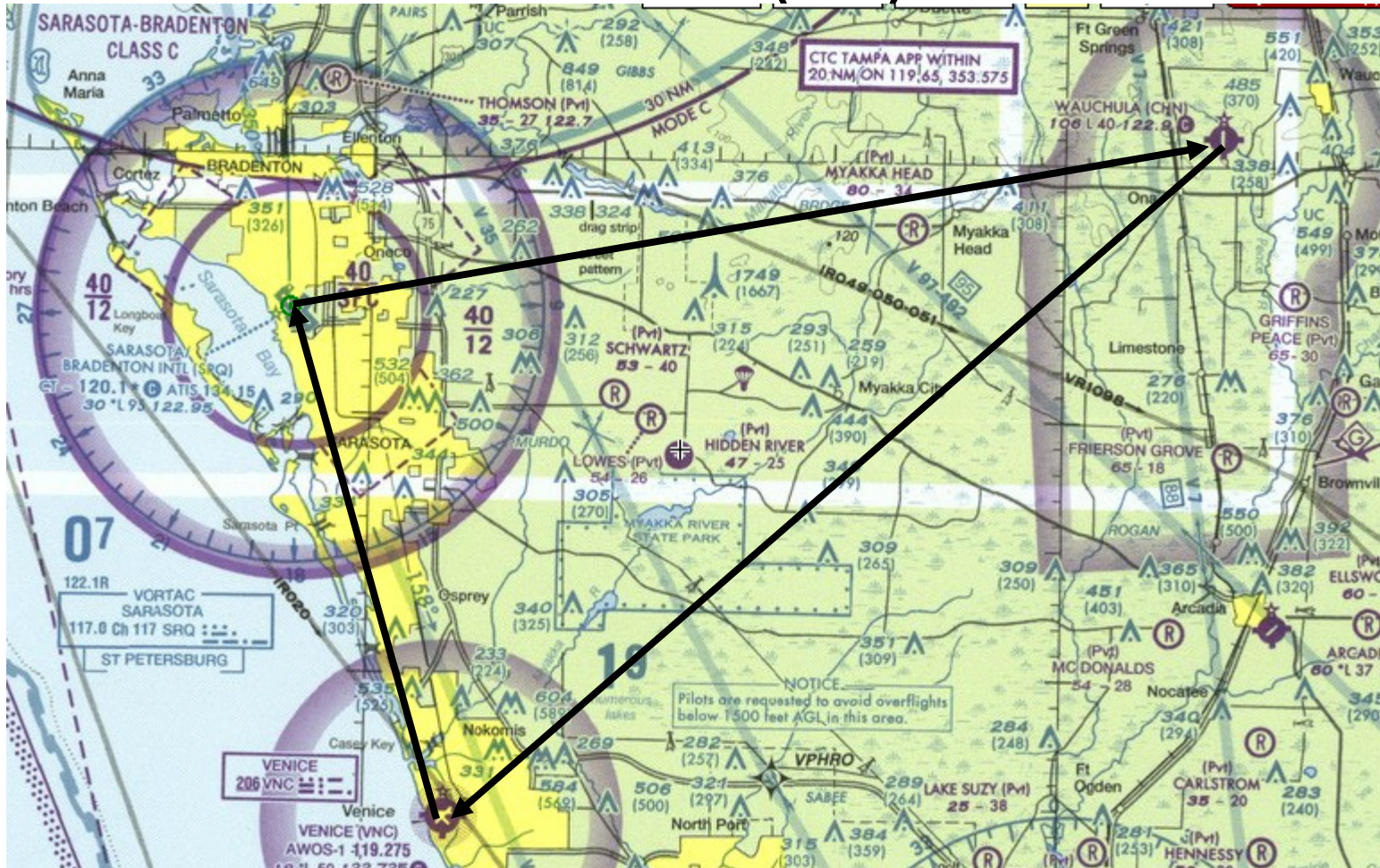
Check pt (fixes)	VOR Ident	Course (flow)	Altitude	WIND		CAS TAS	TC -L +R WCA	TH -E +W Var.	MH +/- Dev.	CH	Dist. Leg	GS Est.	Time Off		GPH Fuel Rem.
				Dir.	Vel.								ETE	ETA	
ZPH		↻ 15		from your FD	calc	1	3	5							
				forecast	TAS	2	4	6	7						
X39		↻ 16		from your FD	calc	8	10	12							
LAL				forecast	TAS	9	11	13	14	0					

Totals >	sum leg total	none	sum est time enroute	none	sum fuel
----------	---------------	------	----------------------	------	----------

- TC TO CH EXPLAINED (IT SIMPLY SHOWS THE MATH TO GET TO EACH VALUE**
- IN THIS BOX PUT THE TC between ZPH and X39
 - IN THIS BOX PUT THE WIND CORRECTION ANGLE between ZPH and X39
 - PUT TC-WCA = TH between ZPH and X39
 - PUT IN THE VARIANCE (+/- ISOGONAL LINE VARIANCE FROM SECTIONAL) between ZPH and X39
 - PUT TH-VAR = MH between ZPH and X39
 - PUT IN DEVIATION (BASED ON TC AND DEVIATION AS INDICATED ON MAG COMPASS between ZPH and X39
 - PUT IN CH WHICH IS THE MH(5) +/- DEV(6) between ZPH and X39
-
- IN THIS BOX PUT THE TC between X39 and LAL
 - IN THIS BOX PUT THE WIND CORRECTION ANGLE between X39 and LAL
 - PUT TC-WCA = TH ZPH and X39 between X39 and LAL
 - PUT IN THE VARIANCE (+/- ISOGONAL LINE VARIANCE FROM SECTIONAL) between X39 and LAL
 - PUT TH-VAR = MH between between X39 and LAL
 - PUT IN DEVIATION (BASED ON TC AND DEVIATION AS INDICATED ON MAG COMPASS between X39 and LAL
 - PUT IN CH WHICH IS THE MH(5) +/- DEV(6) between X39 and LAL

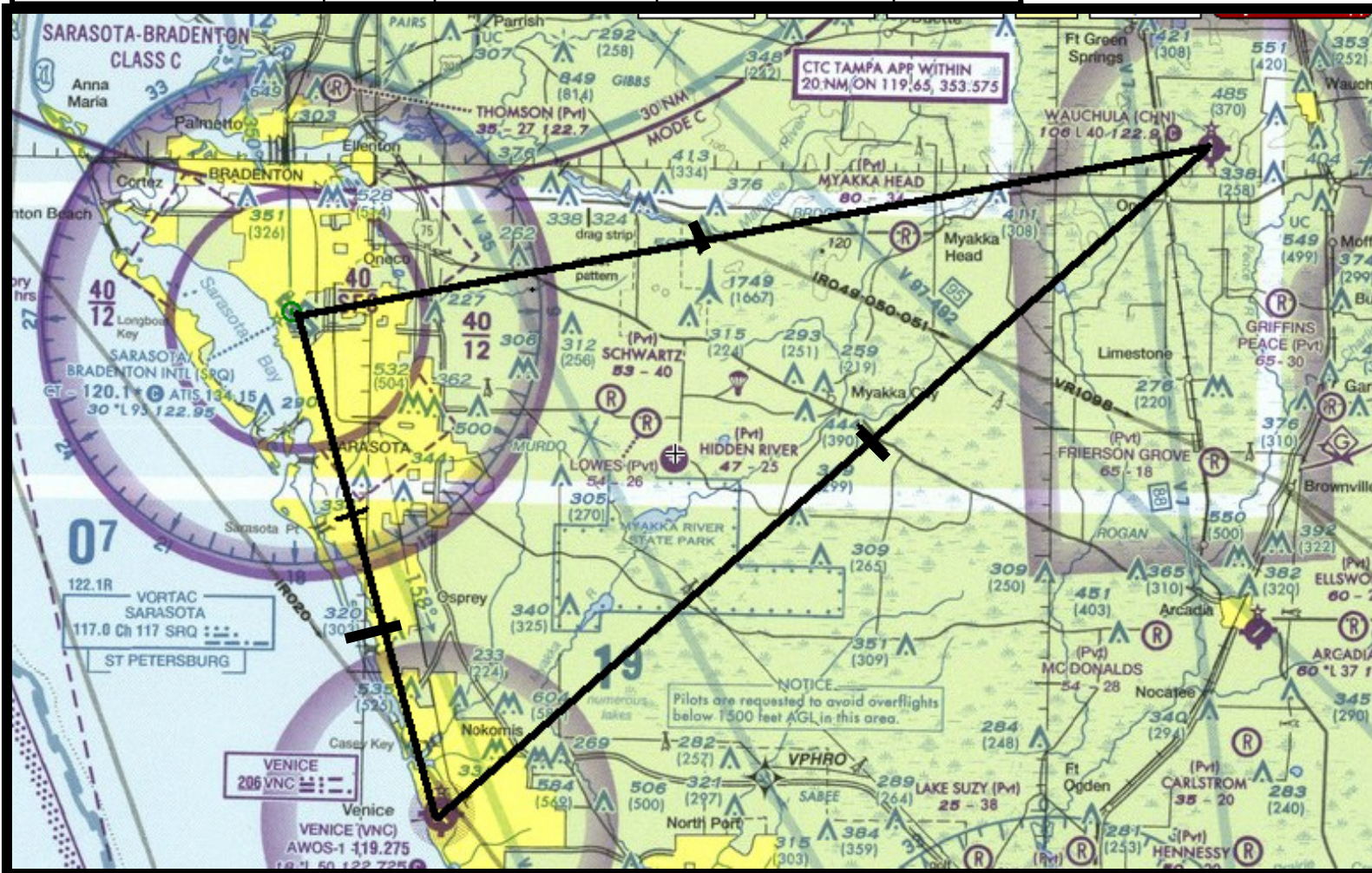
15 & 16 Use Direct symbol between way points. If flying victor airways, then use V-### to indicate route

CROSS COUNTRY (X/C) PLANNING



STUDENT EXERCISE. Determine the TC between Sarasota Bradenton(SRQ) and Wauchula (CHN)
Wauchula(CHN) and Venice(VNC)?
Venice(VNC) and Sarasota Bradenton(SRQ)?

LEG	TC	LEG DISTANCE	VARIATION (4W)	MC
KSRQ-KCHN	81	37	+4	85
KCHN-KVNC	230	40	+4	234
KVNC-KSRQ	343	20	+4	347



Need to use “waypoints” along route. Now figure distance by waypoints. Put the Airports, Waypoints on Nav Log

CROSS COUNTRY (X/C) PLANNING:NAV LOG TEMPLATE – Reusable for later X/C

NAVIGATION LOG																										
Aircraft Number	N525SL		Notes																							
Check Points (Fixed)	VOR		Altitude	Wind		CAS 120	TC	TH	MH	CH	Dist. Log	GS Est.	Time Off			Airport & ATIS Advisories										
	Ident	Course (Route)		Dir.	Vel.								Temp.	TAS	+L +R WCA	-E +W Var.	+ Dev.	Rem.	Act.	ETE	ETA	Fuel	Departure	Destination		
SRQ		D→					81				16						Departure	ATIS Code								
tower		D→					81	+4			21							Calling & Visibility								
CHN		D→					230	+4			17							Wind								
road		D→					230	+4			23							Altimeter								
VNC		D→					230	+4			7							Approach								
tower		D→					343	+4			13							Runway								
SRQ		D→					343	+4										Time Check								
																		Airport Frequencies								
																	Departure	Destination								
																	ATIS	ATIS								
																	Grid	Apch								
																	Tower	Tower								
																	Dep.	Grid								
																	CTAF	CTAF								
																	FSS	FSS								
																	UNICOM	UNICOM								
																	Field Elev.	Field Elev.								
																	Block In		Log Time							
																	Block Out									
Totals																97										

Flight Plan and Weather Log on Reverse Side

SCALE 1:500,000 SECTIONAL AERONAUTICAL CHARTS

CROSS COUNTRY (X/C) PLANNING

CALCULATION PHASE

Weather check 6 hours prior to flight. Get a “STANDARD BRIEFING.” You will get LOTS of information. If it still is feasible, safe and legal then proceed to prepare full cross country information. You want to fly between 3000-6000 MSL. What are the best (legal) altitudes?

Determine True Airspeed (TAS)

You know altitude you will fly (odd+500, even+500), IAS, wind and temperature aloft from weather briefing.

- Use EB6 “calculator side” to align temperature over altitude in the pressure altitude window.
- Find CAS on the “B” scale. TAS is directly above on the “A” scale. For each leg (until altitude again changes), Record _____ for each leg

Winds

Location	3000	6000
PIE	09010+30	11020+24

Pressure = 29.92 CAS=120

Leg	ALT	Wind Dir	VEL	TEMP	TAS
KSRQ-KCHN	3500	093	12	29	131
KCHN-KVNC	4500	107	18	25	133
KVNC-KSRQ	4500	107	18	25	133

CROSS COUNTRY (X/C) PLANNING

Determine Wind Correction Angle (WCA) and Ground Speed (GS)

- Use the “wind side” of the EB6. Rotate the azimuth so the true index is on the wind direction.
- Adjust the sliding grid so the grommet rests above an even number (i.e., 100)
- Using a pencil, mark an “X” at a point representing the number of knots wind speed above the grommet.
- Rotate the azimuth to the TC.
- Slide the penciled “X” to the TAS.
- Read the **WCA**. Subtract if to left, or add if to right. Record _____
- Ground speed** is that speed indicated below the grommet. Record _____

WCA – TAS & CONFIG PRIOR TO WIND CALS BELOW:

NAVIGATION LOG																								
Aircraft Number	525SL		Notes																					
Check Points (Fixes)	VOR		Altitude	Wind		CAS 120	TC	TH	MH	CH	Dist. Log	GS Est.	Time Off			BPH	Airport & ATIS Advisories							
	Ident	Course (Route)		Dir.	Vel.								TAS	+L +R WCA	-E +W Var.		+ Dev.	Rem.	Act.	ETE	ETA	Fuel	Departure	Destination
	Freq.			Temp.																			ATE	ATA
SRQ	D	→	3500	093	12	131	81				16							Departure	Destination					
				29			+1	+4										ATIS Code						
tower	D	→	3500	093	12	131	81				21							Callng & Visibility						
				29			+1	+4										Altimeter						
CHN	D	→	3500	093	12	131	81				21							Approach						
				29			+1	+4										Runway						
road	D	→	4500	107	18	133	230				17							Time Check						
				25			-7	+4																
VNC	D	→	4500	107	18	133	230				23							Airport Frequencies						
				25			-7	+4												Departure	Destination			
tower	D	→	4500	107	18	133	343				7							ATIS	ATIS					
				25			+6	+4												Grnd	Apch			
SRQ	D	→	4500	107	18	133	343				13							Tower	Tower					
				25			+6	+4												Dep.	Grnd			
																		CTAF	CTAF					
																		FSS	FSS					
																		UNICOM	UNICOM					
																		Field Elev.	Field Elev.					
Totals											97													

Flight Plan and Weather Log on Reverse Side

SCALE 1:500,000

SECTIONAL AERONAUTICAL CHARTS



CROSS COUNTRY (X/C) PLANNING

Determine **True Heading** (TH) by adjusting for WCA. **TC +/- WCA** Record _____

Determine **Magnetic Heading** (MH). **MH=TH +W/-E** Record _____

Determine **Compass Heading** (CH). The magnetic heading is adjusted on the deviation created by the aircraft. Adjust **the MH +/- Deviation = Compass Heading** Record _____

FINALLY: Determine **Time** and **Fuel** for each segment, leg of the flight.

TIME: Speed Index on GS on "A" scale, view distance on "A", and read time underneath on "B" (minutes) or "C" if greater than 1 hour. Record time enroute and time remaining. _____

FUEL: Speed Index on GPH on "A" scale, view time on "B", and read fuel used above on "A". Record fuel consumed and remaining _____

Complete the data: Use +2 on deviation, 6 gph to complete calculations

NAVIGATION LOG																			
Aircraft Number		525SL		Notes															
Check Points (Fixes)	VOR		Altitude	Wind		CAS 120	TC	TH	MH	CH	Dist. Log	GS Est.	Time Off			BPH	Airport & ATIS Advisories		
	Ident	Course (Route)		Dir.	Vel.								TAS	+L +R WCA	-E +W Var.		+ Dev.	Rem.	Act.
SRQ	D	3500	093	12		81	82	86	88	16	119								
			29	131	+1	+4	+2												
tower	D	3500	093	12		81	82	86	88	21	119								
			29	131	+1	+4	+2												
CHN	D	4500	107	18		230	223	227	229	17	142								
			25	133	-7	+4	+2												
road	D	4500	107	18		230	223	227	229	23	142								
			25	133	-7	+4	+2												
VNC	D	4500	107	18		343	349	353	355	7	142								
			25	133	+6	+4	+2												
tower	D	4500	107	18		343	349	353	355	13	142								
			25	133	+6	+4	+2												
CHN	D	4500	107	18		343	349	353	355	13	142								
			25	133	+6	+4	+2												
Totals										97									

Flight Plan and Weather Log on Reverse Side

SCALE 1:500,000

SECTIONAL AERONAUTICAL CHARTS

CROSS COUNTRY (X/C) PLANNING

From FSS briefing

Distances
Leg Remaining

Check Points (Fixes)	VOR		Altitude	Wind		CAS	TC	TH	MH	CH	Dist. Leg	GS Est.	Time Off		GPH
	Ident	Course		Dir.	Vel.								-L +R	-E +W	
	Freq.	(Route)	Temp.	TAS	-L +R WCA	-E +W Var.	Dev.	Act.	ATE	ATA	Fuel Rem.				
ZPH															
X39															

TAS changes with change
In altitude and/or temperature

TC WCA TH VAR MH DEV CH TIME Enroute

FUEL Used Remaining

Estimate Actual
TIME Enroute

ONE LAST CONSIDERATION BEFORE YOU GET IT ALL CORRECT.
RUNUP-TAXI-CLIMBOUT CONSIDERATIONS.

Complete the data: Use +2 on deviation

NAVIGATION LOG																			
Aircraft Number		525SL		Notes															
Check Points (Fixed)	VOR		Altitude	Wind		CAS 120	TC	TH	MH	CH	Dist. Log	GS Est.	Time Off			BPH	Airport & ATIS Advisories		
	Ident	Course (Route)		Dir.	Vel.								Temp.	TAS	+L +R WCA		-E +W Var.	+ Dev.	Rem.
SRQ	D	3500	093	12			81	82	86		16	119	8:04		.8				
			29	131	+1	+4	+2	88											
tower	D	3500	093	12			81	82	86		21	119	10:35		1.1				
			29	131	+1	+4	+2	88											
CHN	D	4500	107	18			230	223	227		17	142	7:11		.7				
			25	133	-7	+4	+2	229											
road	D	4500	107	18			230	223	227		23	142	9:43		1.0				
			25	133	-7	+4	+2	229											
VNC	D	4500	107	18			343	349	353		7	142	2:57		.3				
			25	133	+6	+4	+2	355											
tower	D	4500	107	18			343	349	353		13	142	5:30		.6				
			25	133	+6	+4	+2	355											
SRQ	D																		
Totals										97		44:00		4.4					

Flight Plan and Weather Log on Reverse Side

SCALE 1:500,000 SECTIONAL AERONAUTICAL CHARTS

CROSS COUNTRY (X/C) PLANNING

PROCESS SIMPLIFIED

- **TAS (Temp over Alt in Pressure Window) IAS on “B”, TAS on “A”**
- **WCA (Set Wind on Index, mark velocity, rotate to TC, read WCA (-left, +right))**
- **GS (Move slider so mark on TAS. GS under grommet)**
- **TH = TC +/- WCA**
- **MH = TH +W/-E variance**
- **CH = MH +/- Aircraft Deviation**

T (TH = TC +/- WCA)

V get magnetic variance

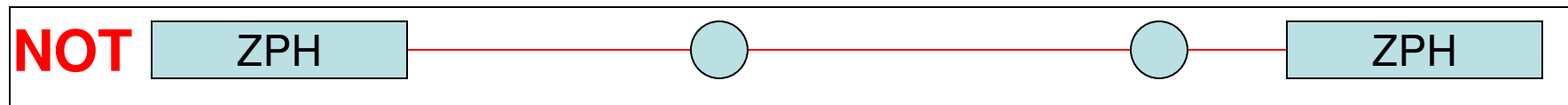
M (MH = TH +/- V)

D get deviation from compass card (or POH)

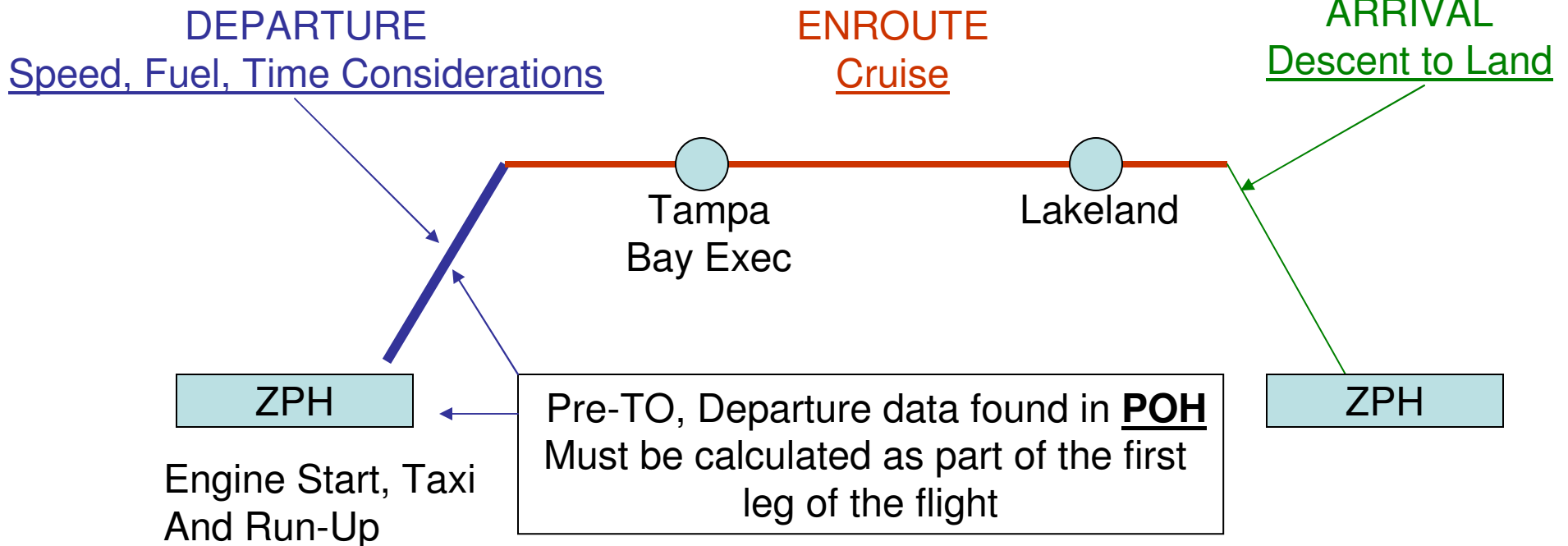
C (CH = MH +/- D)

CROSS COUNTRY (X/C) PLANNING

So far we have been learning how to compute X/C on the ENROUTE portion of flight without consideration of either PRE-TAKEOFF, DEPARTURE OR ARRIVAL.



IT IS DEPARTURE, ENROUTE, ARRIVAL



CROSS COUNTRY (X/C) PLANNING

TIME, FUEL, AND DISTANCE TO CLIMB

MAXIMUM RATE OF CLIMB

CONDITIONS:
 Flaps Up
 Full Throttle
 Standard Temperature

- NOTES:
1. Add 1.1 gallons of fuel for engine start, taxi and takeoff allowance.
 2. Mixture leaned above 3000 feet for maximum RPM.
 3. Increase time, fuel and distance by 10% for each 10°C above standard temperature.
 4. Distances shown are based on zero wind.

Cessna 172N POH INFO
 Specified to ADD 1.1 Gals for engine start, taxi, & TO THIS MUST BE ADDED TO FUEL REQUIRED ON 1ST LEG OF FLIGHT.

WEIGHT LBS	PRESSURE ALTITUDE FT	TEMP °C	CLIMB SPEED KIAS	RATE OF CLIMB FPM	FROM SEA LEVEL		
					TIME MIN	FUEL USED GALLONS	DISTANCE NM
2300	S.L.	15	73	770	0	0.0	0
	1000	13	73	725	1	0.3	2
	2000	11	72	675	3	0.6	3
	3000	9	72	630	4	0.9	5
	4000	7	71	580	6	1.2	8
	5000	5	71	535	8	1.6	10
	6000	3	70	485	10	1.9	12
	7000	1	69	440	12	2.3	15
	8000	-1	69	390	15	2.7	19
	9000	-3	68	345	17	3.2	22
	10,000	-5	68	295	21	3.7	27
	11,000	-7	67	250	24	4.2	32
	12,000	-9	67	200	29	4.9	38

STANDARD DAY
IAS
TIME TO CLIMB
FUEL USED
DISTANCE

DEPARTURE
 COMPUTE
 SEPARATELY
 AND REDUCE
 FROM
 REMAINDER
 OF LEG

CROSS COUNTRY (X/C) PLANNING

DEPART ZPH (ELEVATION=92), CLIMB TO 3,000 MSL, WIND 300@ 20KT

1. TIME, DISTANCE, SPEED (POH [STD DAY]) FOR DEPARTURE FROM ZPH-3000

WEIGHT LBS	PRESSURE ALTITUDE FT	TEMP °C	CLIMB SPEED KIAS	RATE OF CLIMB FPM	FROM SEA LEVEL		
					TIME MIN	FUEL USED GALLONS	DISTANCE NM
2300	S.L.	15	73	770	0	0.0	0
	1000	13	73	725	1	0.3	2
	2000	11	72	675	3	0.6	3
	3000	9	72	630	4	0.9	5

4 MINS
5 NM
72 KTS
0.9 GALS

WHAT WILL YOUR GROUND SPEED BE (NOT 72 BECAUSE OF WINDS)?

GIVEN GROUND SPEED AND TIME, WHAT IS THE DISTANCE BE (5NM)?

2. REVISE FIRST LEG INCLUDING DEPARTURE AND CRUISE TO X39

ZPH

CRUISE CHKPT (SOME PILOTS MAKE THIS THE 1st CHKPT (2nd tower)

X39 OTHERWISE INCLUDE DEPARTURE IN 1ST LEG)

...

...

CROSS COUNTRY (X/C) PLANNING

ENROUTE

CRUISE PERFORMANCE

WE WILL CRUISE 3000 FT WITH 2300 RPM, STD TEMP: **SPEED 105, 6.55 GPH**

CONDITIONS:
2300 Pounds
Recommended Lean Mixture

PRESSURE ALTITUDE FT	RPM	20°C BELOW STANDARD TEMP			STANDARD TEMPERATURE			20°C ABOVE STANDARD TEMPR		
		% BHP	KTAS	GPH	% BHP	KTAS	GPH	% BHP	KTAS	GPH
		A	B	C						
2000	2500	---	---	---	75	116	8.4	71	115	7.9
	2400	72	111	8.0	67	111	7.5	63	110	7.1
	2300	64	106	7.1	60	105	6.7	56	105	6.3
	2200	56	101	6.3	53	100	6.1	50	99	5.8
	2100	50	95	5.8	47	94	5.6	45	93	5.4
4000	2550	---	---	---	75	118	8.4	71	118	7.9
	2500	76	116	8.5	71	115	8.0	67	115	7.5
	2400	68	111	7.6	64	110	7.1	60	109	6.7
	2300	60	106	6.8	57	105	6.4	54	104	6.1
	2200	54	100	6.1	51	99	5.8	48	98	5.7
2100	48	94	5.6	46	93	5.5	44	92	5.3	
6000	2600	---	---	---	75	120	8.4	71	120	7.9
	2500	72	116	8.1	67	115	7.6	64	114	7.1
	2400	64	110	7.2	60	109	6.8	57	109	6.4
	2300	57	106	6.5	54	104	6.2	52	103	5.9
	2200	51	99	5.9	49	98	5.7	47	97	5.5
2100	46	93	5.5	44	92	5.4	42	91	5.2	
8000	2850	---	---	---	75	122	8.4	71	122	7.9
	2600	76	120	8.6	71	120	8.0	67	119	7.5
	2500	68	115	7.7	64	114	7.2	60	113	6.8
	2400	61	110	6.9	58	109	6.5	55	108	6.2
	2300	55	104	6.2	52	103	6.0	50	102	5.8
2200	49	98	5.7	47	97	5.5	45	96	5.4	
10,000	2650	76	122	8.5	71	122	8.0	67	121	7.5
	2600	72	120	8.1	68	119	7.6	64	118	7.1
	2500	65	114	7.3	61	114	6.8	58	112	6.5
	2400	58	109	6.5	55	108	6.2	52	107	6.0
	2300	52	103	6.0	50	102	5.8	48	101	5.6
2200	47	97	5.6	45	96	5.4	44	95	5.3	
12,000	2600	68	119	7.7	64	118	7.2	61	117	6.8
	2500	62	114	6.9	58	113	6.5	55	111	6.2
	2400	56	108	6.3	53	107	6.0	51	106	5.8
	2300	50	102	5.8	48	101	5.6	46	100	5.5
	2200	46	96	5.5	44	95	5.4	43	94	5.3

NEED TO USE POH TO DETERMINE
X. SPEED (TAS) GS WILL DIFFER
Y. FUEL RATE (GPH)

BASED ON
A. PRESSURE ALTITUDE
B. CRUISE RPM
C. TEMPERATURE

INTERPOLATION IS LIKELY
REQUIRED TO DETERMINE
AIRSPEED AND FUEL RATE

CROSS COUNTRY (X/C) PLANNING

ARRIVAL SEGMENT

MINIMAL IMPACT (**AIRSPACE D, E, G**) IN THAT MOST PILOTS REDUCE DESCEND MAINTAINING SAME AIRSPEED WITH SAME OR LESS FUEL CONSUMPTION; THEREFORE TREAT AS YOU DID WITH CRUISE COMPONENT.

IF YOU ARE IN CONTROLLED AIRSPACE WITH APPROACH CONTROL, EXPECT VECTORS AND COURSE CHANGES IN THE ARRIVAL SEGMENT OF THE FLIGHT.

IN **AIRSPACE C & B**, SOME PILOTS WILL ADD 5 MINUTES TO ADJUST FOR EXPECTED VECTORING BEFORE LANDING.

Homework Quiz: Prep NavLog for flight from KTPA-KSEF

Critical Numbers

Cruise Altitude=5,500 MSL, Cruise CAS=120 Kts, Climb GS = 70 Kts,
Fuel 24G, Fuel Flow-Climb =8 GPH, Fuel Flow-Cruise =6 GPH,
Deviation= +3, Variation=+4, Winds Aloft at 3000=33010+20,
Winds Aloft at 6000=35020+10. Taxi/TO requires 2 Gals of fuel,
Climb at TAS 70 will take 8 minutes and yield average of 700 fpm.

Set up Navigation Log to include point of transition from climb to cruise.
Note altitude limits on MOA.

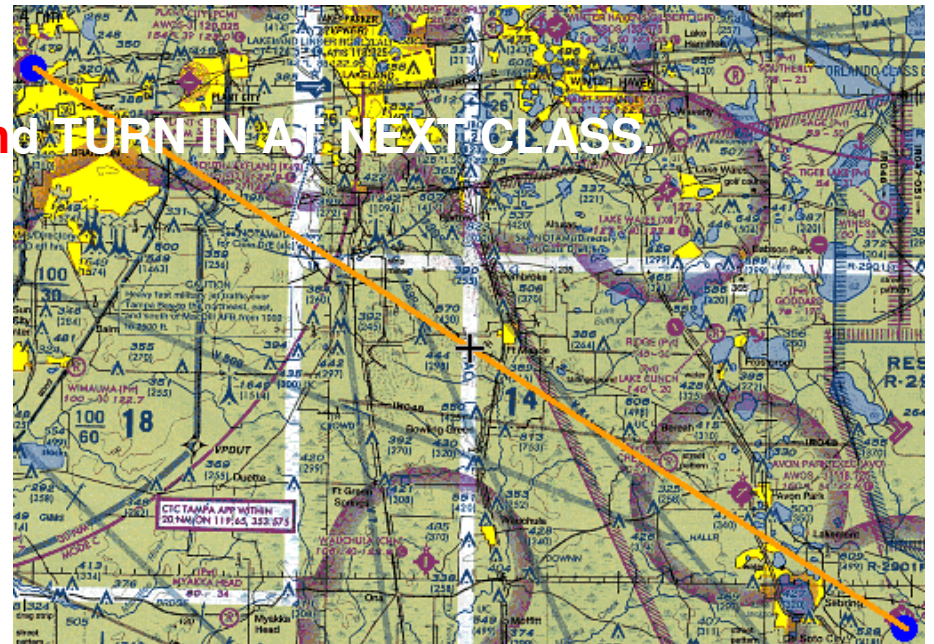
KVDF

You pick 2 waypoint beyond transition from climb to cruise

KSEF

Show all information on Navigation Log and TURN IN AT NEXT CLASS.

SEE HANDOUT INFO SHEET



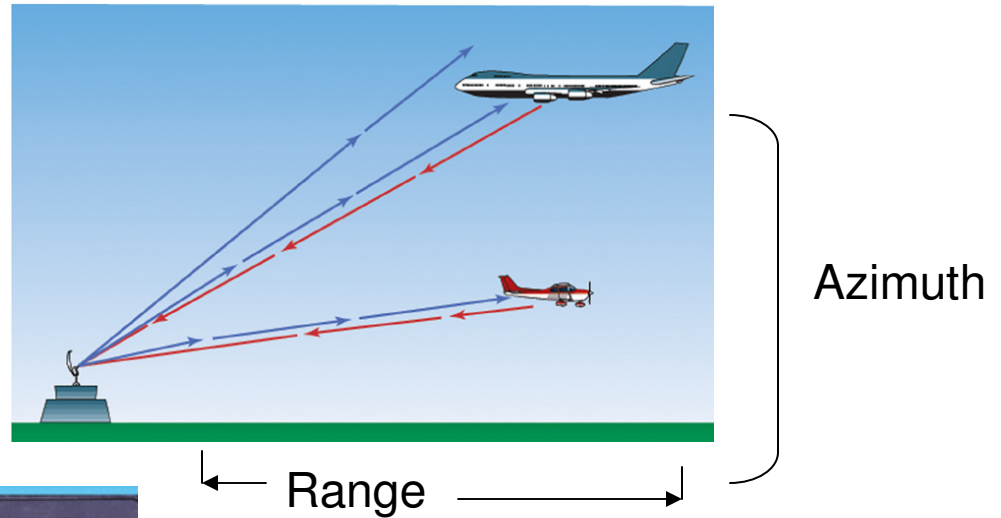
CROSS COUNTRY COMMUNICATIONS AND FLIGHT INFORMATION

QUESTIONS?

ENROUTE ON YOUR CROSS COUNTRY YOU NEED TO KNOW ABOUT RADAR SERVICES, FSS, AND COMMUNICATIONS.

COMMUNICATIONS AND FLIGHT INFORMATION RADAR AND ATC SERVICES

RADAR (Radio detection and ranging) PRIMARY



The coded signal transmitted by the interrogator causes the aircraft transponder to reply automatically with a specific coded signal, independent of, and much stronger than, a primary radar return.

Interrogator Signal

Transponder Reply

Transponder replies are combined with primary returns and both are displayed on the same radarscope.

A diagram of a secondary radar system. A ground station on the left sends a blue 'Interrogator Signal' to an aircraft. The aircraft sends a red 'Transponder Reply' back. The diagram includes a photo of a radar control room with an operator and a close-up of a transponder control panel with buttons for 'REPLY', 'ALT', 'ON SVY', 'OFF', 'TEST', 'ID', '0', '4', '0', '0', 'RT 3004', and '300 XPR'. A photo of a radar antenna tower is also shown.

Air Traffic Control Radar Beacon System (ATCRBS)
Secondary overcomes limitation of primary. When used with transponder (interrogator) it is very solid.

COMMUNICATIONS AND FLIGHT INFORMATION RADAR AND ATC SERVICES

TRANSPONDER



SQUAWK (DIAL 4-DIGIT CODE)

SQUAWK STANDBY – go to standby mode.

STOP ALTITUDE SQUAWK – Move control OFF MODE C usually to MODE A

SQUAWK ALTITUDE – Move control from MODE A to MODE C to report altitude.

IDENT – Press the IDENT button on the transponder to make your squawk stand out from all other squawks currently being viewed the ATC controller.

SQUAWK (4-digit number) and IDENT – set the 4-digit code into the transponder and press IDENT.

SQUAWK LOW/NORMAL – Operate your transponder on LOW or NORMAL as requested. Transponders operated in NORMAL position unless ATC specifies LOW. (Some transponders don't have a "Normal" label but "ON" is the same as NORMAL for those aircraft)

STOP SQUAWK – Turn your transponder OFF.

SQUAWK MAYDAY on 7700: If you have an EMERGENCY, enter 7700 into the transponder. That sets off an alarm at ATC and they will respond accordingly.

SQUAWK VFR – Set code to 1200 if instructed. Normal we always set when flying VFR from an uncontrolled airfield.

SPECIAL CODES:

CODE 7500 IS RESERVED AS HIJACK NOTIFICATION.

CODE 7600 IS RESERVED AS FAILURE OF 2-WAY COMMUNICATION NOTIFICATION.

CODE 7700 IS RESERVED AS EMERGENCY NOTIFICATION.

BE CAREFUL IN CHANGING FREQUENCIES NOT TO ACCIDENTLY ROTATE THRU ONE OF THE RESERVED FREQUENCIES.

COMMUNICATIONS AND FLIGHT INFORMATION RADAR SERVICES

FAA SERVICES

AIRPORTS – ASR, TRACON, ARTS
AIR ROUTE – ARSR, ARTCCs

VFR RADAR SERVICES

FLIGHT FOLLOWING (“Radar Traffic Information Services”)
SAFETY ALERTS: terrain, obstruction, aircraft proximity alerts

TERMINAL VFR RADAR SERVICE:

BASIC – Safety, Alerts, and some vectoring
TRSA - Basic + Sequencing (IFR) and Separation (IFR/VFR)
CLASS C – Basic + sequencing + separation
CLASS B – Basic + sequencing + separation based on weight.

COMMUNICATIONS AND FLIGHT INFORMATION

Following the airport name and ATIS phonetic letter identifier, the broadcast states the time of the current weather report,

*Centennial Airport Information Uniform,
1145 Zulu weather,*

magnetic wind direction and velocity,

wind 330 at 11,

visibility, obstructions to visibility, and ceiling/sky condition,

visibility 30, 8,000 broken,

temperature and dewpoint (if available),

*temperature 21 check density altitude,
dewpoint 10,*

and altimeter setting.

altimeter 30.22.

Next, the instrument approach and runways in use are indicated.

*Visual approach in use landing and
departing Runways 35 Right and Left.
Departing Runway 10, landing Runway 28.*

The ATIS broadcast also contains any other pertinent remarks relating to operations on or near the airport, such as closed runways or temporary obstructions.

*Notices to Airmen, Runway 28 REILs out
of service. Advise ground control direction
of flight. The following special procedures
are in effect; advise ground control when
ready for departure with departure intersection.
Arrivals use caution, simultaneous operations
in progress on parallel runways.*

The phonetic letter identifier is restated at the end of the broadcast.

*Advise on initial contact you have
Information Uniform.*

COMMUNICATIONS AND FLIGHT INFORMATION

FLIGHT SERVICE STATION

BRIEFING: Contact for Briefings (1 800 WX BRIEF)

FLIGHT PLANS: Filing of V/IFR Flight Plans

CONTACT: Airborne contacts for weather and airport advisories

VHF/DF FINDING: Enroute assistance if you get lost (radio triangulation)

SEARCH AND RESCUE: Alerted by FSS when you have not reported (CLOSED YOUR FLIGHT PLAN) within 30 minutes of ETA.

Most now work using automation. Ten years ago there were 1,200 FSS facilities nationwide but due to privatization, Honeywell, that was reduced to 13 by 2009, and after February 2011 there will only be 7 FSS facilities that pilots can use for pilot briefings and contact.

AFSS: Use these shortcuts in place of voice recognition when calling 800-WX-BRIEF

- Press 1 to speak to a Briefer; enter state code (see below).
- Press 2 to issue, cancel, or amend Notams (authorized persons only).
- Press 3 to listen to TIBS (transcribed information briefing service); enter state code.
- Press 4 to record a Fast File Flight Plan.
- Press 5 to hear Special Announcements.

Additional telephone numbers:

- Clearance Delivery: 888-766-8267
- TIBS direct line: 877-4-TIBS-WX (877-484-2799); enter state code

Alabama	AL or 25	Nebraska.....	NE or 63
Alaska.....	AK or 25	Nevada	NV or 68
Arizona	AZ or 29	New Hampshire	NH or 64
Arkansas.....	AR or 27	New Jersey.....	NJ or 65
California.....	CA or 22	New Mexico	NM or 66
Colorado	CO or 26	New York.....	NY or 69
Connecticut.....	CT or 28	North Carolina.....	NC or 62
Delaware	DE or 33	North Dakota	ND or 63
District of Columbia.....	DC or 32	Ohio	OH or 64
Florida	FL or 35	Oklahoma	OK or 65
Georgia	GA or 42	Oregon	OR or 67
Hawaii	HI or 44	Pennsylvania	PA or 72
Idaho	ID or 43	Puerto Rico	PR or 77
Illinois.....	IL or 45	Rhode Island	RI or 74
Indiana	IN or 46	South Carolina.....	SC or 72
Iowa.....	IA or 42	South Dakota	SD or 73
Kansas	KS or 57	Tennessee	TN or 86
Kentucky.....	KY or 59	Texas.....	TX or 89
Louisiana	LA or 52	Utah	UT or 88
Maine	ME or 63	Vermont.....	VT or 88
Maryland	MD or 63	Virgin Islands	VI or 84
Massachusetts	MA or 62	Virginia	VA or 82
Michigan	MI or 64	Washington.....	WA or 92
Minnesota	MN or 66	West Virginia	WV or 98
Mississippi	MS or 67	Wisconsin	WI or 94
Missouri	MO or 66	Wyoming	WY or 99
Montana	MT or 68		



COMMUNICATIONS AND FLIGHT INFORMATION

VHF COMMUNICATIONS IS LIMITED TO “LINE OF SIGHT”

Altitude	NM Range of VHF
1000	39
1500	48
2000	55
3000	69
5000	87
10000	122
15000	152
20000	174

SPEAK ZULU

TIME CONVERSION TABLE	
To Convert From	To UTC (Zulu)
Eastern Standard Time	Add 5 hours
Central Standard Time	Add 6 hours
Mountain Standard Time	Add 7 hours
Pacific Standard Time	Add 8 hours
For DAYLIGHT TIME, SUBTRACT 1 HOUR FROM CONVERSION TIME	

COMMUNICATIONS AND FLIGHT INFORMATION

ALWAYS LISTEN BEFORE HITTING TRANSMIT SO YOU DO NOT "WALK-ON" OTHERS

MOST ALL COMMUNICATIONS HAS 3 PIECES OF INFORMATION

WHO (YOU ARE CALLING AND WHO YOU ARE)

WHERE AND HOW HIGH (IF ALOFT)

WHAT IS YOUR REQUEST OR INTENTION

EXAMPLES

Approaching Zephyrhills..

Zephyrhills Traffic, this is Cessna N735NC...

10 miles west

Inbound for landing, full stop, runway 04

If busy You WAIT for acknowledgement before giving all details.

Tampa approach, Cessna N736NC, over

Tampa...Go ahead 376NC

Cessna N735NC,

Departed Zephyrhills VFR climbing thru 1500

Request vectors thru "Bravo" to Clearwater Airport

Tip on Communicating with a Busy Tower

Say “Request” to Tower

When contacting the tower, state your N number, as you would on any inbound flight, and then add one word: “**Request.**” Now you have the tower’s attention, and you have let the controller know that something’s on your mind. Having heard that one key word, *the controller can decide whether to solicit your request immediately or deal with other chores first.*

What should you expect to hear?

The response will be ‘**Stand by**’ or ‘**Say request.**’ Your prime objective is to fly the airplane, while the controller’s task is to separate traffic. Help them to do their job by being professional on the radio.

VFR Communications Kit

Review CD-Jewels “VFR
Communications Kit”

Communications
phraseology for both
uncontrolled and
controlled airspace.



COMMUNICATIONS AND FLIGHT INFORMATION

Uncontrolled Airport Communications

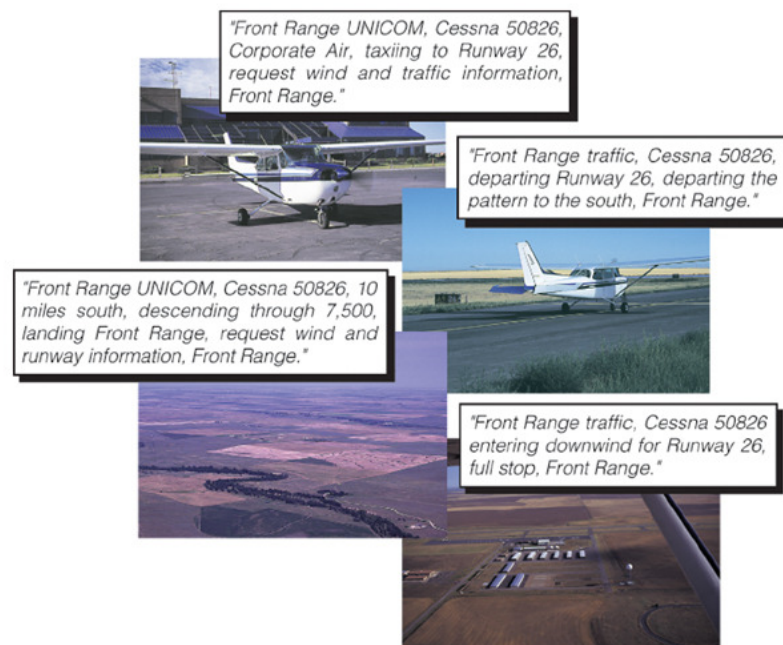
CTAF – Common Traffic Advisory Frequency IN AF/D “(Airport Name) Traffic....”

MULTICOM: Can perform same function if non-published CTAF frequency on 122.9

UNICOM: Privately owned air/ground comm. Will sometimes provide “Airport Advisories” and provide services (phone, taxi, fuel, etc.)

GCO – Ground communication outlet (AF/D) allows VHF-to-telephone link to ATC (FSS). See next slide

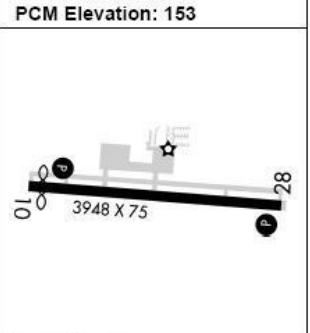

Facility at Airport	Frequency to Use
UNICOM (No Tower or FSS)	Communicate with UNICOM station on published CTAF; 122.7, 122.725, 122.8, 122.975, or 123.0.
No Tower in Operation, FSS Open	Communicate with FSS on CTAF.
No Tower, FSS, or UNICOM	Self-announce on MULTI-COM frequency 122.9.
Tower or FSS Not in Operation	Self-announce on CTAF.



Ground Communication Outlet

A ground communication outlet is an automatic, remotely controlled, ground to ground communications device. Pilots at non-tower airports may contact the local Air Traffic Control (ATC) facility and / or Flight Service Station (FSS) by aircraft radio-to-telephone connection located on the airport. The telephone call goes to the appropriate FSS or sector ATC controller. Pilots may receive an instrument clearance, close a VFR or IFR flight plan, get an updated weather briefing prior to take off, or any other FSS or ATC services.

Use the listed frequency for the airport (121.725 or 135.075). Activate the system with four “key clicks” on the VHF radio to contact the appropriate ATC facility or six “key strokes” to contact the FSS. There is timer on the modem connection. If no voice is heard for a preset time period, the system will disconnect. Note that the VHF transceiver on the airport is very low power, 2 - 5 watts. You may not be able to establish contact when between hanger rows or near other obstructions. Additionally, you may need to reposition your aircraft slightly when stopped on the taxiway. The GCO system is intended to be used only on the ground. Airports with GCO are noted in the text portion of the airport diagram

PCM		Plant City PLANT CITY, FL		
2.0 mi. SW of city. N28-00.01 W082-09.80 Mag Var: 2 deg W				
Nav aids:				
Type:	ID:	Freq:	Radial:	Distance:
VOR	LAL	116.0	275	8
NDB	PCM	346	000	0
Approach Freqs:				
Tampa 119.9		Tampa 120.65		
WX Contacts:				
AWOS 120.025 813-764-8259;				
Traffic Patterns:				
Light Aircraft 1153 MSL; Turbine Aircraft 1653 MSL;				
Runways:				
10-28; 3948X75; asphalt in good condition; DUSK-DAWN; road ry 10 281 ft. from runway, trees ry 28 569 ft. from runway.				
Noise Abatement:				
Depart ry 10, rmn on N of extended cntrln; no turn blw 500' AMSL, unless for safety or directed by ATC				
Communication Freqs:				PCM Elevation: 153
Unicom 123.05 <u>GCO 121.725</u>				
CTAF 123.05				
FSS SAINT PETERS 122.1 R 122.2				
Lights: SS to SR 123.0				
Low - 3 clicks in 5 secs.				
Med - 5 clicks in 5 secs.				
Hi - 7 clicks in 5 secs.				
Beacon: and low light				
 AOPA's Airport Directory Generated 02/16/2010 at http://www.aopa.org/members/airports/ Copyright 2003 Aircraft Owners and Pilots Association				

DVD-VR COMMUNICATIONS

COMMUNICATIONS AND FLIGHT INFORMATION

Controlled Airport Communications

Air Traffic Control (ATC) clearances and instructions: They rule the roost, BUT you are pilot in control and have the final say and total responsibility.

DEPARTURE PROCEDURES

ATIS – Get traffic, weather and expected departure/arrival procedures before contacting **DEPARTURE CONTROL**

DELIVERY CLEARANCE – If it exists at that airport – **USE IT** prior to contact of Ground Control (reduces workload for controllers).

GROUND CONTROL – Command every movement on the ground on all areas except active runways (other than crossing).

CONTROL TOWER – Command every movement entering, on and exiting the active runway, and aircraft movements immediately after liftoff.

DEPARTURE CONTROL – Command every movement after release from the control tower.

ARRIVAL PROCEDURES

ATIS → APPROACH CONTROL → CONTROL TOWER → GROUND CONTROL

APPROACH CONTROL – Commands every movement from entry to hand off to Control Tower. **EXPECT VECTORS ESPECIALLY IN “BRAVO”**

Departure Procedures

P	R	O	C	F	E	D
Plan	Radios	Organize	Clearance	Exercise Caution	Expedite	Depart
Plan your route. Get a preflight weather briefing. Consider filing a VFR flight plan.	Tune before taxiing or at the runup pad— <i>not</i> while taxiing or in the terminal area.	Have charts and notes handy for ready reference. Minimize cockpit distractions.	Get ATIS, AWOS, or ASOS before calling clearance or ground control. Read back all clearances.	Heed all taxiway and runway hold markings. Be extra careful at night or in low visibility.	When cleared to cross an active runway, or for takeoff, scan the area and comply quickly or notify ATC of the delay.	Scan the final approach area as you taxi into position for takeoff.

Arrival Procedures

A	R	R	I	V	A	L
ATIS	Review	Radios	Inbound	Visual Check	Arrival	Landing
Before calling approach or tower controllers, check ATIS, AWOS, or ASOS.	Study the airport diagram, anticipate the active runway, and visualize your taxi route.	Preset the tower and ground frequencies.	Turn on lights when 5-10 miles out. Begin the before-landing checklist.	Look for traffic when approaching the airport. Be accurate in your position reports.	Complete the before-landing checklist. Follow tower's instructions for landing.	Clear the runway ASAP. Don't switch to ground control until instructed.

COMMUNICATIONS AND FLIGHT INFORMATION

If you are unable to contact ATC:

- Ensure that you are using the correct frequency. Try a different frequency for the ATC facility, if available.
- Check the volume and squelch on your transceiver.



- Check the switch position on your audio control panel.



- Verify that your mike is properly plugged into the jack. If you are wearing headsets, ensure that both the speaker and mike plugs are in the jacks all the way.



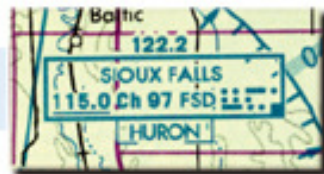
- Try the hand held mike if you are using headsets.



- If your aircraft is equipped with more than one radio, try the alternate transceiver.



- If it is within range, call the last ATC facility with which you had contact to request assistance.



If after taking these steps, you still are unable to contact ATC, follow the lost communication procedures.

LOST COMMUNICATIONS PROCEDURE

You may still land in airspace D if radio failure by tuning Transponder To 7600, follow the pattern, keep visual contact with tower to receive light signals and acknowledge by rocking your wings (daytime) or blinking landing lights (night).



COLOR AND TYPE OF SIGNAL	MEANING	
	On the Ground	In Flight
Steady Green	Cleared for takeoff	Cleared to land
Flashing Green	Cleared to taxi	Return for landing (to be followed by steady green at proper time)
Steady Red	Stop	Give way to other aircraft and continue circling
Flashing Red	Taxi clear of landing area (runway) in use	Airport unsafe — do not land
Flashing White	Return to starting point on airport	(No assigned meaning)
Alternating Red and Green	Exercise extreme caution	Exercise extreme caution

COMMUNICATIONS AND FLIGHT INFORMATION

EMERGENCY COMMUNICATIONS

DON'T HESITATE FOR THE CONCERN TO BECOME URGENT – LET PEOPLE

KNOW IF SOMETHING IS NOT RIGHT. CONTACT **121.5** AND ADVISE.

NEAR EMERGENCY (“PAN-PAN-PAN”)

EMERGENCY (“MAYDAY-MAYDAY-MAYDAY”) TRANSPONDER TO 7700

DISTRESS or URGENCY	“MAYDAY-MAYDAY-MAYDAY or “PAN-PAN-PAN”
NAME OF STATION ADDRESSED	“TAMPA RADIO”
IDENTIFICATION/TYPE OF AIRCRAFT	“5674R Cessna 172,”
NATURE OF DISTRESS OR URGENCY	“trapped above overcast”
WEATHER	“marginal VFR”
YOUR INTENTIONS AND REQUEST	“request radar vectors to nearest VFR airport”
PRESENT POSITION AND HEADING	“Lakeland VOR, heading 253 degrees”
ALTITUDE	“6,500”
FUEL REMAINING IN HRS & MINS	“Estimated 30 minutes fuel remaining”
NUMBER OF PERSONS ONBOARD	“three persons onboard”
ANY OTHER USEFUL INFORMATION	“squawking 7700”

COMMUNICATIONS AND FLIGHT INFORMATION

IN TROUBLE, REMEMBER THE FIVE “C”s

CLIMB

COMMUNICATE

CONFESS

COMPLY

CONSERVE

EMERGENCY LANDINGS – FLIGHT INSTRUCTORS TO SHOW AND PRACTICE APPROPRIATE PROCEDURES.

ELT (Emergency Locator Transmitter) G’s or Manual Trigger to provide search and rescue rapid location by transmitting audio Tones on 121.5(VHF) and 243.0(UHF). Capable of continuous TX For approximately 48 hours. Some even equipped with microphones.

COMMUNICATIONS AND FLIGHT INFORMATION

Helpful Hints

LISTEN to others: Get an aircraft scanner and listen to communications better understand phraseology for different situations. Your flight instructor will tell you most you need, but listen and learn from others.

USE HEADPHONES: Cuts ambient noise, keeps your voice and inflection appropriate (not screaming over the engine noise).

THINK AHEAD: Know what you are going to say before you do it.... Stops “Ums” “Ehrs” and “Ahaas” to a minimum. Helps your organization and makes you sound professional.

BE COURTEOUS: TWO-MULTI-WAY communications – Do hog, be brief. If you can accurately communicate in 10 words, don't use 30. Your hogging airtime that other pilots are needing to communicate.

COMMUNICATIONS AND FLIGHT INFORMATION

MEMORIZE THE PHONETIC ALPHABET – YOU WILL USE IT A LOT

PRONUNCIATION KEYS

<u>Letter</u>	<u>Word</u>	<u>Pronunciation</u>	<u>Number</u>	<u>Pronunciation</u>
A	Alpha	AL FAH	0	ZE-RO
B	Bravo	BRAH VOH	1	WUN
C	Charlie	CHAR LEE or SHAR LEE	2	TOO
D	Delta	DELL TAH	3	TREE
E	Echo	ECK OH	4	FOW- er
F	Foxtrot	FOKS TROT	5	FIFE
G	Golf	GOLF	6	SIX
H	Hotel	HOH TELL	7	SEV - en
I	India	IN DEE AH	8	AIT
J	Juliet	JEW LEE ETT	9	NIN - er
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	KEY BECK		
R	Romeo	ROW ME OH		
S	Sierra	SEE AIR RAH		
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		

<u>Number</u>	<u>Transmitted as</u>	<u>Pronounced as</u>
10	ONE ZERO	WUN ZE-RO
75	SEVEN FIVE	SEV-en FIFE
100	ONE HUNDRED	WUN HUN-dred
583	FIVE EIGHT THREE	FIFE AIT TREE
2 500	TWO THOUSAND FIVE HUNDRED	TOO TOU-SAND FIFE HUN-dred
5 000	FIVE THOUSAND	FIFE TOU-SAND
11 000	ONE ONE THOUSAND	WUN WUN TOU-SAND
25 000	TWO FIVE THOUSAND	TOO FIFE TOU-SAND
38 143	TREE EIGHT ONE FOUR THREE	TREE AIT WUN FOW-er

COMMUNICATIONS AND FLIGHT INFORMATION

SOURCES OF INFORMATION

AIRPORT/FACILITY GUIDE
FEDERAL AVIATION REGULATIONS
AERONAUTICAL INFORMATION MANUAL
NOTAMS

ADVISORY CIRCULARS
JEPPESEN INFORMATION SERVICES – PAY FOR IMMEDIATE NOTIFICATION.
FLIGHT PUBLICATIONS

Aviation Radio Frequency Bands: See instructor notes on CD

WHAT IS THE EMERGENCY FREQUENCY (MEMORIZE IT)



121.5

A stylized 3D rendering of the emergency frequency 121.5. The digits are rendered in a vibrant, multi-colored gradient. The '1' is pink, the '2' is orange, the first '1' is yellow-green, the '5' is purple, and the decimal point is blue. The numbers have a slight shadow beneath them, giving them a three-dimensional appearance.

COMMUNICATIONS AND FLIGHT INFORMATION

Next Session, please bring E6B, PN1, Miami sectional, and home work X/C results

Complete reading chapters 9 and 11 for study of navigation (dead reckoning, pilotage) the flight plan , Radio Navigation (VOR, NDB. DME, HSI, INS, GPS, etc.)

We will start by review of FLIGHT PLANNING, Study your results, and likely do another in-class navigation planning exercise.