



NATIONAL ASSOCIATION OF FLIGHT INSTRUCTORS

# MENTOR

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***Welcome!***

NATIONAL ASSOCIATION OF FLIGHT INSTRUCTORS

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# Best Practices for Teaching in a Simulator



Presented by Josh Harnagel, CFI, CFI-I, MEI,  
Redbird Flight Simulations VP of Marketing

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# Josh Harnagel

- CFI, CFI-I, MEI with 3,000 hours
- Third generation pilot, flying entire life with father
- Attended Texas A&M and Embry Riddle
- VP Marketing, Redbird Flight Simulations
- Oversees a team responsible for marketing, communications, and product development
- With Redbird for over 10 years holding a number of key positions and has been an instrumental contributor to Redbird's explosive growth since its inception

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# Best Practices for Teaching in a Simulator



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# What We'll be Talking About

- What the Sim is Good at Teaching and What it Isn't
- Keys to Teaching in a Simulator
- Examples for Normal VFR and IFR Training Events
- Teaching Emergencies and Judgment
  
- Lots of Time for Your Questions

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Have you instructed in a  
Simulator before?

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# What the Sim is:



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- Procedure Training
- Maneuver Training
- Checklist Familiarization
- Avionics Familiarization
- Situational Awareness
- Decision Making Training
- Emergency Training



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# What the Simulator Isn't



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# Don't Use the Sim For:

(Maybe)

- Landing Training
- Stall Buffet Detection Training
- Taxi Training

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What's the biggest  
obstacle to effective  
training in a Simulator?

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# The Keys to Teaching in a Simulator



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## The Keys to Teaching in a Simulator

# Bad Attitude = Bad Training

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The Keys to Teaching in a Simulator

# Realism Matters

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## The Keys to Teaching in a Simulator

# Pause • Un-Pause

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## The Keys to Teaching in a Simulator

Learn • Practice • Perform

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# Instructor Checklist

1. Instructor Must Reinforce Value of Simulator
2. Have a Goal for the Training Event
3. Brief Every Simulator Session
4. Use Real World Weather and Check It
5. Use Headsets and Seatbelts
6. Keep Failures Realistic
7. Limit Failures/Major Weather Events to 20% of Sessions
8. Never Create Inescapable Situations
9. Know When to Pause

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# Using “Real-World” Weather

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KEDC to KCLL  
Thu Oct 3, 1:00 PM CDT

[Send To Map](#) [Share](#) [Delete](#) [Show Map](#)

DIST **64nm**    ETE **0h42m**    ETA (CDT) **1:42pm**    FLIGHT FUEL **8g**    WIND **12kts head**

Calculated 9 minutes ago [Refresh](#)

[Navlog](#) > [Briefing](#) >

### OVERVIEW

Departure <b>KEDC</b> <a href="#">Info</a>	Destination <b>KCLL</b> <a href="#">Info</a>	Alternate Optional	Date <b>10/03/2019</b> <a href="#">Info</a>	Time (CDT) <b>1:00 PM</b>	Aircraft <b>N65637 (C172)</b> <a href="#">v</a>
Performance Profile <b>C172 (Default)</b> <a href="#">v</a>					

### ROUTE

Route <b>CLL</b> <a href="#">Routes</a> >	Altitude <b>5,000</b>	Advisor >	Flight Rules <b>IFR</b> <a href="#">v</a>
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### DESTINATION SERVICES

FBO  
**Astin Aviation** [Change FBO](#) >

(979) 775-5255  
122.95 UNICOM / \$5.77/gal

[✉](#) [↗](#) [ℹ](#)

### FLIGHT LOG

Fuel at Shutdown (g) Optional	Times Optional	<a href="#">Edit</a> >
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[Add Next Flight](#) [Copy](#) [Delete](#)

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KEDC — KCLL (October 03, 2019) in N65637 (C172)  
Basic Performance Profile @ 5000'

Created Oct 03 2019 13:26Z

ETE 0h41m	Distance 64nm	Avg Wind 12kt head (117°/017)	ETD 1800Z	ETA 1842Z	Flight Fuel 8 g	Taxi Fuel 1 g
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Route  
CLL

Waypoint	Airway	HDG	MAG	CRS	ALT	COMP	WIND	DIR/SPD	ISA	TAS	SPD KT	GS	LEG	DIST NM	REM	LEG	TIME REM	ETE	ACT
KEDC		-	-	-	620	-	-	-	+14	0	0	-	-	64	-	-	0:41	-	-
-TOC-	DCT	079	074	074	5000	H10	110/012		+13	90	80	12	52	0:09	0:32	0:09	0:32	0:09	0:32
-TOD-	DCT	080	075	075	5000	H14	117/017		+12	110	95	38	14	0:23	0:09	0:09	0:32	0:09	0:32
CLL COLLEGE STATION 113.3	DCT	079	076	076	1300	H9	113/011		+14	100	91	11	3	0:07	0:02	0:02	0:39	0:02	0:39
KCLL	DCT	105	106	106	321	H7	094/007		+14	100	93	3	-	0:02	-	-	0:41	-	0:41

Winds Aloft	1000 ft (ISA: 13°C)			3000 ft (ISA: 9°C)			5000 ft (ISA: 6°C)			7000 ft (ISA: 1°C)			9000 ft (ISA: -3°C)		
	(COMP) WIND	ISA	(COMP) WIND	ISA	(COMP) WIND	ISA	(COMP) WIND	ISA	(COMP) WIND	ISA	(COMP) WIND	ISA	(COMP) WIND	ISA	
-TOC-	(H10) 100/011	+15	(H11) 102/012	+13	(H14) 117/017	+12	(H15) 119/018	+12	(H13) 116/016	+13	(H9) 131/014	+12	(H11) 111/013	+13	
-TOD-	(H7) 116/009	+15	(H8) 121/011	+13	(H5) 131/013	+12	(H9) 131/014	+12	(H0) 121/013	+13	(H12) 118/015	+12	(H11) 111/013	+13	
CLL	(H6) 093/007	+14	(H8) 099/008	+13	(H10) 116/013	+12	(H12) 118/015	+12	(H11) 111/013	+13					
	8h30m (+0.04), 6 g Avg wind comp: H8			8h39m (+0.02), 6 g Avg wind comp: H10			8h41m (0.00), 7 g Avg wind comp: H12			8h42m (+3.01), 7 g Avg wind comp: H12			8h42m (+0.02), 7 g Avg wind comp: H10		

Summary & Times

PIC	
Tail	N65637 (C172)
Profile	Basic Performance Profile
Distance	64nm
ETD	1800Z
ETE	0h41m
ETA	1842Z
Route	CLL
Altitude	5000'

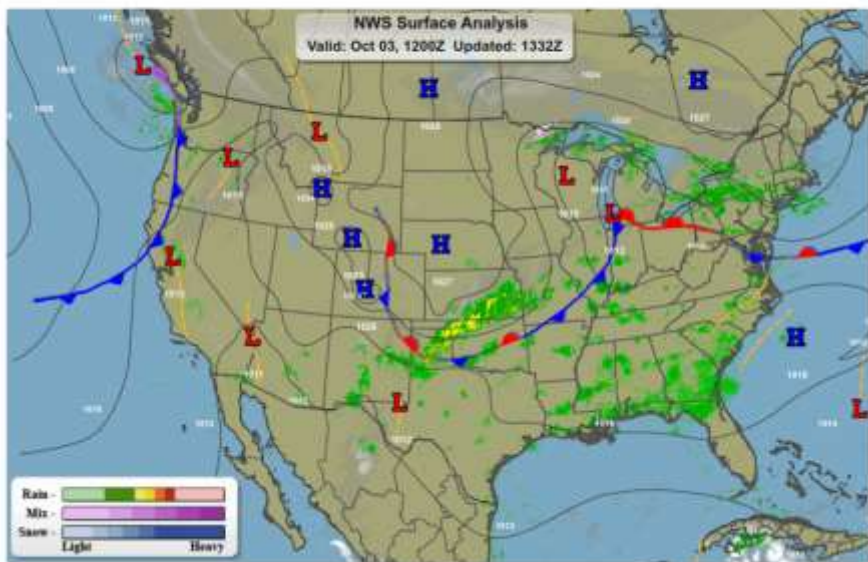
Notes

Out:	In:	Block time:
Off:	On:	Flight time:
Start:	Stop:	Hobbs time:
Start:	Rem:	Fuel used:
Signature:		

Airport	WX	TWR/CTAF	CLR	GND	ELEV	LONGEST RWY
KEDC	118.825	120.3	128.025	119.45	620	13 6025 ft
KCLL Astm Aviation	126.85	118.5	128.699	128.699	321	17 / 35 7000 ft

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## Surface Analysis Chart



### DEPARTURE

IFR KEDC 03195Z 0900KT 2 1/2SM BR FEW002 23/22 A3006 RMK AO2

### ROUTE

MVFR KATT 031308Z 0000KT 10SM BRN014 25/22 A3005 RMK AO2 T02500217  
 VFR KALS 031253Z 0000KT 6SM BR FEW006 FEW200 23/21 A3003 RMK AO2 SLP160 T02220211  
 VFR KGTU 031256Z 0000KT 9SM FEW008 22/21 A3007 RMK AO2 SLP176 T02220206  
 IFR KRYW 03125Z 1300KT 7SM OVC005 23/22 A3007 RMK AO2 T0230222  
 MVFR KGYB 03125Z 0000KT 3SM BR CLR 21/21 A3005 RMK AO2 T0210221  
 VFR KT35 03125Z 0000KT 7SM CLR 22/21 A3005 RMK AO2 T02210230  
 MVFR KRWV 03125Z 0000KT 5SM BR CLR 22/22 A3005 RMK AO2 T02220235  
 VFR KLHB 03125Z 0000KT 10SM CLR 22/20 A3006 RMK AO2 T02210202  
 VFR K3R 03125Z 0000KT 7SM CLR A3005 RMK AO2  
 MVFR KCFD 03125Z 0000KT 10SM BRN010 24/23 A3006 RMK AO2 T02350232

### DESTINATION

MVFR KCLL 031253Z 3500KT 10SM OVC011 24/22 A3004 RMK AO2 SLP167 T02390217

VFR TAF KALS 03130Z 031204Z VRB03KT P6SM SCT09

MVFR TEMPO 03130315 BRN016

1800Z VFR FM031600 10008KT P6SM SCT090

VFR FM040500 VRB04KT P6SM BRN035

VFR FM041400 03006KT P6SM BRN035

VFR TAF KCLL 03120Z 031210Z VRB02KT P6SM SLC

1833Z VFR FM031500 10008KT P6SM FEW020

VFR FM032300 10006KT P6SM VCSH SCT050

VFR FM040500 VRB03KT P6SM SCT030



VALID FOR USE  
**October 03, 1200Z 0800Z - 1500Z** 6hr

Station ID	3000 -2000 FT	5000 FIELD	6000 +1000 FT	7000 +2000 FT	9000 +4000 FT
CLL	150° 15kts	140° 30kts	140° 23kts 16°C	140° 21kts 14°C	140° 17kts 10°C
HOU	110° 15kts	110° 23kts	107° 27kts 16°C	107° 24kts 14°C	107° 20kts 11°C

VALID FOR USE  
**October 03, 1800Z 1500Z - 0000Z** 12hr

Station ID	3000 -2000 FT	5000 FIELD	6000 +1000 FT	7000 +2000 FT	9000 +4000 FT
CLL	100° 07kts	113° 13kts	120° 17kts 16°C	120° 16kts 14°C	120° 16kts 11°C
HOU	090° 10kts	090° 07kts	090° 21kts 16°C	090° 21kts 14°C	090° 23kts 11°C

VALID FOR USE  
**October 04, 0600Z 0000Z - 1200Z** 24hr

Station ID	3000 -2000 FT	5000 FIELD	6000 +1000 FT	7000 +2000 FT	9000 +4000 FT
CLL	100° 14kts	086° 14kts	080° 14kts 15°C	076° 15kts 13°C	070° 15kts 10°C
HOU	070° 08kts	076° 16kts	080° 07kts 16°C	085° 18kts 14°C	100° 23kts 11°C

**NAVIGATION**

Easterwood Field, College Station, TX (KCLL)  
 CLL 10/10023 NAV ILS RWY 35 ROWDY LOM NOT MNT 181020519-PERM

**COMMUNICATION**

Easterwood Field, College Station, TX (KCLL)  
 CLL 06/6008 COM REMOTE COM OUTLET 122.05 OUT OF SERVICE 1906081623-PERM

**SERVICE**

None

**OBSTRUCTION WITHIN 10 NM**

Easterwood Field, College Station, TX (KCLL)  
 CLL 09/9019 OBST TOWER LGT (ASR 1253226) 302835.70N0962557.90W (7.6NM SSW CLL) 620.1FT (400.3FT AGL) ILS 1909122012-1910122359

**AIRSPACE WITHIN 10 NM**

Easterwood Field, College Station, TX (KCLL)  
 CLL 07/7011 AIRSPACE UAS W/ AN AREA DEFINED AS 1NM RADIUS OF CLL18R003.5 (7NM W CLL) 5FC-400FT AGL DLY 1200-2300 1807181200-2007242300

**SPECIAL USE AIRSPACE WITHIN 10 NM**

None

**RUNWAY**

None

**TAXIWAY**

None





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# Example VFR Training Event

- Task: Introduce and Practice Pattern Entry Procedures
- Goal: Enter and Fly Normal Patterns from Any Starting Point to Any Runway in Real Time

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# Example VFR Training Event

1. Instructor Lead Ground Brief
2. Start Simulation In-Air and Paused
3. Identify Current Location, Active Runway, and Plan Entry
4. Un-Pause
5. Customer Enters Pattern and Flies to Short Final
6. Reposition to New Location and Pause
7. Repeat, Reducing Paused Time Until Not Required

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# Example IFR Training Event

- Task: Practice ILS Approach, Full and Partial Panel
- Goal: Enter and Fly ILS Approach to Minimums in a Range of Weather Conditions, both Full and Partial Panel

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# Example IFR Training Event

1. Instructor Lead Ground Brief
2. Start Simulation In-Air and Un-Paused, Instructor as ATC
3. Vectors to FAF x 6, Reposition after Landing/Missed
4. 4 Approaches to MIN with Landing
5. 2 Approaches to Missed
6. 1 Approach with Briefed Partial Panel
7. 1 Approach with Partial Panel Failure During Maneuver

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What emergency training do you think is most important for a Private Pilot?

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# Teaching Emergencies and Judgment

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# Instructor Checklist

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*Thanks for Watching!*

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