

OBJECTIVE

- ★ TO DEVELOP ONE'S KNOWLEDGE & SKILL OF THE ELEMENTS OF SPEED, CONTROL, ORIENTATION, PLANING, AND COORDINATION DURING A MAX. FLIGHT PERFORMANCE MANEUVER.

ELEMENTS

- ★ EXCHANGING A/S FOR ALT
YANK & BANK

SCHEDULE

- ★ DISCUSSION, DEMO, PRACTICE, AND EVALUATION

EQUIPMENT

- ★ COMMERCIAL PTS 1-25,
FLIGHT TRAINING MANUAL 161-63
PRIVATE & COMMERCIAL PILOT FLIGHT MAN.

INSTRUCTOR'S
INSTRUCTIONS

- ★ ORAL DESCRIPTION OF ELEMENTS & COMMON ERRORS:
 1. SELECTING ALTITUDE
 2. A/S AND POWER SETTING
 3. ENTRY TECH.
 4. DIVISION OF ATTENTION & PLANING
 5. COORDINATION OF FLIGHT
 6. PITCH & BANK ATTITUDES AT VARIOUS POINTS DURING THE MANEUVER
 7. PROPER CORRECTION OF TORQUE EFFECT
 8. ACHIEVEMENT OF MAX. PERFORMANCE
 9. COMPLETION TECH.
 10. INSTRUCTOR DEMO

STUDENTS'S
ACTIONS

- ★ DISCUSSION OF ANY QUESTIONS, INFLIGHT REVIEW OF ASSOCIATED MANEUVERS, POST FLIGHT QUESTIONS AND PRACTICE MANEUVER

COMPLETION
STANDARDS

- ★ ROLL OUT AT THE 180°
+ / - 10°

FIRST 90° IS CONSTANT BANK & CHANGING PITCH

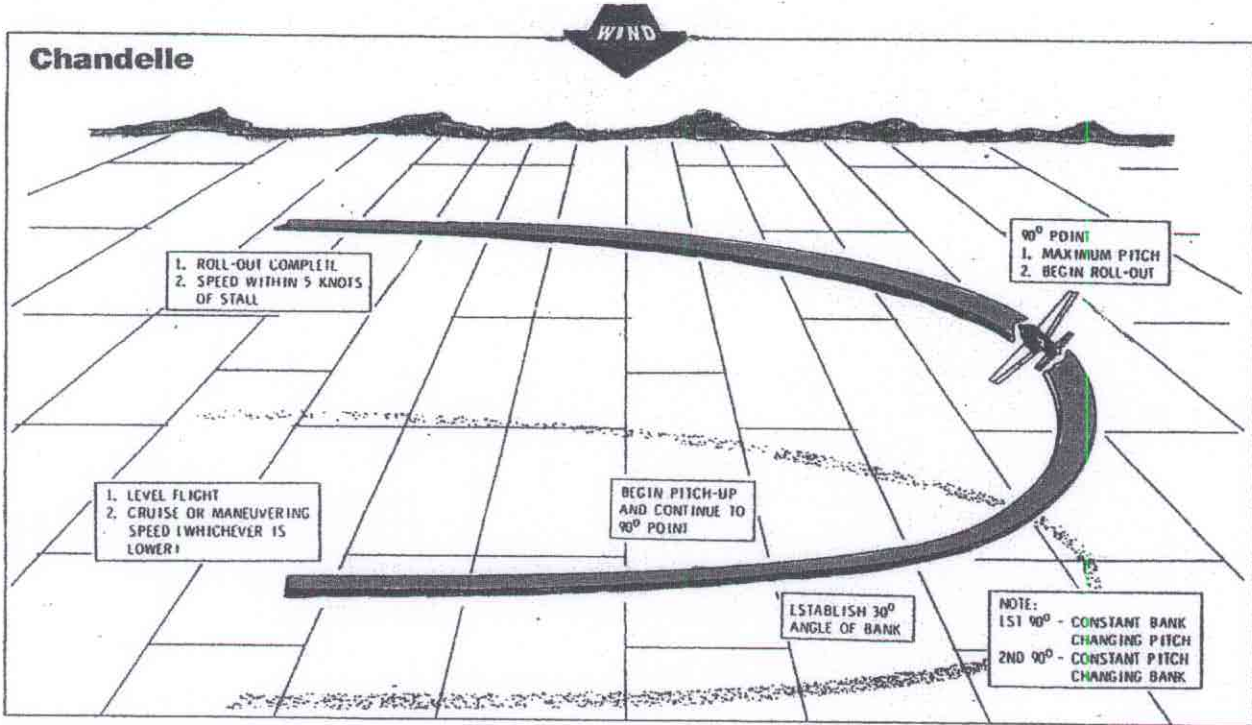
SECOND 90° IS CONSTANT PITCH & CHANGING BANK

MAINTAIN ALT. AFTER ROLL OUT

COMMON
ERRORS

- ★ POOR: TIMING, COORDINATION, AND A/S CONTROL OR INADVERTENT STALL, FAILURE TO RECOVER ON DESIRED HEADING, INADEQUATE ALT. GAIN.

Is a Max. Performance 180° Climbing Turn Finishing in a Wings Level, Nose High Attitude just Above Stall Speed.



CLEAR FOR TRAFFIC!

Why: To develop Coordination, Division of Attention, Orientation, and Planning During a Maximum-Performance flight.

Right Rudder

How to do it:

1. Wind: *(Symmetry)*
Trees, Smoke, ATIS, Water, Wind-Drift Circle.
2. Point:
Not in a Congested Area, Emergency LDG Area,
Pick out a 90° visual Ref. Point.
3. Altitude:
3,000 AGL 3500msl NO LOWER THAN 1500 AGL
4. Setup: *18" 2400/20mph PERMANV*
Clearing Turns, Speed (Va), A-GUMPS. *Prop Forward*
5. Entry: *Begin Down Wind ABEAM Ref. Point.* *max Rich*
6. Remember: *Pump on*
BANK then YANK
You are Exchanging A/S for Altitude.
1st 90° - Constant BANK and Changing PITCH
2nd 90° - Constant PITCH and Changing BANK

Will Start by

1. Banking the A/C 30° Towards Ref. Point
2. Add Full Power & Pitch Up
3. Keep adding back Pressure until the 90° Ref. Point.
4. At the 90° Ref. Point - Max. Pitch Up and 30° B/A
Start Roll out and Begin to Level out.
6. At 180° Ref. Point - Complete Roll Out and Wings Level and A/S +/- 5 kts of (Vs1).

PS

rollout ± 100

A/S +5 at power on stall

altitude ± 50ft



OBJECTIVE

- ★ TO DEVELOP ONE'S FEEL FOR VARYING CONTROL FORCES AND THE ABILITY TO PLAN & REMAIN ORIENTED WHILE MANEUVERING THE PLANE WITH POSITIVE ACCURATE CONTROLS. CONSTANTLY CHANGING THE CONTROL INPUTS TO SATISFY THE MANEUVER CROSSING THE 180° REFERENCE POINT.

ELEMENTS

- ★ 1. REFERENCE POINT SELECTION
- 2. BANK ANGLE CONTRAST
- 3. ALTITUDE CONTROL
- 4. PROPER USE OF RUDDER
- 5. SCANNING FOR TRAFFIC
- 6. A/S WITHIN 5 kts AT 90° + Va AT 180°

SCHEDULE

- ★ PRE-FLIGHT INSTRUCTION => :30
- PRACTICE LAZY 8'S => :45
- POST FLIGHT => :15
- 1:30 TOTAL TIME

INSTRUCTOR'S
NOTIONS

- ★ ORAL DESCRIPTION OF ELEMENTS & COMMON ERRORS:
 1. SELECTING ALTITUDE & REFERENCE POINTS
 2. ENTRY A/S, POWER SETTING, AND TECH.
 3. ORIENTATION, DIVISION OF ATTENTION, AND PLANNING
 4. COORDINATION OF FLIGHT CONTROLS
 5. PITCH AND BANK ATTITUDES AT KEY PTS DURING THE MANEUVER
 6. PROPER CORRECTION FOR TORQUE EFFECT IN RT & LT TURNS
 7. LOOP SYMMETRY
 8. IMPORTANCE OF CONSTANT RATE PITCH AND BANK ATTITUDE CHANGES THROUGHOUT THE MANEUVER
 9. INSTRUCTOR DEMO

STUDENTS'S
ACTIONS
COMPLETION
STANDARDS

- ★ DISCUSS QUESTIONS, LISTEN, AND TAKE NOTES,
- ★ EXHIBITS KNOWLEDGE OF ELEMENTS RELATED TO PERFORMANCE FACTORS
- ★ SELECTS A PROMINENT 90° REFERENCE POINT
- ★ ESTABLISHES THE RECOMMENDED ENTRY POWER & A/S

COMMERCIAL LIMITATIONS

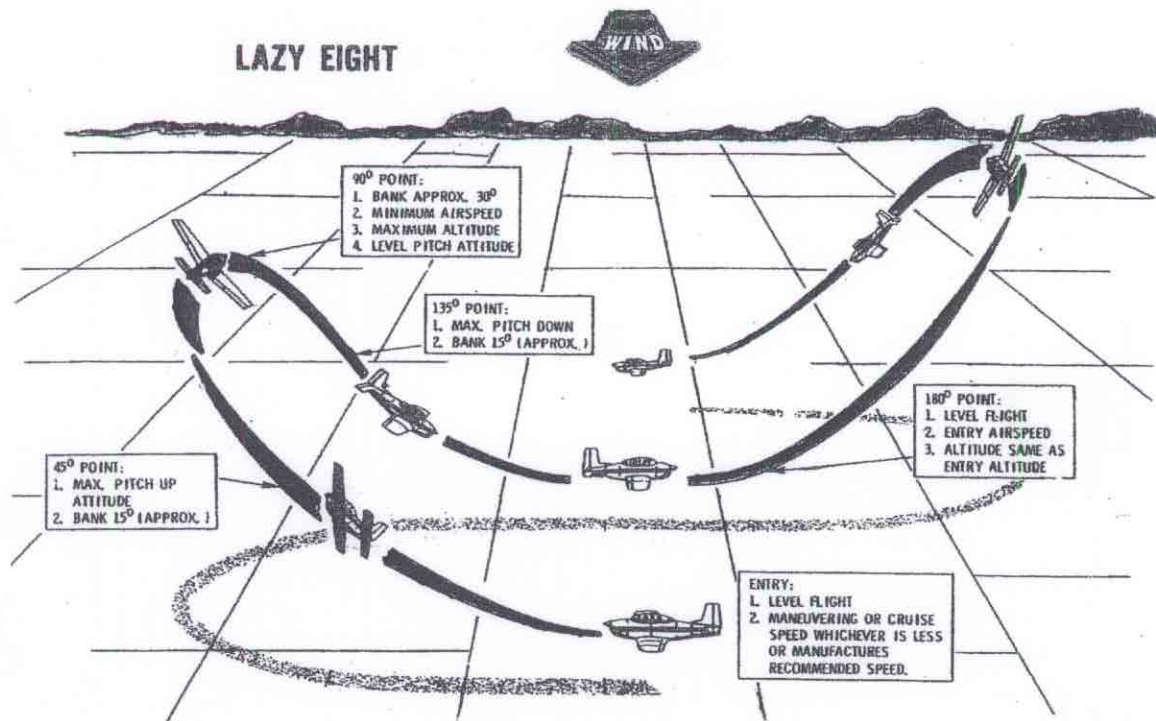
1. ALT AT 180° IS +/- 100' FROM ENTRY
2. A/S +/- 10 kts FROM ENTRY A/S AT 180° PT.
3. HEADING +/- 10° FROM ENTRY HDG AT 180° PT.

COMMON
ERRORS

- ★ FAULTY COORDINATION, POOR TIMING, UNSYMMETRICAL PATTERN, FAILURE TO MAINTAIN ALT, INSUFFICIENT CONTROL APPLICATION AT SLOW SPEEDS

2 Climbing, Descending, 180° Turns

Is two 180° turns in opposite directions while climbing and descending in a symmetrical pattern during each of the turns.



CLEAR FOR TRAFFIC!

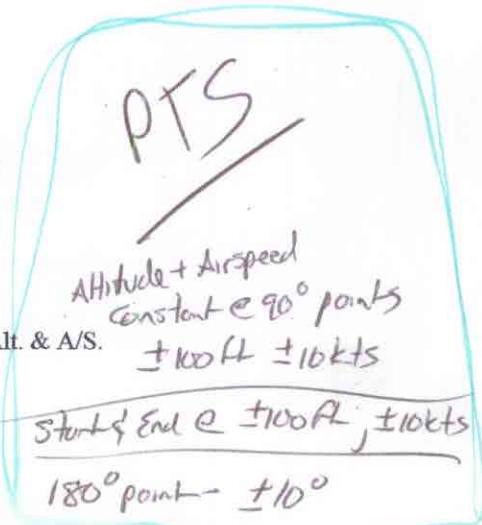
Why: To develop Coordination between flight controls, Planning, Orientation, and Division of Attention.

How to do it:

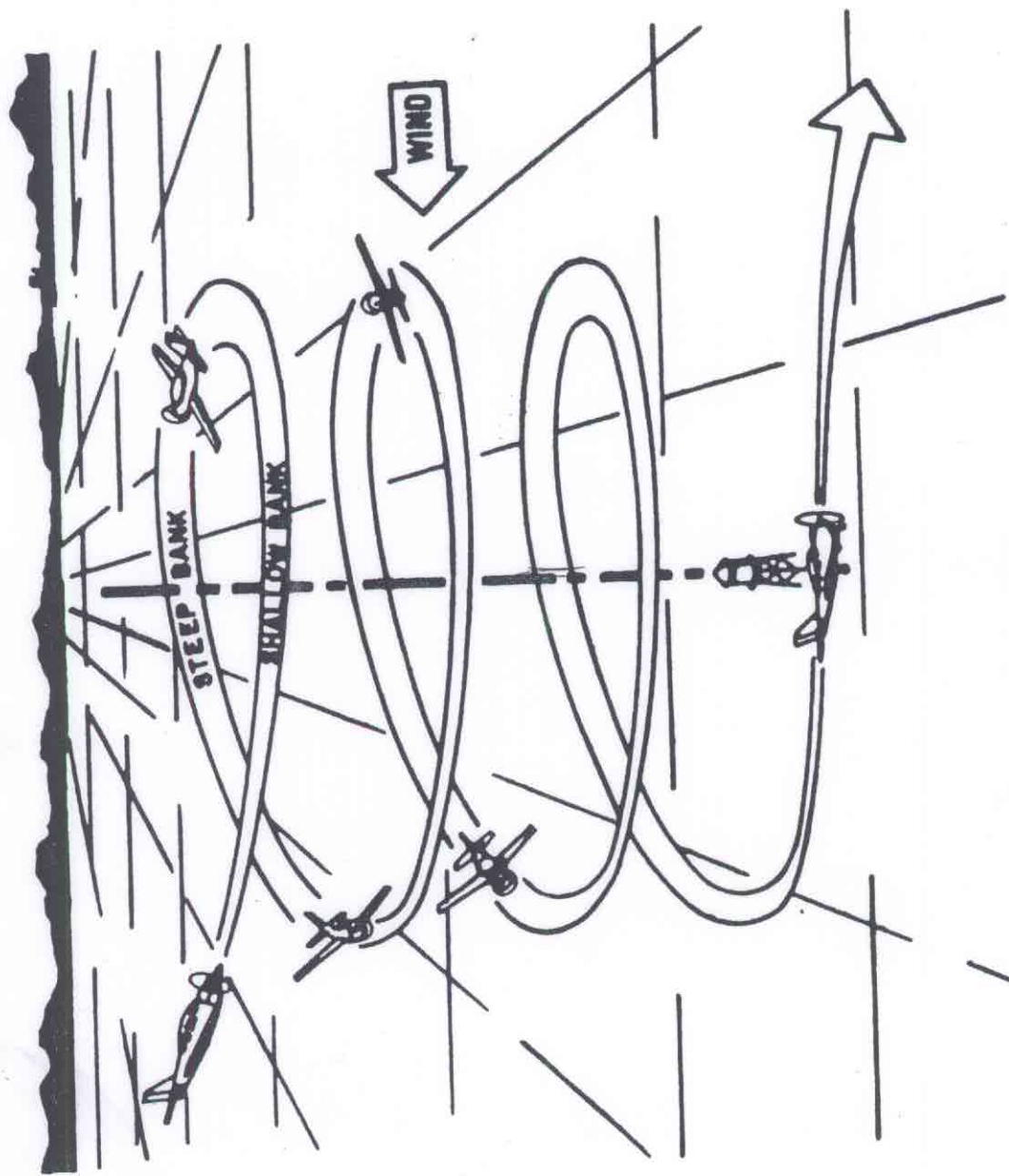
1. Wind: Trees, Smoke, ATIS, Water, Wind-Drift Circle.
2. Point: Not in a Congested Area, Pick out visual Ref. Points: at the 45, 90, 135, and 180° Points.
3. Altitude: *3,000' AGL 3,500' MSL NO LOWER THAN 1500' AGL*
4. Setup: *18" 2400 120mph Premanv*
Clearing Turns, Speed (Va), A-GUMPS. *min Rich Pump on Light 21*
5. Entry: Begin Down ~~Wind~~ ABEAM the 90° Ref. Pt.
6. Remember: Bank & Pitch are constantly changing.
Max. Pitch UP = Max. Pitch DOWN.
Always Bank Towards Ref. Points.

Will Start by

1. Pitching Up and Banking the A/C SLOWLY into a 30° B/A
2. Pass 45° Ref. Point with 15° B/A and Max Pitch Up.
3. Approaching the 90° Ref. Point with a B/A of 30° and NOTE min. A/S and Altitude.
4. Pass 90° Ref. Point - SLASH the horizon and begin to slowly decrease bank.
5. Pass 135° Ref. Point with Max. Pitch Down and 15° Bank.
6. Pass 180° Ref. Point A/C is wings-level and Alt. & A/S are the same as ENTRY Alt. & A/S.
7. Resume Straight and Level flight.



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Steep Spirals

Objective: To improve pilot Technique for power-off turns, wind drift control planning, orientation and division of Attention

Elements:

- Bank Angle control
- Airspeed control
- Wind drift ~~control~~ Correction
- Reference point Selection
- Entry & Rollout point
- Clearing turns

Schedule:

Ground Instruction	: 15 min
Steep Spirals Demo	: 20 min
Student Practice	: 30 min
Post Flight	: 15 min
	<hr/>
	1: 20

Equipment: model airplane
Handout FTH pg 159 & 160

Instructor Action: Discuss lesson objectives
: Discuss individual elements of steep turns

Student Actions: Listen, ASK questions &
TAKE notes

Completion STANDARDS :

1. Selects AN ALTITUDE sufficient TO continue Through A SERIES of AT LEAST ~~3~~ three 360° Turns.
2. Selects a suitable ground Reference point.
3. Establishes A spiral with steepest Angle of Bank $50-55^\circ$, at the Recommended AIRSPEED, and ~~with~~ with The specified RADIUS of Turn.
4. MAINTAINS A CONSTANT Radius around the selected Reference point through coordination CONTROL.
5. Divides attention between AIRPLANE control, planning, ~~the~~ flight PATH, and orientation.
6. MAINTAINS the Specified AIRSPEED ± 10 Kts.
7. Recovers toward A definite object or specific heading which leads into A pattern over AN AREA that could be used for A forced Landing.

PTS ± 10 KTS

$\pm 10^\circ$ HDG

B/A NOT TO exceed 60°

Steep Spirals

PR
Bank not more than
60°
A/S ± 10 kts
Heading $\pm 10^\circ$

WHAT: is a continuous gliding turn, during which a constant radius around a point on the ground is maintained.

Why: To improve pilot technique for power-off turns, wind drift control, planning, orientation and division of attention.

How:

1. ALTITUDE: ⁵⁵⁰⁰~~4500~~ msl no lower than 1500 AGL

2. Setup: Clearing Turns & premaneuver check
prep fuel, mk ↑, pump, Lt,

3. Wind: Smoke, Flags, Trees, ATIS

step
- 4. Maneuver the A/c upwind to a point abeam (almost over) a prominent reference point.

- 5. Slow the A/c to recommended speed maintaining altitude as the airplane approaches your reference point.

- 6. When abeam reduce power to idle, roll into the appropriate bank angle for the wind and adjust the pitch attitude to maintain your desired airspeed.

- 7. Clear the engine by advancing the throttle to normal cruise power at least once each 360° turn.

o only ready to not lose orientation

(over)

8. MAintain a constant Radius through bank Ang adjustment and coordination control.
9. divide your Attention between A/c control, planning, flight path and orientation.
10. Ensure that B/A on downwind side is between $50-55^\circ$.
11. Upon completion of 3 turns, but NOT below 1500'AG recover toward a definite object or specified heading which leads into a pattern over an Area that could be used for a forced landing.
12. Terminate the maneuver by Applying full Power.
13. Clean up A/c.

Remember: On the downwind side of the maneuver, the steeper the B/A the lower the pitch attitude must be to maintain a given A/S. On the upwind side, the shallower the B/A becomes, the pitch attitude must be raised to maintain proper A/S.