

**Introduction**

This Flight Training Manual (FTM) has been designed to provide the pilot with standardization procedures for safe and efficient training operations in the Piper Archer II. It is your responsibility to have a complete and thorough knowledge of these procedures and techniques.

Note that this manual does not include all the information found in the Pilot's Operating Handbook (POH). It is primarily a procedures guide and is to be used as a supplement to the POH, and in conjunction with FAA-8083-3 (Flight Training Handbook), and the Practical Test Standards (PTS) for Private, Instrument and Commercial Pilot ASEL. The procedures in this manual are not intended to limit the pilot's judgement. The pilot can alter procedures to meet existing conditions. No procedure, regardless of how well written, can account for every possible variable; a procedure cannot replace common sense.

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Chapter 1: **AIRPLANE GENERAL**

I. AIRSPEEDS

All airspeeds used throughout this manual are knots indicated airspeeds (KIAS) and assume zero instrument error.

$V_{SO}$	-Stall, landing configuration:	42
$V_S$	-Stall, clean configuration:	47
$V_R$	-Rotation:	55
$V_X$	-Best Angle of Climb:	64
$V_Y$	-Best Rate of Climb:	76
$V_{FE}$	-Maximum Flap Extension:	102
$V_A$	-Maneuvering Speed:	113
$V_{NO}$	-Maximum Structural Cruising:	125
$V_{NE}$	-Never Exceed:	154
	-Emergency Descent:	100
	-Best Glide:	76

VFR Approach Speeds:

-Downwind:	100
-Downwind past abeam:	90
-Base:	80
-Final:	70

IFR Final Approach Speed: 100

IFR Holding Pattern Speed: 100

Chapter 2: **NORMAL PROCEDURES (EXPANDED)**

**I. EXTERNAL CHECKLIST (EXPANDED)**

<b>INTERIOR</b>
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- Documents**..... **A.R.O.W.**
  - Airworthiness Certificate ..... **IN VIEW**
  - Registration Certificate ..... **CHECK ON BOARD**
  - Pilot's Operating Handbook..... **CHECK ON BOARD**
  - Weight and Balance Data..... **CHECK ON BOARD**
- Keybook** ..... **CHECK TIMES**
  - Key..... **REMOVED**
- Circuit Breakers** ..... **IN**
- Control Wheel Lock** ..... **REMOVE**
- Master Switch** ..... **ON**
- Pitot Heat** ..... **ON**
  - Required if flying into precipitation or possible icing conditions.
- Stall Warning**..... **CHECK**
- Aircraft Lights**..... **ON/CHECK**
  - Beacon Light ..... **CHECK**
  - Landing Light..... **CHECK**
  - Misc. Lights ..... **CHECK** (if flying at night)
- Fuel Gauges**..... **QUANTITY**
  - Fuel Gauges..... Verify **QUANTITY** with visual inspection of tanks
- Flaps** ..... **DOWN**
- Electrical Switches**..... **OFF**
- Fuel Selector Valve**..... **FULLEST TANK**
- Static Pressure Alternate Source Valve**..... **OFF**

<b>FUSELAGE/EMPENNAGE</b>
---------------------------

- Baggage Door**..... **CHECK**
- Antennas**..... **CHECK**
  - Two Com..... White, top of plane
  - VOR ..... Top of vertical stabilizer
  - ELT ..... Top of plane, middle of empennage
- Right Skin**..... **CHECK**
  - Check for cracks, dents, rivets, and screws.
- Right half of Stabilator** ..... **CHECK**
  - Movement, Condition, Hinges ..... **CHECK**
- Bottom of Aircraft**..... **CHECK**
  - Antennas..... **CHECK**

- Vertical Stabilizer/Rudder** ..... **CHECK**
  - Movement, Condition, Hinges ..... **CHECK**
- Beacon, Position Light** ..... **CHECK**
- Left half of Stabilator**..... **CHECK**
  - Movement, Condition, Hinges ..... **CHECK**
- Left Skin**..... **CHECK**
  - Check for cracks, dents, rivets, and screws.

<b>LEFT WING</b>
------------------

- Flap**..... **CHECK**
  - Movement, Condition, Hinges ..... **CHECK**
- Aileron**..... **CHECK**
  - Movement, Condition, Hinges ..... **CHECK**
- Wing Tip** ..... **CHECK**
  - Position Light and Strobe..... **CHECK**
- Leading Edge** ..... **CHECK**
  - Ribs ..... **CHECK** for firmness
- Pitot / Static Tube**..... **CLEAR**
  - Pitot Heat ..... **FEEL FOR WARMTH** (careful to not burn fingers)
- Gear Assembly** ..... **INSPECT**
  - Check tire, brake, hydraulic line, and strut.
- Fuel Tank Vent** ..... **CLEAR**
- Fuel Sump** ..... **SAMPLE**
  - Check for water, debris, color (blue), smell, and feel.
- Fuel Tank Quantity** ..... **CHECK**
  - Verify with quantity indicated by the fuel gauges
- Filler Cap** ..... **SECURE**
- Air Inlets** ..... **CHECK**

<b>NOSE</b>
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- Windshield** ..... **CHECK**
  - Check for cracks and visibility.
- Air Inlets** ..... **CHECK**
- Fuel Sump** ..... **SAMPLE**
  - Check for water, debris, color (blue), smell, and feel.
- Left Cowling** ..... **CHECK**
  - Check for cracks, dents, rivets, and screws
- Propeller/Spinner** ..... **CHECK**
  - Check for cracks, dents, screws and security.
- Air Intakes** ..... **CLEAR**
- Air Filter** ..... **CLEAR**

<b>Landing Lights</b> .....	<b>CHECK</b>
<b>Exhaust Pipe</b> .....	<b>CLEAR</b>
<b>Gear Assembly</b> .....	<b>INSPECT</b>
Check tire and strut.	
<b>Engine Inspection</b> .....	<b>CHECK</b>
Inspect engine for any noticeable damage, loose wires, or hoses.	
<b>Engine Oil</b> .....	<b>CHECK</b>
6-8 quarts.	
<b>Right Cowling</b> .....	<b>CHECK</b>
Check for cracks, dents, rivets, screws.	
<b>Breather/Vent</b> .....	<b>CHECK</b>
One hoses/pipes hanging from the bottom of the engine.	

RIGHT WING	
<b>Air Inlets</b> .....	<b>CHECK</b>
<b>Fuel Sump</b> .....	<b>SAMPLE</b>
Check for water, debris, color (blue), smell, and feel.	
<b>Fuel Tank Quantity</b> .....	<b>CHECK</b>
Verify with quantity indicated by the fuel gauges.	
<b>Filler Cap</b> .....	<b>SECURE</b>
<b>Gear Assembly</b> .....	<b>INSPECT</b>
Check tire, brake, hydraulic line, and strut.	
<b>Fuel Tank Vent</b> .....	<b>CLEAR</b>
<b>Leading Edge</b> .....	<b>CHECK</b>
Ribs .....	
Check for firmness	
<b>Wing Tip</b> .....	<b>CHECK</b>
Position Light and Strobe.....	
<b>CHECK</b>	
<b>Aileron</b> .....	<b>CHECK</b>
Movement, Condition, Hinges .....	
<b>CHECK</b>	
<b>Flap</b> .....	<b>CHECK</b>
Movement, Condition, Hinges .....	
<b>CHECK</b>	

**II. NORMAL CHECKLIST (EXPANDED)**

BEFORE START	
<b>Seats</b> .....	<b>POSITION and LOCK</b>
<b>Belts</b> .....	<b>SECURE</b>
Preflight Brief (seatbelts).....	
<b>COMPLETE</b>	
<b>Parking Brake</b> .....	<b>SET</b>
<b>Avionics</b> .....	<b>OFF</b>
<b>Beacon</b> .....	<b>ON</b>
<b>Master Switch</b> .....	<b>ON</b>
<b>Circuit Breakers/Fuses</b> .....	<b>IN</b>
Take note of any circuit breakers that require resetting.	

ENGINE START	
<b>Key</b> .....	<b>IN/OFF</b>
<b>Brakes</b> .....	<b>HOLD</b>
<b>Mixture</b> .....	<b>RICH</b>
<b>Carburetor Heat</b> .....	<b>COLD</b>
<b>Fuel Selector</b> .....	<b>DESIRED TANK</b>
<b>Throttle</b> .....	<b>1/4" OPEN.</b>
<b>Primer</b> .....	<b>A/R</b>
<b>Electric Fuel Pump</b> .....	<b>ON</b>
<b>Propeller Area</b> .....	<b>CLEAR</b>
<b>Ignition Switch</b> .....	<b>START</b>
Max. duration 30 seconds for every 4 minutes.	
<b>Throttle</b> .....	<b>1000 RPM</b>
<b>Engine Instruments</b> .....	<b>CHECK</b>
Oil pressure above lower red line in 30 seconds.	

AFTER START	
<b>Avionics</b> .....	<b>ON/SET</b>
Transponder .....	
<b>STBY &amp; 1200</b>	
<b>ATIS</b> .....	<b>OBTAIN</b>
<b>Circuit Breakers/Fuses</b> .....	<b>IN</b>
Take note of any circuit breakers that require resetting.	
If circuit breaker has popped more than once, discontinue flight.	
<b>Flight Instruments</b> .....	<b>SET</b>
Altimeter and D.G.....	
<b>SET</b>	
All Others.....	
<b>CHECK</b>	
<b>Flaps</b> .....	<b>UP</b>

**TAXI**

- Parking Brake**.....**RELEASE**  
**Throttle**.....**IDLE**  
**Brakes**.....**TEST**  
 Apply just enough pressure to test the brakes, do not send passengers through window.
- Flight Instruments**.....**CHECK**  
 -Attitude Indicator should indicate no more than 5 degrees of bank during turns.  
 -D.G. should indicate turns in proper direction.  
 -Magnetic compass should indicate turns in proper direction.  
 -Turn coordinator should indicate turns in proper direction with ball opposite of turn.

**ENGINE RUNUP**

- Airplane**.....**INTO WIND**  
 Clear behind the airplane.
- Parking Brake**.....**SET**  
**Flight Controls**.....**FULL/FREE**  
 Movement.....**CORRECT**
- Engine Instruments**.....**IN LIMITS**  
 Oil Pressure.....**IN GREEN**  
 Oil Temperature.....**ABOVE WHITE SLASH**
- Throttle**.....**2000 RPM**  
**Magnetos**.....**IN LIMITS**  
 Max. drop.....**175 RPM**  
 Max. difference.....**50 RPM**
- Instrument Air & Ammeter**.....**CHECK**  
 Instrument Air.....**5.0" Hg.**  
 Ammeter.....**CHARGING**
- Carburetor Heat**.....**ON/OFF**  
 RPM drops and stabilizes.
- Engine Instruments**.....**CHECK**  
 Oil Temperature and Pressure.....**IN LIMITS**
- Annunciator Panel**.....**Press-to-Test**  
**Electric Fuel Pump**.....**OFF**  
 Fuel Pressure.....**Check**
- Throttle**.....**1000 RPM**  
**Primer**.....**IN and LOCKED**  
**Magnetos**.....**BOTH**  
**Carburetor Heat**.....**COLD**  
**Mixture**.....**RICH (AR)**

- Elevator Trim**.....**SET T/O**  
**Throttle Friction Lock**.....**ADJUST**  
**Takeoff Brief**.....**COMPLETE**

**BEFORE TAKEOFF**

- Flight Instruments**.....**CHECK**  
 D.G.....**ALIGN** and note precession
- Pitot Heat**.....**A/R**  
 Pitot heat should be used any time when flying in visible moisture.
- Transponder**.....**ALT**  
**Time**.....**RECORD**  
 Call the tower for takeoff and record the time when cleared.
- Engine Instruments**.....**CHECK**  
 Oil Temperature.....**GREEN**  
 All others.....**GREEN**
- Flaps**.....**SET**  
**Doors/Windows**.....**SECURE**  
**Landing Light/Strobes**.....**ON**  
 Do not turn lights on until ready to roll onto the runway for takeoff.

**AFTER TAKEOFF/CLIMB**

- Power**.....**SET**  
**Engine Instruments**.....**MONITOR**  
 Oil Temp. & Press.....**IN GREEN**  
 Instrument Air.....**IN GREEN**  
 RPM.....**CHECK**  
 Ammeter.....**CHARGING**

**CRUISE**

- Power**.....**SET**  
**Mixture**.....**LEAN A/R**  
**Engine Instruments**.....**MONITOR**  
 Oil Temp. & Press.....**IN GREEN**  
 Instrument Air.....**IN GREEN**  
 RPM.....**CHECK**  
 Ammeter.....**CHARGING**
- Landing Light**.....**OFF**

**APPROACH**

**Radio**.....**SET**  
 ATIS..... **OBTAIN**  
**Flight Instruments**..... **CHECK/SET**  
 Altimeter ..... **SET**  
 D.G..... **SET**  
**Engine Instruments**..... **MONITOR**  
 Oil Temp. & Press..... **IN GREEN**  
 Instrument Air ..... **IN GREEN**  
 RPM..... **CHECK**  
 Ammeter..... **CHARGING**  
**Mixture**.....**ENRICH A/R**  
**Electric Fuel Pump**..... **ON**  
**Fuel Selector**..... **Fullest Tank**  
**Landing Light**..... **ON**

**BEFORE LANDING**

**Belts** .....**(B)**..... **SECURE**  
**Boost Pump** .....**(B)**..... **ON**  
**Carburetor Heat**.....**(C)**..... **CHECK**  
**Gas**.....**(G)**..... **FULLEST TANK**  
 Check fuel gauges.  
**Undercarriage**.....**(U)**..... **FIXED**  
**Mixture**.....**(M)**..... **RICH**  
**Power**.....**(P)**..... **A/R**

**AFTER LANDING**

**Flaps** ..... **UP**  
**Elevator Trim** ..... **SET T/O**  
 The above items are done each time a touch and go is performed.  
 The below items are for full stop landings.  
**Transponder** ..... **STBY**  
**Electric Fuel Pump**..... **OFF**  
**Landing Light/Strobes** ..... **OFF**

**SHUTDOWN**

**Avionics** ..... **OFF**  
**Throttle** ..... **CLOSE**  
**Mixture**..... **IDLE CUT-OFF**  
 After engine stops:  
**All Switches**..... **OFF**  
**Magnetos**..... **OFF**  
**Control Lock**..... **INSTALL**  
**Postflight Inspection**..... **COMPLETE**  
 The postflight inspection should consist of a walk around to ensure that nothing has happened to the aircraft since boarding.

Chapter 3: **ABNORMAL PROCEDURES (EXPANDED)**

For the purpose of the abnormal checklist, all items outlined by a box must be memorized and able to be executed from memory. In an emergency situation, the checklist serves as a backup.

**ABNORMAL CHECKLIST**

**ENGINE FIRE - START**

<b>Starter</b> .....	<b>CONTINUE CRANKING (Max 30 sec)</b>
<b>Mixture</b> .....	<b>IDLE CUT-OFF</b>
<b>Throttle</b> .....	<b>OPEN</b>
<b>Electric Fuel Pump</b> .....	<b>OFF</b>
<b>Fuel Shutoff Valve Handle</b> .....	<b>OFF</b>

**ELECTRICAL FIRE**

<b>All Electrical Switches</b> .....	<b>OFF</b>
<b>Vents</b> .....	<b>OPEN</b>
<b>Heat</b> .....	<b>OFF</b>

**ENGINE FAILURE**

<b>Airspeed</b> .....	<b>TRIM FOR 76</b>
<b>Landing Spot</b> .....	<b>SELECT</b>
<b>Fuel Selector</b> .....	<b>SWITCH TANKS</b>
<b>Electric Fuel Pump</b> .....	<b>ON</b>
<b>Mixture</b> .....	<b>RICH</b>
<b>Throttle</b> .....	<b>1/4 - 2" OPEN</b>
<b>Carburetor Heat</b> .....	<b>HOT</b>
<b>Magnetos</b> .....	<b>CHECK LEFT and RIGHT, THEN BOTH</b>
<b>Primer</b> .....	<b>IN and LOCKED</b>

**FORCED LANDING**

<b>Radio</b> .....	<b>SET/MAYDAY</b>
<b>ELT</b> .....	<b>ON</b>
<b>Transponder</b> .....	<b>7700</b>
<b>Fuel Shutoff Valve Handle</b> .....	<b>OFF</b>
<b>Mixture</b> .....	<b>IDLE CUT-OFF</b>
<b>Throttle</b> .....	<b>CLOSE</b>
<b>Carburetor Heat</b> .....	<b>COLD</b>
<b>Magnetos</b> .....	<b>OFF</b>

<b>Flaps</b> .....	<b>A/R</b>
<b>Master Switch</b> .....	<b>OFF</b>
<b>Seat Belts</b> .....	<b>SECURE</b>
<b>Door</b> .....	<b>AJAR</b>

**ELECTRICAL FAILURE**

<b>Alternator</b> .....	<b>OFF then ON</b>
<b>Ammeter</b> .....	<b>CHECK</b>
If ammeter shows a charge:..... Continue Flight	
If ammeter shows a discharge:	
<b>Alternator</b> .....	<b>OFF</b>
<b>Nonessential Electrics</b> .....	<b>OFF</b>
<b>Land As Soon As Practical</b>	

Chapter 4: **TRAFFIC PATTERNS/VFR AIRWORK**

**I. TRAFFIC PATTERN** -Takeoff and Landing

**A. Traffic Pattern - Normal Takeoff and Landing**

- Complete Before Takeoff checklist.
- Takeoff with 10 degrees of flaps
- Advance throttle smoothly to full power.
- Check engine instruments.
- Maintain directional control on the runway centerline.
- Rotate at 55 knots.
- Liftoff at 65 knots.
- Pitch to  $V_Y$  attitude; airspeed 76 knots.
- Maintain a straight track over the extended runway centerline until within 300 feet of traffic pattern altitude.
- Turn with medium bank (30 degrees) to crosswind leg or depart the traffic pattern.

**Crosswind leg**

- Maintain perpendicular ground track to the runway.
- Scan for traffic.
- Turn with medium bank (30 degrees) to downwind leg within 2 - 1 mile of the runway.

**Normal Landing - Downwind leg**

- Level off at pattern altitude.
- Establish speed of 100 knots, power about 2000 rpm.
- Perform Before Landing checklist (BCGUMP).

**Abeam touchdown**

- Reduce power to 1500 rpm (AR).
- Set flaps to  $10^\circ$  (AR).
- Establish speed of 90 knots.
- Turn with medium bank (30 degrees) to base leg when approximately  $45^\circ$  from touchdown.

**Base leg**

- Maintain perpendicular ground track to the runway.
- Set flaps to  $25^\circ$  (AR).
- Establish 80 knots.
- Scan final approach for traffic.
- Turn to final approach.

**Final approach**

- Set flaps to  $40^\circ$  (AR).
- Establish stabilized approach at 70 knots.
- Align the longitudinal axis of the airplane with the runway centerline.
- Touchdown smoothly on the main landing gear at the approximate stalling speed with no drift and the airplane over the runway centerline.
- Keep the nosewheel off the runway with aft control wheel as long as practical.
- Complete the After Landing checklist.

**B. Crosswind Takeoff and Landing**

- Same procedure as a Normal Takeoff.
- Turn ailerons into the wind.
- Maintain directional control on the runway centerline.
- Add 5 knots to the rotation speed for crosswinds greater than 10 knots.
- Establish a positive rate of climb.
- Remove the slip and return to normal flight.

**Crosswind Landing**

- Same procedure as a Normal Landing.
- Establish sideslip on final approach. Drift is controlled with aileron and the heading with rudder.
- Touchdown on the upwind main wheel first.

**C. Go-Around**

- Make timely decision to discontinue the approach.
- Push carburetor heat off.
- Apply full power.
- Pitch to  $V_Y$  attitude.
- Retract flaps to  $25^\circ$ .
- Establish a positive rate of climb and retract flaps.

**D. Short-Field Takeoff and Landing**

- Complete Before Takeoff checklist.
- Extend Flaps to 25 degrees
- Utilize the full length of runway.
- Hold brakes and advance throttle to full power.
- Check engine instruments.
- Release brakes.
- Maintain directional control on the runway centerline.
- Hold elevator in a neutral position.
- Liftoff at 64 knots.
- Pitch to  $V_X$  attitude ( 64 knots) until clear of obstacles.
- Pitch to  $V_Y$  attitude ( 76 knots).

**Short-Field Landing**

- Same procedure as a Normal Landing using a slower airspeed on final approach resulting in a steeper angle of descent.
- Fly final approach at 60 knots.
- Reduce power to idle while rotating the aircraft to the landing attitude.
- Touchdown smoothly at approximate stalling speed.
- Apply maximum braking without lockup, with full aft control wheel

**E. Soft-Field Takeoff and Landing**

- Complete Before Takeoff checklist.
- Extend flaps to 25°.
- Hold control wheel full aft during taxi and start of takeoff roll.
- Continue rolling from taxiway into the takeoff roll.
- Apply full power smoothly.
- Check engine instruments.
- Maintain directional control on the runway centerline.
- Raise nosewheel off the runway as soon as possible.
- Liftoff as soon as possible and remain in ground effect.
- Accelerate to  $V_X$  (64 knots) in ground effect.
- Pitch for  $V_Y$  (72 knots) and climb out.
- Retract flaps in stages.

**Soft-Field Landing**

- Same procedure as a Normal Landing.
- Maintain slight power on during the flare.
- Touchdown smoothly, power as required.
- Hold control wheel aft to keep the nose wheel off the runway as long as practical.

**II. VFR AIRWORK**

**A. Pre-Maneuver Checklist**

This checklist is to be performed prior to beginning any maneuver.

**(H)eight ..... A/R**

All maneuvers (except ground reference maneuvers) must be performed at an altitude that allows recovery above 1500 feet AGL.

Ground reference maneuvers will be performed at 600-1000 feet AGL.

**(E)ngine Instruments ..... CHECK**

**(L)ocation ..... NOTE**

Note location to ensure that maneuvers are being performed in a safe area away from towns, built-up areas, and airspace. Be within gliding distance of an emergency landing site. In the event of an emergency, be able to notify ATC of your location before landing.

**(L)ookout ..... COMPLETE**

Two 90 degree turns or one 180 degree turn with no more than 30 degrees of bank will be executed to be certain that the airspace is clear. Always maintain a constant lookout for traffic.

**B. Training Cruise Flight**

- Perform Cruise checklist.
- Establish 100 knots.
- Set power as required.

**C. Steep Turns**

- Establish 100 knots, power as required.
- Roll into a 360° turn at an angle of bank of 45° (50° for commercial).
- Apply power and trim as required to maintain 100 knots and altitude.
- Begin rollout 20° before the initial heading is reached.
- Roll into a 360° turn at an angle of bank of 45° (50° for commercial) in the opposite direction.
- Begin rollout 20° before the initial heading is reached.
- Recover to training cruise flight.

**D. Maneuvering During Slow Flight**

- Carburetor Heat Check.
- Reduce power to 1500 rpm.
- Extend flaps below 102 knots.
- Adjust pitch to establish MCA.
- Adjust power to maintain altitude.
- Perform maneuvers as specified.
- Retract flaps in stages.
- Adjust pitch to establish MCA.
- Adjust power to maintain altitude.
- Perform maneuvers as specified.
- Increase throttle to full power.
- Recover to training cruise flight.

**E. Power-Off Stall**

- Carburetor Heat Check.
- Reduce power to 1500 rpm.
- Extend flaps below 102 knots.
- Reduce power to idle.
- Establish a stabilized descent.
- Increase pitch to a stall attitude.
- Announce the imminent stall.
- Execute a full stall.
- Recover promptly by decreasing pitch attitude.
- Apply full power.
- Level the wings.
- Minimize the loss of altitude.
- Retract flaps to 25°.
- Accelerate to 64 knots.
- Retract flaps to 10°.
- Accelerate to 76 knots (V<sub>Y</sub>).
- Retract flaps.
- Recover to training cruise flight.

**F. Power-On Stall**

- Carburetor Heat Check.
- Reduce power to 1500 rpm.
- Slow to 75 knots.
- Increase pitch to stall attitude.
- Apply full power.
- Carburetor Heat off.

- Announce the imminent stall.
- Execute a full stall.
- Recover promptly by decreasing pitch attitude.
- Level the wings.
- Minimize the loss of altitude.
- Accelerate to 76 knots (V<sub>Y</sub>).
- Recover to training cruise flight.

**G. Rectangular Course**

- Establish 100 knots, power as required.
- Altitude at 1000 ft. AGL (pattern altitude).
- Enter the maneuver 45° to the downwind leg.
- Maintain a ground track parallel to and within 2 mile of the course.
- Apply adequate wind drift correction.
- Use 30° of bank in the turns.
- Exit at the point of entry.
- Reverse the course.

**H. S-Turns Across a Road**

- Establish 100 knots, power as required.
- Select a line aligned 90° to the wind.
- Enter the maneuver downwind.
- Cross the line and roll into a 45° bank to the left.
- Maintain a constant radius through 180° of turn with varying bank.
- Cross the line and roll into a bank to the right with the same radius.
- Maintain a constant radius through 180° of turn with varying bank.

**I. Turns Around a Point**

- Establish 100 knots, power as required.
- Enter the maneuver downwind approximately 1/4 mile from the point.
- Cross the line and roll into a 45° bank to the left.
- Maintain a constant radius through 720° of turn with varying bank and wind drift correction.
- Reverse the course.

### **J. Eights-On-Pylons**

- Determine the Pivotal Altitude (PA = GS knots<sup>2</sup>/11.3).
- Select suitable pylons.
- Establish 100 knots, power as required.
- Enter the maneuver downwind at a 45° angle at the PA.
- Maintain the line-of-sight reference line on the pylon with minimum longitudinal movement.

### **K. Chandelle**

- Establish 100 knots, power as required.
- Select a 90° reference point.
- Establish a 30° bank turn.
- Apply full power and increase pitch through 90° of turn.
- Hold the pitch attitude and slowly level the wings through the last 90° of turn.
- Complete the maneuver at 180° of turn, airspeed at 60 knots.
- Reduce pitch to resume straight and level flight at the final altitude.

### **L. Lazy 8**

- Establish 100 knots, power as required.
- Select a 90° reference point.
- Enter a coordinated climbing turn towards the reference point.
- At 45° of turn, attain 15° of bank and the maximum pitch up.
- At 90° of turn, attain 30° of bank, level pitch attitude, 60 knots.
- At 135° of turn, attain 15° of bank and the maximum pitch down.
- At 180° of turn, attain straight and level, initial altitude and 90 knots.
- Begin turn in the opposite direction and attain the same standards.

## Chapter 5: **INSTRUMENT FLIGHT**

### **I. BASIC INSTRUMENT MANEUVERS**

#### **A. Intercepting and Tracking Radials**

- Reset the directional gyro to the magnetic compass.
- Tune in the frequency of the radio navigation facility.
- Identify the facility.
- Determine the orientation of the aircraft to the facility.
- Set the OBS to the desired course.
- Determine the intercept angle (20°-90°).
- Turn to intercept the radial.

#### **B. Intercepting and Tracking Bearings**

- Reset the directional gyro to the magnetic compass.
- Tune in the frequency of the radio navigation facility.
- Identify the facility.
- Continuously monitor the facility identification.
- Determine the orientation of the aircraft to the facility.
- Determine the intercept angle (20°-90°).
- Turn to intercept the bearing.

## II. IFR APPROACHES

### Approach Preparation

Perform during the descent and prior to the Initial Approach Fix.

- Complete the Approach Checklist.
- S- select.
- T- tune.
- I - identify.
- M- markers.
- E- entry.
- E- estimate wind drift.
- Perform the Approach Briefing.
  - 1- Type of approach
  - 2- Runway in use (airport)
  - 3- Initial approach altitude (if applicable)
  - 4- Inbound and outbound headings
  - 5- Final approach heading/altitude
  - 6- MDA/DH
  - 7- Missed approach procedure

Example of an IFR Approach Briefing:

Practice ILS  
 Runway 31 Peoria  
 Initial  $\geq$  2400 ft  
 Outbound 126/Inbound 306  
 Final 2400 ft, heading 306  
 Decision Height 850 ft  
 Missed Approach: Climb straight ahead 1300 ft then LT 2400 ft  
 direct PIA

- Set Nav1 on ILS frequency and OBS to final approach course.
- Set Nav2 on ILS frequency or for a cross fix.
- Set both Navs alternate frequencies for the Missed Approach.

At the **Initial Approach Fix:**

- Slow to 100 knots, power as required.
- Perform BCGUMP.

At the **Final Approach Fix:**

- Time - Start time for the approach.
- Turn - Turn to intercept inbound course.
- Transition - Airspeed, power as required.
- Twist - Adjust the radios for navigation.
- Talk - Call ATC, final approach fix inbound.

At the **Missed Approach Point:**

- Apply full power.
- Pitch to  $V_Y$  (76 knots).
- Retract flaps.
- Report Missed Approach to ATC.
- Fly the missed approach procedure.

### Chapter 6: WEIGHT AND BALANCE

<b>USEFUL LOAD</b> .....	1558.72
<b>CG / ARM</b> .....	87.64
<b>MOMENT</b> .....	136608.75

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**SECTION 6  
WEIGHT AND BALANCE**

**6.7 WEIGHT AND BALANCE DETERMINATION FOR FLIGHT**

- (a) Add the weight of all items to be loaded to the basic empty weight.
- (b) Use the Loading Graph (Figure 6-13) to determine the moment of all items to be carried in the airplane.
- (c) Add the moment of all items to be loaded to the basic empty weight moment.
- (d) Divide the total moment by the total weight to determine the C.G. location.
- (e) By using the figure of item (a) and item (d) (above), locate a point on the C.G. range and weight graph (Figure 6-15). If the point falls within the C.G. envelope, the loading meets the weight and balance requirements.

	Weight (lbs)	Arm Aft Datum (Inches)	Moment (In-Lbs)
Basic Empty Weight	1590.0	87.5	139125
Pilot and Front Passenger	340.0	80.5	27370
Passengers (Rear Seats)*	340.0	118.1	40154
Fuel (48 Gallon Maximum)	280.0	95.0	26600
Baggage (200 Lbs. Maximum)*		142.8	
Ramp Weight (2558 Lbs. Maximum) Fuel allowance for engine start, taxi, and run-up	-8	95.0	-760
Total Loaded Airplane (2550 lbs. Normal, 2130 lbs. Utility Maximum)	2550.0	91.5	233249

The center of gravity (C.G.) of this sample loading problem is at 91.5 inches aft of the datum line. Locate this point (91.5) on the C.G. range and weight graph. Since this point falls within the weight - C.G. envelope, this loading meets the weight and balance requirements.

IT IS THE RESPONSIBILITY OF THE PILOT AND AIRCRAFT OWNER TO INSURE THAT THE AIRPLANE IS LOADED PROPERLY.

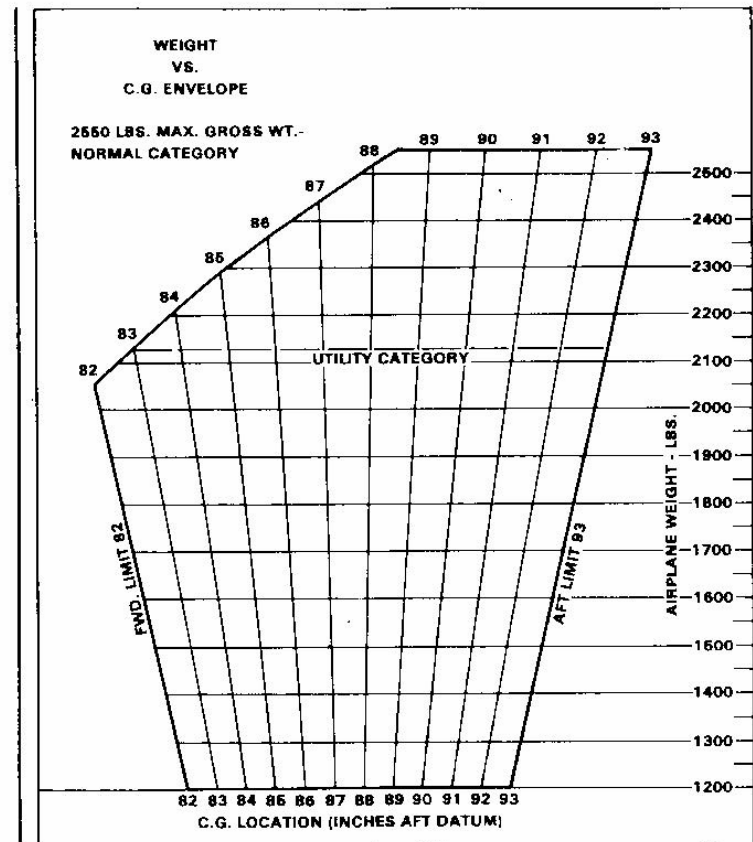
\*Utility Category Operation - No baggage or rear passengers allowed.

**SAMPLE LOADING PROBLEM (NORMAL CATEGORY)**

Figure 6-9

**SECTION 6  
WEIGHT AND BALANCE**

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**C.G. RANGE AND WEIGHT**

Figure 6-15