Normal procedures

▲ = Equipment as installed on airplane

Report to dispatch at least 1 hour prior to your scheduled departure time.
Check aircraft squawk book.

APPROACHING THE AIRCRAFT

Nearby obstacles ..... CHECK
Flap position..... NOTE

The flap position should be noted before boarding the airplane. The flaps must be placed in the up position before they will be locked and support weight on the step.

General aircraft condition ..... CHECK

Check the overall condition of the aircraft. Specifically note the condition of the tires, look for wet spots, etc.

Surfaces ..... CLEAR

Check that all movable surfaces are clear and can be moved without hitting obstacles.

Antennas ..... CHECK

Check presence and condition of following antennas: COM, NAV, transponder, ELT.

PRELIMINARY INSPECTION

Be careful not to use the top of the instrument panel as a support when entering or exiting the aircraft through the front cabin door

Hobbs meter..... CHECK

Compare with previous hobbs time in the aircraft log book. If a discrepancy exists, contact dispatch and make an entry in the aircraft log book (e.g. maintenance engine runup). Check the remaining time or next maintenance inspection due time. In case certain equipment is placarded out of service on the designated area on the instrument panel, look for possible messages from the maintenance department in the aircraft squawk book.

Overhead switch panel..... ALL SWITCHES OFF
Center switch panel ..... ALL SWITCHES OFF
Parking brake ..... SET

To set the parking brake: pull the parking brake lever, then depress the knob attached to the left side of the handle, then release the brake lever.

Battery master switch ..... ON
Fuel gauges ..... CHECK QUANTITY

Flaps .....EXTEND
Battery master switch .....OFF
Trims.....NEUTRAL

Check full control travel of rudder trim and stabilator trim, then – in preparation for the walk-around – set in neutral position.

Pitot-static system..... DRAIN

The purpose is to remove any moisture that has accumulated in the lines. Both the pitot and static lines can be drained through separate drain valves located on the left lower side of the fuselage interior.

Sunscreens, pitot cover, tie-downs, chocks REMOVED

Put sunscreens in their dedicated bag. Put pitot cover in the flight gear bag. If the aircraft's own tie-down ropes and wheel chocks were used, put in the flight gear bag.

Tow bar.....PROPERLY STOWED
Required equipment ..... ON BOARD

The following equipment must be on board and may never be removed from the aircraft:
- Flight organizer containing: aircraft flight time log book.
- Bag containing sunscreens for the windows.
- Flight gear bag containing: fuel tester, flip-up training glasses or hood, flash light, wheel chocks, pitot cover, 3 tie-down ropes, first aid kit.
- Elevator cushion.
- Fire extinguisher.
- FAA approved airplane flight manual (POH) including MEL.
- FAA required documents: certificate of airworthiness, airplane registration.
- Binder with SATC documents (standing orders, accident reporting plan, etc).

Baggage door(s)..... SECURE

Verify the door is closed and secure but do not lock the door with the key.

WALK-AROUND

To prevent damage to the paint on the wing, only 1 person at a time may be on the walk path on the right wing

RIGHT WING

Surface condition..... CLEAR OF ICE, FROST, SNOW

Carefully check both upper and lower surfaces. Never put objects on top of a wing.

Flap and hinges ..... CHECK

Check flap position, no excessive play, and hinges secured and free of cracks, pushing rod.

Aileron, hinges and freedom of movement ..... CHECK

Check full control travel, no excessive dead band, and hinges secured and free of cracks, pushing rod.

Static wicks.....CHECK SECURE
Wing tip and lights ..... CHECK

Light cover clean and not broken. CAUTION! Never lean on a wing tip.

Fuel tank ..... CHECK SUPPLY VISUALLY
Fuel filler cap..... SECURE
Fuel tank vent..... CLEAR
Fuel tank drain ..... DRAIN

Use the fuel tester to drain a full cup of fuel before the first flight of the day and after each refueling. Check for contamination (water or sediment) and proper fuel (the color must be blue for avgas 100LL or green for avgas 100L). When draining any amount of fuel, care should be taken to ensure that no fire hazard exists before starting engine.

Main gear strut.....PROPER INFLATION

4.5 inches. No leaks. Remove tar deposits from gear strut.

Tire ..... CHECK

Tires should be taken out of service when they have one or more flat spots. Generally, a single flat spot or skid burn does not expose the carcass body and the tire may remain in service, unless severe unbalance is reported by the crew. Small cuts are acceptable, if they do not protrude into the tire carcass. Cuts in the side wall are not acceptable. Shallow chevron-shaped cuts across the tread of a tire pose no problem, they are caused by landing on a grooved concrete runway. As long as the tread does not wear down into the body plies of the carcass, the basic strength of the tire is not affected. To provide traction during wet runway operation, operators should replace their tires when the tread depth reaches 1/32 inch = 0.79 mm.

Brake, block and disc..... CHECK

When checking the brakes: verify that there is even wear on the disc, no scratches, no grease, and no leaks near the brake line.

Fresh air inlet ..... CLEAR

NOSE SECTION

General condition ..... CHECK

Look for oil and fluid leakage.

Windshield.....CLEAN

The windshield must be clean to assure an unobstructed view. Take care not to scratch the windshield.

Cowling ..... SECURE
Propeller and spinner..... CHECK

Check no detrimental nicks, cracks or dents in propeller blades. WARNING! Even in the OFF position a magneto may fire in case of bad contact. Always treat a propeller as potentially dangerous. Do not take position underneath a propeller at any time.

Air inlets..... CLEAR

Engine baffle seals..... CHECK
Nose gear strut.....PROPER INFLATION

3.25 inches. No leaks. Remove tar deposits from gear strut.

Tire ..... CHECK

Tires should be taken out of service when they have one or more flat spots. Generally, a single flat spot or skid burn does not expose the carcass body and the tire may remain in service, unless severe unbalance is reported by the crew. Small cuts are acceptable, if they do not protrude into the tire carcass. Cuts in the side wall are not acceptable. Shallow chevron-shaped cuts across the tread of a tire pose no problem, they are caused by landing on a grooved concrete runway. As long as the tread does not wear down into the body plies of the carcass, the basic strength of the tire is not affected. To provide traction during wet runway operation, operators should replace their tires when the tread depth reaches 1/32 inch = 0.79 mm.

Engine oil ..... CHECK

Normal oil quantity is 7 quarts. Do not refill when oil quantity is above 6 quarts. When oil quantity is at 6 quarts, add 1 full oil can (1 quart).

Oil dipstick .....PROPERLY SEATED
Engine oil cap..... SECURE
Fuel strainer ..... DRAIN

The fuel strainer valve is located on the bottom left side of the engine compartment. When draining any amount of fuel, care should be taken to ensure that no fire hazard exists before starting engine.

LEFT WING

Surface condition..... CLEAR OF ICE, FROST, SNOW

Carefully check both upper and lower surfaces. Never put objects on top of a wing.

Fresh air inlet ..... CLEAR
Main gear strut.....PROPER INFLATION

4.5 inches. No leaks. Remove tar deposits from gear strut.

Tire ..... CHECK

Tires should be taken out of service when they have one or more flat spots. Generally, a single flat spot or skid burn does not expose the carcass body and the tire may remain in service, unless severe unbalance is reported by the crew. Small cuts are acceptable, if they do not protrude into the tire carcass. Cuts in the side wall are not acceptable. Shallow chevron-shaped cuts across the tread of a tire pose no problem, they are caused by landing on a grooved concrete runway. As long as the tread does not wear down into the body plies of the carcass, the basic strength of the tire is not affected. To provide traction during wet runway operation, operators should replace their tires when the tread depth reaches 1/32 inch = 0.79 mm.

Brake, block and disc..... CHECK

When checking the brakes: verify that there is even wear on the disc, no scratches, no grease, and no leaks near the brake line.

Fuel tank drain ..... DRAIN

Use the fuel tester to drain a full cup of fuel before the first flight of the day and after each refueling. Check for contamination (water or sediment) and proper fuel (the color must be blue for avgas 100LL or green for avgas 100L). When draining any amount of fuel, care should be taken to ensure that no fire hazard exists before starting engine.

Fuel tank vent..... CLEAR
Fuel tank ..... CHECK SUPPLY VISUALLY
Fuel filler cap..... SECURE
Pitot head..... PITOT AND STATIC HOLES CLEAR
Wing tip and lights ..... CHECK

Light cover clean and not broken. CAUTION! Never lean on a wing tip.

Aileron, hinges and freedom of movement ..... CHECK

Check full control travel, no excessive dead band, and hinges secured and free of cracks, pushing rod.

Flap and hinges ..... CHECK

Check flap position, no excessive play, and hinges secured and free of cracks, pushing rod.

Static wicks.....CHECK SECURE

FUSELAGE

General condition ..... CHECK
Empennage ..... CLEAR OF ICE, FROST, SNOW

Carefully check both upper and lower surfaces.

Stabilator and freedom of movement ..... CHECK

Check full control travel, no excessive dead band, and hinges of both stabilator and trim tab secured and free of cracks. With stabilator neutral, check trim tab in neutral position.

Rudder ..... CHECK

Do not move the rudder.

Trim tabs..... CHECK
Fin strobe ..... CHECK

MISCELLANEOUS

With battery master switch ON, then OFF

For night flight only:
Interior lighting .....ON AND CHECK
Exterior lighting.....ON AND CHECK
All lighting switches .....OFF

Pilot's discretion:
Pitot heat..... ON
Pitot heat annunciator ..... EXTINGUISHED
Pitot head.....CHECK WARM

Care should be taken when an operational check of the heated pitot head is performed. The unit becomes very hot. Ground operation should be limited to 3 minutes to avoid damaging the heater elements.

Pitot heat ..... OFF
Pitot heat annunciator ..... ILLUMINATED

Pilot's discretion:
Stall warning detectors .....LIFT
Stall warning horn ..... ACTUATED

COCKPIT PREPARATION

Seats ..... ADJUSTED AND LOCKED

The seating position should be the same for both VFR and IFR flights. Most students tend to sit too high (wanting to see over the nose of the aircraft) and too close to the instrument panel (making scanning instruments more difficult). The instructor should advise the student of the correct position. Verify that the seat is locked by moving it forward or back until you hear the lock catch and the seat doesn't move.

Seat belts and harness ..... LOCKED

Use of shoulder harness is mandatory. With the shoulder harness fastened and adjusted, a pull test of its locking restraint feature should be performed. Seat belts of empty seats will be fastened and crossed over the seat bottom (and the shoulder harness secured) to prevent control interference or passenger injury during flight in turbulent air, very common in Arizona. Fasten belts before closing cockpit door. Do not unlock seat belts during flight or taxi.

Flight controls ..... PROPER OPERATION

"Control wheel left, left aileron up, right aileron down. Control wheel right, right aileron up, left aileron down. Control wheel aft, stabilator up. Control wheel forward, elevator down. Left pedal. Right pedal." Aileron and stabilator deflections can be visually checked from the pilot's seat. Do not push in the rudder pedals too hard against system resistance.

Battery master switch ..... ON
Alternator ..... ON
Magnetic compass ..... CHECK

Check magnetic compass for normal reading, no bubbles in the fluid and no leaks. Deviation chart present.

Following now are the checks of the 5 panels.

1/ ANNUNCIATOR PANEL

Day/night switch .....AS REQUIRED
Press to test switch..... TEST

When the button is depressed all annunciator panel lights should illuminate. After releasing the switch, verify that illumination of some of these lights reflects actual system status, rather than being an indication of system malfunction.

2/ PILOT'S INSTRUMENT PANEL

ELT switch ..... ARM

The switch is normally in ARM position. Moving the switch to ON will activate the transmitter. A warning light located above the switch will alert you whenever the ELT is activated. If for any reason a test transmission is necessary, the test transmission should be conducted only in the first 5 minutes of any hour and limited to 3 audio sweeps. 3 sweeps of the emergency tone and an illuminated warning light indicate a normally functioning unit. The warning light must illuminate during the first 3 second test period. If it does not illuminate, a problem is indicated. Should the ELT be activated inadvertently it can be reset by positioning the switch to ON then immediately to ARM.

Auxiliary vacuum system ..... CHECK

Verify VAC OFF light illuminated. Turn ON auxiliary vacuum pump and verify AUX ON light is illuminated. Verify vacuum system suction 4.8 to 5.2. Turn OFF auxiliary vacuum pump and verify AUX ON light extinguished. Due to the electrical power requirement of the auxiliary vacuum pump this check should be limited in duration to a few seconds.

Compass error may exceed 10 degrees when auxiliary vacuum system is in operation. For maximum service life, avoid continuous non-emergency operation of the auxiliary vacuum pump.

▲Trim switch ..... ON

Clock..... SET
Airspeed.....ZERO

Check TAS scale free to move. Align TAS with IAS. (Ex. 120 over 120)

Attitude indicator ..... CHECK

No obvious damage. Align the airplane symbol with the 90 degree markings.

Altimeter ..... CHECK

Set altimeter setting and crosscheck with airfield elevation. Add .30 inches. Check needle moving, and indication + 300 feet. Reset to altimeter setting without overshoot and check airfield elevation again.

Vacuum .....ZERO
Turn coordinator ..... CHECK

Check airplane symbol in neutral position and ball according to aircraft lateral inclination. Power off indicator out of view.

DG..... CHECK

▲HSI ..... CHECK

Check OBS and heading bug free to move. Set heading bug on runway heading. Set OBS on first radial to be intercepted. If none of the above, set both on runway heading.

VSI..... CHECK

Maximum error 200 feet per minute up or down.

▲ADF/RMI..... CHECK

Check compass rose free to move.

VOR indicator ..... CHECK

3/ ENGINE PANEL

Oil temperature .....NORMAL
Oil pressure and fuel pressure .....ZERO
EGT .....NORMAL
RPM.....ZERO

4/ RADIO PANEL

Radio master switch ..... ON
Audio panel..... SET

Intercom mode switch: ALL. Transmitter rotary switch: select COM 1 => green COM 1 receive light automatically illuminated.

▲GPS ..... SET

When the GPS is loading up it is performing an internal self test. Cross check the effective dates and press 'ENT' to accept. For VFR flights the database does NOT have to be current! After this the GPS presents the defection test to make sure the needles and flags of the HSI/OBS are indicating properly. Press 'ENT' to accept. Use the left rotary knob (C/V) to set the required COM and NAV frequencies.

ATIS .....COPY
VFR or IFR clearance .....COPY

Obtain from ATC or instructor.

Radios and navaids..... SET

Use the VFR or simulated IFR clearance (each item chronologically) as a guideline to set radios and navaids. COM: Ground frequency. NAV: first VOR required by clearance, set first radial on VOR indicator.

Transponder..... ASSIGNED CODE or1200 & STANDBY

Test the transponder and set it to the assigned code (by ATC) or 1200 and STANDBY.

Radio master switch .....OFF

5/ LOWER INSTRUMENT PANEL

Fuel selector..... LOWEST TANK

Engine start and taxi will be performed using fuel from the LOWEST tank. Engine runup and takeoff will be performed using fuel from the FULLEST tank.

Alternate static source .....NORMAL

The control valve is located below the left side of the instrument panel.

Dimmer controls..... SET

The panel lights are adjusted by 3 rheostats labeled switch lights, panel lights and avionics. Day flight: OFF. Night flight: as required. At this time also adjust the rheostats adjacent the overhead panel.

Throttle ..... ¼ INCH OPEN
Mixture..... FULL RICH
Friction lever ..... ADJUST
Carburetor heat .....FULL COLD
Circuit breakers .....IN
Cabin and windshield air .....AS REQUIRED
▲Air conditioner ..... CHECK

Turn the air conditioner control switch to ON and the fan switch to LOW => the AIR COND DOOR annunciator light will turn on, thereby indicating proper air conditioner condenser door actuation. Turn the air conditioner control switch to OFF and the fan switch to the center (OFF) position => the AIR COND DOOR annunciator light will go out, thereby indicating the air conditioner condenser door is in the up position. If the AIR COND DOOR light does not respond as specified above, an air conditioner system or indicator bulb malfunction is indicated and further investigation should be conducted prior to flight.

Flaps .....RETRACT
Briefing.....PERFORM

The briefing will include:

- Pilot flying.
- Type of takeoff (normal or short field) and power setting (full throttle).
- Flap setting (0 or 25).
- Vr and Vclimb.
- Engine failure procedure.
- VFR departure procedure or simulated IFR departure procedure. Crosscheck radio setup (point to radios, instruments and altitude reminder pointer while reading departure procedure).

Example VFR:
"I fly. Normal takeoff, full throttle. Flaps 0. Vr 65, Vclimb 75. In case of engine failure, lower the nose, speed 75 clean, 70 with flaps, land straight ahead or slightly left or right. VFR departure procedure: left closed traffic, 2500 feet."

Example simulated IFR:
"I fly. Normal takeoff, full throttle. Flaps 0. Vr 65, Vclimb 75. In case of engine failure, lower the nose, speed 75 clean, 70 with flaps, land straight ahead or slightly left or right. IFR departure procedure: left heading 300, climb to 4500 feet."

Brief your passengers about seat belts (keep fastened during whole flight), doors (how to open in an emergency), sick sacs (must ask for them before it's too late!) and the intercom (explain that, in order to respect the sterile cockpit concept during critical phases of flight, you may isolate them from the crew).

Read the before start check list

ENGINE START

Starting with external power source: perform procedure with Piper Information Manual page 4-8 (read-and-do)

Brakes ..... HOLD

Although parking brake is set, keep feet on the brakes during engine start.

Strobe lights ..... FIN

CAUTION! Only the red fin strobe light may be used at this time. The white wing tip strobe lights should not be used on the ground.

Left Magneto ..... ON
Fuel pump ..... ON
Propeller area ..... CLEAR

Check the area around the airplane. Open the window momentarily and shout **"Prop clear!"**.

Starter ..... ENGAGE

If engine does not start within 10 seconds, prime and repeat starting procedure. If engine is hot, open throttle ½ inch instead of ¼ inch. If engine is flooded: start with throttle FULL OPEN, fuel pump OFF and mixture IDLE CUT-OFF. Advance mixture and retard throttle when engine starts. CAUTION! Do not pump throttle.

To prevent starter damage, limit starter cranking to 30 second periods. If the engine does not start within that time, allow a cooling period of 2 minutes before engaging starter again.

CAUTION!

DO NOT RE-ENGAGE THE STARTER IMMEDIATELY AFTER RELEASING IT, AS THIS MAY DAMAGE THE STARTER MECHANISM.

Throttle ..... 800 RPM
Right Magneto ..... ON
Throttle ..... 1000 RPM
Oil pressure ..... CHECKED

If positive oil pressure is not indicated within 30 seconds, stop the engine. In cold weather it will take a few seconds longer to get a positive oil pressure indication.

Fuel pump ..... OFF

After switching off the electric fuel pump, verify fuel pressure indicator to confirm that the engine driven fuel pump is providing fuel pressure.

Vacuum ..... CHECKED

4.8 to 5.2. If low, slightly increase engine power and check vacuum increasing.

Attitude indicator ..... CHECK

Verify horizon is leveling.

▲DG ..... SET

Align with magnetic compass.

Alternator output..... CHECKED

Check digital ammeter. Do not attempt flight if there is no indication of alternator output. If output very low, slightly increase engine power and check load increasing. If output very high, the starter may have failed to disengage. If this is confirmed on the annunciator panel (START ENGAGE light), switch off the battery master switch and shut down the engine.

Radio master switch ..... ON

▲HSI/RMI ..... SLAVED AND X-CHECKED

Check that the slaved compass system is on SLAVE, and the deviation indicator shows ZERO. Verify that compass roses on HIS and ADF/RMI are synchronized, and that the heading flag on the HSI is out of view. Slaved compass cards should be within 6 degrees of the magnetic compass reading.

▲GPS ..... SET

Press 'ENT' twice to accept the databases dates and the HSI/OBS test. Both actions were already performed in the before start flow and do not need to be repeated, but 'ENT' has to be pressed twice to resume normal GPS operation.

▲Electric trim ..... TEST

ELECTRIC TRIM

- Actuate LEFT side of split switch in both directions => trim wheel should not move.
- Actuate RIGHT side of split switch in both directions => trim wheel should not move.
- Press TRIM INTER switch => you should be unable to operate electric trim.
- Set trim for takeoff.

Read the after start check list

TAXI

▲Air conditioner and fan.....AS REQUIRED

DO NOT OPERATE THE AIR CONDITIONING IF THE AIRCRAFT IS NOT MOVING.

Do not operate the air conditioner with the fan switch in the center (OFF) position; the fan must be on HIGH or LOW during air conditioner operation. If the system is not operating in 5 minutes, turn the system OFF until the fault is corrected. Do not operate the air conditioning when the aircraft is not moving. This will cause overpressure in the air conditioning system which will eventually lead to failure of the complete air conditioning system.

Observe wing clearances when taxiing near buildings or other stationary objects. Avoid holes and ruts when taxiing over uneven ground. Do not operate the engine at high RPM when taxiing over ground containing loose stones, gravel or any loose material that may cause damage to the propeller blades.

During taxi, if the LOW BUS VOLTAGE annunciator illuminates, increase engine RPM (if possible) to retain adequate battery charging.

Mixture..... LEAN

Taxiing is best done with the mixture partially leaned to avoid spark plug fouling. Avoid prolonged idling at low RPM as this practice may result in fouled spark plugs.

Area .....FREE

Check the area around the airplane. Call out **"Left is free, free right?"** Instructor will reply **"Right is free".** In case of solo flights, the call out will be **"Left is free, right is free"** after having verified both sides.

Brakes ..... CHECK

To release the parking brake, pull back on the brake lever to disengage the catch mechanism and allow the handle to swing forward.

Perform the brake check immediately after the aircraft starts rolling. Apply light and even pressure on both pedals. It is <u>not</u> necessary to bring the airplane to a complete stop; as soon as it becomes apparent that normal brake pressure is available, release the brakes again. Ask the pilot in the right seat to check the brakes on the right side.

Archers have rudder pedals that are suspended from a torque tube which extends across the fuselage. Pilots should become familiar with the proper positioning of their feet on the rudder pedals so as to avoid interference with the torque tube when moving the rudder pedals or operating the toe brakes.

Taxi turns can be made using rudder pedal motion only. Brakes are only needed to slow the taxi speed or when maneuvering in close quarters on the parking ramp. On the ground and in flight the pilot's feet should be in an almost horizontal position – heels on the floor, toes on the lower part of the rudder pedal – sliding the feet up on the rudder pedals only when required to apply brakes.

Flight instruments ..... CHECKED

In a left turn: **"Turning left** (=> check airplane symbol in turn coordinator going left)**, skidding right** (=> check ball in turn coordinator going right)**, DG and compass decreasing** (=> check numbers on DG and magnetic compass decreasing)**, horizon level** (=> check attitude indicator level)**"**.

In a right turn: **"Turning right, skidding left, DG and compass increasing, horizon level"**.

▲With HSI/RMI installed:
In a left turn: "**Turning left** (=> check airplane symbol in turn coordinator going left), **skidding right** (=> check ball in turn coordinator going right), **R** … (=> check numbers on ADF/RMI compass card decreasing) … **M** … (check numbers on HSI compass card decreasing) … **I** (check numbers on magnetic compass decreasing), **horizon level** (=> check attitude indicator level), **ADF tracking** (=>ADF needle should be pointing and turning in approximated direction to the station)".

In a right turn: "**Turning right, skidding left, R-M-I increasing, horizon level, ADF tracking**".

The checks need to be done only once, in a left turn or a right turn, outside congested area.

GROUND CHECK

Nose wheel ..... STRAIGHT

To prevent high side loads on the nose wheel. Wind 10 knots or more: turn the aircraft into the wind to avoid abnormal propeller loads and to ensure engine cooling during runup. Wind less than 10 knots: park the aircraft in any convenient position where prop wash cannot cause damage to an aircraft behind you. To prevent a collision in case of inadvertent brake release during engine runup, never point your propeller in the direction of another airplane, and never “hook” your wing “into” the wing of another airplane parked ahead of you! When no runup area available, perform the ground check on the taxiway with the aircraft at an angle of approximately 30 degrees referenced to the taxiway centerline.

Parking brake ..... SET

To set the parking brake: pull the parking brake lever then depress the knob attached to the left side of the handle, then release the brake lever. Even with parking brake set, keep your feet on the brakes during engine runup. During runup divide your attention inside-outside. Be alert for skidding brakes.

▲Air conditioner ..... OFF

DO NOT OPERATE THE AIR CONDITIONING IF THE AIRCRAFT IS NOT MOVING.

Fuel selector .....FULLEST TANK

Engine runup and takeoff will be performed using fuel from the FULLEST tank. The electric fuel pump should be ON when switching tanks (even on ground).

Oil temperature .....RISING

Warm-up the engine at 800 to 1200 RPM for not more than two minutes in warm weather and four minutes in cold. Avoid prolonged Idling at low RPM, as this practice may result in fouled spark plugs.

Mixture..... FULL RICH
Area behind aircraft.....FREE

Always clear the area behind the aircraft before starting runup! Call out **"Area behind free."**

Throttle ..... 2000 RPM
Carburetor heat .....CHECK OPERATION

Carburetor heat should be checked prior to takeoff to be sure the control is operating properly and to clear any ice which may have formed during taxiing. Avoid prolonged ground operation with carburetor heat on as the air is unfiltered. Engine RPM should decrease no more than 75 RPM when carburetor heat is on. If no or excessive RPM decrease is observed, investigate and have the cause corrected prior to flight. If RPM increases after selecting carburetor heat on, ice was present in the carburetor venturi and is in the process of melting.

Magnetos ..... CHECK

Drop off on either magneto should not exceed 175 RPM and the difference between the magnetos should not exceed 50 RPM. Operation on 1 magneto should not exceed 10 seconds. If RPM does not drop, flight is not permitted as a hot magneto exists (faulty grounding of one side of the ignition system). If excessive drop is noted, try to clear the spark plugs from carbon deposits by leaning the mixture (at 2000 RPM) to peak RPM, and then rechecking the ignition. Company procedure: no full throttle runups in the runup area allowed! The RPM drops observed during the check should be announced at loud voice.

Vacuum, engine instruments, alternator output ..... CHECKED

Verify parameters in previously stated limits at this higher engine RPM.

Throttle ..... IDLE THEN 1000 RPM

Engine not faltering at idle RPM.

Mixture..... LEAN

Waiting at the holding point is best done with the mixture partially leaned to avoid spark plug fouling just prior to takeoff. In case of prolonged waiting (> 15 minutes), even with mixture leaned, it is recommended to repeat the run up procedure.

DO NOT OPERATE THE AIR CONDITIONING IF THE AIRCRAFT IS NOT MOVING.

BEFORE TAKEOFF

Fuel pump ..... ON

The electric fuel pump must be ON to prevent loss of power during takeoff should the engine driven fuel pump fail.

Magnetos ..... ON
Mixture.....AS REQUIRED
Carburetor heat ..... FULL COLD
▲Air conditioner ..... OFF

To ensure maximum climb performance the air conditioner must be turned OFF manually prior to takeoff to disengage the compressor and retract the condenser door. Although these 2 actions would occur both automatically when a full throttle position is selected, it is company policy to

always confirm system status with switch position. Pilots are not allowed to rely on the throttle micro switch to deactivate the air conditioner.

Trims..... SET

Normal stabilator trim position: slightly AFT. Normal rudder trim position: slightly RIGHT.

Flaps .....AS REQUIRED

Normal takeoff: flaps 0. Short field takeoff: flaps 25.

Short briefing .....PERFORM

The short briefing will include:
- Type of takeoff.
- Initial heading and altitude.
- **"Confirmed?"**. The instructor answers **"Confirmed"** (or amends the instructions as necessary).

Example:
"Normal takeoff, heading 330, 5500 feet, confirmed?" – "Confirmed".

Annunciator panel ..... CHECKED

Press-to-test switch: TEST. When the button is depressed all annunciator panel lights should illuminate. After releasing the switch all annunciator lights, except PITOT HEAT, should remain extinguished.

Doors ..... CLOSED AND SECURED

To prevent damage to doors pilots must be thoroughly familiar with the correct procedures for opening and closing doors, especially the correct sequence of engaging and disengaging latches. Never slam a door closed. Do not put your body weight on the upper part of the doors.

Read the before takeoff check list

LINING UP ON THE RUNWAY

When ATC clearance (if required) received and acknowledged to line up on the runway, FIRST release the parking brake and start to roll to the runway, THEN perform the following actions (while taxiing).
To release the parking brake, pull back on the brake lever to disengage the catch mechanism and allow the handle to swing forward.
Fast taxi turns immediately prior to takeoff should be avoided to prevent unporting fuel feed lines.

Approach.....FREE

Visually clear the final approach area before entering the runway. Call out: **"Approach free**".

Landing lights..... ON
Strobe lights ..... ON

With the rocking-switch in the ON position, besides the red fin strobe, both white wing tip strobes will be on also.

Transponder..... ALT
Pitot heat.....AS REQUIRED

Use of the pitot heat should be the pilot's judgment based on the weather conditions.

Mixture..... FULL RICH
Altimeter ..... CHECK

Read threshold elevation from Jeppesen or other airport chart and call out: **"Threshold elevation .... feet"**. This check may be done while taxiing out of the runup area. Altimeter should not differ more than 60 feet from threshold elevation at sea level and 80 feet at 5000 feet (pressure altitude).

DG..... RUNWAY HEADING
▲HSI ..... RUNWAY HEADING

This is a runway + compass check. Read runway heading from Jeppesen or other airport chart and call out: **"Runway heading .... degrees"**. Adjust DG if required. Maximum difference allowed between published runway heading and magnetic compass is 6 degrees.

TAKEOFF

Before applying engine power for takeoff, **top the timer**,call out: **"Takeoff, I have control"**. The instructor will confirm: **"You have control".** Then apply takeoff power.

The engine is warm for takeoff when throttle can be opened fully without engine faltering (backfiring or skipping) and without a reduction in engine oil pressure. It is important to check takeoff power early in the takeoff run. Any sign of rough engine operation or sluggish acceleration is good cause for discontinuing the takeoff. In high and hot conditions, it may be necessary to lean the mixture during a static run up before brake release to obtain full takeoff power and smooth engine operation. Static RPM at maximum throttle setting should not be below 2240 RPM (sea level at ISA). Call out: **"Power checked".**

Check airspeed increasing. Call out: **"Speed checked".**

At Vr, call out **"65 knots, rotate"** and rotate smoothly to BA 7 degrees. Avoid abrupt, premature or late rotation.

Accelerate to normal climb speed (= 75 KIAS initially) unless there are obstacles immediately ahead of the aircraft. The best angle of climb speed – approximately 65 KIAS – is the speed to maintain when still below obstacle height.

AFTER TAKEOFF

Fuel pump .....AS REQUIRED

Switch OFF when climbing through 1000 feet AGL. After switching off the electric fuel pump, verify fuel pressure indicator to confirm that the engine driven fuel pump is providing fuel pressure. Leave ON when remaining in the traffic pattern.

Landing lights.....AS REQUIRED

When out of the traffic pattern and congested area, switch off the landing lights. Do not switch off the landing lights when remaining in the traffic pattern or transiting controlled airspace.

Flaps .....RETRACTED

Perform the after takeoff check list

CLIMB

Enroute climb speed is 85 KIAS. Accelerate to this speed when climbing through 1000 feet AGL for better forward speed, engine cooling, and increased visibility over the nose during the climb.

Climb with mixture full rich. Lean only if necessary for smooth engine operation.

When the full throttle position is not used, and with the air conditioner ON, a decrease in rate of climb of as much as 100 FPM can be expected.

CRUISE

Standard company power setting for cruise is 2400 RPM, corresponding with 65 % power. The resulting cruising speed will be approximately 115 KTAS with air conditioner OFF, and 110 KTAS with air conditioner ON. Fuel flow will be approximately 9.5 GPH.

The mixture should be leaned during cruising operation above 5000 feet density altitude and at pilot's discretion at lower altitudes when 75 % power or less is being used. If any doubt exists as to the amount of power being used, the mixture should be in the full rich position. Best economy mixture is obtained by moving the mixture control aft until PEAK EGT is reached. Best power mixture is obtained by leaning to PEAK EGT and then enriching until the EGT is 100 degrees F rich of the peak value.

The electric fuel pump should be turned ON before switching tanks, and should be left ON for a short period thereafter. In order to keep the airplane in best lateral trim during cruising flight the fuel should be used alternately from each tank. Company policy is to switch tanks every 5 gallons (= 30 minutes). The electric fuel pump should be normally OFF so that any malfunction of the engine driven fuel pump is immediately apparent.

In case carburetor ice is encountered apply full carburetor heat.

▲Air conditioner and fan.....AS REQUIRED

Do not operate the air conditioner with the fan switch in the center (OFF) position; the fan must be on HIGH or LOW during air conditioner operation. If the system is not operating in 5 minutes, turn the system OFF until the fault is corrected.

With the air conditioner ON, the decrease in range may be as much as 32 nautical miles for the 48 gallon capacity.

Perform following cruise check list every 5 to 10 minutes:

Vacuum, engine instruments, alternator output ..... CHECK

Verify parameters in previously stated limits.

DG..... SET

Align with magnetic compass.

Fuel gauges ..... CHECK QUANTITY

Check fuel remaining. Small airplane fuel indicators are very unreliable! It is your responsibility to keep track of your fuel status.

Carburetor heat .....AS REQUIRED

Carburetor heat should be applied during 5 to 10 seconds to clear any ice which may have formed. If RPM increases after selecting carburetor heat on, ice was present in the carburetor venturi and is in the process of melting.

DESCENT – APPROACH

In case carburetor ice is encountered during descent apply full carburetor heat.

Altimeter setting for the destination airport set:

Fuel pump ..... ON
Fuel selector .....FULLEST TANK
Landing lights..... ON
Altimeter ....._____SET

Set local altimeter setting for the destination airport. Complete answer to this check list item is: **"(altimeter setting) set".**

DG..... SET

Align with magnetic compass.

▲HSI/RMI ..... SLEVED AND X-CHECKED

Check that the slaved compass system is on SLAVE, and the deviation indicator shows ZERO. Verify that compass roses on HIS and ADF/RMI are synchronized, and that the heading flag on the HSI is out of view. Slaved compass cards should be within 6 degrees of the magnetic compass reading.

Vacuum, engine instruments, alternator output ..... CHECKED

Verify parameters in previously stated limits.

Annunciator panel ..... CHECKED

Press-to-test switch: TEST. When the button is depressed all annunciator panel lights should illuminate. After releasing the switch all annunciator lights should remain extinguished. The pitot heat light will vary depending on usage of pitot heat. Pitot heat light will be illuminated if the pitot heat is off. In that case the check list item reply will be **"1 light – Pitot heat"**.

Perform the descent – approach check list

LANDING

Turning base:
Mixture..... FULL RICH
Carburetor heat .....AS REQUIRED

Flaps .....AS REQUIRED

Air conditioner ..... OFF

The air conditioner must be turned OFF manually before the landing approach in preparation for a possible go-around. It is company policy to always confirm system status with switch position. Pilots are not allowed to rely on the throttle micro switch to deactivate the air conditioner when initiating a go-around.

Perform the landing check list

SHORT FINAL

Carburetor heat .....IF ON – OFF

In preparation for a possible go-around. Full throttle operation with carburetor heat on can cause engine detonation.

TOUCHDOWN

Maintain desired approach flight path with BA. Maintain desired airspeed (65 KIAS) with power.

Reduce power to idle during the flare out. After ground contact hold the nose wheel off as long as possible. Braking - if needed - is most effective when back pressure is applied to the control wheel, putting most of the aircraft weight on the main wheels.

When the head wind component exceeds 15 knots, or when the crosswind component exceeds 10 knots, as well as in gusty wind conditions, the approach will be flown at a slightly higher than normal speed (70 KIAS) with partial flaps (25 degrees).

AFTER LANDING

Runway vacated, aircraft stopped behind hold short line:

Fuel pump ..... OFF

After switching off the electric fuel pump, verify fuel pressure indicator to confirm that the engine driven fuel pump is providing fuel pressure.

Landing lights..... OFF
Strobe lights ..... FIN

CAUTION! Only the red fin strobe light may be used at this time. The white wing tip strobe lights should not be used on the ground.

Transponder..... STBY
Pitot heat.....IF ON - OFF
Mixture..... LEAN
Flaps .....RETRACTED

The flaps must be placed in the UP position for the flap step to support weight. Passengers should be cautioned accordingly.

▲Air conditioner and fan.....AS REQUIRED

Do not operate the air conditioner with the fan switch in the center (OFF) position; the fan must be on HIGH or LOW during air conditioner operation. If the system is not operating in 5 minutes, turn the system OFF until the fault is corrected.

DO NOT OPERATE THE AIR CONDITIONING IF THE AIRCRAFT IS NOT MOVING.

Read the after landing check list

SHUTDOWN

Do not taxi aircraft into parking space over tie down ropes or chains. Stop aircraft in front or behind parking space on the yellow line.

Parking brake ..... SET

To set the parking brake: pull the parking brake lever then depress the knob attached to the left side of the handle, then release the brake lever. WARNING! Do not set the parking brake when brakes are overheated.

▲Air conditioner and fan ..... OFF
Center switch panel ..... ALL SWITCHES OFF
Throttle ..... 1000 RPM
Mixture..... IDLE CUT-OFF
Magnetos ..... OFF

Wait until propellers have come to a full stop to switch off the magnetos. Switching off magnetos prematurely leaves a combustible mixture in the engine cylinders, creating a potentially hazardous situation for people approaching the airplane outside.

Overhead switch panel..... ALL SWITCHES OFF

From right to left.

Read the shutdown check list

MOORING

Do <u>not</u> loop a seat belt or harness through the control wheel

Hobbs meter..... CHECK

Fill in aircraft flight time log book in flight organizer. Leave on board.

Parking brake ..... RELEASE

To release the parking brake, pull back on the brake lever to disengage the catch mechanism and allow the handle to swing forward.

Push aircraft backward or pull aircraft forward into parking space using the tow bar for steering. Do not turn the nose gear beyond its steering radius in either direction as this will result in damage to the nose gear and steering mechanism.

Tow bar .....STOW PROPERLY
Sunscreens, pitot cover, tie-downs, chocks .. INSTALL

<u>TIE-DOWN ROPES</u>
Required when aircraft is left unattended longer than for a normal crew change. If no tie-down ropes available on ramp, use the aircraft's own tie-down ropes (in flight gear bag). Secure tie-down ropes to the wing tie-down rings and to the tail skid at approximately 45 degrees angles to the ground. Use bowline knots, square knots or locked slip knots. Do not use plain slip knots.
<u>PARKING BRAKE</u>
Required when aircraft is not tied down but with the crew around. WARNING! Do not set the parking brake when brakes are overheated.
<u>WHEEL CHOCKS</u>

Required when aircraft is not tied down and left unattended. If no wheel chocks available at FBO, use the aircraft's own wheel chocks (in flight gear bag).

Seat belts and harness ..... LOCK

Seat belts of all seats will be fastened and crossed over the seat bottom (and the shoulder harness secured).

Personal belongings and trash bag ..... REMOVE
Doors .....CLOSE AND SECURE

Lock with key.

If required: fill in strip in aircraft squawk book.
If required: fill in ASR
Return aircraft key to dispatch and perform post-flight duties.
If required: close flight plan (a VFR flight plan must always be closed by the pilot, even at a controlled airport)

NOTES REGARDING THE NORMAL PROCEDURES

1. Through flight = same day, same airplane, same crew (team of instructor + student[s]).
Through flight WALK-AROUND = fuel, oil and tires only.
Through flight GROUND CHECK = magnetos only.

2. All cockpit flows must be read out loud, except AFTER TAKEOFF, DESCENT-APPROACH and LANDING which will be done quietly (although the check list will still be read out loud).

Normal check list

WARNING!

This check list is not a read-and-do check list for the Archer. This check list should only be used by a knowledgeable crew using SATC's cockpit flows.

BEFORE START CHECK LIST

Read as confirmation of preceding flow.

Parking brake ..... SET
Fuel quantity ..... CHECKED
Pitot cover, tie-downs, chocks ..... REMOVED
Tow bar ..... STOWED
Walk-around ..... COMPLETED
Cockpit preparation ..... COMPLETED
Seats ..... ADJUSTED AND LOCKED
Seat belts and harnesses ..... LOCKED
Battery master switch ..... ON
Alternator ..... ON
Fuel selector ..... LOWEST TANK
Throttle ..... ¼ INCH OPEN
Mixture ..... FULL RICH
Carburetor heat ..... FULL COLD
Circuit breakers ..... IN
Radio master switch ..... OFF

"Before start check list completed"

AFTER START CHECK LIST

Read as confirmation of preceding flow

Oil pressure ..... CHECKED
Vacuum ..... CHECKED
Alternator output ..... CHECKED
▲HSI/RMI ..... SLAVED & X-CHECKED

"After start check list completed"

BEFORE TAKEOFF CHECK LIST

Read as confirmation of preceding flow

Flight instruments ..... CHECKED
Engine instruments ..... CHECKED
Fuel selector ..... FULLEST TANK
Fuel pump ..... ON
Magnetos ..... ON

Mixture..... SET
Carburetor heat .....FULL COLD
▲Air conditioner ..... OFF
Trims..... SET
Flaps ..... SET
Annunciator panel ..... CHECKED
Doors ..... CLOSED AND SECURED

"Before takeoff check list completed"

AFTER TAKEOFF CHECK LIST

<u>Perform</u> by memory

Fuel pump .....AS REQUIRED
Landing lights.....AS REQUIRED
Flaps .....RETRACTED

"After takeoff check list completed"

DESCENT – APPROACH CHECK LIST

<u>Perform</u> by memory

- *These items only when remaining in the pattern*

Fuel pump ..... ON
Fuel selector.....FULLEST TANK
Landing lights..... ON
Altimeter ..... SET
- *DG..... SET*
  ▲HSI/RMI .....SLAVED & X-CHECKED
- *Vacuum, engine instruments, alternator output ..... CHECKED*
- *Fuel selector .....SWITCH TANK IF NEEDED*

Annunciator panel ..... CHECKED

"Descent – approach check list completed"

LANDING CHECK LIST

<u>Perform</u> by memory

Mixture..... FULL RICH
Carburetor heat .....AS REQUIRED
Flaps .....AS REQUIRED
▲Air conditioner ..... OFF

"Landing check list completed"

AFTER LANDING CHECK LIST

<u>Read</u> as confirmation of preceding flow

Fuel pump ..... OFF

Landing lights.....OFF
Strobe lights.....FIN
Transponder ..... STBY
Pitot heat.....IF ON – OFF
Flaps .....RETRACTED

"After landing check list completed"

SHUTDOWN CHECK LIST

Read as confirmation of preceding flow

▲Air conditioner and fan.....OFF
Center switch panel ..... ALL SWITCHES OFF
Overhead switch panel..... ALL SWITCHES OFF

"Shutdown check list completed"

Emergency procedures

Piper Information Manual pages 3-9 → 3-16

Emergency check list

WORKMETHOD FOR ABNORMAL / EMERGENCY SITUATIONS

1/ State the facts ..... "FACTS are ____"
2/ Perform boxed items (if any) by memory ..... STATE & DO MEMORY ITEMS
3/ State the short term plan ..... "SHORT TERM PLAN is ___"
4/ Read boxed items (if any) as confirmation ..... READ & CONFIRM
5/ Perform non-boxed items in read-and-do ..... READ & DO NON-MEMORY ITEMS
6/ Perform the normal checklist (if applicable) ..... NORMAL CHECKLIST
7/ State the long term plan ..... "LONG TERM PLAN is ___"

For certain failures – such as an engine failure close to the ground – it may not be possible to perform all steps of the abnormal management procedure described above. In that case at least the first 3 steps (up to and including the short term plan) will be performed.

ENGINE FAILURE DURING FLIGHT

Glide ..... ESTABLISH
Suitable landing field ..... LOCATE

Conditions permitting, check for cause of power loss:

Magnetos ..... ON
Fuel pump ..... ON
Fuel selector ..... SWITCH TO TANK CONTAINING FUEL
Mixture ..... FULL RICH
Carburetor heat ..... ON
Engine instruments ..... CHECK

If these actions do not restore power, prepare for power-off landing.

Time permitting, communicate:

Transponder 7700
Mayday call ..... TRANSMIT TO ATC OR ON CTAF OR ON 121.5

Time permitting, secure airplane:

▲Air conditioner ..... OFF, ANNUNCIATOR CHECK
Battery master switch ..... OFF
Magnetos ..... OFF
Throttle ..... CLOSE
Mixture ..... IDLE CUT-OFF
Fuel selector ..... OFF
Seat belts and harnesses ..... LOCK

Altitude permitting:

Fly ..... SFA POWER OFF PATTERN

Engine failure immediately after takeoff:

Land ..... STRAIGHT AHEAD OR SLIGHTLY LEFT OR RIGHT

LOSS OF FUEL PRESSURE

Fuel pump.....ON
Fuel selector..... CHECK ON TANK CONTAINING FUEL

LOSS OF OIL PRESSURE

LAND AS SOON AS POSSIBLE
PREPARE FOR POWER OFF LANDING

HIGH OIL TEMPERATURE

LAND AT NEAREST SUITABLE AIRPORT
PREPARE FOR POWER OFF LANDING

ENGINE FIRE DURING START

Starter.....CONTINUE CRANKING ENGINE

If engine starts:

Throttle.....1500 RPM FOR A FEW MINUTES
Engine..... SHUTDOWN

If engine fails to start:

Starter.....CONTINUE CRANKING ENGINE
Throttle.....FULL OPEN
Mixture .....IDLE CUT-OFF
Fuel pump..... OFF
Fuel selector..... OFF
Fire extinguisher .....OBTAIN
Battery master switch ..... OFF
Alternator..... OFF
Magnetos ..... OFF
Fire ..... Extinguish

FIRE IN FLIGHT

Source of fire .....DETERMINE

Electrical fire – Smoke in aircraft cabin
LAND AS SOON AS POSSIBLE

Battery master switch ..... OFF
Alternator..... OFF
Overhead cabin vents ..... OPEN
Cabin and windshield air ..... OFF

Engine Fire
LAND AS SOON AS POSSIBLE

Fuel selector..... OFF
Throttle.....CLOSE
Mixture .....IDLE CUT-OFF
Fuel pump..... OFF
Cabin and windshield air ..... OFF

PREPARE FOR POWER OFF LANDING

ELECTRICAL FAILURES

Anytime bus voltage is below 25V DC, the low bus voltage annunciator will be illuminated.

Alternator inop annunciator illuminated:

Alternator output ..... CHECK

If alternator output = 0:

Alternator..... OFF
Electrical loads ..... REDUCE TO MINIMUM
Alternator circuit breaker .....RESET or PULL-RESET
Alternator.....ON

If these actions do not restore electrical power:

Alternator..... OFF

LAND AT THE NEAREST SUITABLE AIRPORT
ANTICIPATE COMPLETE ELECTRICAL FAILURE

ELECTRICAL OVERLOAD

Alternator over 20A above known electrical load:

Alternator.....ON
Battery master switch ..... OFF

If alternator loads are reduced:

Electrical loads ..... REDUCE TO MINIMUM

If alternator loads are NOT reduced:

Alternator..... OFF
Battery master switch .....ON

LAND AT THE NEAREST SUITABLE AIRPORT
ANTICIPATE COMPLETE ELECTRICAL FAILURE

DOOR OPEN IN FLIGHT

Speed..... BELOW 87 KIAS
Overhead cabin vents .....CLOSE
Window ..... OPEN
Upper latch ..... LATCH
Armrest..... PULL
Side latch ..... LATCH
Upper latch ..... LATCH

CARBURETOR ICING

Carburetor heat.....ON
Mixture ..... ADJUST FOR MAXIMUM SMOOTHNESS

ENGINE ROUGHNESS

Carburetor heat.....ON

If engine is still running rough after 1 minute:

Carburetor heat..... FULL COLD
Mixture ..... ADJUST FOR MAXIMUM SMOOTHNESS
Fuel pump.....ON
Fuel selector..... SWITCH TANKS
Engine instruments .....CHECK
Magnetos ..... CHECK LEFT ONLY – THEN RIGHT ONLY

If operation is satisfactory on 1 magneto, continue on that magneto at reduced power and full rich mixture to closest suitable airport

PREPARE FOR POWER OFF LANDING

LOSS OF RADIO COMMUNICATIONS

Intercom .....CHECK VOLUME & SQUELCH
COM radio.....CHECK VOLUME & SQUELCH
Headset.....CHECK VOLUME (IF APPLICABLE)
Audio panel.....CHECK FOR PROPER SELECTIONS
Circuit breakers..... IN
Headset connectors..... CHECK PROPERLY PLUGGED IN
PTT switch .....CHECK CONDITION
Frequency .....RECYCLE
COM radio..... SWITCH OFF and ON AGAIN
Other headset (if available)..... TRY
Hand mike ..... TRY
Other ATC frequency..... TRY
Alternator output .....CHECK FOR ALTERNATOR FAILURE

If these actions do not restore radio communications, apply LOSS OF COMMUNICATIONS PROCEDURE