12. CHECKLISTS

Introduction

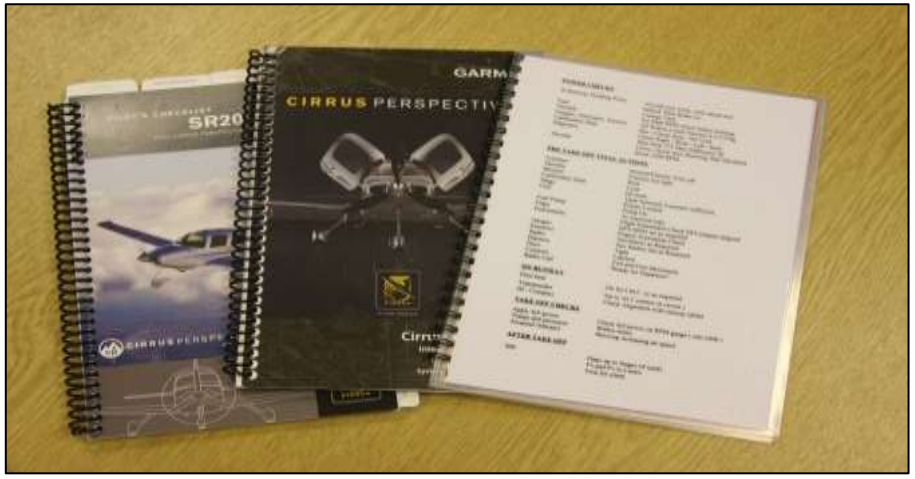
Checks form a very important part of any instrument flying skill. Pilots will obviously have encountered checks as part of their basic PPL training but these are entirely inadequate for IF. This is one aspect of your training which costs nothing but personal effort. If you don't really thoroughly learn your checks at the outset and understand their purpose in prompting action and forward planning at every stage of a flight you are shooting yourself in the foot. You flight training will not progress as smoothly as it should and you will waste expensive flight, simulator and instructor time

Use of checklists

There will be a check list specific to your aircraft type laid out in the POH or flight manual by the manufacturer. In reality almost all light singles and twins can use the same checklist except for some speeds and a very limited number of systems such as emergency gear lowering which tends to be type specific. Unfortunately over the years check lists used in skill tests have become rather bloated and typically trickle down from the airline environment where they were designed for use in a two crew cockpit. They operate in a challenge response mode and are really not very suitable for single pilot operation. Often the checks happen in a slightly different order according to circumstances and it is necessary to run a list more than once to be sure all items have been completed. The following generic list has been developed for use at Rate One Aviation. It has a very limited number of mnemonics which cover the essentials in every aircraft including the larger more complex twins. The idea is to complete the actions as and when needed and then run the checklist from memory to confirm that nothing has been forgotten. If for whatever reason an item is still outstanding keep repeating the list till every item has been mentally ticked off. By all means adopt some other mnemonic or system. However you simply must cover all these point and be able to run each list effectively and quickly at the appropriate point of each flight. You simply cannot allow the checklist to use up mental bandwidth. Their purpose is to conserve your mental capacity other tasks.

For items like the power checks or the pre take off checks you can read directly from the aircraft specific checklist or if you are experienced on type use a flow going round the cockpit in a logical manner considering and setting each piece of equipment. Then you can use the list after the event to confirm nothing has been missed.

The emergencies involve some memory items and some response which are just common sense. As and when time allows the list can be consulted to make sure nothing has been missed. The list should definitely be consulted for unusual events such as emergency gear lowering or cross feeding when the sequence of actions may not be obvious and in general there is no need to act with haste.



For some reason at the end of a flight pilots are desperate to raise the flaps before leaving the runway. This is completely unnecessary and potentially disastrous if you grab the gear handle by mistake. Don't do anything until you have cleared the runway and come to a halt. Any talk of improving braking efficiency by getting more weight on the wheels is nonsense at least in this class of aircraft operating out of IFR airfields.

12. CHECKLISTS: GENERIC CHECKLISTS

A generic checklist, suitable for any light aircraft to be used for a skill test follows. There is also a list of mnemonics which cover all the requirements for checks while in the air. Items in green are only applicable to MEP aircraft.

Taxi Checks

As soon as the aircraft moves you should ensure your brakes are working and the instructor or examiner will also check their brakes. Perhaps at this point perhaps at some other suitable point while taxying make sure you have full rudder travel available. Learn the following sequence for the instrument checks while taxying.

Turn to the right numbers increasing, turn right skid left, AH level VSI zero and the ADF is tracking. Turn left numbers decreasing and the other checks are the same as for the right turn.

This is an important check both in the skill test and in the real world. Do you want to take off into a low cloud ceiling and find some critical instrument is not working? You establish a reasonable brisk turn and see that the compass and any heading referenced instruments like the HSI and RMI as behaving as you would expect. If you turn right from any heading you expect to see a bigger number. If you turn left the numbers get smaller.

The turn coordinator should show an appropriate turn direction with the skid ball going in the opposite direction. Each and every AH should be level. The VSI should obviously be zero and the ADF needle, previously selected to an NDB on the airfield, should track and indicate sensibly.

Make the turn brisk enough to really show the indication described but not to the extent of risking going off the taxiway. On some airfields with a long taxi to the active runway you will get a good chance to do this check along the normal taxi route.

These checks are an excellent simple moment to impress your examiner. You are getting your skill test off to a good start doing something which will stand you in good stead throughout your flying career.

After Take Off

The priority is to establish in the climb, get your scan going and then retract the under carriage and flaps. It is good practice to pause slightly between the gear and the flap both to minimise trim changes and to avoid a single high load on the electrical system as both the motors involved impose a high load as they come into operation.

The next priority is to navigate appropriately. This may or may not involve a navigation aid that has not been identified on the ground. At some safe altitude, typically 1000 ft. there are after take-off actions such as switching off a fuel pump or turning off lights. There is likely to be a frequency change and possibly a change in the barometric setting if you are cleared to a flight level.

As soon as these immediate actions are out of the away you can run **BUFFPEAR** which is both the after take-off check and the pre landing check. **B**rakes, **U**ndercarriage, **F**laps, **F**uel **P**ower, **E**ngine **A**ltimeters and **R**adios. (You can add lights if they are in your SOP and that makes it **BUFFPEARL.**) It's a check list not a 'to do' list. Thus when you run the list you will almost certainly have touched the brakes and retracted the gear and the flaps. (However you will not be the first pilot to have been distracted and failed to do one of these apparently obvious tasks.)

P is a prompt to consider power. Any consideration of power involves three knobs or levers - the throttle, the prop control and the mixture. Maybe you come back to a cruise climb or perhaps you maintain a full power climb if terrain or your clearance warrants this. Perhaps you ease off maximum RPM to reduce noise or perhaps your SOP allows for some leaning in the climb. The important thing is the P for Power reminds you to either do something sensible or confirm that it has already been done.

E prompts you to scan the engine instruments for appropriate temperature and pressure indications.

A for Altimeters should almost always be a confirmation. As soon as you are cleared to an altitude or a flight level or for whatever other reason are given a new pressure setting it should be dialled in immediately. **R** for Radios is a prompt to consider every electronic device on the aircraft. Work round the panel in a logical systematic way. Is there something appropriate selected on every box. Always think in terms of SID. Select a navaid, identify it and then display it. It is ever so easy to select say an ILS frequency, listen to the aural identification and then fail to set the HSI correctly. If you have a glass panel and this is done automatically it can still go very wrong as, according to your geographical position, the avionics may select the opposite runway to the one you were expecting. In the climb be sure that you have identified the aids you are using and it does not harm to re identify the primary aid in use. Finally you switch off the landing light if this is part of your SOP.

You might need to run this mnemonic, two or three times, before you can mentally check off every item. However you don't need to make hard work of this. It can be done in a few seconds. If you are really sure that you have dealt with brakes, undercarriage and flaps don't laboriously look or touch each item just move onto the first item in the list that needs further consideration. However don't abandon the full list. That is a way of ensuring that the one item you missed is the one you have not reconsidered.

Top of the Climb

This may be the first time you have run **FATRED**, however, in a long climb it will be appropriate to run it every couple of thousand feet once all the BUFF PEARL items have been dealt with.

Fuel **A**ltimeter **T**hreats **R**adios **E**ngine **D**irection

Fuel is quick glance at the gauges or totalizer for gross errors. Maybe you left a fuel cap off and fuel is streaming away. This is likely to be an appropriate point to lean the mixture to conserve fuel. **A**ltimeter is just to reconfirm that you have an appropriate pressure setting and normally should require no action.

Threats are contextual. If it's cold ice is a likely threat so this should have been checked at several points in the climb as the temperature dropped. However be intelligent. Is it a convective day? Are your passengers OK? Are you now well above the MSA. Is there anything about the aircraft that seems unusual or is making you even slightly uneasy? **R**adio means a check on something appropriate on every box selected, identified and displayed. There are almost certainly radio frequencies and navigation aids that are no longer needed and the next likely frequency can be selected. **E**ngine is another glance at the temperature and pressures perhaps with the addition of closing cowl flaps if no equipped. The final **D** is for DI or direction. If you still have a manual DI then it needs to be reset against the compass from time to time. This is getting to be a less and less likely chore in modern aircraft but the **D** is now for Direction. A gross error check will confirm that you are going where you expected to go and that you are organised to navigate the next planned leg.

FAT RED should be run every 10 or 15 minutes in real world flying. In the skill test it can be run every time you have nothing to do. An extra ident never goes amiss. There may be a real need to consider the fuel state, switch tanks, and note the tank change or whatever.

Initial Approach Checks

These seem to sometimes be mixed up with final approach checks. The initial checks take place as far away from your destination as is reasonable and effective. Choose a low workload point in the flight. This will probably be as soon as you can get the destination weather and confirm the runway in use but before you start your decent. We add **WASP** to the standard FAT RED.

W is weather which means getting the ATIS or asking ATC for the current destination weather. We are mainly interested in knowing the runway in use especially if light winds mean that this was uncertain at the time of departure. Secondly we want to ensure that other conditions are within our operating limits. Be proactive here. If you cannot receive an ATIS don't hesitate to ask ATC at a point that is convenient to you. You can be sure that if you do this you will be offered the weather at a time when you are already fully occupied.

A in this situation is not altimeters but altitude. Are you aware of the MSA and comfortable that any descent clearance is safe? Be aware that in some situations you can be given a clearance which implies that terrain clearance is your own responsibility.

S is to slow down and have an estimate for the beacon. In many training aircraft slowing is academic but it is certainly not academic in more advanced aircraft where it is quite possible to get into a situation where descending and reducing speed at the same time is simply impossible. Estimates are less needed now than used to be the case but in the training situation ATC will often ask for one since they are trying to foresee the demand for holding levels and integrating training traffic with normal flights.

P is for approach plates. You need to be sure you have the plates you need to hand and that you have briefed yourself on any unusual features. Understanding and using approach plates is a topic in itself but as a minimum at this early stage you should be sure you have the correct plate to hand. It is very easy to have the NDB DME for runway 30 when you really want the NDB DME ILS for runway 30. Look for any confusion such as procedures with multiple versions of the same approach. In a two crew environment ensure that both pilots are working off the same plate. If you are loading an approach into a FMS of some sort confirm that what you see on the paper or the I Pad is the same thing you are seeing on the panel mounted equipment.

Confirm your minima. Really you should have written this on the plate before departure taking account of any allowance for PEC or inertia on a non-precision CDFA approach. At least know what the initial actions are for the standard missed approach. Tell yourself not to forget any nonstandard features, for example a descending base turn or an off airfield NDB hold. If you are expecting a hold get the entry clear in your mind.

In the descent one or more **FATRED** checks may be appropriate but if you are ahead of the game they are unlikely to actually require any actions.

Final Approach Checks

These can cause problems. Given distractions or ATC involvement it may not be obvious exactly when to run them. Rate One Aviation uses BUFF PEARL again.

Final approach checks are the equivalent of downwind checks in a visual circuit. If you are on a radar vectored approach the downwind vector would be an appropriate low workload time at which to run this check. On a procedural approach once you are beacon outbound and established in the descent is the best time.

Almost inevitable the BUF part of the checks will be inappropriate since these are actions taken later in the approach. Power prompts the confirmation that it is set appropriately and is giving you the expected speed. Engine is a very quick gauges scan. An altimeter is a last crosscheck on appropriate setting and agreement. , Radios a further ident and any required selection of tower or ground frequencies. On some aircraft installations it may not have been possible to fully select the final approach aid till this point or some automatic sequencing needs to be confirmed. This is the time for a landing light if it is night, or you believe in them as a means of reducing collision risk.

Normally the gear is selected down and one stage of flaps taken just before the final approach fix or glideslope intercept. It is relatively rare but not unknown for these actions to be forgotten. A power adjustment may be needed on some aircraft. If you can find the time at this high workload moment to just quickly run BUFF PEAR a second time. This is worthwhile and hopefully will not need to actually prompt any actions.

Checks on Short Finals

This is perhaps the most vital check of all and in some form it should be an absolutely non-negotiable part of all flying even VFR in a simple fixed gear aircraft. Time after time pilots of all levels of experience land with their undercarriage still retracted sometimes even with warning horns blaring.
Some pilots use reds Blues Greens some use **PUFFA.** This is **P**itch full fine, **U**nder Carriage down and locked, **F**laps as required, **F**uel and **A**ltimeters set.

Both of these are somewhat unsatisfactory as they don't encompass everything that is important and there can be differences between training practice and everyday operations. Here are the issues.

The only reason for putting the prop full fine and the mixture rich on finals is to place them in the appropriated position for a go round. In normal circumstances these actions make more noise and waste fuel to no good purpose. An alternative approach is to have an ingrained habit that ensures any significant power change using the throttle is only made after consideration of the other two power levers. This more sophisticated way of operating does carry the small chance of a pilot making a full throttle go round with the prop lever not fully forward and hence not developing full power. More seriously with the mixture lean full power can quite quickly cause engine damage.

This is a decision for individual pilots and ATO's to make. Perhaps in a training aircraft the safest course will be to train for mixture rich, pitch full fine while recognizing that this could be changed in real world flying.

The undercarriage does need to be down and three greens (or other indication according to aircraft type) shown to confirm that this is the case. A last altimeter cross check was traditional at this point although it is somewhat doubtful if the benefits outweigh the distraction. Another gotcha here is to land or carry out a missed approach without an appropriate clearance.

Rate One Aviation's referred actions, which unfortunately don't lend themselves to a neat mnemonic, would be:-

- Gear down and locked
- Flaps as required
- Levers (throttle prop mixture) as required
- Clearance received

It does no harm to quickly repeat this after becoming visual for the landing to ensure that the gear really is down and that landing flap has been selected.

Go round

It is remarkable how many pilots select full power but do not pitch up. You are very close to the ground at this point and should definitely chant:-

- Power up
- Nose up
- Gear up
- Flaps up



Avionics Expanded Checks

Try to work round your cockpit in a logical manner. Given the huge change in avionics since most aircraft were built it is highly unlikely that the manufacturer's checklist will provide any useful information. At least in theory at every annual the maintenance organisation should check to see that your flight manual is current. This should include having supplements for every piece of equipment in the instrument panels. Here is a general idea of how to check a modern IFR panel.

Please note, that given the many different illustrations this is only a guide and you must consult the weighty manuals that should accompany all modern equipment.

First, a common sense scan of everything, for broken glass, inoperative stickers or any other evidence of physical damage. If there is a slightly strange smell look for compass fluid leaks which are often accompanied by visible bubbles above the numbers. It is likely that the audio panel is at the top of the stick. It has a self-test button which should light everything up. There is also a test button for the marker lights although; given that most ILS installations also have DME these are getting to be quite rare, in Europe at least.

GPS NAV/COM

Next, in the sample panel there is a Garmin GTN providing Com 1 and Nav. 1 functions. On start-up there is a self-test routine and a chance to check that the data bases are in date. The box will give you messages if there are any errors. You might at this stage enter information for any auxiliary functions such as fuel usage. Having reached the home screen, unless you are sure no one else has used the aircraft, check that the settings you use as standard have not been changed. This might include the map, de-clutter the display in North up or Track up, a scale fixed at 0.33 NM and the radio selected to provide 8.33 KHz spacing and the data fields are as you like them. This is a WAAS box so there is no need to check RAIM.

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At some point in the pre-flight you will need to check that both com radios are working. Usually this is done by obtaining the ATIS and start clearance on Box 2 and then using Box 1 for the tower and departure frequencies.

You can switch the GTN to VLOC and if there is an ILs on the field select its frequency. It should ident on the HSI and you should be able to confirm the audible ident. Rotate the beam bar and there should be no effect on the needle displacement since this is an ILS. The indication should be sensible. If you are parked to the left of the runway it should indicate 'fly right' just as if you were on the ILS. If you have an electronic HSI it will have auto slewed to the Runway direction. If you have a manual HSI select correct the heading manually to confirm your orientation. If a VOR is in range you can select its frequency and check the ident. In this case you can rotate the beam bar and see that you get full scale deflection in both directions and that, when centred, the direction indicated is sensible.

DME

If you are in the habit of using the DME remote function, in which the frequency is selected on Nav1 or Nav. 2, you can check its operation. Our advice is not to use this but set DME frequency directly to avoid possible confusion.

You repeat this process for Box 2, which in this case is a non WAAS Garmin 430. If you intend to use this you will need to do a RAIM check. This can be done through the auxiliary menus or better still done the night before at home. In reality hardly anyone bothers to do this on a day to day basis, certainly not if you also have a WAAS box in this cockpit, but don't omit this on skill test day. This leads us to the DME, which in this case is the most common King unit. Select a DME within range, listen to the ident and look for a sensible distance indication.

ADF

Next it's the ADF a King KR87 unit. This is almost the only ADF that will provide adequate performance for a skill test. Select an NDB within range, listen for the ident and see that the direction indicated looks good. Press the ADR button and see that the needle parks in the 3 o'clock position. Often the ADF is the most convenient source of a stop watch, so be sure you know how to check that this is working.

Autopilot

Finally in this stack there is the autopilot. In this case a KFC150. It has its own test button and a series of bleeps and lights indicate that all is well. Autopilots are both important and vary considerably between models so you really do need to study the manual for the model in your aircraft.

Cross check the altimeters against the local QNH. You are looking for agreement and errors within +75 ft. and - 50 ft., hopefully a lot less than this in a well maintained aircraft.

In this case over on the P2 panel there is the transponder, but in many installations that will have been in the main stack. For test purposes it may be configured to accept a call sign, and if so, you need to know how to enter one. This is an awkward and non-intuitive, so be sure to practice.

You can also cast your eye over whatever else is to be found on the P2 panel. Engine instruments just need a common sense look for broken glasses and the like. The VSI should indicate zero. If you have any sort of engine analyser of fuel flow measuring device, make absolutely sure you enter any fuel additions and look for broad agreement, or more commonly consistent non agreement, with the fuel gauges. If your fuel gauges are hopeless as most are, then ensure you start with a known quantity either from being full, full to tabs, mechanical gauges on the wings known to be accurate, or a calibrated dipstick.

Avionics Set Up

The topic of how best to set up modern avionics might almost be the subject of short book in itself. In the days of basic radios, navigation by VOR or NDB almost every aircraft was identical and apart from some minor differences between different manufacturers equipment, there was not a lot of choice and the best way to employ the available resources was obvious.

Now we are in the feature and information rich age and nothing is obvious. There is vastly more useful data available to pilots, and naturally with that, comes a range of new ways in which to become confused.

If you fly one aircraft regularly doubtless you will arrive at methods that work for you. Here we will concentrate on issues as they are likely to affect the skill test. First you should have some grasp of the range of functions that devices offer. This does not mean you have to use them, but if asked you should be aware that they exist and have some idea of where in the menu system they could be found. GPS functions understandably assume that you will take off, fly a route and land at a planned destination. This does not stack up well with a test where you fly somewhere, do an approach, wander about doing general handling and then return to land at the airfield you departed from. Your GPS may be loyally trying to guess, in all this meandering, which active leg you really wanted to be on, whereas in reality, you have long ago lost interest in the flight plan and you just want the GPS to navigate somewhere directly. It may, or may not, be wiling to do this without you cancelling the flight plan, and doing this requires some understanding of the menu structure. For this reason, although it might be a suboptimal way of using the equipment in everyday flying, there is certainly an argument for only using the direct to function.

With a dedicated test aircraft we have avoided this issue at ROA and we put a flight plan into GPS 2 which has its own HSI and do approaches and any direct to legs needed on GPS 1 which has a separate HSI.

Whatever you decide in your situation it is imperative that you are absolutely clear on how to engage and perhaps more importantly disengage the functionality you decide to use. You don't want to be stuck in some impenetrable menu structure looking like a paralysed rabbit caught in a cars headlights, do you?

There is also a decision as to whether to load a procedure into the GPS. This would be absolutely the right thing to do in everyday flying, but it is quite likely that an examiner will disable some part of the GPS functionality. If you get used to flying a procedural approach with GPS guidance allowing the unit to auto switch to the ILS at an appropriate moment, you are likely to be completely at a loss. You will have to ask you instructor or ATO what they advise given local circumstances. At ROA we are trying to push the boundaries and move the system in the 20th century (yes we know it's the 21st century, but we have low expectations in this regard). Thus we are teaching the use of desired track and track made good as helpful information and this is displayed in some many places. We rather hope the examiners will struggle to switch everything off. On the other hand, we don't advocate auto switching, nor do we advocate using the autopilot in those stages of the test where it is allowed, in anything other than altitude hold and heading mode. This is to try and ensure that the pilot stays in the loop fully aware of drift and always thinking ahead. There are certainly other equally valid approaches so it's a matter finding one that works for you.

You will see that this aircraft has a two needle RMI. If you are fortunate enough to have such equipment, the best idea is to always have the GPS linked needle, pointing at the immediate destination. At various critical stages of the flight this will be the NDB that forms part of the instrument approach. Providing the examiner does not deselect it, this means that you have a stable needle orientating you in the direction of the beacon. It is free of the Dip error of the ADF and so can be a great help.

Other Instruments

If you have a fuel flow indication from something like a Shadin standalone instrument or as part of an engine analyser, then set it to endurance if at all possible. This obviates the need to keep a fuel log and is a real boon in both the test and in real life. It does not absolve you from the need to change tanks, and if this is something you tend to forget, then by all means set the scheduler alarm that is a function of GPS units.



CHECK LIST

Generic SEP / MEP

Pre Start

Externals	Complete
Chocks / Tow Bar	Out
Pitot Cover/locks	Off
Master	Off
Mixture	CO
Doors/ belts	Secure
Battery	On
Beacon /lights	A/R
C/B & Alt air	Check
Fuel contents	OK / tank selected
Flaps /cowl flaps	A/R
Hobbs	Noted
U/C	Down
Briefs	Given
ATIS /clearance/start	A/R

Cold Start

Brakes	On
Area	Clear
Mixture	A/R
Prop	Max
Throttle	A/R
Pump	A/R
Primer	A/R
Prop	Clear
Starter	Operate
Starter warning	Out
Oil Pressure	Rising
Alternator	On
Mixture	Lean
Fuel pump	Off

After Start

Annunciators	Check /off
Avionics master	On
Gyro pressure	Check
Avionics	As required
DI	Set
Heat/ Air con	A/R
De ice equipment	Check A/R
Flight instruments	Check
Nav aids	Check
Autopilot / trim	Test A/R
Taxi clearance	Obtain
Time	Note

Taxy

Brakes	Check both sides
Rudder	Travel check
Flight instruments	Check.

Power Checks Left / Right Engine)

Brakes	Set
Tanks	Change
MP drains	Check
Mixture	Rich
Throttle	Set
T & P	Check
Propeller	Function check
Throttle	Set
Propeller	Feather check
Mags L / R	Check mag drop
Ammeter / gyro pres	Check
Throttle	Check idle / Set
Mixture	Lean

Pre Take Off

Flaps /cowl flaps	A/R
Trims	Set take off
Throttle friction	Tight
Mixture	A/R
Prop	Max
Fuel	Pump on/primer locked
Mags	Both
Carb heat /Alt air	A/R
Engine / Flt instruments	Check /set
Autopilot /air con	Off
Belts/doors/windows	Secure
Controls	Full & free
Altimeters	Set
Prop sync	A/R
Pressurization	A/R
Departure Clearance	Obtain
Departure Brief	A/R
Lights /screens	A/R

On Runway

Nosewheel	Centre
Time/ Txpdr	Noted / Set
Mixture	Rich
Pitot heat	On
Compass /DI	Runway heading

After take-off **BUFFPEARL**

Brakes	Touch
Under Carriage	Up
Flaps	Up in stages
Fuel	Pump A/R
Power	Set
Pressurization	A/R
Prop sync	A/R
Engine	T&P
Altimeter	Set
Radio / nav aids	Set / ident
Lights	A/R

Climb **FATRED**

Fuel	Pump A/R
Altimeters	Set
Threats	Consider
Radio / Nav / Auto.P	Set / Ident / A/R
Engine	T&P / mixture/ power/cowl flaps
DI	Set

Cruise **FATRED**

Fuel	Quantity / tank
Altimeters	Set
Threats	Consider
Radios / Nav	Set / identify
Engine	T & P / mixture/ power/cowl flaps
DI	Set/ gross error check

Initial Approach	**FATRED WASP**
Fuel	Quantity / tanks
Altimeter	Set
Threats	Consider
Radio / Nav	Set / Ident /VLOC
Engine	T & P / mixture
DI	Set / gross error check
Weather	ATIS
Altitude	Safe Altitude
Speed	Slow
Plates	To hand
Pressurization	Set
Prop sync	A/R

Pre Landing	**BUFFPEARL**
Brakes	Check / off
Undercarriage	Down
Flaps	A/R
Fuel	Confirm pump on
Power	As required
Pressurization	Set
Prop sync	Off
Engine	T & P
Altimeter	Check
Radio / Nav	Ident/ radar conf. off
Lights	As required

Finals	**PUFA**
Pitch	A/R
Undercarriage	Down & locked
Flaps	A/R
Altimeter	Check

After Landing	
Clear of runway	
Flaps	Up
Pitot heat	Off
Mixture	Lean
Transponder	Off
Fuel pump	Off
Lights	A/R

Shutdown	
Brakes	A/R
Avionics master	Off
Mixture	Rich then ICO Check rise
Mags	Check / Off
Master/switches	Off
Controls	Secured
Time / Hobbs	Note

Avionics Expanded Checks	
Garmin 430	RAIM check / Obs off / VLOC/GPS set
	COM / Nav freq set, scale 0.3/ disable terrain warning
Com 2	Set ATIS / 121.5
ADF	Set freq consider ident.
DME	Set freq consider ident.
Nav 2	Set freq /set indicator
RBI	Set on North
Txponder	Set
Autopilot	Confirm tested/ set Heading

Taxi checks

Turn left

Numbers increasing
T/C turn left skid right
Horizon level
VSI zero
ADF tracking

Turn right

Numbers increasing
T/C turn right skid left
Horizon level
VSI zero
ADF tracking

EMERGENCIES

Engine Failure After Take Off SEP

Runway available	Land back
If not	
Pitch down	Best glide
If time allows try	
Fuel pump	On
Carb heat	On
Tank	Change
Radio	Mayday call
Door	Unlatch

Land best field within 30 degrees of heading

Engine Failure In The Cruise

As above plus

Primer	Locked
Throttle /mixture	Try various settings
Harness	Tight

EFATO MEP

Control	Maintain
Power	Full
Speed	Blue line
Failed engine	Identify
Failed engine	Feather
Gear /flaps	Up
Fire	Check
Ice	Check
Live engine	instruments /cowl flaps
Dead engine	fuel/mags/alt off
Dead engine	Cowl flaps closed

Unfeathering
Type specific

Cross Feed
Type specific

Fire in Flight
Cabin / Electrical

Master	Off
Vents	Open
Land	ASAP

Engine fire

Fuel	Off
Mixture	ICO
Cabin heat	Off
Land	ASAP

Engine Fire On Start

Throttle	Close
Mixture	ICO
Switches	Off
Cabin	Evacuate.

Max Range Glide

Flaps	Up
Prop lever	Full aft
Speed	Best glide

Alternator Failure

Load	Reduce
CB	Check
Alternator switch	Off then on

If no success turn off alt land ASAP

Engine Roughness

Gauges	Check
Carb heat	Operate
Mixture	Try leaning
Tanks	Change
Mags	Try left /right only

Oil Pressure /Temp
If oil pressure low and temp high land ASAP

Door Opens In Flight
Not dangerous land when convenient

Spinning
Not approved standard recovery procedure

Emergency Gear Lowering (see flight manual)

Speed	Low safe
Gear handle	Down
Guards	Raise
Emergency handle	Operate
Indicators	Green/ mirror

Prop Over Speed

Throtttle	Retard
Prop	Full aft
Oil pressure	Check
Airspeed	Reduce
Throttle	A/R to control RPM

Mnemonics to cover all in flight checks

After Take Off & Top of Climb & Final Approach

Brakes	Check
Under carriage	A/R
Flaps	A/R
Fuel	Pump
Power	Prop mixture A/R
Pressurization	*If required*
Prop sync	*if required*
Engine	T&P/ cowl flaps /
Altimeter	Set
Radio	Radios /avionics A/R/ *radar*

En Route

Fuel	Quantity
Altimeter	Set
Threats	Weather /ice/ terrain
Radio	Radio avionics set
Engine	T&P /mixture/prop/carb heat /cowl flaps
DI	Set /gross error check

Initial Approach

Fuel	Tanks /quantity
Altimeter	Set
Threats	Ice /CB/ Fog Considered
Radio	Radios / avionics set up
Engine	T&P /mixture/prop/ carb heat/ cowl flap/
DI	Gross error check
Weather	ATIS
Altitude	SSA consider
Slow	To approach speed
Plates	To hand / boxes set

Pressurization	*if required*
Prop sync	*if required*

Finals

Pitch	A/R
Undercarriage	Down locked
Flaps	A/R
Altimeter	Check

General Handling

H	Height
A	Airframe
S	Security
E	Engine
L	Location
L	Lookout

Go round

Nose Up/ Power Up/ Gear Up / Flaps Up

This is an attempt to cover everything you need to check in anything up to the most complex twin without making it way over the top for a PA 28. There is a limited amount of ineffective repetition in return for having the absolute minimum number of lists.

The Engine prompt is a flow round the cockpit covering everything engine related.

Threats cover everything that might be an issue on the day that might require a reaction: Terrain, ice, CBs, fog, turbulence, over water, aircraft equipment unserviceable, personal issues.

Radios is a flow round every radio and electronic box to confirm something useful or appropriate setting which might include switched off.

If you fly a twin you might like to add as the only real emergency memory item:-

Dead Leg - Dead engine

Levers	All forward
Pitch	Blue line +5 knots
Throttle	Dead Engine Confirm
Prop	Dead Engine Feather
Mixture	Dead Engine ICO
Gear & Flaps	Up
Fire	Check

IFR Taxi checks need to be remembered. You should to be looking out as well as at the instruments while doing them so you cannot read a checklist as well.

Turn to the right numbers increasing
Turn right skid left
Horizon level
VSI zero
ADF tracking

Turn to the left numbers decreasing
Turn left skid right
Horizon level
VSI zero
ADF tracking