



# Quick Reference Handbook



# Cessna 172S

## VH-CPQ

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### NOTICE

**The information and figures contained in this booklet are to be used for general purposes only. This document is not a substitute for the approved aeroplane flight manual.**

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# Aircraft Overview

This C172S is one of our new generation Cessna's.

It is used as our primary training aeroplane for the Private Pilot Licence. With a 120kt cruise speed and autopilot it is also a great tourer.

## Equipment & Features

- Dual NAV/COM (One with glide-slope)
- GPS (KLN 89B – TSO 129)
- ADF Receiver
- Transponder
- Single axis autopilot
- Leather Seats

## Recency & Restrictions

Private Hire:	Company check flight.
Dual training:	No restrictions.
Recency:	Flown any company aircraft in the last 45 days or at the discretion of the CFI.

## Panel Photo



# Performance – Standard Specifications

## SPEED:

Maximum at Sea Level .....	126 KTS
Cruise, 75% Power at 8500 FT .....	124 KTS

## CRUISE:

*Using recommended lean mixture with fuel allowance for engine start, taxi, takeoff, climb and 45 minutes reserve.*

75% Power at 8500 Ft .....	Range 518NM
53 Gallons Usable Fuel .....	Time 4.25 HRS

RATE OF CLIMB AT SEA LEVEL .....

SERVICE CEILING .....

## TAKEOFF PERFORMANCE:

Ground Roll .....

Total Distance Over 50 Ft. Obstacle .....

## LANDING PERFORMANCE:

Ground Roll .....

Total Distance Over 50 Ft. Obstacle .....

## STALL SPEED:

Flaps Up, Power Off .....

Flaps Down, Power Off .....

## MAXIMUM WEIGHT:

Ramp .....

Takeoff .....

Landing .....

BASIC EMPTY WEIGHT .....

MAXIMUM USEFUL LOAD .....

BAGGAGE ALLOWANCE .....

WING LOADING .....

POWER LOADING .....

FUEL CAPACITY .....

OIL CAPACITY .....

ENGINE: Textron Lycoming .....

180 BHP at 2700 RPM

PROPELLER: Fixed Pitch, Diameter .....

**The above performance figures are based on aeroplane weights at 2550 pounds, standard atmospheric conditions, level hard-surface dry runways and no wind. They are calculated values derived from flight tests conducted by the Cessna Aircraft Company under carefully documented conditions and will vary with individual aeroplanes and numerous other factors affecting flight performance.**

# Operating Information

## AIRSPEDS - NORMAL OPERATIONS

### Takeoff:

Normal Climb Out.....	75-85 KIAS
Short Field Takeoff, Flaps 10°, Speed at 50 ft .....	56 KIAS

### Enroute Climb, Flaps Up:

Normal, sea level.....	75-85 KIAS
Normal, 10,000 Feet .....	70-80 KIAS
Best Rate-of-Climb, Sea level.....	74 KIAS
Best Rate-of-Climb, 10,000 Feet.....	72 KIAS
Best Angle-of-Climb, Sea level .....	62 KIAS
Best Angle-of-Climb, 10,000 Feet .....	67 KIAS

### Landing Approach:

Normal Approach Flaps Up.....	65-75 KIAS
Normal Approach, Flaps FULL.....	60-70 KIAS
Short Field Approach, Flaps FULL.....	61 KIAS

### Balked Landing:

Maximum Power, Flaps 20°.....	60 KIAS
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### V-Speeds:

Vne (never exceed) .....	163 KIAS
Vno (Maximum structural cruising speed) .....	140 KIAS
Vfe (Flaps 10°).....	110 KIAS
(Flaps 20°).....	85 KIAS
(Flaps 30°).....	85 KIAS

### Maximum Recommended Turbulent Air Penetration Speed:

2550 Lbs .....	105 KIAS
2200 Lbs .....	98 KIAS
1900 lbs.....	90 KIAS

### Maximum Demonstrated Crosswind Velocity:

Takeoff or landing.....	15 KNOTS
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### Stall Speed:

Flaps Up, Power Off .....	48 KIAS
Flaps Down, Power Off .....	40 KIAS

Unless otherwise noted, the speeds listed above are based on a maximum weight and may be used for any lesser weight. To achieve the performance specified in the performance section for take-off distance of the aircraft approved flight manual, the speed appropriate to the particular weight must be used.

## POWER PLANT

Oil Type ..... Ashless Dispersant 100 (SAE 50)

Oil Quantities:

Maximum .....8 QTS

Minimum (Company minimum) .....5 QTS

Engine operating limits including RPM, pressures, and temperatures, can be found by referring to the green arcs and red lines on applicable gauges.

Detailed information can also be found in the approved flight manual.

## FUEL SYSTEM

Total Capacity .....213 litres / 56.0 gallons

Total Usable ..... 201 litres / 53.0 gallons

Fuel Consumption per hour..... 40 litres / 10.5 gallons

Approved Fuels:

Option A.....100LL Grade Aviation Fuel (Blue)

Option B.....100 Grade Aviation Fuel (Green)

## TYRE PRESSURES

Nose wheel..... 45 PSI

Main wheels ..... 38 PSI

## MANOEUVRE / LOAD LIMITS

This aeroplane is certified in both the normal and utility categories. Refer to the approved flight manual for specific details on permitted manoeuvres and limitations in the utility category.

Normal Category - Flight Load Factors (MTOW 2550 lbs):

Flaps Up ..... +3.8g, -1.52g

Flaps Down .....+3.0g

Utility Category - Flight Load Factors (MTOW 2200 lbs):

Flaps Up ..... +4.4g, -1.76g

Flaps Down .....+3.0g

The design load factors are 150% of the above, and in all cases, the structure meets or exceeds design loads.

# Weight and Balance

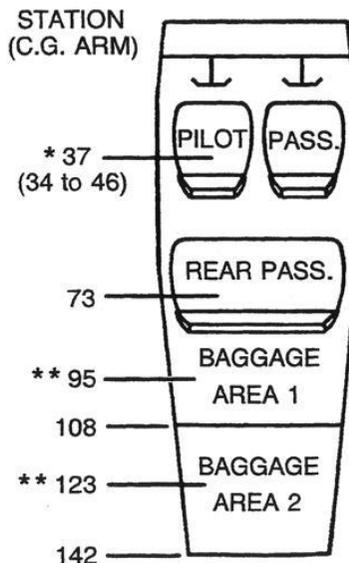
ITEM DESCRIPTION	WEIGHT AND MOMENT TABULATION			
	SAMPLE AIRPLANE		YOUR AIRPLANE	
	Weight (lbs.)	Moment (Lb-ins. /1000)	Weight (lbs.)	Moment (Lb-ins. /1000)
1. Basic Empty Weight (Use the data pertaining to your airplane as it is presently equipped. Includes unusable fuel and full oil)	1642	62.6	<b>1676</b>	<b>65.9</b>
2. Usable Fuel (At 6 Lbs./Gal.)				
53 Gallons Maximum				
30 Gallons (Quantity used for example)	180	8.6		
3. Pilot and Front Passenger (Station 34 to 46)	340	12.6		
4. Rear Passengers	340	24.8		
5. *Baggage Area 1 (Station 82 to 108; 120 Lbs. Max.)	56	4.6		
6. *Baggage Area 2 (Station 108 to 142; 50 Lbs. Max.)				
7. <b>RAMP WEIGHT AND MOMENT</b> (add columns)	<b>2558</b>	<b>113.2</b>		
8. Fuel allowance for engine start, taxi and runup	-8.0	-0.4		
9. <b>TAKEOFF WEIGHT AND MOMENT</b> (Subtract Step 8 from Step 7)	<b>2550</b>	<b>112.8</b>		
<p>10. Locate this point (2550 at 112.8) on the Center of Gravity Moment Envelope, and since this point falls within the envelope, the loading is acceptable.</p> <p>* The maximum allowable combined weight capacity for baggage areas 1 and 2 is 120 pounds.</p>				

# LOADING ARRANGEMENTS

\* Pilot or passenger center of gravity on adjustable seats positioned for average occupant. Numbers in parentheses indicate forward and aft limits of occupant center of gravity range.

\*\* Arm measured to the center of the areas shown.

- NOTES:**
1. The usable fuel C.G. arm for integral tanks is located at station 48.0.
  2. The rear cabin wall (approximate station 108) or aft baggage wall (approximate station 142) can be used as convenient interior reference points for determining the location of baggage area fuselage stations.

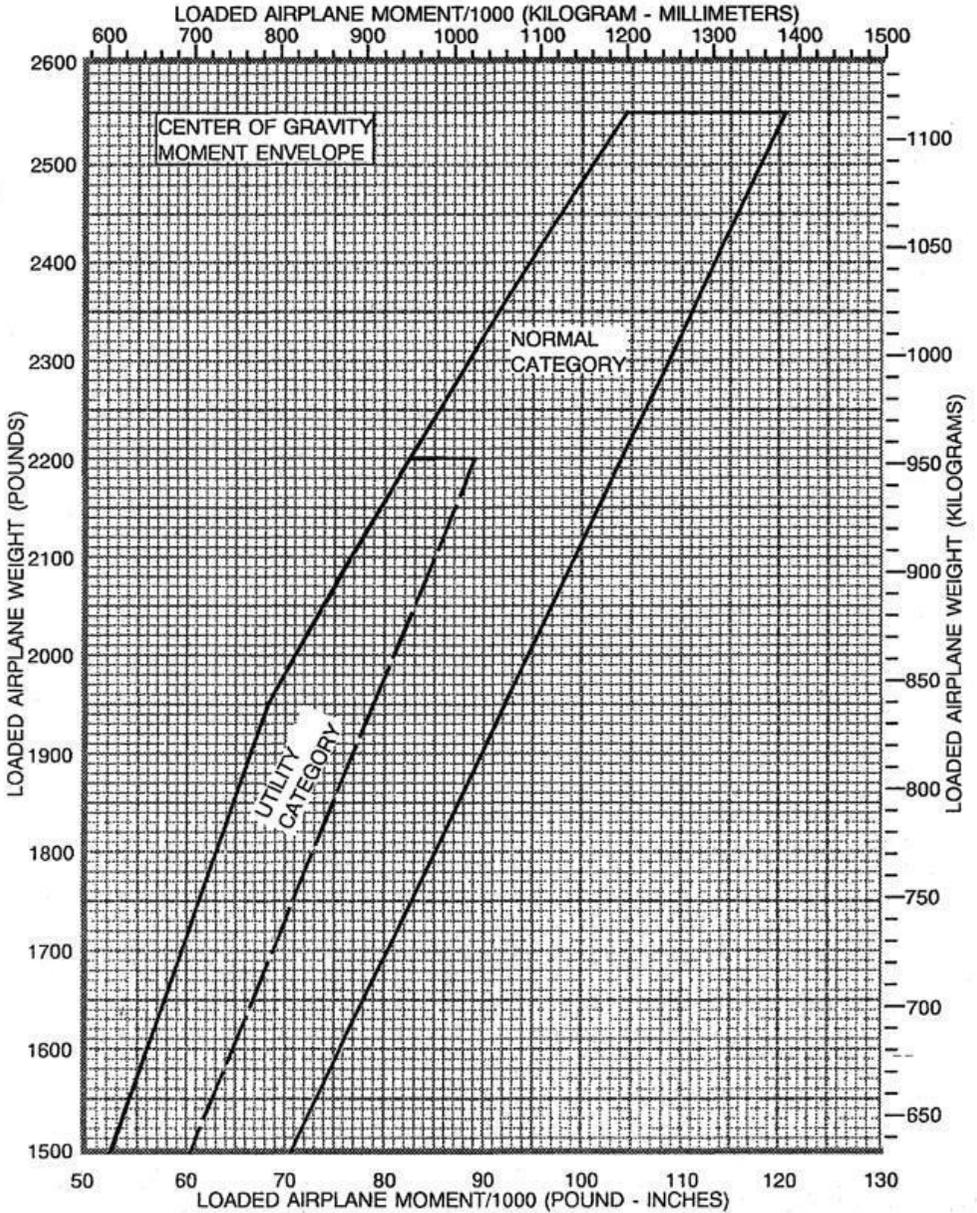


## CALCULATING THE MOMENT

The moment is the weight multiplied by the C.G. arm, divided by 1000.

Example: Pilot and front passenger weigh 340lbs, the arm is 37".

Answer:  $(340 \times 37) / 1000 = 12.58$



Center of Gravity Moment Envelope

## SAMPLE CONFIGURATIONS

Listed in the table below are the maximum passenger/baggage weights for various endurances.

The purpose of this table is to allow you to quickly determine the maximum load permissible on a particular length flight.

### WARNING

**THIS TABLE IS PROVIDED AS A GUIDE ONLY. THE AEROPLANE NEEDS TO BE LOADED WITHIN THE SPECIFIED CENTRE OF GRAVITY MOMENT ENVELOPE FOUND IN THE APPROVED FLIGHT MANUAL.**

#### **MAXIMUM PASSENGER & BAGGAGE WEIGHTS**

- 75% cruise power @ 6000 FT - 10.5 gal / 40 litres per hour
- 45 minute reserve fuel included in flight fuel.
- Taxi fuel not included, add approximately 5 litres.

##### **1.0 Hour Flight**

Flight Fuel Required: 18.4 gals / 70.0 litres / 110.9 lbs  
Pax / Baggage: 763.1 lbs / 346.9 kg

##### **1.5 Hour Flight**

Flight Fuel Required: 23.7 gals / 90.0 litres / 142.6 lbs  
Pax / Baggage: 731.4 lbs / 332.5 kg

##### **2.0 Hour Flight**

Flight Fuel Required: 29.9 gals / 110.0 litres / 174.2 lbs  
Pax / Baggage: 699.8 lbs / 318.1 kg

##### **3.0 Hour Flight**

Flight Fuel Required: 39.5 gals / 150.0 litres / 237.6 lbs  
Pax / Baggage: 636.4 lbs / 289.3 kg

##### **4.0 Hour Flight**

Flight Fuel Required: 50.0 gals / 190.0 litres / 301.0 lbs  
Pax / Baggage: 573.0 lbs / 260.5 kg

##### **4.3 Hour Flight (Full fuel)**

Flight Fuel Required: 53.0 gals / 201.4 litres / 319.0 lbs  
Pax / Baggage: 555.0 lbs / 252.3 kg

# Performance Charts

## SHORT FIELD TAKEOFF DISTANCE AT 2550 POUNDS

### CONDITIONS:

Flaps 10°

Full Throttle Prior to Brake Release

Paved, level, dry runway

Zero Wind

Lift Off: 51 KIAS

Speed at 50 Ft: 56 KIAS

Press Alt In Feet	0°C		10°C		20°C		30°C		40°C	
	Grnd Roll Ft	Total Ft To Clear 50 Ft Obst								
S. L.	860	1465	925	1575	995	1690	1070	1810	1150	1945
1000	940	1600	1010	1720	1090	1850	1170	1990	1260	2135
2000	1025	1755	1110	1890	1195	2035	1285	2190	1380	2355
3000	1125	1925	1215	2080	1310	2240	1410	2420	1515	2605
4000	1235	2120	1335	2295	1440	2480	1550	2685	1660	2880
5000	1355	2345	1465	2545	1585	2755	1705	2975	1825	3205
6000	1495	2605	1615	2830	1745	3075	1875	3320	2010	3585
7000	1645	2910	1785	3170	1920	3440	2065	3730	2215	4045
8000	1820	3265	1970	3575	2120	3880	2280	4225	2450	4615

### NOTES:

1. Short field technique as specified in Section 4.
2. Prior to takeoff from fields above 3000 feet elevation, the mixture should be leaned to give maximum RPM in a full throttle, static runup.
3. Decrease distances 10% for each 9 knots headwind. For operation with tail winds up to 10 knots, increase distances by 10% for each 2 knots.
4. For operation on dry, grass runway, increase distances by 15% of the "ground roll" figure.

**Note:** Section 4 as mentioned above is making reference to the checklist section of this document.

# SHORT FIELD LANDING DISTANCE AT 2550 POUNDS

**CONDITIONS:**

Flaps 30°  
 Power Off  
 Maximum Braking  
 Paved, level, dry runway  
 Zero Wind  
 Speed at 50 Ft: 61 KIAS

Press Alt In Feet	0°C		10°C		20°C		30°C		40°C	
	Grnd Roll Ft	Total Ft To Clear 50 Ft Obst	Grnd Roll Ft	Total Ft To Clear 50 Ft Obst	Grnd Roll Ft	Total Ft To Clear 50 Ft Obst	Grnd Roll Ft	Total Ft To Clear 50 Ft Obst	Grnd Roll Ft	Total Ft To Clear 50 Ft Obst
S. L.	545	1290	565	1320	585	1350	605	1380	625	1415
1000	565	1320	585	1350	605	1385	625	1420	650	1450
2000	585	1355	610	1385	630	1420	650	1455	670	1490
3000	610	1385	630	1425	655	1460	675	1495	695	1530
4000	630	1425	655	1460	675	1495	700	1535	725	1570
5000	655	1460	680	1500	705	1535	725	1575	750	1615
6000	680	1500	705	1540	730	1580	755	1620	780	1660
7000	705	1545	730	1585	760	1625	785	1665	810	1705
8000	735	1585	760	1630	790	1670	815	1715	840	1755

**NOTES:**

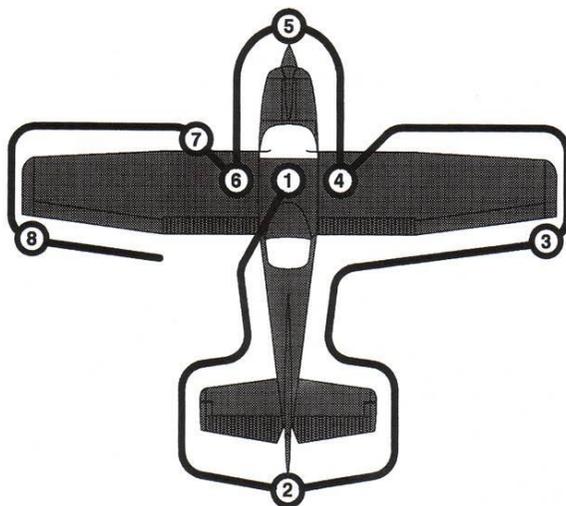
1. Short field technique as specified in Section 4.
2. Decrease distances 10% for each 9 knots headwind. For operation with tail winds up to 10 knots, increase distances by 10% for each 2 knots.
3. For operation on dry, grass runway, increase distances by 45% of the "ground roll" figure.
4. If landing with flaps up, increase the approach speed by 9 KIAS and allow for 35% longer distances.

**Note:** Section 4 as mentioned above is making reference to the checklist section of this document.

# Checklists – Normal Operations

## PREFLIGHT INSPECTION

Visually check the aeroplane for general condition during walk-around inspection. Aeroplane should be parked in a level ground attitude to ensure that fuel drain valves allow for accurate sampling. Use of the refuelling steps and assist handles will simplify access to the upper wing surfaces for visual checks and refuelling operations. In cold weather, remove even small accumulations of frost, ice or snow from wing, tail and control surfaces. Also, make sure that control surfaces contain no internal accumulations of ice or debris. Prior to flight, check that pitot heater is warm to touch within 30 seconds with battery and pitot heat switches on. If a night flight is planned, check operation of all lights, and make sure a flashlight is available.



### (1) CABIN

1. Pitot tube cover -- REMOVE, check for pitot blockage.
2. Pilots Operating Handbook -- ONBOARD.
3. Portable ELB -- ONBOARD.
4. Air sickness bags -- ONBOARD.
5. Aeroplane weight and balance -- CHECKED.
6. Parking brake -- SET.
7. Control Wheel Lock -- REMOVE.
8. Ignition Switch -- OFF.
9. Avionics Master Switch -- OFF.

## **WARNING**

**WHEN TURNING ON THE MASTER SWITCH, USING AN EXTERNAL POWER SOURCE, OR PULLING THE PROPELLER THROUGH BY HAND, TREAT THE PROPELLER AS IF THE IGNITION SWITCH WERE ON. DO NOT STAND, NOR ALLOW ANYONE ELSE TO STAND, WITHIN THE ARC OF THE PROPELLER, SINCE A LOOSE OR BROKEN WIRE OR A COMPONENT MALFUNCTION COULD CAUSE THE PROPELLER TO ROTATE.**

10. Master Switch -- ON.
11. Fuel Quantity Indicators -- CHECK QUANTITY and ENSURE LOW FUEL ANNUNCIATORS (L LOW FUEL R) ARE EXTINGUISHED.
12. Avionics Master Switch -- ON.
13. Avionics Cooling Fan -- CHECK AUDIBLY FOR OPERATION.
14. Avionics Master Switch -- OFF.
15. Static Pressure Alternate Source Valve -- OFF.
16. Annunciator Panel Test Switch -- PLACE AND HOLD IN TEST POSITION and ensure all amber and red annunciators illuminate.
17. Annunciator Panel Test Switch -- RELEASE. Check that appropriate annunciators remain on.

## **NOTE**

When Master Switch is turned ON, some annunciators will flash for approximately 10 seconds before illuminating steadily. When panel TST switch is toggled up and held in position, all remaining lights will flash until the switch is released

18. Fuel Selector Valve -- BOTH.
19. Flaps -- EXTEND.
20. Pitot Heat -- ON only if required for flight. (Carefully check that pitot tube is warm to touch within 30 seconds).
21. Pitot Heat -- OFF.
22. Master Switch -- OFF.

## **(2) EMPENNAGE**

1. Rudder Gust Lock -- REMOVE.
2. Tail Tie-down -- DISCONNECT.
3. Control Surfaces -- CHECK freedom of movement and security.
4. Trim Tab -- CHECK security.
5. Antennas -- CHECK for security of attachment and general condition.

### **(3) RIGHT WING Trailing Edge**

1. Flap -- CHECK for security and condition.
2. Aileron -- CHECK freedom of movement and security.

### **(4) RIGHT WING**

1. Wing Tie-down -- DISCONNECT.
2. Main Wheel Tyre -- CHECK for proper inflation and general condition (weather checks, tread depth, and wear etc).

#### **WARNING**

**IF, AFTER REPEATED SAMPLING, EVIDENCE OF CONTAMINATION STILL EXISTS, THE AEROPLANE SHOULD NOT BE FLOWN. TANKS SHOULD BE DRAINED AND SYSTEM PURGED BY QUALIFIED MAINTENANCE PERSONNEL. ALL EVIDENCE OF CONTAMINATION MUST BE REMOVED BEFORE FURTHER FLIGHT.**

3. Fuel Tank Sump Quick Drain Valves -- DRAIN at least a cupful of fuel (using sampler cup) from each sump location to check for water, sediment, and proper fuel grade before each flight and after each refuelling. If water is observed, take further samples until clear and then gently rock wings and lower tail to the ground to move any additional contaminants to the sampling points. Take repeated samples from all fuel drain points until all contamination has been removed. If contaminants are still present, refer to above WARNING and do not fly aeroplane.
4. Fuel quantity -- CHECK with dipstick for desired level.
5. Fuel Filler Cap -- SECURE.

### **(5) NOSE**

1. Fuel Selector Quick Drain Valve (located on bottom of fuselage below the fuel selector valve) -- DRAIN at least a cupful of fuel (using sampler cup) from valve to check for water, sediment, and proper fuel grade before each flight and after each refuelling. If water is observed, take further samples until clear and then gently rock wings and lower tail to the ground to move any additional contaminants to the sampling points. Take repeated samples from all fuel drain points until all contamination has been removed. If contaminants are still present, refer to WARNING above and do not fly aeroplane.
2. Engine Oil Dipstick/Filler Cap -- CHECK oil level, than check dipstick/filler cap SECURE. Do not operate with less than five quarts. Fill to eight quarts for extended flights.

3. Engine Cooling Air Inlets -- CLEAR of obstructions.
4. Propeller and spinner -- CHECK for nicks and security.
5. Air Filter -- CHECK for restrictions by dust or other foreign matter.
6. Nose Wheel Strut and Tyre -- CHECK for proper inflation of strut and general condition (weather checks, tread depth and wear, etc) of tyre.
7. Static Source Opening -- CHECK for blockage.

## **(6) LEFT WING**

1. Fuel Quantity -- CHECK with dipstick for desired level.
2. Fuel Filler Cap -- SECURE.
3. Fuel Tank Sump Quick Drain Valves -- DRAIN at least a cupful of fuel (using a sampler cup) from each sump location to check for water, sediment and proper fuel grade before each flight and after each refuelling. If water is observed, take further samples until clear and then gently rock wings and lower tail to the ground to move any additional contaminants to the sampling points. Take repeated samples from all fuel drain points until all contamination has been removed. If contaminants are still present do not fly aeroplane.
4. Main Wheel Tyre -- CHECK for proper inflation and general condition (weather checks, tread depth and wear, etc).

## **(7) LEFT WING Leading Edge**

1. Pitot Tube Cover -- REMOVE and check opening for blockage.
2. Fuel Tank Vent Opening -- CHECK for blockage.
3. Stall Warning System -- CHECK operation.
4. Wing Tie-Down -- DISCONNECT.
5. Landing/Taxi Lights -- CHECK for condition and cleanliness of cover.

## **(8) LEFT WING Trailing edge**

1. Aileron -- CHECK for freedom of movement and security.
2. Flap -- CHECK for security and condition.
3. Baggage door -- CHECK, lock with key.

# BEFORE STARTING ENGINE

1. Pre-flight Inspection -- COMPLETE.
2. Aircraft Dispatch -- COMPLETED / AUTHORISED.
3. Running Sheet Figures -- COMPLETE.
4. Maintenance Release -- CHECKED.
5. Air Sickness Bags -- AVAILABLE.
6. Passenger Briefing -- COMPLETE.
7. Seats, Seatbelts, Shoulder Harnesses -- ADJUST and LOCK. Ensure inertia reel locking.
8. Brakes -- TEST and PARKING BRAKE SET.
9. Fuel Selector Valve -- BOTH.
10. Fuel Shutoff Valve -- ON (push full in).
11. Circuit Breakers -- CHECK IN.
12. ATIS / Clearance -- OBTAIN as required.
  - a. Master Switch -- ON
  - b. Avionics Master Switch -- ON.
  - c. Radios/Nav aids -- ON, set as required.
  - d. ATIS / Clearance -- OBTAIN.

## **WARNING**

**THE AVIONICS MASTER SWITCH MUST BE OFF DURING ENGINE START TO PREVENT POSSIBLE DAMAGE TO AVIONICS.**

13. Avionics Master Switch -- OFF.
14. Master Switch -- OFF

## **STARTING ENGINE (With Battery)**

1. Throttle -- OPEN ¼ INCH (5mm).
2. Mixture -- IDLE CUT OFF.
3. Propeller Area -- CLEAR.
4. Master Switch -- ON.

### **NOTE**

**If engine is warm omit priming procedure in steps 5, 6, & 7.**

5. Auxiliary Fuel Pump Switch -- ON.
6. Mixture -- ADVANCE until fuel flow rises for a few seconds, then return to IDLE CUT OFF position.
7. Auxiliary Fuel Pump -- OFF.
8. Confirm area around aircraft is clear -- call "CLEAR PROP!"
9. Ignition Switch -- START (release when engine starts).
10. Mixture -- ADVANCE smoothly to RICH when engine starts to fire.
11. Set throttle -- 1000 RPM.

### **NOTE**

If engine floods, turn off auxiliary fuel pump, place mixture in idle cut off, open throttle ½ to full, and crank engine. When engine fires, advance mixture to full rich and retard throttle promptly.

12. Oil Pressure -- CHECK, confirm rising within 30 seconds or shut down.
13. AMPS/VOLTS -- Check for discharge.
14. Navigation lights and Flashing Beacon -- ON as required.
15. Avionics Master Switch -- ON.
16. Radios/Nav aids -- ON, set as required.
17. Flaps -- RETRACT.

## **STARTING ENGINE (With External Power)**

Procedures for starting the engine with external power are similar to starting with battery power.

Insert two additional steps to the STARTING ENGINE (with battery) checklist:

- 3.1 External Power -- CONNECT to Aeroplane receptacle.
- 12.1 External Power -- DISCONNECT from aeroplane receptacle.

# TAXYING

1. Brakes -- CHECK.
2. Instruments -- CHECK indications in correct sense.
3. Flight Controls – AS REQUIRED (Column AFT or as required due wind)

## BEFORE TAKEOFF

1. Parking Brake -- SET.
2. Passenger Seat Backs -- MOST UPRIGHT POSITION.
3. Seats, Seatbelts and Shoulder Harnesses -- CHECK SECURE.
4. Cabin Doors -- CLOSED and LOCKED.
5. Flight Controls -- FULL FREE and CORRECT movement.
6. Flight Instruments -- CHECK and SET.
7. Fuel Quantity -- CHECK.
8. Mixture -- RICH.
9. Fuel Selector Valve -- RECHECK BOTH.
10. Elevator Trim -- SET for takeoff.
11. Throttle -- 1800 RPM.
  - a. Magnetos -- CHECK. RPM drop should not exceed 150 RPM on either magneto or 50 RPM differential between Magnetos. Confirm on BOTH.
  - b. Vacuum Gauge -- CHECK.
  - c. Engine Instruments and Ammeter -- CHECK.
12. Annunciator Panel -- Ensure no Annunciators are illuminated.
13. Throttle -- CHECK idle.
14. Throttle -- 1000 RPM.
15. Throttle Friction Lock -- ADJUST.
16. Radios and Avionics -- SET.
17. Wing Flaps -- SET for takeoff (0° - normal, 10° - short field).
18. Self Brief -- COMPLETE (Aborted T/O, engine failure, TEM)
19. Brakes -- RELEASE.

## HOLDING POINT CLEAR CHECKS

1. **C** - Clear approaches (final, base and RWY?)
2. **L** - Lights: Landing, Taxi, Strobes - ON (Nav - if required, eg. NVFR)
3. **E** - Engine: T&P green, flaps – set as required
4. **A** - **ALT** – set on TRANSPONDER and (3000 or 1200)
5. **R** - **Radio** – Frequency set, volume tested, request clearance.

# TAKEOFF

## NORMAL TAKEOFF

1. Wing Flaps -- 0°.
2. Throttle -- FULL OPEN.
3. Mixture -- RICH (above 3000 feet, LEAN to obtain maximum RPM).
4. Checks -- REVS achieved, AIRSPEED rising, GAUGES in the green.
5. Elevator Control -- LIFT NOSE WHEEL at 55 KIAS.
6. Climb Speed -- 70-80 KIAS.
7. Lights -- As applicable when clear of airport.

## SHORT FIELD TAKEOFF

1. Wing Flaps -- 10°.
2. Foot Brakes -- APPLY.
3. Throttle -- FULL OPEN.
4. Mixture -- RICH (above 3000 feet, LEAN to obtain maximum RPM).
5. Brakes -- RELEASE.
6. Checks -- REVS achieved, AIRSPEED rising, GAUGES in the green.
7. Elevator Control -- MAINTAIN SLIGHTLY TAIL LOW ATTITUDE.
8. Climb Speed -- 56 KIAS (Until all obstacles are cleared).
9. Wing Flaps -- RETRACT slowly after reaching 70 KIAS.
10. Lights -- As applicable when clear of airport

# ENROUTE CLIMB

## NORMAL CLIMB

1. Airspeed -- 70-85 KIAS.
2. Throttle -- FULL OPEN.
3. Mixture -- RICH (above 3000 feet, LEAN to obtain maximum RPM).
4. QNH -- SET area QNH.

## MAXIMUM PERFORMANCE CLIMB

1. Airspeed -- 74 KIAS at sea level, 72 KIAS at 10,000 feet.
2. Throttle -- FULL OPEN.
3. Mixture -- RICH (above 3000 feet, LEAN to obtain maximum RPM).
4. QNH -- SET area QNH.

## **CRUISE**

1. Power -- 2100-2700 RPM (No more than 75% is recommended).
2. Mixture -- LEAN.

## **DESCENT**

1. Self Brief -- COMPLETE (Arrival plan/expectations, TEM, contingencies)
2. QNH -- Set aerodrome QNH.
3. Power -- AS DESIRED.
4. Mixture -- ENRICHEN on descent, full rich for idle power.
5. Fuel Selector Valve -- BOTH.
6. Wing Flaps -- AS DESIRED (0° - 10° below 110 KIAS; 10° - 30° below 85 KIAS).

## **BEFORE LANDING**

1. Brakes -- Checked and OFF.
2. Undercarriage -- DOWN and locked.
3. Mixture -- RICH.
4. Fuel -- Check quantity, pressure and tank selection on BOTH.
5. Instruments -- Check temps and pressures in GREEN.
6. Switches -- MAGS both, MASTER on, LIGHTS as required.
7. Seat Backs -- MOST UPRIGHT POSITION.
8. Hatches and Harnesses -- SECURED and LOCKED.

# LANDING

## NORMAL LANDING

1. Airspeed -- 65-75 KIAS (flaps UP).
2. Wing Flaps -- AS DESIRED (0°-10° below 110 KIAS; 10°-30° below 85 KIAS).
3. Airspeed -- 60-70 KIAS (flaps FULL).
4. Power -- REDUCE to idle as obstacles are cleared.
5. Trim -- ADJUST as desired.
6. Touchdown -- MAIN WHEELS FIRST.
7. Landing Roll -- LOWER NOSE WHEEL GENTLY.
8. Braking -- MINIMUM REQUIRED.

## SHORT FIELD LANDING

1. Airspeed -- 65-75 KIAS (Flaps UP).
2. Wing Flaps -- FULL DOWN (30°).
3. Airspeed -- 61 KIAS (until flare).
4. Trim -- ADJUST as desired.
5. Power -- REDUCE to idle after clearing obstacles.
6. Touchdown -- MAIN WHEELS FIRST.
7. Brakes -- APPLY HEAVILY.
8. Wing Flaps -- RETRACT for maximum brake effectiveness.

## BALKED LANDING

1. THROTTLE -- FULL OPEN.
2. Wing Flaps -- RETRACT to 20°.
3. Climb Speed -- 60 KIAS.
4. Wing Flaps -- RETRACT slowly after reaching a safe altitude and 65 KIAS.

## **AFTER LANDING CLEAR CHECK**

1. **C** - Cleared of RWY & Cleared to Taxi?
2. **L** - Lights: Strobes – ON, others off (Keep Nav ON if NVFR)
3. **E** - Engine: T&P green, flaps – retract
4. **A** - ALT – switch to standby
5. **R** - Radio – switch to GND

## **SHUT DOWN/SECURING AEROPLANE**

1. Parking Brake -- SET (if required).
2. After Landing Checks -- CONFIRM COMPLETED.
3. Throttle -- 1000 RPM.
4. Ignition Switches -- CHECK L, R, then ON BOTH.
5. Lights -- OFF.
6. Avionics Master Switch -- OFF.
7. Mixture -- IDLE CUT OFF (pulled fully out).
8. Throttle -- CLOSED once propeller has stopped.
9. Ignition Switches -- OFF.
10. Master Switch -- OFF.
11. Control Lock -- INSTALL.
12. Fuel Selector Valve -- AS APPROPRIATE.
13. Aeroplane Interior -- TIDY.
14. Running Sheet Figures -- COMPLETE.
15. Parking -- BRAKES RELEASED, chock if necessary.
16. Pitot Cover -- INSTALL.

# Checklists – Emergency Procedures

## INTRODUCTION

Emergencies caused by aeroplane or engine malfunctions are extremely rare if proper pre-flight inspections and maintenance are performed.

Section 3 of the approved flight manual provides amplified procedures for coping with emergencies that may occur.

Should an emergency arise the basic guidelines described in this section and the approved flight manual should be considered and applied as necessary to correct the problem.

Procedures in this section shown in **bold faced** type are immediate action items that should be committed to memory.

## AIRSPEEDS

### AIRSPEEDS FOR EMERGENCY OPERATION

Engine Failure After Takeoff:

Wing Flaps Up ..... 70 KIAS  
Wing Flaps Down ..... 65 KIAS

Manoeuvring Speed:

2550 Lbs ..... 105 KIAS  
2200 Lbs ..... 98 KIAS  
1900 Lbs ..... 90 KIAS

Maximum Glide ..... 68 KIAS

Precautionary Landing With Engine Power ..... 65 KIAS

Landing Without Engine Power:

Wing Flaps Up ..... 70 KIAS  
Wing Flaps Down ..... 65 KIAS

# ENGINE FAILURES

## ENGINE FAILURE DURING TAKEOFF ROLL

1. **Throttle -- IDLE.**
2. **Brakes -- APPLY.**
3. Wing Flaps -- RETRACT.
4. Mixture -- IDLE CUT OFF.
5. Ignition Switch -- OFF.
6. Master Switch -- OFF.

## ENGINE FAILURE IMMEDIATELY AFTER TAKEOFF

1. **Airspeed -- 70 KIAS Flaps UP, 65 KIAS Flaps DOWN.**
2. Mixture -- IDLE CUT OFF.
3. Fuel Shutoff Valve -- OFF (Pull Full Out).
4. Ignition Switch -- OFF.
5. Wing Flaps -- AS REQUIRED (FULL recommended).
6. Master Switch -- OFF.
7. Cabin Door -- UNLATCH.
8. Land -- STRAIGHT AHEAD.

## ENGINE FAILURE DURING FLIGHT (Restart Procedures)

1. **Airspeed -- 68 KIAS (Best glide speed).**
2. **Fuel Shutoff Valve -- ON (Push Full In).**
3. **Fuel Selector Valve -- BOTH.**
4. **Auxiliary Fuel Pump Switch -- ON.**
5. **Mixture -- RICH (if restart has not occurred).**
6. Ignition Switch -- BOTH (or START if propeller is stopped).

# FORCED LANDINGS

## EMERGENCY LANDING WITHOUT ENGINE POWER

1. Passenger Seat Backs -- MOST UPRIGHT POSITION.
2. Seats and Seat Belts -- SECURE.
3. Airspeed -- 70 KIAS Flaps UP, 65 KIAS Flaps DOWN.
4. Mixture -- IDLE CUT OFF.
5. Fuel Shutoff Valve -- OFF (Pull Full Out).
6. Ignition Switch -- OFF.
7. Wing Flaps -- AS REQUIRED (30° recommended).
8. Master Switch -- OFF (when landing is assured).

9. Doors -- UNLATCH PRIOR TO TOUCHDOWN.
10. Touchdown -- SLIGHTLY TAIL LOW.
11. Brakes -- APPLY HEAVILY.

## **PRECAUTIONARY LANDING WITH ENGINE POWER**

1. Passenger Seat Backs -- MOST UPRIGHT POSITION.
2. Seats and Seat Belts -- SECURE.
3. Airspeed -- 65 KIAS
4. Wing Flaps -- 20°
5. Selected Field -- FLY OVER, noting terrain and obstructions, then retract flaps upon reaching a safe altitude and airspeed.
6. Avionics Master Switch and Electrical Switches -- OFF.
7. Wing Flaps -- 30° (on final approach).
8. Airspeed -- 65 KIAS
9. Master Switch -- OFF.
10. Doors -- UNLATCH PRIOR TO TOUCHDOWN.
11. Touchdown -- SLIGHTLY TAIL LOW.
12. Ignition Switch -- OFF.
13. Brakes -- APPLY HEAVILY.

## **DITCHING**

1. Radio -- TRANSMIT MAYDAY on 121.5 MHz or appropriate frequency, giving location and intentions and SQUAWK 7700.
2. Heavy Objects in baggage area -- SECURE OR JETTISON (if possible).
3. Passenger Seat Backs -- MOST UPRIGHT POSITION.
4. Seats and Seat Belts -- SECURE.
5. Wing Flaps -- 20° to 30°.
6. Power -- ESTABLISH 300FT/MIN DESCENT AT 55 KIAS.

### **NOTE**

If no power is available, approach at 70 KIAS with flaps up or at 65 KIAS with 10° flaps.

7. Approach -- High Winds, Heavy Seas -- INTO THE WIND.  
Light Winds, Heavy Swells -- PARALLEL TO SWELLS.
8. Cabin Doors -- UNLATCH.
9. Touchdown -- LEVEL ATTITUDE AT ESTABLISHED RATE OF DESCENT.
10. Face -- CUSHION at touchdown with folded coat.
11. ELT -- Activate.
12. Aeroplane -- EVACUATE through cabin doors. If necessary open window and flood cabin to equalize pressure so doors can be opened.
13. Life Vests and Raft -- INFLAT WHEN CLEAR OF AEROPLANE.

# FIRES

## DURING START ON GROUND

1. **Cracking -- CONTINUE** to get a start which would suck the flames and accumulated fuel into the engine.

If engine starts:

2. Power -- 1800 RPM for a few minutes.
3. Engine -- SHUTDOWN and inspect for damage.

If engine fails to start:

4. **Throttle -- FULL OPEN**
5. **Mixture -- IDLE CUT OFF.**
6. **Cranking -- CONTINUE.**
7. **Fuel Shutoff Valve -- OFF (Pull Full Out).**
8. **Auxiliary Fuel Pump -- OFF.**
9. Fire Extinguisher -- OBTAIN and ACTIVATE.
10. Engine -- Master Switch OFF, Ignition Switch OFF.
11. Parking Brake -- RELEASE.
12. Aeroplane -- EVACUATE.
13. Fire -- EXTINGUISH using fire extinguisher, wool blanket or dirt.
14. Fire Damage -- INSPECT, repair damage or replace damaged components or wiring before conducting another flight.

## ENGINE FIRE IN FLIGHT

1. **Mixture -- IDLE CUT OFF.**
2. **Fuel Shutoff Valve -- OFF (Pull Full Out).**
3. **Auxiliary Fuel Pump Switch -- OFF.**
4. **Master Switch -- OFF.**
5. Cabin Heat and Air -- OFF (except overhead vents).
6. Airspeed -- 100 KIAS (If fire is not extinguished, increase glide speed to find an airspeed – within airspeed limitations – which will provide an incombustible mixture).
7. Forced Landing -- EXECUTE (as described in Emergency Landing Without Engine Power).

## **ELECTRICAL FIRE IN FLIGHT**

- 1. Master Switch -- OFF.**
- 2. Vents, Cabin Air, Heat -- CLOSED.**
- 3. Fire Extinguisher -- ACTIVATE.**
4. Avionics Master Switch -- OFF.
5. All other Switches (except ignition switch) -- OFF.

### **WARNING**

**AFTER DISCHARGING FIRE EXTINGUISHER AND ASCERTAINING THAT THE FIRE HAS BEEN EXTINGUISHED, VENTILATE CABIN.**

6. Vents, Cabin Air, Heat -- OPEN when it is ascertained that fire is completely extinguished.

If fire has been extinguished and electrical power is necessary for continuance of flight to the nearest suitable airport or landing area:

7. Master Switch -- ON.
8. Circuit Breakers -- CHECK for faulty circuit, do not reset.
9. Radio Switches -- OFF.
10. Avionics Master Switch -- ON.
11. Radio/Electrical Switches -- ON one at a time, with delay after each until short circuit is localised.

## **CABIN FIRE**

- 1. Master Switch -- OFF.**
- 2. Vents, Cabin Air, Heat -- CLOSED (to avoid drafts).**
- 3. Fire Extinguisher -- ACTIVATE.**

### **WARNING**

**AFTER DISCHARGING FIRE EXTINGUISHER AND ASCERTAINING THAT THE FIRE HAS BEEN EXTINGUISHED, VENTILATE CABIN.**

4. Vents, Cabin Air, Heat -- OPEN when it is ascertained that fire is completely extinguished.
5. Land the aeroplane as soon as possible to inspect for damage.

## **WING FIRE**

- 1. Landing/Taxi/Strobe/Navigation Light Switches -- OFF.**
- 2. Pitot Heat Switch -- OFF.**
3. Sideslip to keep flames away from cabin and fuel tank.
4. Land as soon as possible using flaps only on final approach.

# ICING

## INADVERTENT ICING ENCOUNTER

1. **Turn pitot heat switch ON.**
2. **Turn back or change altitude** to obtain an outside air temperature that is less conducive to icing.
3. **Pull cabin heat full out and rotate defroster control clockwise** to obtain maximum defroster airflow.
4. Watch for signs of engine-related icing conditions. An unexplained loss of engine speed could be caused by ice blocking the air intake filter. Adjust the throttle position to obtain maximum RPM, this may require advancing or retarding of the throttle depending on where the ice has accumulated. Adjust mixture, as required for maximum RPM.
5. Plan a landing at the nearest airport. With an extremely rapid ice build up, select a suitable "off airport" landing site.
6. With an ice accumulation of ¼ inch or more on the wing leading edges, be prepared for significantly higher stall speed.
7. Leave wing flaps retracted. With a severe ice build up on the horizontal tail, the change in wing wake airflow direction caused by wing flap extension could result in a loss of elevator effectiveness.
8. Open left window and, if practical, scrape ice from a portion of the windshield for visibility in the landing approach.
9. Perform a landing approach using a forward slip, if necessary, for improved visibility.
10. Approach at 65 to 75 KIAS depending upon the amount of the accumulation.
11. Perform a landing in a level attitude.

## STATIC SOURCE BLOCKAGE (Erroneous Instrument Readings Suspected)

1. **Static Pressure Alternate Source Valve -- PULL ON.**
2. Airspeed/Altitude -- See Flight Manual (Section 5) for correction table.

## VACUUM SYSTEM FAILURE

Left or Right Vacuum Annunciator Light illuminates.

1. **Vacuum Gauge -- CHECK** to ensure vacuum within green arc.

If vacuum is not within normal operating limits a failure has occurred in the vacuum system and partial panel procedures may be required for continued flight.

## **LANDING WITH A FLAT MAIN TYRE**

1. Approach -- NORMAL.
2. Wing Flaps -- FULL DOWN.
3. Touchdown -- GOOD MAIN TYRE FIRST, hold aeroplane off flat tyre as long as possible with aileron control.
4. Directional Control -- MAINTAIN using brake on good wheel as required.

## **LANDING WITH A FLAT NOSE TYRE**

1. Approach -- NORMAL.
2. Wing Flaps -- As required.
3. Touchdown -- ON MAINS, hold nose wheel off the ground as long as possible.
4. When nose wheel touches down, maintain full up elevator as aeroplane slows to stop.

## **ELECTRICAL POWER SUPPLY SYSTEM MALFUNCTIONS**

### **AMMETER SHOWS EXCESSIVE RATE OF CHARGE (Full Scale Deflection)**

1. Alternator -- OFF.
2. Nonessential Electrical Equipment -- OFF.
3. Flight -- TERMINATE as soon as practical.

### **LOW VOLTAGE ANNUNCIATOR ILLUMINATES DURING FLIGHT (Ammeter Indicates Discharge)**

1. Avionics Master Switch -- OFF
2. Alternator Circuit Breaker -- CHECK IN.
3. Master Switch -- OFF (both sides)
4. Master Switch -- ON.
5. Low Voltage Annunciator -- CHECK OFF.
6. Avionics Master Switch -- ON.

If low voltage light illuminates again:

7. Alternator -- OFF.
8. Nonessential Radio and Electrical Equipment -- OFF.
9. Flight -- TERMINATE as soon as practical.

# PASSENGER BRIEFINGS

It is important to brief your passengers thoroughly prior to flight, and also keep passengers updated during the flight. Included are some suggestions for items to be included in your briefs.

## PRIOR TO GOING AIRSIDE

- Passengers should stay with you while airside for security and safety.
- No smoking anywhere while airside or in the aircraft.
- Stay away from other aircraft and be alert to hazards.
- Overview of flight and expected flying conditions.
- Does anybody require the toilet before we take-off?

## ON THE GROUND

- Don't scare your passengers by talking about engine failures, fires, or similar – simply ensure they are told to follow your instructions and know how to operate the doors and/or emergency exits.
- Adjustment of seat belts and seat position.
- Location of sick bags.
- An intercom is provided so passengers can easily communicate.
- Passengers to minimise chat when radio is busy, or as requested.
- Front seat passenger should be encouraged to point out any aircraft spotted that might be of conflict – another set of eyes is always useful.
- Front seat passenger briefed on not interfering with controls.
- If any passengers have any concerns during the flight they should be encouraged to raise them.
- Be sure to ask your passengers if they have any questions.
- Encourage passengers to read the self-briefing cards if available.

## IN FLIGHT

- A running commentary of sights that can be seen, locations flown over and how the flight is progressing can be useful.
- Update your passengers about any change of plans.
- Check on the status of your passengers regularly.

*Should a situation arise in flight you should remain calm. Communicate clearly and confidently the situation and your intentions to passengers.*

## SELF BRIEFING - DEPARTURE

A takeoff briefing should clearly state your plan-of-action for both when everything goes as planned and when they do not!

*"He who fails to plan, plans to fail!"*

You should brief yourself on the following points:

- How you plan on taking off and departing the aerodrome.
- Consider any threats relevant to the departure and manage them.
- Reasons for an aborted takeoff and how to execute it.
- Dealing with an engine failure with runway remaining.
- Dealing with an engine failure at low level with no runway remaining.

## SELF BRIEFING - ARRIVAL

The arrival is the single most demanding phase of flight, and the one that carries the highest risk. As with a departure briefing, a thorough self brief on arrival is the key to a smooth and arrival.

You should brief yourself on the following points:

- How you plan on conducting your approach to the aerodrome, and what clearance or joining procedure you anticipate based on ATIS / AWIS.  
*Example: Join upwind for RWY 06 at 1,800ft descending on upwind to 1,300ft.*
- Any NOTAMS relevant to your approach and landing.  
*Example: RWY 10/28 closed due soft wet surface.*
- Consider any threats relevant to the arrival and manage them.  
*Example: Particularly strong crosswind and in-to-wind runway not available.*
  - Revise crosswind procedure, be go-around minded if unstable.
  - Consider diversion if necessary.
- The type of approach and landing you plan on making.  
*Example: Reduced flap setting due to strong winds, final speed 65-75kts.*
- If needing to go-around, the actions required to execute the procedure.  
*Example: Full power, raise nose, establish positive climb, flaps up slowly, communicate with ATC or other aircraft.*

# THREAT AND ERROR MANAGEMENT

TEM is an approach to flying that seeks to equip the pilot with the skills to recognise and counter everyday problems which, if ignored, could result in accidents or incidents.

Not all threats can be anticipated, it is unrealistic to make contingency plans to try to cover unexpected events. Experience shows that many threats can be anticipated, the first step is to identify likely threats. Once a threat has been identified, it must be managed.

***If you identify a threat that cannot be managed you should not go flying!***

Example Threat	Management
<i>High number of aircraft operating at aerodrome</i>	<i>Extra vigilance of traffic in the circuit through visual means and radio monitoring.</i>
<i>Tower closed, CTAF procedures in operation</i>	<i>Without additional safety of tower protection maintain an enhanced lookout and radio monitoring.</i>
<i>Short Runway</i>	<i>Ensure correct short field take-off or landing procedures are used and that performance has been confirmed.</i>
<i>Terrain or obstacles</i>	<i>Maintain enhanced situational awareness, also modify departure or arrival as appropriate.</i>
<i>Landing in to setting sun</i>	<i>Use another runway if possible. Wear sunglasses and be go-around minded if unhappy with any aspect of the approach.</i>
<i>Adverse Weather ie. Crosswind on landing</i>	<i>Ensure correct crosswind procedures are adopted and you are up to the task (aircraft and/or crosswind recency). Be go-around minded if the approach or landing becomes unstable. Request an alternate runway if operationally required or preferred.</i>
<i>Your recency</i>	<i>Study aircraft procedures prior to flight and take extra time to perform checks and monitor your own performance, or take a safety pilot.</i>
<i>Aircraft status ie. COM1 distorted / unreadable</i>	<i>Utilise COM2 for primary communications if available, otherwise divert or abort flight after troubleshooting.</i>
<i>NOTAMS</i>	<i>Familiarise yourself with changes to regular procedures and include in departure or arrival briefs.</i>

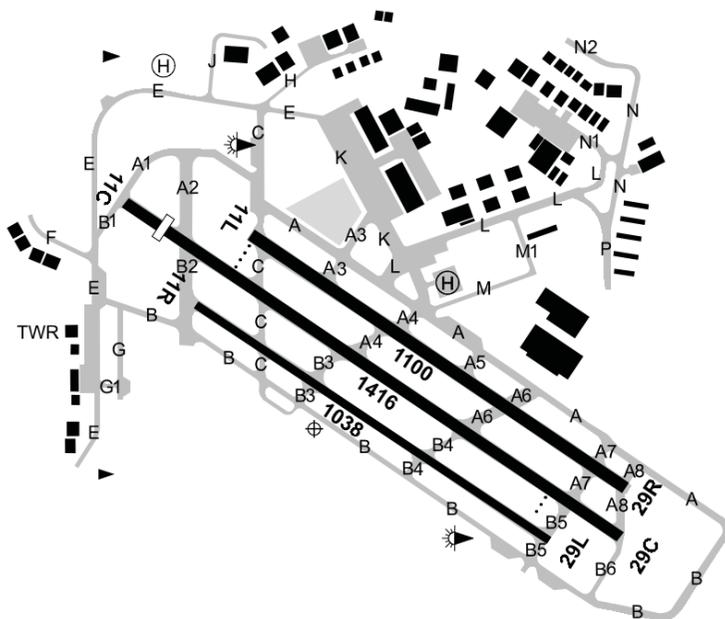
## ERROR MANAGEMENT

The TEM model accepts that it is unavoidable that pilots, as human beings, will make errors. While errors may be inevitable, safety of flight requires that errors that occur are identified and managed before flight safety margins are compromised.

Identification of errors requires aircraft/systems/procedure knowledge and situational awareness. Analyse your own performance and identify errors before they lead to an undesired aircraft state or more serious error.

# USEFUL INFORMATION

Location	Frequency	
Camden	Tower / CTAF(R)	120.1
	Ground	121.9
	ATIS / AWIS	125.1
Training Area	Sydney Radar	124.55
Bankstown <i>Preferred diversion airport</i>	Tower / CTAF(R)	132.8
	Ground	119.9
	ATIS / AWIS	120.9
	NDB	416
Wedderburn	CTAF	122.55
The Oaks	CTAF	126.7
Airborne Aviation	Airborne Base	119.2
	Phone	(02) 4655 7200



**SYDNEY/Bankstown (YSBK)**

