Aircraft Information Booklet

Cessna 152A

VH-UQS

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Contents

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

The C152A is primarily used as a training aeroplane for the GFPT and PPL. With a cruise speed of 95kts it is ideal for cruising around, or in this models' case, conducting aerobatics.

Equipment and Features

- Transponder

Recency & Restrictions

Private Hire:	Company check flight.
Dual training:	No restrictions.
Recency:	Flown any aircraft in the last 45 days.

Panel Photo

Performance – Standard Specifications

SPEED:
- Maximum at Sea Level ..... 109 KTS
- Cruise, 75% Power at 8000 FT ..... 106 KTS

CRUISE:
- 80% Power at 8000 Ft ..... Range 345 NM
- 24.5 Gallons Usable Fuel ..... Time 3.4 HRS

RATE OF CLIMB AT SEA LEVEL ..... 715 FPM
SERVICE CEILING ..... 14 700 FT
TAKEOFF PERFORMANCE:
- Ground Roll ..... 725 FT
- Total Distance Over 50 Ft. Obstacle ..... 1340 FT

LANDING PERFORMANCE:
- Ground Roll ..... 475 FT
- Total Distance Over 50 Ft. Obstacle ..... 1200 FT

STALL SPEED:
- Flaps Up, Power Off ..... 40 KIAS
- Flaps Down, Power Off ..... 35 KIAS

MAXIMUM WEIGHT:
- Ramp ..... 1670 LBS

STANDARD EMPTY WEIGHT ..... 1125 LBS
MAXIMUM USEFUL LOAD .....545 LBS
BAGGAGE ALLOWANCE .....120 LBS
WING LOADING ..... 10.5 Lbs/Sq Ft
POWER LOADING ..... 15.2 Lbs/HP
FUEL CAPACITY ..... 26 GAL
OIL CAPACITY ..... 6 QTS
ENGINE: O-235-L2C
PROPELLER: Fixed Pitch, Diameter ..... 69 IN

The above performance figures are based on aeroplane weights at 1670 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

AIRSPEEDS - NORMAL OPERATIONS

Takeoff:
- Normal Climb Out ..... 65-75 KIAS
- Short Field Takeoff, Flaps 10º, Speed at 50 ft ..... 54 KIAS

Enroute Climb, Flaps Up:
- Normal, sea level 70-80KIAS
- Best Rate-of-Climb, Sea level ..... 67 KIAS
- Best Rate-of-Climb, 10,000 Feet ..... 61 KIAS
- Best Angle-of-Climb, Sea level ..... 55 KIAS
- Best Angle-of-Climb, 10,000 Feet ..... 55 KIAS

Landing Approach:
- Normal Approach Flaps Up ..... 60-70 KIAS
- Normal Approach, Flaps FULL ..... 55-65 KIAS
- Short Field Approach, Flaps FULL ..... 54 KIAS

Balked Landing:
- Maximum Power, Flaps 20º ..... 55 KIAS

V-Speeds:
- Vne (never exceed) ..... 172 KIAS
- Vno (Maximum structural cruising speed) ..... 125 KIAS
- Vfe ..... 85 KIAS

Maximum Recommended Turbulent Air Penetration Speed: ..... 108 KIAS

Maximum Demonstrated Crosswind Velocity:
- Takeoff or landing ..... 12 KNOTS

Stall Speed:
- Flaps Up, Power Off ..... 40 KIAS
- Flaps Down, Power Off ..... 35 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 ..... W100 / 15W50
Oil Quantities:
- Maximum ..... 6 QTS
- Minimum ..... 4 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 Pilot's Operating Handbook.

FUEL SYSTEM

Total Capacity ..... 98 litres /26 gallons
Total Usable ..... 93 litres /24.5 gallons
Fuel Consumption per hour ..... 25 litres / 6.5 gallons
Approved Fuels:
- Option A ..... 100LL Grade Aviation Fuel (Blue)
- Option B ..... 100 Grade Aviation Fuel (Green)

TYRE PRESSURES

Nose wheel ..... 30 PSI
Main wheels ..... 30 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
- Flaps Up ..... +6.0g, -3.0g
- Flaps Down ..... +3.5g

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

SAMPLE LOADING PROBLEM (WITHOUT PARACHUTES)	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)	1172	36.1	1220.7	37.6
2. Usable Fuel (At 6 Lbs./Gal.) Standard Tanks (24.5 Gal. Maximum)	147	6.2		
Long Range Tanks (37.5 Gal. Maximum)				
Reduced Fuel (As limited by maximum weight)				
3. Pilot and Passenger (Station 33 to 41)	340	13.3		
4. *Baggage - Area 1 (Or passenger on child's seat) (Station 50 to 76)	11	.7		
5. *Baggage - Area 2 (Station 76 to 94)				
6. TOTAL WEIGHT AND MOMENT	1670	56.3		

7. Locate this point (1670 at 56.3) on the Center of Gravity Moment Envelope, and since this point falls within the envelope, the loading is acceptable.

* Baggage and/or Passengers on child's seat not authorized during aerobatic maneuvers.

Sample ~~Problem~~ Loading Problem (Without Parachutes)

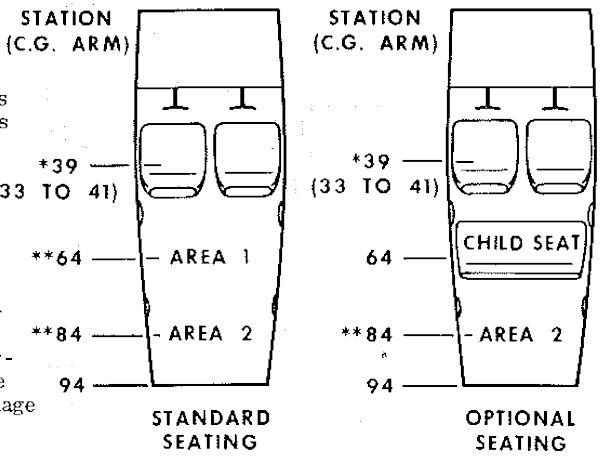
LOADING ARRANGEMENTS

*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.

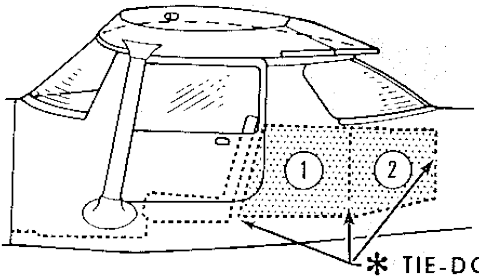
**Arms measured to the center of the areas shown.

NOTE

The aft baggage wall (approximate station 94) can be used as a convenient interior reference point for determining the location of baggage area fuselage stations.



BAGGAGE LOADING AND TIE-DOWN



BAGGAGE AREA MAXIMUM ALLOWABLE LOADS

Baggage and/or passenger on child's seat not authorized during aerobatics.

AREA (1) = 120 POUNDS
AREA (2) = 40 POUNDS
AREAS (1) + (2) = 120 POUNDS

* TIE-DOWN NET ATTACH POINTS

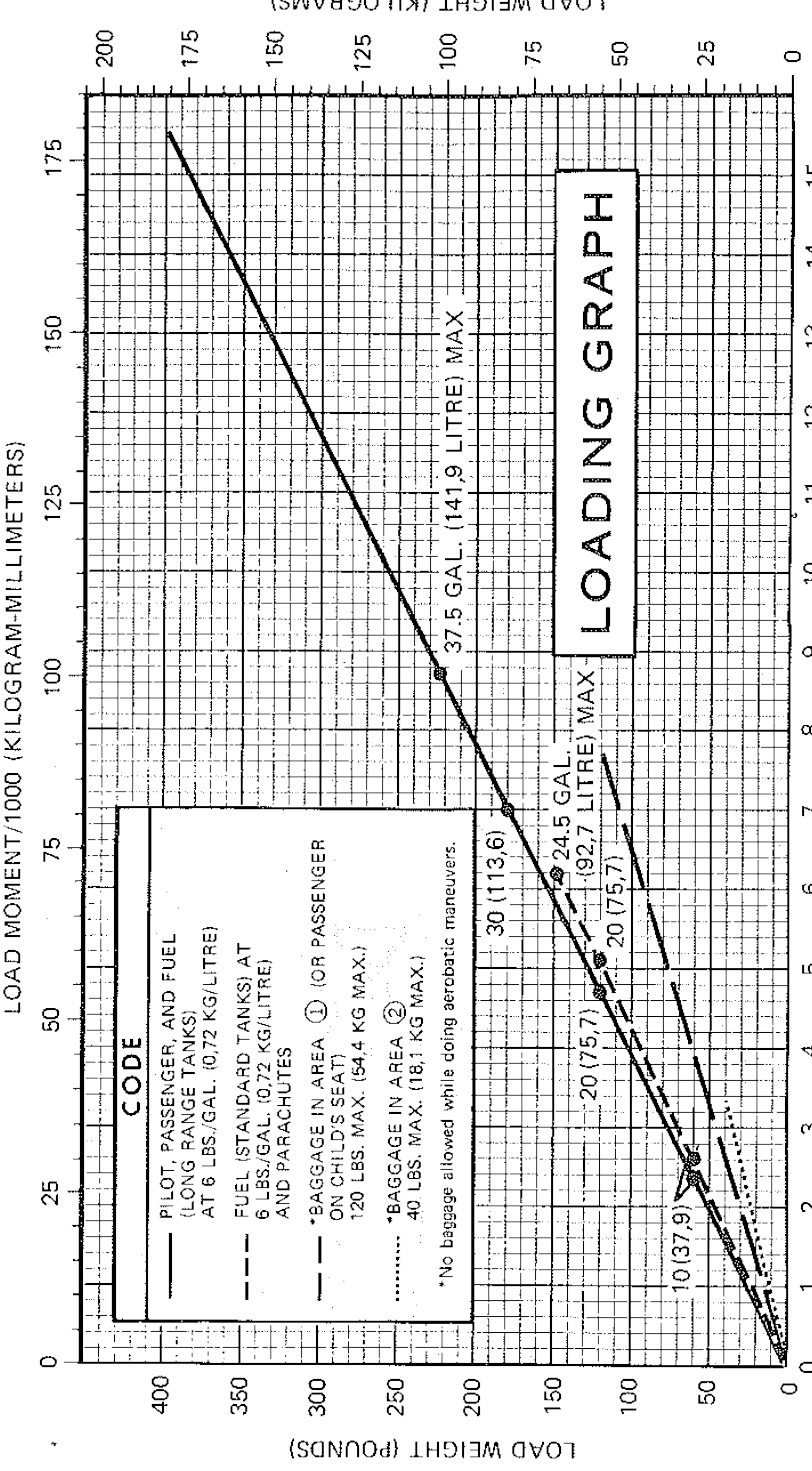
* A cargo tie-down net is provided to secure baggage in the baggage area. The net attaches to six tie-down rings. Two rings are located on the floor just aft of the seat backs and one ring is located two inches above the floor on each cabin wall at the aft end of area (1). Two additional rings are located at the top, aft end of area (2). At least four rings should be used to restrain the maximum baggage load of 120#.

CALCULATING THE MOMENT

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

Example: Pilot and passenger weigh 340lbs, the arm is 39”.
Answer: (340 x 39) / 1000 = 13.26

LOADING GRAPH



NOTES: Line representing adjustable seats shows the pilot or passenger center of gravity on adjustable seats positioned for an average occupant. Refer to the Loading Arrangements Diagram for forward and aft limits of occupant C.G. range.

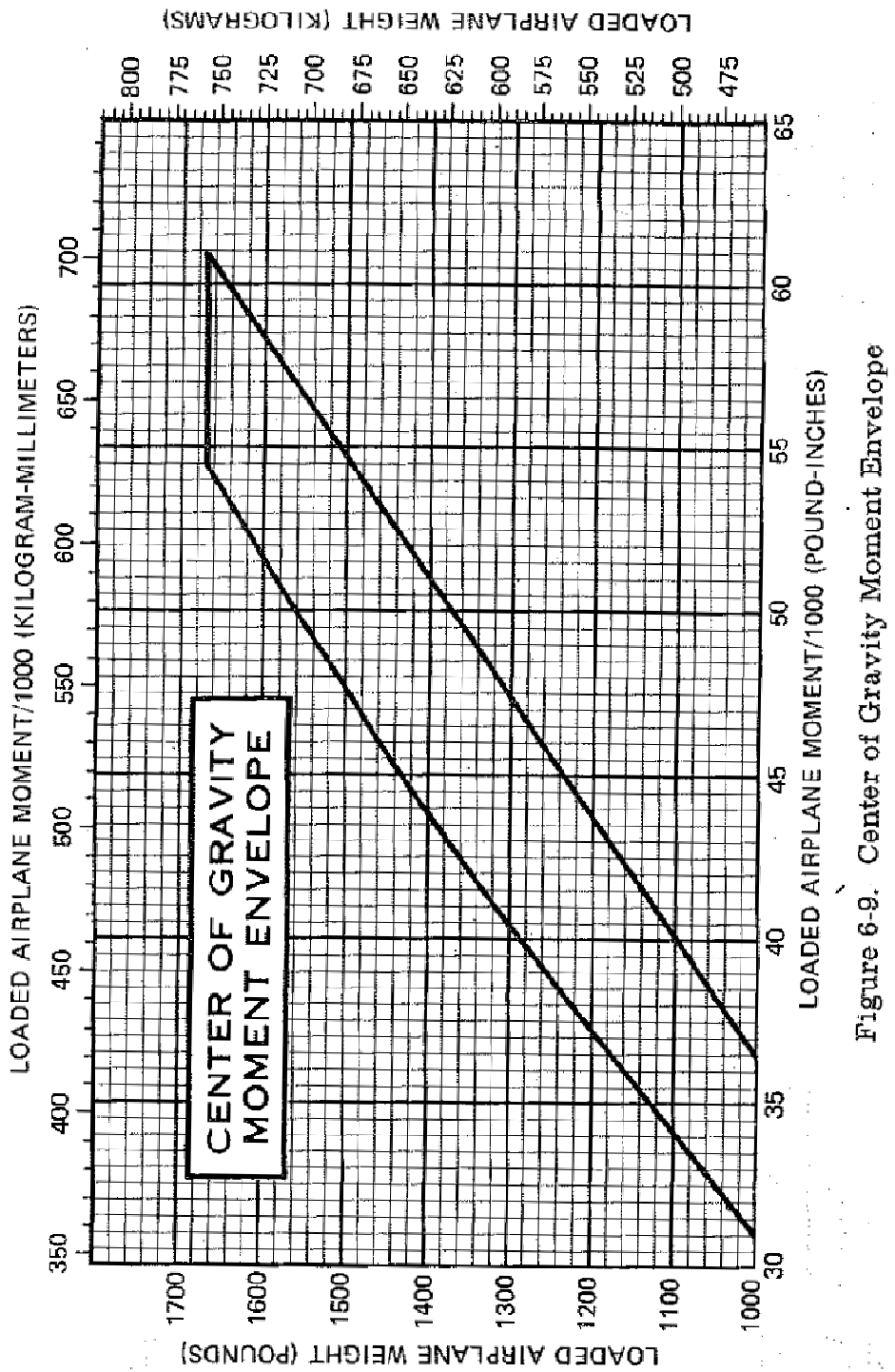


Figure 6-9. Center of Gravity Moment Envelope

Aerobatic Operations

Pilots may only perform manoeuvres that have been specifically endorsed in their logbook. Manoeuvres are endorsed after all aspects of each manoeuvre have been demonstrated during dual training.

Certain advanced aerobatic manoeuvres such as tail slides, tumbles, and torque rolls are prohibited by company policy. Speak with your instructor if you would like further details.

APPROVED MANOEUVRES (PILOT'S OPERATING HANDBOOK)

The following aerobatic manoeuvres and entrance speeds are approved with no baggage and the aft C.G. within the limits specified for the Acrobatic category.

Manoeuvres	Speed
Chandelles	105 KIAS
Lazy Eights	105 KIAS
Loops	115 KIAS
Aileron and Barrel rolls	115 KIAS
Rolls off the top	130 KIAS
Cuban 8's	115 KIAS
Stalls & Spins	Slow Deceleration

Spin Recovery	"Out of Control" Recovery
• Power to idle. • Aileron neutral. • Full opposite rudder briskly to stop rotation. • Forward elevator. • Recover aeroplane to straight and level flight.	• Power to idle. • Stick and rudder held neutral. • Wait for 60 KIAS. • Recover aeroplane to straight and level flight.

TAKEOFF DISTANCE

SHORT FIELD

CONDITION:
Flaps 10°
Full Throttle Prior to Brake Release
Paved, Level, Dry Runway
Zero Wind

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 tailwinds up to 10 knots, increase distances by 10% for each 2 knots.
4. For operation on a dry, grass runway, increase distances by 15% of the "ground roll" figure.

WEIGHT LBS	TAKEOFF SPEED KIAS		PRESS ALT FT	0°C		10°C		20°C		30°C		40°C	
	LIFT OFF	AT 50 FT		GRND ROLL	TOTAL TO CLEAR 50 FT OBS	GRND ROLL	TOTAL TO CLEAR 50 FT OBS	GRND ROLL	TOTAL TO CLEAR 50 FT OBS	GRND ROLL	TOTAL TO CLEAR 50 FT OBS	GRND ROLL	TOTAL TO CLEAR 50 FT OBS
1670	50	54	S.L.	640	1190	695	1290	755	1390	810	1495	875	1605
			1000	705	1310	765	1420	825	1530	890	1645	960	1770
			2000	775	1445	840	1565	910	1690	980	1820	1055	1960
			3000	855	1600	925	1730	1000	1870	1080	2020	1165	2185
			4000	940	1775	1020	1920	1100	2080	1190	2250	1285	2440
			5000	1040	1970	1125	2140	1215	2320	1315	2525	1420	2750
			6000	1145	2200	1245	2395	1345	2610	1455	2855	1570	3125
			7000	1270	2470	1375	2705	1490	2960	1615	3255	1745	3590
			8000	1405	2800	1525	3080	1655	3395	1795	3765	1940	4195

LANDING DISTANCE

SHORT FIELD

CONDITIONS:
Flaps 30°
Power Off
Maximum Braking
Paved, Level, Dry Runway
Zero Wind

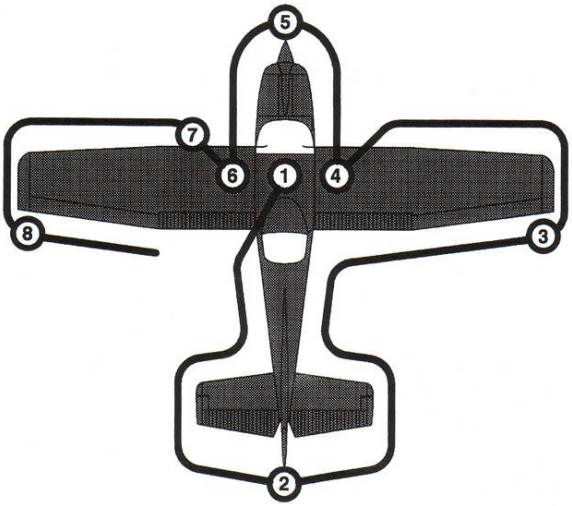
NOTES:
1. Short field technique as specified in Section 4.
2. Decrease distances 10% for each 9 knots headwind. For operation with tailwinds up to 10 knots, increase distances by 10% for each 2 knots.
3. For operation on a dry, grass runway, increase distances by 45% of the "ground roll" figure.

WEIGHT LBS	SPEED AT 50 FT KIAS	PRESS ALT FT	0°C		10°C		20°C		30°C		40°C	
			GRND ROLL	TOTAL TO CLEAR 50 FT OBS	GRND ROLL	TOTAL TO CLEAR 50 FT OBS	GRND ROLL	TOTAL TO CLEAR 50 FT OBS	GRND ROLL	TOTAL TO CLEAR 50 FT OBS	GRND ROLL	TOTAL TO CLEAR 50 FT OBS
1670	54	S.L.	450	1160	465	1185	485	1215	500	1240	515	1265
		1000	465	1185	485	1215	500	1240	520	1270	535	1295
		2000	485	1215	500	1240	520	1270	535	1300	555	1330
		3000	500	1240	520	1275	540	1305	560	1335	575	1360
		4000	520	1275	540	1305	560	1335	580	1370	600	1400
		5000	540	1305	560	1335	580	1370	600	1400	620	1435
		6000	560	1340	580	1370	605	1410	625	1440	645	1475
		7000	585	1375	605	1410	625	1440	650	1480	670	1515
		8000	605	1410	630	1450	650	1480	675	1520	695	1555

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.



(1) CABIN

1. Pitot tube cover -- REMOVE. Check for pitot blockage.
2. Pilots Operating Handbook -- AVAILABLE IN THE AEROPLANE.
3. Aeroplane weight and balance -- CHECKED.
4. Parking brake -- AS REQUIRED.
5. Control Wheel Lock -- REMOVE.
6. Ignition Switch -- OFF.
7. Lights, Radios, Electrical Equipment -- 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.

8. Seats, Seatbelts & Shoulder Harnesses -- CHECK security & condition.
9. Master Switch -- ON.
10. Fuel Quantity Indicators -- CHECK QUANTITY.
11. Fuel Shut Off Valve -- ON (Down).
13. Door Release Pins –- CHECK security and condition.
14. Flaps -- EXTEND.
15. Master Switch -- OFF.

(2) EMPENNAGE

1. Rudder Gust Lock -- REMOVE if installed.
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).
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 below WARNING and do not fly aeroplane.

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 MAINENANCE PERSONNEL. ALL EVIDENCE OF CONTAMINATION MUST BE REMOVED BEFORE FURTHER FLIGHT.

4. Fuel quantity -- CHECK VISUALLY for desired level.
5. Fuel Filler Cap -- SECURE.

(5) NOSE

1. Engine Oil Level – CHECK do not operate with less than 4 quarts. Fill to 6 quarts for extended flights.
2. Before the first flight of each day and after each refuelling, pull out strainer drain knob for about four seconds to clear fuel strainer of possible water and sediment. Check strainer drain is closed. If water is observed, the fuel system may contain additional water, and further draining of the system at the strainer, fuel sumps and fuel line drain plug will be necessary.
3. Propeller and Spinner – CHECK for nicks and security.
4. Carburettor Air Filter – CHECK for restrictions by dust or other foreign matter.
5. Landing Light – CHECK for condition and cleanliness.
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 (left side of fuselage) -- CHECK for blockage.

(6) LEFT WING

1. Fuel Quantity -- CHECK VISUALLY 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, refer to above WARNING and 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 for blockage. CHECK operation.
4. Wing Tie-Down -- DISCONNECT.

(8) LEFT WING Trailing edge

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

BEFORE STARTING ENGINE

1. Pre-flight Inspection -- COMPLETE.
2. Aircraft Dispatch -- COMPLETED / AUTHORISED.
3. Running Sheet Figures -- COMPLETE.
4. Maintenance Release – CHECKED / CURRENT.
5. Air Sickness Bags -- AVAILABLE.
6. Passenger Briefing -- COMPLETE.
7. Seats, Seatbelts, Shoulder Harnesses -- CHECK SECURE.
8. Brakes -- TEST and PARKING BRAKE as required.
9. Circuit Breakers -- CHECK IN.
10. Fuel Shutoff Valve -- ON.
11. ATIS / Clearance -- OBTAIN as required.
    a. Master Switch -- ON
    c. Radios/Navaids -- ON, set as required.
    d. ATIS / Clearance -- OBTAIN.

WARNING

THE RADIOS AND ELECTRICAL EQUIPMENT MUST BE OFF DURING ENGINE START TO PREVENT POSSIBLE DAMAGE.

12. Radios/Navaids -- OFF.
13. Master Switch -- OFF

STARTING ENGINE (With Battery)

1. Mixture—RICH.
2. Carburettor Heat—COLD.
3. Prime—AS REQUIRED (up to 3 strokes).
4. Throttle—OPEN ½ INCH.
5. Propeller Area—CLEAR.
6. Master Switch— ON.
7. Confirm area around aircraft is clear -- call “CLEAR PROP!”
8. Ignition Switch— START (release when engine starts).
9. Throttle—Adjust for 1000RPM.
10. Oil Pressure -- CHECK, confirm rising within 30 seconds or shut down.
11. Navigation Lights and Flashing Beacon -- ON as required.
12. Radios/Navaids -- ON, set as required.
13. Flaps -- RETRACT.

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 – AS REQUIRED.
2. Seats, Seatbelts and Shoulder Harnesses -- CHECK SECURE.
3. Cabin Doors -- CLOSED and LOCKED.
4. Flight Controls -- FULL, FREE and CORRECT movement.
5. Flight Instruments -- CHECK and SET. (AI, DG aligned, QNH SET etc.)
6. Fuel Quantity -- CHECK.
7. Mixture -- RICH.
8. Fuel Shut-off Valve -- ON.
9. Trim -- SET for takeoff.
10. Throttle -- 1700 RPM.
    a. Magnetos -- CHECK. RPM drop should not exceed 125 RPM on either magneto or 50 RPM differential between Magnetos. Confirm on BOTH.
    b. Carburetor Heat—CHECK (for RPM drop) then COLD.
    c. Suction Gauge -- CHECK.
    d. Engine Instruments and Ammeter -- CHECK.
11. Throttle -- CHECK idle.

12. Throttle -- 1000 RPM.
13. Throttle Friction Lock -- ADJUST.
14. Radios and Avionics -- SET.
15. Wing Flaps -- SET for takeoff (0º-10º).
16. Self Brief -- COMPLETE (Aborted T/O, engine failure, TEM)
17. 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 -- 0º-10 º.
2. Carburetor -- COLD.
3. Throttle -- FULL OPEN.
4. Mixture -- RICH (above 3000 feet, LEAN to obtain maximum RPM).
5. Checks -- REVS achieved, AIRSPEED rising, GAUGES in the green.
6. Elevator Control -- LIFT NOSE WHEEL at 50 KIAS.
7. Climb Speed – 65-75 KIAS.
8. Lights -- AS REQUIRED when clear of airport.

SHORT FIELD TAKEOFF

1. Wing Flaps -- 10º.
2. Carburettor -- COLD.
3. Foot Brakes -- APPLY.
4. Throttle -- FULL OPEN.
5. Mixture -- RICH (above 3000 feet, LEAN to obtain maximum RPM).
6. Brakes -- RELEASE.
7. Checks -- REVS achieved, AIRSPEED rising, GAUGES in the green.
8. Elevator Control -- MAINTAIN SLIGHTLY TAIL LOW ATTITUDE.
9. Climb Speed -- 54 KIAS (Until all obstacles are cleared).
10. Wing Flaps -- RETRACT slowly after reaching 60 KIAS.

ENROUTE CLIMB

NORMAL CLIMB

1. Airspeed -- 70-80 KIAS.
2. Throttle -- FULL OPEN.
3. Mixture -- RICH (above 3000 feet, LEAN to obtain maximum RPM ABOVE 3000 feet).

CRUISE

1. Power -- 1900-2550 RPM (No more than 75% is recommended).
2. Elevator Trim -- AS REQUIRED.
3. Mixture -- LEAN.

DESCENT

1. Self Brief -- COMPLETE (Arrival plan/expectations, TEM, contingencies)
2. QNH -- Set aerodrome QNH.
3. Power -- AS DESIRED.
4. Carburettor Heat -- ON (apply FULL HOT below 1500 RPM).
5. Mixture -- ENRICHEN on descent, full rich for idle power.
6. Fuel Selector Valve -- BOTH.
7. Wing Flaps -- AS DESIRED (below 85 KIAS)

BEFORE LANDING

1. Brakes -- Checked and parking brake OFF.
2. Undercarriage -- DOWN and locked.
3. Mixture -- RICH.
4. Fuel -- Check ON, check quantity.
5. Instruments -- Check temps and pressures in GREEN, QNH SET.
6. Switches -- MAGS both, MASTER on, LIGHTS as required.
7. Seat Backs -- MOST UPRIGHT POSITION.
8. Hatches and Harnesses -- SECURED and LOCKED.
9. Carburettor Heat -- ON (apply FULL HOT below 1500 RPM).

LANDING

NORMAL LANDING

1. Airspeed -- 60-70 KIAS (flaps UP).
2. Wing Flaps -- AS DESIRED (below 85 KIAS).
3. Airspeed -- 55-65 KIAS (flaps FULL).
4. Carburettor Heat -- COLD (on final leg).
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 -- 60-70 KIAS (Flaps UP).
2. Wing Flaps -- FULL DOWN (30° below 85 KIAS).
3. Airspeed -- 54 KIAS (until flare).
4. Carburettor Heat -- COLD (on final leg).
5. Trim -- ADJUST as desired.
6. Power -- REDUCE to idle after clearing obstacles.
7. Touchdown -- MAIN WHEELS FIRST.
8. Brakes -- APPLY HEAVILY.
9. Wing Flaps -- RETRACT for maximum brake effectiveness.

BALKED LANDING

1. THROTTLE -- FULL OPEN.
2. Carburettor Heat -- COLD (on final leg).
3. Wing Flaps -- RETRACT to 20º.
4. Climb Speed -- 55 KIAS.
5. Wing Flaps -- RETRACT slowly after reaching a safe altitude and 60 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. Throttle -- 1000 RPM.
3. Ignition Switches -- CHECK L, R, then ON BOTH.
4. Radios, Electrical equipment -- OFF.
5. Lights -- OFF
6. Mixture -- IDLE CUT OFF (pulled fully out).
7. Throttle -- CLOSED once propeller has stopped.
8. Ignition Switches -- OFF.
9. Master Switch -- OFF.
10. Control Lock -- INSTALL.
11. Aeroplane Interior -- TIDY.
12. Running Sheet Figures -- COMPLETE.
13. Parking -- BRAKES RELEASED, chock if necessary.
14. 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 Pilot's Operating Handbook provides amplified procedures for coping with emergencies that may occur.

Should an emergency arise the basic guidelines described in this section and the approved Pilot's Operating Handbook 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 ..... 60 KIAS
- Manoeuvring Speed (all weights): ..... 108 KIAS

Maximum Glide ..... 60 KIAS
Precautionary Landing With Engine Power ..... 55 KIAS
Landing Without Engine Power:
- Wing Flaps Up ..... 65 KIAS
- Wing Flaps Down ..... 60 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 -- 60 KIAS.
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 – 60 KIAS (Best glide speed).
2. Carburettor Heat -- ON.
3. Fuel Shutoff Valve -- ON (Push Full Down).
4. Primer -- IN and LOCKED.
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 -- 65 KIAS Flaps UP, 60 KIAS Flaps DOWN.
4. Mixture -- IDLE CUT OFF.
5. Fuel Shutoff Valve -- OFF
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 -- 60 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. Radios and Electrical Switches -- OFF.
7. Wing Flaps -- 30° (on final approach).
8. Airspeed -- 55 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 -- 30°.
6. Power -- ESTABLISH 300FT/MIN DESCENT AT 55 KIAS.

NOTE
If no power is available, approach at 65 KIAS
with flaps up or at 60 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 -- INFLATE WHEN CLEAR OF AEROPLANE.

FIRES

DURING START ON GROUND

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

If engine starts:

2. Power -- 1700 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 Up).
8. Fire Extinguisher -- OBTAIN and ACTIVATE.
9. Engine -- Master Switch OFF, Ignition Switch OFF.
10. Parking Brake -- RELEASE.
11. Aeroplane -- EVACUATE.
12. Fire -- EXTINGUISH using fire extinguisher, wool blanket or dirt.
13. 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 Up).
3. Master Switch -- OFF.
4. Cabin Heat and Air -- OFF (except overhead vents).
5. Airspeed -- 85 KIAS (If fire is not extinguished, increase glide speed to find an airspeed – within airspeed limitations – which will provide an incombustible mixture).
6. Forced Landing -- EXECUTE (as described in Emergency Landing Without Engine Power).

ELECTRICAL FIRE IN FLIGHT

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

WARNING

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

5. 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:

6. Master Switch -- ON.
7. Circuit Breakers -- CHECK for faulty circuit, do not reset.
8. Radio Switches -- OFF.
9. Avionics Master Switch -- ON.
10. 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 once 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 conductive 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
High number of aircraft operating at aerodrome	Extra vigilance of traffic in the circuit through visual means and radio monitoring.
Tower closed, CTAF procedures in operation	Without additional safety of tower protection maintain an enhanced lookout and radio monitoring.
Short Runway	Ensure correct short field take-off or landing procedures are used and that performance has been confirmed.
Terrain or obstacles	Maintain enhanced situational awareness, also modify departure or arrival as appropriate.
Landing in to setting sun	Use another runway if possible. Wear sunglasses and be go-around minded if unhappy with any aspect of the approach.
Adverse Weather ie. Crosswind on landing	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.
Your recency	Study aircraft procedures prior to flight and take extra time to perform checks and monitor your own performance, or take a safety pilot.
Aircraft status ie. COM1 distorted / unreadable	Utilise COM2 for primary communications if available, otherwise divert or abort flight after troubleshooting.
NOTAMS	Familiarise yourself with changes to regular procedures and include in departure or arrival briefs.

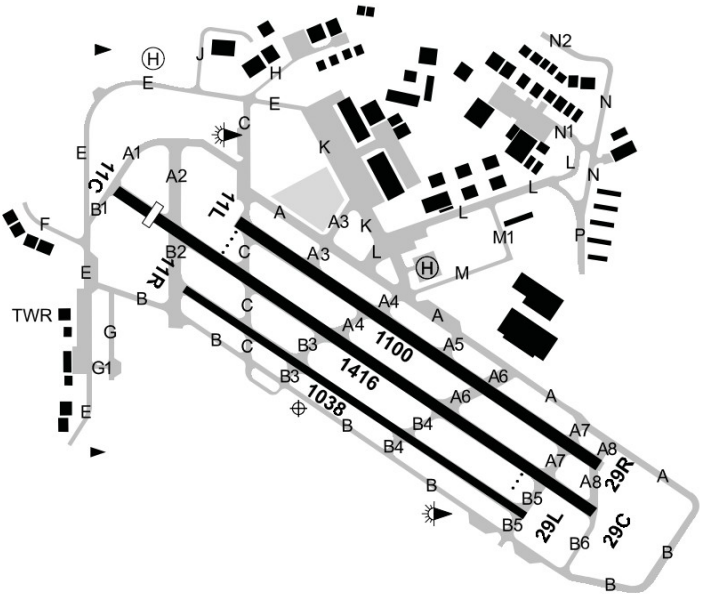
ERROR MANAGEMENT

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
	NDB	281
Training Area	Sydney Radar	124.55
Bankstown Preferred diversion airport	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)

Notes

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