PREAMBLE

The flowing pages represent a draft flight manual that has been prepared to help owners of new gyroplanes enter data required for the issue of the final ASRA approved flight manual. You should have Microsoft Word and Excel loaded on your PC.

*If you do not have a PC, or do not have the necessary PC skills, contact the Operations Manager or Technical Manager who can have the flight manual created for you.*

Owners are free to edit the following pages with the data that is relevant to their particular gyroplane. Headings/fields in RED – are mandatory where applicable.

Table of Contents

This will be updated once the Flight Manual has been created.

Section 1- Specifications

These are the general details of the gyroplane and are required for identification. If you have 2 options available e.g. 2 sets of rotors, both manufacturers must be listed.

Section 2 – Limitations

This establishes the envelope the gyroplane must be operated within and represents the majority of the mandatory requirements. Clearly some fields are not required for single seat gyroplanes and can be deleted. Text with “?” will require your own parameter to be entered.

Follow the instructions on 2.09 to create the graph.

Section 3 – Normal Procedures

These procedures are samples only and can be fully edited with your particulars.

Section 4 – Emergency Procedures

These procedures are samples only and can be fully edited with your particulars except 4.07 (mandatory) which is required to be filled in.

Section 5 – Normal Procedures (Mandatory)

These schedules are samples only and can be fully edited with your particulars.

Section 6 – Maintenance Schedule (Mandatory)

These schedules are samples only and can be fully edited with your particulars

*Once the flight manual is filled in with all your relevant details, delete this first page, change all the text back to black, save the file to your PC and submit to the ASRA registrar for final approval. Once approved the Flight Manual will appear on the Gyroplane file and can be downloaded at any time.*

GYROPLANE FLIGHT MANUAL

GXXXX

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*Insert Gyroplane photo here if required*

# SECTION 1

## SPECIFICATIONS

### **1.01 - GENERAL**

|  |  |
| --- | --- |
| Gyroplane Type | Tandem/Side by Side/Single Seat ? |
| ASRA Listing No | G…… |
| ASRA Approval No | If applicable? |
| Model | ? |
| Airframe Serial Number | ? |

### **1.02 - DIMENSIONS**

|  |  |
| --- | --- |
| Length | ? m |
| Height | ? m |
| Width | ? m |

##### **1.03 - ENGINE**

|  |  |
| --- | --- |
| Manufacturer | ? |
| Type | ? |
| Displacement | ? cc |
| Horsepower | ? |
| Cycles | ? |
| Fuel Consumption @ ? rpm | ? L/Hr |
| Approved Oil Grade | ? |
| Serial No | ? |

##### 

### **1.04 - REDUCTION UNIT**

|  |  |
| --- | --- |
| Manufacturer | ? |
| Type | Gear/Belt? |
| Ratio | ? : 1 |
| Approved Oil Grade | ? |
| Serial No | ? |

### **1.05 - PROPELLER**

|  |  |
| --- | --- |
| Manufacturer | ? |
| Diameter | ? in |
| Pitch | ? deg |
| Serial No | ? |

### **1.06 - ROTOR**

|  |  |
| --- | --- |
| Manufacturer | ? |
| Rotor Diameter | ? ft |
| Rotor Chord | ? in |
| Materials | ? |
| Serial No | ? |

### **1.07 - ROTOR HEAD**

|  |  |
| --- | --- |
| Manufacturer | ? |
| Material | ? |
| Prerotator | ? |
| Rotor Tachometer | ? |
| Serial No | ? |

### **1.08 - FUEL SYSTEM**

|  |  |
| --- | --- |
| Capacity | ? ltrs |
| Unusable | ? ltrs |
| Approved Fuel Grade | ? |
| Delivery System | Fuel Injection/Carburettor? |
| Fuel Quantity Indicating System | Sight/Digital/Analogue Gauge? |
| Filter Type | Paper (\*no 2 strokes)/inline mesh? |
| Water Drain | Yes |

# SECTION 2

## LIMITATIONS

**COMPLIANCE WITH THE FOLLOWING IS MANDATORY**

### **2.01 - WEIGHT and BALANCE**

|  |  |
| --- | --- |
| Empty Weight (Includes oil, coolant and unusable fuel) | ? kg |
| Maximum allowable Take-off Weight | ? kg |
| Minimum Pilot Weight Solo Operations | ? kg |
| Maximum Passenger Weight | ? kg |
| Under seat Storage compartments | ? kg |
| Hang Test at empty weight (nose up/dn?) | ? deg |
| Hang Test at full weight (nose up/dn?) | ? deg |

### **2.02 - PERFORMANCE**

|  |  |
| --- | --- |
| Take-off Distance to 50 feet (ISA, nil wind) No Prerotator | ? m |
| Take-off Distance to 50 feet (ISA, nil wind) with Prerotator | ? m |
| Sea Level Rate of Climb at “?” KIAS | ? ft/min |
| Minimum Sink Rate at “?” KIAS | ? ft/min |
| Best Glide Ratio at “?” KIAS | X.X:1 |
| Landing Distance from 50 feet at “?” KIAS (ISA, nil wind) | ? m |
| Max operating altitude | ? ft |

### **2.03 - SPEEDS**

|  |  |
| --- | --- |
| VNE (Never exceed airspeed) | ? KIAS |
| VMIN (Minimum airspeed straight and level flight) | ? KIAS |
| Normal take-off speed | ? KIAS |
| Short field take-off speed | ? KIAS |
| Normal cruise speed | ? KIAS |
| Normal climb speed | ? KIAS |
| VY (Best rate of climb speed) | ? KIAS |
| VX (Best angle of climb)  Normal approach speed | ? KIAS  ? KIAS |
| Short field approach speed | ? KIAS |
|  |  |
| Max. Taxiing Speed over rough ground | ? Kts |
| Max. Ground Speed on take-off | ? Kts |
| Max. Ground Speed on landing | ? Kts |

### **2.04 - ROTOR**

|  |  |
| --- | --- |
| Maximum rotor RPM | ? rpm |
| Minimum rotor RPM in flight | ? rpm |
| Minimum sustained load factor | ? G |
| Minimum rotor RPM taxying | ? rpm |
|  |  |
| Pre-rotator operation is limited to | ? |
|  |  |
| Rotor brake must only be applied when less than  rotor speed is less than | ? rpm |

### **2.05 - ENGINE**

|  |  |
| --- | --- |
| Maximum Engine RPM | ? rpm |
| Normal Engine Idle RPM | ? rpm |
| Minimum Oil Pressure | ? PSI |
| Maximum Oil Pressure | ? PSI |
| Minimum Water Temperature for Take-off | ? deg C |
| Maximum Water Temperature | ? deg C |
| Maximum Voltmeter Reading | ? volts |

### **2.06 - WIND**

|  |  |
| --- | --- |
| Maximum Wind Normal Operations | ? Kts |
| Maximum crosswind | ? Kts |
| Maximum Tailwind | ? Kts |

### **2.07 - MANOEUVRES**

Aerobatic manoeuvres are prohibited.

Steep turns in excess of 60 degrees of bank are prohibited

Flight Load Factor Limits:

Positive G’s………… “?”

Negative G’s……….. Absolutely None

Avoid abrupt manoeuvres in the pitching plane.

### **2.08 - TYPES OF OPERATION**

This aircraft is limited to flight by day in VMC.

Solo operations must be conducted from the “?” seat only.

For operations into registered/certified aerodromes, flashing beacons must be operating.

### **2.09 – HEIGHT SPEED GRAPH (MTOW)**



***Double click on the chart above and it will open as an imbedded object in Excel.***

***Select sheet 1 tab at the bottom of the window.***

***Fill in the values for the heights against the respective speeds.***

***When completed, click on Chart 1 tab at the bottom of the window then select an area outside the chart.***

***The height speed graph will update.***

***Delete this text when finished.***

# SECTION 3

## NORMAL PROCEDURES

***Never start the engine while standing outside the cockpit.***

### **3.01 - PRE – FLIGHT INSPECTION**

COCKPIT.

Master Switch – ON

Battery Volts – Checked

Fuel Quantity Indication – Checked

Rotor Tach and Engine Tach – Zero

Radio (if required) - Checked

Strobe and Landing Lights – ON. Check operation

Strobe and Landing Lights – OFF

Control Lock – OFF. Check full, free movement and correct sense

Rudder Pedals – Check full, free movement and correct sense

Control Lock – ON

Rotor Brake – Check operation

Trims – Checked

Seat Belts – Condition checked

EPIRB – Fitted & battery checked.

EXTERIOR.

Note: Commence this inspection from the left-hand side, adjacent to the pilot’s seat.

Main wheels/disc brakes – Inflated, spins freely.

Fuel cap secure

Pitot Tube – Secure and clear

Radio Antennae – Secure

Nosewheel – Correct inflation, spins freely, spat secure

Windscreen – Clean

Landing light secure

Door hinges and latches – Checked

Upper Strobe Light – Secure

Rotor Head – No cracks or damage, Bolts secure, Lock Pins in place

Pre-Rotator Ring Gear – Checked

Pre-Rotator motor secure

Rotor Tach Sender Unit – Secure, Electrical connections intact.

Right-hand Control Rod – Checked. Rod ends free, Lock Nuts secure, Lock Pins in place

Trim Spring – Checked, Safety Cord intact

Coolant – Fluid visible in overflow tube.

Engine – No Oil or Coolant leaks. Electrical cables secure

Engine Mounts - Checked

Tall Tail top mount secure

Radiator and Hoses – Clean, no leaks

Fuel Pump and Lines – Electrical Cables secure, Fuel Lines intact, Fuel Filter clear

Fuel drain check carried out

Vertical and Lateral Struts – Secure

Main Wheel – Inflation, Spat secure

Propeller – Checked

Reduction Drive – no play or oil leaks

Rudder Cables – Checked

Right-hand Turnbuckle and Lock Wire – Checked

Right-hand Stabiliser – Secure

Rudder/Fin – Secure, Rudder moves freely

Rotor Blades (Both) – Clean, free from Damage, aligned Fore and Aft

Left-hand Turnbuckle and Lock Wire – Checked

Left-hand Stabiliser – Secure

Left-hand Control Rod – Checked. Rod ends free, Lock Nuts secure, Lock Pins in place

Alternator – Secure, Belt Tension

Battery – Secure, Lock Wire intact, Electrical Cables secure

Engine Oil Quantity – Checked, Dipstick secure

Engine Oil Filler – Cap secure

### **3.02 – BEFORE START**

|  |  |
| --- | --- |
| Passenger Briefing | Complete |
| Harnesses | Secure |
| Fuel | Sufficient for flight |
| Flight Instruments | Checked and Set |
| Switches | OFF |
| Circuit Breakers | Checked |
| Controls | Free, Correct Sense |

### **3.03 – ENGINE START**

|  |  |
| --- | --- |
| Master Power Key (Left lower side of engine.) | ON |
| Ignition switch | ON |
| Brakes | SET |
| Control lock | Removed & secure |
| Choke | N/A |
| Battery Volts | Checked |
| Throttle | Set for Start |
| Engine/Propeller | CLEAR |
| Engine Start | Accomplish |

### **3.04 – AFTER START**

|  |  |
| --- | --- |
| Throttle | Minimum Idle |
| Oil Pressure | Checked |
| Battery Volts | Checked |
| Radio Master Switch | ON |

### **3.05 - TAXIING**

|  |  |
| --- | --- |
| Brakes | Checked |
| Nosewheel Steering | Checked |
| Pre-Rotator | Maintain 100 Rotor RPM Minimum |

### **3.06 – BEFORE TAKE-OFF**

|  |  |
| --- | --- |
| QNH | Set |
| Trims | Set |
| Fuel | Quantity Checked |
| Instruments | Checked |
| Switches | Set |
| Harnesses | Secure |
| Landing Lights | ON |

### **3.07 – AFTER TAKE-OFF**

|  |  |
| --- | --- |
| Engine Instruments | Normal |

### **3.08 – BEFORE LANDING**

|  |  |
| --- | --- |
| QNH | Set |
| Fuel Quantity | Checked |
| Engine Instruments | Normal |

### **3.09 – AFTER LANDING**

|  |  |
| --- | --- |
| Landing Lights | OFF |
| Control Lock | ON |
| Rotor Brake | Engage (Align Blades Fore and Aft) |
| Engine Instruments | Checked |

### **3.10 - SHUTDOWN**

|  |  |
| --- | --- |
| Rotor Blades | Aligned Fore and Aft |
| Rotor Brake | As required |
| Radio Master Switch | OFF |
| Engine Ignition Switch | OFF |
| Strobe Light Switch | OFF |
| Master Switch | OFF |
| Rotor Blades | Secured |

# SECTION 4

## EMERGENCY PROCEDURES

### **4.01 – ENGINE FIRE DURING START**

|  |  |
| --- | --- |
| Master Switch | OFF |
| Engine Ignition Switch | Crank Engine |
|  |  |
| If the Fire extinguishes: |  |
|  |  |
| Engine Ignition Switch | OFF |
|  |  |
| If Fire persists: |  |
|  |  |
| Engine Ignition Switch | OFF |
| Evacuation | Order |
|  |  |
| Fight Fire with Ground Equipment | Located under R/H seat |

### **4.02 – ENGINE FAILURE**

|  |  |
| --- | --- |
| Control | Maintain |
| Airspeed | Establish Glide at ? KIAS |
| Landing Area | Identify and Track towards |
| Trouble-shooting | Accomplish |
|  |  |
| If Engine Fails to Start: |  |
|  |  |
| Radio | Broadcast MAYDAY |
| Master Switch | OFF |
| Engine Ignition Switch | OFF |
| Emergency Landing | Accomplish |

### **4.03 – ENGINE FIRE IN FLIGHT**

|  |  |
| --- | --- |
| Master Switch | OFF |
| Ignition switch | OFF |
| Emergency Landing | Accomplish |

### **4.04 – ELECTRICAL FIRE INFLIGHT**

|  |  |
| --- | --- |
| Individual Electrical Circuits | Isolate |
|  |  |
| If Fires persists: |  |
|  |  |
| Master Switch | OFF |
| Engine Ignition Switch | OFF |
| Emergency Landing | Accomplish |

### **4.05 – ELECTRICAL MALFUNCTIONS**

|  |  |
| --- | --- |
| Excessive Battery Volts: |  |
|  |  |
| Non-essential Electrical Circuits | Isolate |
| Land as soon as possible |  |
|  |  |
| Low Battery Volts: |  |
|  |  |
| Non-essential Electrical Circuits | Isolate |
| Land as soon as possible |  |

### **4.06 – DITCHING**

|  |  |
| --- | --- |
| MAYDAY | Transmit |
| Lifejackets | Fit (do not Inflate inside the cabin) |
| EPIRB | Activate |
| Cabin Doors | N/A |
|  |  |

Flare to a full stop at 10 feet AGL. Level airframe with control stick.

On touchdown, roll to the right.

### **4.07 – LANDING WITH THE ENGINE AT IDLE OR STOPPED???**

#### When landing with an engine at Idle, the pilot must be aware of the disrupted airflow over the rudder. Maintain ? KIAS or greater until the landing flare is initiated. Side slips must be avoided and rudder control maintained at all times.

# SECTION 5

## PERFORMANCE CHART



# SECTION 6

## MAINTENANCE SCHEDULE

### **6.01 – 25 Hourly Inspection**

* Change Oil.
* Change Oil Filter
* Service Air Filter as per manufacturer’s instructions
* Check colour and condition of Spark Plugs
* Check security and condition of Ignition Coil and Leads
* Check Coolant Level
* Check and clean Radiator
* Check Battery and Electrical Cables
* Check Exhaust System for cracks
* Inspect Gimble Head and Main Ring Gear for excessive wear.
* Check electric prerotator - secure
* Remove, clean re-grease and reassemble Rotor Teeter Tower Flange Inserts
* Check Teeter Bolt for fretting or unusual wear
* Check bolts holding Ring Gear to Ring Gear Plate for security
* Check all Rod Ends for side and end-play
* Check Tyres for damage and correct pressure.
* Inspect hub bar & rotor blades – damage, nicks or dings
* Check redrive free play & oil leaks
* Check Trim and Rotor Brake Cables.
* Drain & renew redrive oil

### **6.02 – 50 Hourly Inspection**

* Complete 25 Hourly Inspection
* Check Propeller for security and condition, and re-torque blots
* Check Engine Mounts for cracks and Rod Ends for play
* Check Rudder Cables and Horns for excessive wear
* Check Nose Wheel Steering free
* Check Nose Wheel Shaft for End Play
* Check Rudder Pedals for freedom of movement and lubricate Pivot Points
* Check Wheel Bearings for smoothness and End Play.
* Check rear brake discs for warping or damage
* Check Rudder for cracks around hinge points
* Check main Control Tube Front and Rear “L” Bracket Pivot Points for excessive play
* Check main undercarriage locating blocks.
* Grease front wheel downtube, check spring for sag.
* Inspect undercarriage top rubber suspension.

### **6.03 – 100 Hourly Inspection**

* Complete 25 Hourly Inspection
* Complete 50 Hourly Inspection
* Check Hub Bar for cracks using a 10X magnifying glass
* Lubricate the Teetering Bearing
* Check Radiator Mounts for chafing and leaks
* Check Compression of each cylinder
* Check all cables for wear
* Check Undercarriage Cross Tube (axle) for bow or bending, and check all Rod Ends for excessive play
* Check Undercarriage Support Brackets for cracks or distortion
* Change Fuel Filter
* Remove rocker covers & adjust tappet clearance

### **6.04 – 200 Hourly Inspection**

* Complete 25 Hourly Inspection
* Complete 50 Hourly Inspection
* Complete 100 Hourly Inspection
* Replace Gimble Head Bearing
* Check Reduction Drive Upper Bearings for play and smoothness
* Re-lubricate Torque Tube and Lateral Movement Block with anti-seize compound
* Remove Alternator and inspect Brushes and Bearings
* Replace all Male Rod Ends in Control System.
* Remove throttle body, clean & inspect.

### **6.05 – 500 Hourly Inspection**

* Complete 25 Hourly Inspection
* Complete 50 Hourly Inspection
* Complete 100 Hourly Inspection
* Replace all Fuel Hoses
* Replace Coolant Hoses and Coolant
* Check Throttle Shaft for excessive wear
* Replace bearings in main control system.
* Replace disc brake pads.