MD – RA

Minister's Delegates - Recreational Aviation
Représentants du Ministre - Aviation de loisir

Inspection Service Service d'inspection

MDRA C20 MANUAL of PROCEDURES for INSPECTION of *GYROCOPTER/HELICOPTER*
AMATEUR-BUILT AIRCRAFT, INSPECTION AND TECHNICAL INFORMATION RECORD

BUILDER ☐ **IMPORTER** ☐		**MD-RA REGISTRY NUMBER:**
SURNAME:		**GIVEN NAME(S)**
ADDRESS:		
CITY:	**PROVINCE:**	**POSTAL CODE:**
HOME TELEPHONE:		**FACSIMILE:**
BUSINESS TELEPHONE:		**EMAIL:**
REGISTRATION MARKS C-		**CERT OF REGISTRATION DATE:**
A/C MAKE:	**MODEL:**	**SERIAL NO.:**
PRESSURIZED ☐	**PISTON ENGINE** ☐	**TURBINE** ☐
MAXIMUM TAKE- OFF WEIGHT _____**Lb** ☐ **Kg** ☐		
OWN DESIGN ☐		**FROM PLAN** ☐
LISTED ON TCA/FAA ELIGIBLE KITS LIST ☐		**KIT REQUIRING MAJOR PORTION, (51%) INSPECTION** ☐
QUICK BUILT KIT ☐		
DATE CONSTRUCTION STARTED:		**DATE CONSTRUCTION COMPLETED:**
NAME of DESIGNER or SOURCE of PLANS, KIT and/or MATERIALS (ATTACH LIST IF REQUIRED):		
ADDRESS:		
CHANGE OF OWNERSHIP ☐ **OR ADDRESS** ☐		**DATE:**
SURNAME:		**GIVEN NAME(S)**
ADDRESS:		**CITY:**
PROVINCE:	**POSTAL CODE:**	**TELEPHONE:**

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RECORD OF INSPECTIONS					
Job number	Type	Inspector Name (Print)	Obs. Sheet No.	Date	Signature

<u>The builder must be present for the inspection</u>

Section 1.0 GENERALITIES

1. Will the builder be incorporating any modifications to the structure which will affect flight, structural integrity of the Gyrocopter/Helicopter? (Y N)
   If yes, give details below.

1. Is the builder using professional assistance? (Y N)
   If yes, provide:
   Contractor Name: _____ Telephone_____
2. What work is subject to assistance? (List below)

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(Y) - Indicates compliance with requirements for Amateur Built aircraft contained in the applicable sections of CARs and the exemption from section 549.01 of the Canadian Aviation Regulations and Chapter 549 of the airworthiness manual - airworthiness standards-amateur -built aircraft.

(N) - Indicates non-compliance. State nature of discrepancy under "Notes"

(N/A) - Indicates not applicable.

Section 1.1 COMPLIANCE WITH AMATEUR-BUILT REQUIREMENTS

1. Has the builder filed a Letter of Intent? (Y N)
2. Is an Amateur Built Information Package available? (Y N)
3. Is the builder familiar with the applicable legislation? (Y N)
4. Does the aircraft gross weight comply with the weight specified by the aircraft designer and /or kit supplier? (Y N)
5. Will the aircraft be built from a kit (Y N)
6. Does the builder have copies of applicable newsletters or other pertinent information from the kit supplier? (Y N)
7. Does the project meet major portion requirements? (Y N)
8. Does the builder have "Acceptable Methods, Techniques and Practices" (AC 4313 1B or latest amendment) (Y N)
9. Has the builder established a project record system? (Y N)
10. Are drawings available? (Y N)
11. Is the shop adequately heated and does it provide the proper environment for the construction of the project? (Y N)

Summary, Compliance With Amateur-Built Requirements:

Has builder been notified of your findings? On site? ❑ By Mail? ❑

White Copy of MDRA C21 Inspection Sheet – number_____

Date -_____ Inspector's Signature_____Print Name_____

yyyy-mm-dd

End of Section 1.1 Use the space below for notes if required

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Section 1.4 GYROPLANES AND HELICOPTERS, FINAL INSPECTION

1. Have all cowls, covers, inspection openings, fairings etc been removed to allow access for proper inspection? (Y N)

GENERAL

1. Is pitot tube secure and clear? (Y N)
2. Has pitot and static system been tested for leaks? (Y N)
3. Has pitot-static been calibrated? (Y N)
4. Are registration markings properly installed, legal size and of sufficient contrast to background colours? (Ref **Std 222.01**) (Y N)
5. Is an approved first aid kit installed and readily available? **CAR 602.60 (1) (h)** (Y N)
6. Is an approved ELT installed? (except Glider, Balloon, Airship or Gyrocopter) **CAR 605.38 (1)** (Y N)
7. Is cockpit provided with ventilation? (Y N)

FUSELAGE (KEEL) ASSEMBLY

1. Are all welded parts to accepted practice? (Y N)
2. Are attachment fittings to accepted practice? (Y N)
3. Are all drilled holes properly located, free from elongation and are all interiors treated for protection from environmental deterioration? (Y N)
4. Are all surfaces protected against environmental deterioration? (Y N)
5. Is all attachment hardware employed and safely tied? (Y N)
6. Are rivets, where employed, of proper type (ref dwgs) and suitably installed? (Y N)
7. Is sheet metal fabrication to accepted practice? (Y N)
8. Are fittings fabricated to acceptable practice? (Y N)
9. Is craftsmanship to accepted practice? (Y N)
10. Firewall material and thickness- Correct? Is it sealed? (Y N)

EXITS

1. Can aircraft be rapidly cleared in the event of an emergency? (Y N)
2. Is there provision for emergency external release of canopy or door? (Y N)
3. Is the external emergency canopy/door release placarded? (Y N)

WINDSHIELD AND WINDOWS

1. Are windshield and windows of acceptable materials? (Y N)
2. Are they braced for positive and negative pressure? (Y N)
3. Are they free from distortion to allow proper vision? (Y N)

CONTROLS

1. Are all control tube assembly parts to accepted practice and according to drawing? (Y N)
2. Are all controls for pre-rotor assembly properly attached and secured to accepted practice? (Check with drawing) (Y N)
3. Are control stops provided? (Y N)
4. Are all controls secured and safely tied? (Y N)
5. Are pulleys of proper diameter for bends involved, suited to cable size and provided with cable guard? (Y N)
6. Is cable fabrication to accepted practice? (Y N)
7. Has builder access to "Go-No-Go" gauge to check nicropress sleeve after squeezing? (Y N)
8. Is all hardware throughout the control system properly installed and safely tied? (Y N)

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9. Is there full throw of all controls with seats occupied and harness secured? (Y N)
10. Are fairleads incorporated which alter cable direction in excess of 3 degrees? (Y N)
11. Are rudder pedal assembly and brake cylinder properly installed and secured to accepted practice? (Y N)
12. Is rudder assembly properly secured to accepted standard? (Y N)
13. Is horizontal stabilizer properly attached and secured to accepted standard? (Y N)
14. Has the builder assured symmetry? (Y N)

ENGINE TESTING

Have builder setup aircraft for an engine run-up.

Explain that you will check for the following during run up:

Engine start: Hard ❑ Easy ❑

1. Does engine idle smoothly? (Y N)
2. Have builder apply power and check the following: (Y N)
3. Are brakes operative and holding the aircraft in position? (Y N)
4. Are the following readings or operations normal:

Oil temp and pressure ❑

Cyl head temp ❑

Exhaust Gas temp ❑

Engine/rotor vibration ❑

Cycle of Carb heat control ❑

Cycle of Mixture control ❑

Right and left magnetos, (electronic ignition) OFF- Normal RPM drop ❑

Momentary ignition switch OFF- test for no live mag, (electronic ignition) ❑

Have engine brought to idle, then shut off.

5. Shut down normal? (Y N)
6. Are there any oil leaks? (Y N)

CABIN COCKPIT

1. Instruments and gauges installation and range markings? (Y N)
2. Are primary instruments readily visible to pilot? (Y N)
3. Is standalone magnetic compass installed (Y N)
   (No scrolling permitted on glass type displays).
4. Is fire extinguisher properly mounted and accessible with harness secured? (Y N)
5. Is rotor brake properly installed and all the hardware secured? (Y N)
6. Are the following placards installed?
   - Fireproof Aircraft Identification Plate_ (Per **CAR 201.01**) (Y N)
   - Aerobatics prohibited: (Y N)
   - Passengers prohibited, (not applicable to imported aircraft) (Y N)
   - Amateur built warning: (Y N)
   - Compass deviation card (Y N)
   - Door release (external & internal): (Y N)
7. Are engine controls free and smooth throughout their ranges? (Y N)
8. Are seat belts to aeronautical standard (T. S.O.) or equivalent? (Y N)
9. Are seat belts anchored to primary structure? (Y N)
10. Is main rotor tachometer installed and the rotor speed limits clearly marked? (Y N)
11. Is the placard clearly visible stating any ballast requirement, correct per Aircraft weight and balance report? (Y N)

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KEEL AND MAST ASSEMBLY

1. Are all welded parts to accepted practice? (Y N)
2. Are all bolted parts to accepted practice? (Y N)
3. Are all attached hardware employed and safely tied? (Y N)
4. Are all attachments hardware for keel to mast plate assembly to accepted practice? (Y N)
5. Are all mast and Rotor Head assembly to accepted practice? (Y N)
   (Check drawing)
6. Are the pre-rotor assembly parts to accepted practice? (Y N)
7. Has the builder assured symmetry? (Y N)

FLEXIBLE MAST ASSEMBLY

The following checks must conform to the applicable drawing

1. Is the torque bar and link assembly properly installed? (Y N)
2. Are the cheek plates properly attached and the hardware secured to accepted standard? (Y N)
3. Are the pilot points properly installed and secured? (Y N)
4. Are the push/pull control rods properly installed and working correctly? (Y N)
5. Check all above to drawing conformity (Y N)

ROTOR BLADE(S) ASSEMBLY

1. Are all main rotor control assembly(ies) properly installed? (Check the drawing) (Y N)
2. Are all components for the rotor blade(s), Rotor Hub, and RT sensor assembly properly assembled and secured? (Ref_ Drawing) (Y N)
3. Are the controls for the above free **and** smooth throughout full range? (Y N)
   (Get the builder to operate controls). Check the whole assembly to the drawing for conformity

GYROCOPTER; NOTE: Builder supplies these data, inspector records them below.

Control	Test conditions	Deflection	Test results	
Rotor	Stick neutral, blades aligned with fore/aft axis	Angle wrt horizontal in wrt = with respect to Deg	Blades pointing upward, front up	(Y N)
	Stick full forward	Angle wrt horizontal in Deg	Blades pointing downward , front down	(Y N)
	Stick full aft	Angle wrt horizontal in Deg	Blades pointing upward, front up	(Y N)
	Stick neutral, blades aligned with right/left axis	Angle wrt horizontal in Deg	Blades horizontal	(Y N)
	Stick full left	Angle wrt horizontal in Deg	Blades pointing downward , left side down	(Y N)
	Stick full right	Angle wrt horizontal in Deg	Blades pointing downward , right side down	(Y N)

HELICOPTER; NOTE: Builder supplies these data, inspector records them below.

Control	Test conditions	Deflection	Test results	
Collective	Collective full down Cyclic neutral, blades aligned with fore/aft axis	Angle wrt horizontal in Deg Blade incidence in Deg	Blades horizontal	(Y N)
	Collective full up Cyclic neutral, blades aligned with fore/aft axis	Angle wrt horizontal in Deg Blade incidence in Deg	Blades horizontal Blade incidence increase	(Y N) (Y N)
Cyclic	Collective full down Cyclic full forward, blades aligned with fore/aft axis	Angle wrt horizontal in Deg Blade incidence in Deg	Blades pointing downward , front down	(Y N)

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	Collective full down Cyclic full aft, blades aligned with fore/aft axis	Angle wrt horizontal in Deg Blade incidence in Deg	Blades pointing upward, front up	(Y N)
	Collective full down Cyclic neutral, blades aligned with right/left axis	Angle wrt horizontal in Deg Blade incidence in Deg	Blades horizontal	(Y N)
	Collective full down Cyclic full left, blades aligned with right/left axis	Angle wrt horizontal in Deg Blade incidence in Deg	Blades pointing downward , left down	(Y N)
	Collective full down Cyclic full right, blades aligned with right/left axis	Angle wrt horizontal in Deg Blade incidence in Deg	Blades pointing downward , right down	(Y N)
Rudder	Rudder pedals, neutral, blades aligned with vertical axis	Measure blade incidence Deg	Positive blade incidence	(Y N)
	Rudder pedals, full left, blades aligned with vertical axis	Measure blade incidence Deg	Blade incidence increase	(Y N)
	Rudder pedals, full right, blades aligned with vertical axis	Measure blade incidence Deg	Blade incidence decrease	(Y N)

UNDERCARRIAGE

1. Are all axles shaft assembly parts to accepted practice? (Y N)
2. Are gear / skids assembly parts to accepted standard? (Y N)
3. Are the axle struts assembly parts to accepted practice? (Y N)
4. Has the builder assured symmetry? (Y N)
5. Is all hardware safely tied? (Y N)
6. Are brake system components and lines installed and safely tied? (Y N)
7. Are wheel and brakes in good condition? (Y N)
8. Are tires sound and good tread? (Y N)

TAIL BOOM AND ROTOR ASSEMBLY

1. Are the surfaces free from defects? (Y N)
2. Are all the attachments employed and safely tied? (Y N)
3. Are all surfaces protected against environmental deterioration? (Y N)
4. Is all attachment hardware employed and safely tied? (Y N)
5. Is sheet metal fabrication to accepted practice? (Y N)
6. Are all rivets where employed, of proper type (ref drawing) and suitably installed? (Y N)
7. Are fittings fabricated to acceptable standard and do they conform to drawing? (Y N)
8. Has builder insured alignment and symmetry? (Y N)
9. Is the rotor assembly, applicable fittings and hardware to accepted standard and conform to drawing? (Y N)
10. Is the tail rotor drive tube fittings and hardware to drawing requirement? (Y N)
11. Are all joints for the rotor drive properly installed and is all hardware to accepted standard and properly safely tied? (Y N)
12. Are the stabilizer plates properly installed and aligned? (see drawing). (Y N)

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SUMMARY, Gyroplanes and Helicopters, Final Inspection

Re-inspection of following is required: None ☐

Has builder been notified of your findings? On site? ❑ By Mail? ❑

Date -_____ Inspector's Signature_____Print Name_____

yyyy-mm-dd

End of Section 1.4 Use the space below for notes if required

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Section 1.5 COMPOSITE STRUCTURES INSPECTION,

PRE PAINT INSPECTION

1. Has kit of materials been purchased from a recognized dealer and do materials meet designer's specs? (Y N)
2. Has the builder constructed confidence samples and presented them for examination? (Y N)
3. Is the builder fully conversant with procedures and is he following kit instructions? (Y N)
4. Has the builder kept resin samples, labeled for identification, and were they presented for your examination? (Y N)
5. Do shop conditions meet minimum standards? eg-temp, humidity, cleanliness (grease, oil) (Y N)
6. Are all lay-ups done in accordance with designer's instructions? (Y N)
7. Is workmanship to accepted practice? (Y N)
   If not, elaborate:
8. How have alignment and symmetry of aircraft been assured? (Y N)
   Explain
9. Are surfaces flair and free of large deviation in contour? Are there voids or irregularities? (Y N)
10. Have any repairs been carried out by the builder? (Y N)
    If so, do they meet designer's criteria? (Y N)
11. Has all attachment hardware been installed an is the work in accordance with designer's instructions? (Y N)
12. Will large amounts of filler be required to prepare surfaces for paint? (Y N)
13. Is there any evidence of over-sanding of structure with resultant damage to glass-cloth structure? (Y N)
14. Does builder understand the need to adhere to designer's colour preference? (Light basic colours, white, pale blue, etc)? (Y N)
15. Is pre paint inspection complete? (Y N)

SUMMARY, Pre Paint Inspection:

Re-inspection of following is required: None ☐

Has builder been notified of your findings? On site? ❑ By Mail? ❑

Date -_____ Inspector's Signature_____Print Name_____
yyyy-mm-dd

End of Section 1.5 Use the space below for notes if required

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Section 1.51 COMPOSITE STRUCTURES INSPECTION

1. Has the aircraft been painted in accordance with designer's recommendations? (Y N)
2. Is there any evidence of over-sanding of structure with resultant damage to glass-cloth structure? (Y N)

SUMMARY, Composite Structures Inspection:

Re-inspection of following is required: None ☐

Has builder been notified of your findings? On site? ❑ By Mail? ❑

Date -_____ Inspector's Signature_____Print Name_____
yyyy-mm-dd

End of Section 1.5.1 Use the space below for notes if required

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