



** SHOTS FROM EVERY ANGLE **

Portable Remote Controlled Helicopter Video / Filming Systems

Tel/Fax 01275 545133 e-mail: info@anglecam.com : www.anglecam.com : Mobile 07831 500833

Unit 15 Shelley Avenue Clevedon North Somerset BS21 6HD

AngleCam Ltd

Safety from Every Angle

Introduction

AngleCam provides professional aerial filming utilising state of the art remote controlled purpose built miniature helicopters as a camera-carrying platform. As such we feel it is very important to address the important safety aspects of operating such a flying machine.

Our team have many years experience of flying remote controlled aircraft and as such possess a thorough understanding of the safety issues surrounding the operation of such machinery. Safety is the number one overriding concern in everything we do.

Safety through design

AngleCam has designed the flying platform using the latest CAD techniques to ensure that manufacture is to the closest tolerances. We have utilised aircraft grade alloys and composites where appropriate and emphasis has been placed on simple, easily maintained mechanics that can be inspected thoroughly between each flight.

The rotor head uses proven, reliable, commercially available components to maximise reliability. Our rotor blades are fabricated using the latest composites for safety and strength. The rotor head and all revolving parts of the machine are optimised for smooth running. Principal flight controls utilise dual servo push pull operation for maximum safety.

We have chosen a horizontal twin cylinder petrol engine for motive power, due to its low vibration and ease of use. We are very aware that a smooth running engine and transmission components are a key to the long-term safe operation of this type of aircraft. In the event of one cylinder failing, the aircraft can be safely landed on the remaining cylinder. In the unlikely event of complete engine failure, the helicopter has autorotational capabilities, which should enable a controlled landing in any event.



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Our radio system utilises dual conversion receivers that are effectively two receivers in one unit. We utilise a special circuit to enable two receivers to be used on the same channel. The circuit detects interference or failure of one receiver and seamlessly switches control of the servos to the other receiver ensuring the most robust radio link possible. This unit also allows twin battery packs to be used, again ensuring against single component failure.

Safety through effective procedures

We do not separate safety procedures from our normal operational procedures. We have one set of firm operating procedures based on the principle of safety above all else. We will not operate in any marginal safety environment.

Every component of the system is checked thoroughly prior to every flight and after every flight. All personnel who have to be in the vicinity of the operating camera platform are fully briefed on its operation and capabilities, they are informed how we expect them to behave whilst the helicopter is operating and warned what not to do.

Care is taken to ensure a clear take-off and approach corridor, such that the helicopter can lift off and climb into wind and descend into wind upon approach to landing. This is important as it minimises load and optimises rotor performance for safe flying.

Spectators are not encouraged but where people are observing, we aim to keep them at least 30 metres from the take-off/landing zone. All crew are warned to move back to at least ten metres during flight.

Wherever possible the ground operating area should be cordoned off and cleared of people and vehicles. AngleCam do not overfly public roads unless police sanctioned traffic controls are in operation. Without this, no approach closer than 20 metres and at safe height will be made.

Pre-flight Checks

Visual inspection of all mechanical components and rotor blades

Radio frequency check using frequency monitor

Radio range check (TX antenna collapsed to one segment)

Control sense check to ensure correct radio operation

Check to ensure that all equipment carried on the platform is properly attached and secure

Check all non-essential personnel are moved back to a safe distance (minimum 10 metres, 20 metres preferred)

All mobile phones should be turned off for the duration of the flight.



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Only then is the helicopter fuelled, using best practise for handling petroleum spirit. AngleCam carry a correctly maintained fire extinguisher and ensure it is at hand during this time. The fuel container is then removed to a safe storage position away from the vehicle. No smoking or operation of electrical equipment is allowed in the vicinity.

Next, the pilot will extend the TX antenna and perform final radio checks. The pilot will then test the softstart system for the helicopter prior to connecting to the helicopter to ensure against circuit failure. The helicopter is started by onboard electric starter using a 12v gel battery, and no connections are made to the battery in proximity to the helicopter or the fuel to minimise risk from sparks. Once connected, a connection to the radio control system is made, which arms the softstart circuit. All ground crew (including the pilot) then move back at least eight metres prior to remote starting of the engine. Once started, and having ensured that a stable idle condition can be obtained, a member of the ground support team will disconnect the starting support system and remove it from the immediate area.

The pilot will issue visual and verbal warnings that he is about to engage the rotorhead and when he is sure that the system is operating properly and the rotors are turning at the normal operating RPM, take off will commence into wind.

During flight the pilot will be in communication with the camera operator/co-pilot by radio link (on non-associated channel to the control system). No one else may talk to the pilot during this time except a member of the ground crew briefed to warn of any unforeseen movement of people or obstructions in the vicinity of operation.

Upon completion of the flight, the pilot or ground crew will issue a verbal warning of landing and the helicopter will be manoeuvred along the pre-agreed flight corridor for landing approach into wind.

Landing will only take place when the area is clear and safe. Failure to obtain this situation may result in the helicopter being ditched into a clear safe zone away from people and property. This will be an emergency measure should circumstances dictate and used only as a final resort.

No flying will take place in areas where there is a possibility of the helicopter leaving the direct view of the pilot, however slim a chance or small the obstruction. Radio links are line of sight and this must be remembered at all times.

No flying will take place in poor light or unsafe weather conditions (though winds are not generally a problem below 30mph). Precision flying would however require a wind speed of below 10 mph. The maximum operating height is 400 feet above ground. Distance from pilot is not generally an issue though for safe judgement of speed, direction and altitude, we aim to remain within 80 metres during filming. Radio range is well in excess of 1,000 metres under normal conditions.



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AngleCam will not fly in rain or snow, or bad weather conditions in general.

AngleCam's clients will require special permission for flying near active airports and this permission can only be granted by the C.A.A. (Civil Aviation Authority). This may not always be granted, depending on the information provided to the C.A.A. by the Anglecam Client.

The CAA may review or change regulations without prior warning, so as to protect persons and property as and when they see fit.

AngleCam recommend that all information on a potential film location be discussed with the CAA as a precautionary measure to avoid any unforeseen filming activities outside aviation rules and CAA law.

For further information please call:

Karen Jones or Rob Metcalf

C.A.A.
Genral Aviation Department
Aviation House
Gatwick House
Crawley
West Sussex
RH6 OVR



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Basic Helicopter Technical Specification

Fuselage construction	Aircraft grade alloy CNC machined from CAD Drawings
All fasteners	Stud locked or Nylock Nuts & Bolts
All moving or revolving components	Ball or roller bearings
Mechanics & internals	All components designed on computer & precision engineered
Engine Noise	Similar to small moped, well within 70 db @7 metres
Dry weight (No fuel)	23 lbs 10.45 Kg
Helicopter Payload	12 lbs 5.5 Kg
Fuel tank capacity	1 ltr 2.2 Pints (approx)
Main Rotor Blades – Carbon & Glass fibre Construction	Shatter on impact
Rotor Diameter	1.8 metres
Helicopter length	1.6 metres
Tail Rotor diameter	0.33 metres
Fuel	Unleaded two stroke petroleum mix
Operating Ceiling	Max 400 ft safe limit (above ground level)
Range from operator	500 metres Approx safe flying distance
Flight Speed	Max 55 mph Approx
Flight Log Book	All aircraft have their own flight records & maintenance schedules

AngleCam operate under full Third Party Public Liability Insurance (Mandatory)