



*Light UAS Scheme*TM



DAI/9932/09

UAS Pilot Training

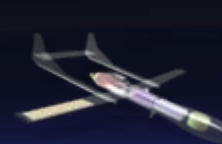
Small UAS Pilot Qualifications

A UK Perspective

EUROCAE WG 73, Brussels / 27th June 2011

André J. Clot

European Unmanned Systems Centre



Qualified Entity Status

Light UAS Scheme

Principles

Airworthiness

Pilot/Crew qualifications

Ground School Examination

- Air Law etc.

Good Airmanship

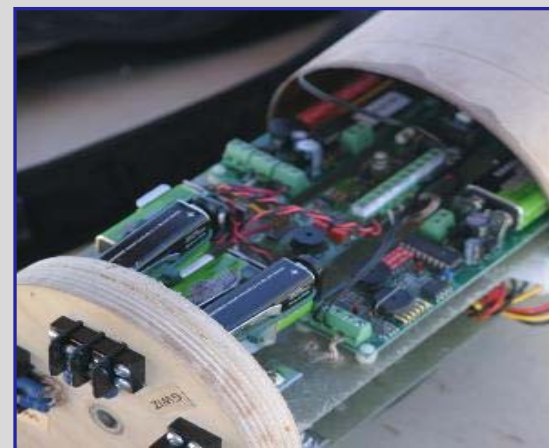
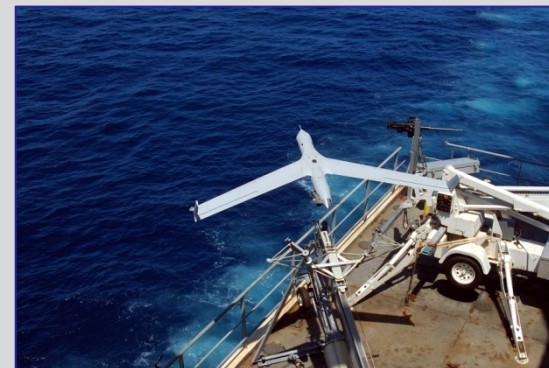
Flight Test

Operational Evaluation

Medical Requirements

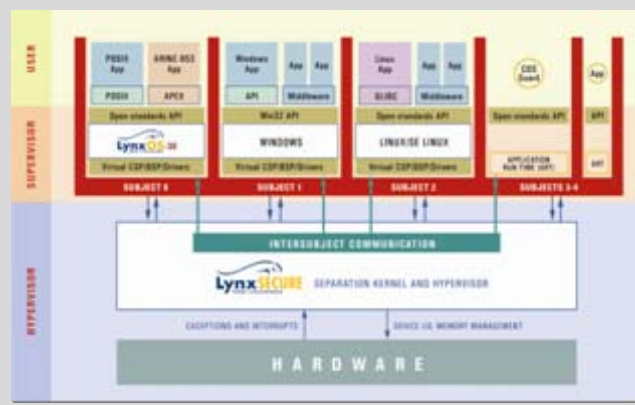
Recognising Issues

Records





- ▶ **CAP 553 – Annex A8-22 Approval**
- ▶ **Includes EASA Qualified Entity Requirements**
- ▶ **Subject to annual audit**
- ▶ **EuroUSC Specifics**
 - Light UAS (0-150kg)
 - Functional assessment of embedded control software





**Independent recommendation to the National Authority
for Permission/Exemption to operate**

**Recommendations accepted without further
investigation**

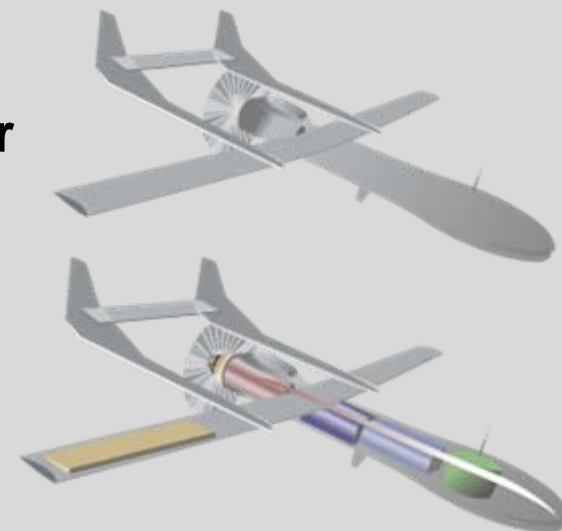
Covers

What can operate (Airworthiness)

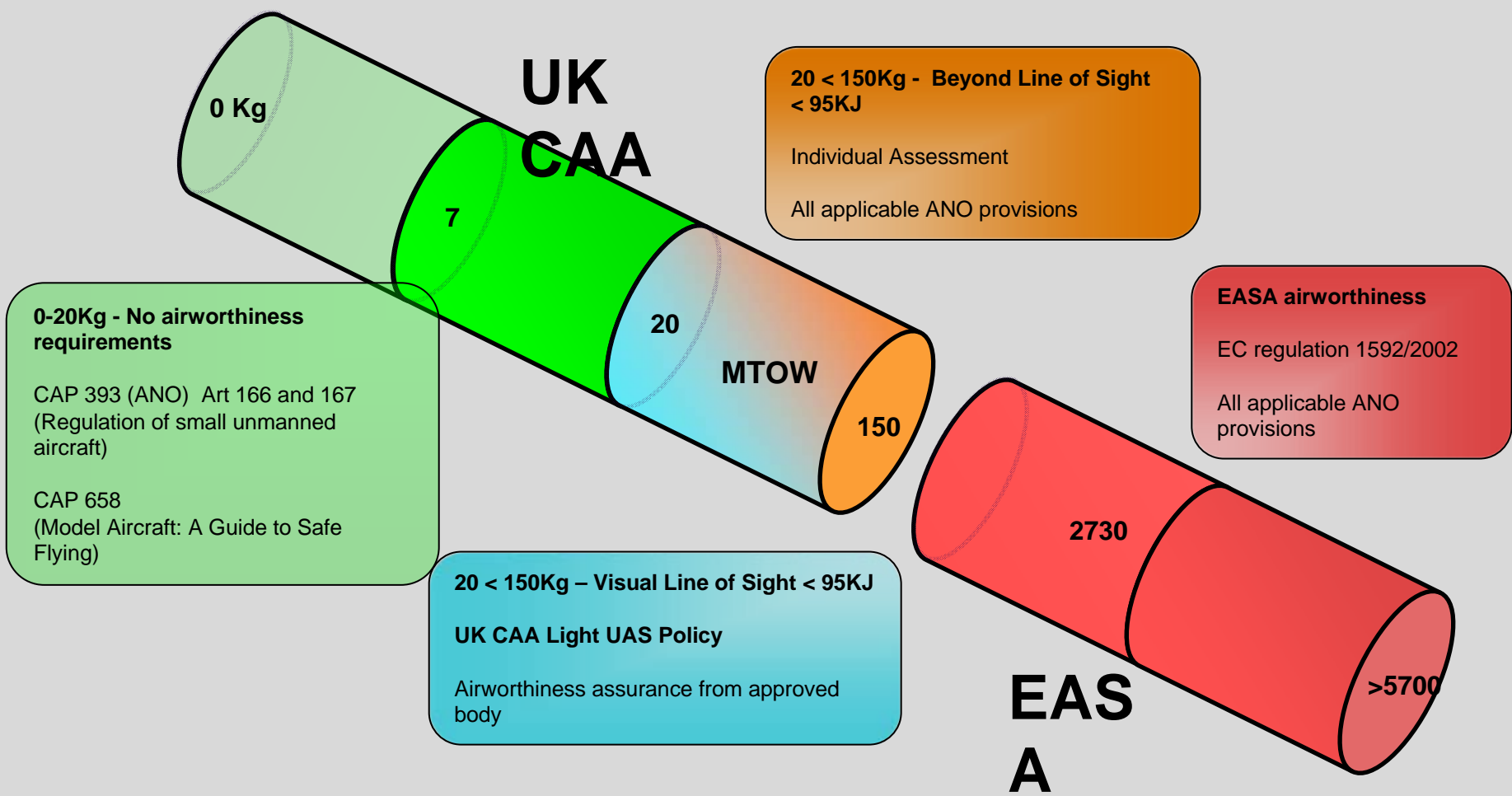
Who can operate (Pilot Qualification)

Where you can operate (Operational evaluation)

Assessments & Flight Tests carried out in any country



UAS Categories (MTOM)





Specific aircraft registration

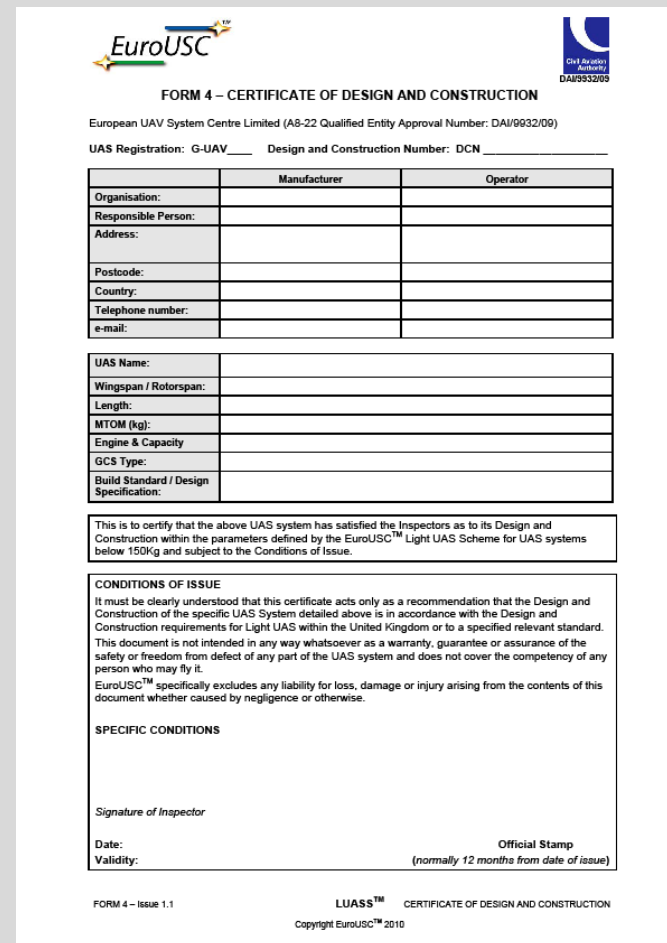
e.g. G-UAV007


Design & Construction No.

e.g. DCN 004-10-04-01

Common build state option

**Flight test requirements
depending on MTOM and
type**



EuroUSC 

FORM 4 – CERTIFICATE OF DESIGN AND CONSTRUCTION

European UAV System Centre Limited (A8-22 Qualified Entity Approval Number: DAI/9932/09)

UAS Registration: G-UAV _____ Design and Construction Number: DCN _____

	Manufacturer	Operator
Organisation:		
Responsible Person:		
Address:		
Postcode:		
Country:		
Telephone number:		
e-mail:		

UAS Name:	
Wingspan / Rotorspan:	
Length:	
MTOM (kg):	
Engine & Capacity	
GCS Type:	
Build Standard / Design Specification:	

This is to certify that the above UAS system has satisfied the Inspectors as to its Design and Construction within the parameters defined by the EuroUSC™ Light UAS Scheme for UAS systems below 150Kg and subject to the Conditions of Issue.

CONDITIONS OF ISSUE

It must be clearly understood that this certificate acts only as a recommendation that the Design and Construction of the specific UAS System detailed above is in accordance with the Design and Construction requirements for Light UAS within the United Kingdom or to a specified relevant standard. This document is not intended in any way whatsoever as a warranty, guarantee or assurance of the safety or freedom from defect of any part of the UAS system and does not cover the competency of any person who may fly it. EuroUSC™ specifically excludes any liability for loss, damage or injury arising from the contents of this document whether caused by negligence or otherwise.

SPECIFIC CONDITIONS

Signature of Inspector _____

Date: _____ Official Stamp _____
Validity: _____ (normally 12 months from date of issue)

FORM 4 – Issue 1.1 LUASS™ CERTIFICATE OF DESIGN AND CONSTRUCTION
Copyright EuroUSC™ 2010



Aerial Vehicle Mass Related Licensing Requirements

OM(max)	Case 0 (Risk Mitigating Factors)	Case 1
Less than 7 kg	BNUC-S™ Certificate, or equivalent	BNUC-S™ Certificate, or equivalent
7 kg to 20 kg	BNUC-S™ Certificate or equivalent	CPL(U) or equivalent
20 kg to 150 kg	BNUC™ Certificate or equivalent	CPL(U) or equivalent
More than 150 kg	BNUC™ Certificate, CPL(U) or ATPL(U) or equivalent	CPL(U) or ATPL(U) or equivalent





Risk Mitigating Factors in UAS/UAV Operations

Factor:	Effect:
Airspace Segregation	Airspace segregation ensures separation of the UAS/UAV operation from other airspace users and third parties. Risk of collision, airprox or separation infringement is eliminated, except in the case of unintentional incursion by other airspace users into segregated airspace, or uncommanded excursion by the UAV.
Line-of-Sight Operation	Operation within the unassisted direct line-of-sight of the UAV pilot (accepted as within 500 metres horizontally and 400 feet vertically of the UAV pilot) permits the UAV pilot to respond to and avoid other airspace users.
Low Aerial Vehicle Mass	Aerial vehicle mass below a specified limit eliminates all risk to other airspace users and third parties, by reducing maximum kinetic energy damage potential below a significant level. This mass limit is determined by CAA Airworthiness Division.



BNUC™

- ▶ Specific to a UAS
- ▶ Specific to an individual/crew
- ▶ Manual, GCS and crew ratings
- ▶ 0-20, 20-80, 80-150 kg - ratings
- ▶ Other ratings e.g. Water rating

FORM 6 – BASIC NATIONAL UAS CERTIFICATE

European UAV System Centre Limited (A8-22 Qualified Entity Approval Number: DAI/9932/09)

Name of Holder		
Address:		
Postcode:		
Country:		
Telephone:		
Mobile:		
e-mail:		

VALID FOR SPECIFIC LIGHT UAS DETAILED AS FOLLOWS

UAS Registration:	Design and Construction Certificate Number:	CAA Permission/Exemption reference:

COMPETENCY ASSESSED

Responsibility	Tick	Capacity	Tick
Commander	<input type="checkbox"/>	BNUC-S™ : Manual Operation (<20Kg)	<input type="checkbox"/>
Pilot	<input type="checkbox"/>	BNUC-S™ : GCS Operation (<20Kg)	<input type="checkbox"/>
	<input type="checkbox"/>	BNUC™ : Manual Operation (20-80Kg)	<input type="checkbox"/>
	<input type="checkbox"/>	BNUC™ : Manual Operation (80 - 150Kg)	<input type="checkbox"/>
	<input type="checkbox"/>	BNUC™ : GCS Operation (20-150Kg)	<input type="checkbox"/>
	<input type="checkbox"/>	BNUC™ : Water Operations (fixed-wing only)	<input type="checkbox"/>

CONDITIONS OF USE

Holders are subject to any conditions in the Operations Manuals for the Specific Light UAS, CAA Permissions/Exemptions or other conditions that may be communicated to them by the CAA or EuroUSC. The Holder must maintain an accurate record of their Light UAS Flights and submit these annually for inspection to EuroUSC™ in order for the BNUC™ to be valid.

Recognition

The above named individual has been assessed by EuroUSC™ as being competent to hold the Basic National UAS Certificate having demonstrated the level of competency required to operate the Light Aircraft Systems detailed above in the capacity indicated under Competency Assessed.

SPECIFIC CONDITIONS

- Visual Line of Sight operations only (500m/400ft).
- Safety Pilot present at all times.

Signature of Examiner _____ Date: _____ Official Stamp _____

FORM 6 – issue 2 LUASS™ BASIC NATIONAL UAS CERTIFICATE
 Copyright EuroUSC™ 2010




PART 1 - Ground School Examination

- Air Law
- Aircraft general knowledge
- Flight Performance and Planning
- Human factors, performance, limitations and Good Airmanship
- Meteorology
- Navigation
- Operational Procedures
- Communications.


PART 2 - Flight Test Examination

- Generic competence
- Operations Manual
- Commercial Operation



Light UAS Scheme™
United Kingdom

Basic National UAS Certificate
Small Unmanned Aircraft



DAI/9932/09

Surname	Candidate No.	<i>Examiner's use only</i>	
Forename	Signature		

BNUC-S™

**Pilot Ground School Examination for
UAS Operations (MTOM < 20kg)**

Paper: BNUC-S/004

Date: 7th April 2011 – 11:30 a.m.

Time Allowed: 1 hour 15 minutes

Instructions to Candidates

In the boxes above write your forename, surname, signature and candidate number.

Answer ALL questions on the paper in the boxes provided. Indicate your answer with a cross or tick or a number in the boxes as directed. Use black or blue pen.

Information for Candidates

The paper has 60 questions. All questions on the paper are multiple choice. There are no blank pages.

TURN OVER

Copyright 2011 – European UAV Systems Centre Limited©



PART 1

UAS Principles

CAP 393 :Air Navigation Order / Rules of The Air

CAP 722 : Guidance

CAP 403 : Flying Displays

CAP 382 : Mandatory Occurrence Reporting



Organisational responsibilities

Flight Operation responsibilities

Permissions, Exemptions and Aerial Work

Documentation requirements

Dual Use and ITAR

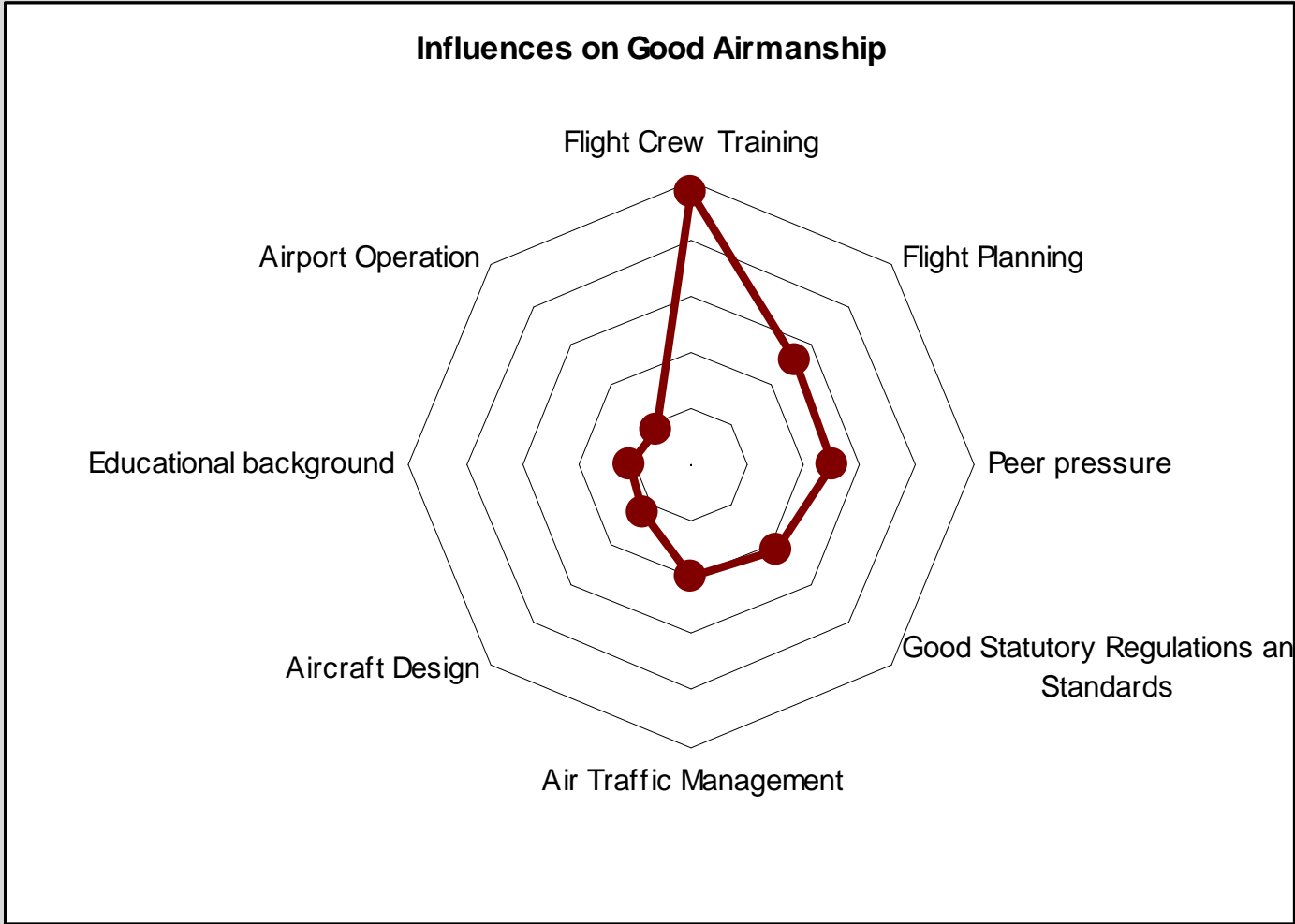
Accident, Incident and Investigation Handling

Terms and Terminology



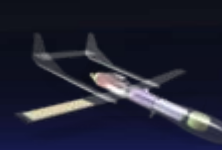
Good Airmanship
Medical Fitness
Ground Crew Management
Air Crew Management
Flight Duration and workload
Weather and human performance

Influences on Good Airmanship (ASTRAEA)





- Aircrew gain good airmanship through a process of training.
- The environment of the aircrew is an important factor in developing Good Airmanship.
- Good Airmanship is a product of Education, Training and Learning ability
- Aircrew working environment important driver for overall Good Airmanship
- To exhibit Good Airmanship in a new complex type of aircraft becomes more difficult the greater the increase in aircraft complexity and performance.



Pilots must be at least 18 years of age, and persons deemed to be the legal Operator are required to be at least 18 years of age.

Candidates must ensure that they are medically fit to operate the relevant aircraft

Candidates may wish to undertake a Medical declaration.



- Aviation Law for Light UAS
- R/C Manual and other modes of operations
- Flight Preparation – Site Survey etc.
- Flight Operation
- Emergency Handling
- Crew Management
- Post Flight Checks
- Flight Documentation
- Recommendations
- Sign Off



Flight Test

Carried out against Operations Manual



Light UAS Scheme™
United Kingdom

SMALL UNMANNED AIRCRAFT (SUA/SUSA) OPERATIONS MANUAL ASSESSMENT



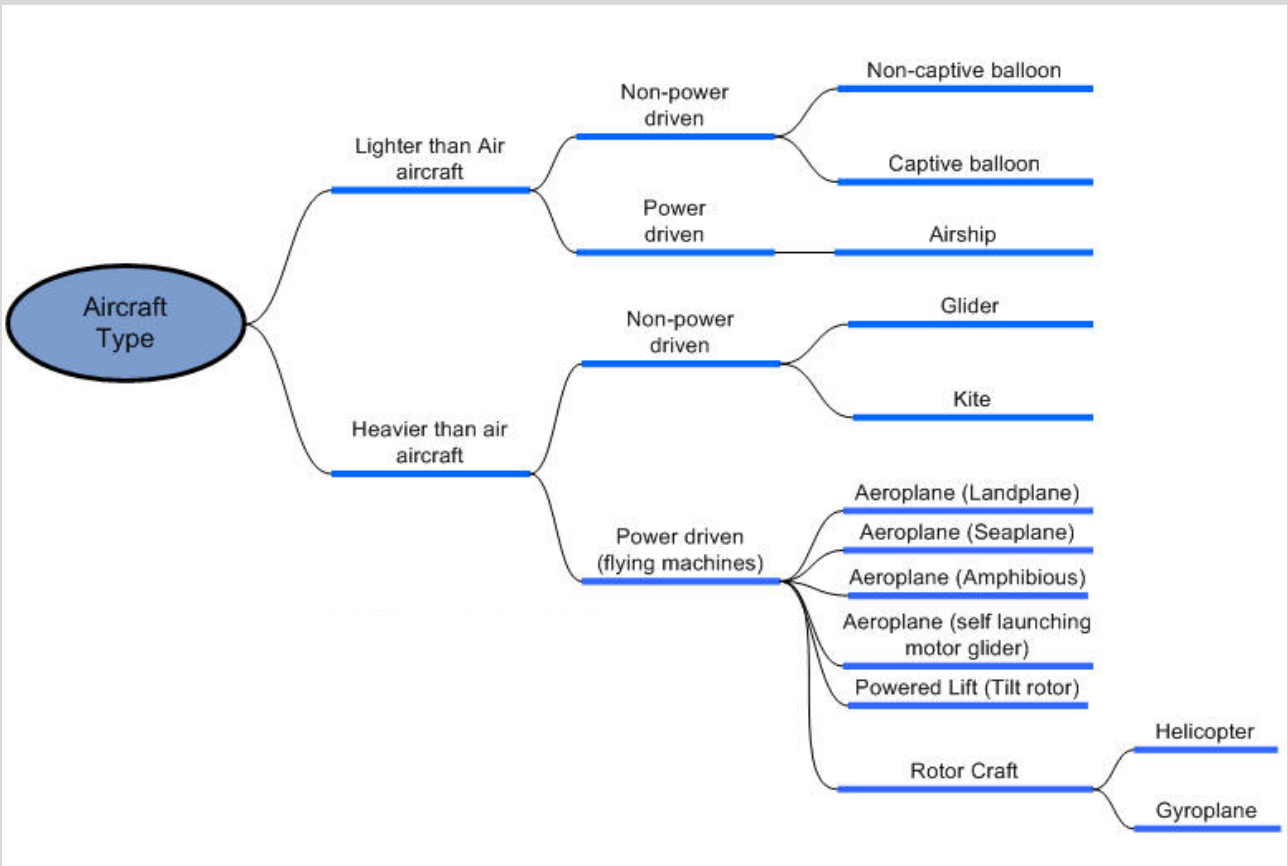
DAI/9932/09

Operator: _____

The following table provides an outline of the sort of areas and details that an operator should consider including in a SUA/SUSA Operations Manual to provide all the information and instructions necessary to enable the operating staff to perform their duties safely and effectively. The template is not exhaustive and may be adjusted as necessary to suit the particular arrangements of an individual operator.

Section	Subject	Criteria	Comment
Part A	Introduction		
1	Contents	Brief list of the Operations Manual contents	
2	Introductory Statement including outline of operations	Include statement of compliance with any Permission and the requirement that operational instructions contained within the manual are to be adhered to by all personnel involved in the operation.	
3	Definitions and Abbreviations	Include common definitions and acronyms to aid clarity	
4	Document control and amendment process	To ensure Operations Manual remains in date and that different versions are not being used. Amendments should be sent to EuroUSC™ and the relevant amendments identified.	
5	List of referenced documents	This may include documents from the Manufacturer, industry specific to applications areas and from a regulatory perspective such as: CAP 382 : Mandatory Occurrence Reporting CAP 393 : Air Navigation Order and Rules of the Air CAP 403 : Flying Displays also relevant to demonstrations CAP 722 : Guidance for UAS Operations in the UK	

Recognise a specific aircraft make and model



e.g.

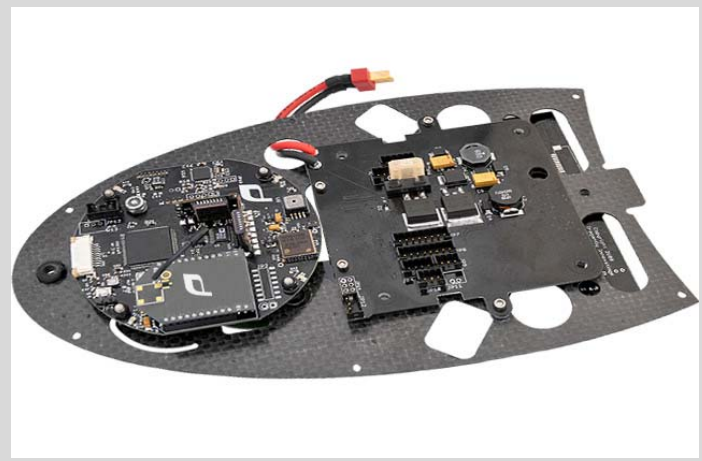
Quadcopter

then

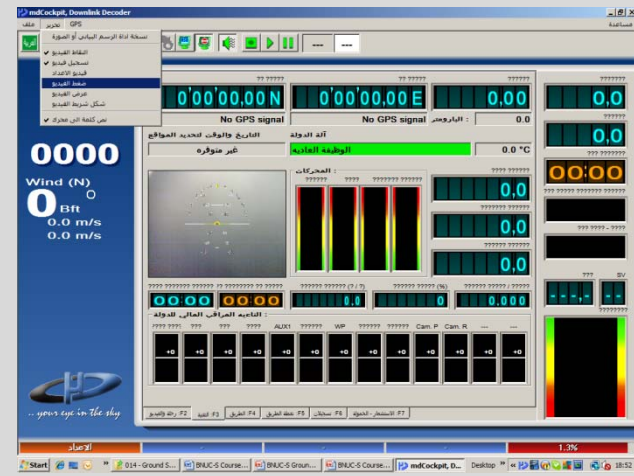
Microdrone

then

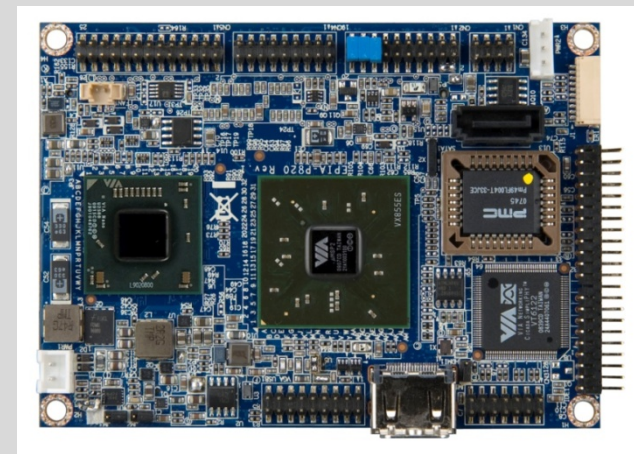
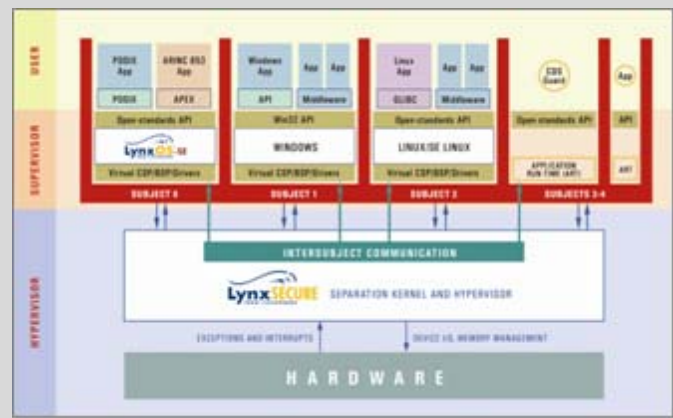
MD-200 or MD-1000



AIRBORNE



GROUND BASED







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European UAV System Centre Limited (A8-22 Qualified Entity Approval Number: DAI/9932/09)

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Country:	
Telephone:	
Mobile	
e-mail:	

VALID FOR SPECIFIC LIGHT UAS DETAILED AS FOLLOWS

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Pilot	<input type="checkbox"/>	BNUC-S™ : GCS Operation (<20Kg)	<input type="checkbox"/>
	<input type="checkbox"/>	BNUC™ : Manual Operation (20-80Kg)	<input type="checkbox"/>
	<input type="checkbox"/>	BNUC™ : Manual Operation (80 -150Kg)	<input type="checkbox"/>
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Recognition

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SPECIFIC CONDITIONS

- Visual Line of Sight operations only (500m/400ft.).
- Safety Pilot present at all times.

Signature of Examiner

Date:

Official Stamp





Keeping track

- ▶ **Approved Flight School,
Manufacturer and Operator
Register (Companies)**
- ▶ **Light UAS Register (Aircraft)**
- ▶ **BNUC Register (Pilot/Crew)**
- ▶ **AI Register (Occurrences)**
- ▶ **Occurrence Investigations**



UAV Vision T21 – 30Kg
Powerline Inspection



Integrator – 61Kg
Science and Research



RMAX – 65Kg
Crop Spraying



Civil Aviation Authority test-only version print version

Unmanned Aircraft

Safety Regulation Information and guidance associated with the operation of Unmanned Aircraft Systems (UASs) and Unmanned Aerial Vehicles (UAVs)

Operations & Airworthiness These pages provide a general overview of the regulatory requirements for the design and operation of unmanned aircraft. Please refer to the [Model Aircraft](#) webpage for more information about recreational flying.

Flight Operations **Introduction** Traditionally unmanned aircraft have only been used by model aircraft enthusiasts for recreational purposes. However, they are increasingly being used for professional applications such as surveillance and data-gathering. Such aircraft are likely to be operated in a way that may pose a greater risk to the general public. Unlike manned aircraft or model aircraft used for recreational purposes, there are no established operating guidelines so operators may not be aware of the potential dangers or indeed the responsibility they have towards not endangering the public.

Types of Operation Furthermore, much larger unmanned aircraft are now being developed. These aircraft are required by National and European law to be designed and manufactured to an approved standard, and very often require a great deal more space in which to operate. Therefore it is often necessary to take additional steps to ensure that the aircraft can be safely integrated with other airspace users - both in the air and on the ground.

General Aviation In January 2010 the CAA introduced new regulations that require operators of small unmanned aircraft used for aerial work purposes and those equipped for data acquisition and/or surveillance to obtain permission from the CAA before commencing a flight within a congested area or in proximity to people or property. Details of the permission and how to apply are explained in the links below.

Corporate Aviation **Terminology** The terms Unmanned Aircraft (UA) or Remotely Piloted Aircraft (RPA) are used to describe the aircraft itself, whereas the term Unmanned Aircraft System (UAS) is generally used to describe the entire operating equipment including the aircraft, the control station from where the aircraft is operated and the wireless data link. The term Unmanned Aerial Vehicle (UAV) is still referred to in some areas, but this is progressively being phased out so that the 'aircraft' classification is given a clearer emphasis.

Flying Displays and Special Events **Guidance** Guidance on various aspects of the operation of unmanned aircraft is available via the following links:

Charity Flights **Basic Principles**

Paragliding **Airspace and Avoiding Collisions**

Low Flying **Airworthiness**

Operating in a Congested Area **Aerial Work**

Aerial Application Certificates

Aircraft Loading

Air Ambulance Operation

All Weather Operations

Winter Operations

Unmanned Aircraft

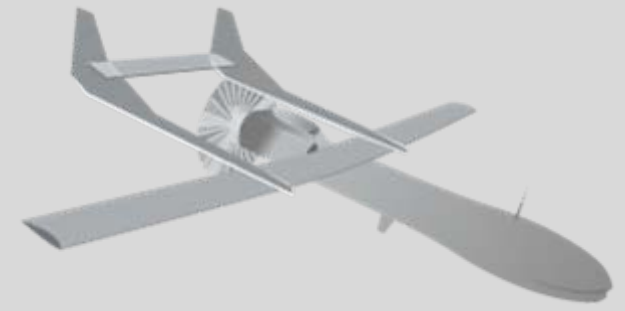
Basic Principles

Airspace and Avoiding Collisions

Airworthiness

CAA Website

www.caa.co.uk/uav



EuroUSC™ European Unmanned Systems Centre Civil Aviation Authority

Europe's leading independent UAS Approvals Specialist for assessing 'Airworthiness & Pilot Qualifications'

Introduction Main Website Light UAS Scheme Consultancy Downloads Contact Staff Login

Welcome - Introduction to EuroUSC™ 'Qualified Entity'

The European Unmanned Systems Centre (EuroUSC™) is Europe's leading independent Light UAS Approvals Specialist for assessing 'Airworthiness & Pilot Qualifications'.

EuroUSC™ is authorised by the [UK CAA \(DAI/9932/09\)](#) to assess the 'airworthiness' of Light Unmanned Aircraft Systems of 150kg and below. The Light UAS Scheme™ (LUAS™) covers the Design, Construction (including functionality of embedded FCS software), Airworthiness, Operation, Pilot/Crew Qualifications and Exemption or Permission to operate.

NEW UK CAA Basic Principles for Unmanned Aircraft Systems: Basic National UAS Certificate (BNUC™) is the new UAS specific Pilot & Crew qualification - Valid in the UK and other specified countries.

The Basic National UAS Certificate ([BNUC™](#)) - EuroUSC™ offers the only nationally approved [CAA specific Pilot/Crew Qualification](#) for small UAS.

NEW Download BNUC-5™ Candidate Guide April 2011 e880a and BNUC-5™ Fees, Terms & Conditions

The BNUC-5™ qualification for systems <20kg consists of two parts:

PART 1 - Ground School Examination (Training by EuroUSC™ or Approved Organisation) and

PART 2 - Flight Test Examination (Training by Approved Flight Schools or Approved Manufacturer's Course) See below for current list:-

Main Website - UAS Airworthiness and Operations

Training - UAS Pilot & Crew Qualifications

Training - Approved UAS Flight Schools

Approved UAS Manufacturers

Approved UAS Operators

EuroUSC™ are active in most European countries - for further information e-mail [Admin](#)



Light UAS Scheme™

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