EuroUSC™

Light UAS Scheme™

Civil Aviation Authority

DAI/9932/09

UAS Pilot Training

Small UAS Pilot Qualifications

A UK Perspective

EUROCAE WG 73, Brussels / 27th June 2011

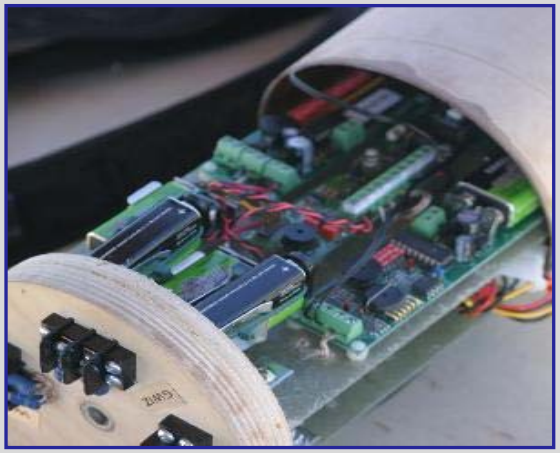
André J. Clot

European Unmanned Systems Centre

Qualified Entity Status

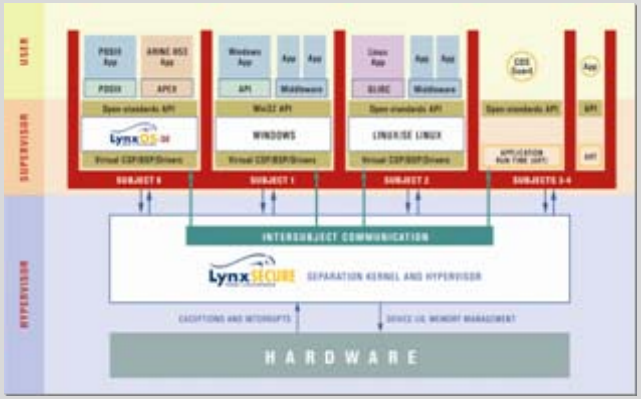
Light UAS Scheme

- Principles
- Airworthiness
- Pilot/Crew qualifications
  - Ground School Examination
    - Air Law etc.
  - Good Airmanship
  - Flight Test
  - Operational Evaluation
- Medical Requirements
- Recognising Issues
- Records



UK CAA Qualified entity

- **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**

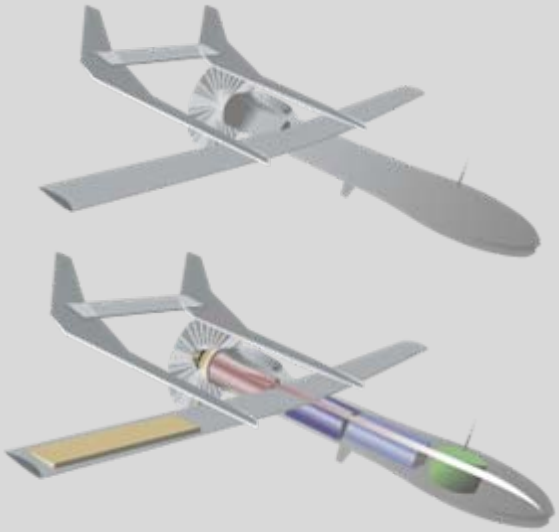


Independent recommendation to the National Authority for Permission/Exemption to operate

Recommendations accepted without further investigation

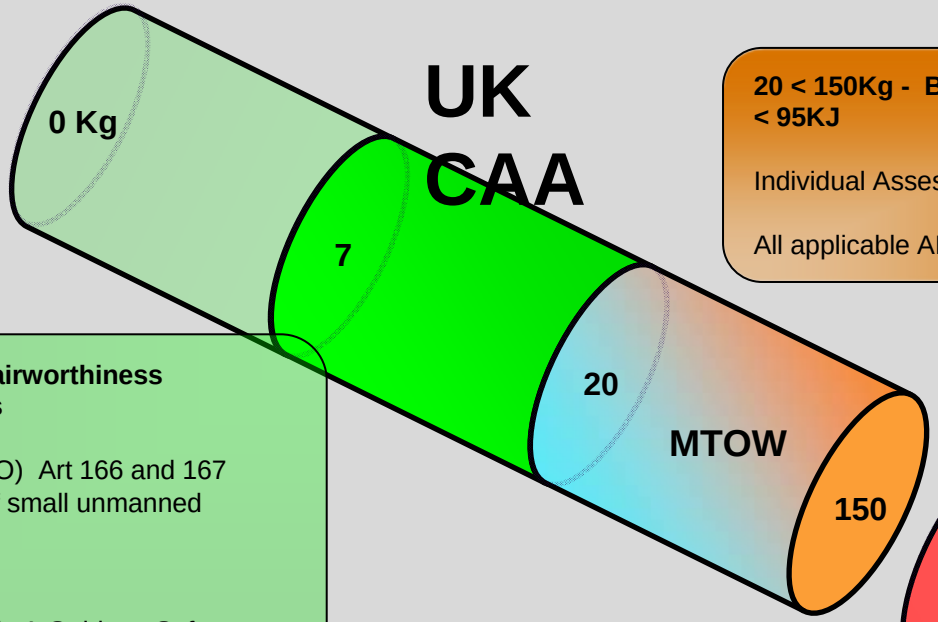
Covers

- **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)



0-20Kg - No airworthiness requirements

CAP 393 (ANO) Art 166 and 167 (Regulation of small unmanned aircraft)

CAP 658 (Model Aircraft: A Guide to Safe Flying)

20 < 150Kg - Beyond Line of Sight < 95KJ

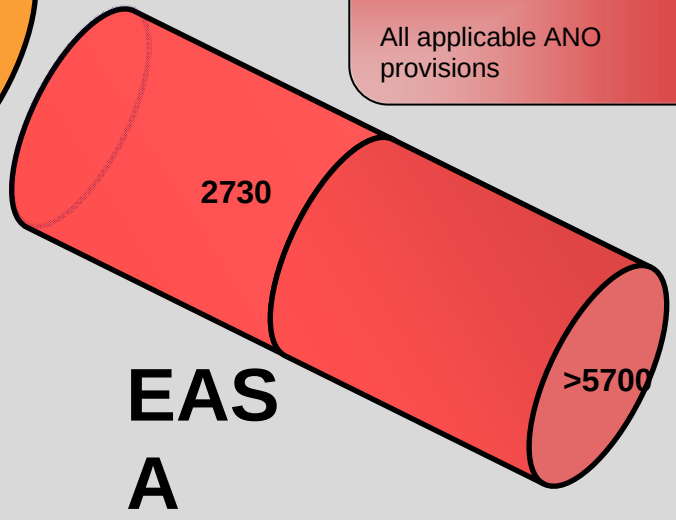
Individual Assessment

All applicable ANO provisions

20 < 150Kg – Visual Line of Sight < 95KJ

UK CAA Light UAS Policy

Airworthiness assurance from approved body



EASA airworthiness

EC regulation 1592/2002

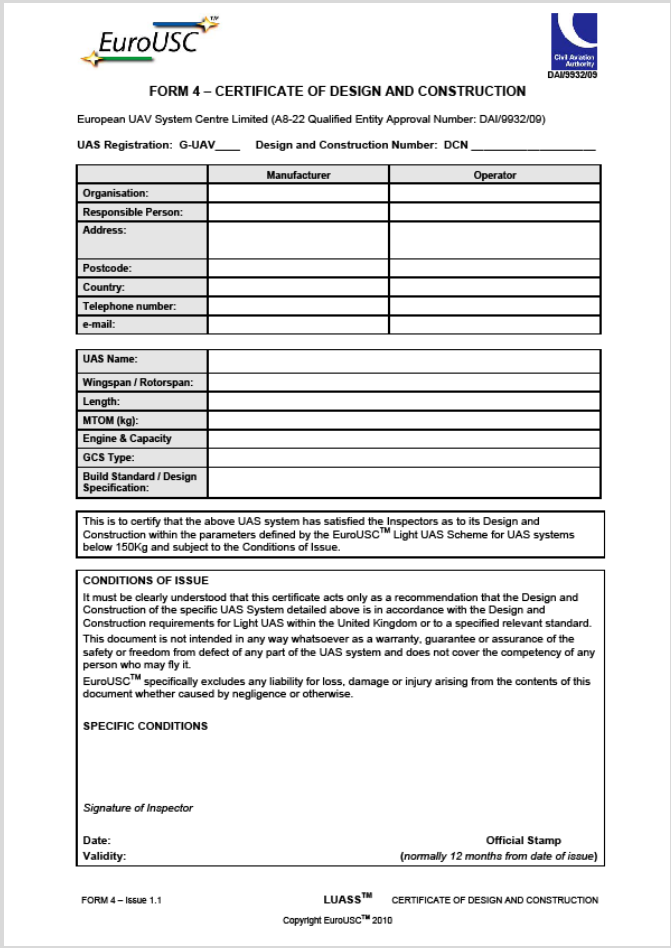
All applicable ANO provisions

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™ Civil Aviation Authority DAI/9932/09

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

Licensing Requirements

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

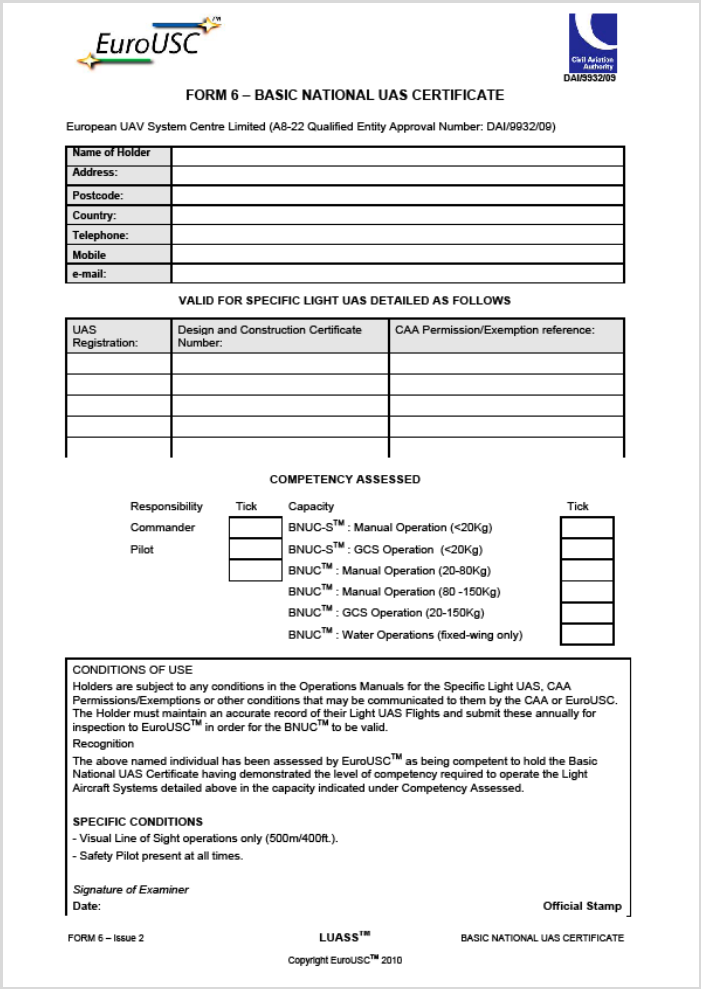
Risk Mitigating Factors in UAS/UAV Operations	
Factor:	**Effect:**
Airspace Segregation	Airspace segregation ensures separation of the UAS/UAV operation from other airspace users and third parties. Risk of collision, airprox or separation infringement is eliminated, except in the case of unintentional 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.

Pilot Qualifications (1)

DAI/9932/09

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



EuroUSC

DAI/9932/09

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		BNUC-S™ : Manual Operation (<20Kg)	
Pilot		BNUC-S™ : GCS Operation (<20Kg)	
		BNUC™ : Manual Operation (20-80Kg)	
		BNUC™ : Manual Operation (80 -150Kg)	
		BNUC™ : GCS Operation (20-150Kg)	
		BNUC™ : Water Operations (fixed-wing only)	

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

Pilot Qualifications (2)

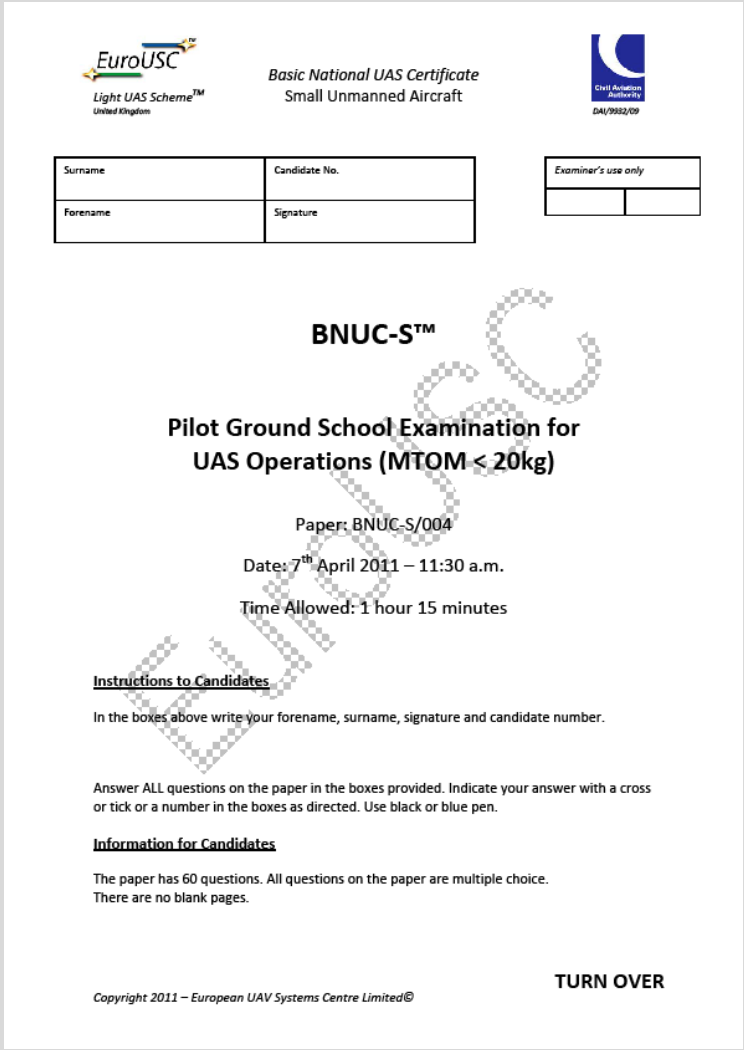
DAI/9932/09

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



EuroUSC Light UAS Scheme™ United Kingdom

Basic National UAS Certificate
Small Unmanned Aircraft

Civil Aviation Authority DAI/9932/09

Surname	Candidate No.
Forename	Signature

Examiner's use only	

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

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

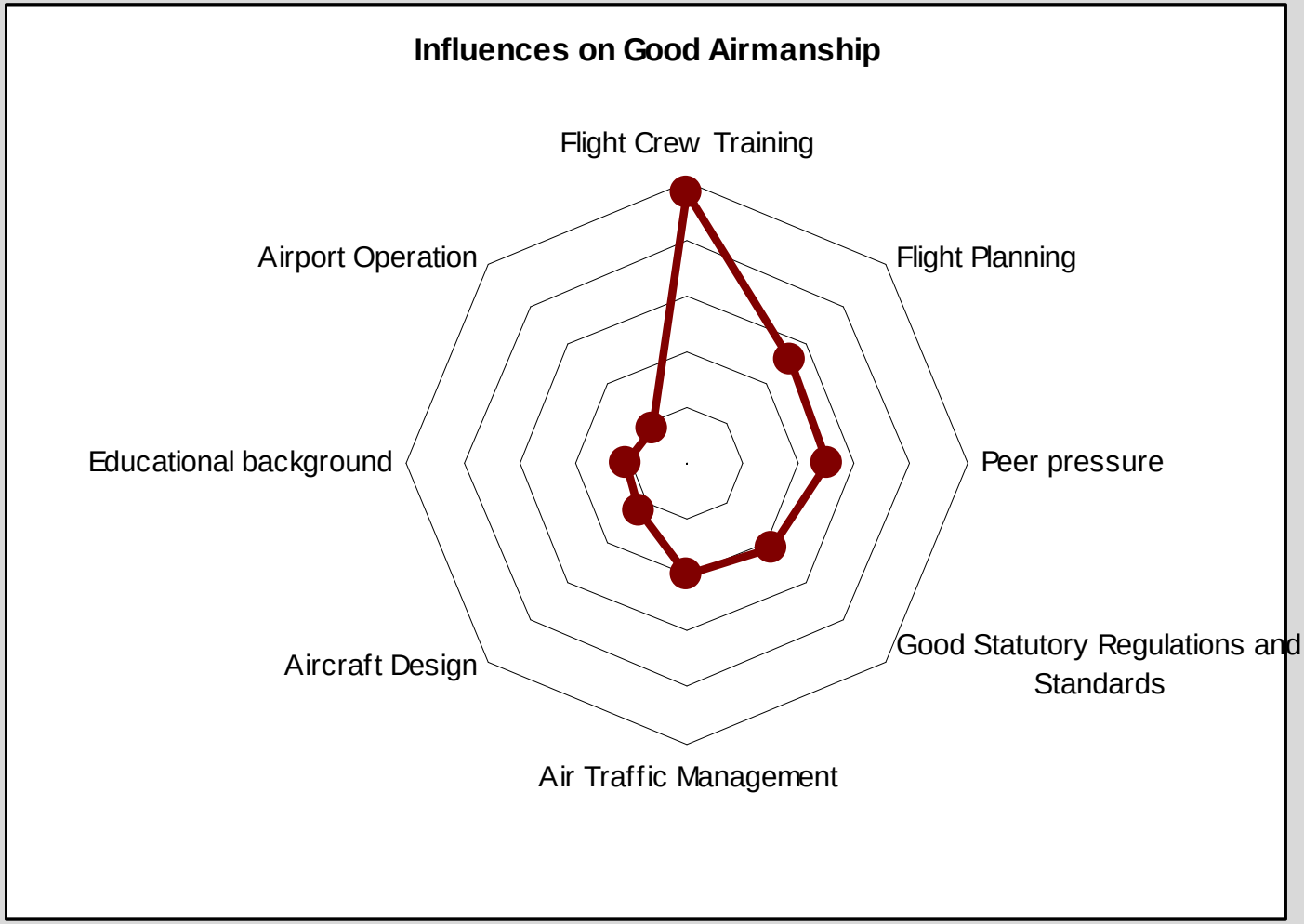
AIR LAW – Part 2

- Organisational responsibilities
- Flight Operation responsibilities
- Permissions, Exemptions and Aerial Work
- Documentation requirements
- Dual Use and ITAR
- Accident, Incident and Investigation Handling
- Terms and Terminology

Human Factors, Performance & Limitations

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

Influences on Good Airmanship (ASTRAEA)



Good Airmanship

- 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.

Age and Medical Fitness

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.

Flight Test

- 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

EuroUSC™

Light UAS Scheme™
United Kingdom

SMALL UNMANNED AIRCRAFT (SUA/SUSA)
OPERATIONS MANUAL ASSESSMENT

Civil Aviation Authority

DAI/9932/09

Operator:

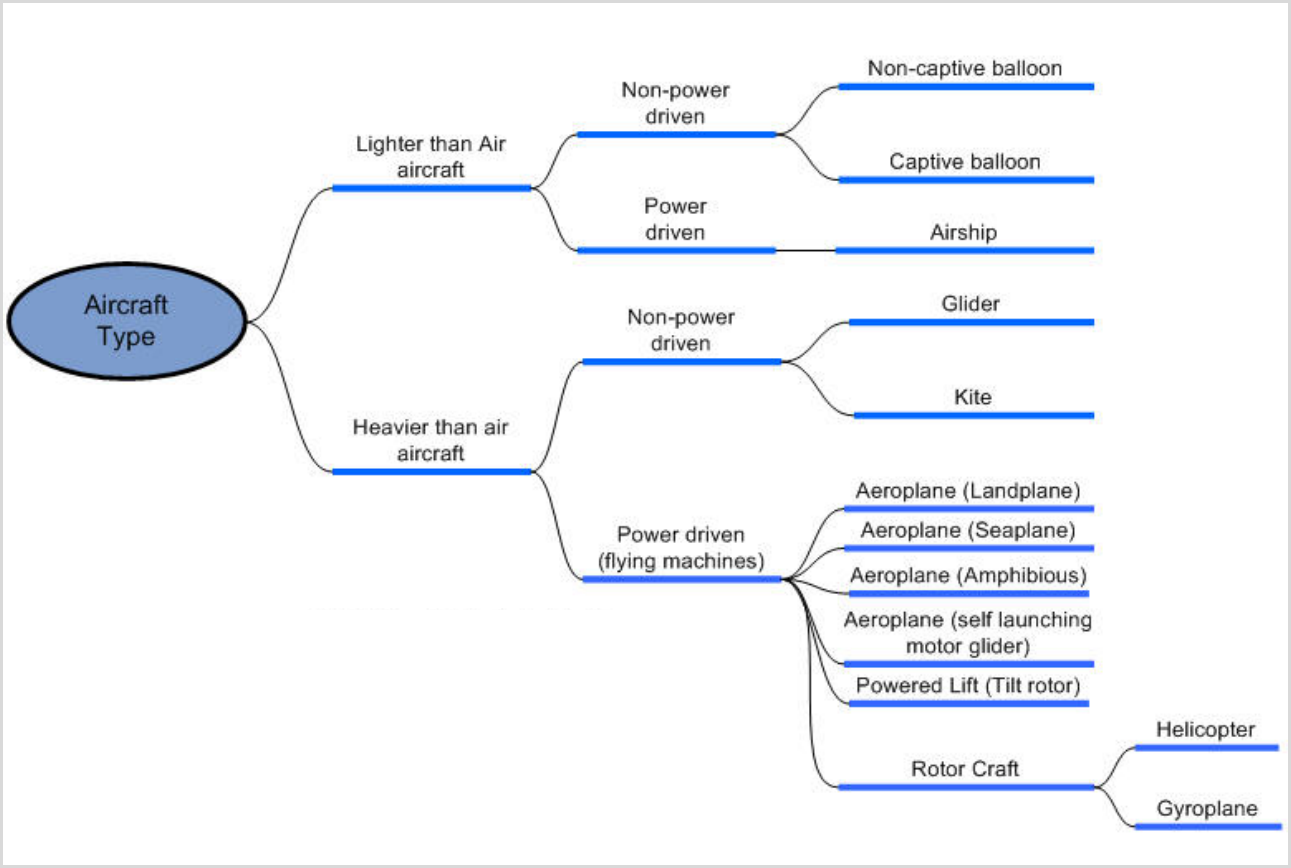
The following table provides an outline of the sort of areas and details that an operator should consider including in a SUA/SUSA Operations Manual to provide all the information and instructions necessary to enable the operating staff to perform their duties safely and effectively. The template is not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

1

EuroUSC™ Doc: EUSC 21-07/016 - Issue 1.0

Recognise a specific aircraft make and model



e.g.

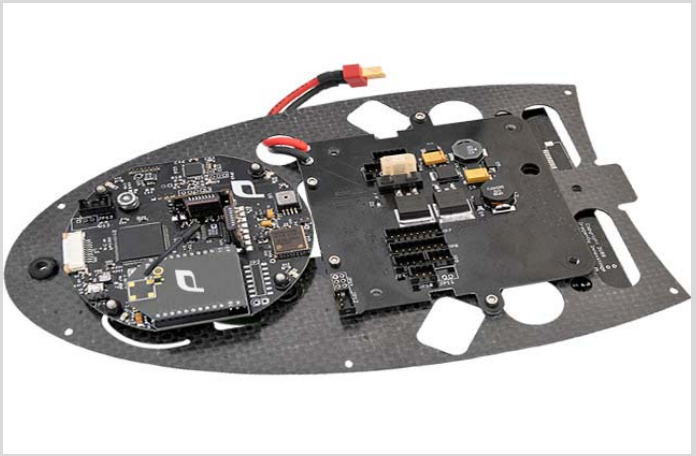
Quadcopter

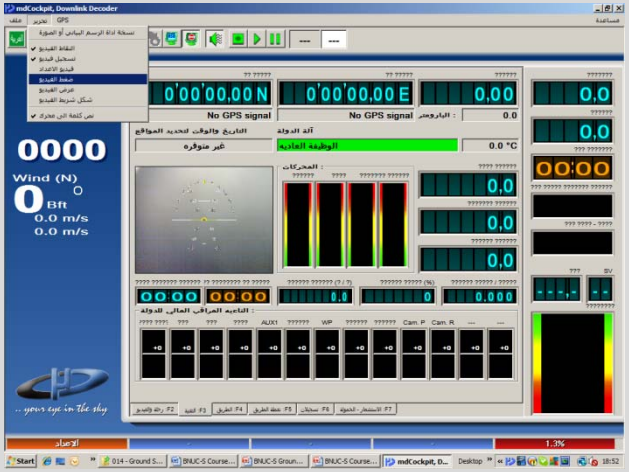
then

Microdrone

then

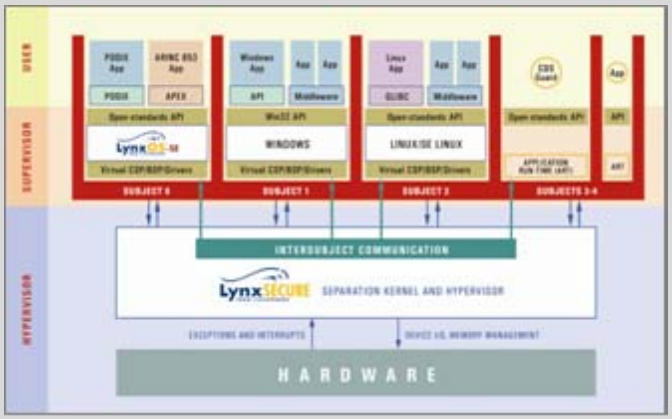
MD-200 or MD-1000

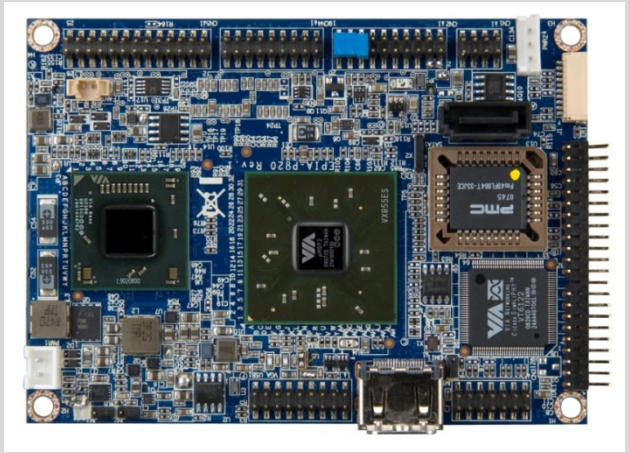




AIRBORNE

GROUND BASED





Recognise - Embryonic nature of industry

BNUC-S™ Qualification

DAI/9932/09

EuroUSC

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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**

FORM 6 – Issue 2 **LUASS™** BASIC NATIONAL UAS CERTIFICATE

Certificate No: 004-10-04-01

Light UAS Scheme : BNUC-S™

EuroUSC

Basic National UAS Certificate

Small Unmanned Aircraft

This certificate is awarded to

Andrew Bonnington

having passed the Ground School Examination

and demonstrated the required level of competency to operate the following Small Unmanned Aircraft(s) for Aerial Work

G-UAV007 : Microdrone MD4-200

Valid for 12months from date of Flight Test and in accordance with any specific conditions detailed on FORM 6.

Tony Hooper (MBE), Chief Examiner — 22nd April 2010 — Flight Test Date

The Light UAS Scheme is operated by the European Unmanned Systems Centre (EuroUSC™) as the accredited body (No: A8-22—DAI/9932/09) approved by the United Kingdom Civil Aviation Authority

Records

Keeping track

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

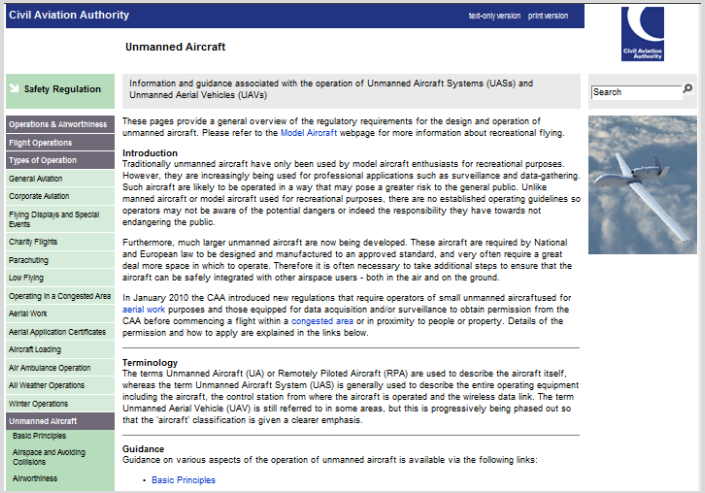
UAV Vision T21 – 30Kg
Powerline Inspection

Integrator – 61Kg
Science and Research

RMAX – 65Kg
Crop Spraying

Further Information

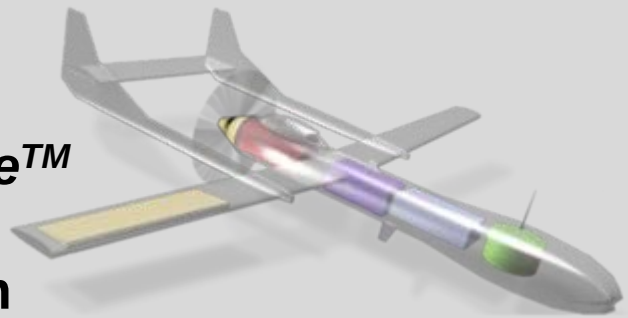
DAI/9932/09



CAA Website

www.caa.co.uk/uav

Light UAS Scheme™



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