

# PROCEDURE FOR THE APPROVAL OF LAA PERMIT AIRCRAFT FOR OPERATION IN IMC, UNDER IFR OR AT NIGHT

TL 2.27  
ISSUE 3  
27 June 22

## INTRODUCTION

Each individual LAA Permit aircraft has an Operating Limitations document issued by the LAA which forms part of the Permit to Fly. At initial issue, all Permit aircraft are limited to Day/Visual Flight Rules (VFR) operation. Some types have the potential to operate beyond these limitations. On a case-by-case basis, LAA will consider removing the Day/VFR limitation provided appropriate airworthiness, maintenance and equipment requirements are met.

This Technical leaflet explains the philosophy behind LAA aircraft operation at night and/or in IMC conditions, how to apply for the Day/VFR limitation to be removed from your aircraft's LAA Permit to Fly and the process that will be followed to assess the aircraft. TL 2.28 provides details of the standards that aircraft must meet and should be read in conjunction with this TL. Part 1 of form LAA/MOD15 is the application form to start the process, while part 2 of MOD15 is used to accompany the full submission on completion of the reports etc when it is sent to LAA HQ.

## BACKGROUND

In the early days of amateur built aircraft in the UK, it was reasonable to limit amateur-built aircraft to Day/VFR operations, as such aircraft were generally very basic types with minimal equipment.

In recent years, much more capable aircraft have become available to the amateur constructor and many builders have chosen to install instrument fits that provide the capability to fly in non-Visual Meteorological Conditions (VMC) and/or at night. At the same time many factory-built, ex-certified aircraft which were previously night/IMC approved have transferred to a Permit to Fly but have automatically lost that facility due to the change to a Permit regime.

Day/VFR aircraft are cleared by the LAA using a variety of approaches, in which formal compliance with a design code is often not fully demonstrated. To be granted permission for more demanding IMC/IFR and night operations, the CAA has determined that LAA Permit aeroplanes must be individually re-investigated. Aircraft must comply with the applicable Air Navigation Order (ANO) requirements for night and/or IMC/IFR flight and, as far as is practicable, with the relevant requirements of EASA's CS23 design code. CS23 is the least prescriptive certification standard that allows instrument flight.

LAA aircraft are generally operated for non-commercial, private purposes only, and are typically flown by their owners. On this basis it's reasonable to assume that the people flying in the aircraft are informed participants and have an awareness of the risks involved. In these circumstances it is appropriate to allow a greater degree of pragmatism and flexibility in the strict interpretation of the rules that are formulated to apply to certified aircraft.

The LAA has developed the rules described in TL 2.28 to ensure that aircraft seeking the removal of the Day/VFR limitation are appropriately equipped. Several in depth analyses have been carried out to derive standards that are appropriate for the LAA fleet, which have been agreed with the CAA. The standards to be applied are appropriate and proportionate to the privileges granted and the non-commercial, private nature of the permitted operations and have been derived from detailed analyses of the risks that must be mitigated.

However, flying single-engined aircraft in IMC or at night is a higher risk activity than flying those same aircraft during the day in VMC. This is because the consequences of any failure, especially engine failure, are likely to be more serious. Each individual owner seeking night or IMC/IFR clearance should understand the risks and ensure the aircraft is equipped to as far as possible mitigate these additional risks and that the pilot is qualified and appropriately experienced.

# **PROCEDURE FOR THE APPROVAL OF LAA PERMIT AIRCRAFT FOR OPERATION IN IMC, UNDER IFR OR AT NIGHT**

TL 2.27  
ISSUE 3  
27 June 22

Not all LAA types are suitable for night or IMC/IFR flight. Types listed in Table 1 at the end of this document have already been evaluated and found to be suitable. Further examples of these types should be straight forward to approve, depending on individual configurations. The LAA will consider other types of aircraft in due course but for these, a more involved 'First of Type' (FOT) process is required, and, particularly with LAA's many recreational types with 'sporty' handling, there's a strong possibility that the type is found impractical or unsuitable for instrument flight when flight tested against the more stringent night/IFR standards. This is particularly the case with aircraft of the light sport category/600 kg microlights which have generally been designed for VFR use only.

In either case you will need to show that your individual aircraft's systems and chosen instrumentation fit are suitable for night or IFR operation and that a certain level of failure can be tolerated without the loss of flight critical information.

In this TL flight that is not under VFR will be referred to as IFR, whether that is in IMC or VMC. Night has the same meaning as in the ANO. Aircraft types that have been operated on a Certificate of Airworthiness will be referred to as 'Previously Type Certified' (PTC) aircraft.

## **PHILOSOPHY FOR LAA AIRCRAFT REMOVAL OF DAY/VFR LIMITATION**

Where an aircraft can be shown to meet a broadly similar level of safety to a certificated aircraft then a case will be considered for the Operating Limitations to be amended. This will require the following areas to be shown to meet a broadly similar level of safety (and hence reliability):

1. Powerplant and propeller
2. Instrumentation power supply duplication and effects of failure
3. Flight guidance instrumentation
4. Communications equipment
5. Aircraft handling
6. Cockpit and external illumination (night only)
7. Guidance for pilots on operation of the aircraft and its systems (i.e. POH/Pilot's Notes)
8. Continued airworthiness (i.e. maintenance schedule)

While this is not meant to preclude any novel or new approach it will be easier for the LAA to assess any system if it is either similar to one that is certificated or has a long history of reliable use. Any LAA member wishing to achieve this approval must gather sufficient information to show the areas above meet the rules: TL 2.28 describes the information required. In order to help applicants through the process, one of a team of LAA nominated 'assessors' will liaise with the applicant and validate the submission before it is passed to LAA HQ.

The privilege to approve certain individual LAA Permit aircraft for IMC/IFR/Night operation should not be taken for granted. Unlike other countries which operate an 'Experimental' airworthiness category, and whose statutes do not prohibit such aircraft from IFR operation, UK legislation gives the CAA power to issue a national Permit to Fly 'subject to such conditions relating to the airworthiness, operation or maintenance of the aircraft as it thinks fit' and is under 'no obligation to do so unless that application is supported by reports from approved persons'. In other words, it is in everyone's interests that UK LAA Permit aircraft not limited to Day/VFR are operated to the highest levels of safety. While LAA will have satisfied itself that the initial and continued airworthiness of each IFR-approved aircraft is acceptably safe, it is up to the pilot to ensure the aircraft is operated and maintained in such a manner as to maximise that safety, especially during IMC/IFR/Night operation. This privilege has been hard won; we must do all we can to safeguard it for the future.

# **PROCEDURE FOR THE APPROVAL OF LAA PERMIT AIRCRAFT FOR OPERATION IN IMC, UNDER IFR OR AT NIGHT**

TL 2.27  
ISSUE 3  
27 June 22

## **COMMON LIMITATIONS**

No matter how the aircraft is equipped all Permit aircraft will have the following limitations applied,

1. Flight in known or forecast icing conditions is prohibited.
2. Operation in IMC in areas of known or forecast thunderstorm activity is prohibited.
3. Take-off and landing in visibility less than 1500m is prohibited.
4. The aircraft may not be operated in IMC below 500ft agl for a precision approach, or 600ft for a non-precision approach or approach system limits, whichever is the greater.
5. Autopilot engagement below 1000ft is prohibited.

## **THE APPLICATION PROCESS**

The application process is different for Previously Type Certified (PTC) aircraft and for homebuilts. The application and approval process is designed around the needs of homebuilts. As PTC aircraft have largely already gone through a much more rigorous certification process, many of the activities required for a homebuilt can often be bypassed if the aircraft remains close to its certified configuration.

## **POTENTIAL COSTS AND TIMESCALES**

LAA will publish the cost of this approval separately. Assessors may also make a charge for their time and expertise (to be agreed between the owner and the assessor). You may need to arrange for a suitably experienced test pilot and/or authorised LAA inspector to be involved in the process, and you will need to arrange fees with them separately. If the owner is unable to provide the data requested in a coherent form, or a very in depth investigation is required, the owner may be asked to fund the additional work. There is no guarantee of a successful outcome from any assessment. The payment of the fee is no guarantee that an IMC/IFR/Night clearance will be provided.

The potential timescale for approval is dependent on several factors. At the time of writing there are many more owners who have applied for a clearance than assessors available. Some assessors will look at aircraft for only a minimal charge, but owners will have to fit in with the assessor's schedule. For those owners who are looking for a more speedy clearance other assessors may be available for a greater fee.

To minimise the potential for disappointment later on, it is suggested that if the aircraft type is not one that LAA have already approved for night/IFR use, or it has any unusual feature such as an unusual engine or propeller, an initial assessment is carried out before any significant time or money is expended - on an expensive IFR instrument upgrade, for example, that might turn out to be in vain.

## **HOMEBUILT AIRCRAFT**

The owner initiates the process by submitting Part 1 of form MOD15 to LAA Engineering as the aircraft approaches its first birthday after receiving its initial Permit to Fly, or at any time afterwards. The application will be reviewed to check whether the aircraft type has been approved previously, any problems encountered during approval and the suitability of the installed equipment. The owner will receive a reply outlining how the process is likely to proceed and an approximate waiting time before the assessment will begin. Where the aircraft is the first of a particular type to apply a more in-depth assessment is required, see below.

## **EXAMPLE OF TYPE PROCESS (EOT)**

Assuming the owner decides to proceed with their application, an assessor will be assigned and the owner invited to submit a datapack, as described in TL 2.28, and part 2 of the MOD15 form.

## **PROCEDURE FOR THE APPROVAL OF LAA PERMIT AIRCRAFT FOR OPERATION IN IMC, UNDER IFR OR AT NIGHT**

TL 2.27  
ISSUE 3  
27 June 22

The process is illustrated in Figure 1 with the datapack creation depicted in further detail in Figure 2.

The Permit IFR Assessor will review the information provided and work with the owner to fill in any areas where additional information may be required. Any notable features of the aircraft will be discussed with the owner. At the appropriate point in the process the assessor will also arrange for the aircraft to be inspected and for a flight evaluation. Assuming the assessment is broadly positive, any additional information required or deficiencies with the aircraft will be discussed with the owner.

Once the datapack is finalised, the assessor will be able to complete his report forwarding it to LAA Engineering for their consideration, accompanied by part 2 of the MOD15 form. When satisfied with the data and reports, LAA Engineering will re-issue the aircraft's Permit to Fly with the Operating Limitations suitably amended.

Where approval for night operation is requested, a night lighting evaluation will be required, which will usually include an evaluation flight. Any evaluation flight will be outside the current Permit Operating Limitations and will require a specific permit to test. The process for the night evaluation is shown in Figure 3. Much of the data for an instrument approval will be required, including the example of type check flight.

If the aircraft is found to be un-suitable for IFR approval, the LAA assessor will report that to LAA Engineering and the owner. The assessor may be able to work with the owner to modify the aircraft's equipment or behaviour, but also may report the deficiencies that require correction and leave those activities to the owner using the normal LAA modification processes.

Please note that the process described here appears to be entirely sequential. The assessor may choose to carry out the stages in a different order or may combine stages. The aim is to collect all the data required to enable the final report to be submitted to LAA Engineering.

### **FIRST OF TYPE CLEARANCE (FOT)**

Before an aircraft type can be assessed as suitable for Night/IFR operation, it will be evaluated both technically and in flight, broadly against requirements of CS23, known as the 'First of Type' evaluation. The intention is this evaluation will be required only once for each type, but for types that shown some variation between examples it may be required for each aircraft. A significant part of this process is the assessment of the aircraft's handling qualities by a professional test pilot who is suitably approved by the LAA, who will almost certainly charge a significant figure for their time spent on the project, and spent writing their report. This assessment will inevitably be more costly than an EOT aircraft approval. If your aircraft type is one the LAA has not yet assessed for night/IFR, be sure you are prepared to fund the clearance process at the outset.

A number of factors such as design strength, stability, performance, wing-loading and powerplant type influence the suitability of any type for an IMC clearance. In general the LAA would not support a recommendation for removal of Day/VFR limitations for a type which has a wing loading less than 60 kg/m<sup>2</sup>. It is recognised that many LAA types have a lighter wing loading than 60kg/m<sup>2</sup>, including some PTC aircraft. This limit may be reviewed as more experience is gained in assessing aircraft.

Clearly any aircraft not on the accepted list will take significantly longer than a previously approved type, or worse, the type may be found unsuitable. It is very strongly suggested that no great expense on new equipment is incurred until the aircraft type has successfully completed the FOT assessment. If your aircraft is not already equipped for IFR, LAA strongly recommends you complete the FOT evaluation process before proceeding with the costly business of modifying the on-board equipment for IFR operation.

## **PROCEDURE FOR THE APPROVAL OF LAA PERMIT AIRCRAFT FOR OPERATION IN IMC, UNDER IFR OR AT NIGHT**

TL 2.27  
ISSUE 3  
27 June 22

Where the FOT assessment is not successful, LAA will not be able to progress further applications for that type unless facilitated by a change in configuration to address the issue. LAA will assist wherever possible with IFR applications, however owners should realise at the outset that this is not a 'rubber-stamping' exercise and that not all types and not all examples of each type are suitable candidates for IFR operation.

### **PREVIOUSLY TYPE CERTIFIED AIRCRAFT (PTC)**

The process described above has been designed primarily to address the needs of amateur-built aircraft. PTC aircraft that have previously been certified for night and/or IMC flight, and that remain similar to the type certified configuration, will be able to use an abbreviated process managed entirely by LAA Engineering.

The process for a Previous Type Certified aircraft is:

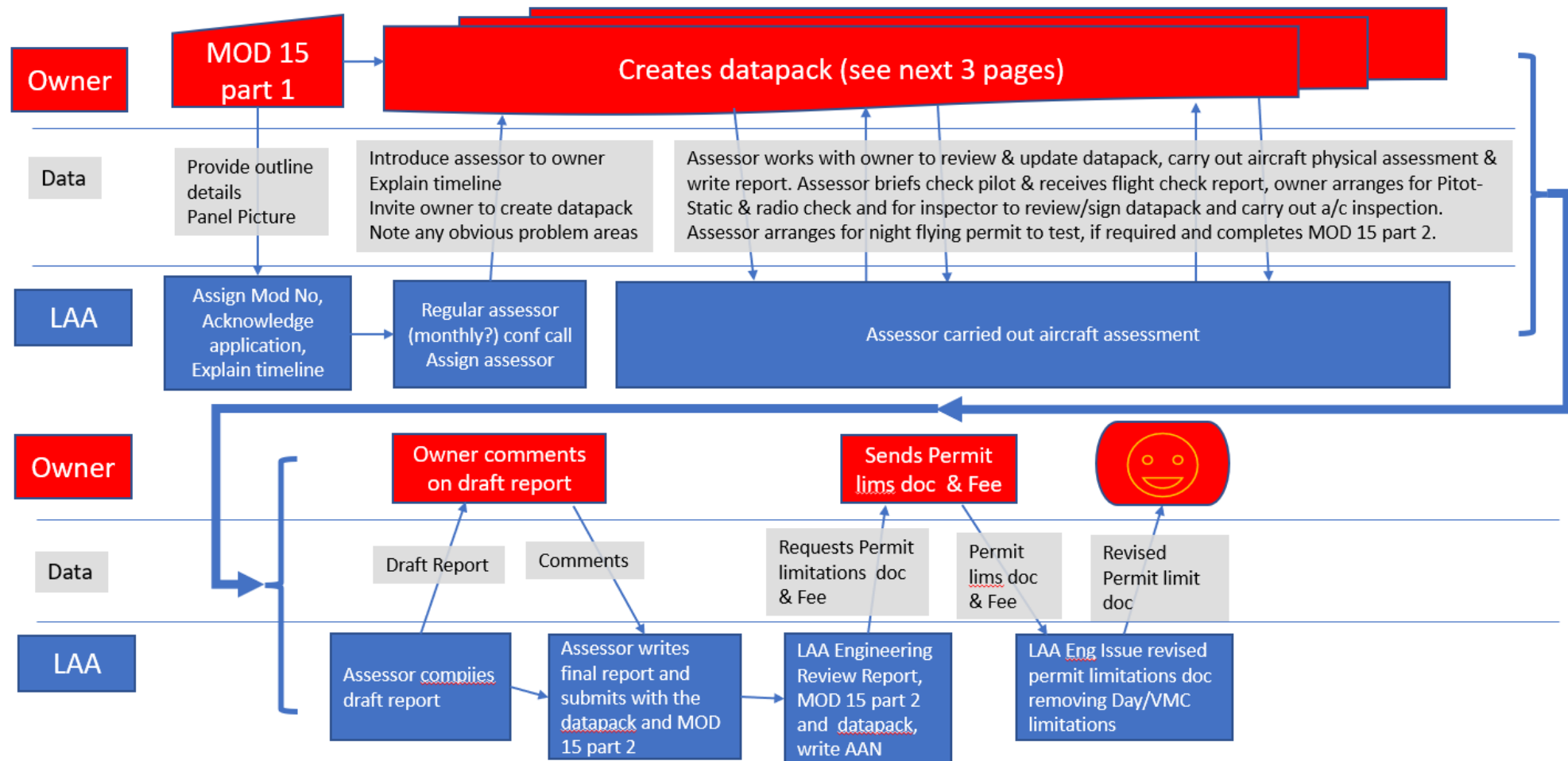
1. Owner completes MOD15 part 1 and submits it to LAA Engineering.
2. LAA Engineering will assess the application, and in particular the similarity of the aircraft to the type certified standard.
3. If the aircraft is too far removed from the type certified standard the owner will be advised to follow the homebuilt process above.
4. If the aircraft is suitable LAA Engineering will invite the owner to provide:
  - a. A completed Aircraft Equipment List
  - b. The certification from a recent 'avionics annual' and pitot-static check
  - c. A maintenance schedule
  - d. A TC POH or Flight Manual updated for any additional equipment fitted
  - e. A photo of the instrument panel
  - f. A Permit IFR inspection signed by an IFR-approved inspector
  - g. The appropriate fee
  - h. MOD15 part 2
  - i. Mod report
5. LAA Engineering will assess the data provided and if suitable will update the aircraft's Operating Limitations.

Flow Diagrams for the processes described above are included on the following pages. These do not include the First of Type clearance as this process will be tailored to each individual application.

# PROCEDURE FOR THE APPROVAL OF LAA PERMIT AIRCRAFT FOR OPERATION IN IMC, UNDER IFR OR AT NIGHT

TL 2.27  
ISSUE 3  
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FIGURE 1 EXAMPLE OF TYPE – REMOVAL OF VMC LIMITATION PROCESS

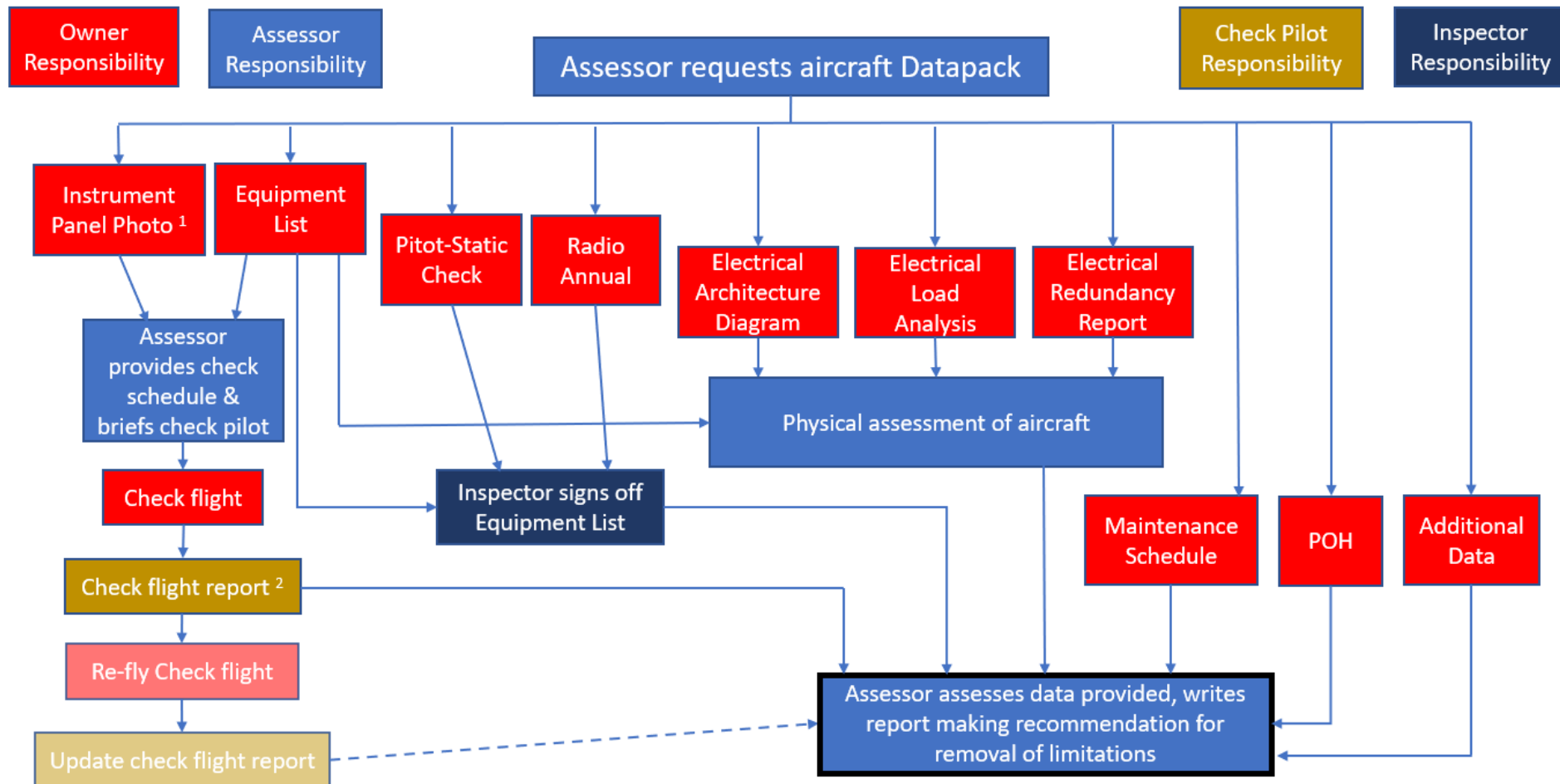




# PROCEDURE FOR THE APPROVAL OF LAA PERMIT AIRCRAFT FOR OPERATION IN IMC, UNDER IFR OR AT NIGHT

TL 2.27  
ISSUE 3  
27 June 22

FIGURE 2 DATAPACK CREATION



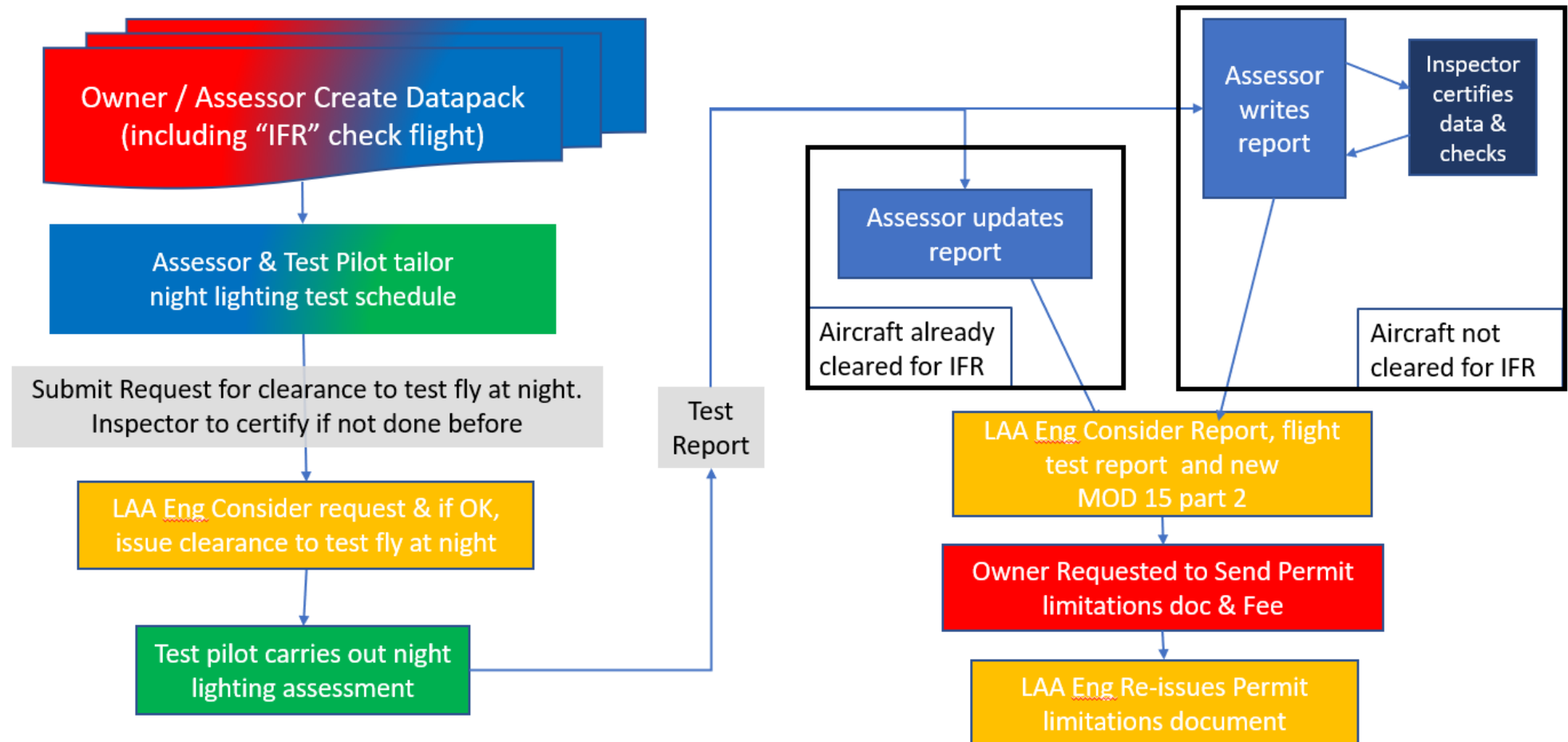
This does not depict a 'time-line'  
The Assessor may vary the order in which data is provided

1. Photo should be provided with initial application
2. Check flight report written by check pilot

# **PROCEDURE FOR THE APPROVAL OF LAA PERMIT AIRCRAFT FOR OPERATION IN IMC, UNDER IFR OR AT NIGHT**

TL 2.27  
ISSUE 3  
27 June 22

FIGURE 3 REMOVAL OF DAY LIMITATION





# PROCEDURE FOR THE APPROVAL OF LAA PERMIT AIRCRAFT FOR OPERATION IN IMC, UNDER IFR OR AT NIGHT

TL 2.27  
ISSUE 3  
27 June 22

## TYPES APPROVED FOR IFR/IMC OR NIGHT OPERATIONS

Table 1 – Aircraft types which have been cleared for IMC and/or night operation:

Type	Comment
All ex CofA types that have been previously certified for IMC or night operation	Jodel aircraft will be expected to install a heated pitot tube. Aircraft with venturi powered instruments are likely to be limited to temperatures of +5°C unless a venturi heating system is fitted.
Vans RV-6, -6A, -7, -7A	With a restricted aft cg limit
Vans RV-8, -8A	
Vans RV-9, -9A	
Vans RV-10	
Vans RV-14	Successful FoT flight test carried out, first aircraft yet to be approved
Glasair I	With a restricted aft cg limit and modification to enhance lateral stability
Europa, XS & Liberty XL-2	

It is likely that the list of eligible aircraft types will be expanded over time as more types are evaluated, these tables will be moved to the LAA website once this process is fully established.

Please report any errors or omissions to LAA Engineering: [engineering@laa.uk.com](mailto:engineering@laa.uk.com)