Civil Aviation Authority

CAP1529 Guidance Material

Aircraft Maintenance Type Practical Training (within a UK Part 147 Organisation)

Index

Abbreviations and Terms

CA	Competent Authority
CAA	Civil Aviation Authority
EASA	European Aviation Safety Agency
MTO	Maintenance Training Organisation
MTOE	Maintenance Training Organisation Exposition
NAA	National Aviation Authority
OJT	On the Job Training
PTP	Practical Training Program
PTS	Practical Training Syllabus

"The objective of type practical training is to gain competence in performing safe maintenance....as appropriate for the type of aircraft..."

Part-66, Appendix III

1. Introduction

This guidance material has been produced to assist those involved with Part-147 aircraft maintenance training, by providing guidance to existing Aircraft Maintenance Licensing requirements regarding the **Practical training** element of type training under changes introduced by Commission Regulation (EU) No.1321/2014.

NOTE: This document is for guidance only and the main reference points; Annex III of Regulation (EC) No. 1321/2014 (Part-66) Appendix III. Para 3.2, its amendments and associated AMC & GM, should always be referred to.

Type Practical training should not be confused with On the Job Training (OJT), which forms part of the first type rating application process.

OJT is a programme of hands on maintenance experience agreed with the competent authority and provided by an approved maintenance organisation that includes one to one supervision involving actual work tasks performance on the relevant aircraft/components, covering line and/or base maintenance. The supervisor shall have oversight of the entire process and must ensure that tasks are completed satisfactorily, utilising relevant manuals and observing any safety measures etc. The supervisor should also carry out a competency assessment as part of the OJT and the feedback report(s) be supplied to the Nominated Assessor. Once the requisite number of tasks has been completed, the nominated assessor will conduct an individual assessment of the OJT records to determine compliance with the requirements and refer to any feedback reports from the supervisors. This is dealt with in a separate guidance document: CAP1530 Licensed Engineer OJT Guidance.

NOTE: Simulation of OJT tasks is not allowed, however flight simulators may be of benefit for certain tasks.

2. Practical Training

Practical training is not to be confused or substituted with the practical element of the theory training, (i.e. the aircraft visit). Practical training is a structured training event which consolidates the knowledge gained during the theoretical phase of type training and as such, may be performed after or integrated within the theory training. However, it must not be performed before theoretical training (AMC to section 1 of Appendix III of Part-66 refers).

Practical training should:

- Address the different parts of the aircraft which are representative of the structure, the systems/components installed and the cabin.
- Include the use of technical manuals, maintenance procedures and the operational interfaces with the aircraft (e.g. FMC, electronic flight bag, etc).
- Include common maintenance and ground handling activities.
- Cover both type specific and generic safety elements of the aircraft's maintenance.
- Develop the student's competence in performing safe maintenance, prior to the practical assessment.

The purpose of Practical training is not to include all the maintenance tasks associated with a particular type, but a representative sample of them that will allow the student to acquire the knowledge, attitude and skills to safely carry out maintenance on that type.

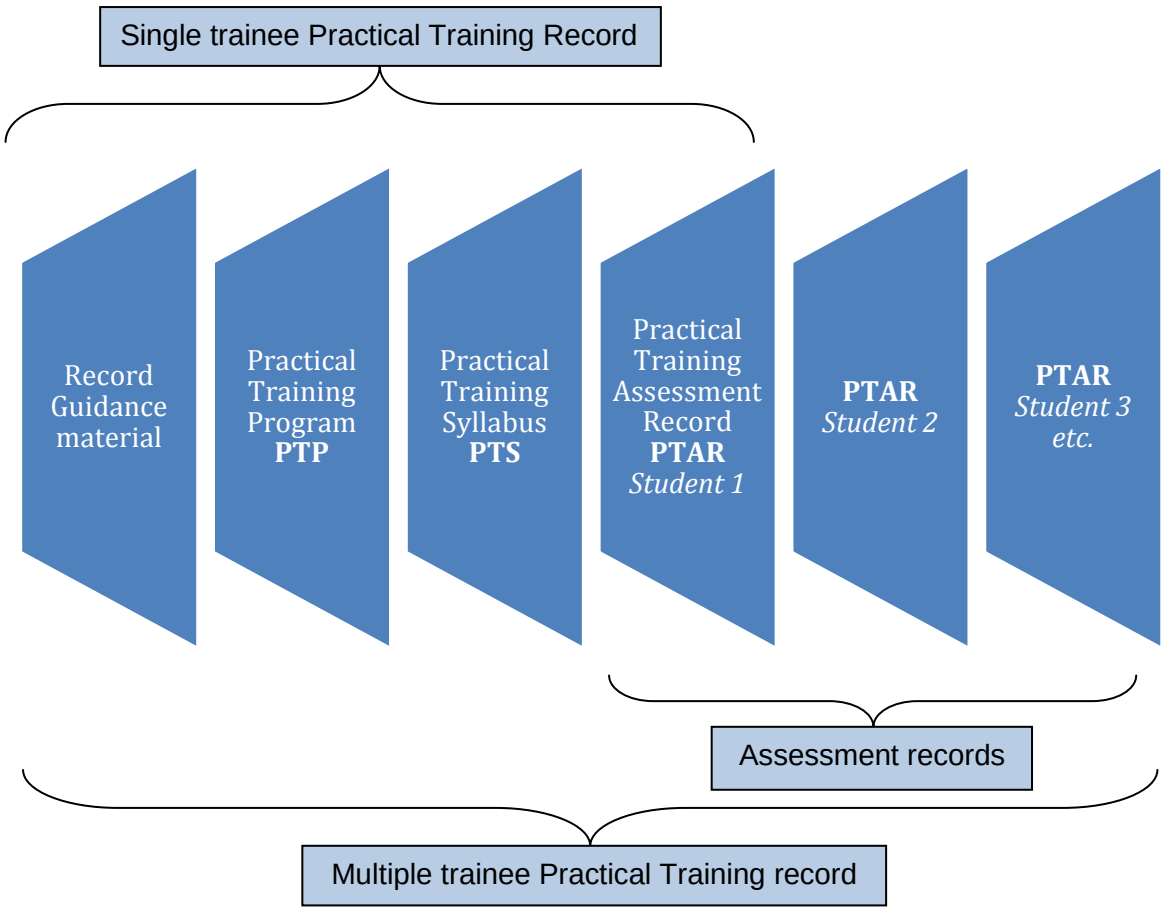
3. Practical Training Record

A Practical Training Record (often referred to as a Practical training logbook) will be created by the Part 147, completed by the student and a certified true copy retained by the Part 147 organisation delivering the training. It will chronicle the training activities carried out during the practical training course and the subsequent assessment of trainee competence.

This booklet will be created by the Part 147 organisation and be type specific. The Practical Logbook shall list all of the applicable ATA's as specified within Appendix III Section 3.2 to Part 66 and must be approved by the competent authority. It shall accurately record the training given to each of the students; therefore if the students are split into separate groups it will be necessary to ensure accurate recording of each student's participation and progress throughout the training. This may be done by using individual PTRs or linking an attendance record sheet with a master PTR.

As a record of type training and student participation, it must be retained in its entirety for audit purposes and will be constructed from the following basic elements:

a) Record Guidance Material.
b) Practical training Program (high level calendar).
c) Practical Training Syllabus (detailed training activities).
d) Practical Training Assessment for each student.



4. Record of Guidance Material

Although the Instructor will have received training on the use of the practical training record, it should still contain detailed instructions on how to use and complete the various sections of the document and should include definitions and the responsibilities of those involved.

5. Practical Training Program (PTP)

A training schedule must be provided to give a high level, ideal outline of the intended training program. The program should be broad in nature and be adhered to as closely as possible; however deviation from the program is acceptable as long as a logical sequence of training is retained.

The program may be in the form of a calendar linked to ATA chapters:
e.g: Day 1 - ATA chapter 11, 12 and 24

6. Practical Training Syllabus (PTS)

The PTS is the approved list of training tasks to be accomplished during the practical training phase. It also forms part of the instructor's log for recording the instruction and completion of these tasks. The PTS shall include 100% of the applicable content from the table in Appendix III to Part 66, paragraph 3.2.b (applicable to the aircraft type and licence category).

For course approval purposes, the PTS must contain at least 100% of the applicable content; however, when considering the number of tasks it should always be remembered that the overall goal of Practical training is to ensure the student attains the competence to perform safe maintenance on that particular aircraft type.

The PTS should include:

- Trainee attendance sheet.
- Course and Instructor's details.
- ATA chapter Number and title.
- AMM or work-pack reference for each training task.
- A list and detailed description of the training tasks.
- Each task must have a method of denoting the training technique (Synthetic, Aircraft registration, Classroom, etc).
- Task type (R/I, LOC, SGH etc).
- Date of each individual task completion.
- Instructor signatures or stamps.
- Spare entries for documenting additional/replacement "ad hoc" training tasks *.

  ***NOTE:** Additional/replacement tasks must be of relevance to those they replace, be of benefit to the training objective and only replace planned tasks in exceptional circumstances.

Example of a Multi student PTS log

Course content

Student attendance and participation

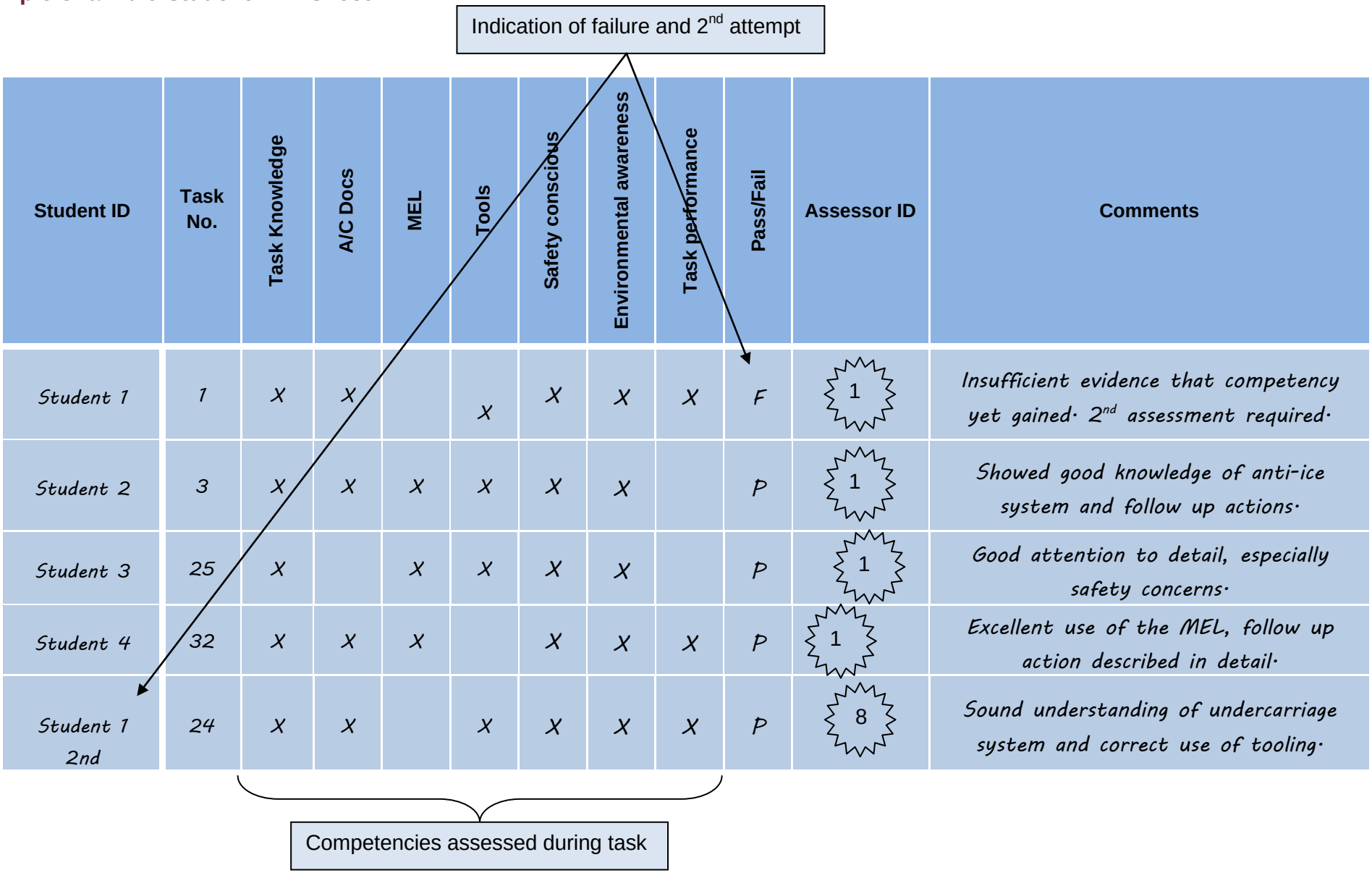
Task No.	ATA reference	Task description	Training location/ A/C Reg	Task type	Date	Instructor ID	Student 1	Student 2	Student 3	Student 4
1	AMM 30-21-03/201	Engine ant-ice valve controller	G-DIMB	R/I	03/07/13	2	X A	X		X
2	AMM 30-xx-xx	Engine anti-ice valve deactivation reactivation	Classroom	MEL	04/07/13	2	X			X
3	AMM 30-xx-xx	Engine anti-ice valve failure indication	Simulator	TS	05/07/13	3	X	X A	X	X
4	AMM 30-xx-xx	Engine anti-ice valve operation	Simulator	FOT	05/07/13	3	X	X	X	
~~5~~	~~AMM 32-xx-xx~~	~~Main wheel removal / fitment~~		~~R/I~~						
5	AMM 32-xx-xx	Port, OTBD wheel brake pack replaced	G-DIMX	R/I	10/07/13	3	X	X	X	X

Brake pack task replaces Main wheel task due to aircraft configuration – aircraft on jacks with wheels removed.

'**A**' denotes: individual was assessed on this task

'**X**' denotes: individual was present during task instruction

Example of a Multi student PTA sheet



Student ID	Task No.	Task Knowledge	A/C Docs	MEL	Tools	Safety conscious	Environmental awareness	Task performance	Pass/Fail	Assessor ID	Comments
Student 1	1	X	X		X	X	X	X	F	1	Insufficient evidence that competency yet gained. 2nd assessment required.
Student 2	3	X	X	X	X	X	X		P	1	Showed good knowledge of anti-ice system and follow up actions.
Student 3	25	X		X	X	X	X		P	1	Good attention to detail, especially safety concerns.
Student 4	32	X	X	X		X	X	X	P	1	Excellent use of the MEL, follow up action described in detail.
Student 1 2nd	24	X	X		X	X	X	X	P	8	Sound understanding of undercarriage system and correct use of tooling.

7. Practical Training Tasks

The PTS should be a list of tasks created by analysing each of the ATA chapters with reference to the aircraft type concerned and should be representative of the complexity and individuality of those systems, particularly if there are important safety issues that ought to be addressed.

How each task is categorised (LOC, SGH, etc), should be based upon the potential gains for the students' competency or its impact on safety. Availability should not be a reason to omit a pertinent task and consideration should be made to mix 'actual hands on' and 'task simulation' to complete an important or critical learning objective.

All pertinent sub-tasks, associated with the safe completion of each main task, such as Isolating mechanical/electrical systems, opening/closing CBs, locking flight controls, etc, should be included and the applicable aircraft maintenance manuals used.

The process for task selection to fulfil the training objectives should be detailed and available for review by the competent authority.

The suitability of each task should be based upon:

- The relevance to the type.
- The frequency, variety, safety, criticality, novelty, complexity of the maintenance tasks for the type.
- The uniqueness of the components or maintenance task (e.g. NOTAR tail assembly).
- Feedback from in-service experience.
- The use of type specific special tooling.

The task syllabus must:

- Be distributed in order to cover all applicable ATA chapters.
- Include all of the task categories (LOC, FOT, SGH, R/I, MEL, TS) and may include others deemed appropriate to the type (e.g. 'INS'pection, 'ADJ'ustment).
- Include an appropriate number of each task category for the aircraft type's training requirements to be met.
- Be sufficient to cover at least 50% of the crossed tasks in Part-66, Appendix III, para 3.2, subject to the provisions above.

8. Training Methodology

Practical Training involves a combination of different training methodologies to achieve the intended goal. It is important to check that each selected task has the most appropriate methodology to ensure the fulfilment of the training objective. For example: Task practicing, Practical demonstration, Simulation

Task Practicing:

Task practicing involves the trainee personally performing the entire task or an element of it. A significant portion of the training will be done via this method as this training technique remains an essential step for practicing the use of special tools, the completion of tasks involving human factors or specific difficulties that require physical contact to adequately understand the system or component.

Practical Demonstration:

This is an Instructor led, ‘on aircraft’ exercise during which the student will not perform the task but will witness its completion by the instructor or another student. The students may alternatively carry out elements of the entire task, whilst still allowing an overall appreciation to be gained. This method can be used where there is no value in the repeated completion of the task. The demonstration will include the use of appropriate manuals/documents, access to the component, specialist tooling, potential MEL deferments and the isolation of the affected system.

Simulation:

As the availability of an unserviceable aircraft cannot be guaranteed, simulators provide an opportunity to practice trouble shooting procedures or witness the effects of faults or incorrect maintenance activities.

Simulation (basic):

The task is performed in a way that does not result in the physical removal/installation of a component nor the alteration or activation/de-activation of an aircraft system. It includes the manipulation of real tooling during the operation.

Or

The task is performed on a device such as a flight simulator that is not primarily designed as a maintenance training aid and unable to produce specific maintenance scenarios.

Simulation (advanced):

The student uses a dedicated interactive maintenance simulator to reproduce the complete task in a virtual environment. The simulator should be able to reproduce the resulting effects of incorrect maintenance actions.

Ideally, simulations should not be used intensively in order to mitigate the lack of access to an aircraft; they should be used when the added value of simulators is established. The use of simulators or simulated tasks must be approved by the competent authority prior to seeking full practical training course approval.

However it is unrealistic to build in multiple errors in to the aircraft maintenance environment so where possible basic simulation is generally acceptable in respect to maintenance of systems. Use of Tech logs, MEL’s, AMM’s and supporting maintenance data is encouraged.

The performance of the physical tasks will likely be gained in the Part 145 organisation under the approved OJT programme defined in Section 3.15 of their MOE.

9. Practical Training Assessment

Each student is to be assessed to a minimum of one assessment. This assessment will verify that the theoretical and practical elements of the training process have been absorbed and understood. It will gauge whether the student has attained a level of competence that enables safe maintenance activities on that aircraft type.

The assessment of a student's competence may be carried out at any time during the practical training phase; however, if the assessment is carried out at the end of the training period, the Training Organisation's processes must cater for student failure and include provisions for re-assessment if required. Note: The entire course must be completed.

The PTA must adhere to the following requirements:

- It must include an element of 1-2-1 interaction.
- It may form part of a group exercise but will further require an element of 1-2-1 interaction to fully determine the individual's competence.
- It may be carried out in one session, as long as it incorporates all the competencies relevant to the aircraft type and its maintenance.
- It should be representative of the aircraft's complexity and in the technical input required to complete the task.
- It should include the assessor's details on the PTA sheet.
- It must assess an actual 'hands on' practical task (i.e. not completed in a classroom or through discussion).
- A student's previous experience or preconceived competence should not be taken into account as it cannot be accurately quantified or evidenced.

Generally, knowledge is evaluated by examination. The purpose of this document is not to describe the examination process but to aid with the evaluation of 'skills' and 'attitude' after training containing practical elements. Nevertheless, the trainee needs to demonstrate to the assessor that they have sufficient knowledge to perform the required tasks.
'Attitude' is indivisible from the 'skill' as this greatly contributes to the safe performance of the tasks.

The assessment should therefore focus on the competencies relevant to the aircraft type and its maintenance such as, but not limited to:

- Environment awareness (act safely, apply safety precautions and prevent dangerous situations);
- Systems integration (demonstrate understanding of aircraft systems interaction – identify, describe, explain, plan, execute);
- Knowledge and understanding of areas requiring special emphasis or novelty (areas peculiar to the aircraft type, domains not covered by Part-66 Appendix I, practical training elements that cannot be imparted through simulation devices, etc.);
- Using reports and indications (the ability to read and interpret);

- Aircraft documentation finding and handling (identify the appropriate aircraft documentation, navigate, execute and obey the prescribed maintenance procedures);
- Perform maintenance actions (demonstrate safe handling of aircraft, engines, components and tools).

As far as feasible, the objectives of the assessment should be associated with the learning objectives and the passing level; it means that observable criteria should be set in order to measure the performance and should remain as objective as possible.

The assessment may be:

- Diagnostic (prior to a course), formative (re-orientate the course on areas where there is a need to reinforce) or summative (partial or final evaluation);
- Performed task-by-task, as a group of tasks or as a final assessment;
- One method might be an initial assessment to be performed by the trainee himself, then discussing areas where the perceptions of the trainee's performance by the assessors differ in order to:
- Develop the self-assessment habits;
- Make the assessment more acceptable and understandable to both parties.

A 'box-ticking' exercise would be pointless. Experience has shown that assessment sheets have largely evolved over time into assessment of groups of 'skills' because in practice such things eventually detracted from the training and assessment that it was intended to serve.

10. Practical Training Assessment Record

The PTAR must be documented and attached to the Practical Training Record and is a means to evidencing how the assessment was performed and as to how any competency determinations were made. It should include the following information:

- Course and Student details.
- Assessment Task description.
- Task reference details (e.g. AMM ref).
- Description of the competences assessed with regard to Knowledge (recitation of theory), Skills (use of A/C docs, MEL, tools, etc) and Attitude (safety consciousness), including environmental awareness, system integration, performance of the maintenance and final airworthiness restoration tasks (panel fitment etc.).
- Pass or Fail indicator.
- Provision for multiple assessments to be carried out, I.A.W. MTOE procedure, to ensure full competency has been measured and to accommodate any assessment failures and subsequent re-assessments.
- Assessor's signature box.

11. MTO/145 contracts and sub-contracting

Where no direct company affiliation is present between the Part-147 and the Part-145 organisation where the Practical Training is to take place, the MTO must have a contractual agreement in place which gives full access to the aircraft for the purpose of maintenance training and actual hands on maintenance tasks, sufficient to meet the requirements of Part-66, Appendix III, para 3.2.

The contract must include provisions for CAA representatives to access facilities, personnel and relevant work records during the execution of their oversight.

The contract must be in place prior to the application for remote site training and form part of the application process.

Part-145 Engineering staff may be used to assist or supervise the Instructor during training events and provide an interface between the Part-147 and Part-145 activities (raising Tech log entries, certifying tasks, etc). It may also be possible for Part-145 engineering personnel to be qualified as Instructors or Assessors. They must have undergone a suitably robust qualification process and have attended a Train the Trainer course. Instructor records for these personnel will attract an equal level of scrutiny to those of the permanent Part-147 staff and must evidence the qualifying process and training received to gain competence as instructors.

NOTE: All maintenance activities on live aircraft, including those being carried out by Practical training Instructors and students, during the Practical phase of type training, must be conducted in accordance with the relevant maintenance manuals and regulations in force at the time the training is conducted.

The Part-147 organisation must ensure that their training processes align with the continuing airworthiness responsibilities of the Part-M organisation. And also the maintenance responsibilities of the Part 145.

12. Practical Instructors and Assessors

In the majority of cases, the Practical instructor will be the same as that used for the Theory phase of the type training. They are a logical choice, as they possess an in depth knowledge of the aircraft's systems and will have developed an understanding of each student's specific academic requirements.

Using the same instructor for both the Theory and Practical phases will suit the business model of many organisations. In some cases however, especially where a Part-147 / Part-145 affiliation exists, the organisation may choose to utilise experienced engineers from their own maintenance workforce to deliver the Practical training.

These individuals must be given suitable training on the organisational processes involved, particularly the use of the Practical training record. They must also have attended a train the trainer course, whether delivered by an external or internal source, which should specifically target the training techniques required for Practical training and set the organisation's bench mark for the conduct of this training.

Workforce sourced Instructors will be qualified and managed by the Part-147 organisation. They must be included in the list Instructional staff (1.5 of the MTOE) and be subject to the same Instructor records and update training requirements as the directly employed Instructors.

Practical assessments may be conducted by either the Practical Instructor or a dedicated assessor, who has undergone a similar training and qualification process to that detailed above.

13. Remote site approval

Practical training carried out in locations not listed in the organisation's approved MTOE, must be treated as a remote site and approved as per 147.A.145(c). Sufficient time should be allowed for the establishment of contractual agreements and CAA review/approval prior to the course being started.

An organisation holding remote site approval should have a defined procedure listed in their MTOE section 2.8 and should, where possible consider supplying the following as a guide to support any notification of remote site training. The notification of remote site should be made to LTSApprovals@caa.co.uk as early as possible to avoid any delays and the email of notification should contain:

- Completed SRG1019
- Copy of supporting Internal audit
- Details of Instructors/Examiners (copy of PAC will suffice)
- Any supporting documents i.e contracts relating to Aircraft for Theory and Practical training.

Once received the email will be processed by the LTS Team and an audit event created for the allocated surveyor to complete (if required). An email will be sent by the LTS Approvals team advising that the training may proceed and the organisation is to retain this email in the course records.

Organisation should be aware that when negotiating a contract for such training, the terms of the organisation approval are to ensure that the CAA/EASA must be permitted access at all times. Failure to ensure this may result in findings being raised as per 147.A.160 and possible removal of the remote site privilege.