

Joint Aviation Authorities

Master Minimum Equipment List Procedures Manual

*Version 2
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JAA

Abbreviations

AFM	Aircraft Flight Manual
ATA	Air Transport Association
CDL	Configuration Deviation List
DDG	Dispatch Deviation Guide
DDPG	Dispatch Deviation Procedures Guide
EASA	European Aviation Safety Agency
ETOPS	Extended Range Operations of a two-engined aeroplane
IFR	Instrument Flight Rules
IMC	Instrument Meteorological Conditions
JAA	Joint Aviation Authorities
JAR	Joint Aviation Requirements
JOEB	Joint Operations Evaluation Board
MEL	Minimum Equipment List
MMEL	Master Minimum Equipment List
NAA	National Aviation Authority
RIE	Rectification Interval Extension
RNP/RNAV	Required Navigation Performance/Area Navigation
RVSM	Reduced Vertical Separation Minima
SG	Sub-Group
SSA	System Safety Assessment
STD	Synthetic Training Devices
VFR	Visual Flight Rules
VMC	Visual Meteorological Conditions

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Chapter 1

Introduction

1.1 Terminology

The definitions of specific words and phrases used in this manual may be found in Appendix A (expanded from JAR-MMEL/MEL.005).

1.2 The Master Minimum Equipment List

(see JAR MMEL/MEL.010)

The Master Minimum Equipment List (MMEL) is a document which lists the equipment that may temporarily be inoperative, subject to certain conditions, whilst maintaining an acceptable level of safety as intended in the applicable JAR. Each MMEL is specific to an aircraft type.

For an aircraft manufactured in a JAA member state, the MMEL consists of a single document for each aircraft type. For a foreign manufactured aircraft, the document will normally consist of the original MMEL, issued by the Authority of the state of design, with the addition of a JAA MMEL Supplement, if deemed appropriate by JAA. The JAA MMEL Supplement is an overriding document which modifies items in the original MMEL to conform with JARs, interpretations and policies (see JAR MMEL/MEL.045).

1.3 Dispatch with Inoperative Equipment

The MMEL and associated Minimum Equipment List (MEL) are alleviating documents. Their purpose is not, however, to encourage the operation of aircraft with inoperative equipment. It is undesirable for aircraft to be dispatched with inoperative equipment and such operations are permitted only as a result of careful analysis of each item to ensure that the acceptable level of safety, as intended in the applicable JAR or equivalent requirement, is maintained. A fundamental consideration is that the continued operation of an aircraft in this condition should be minimised. The limitations governing rectification intervals are discussed later in this document. (see JAR-MMEL/MEL .040 & .080)

1.4 Legal Basis

JAR-OPS 1.030 provides for operation of an aircraft with equipment inoperative, through the use of an approved MEL. JAR-MMEL/MEL provides the rules under which a MMEL and a MEL can be established for a given aircraft type.

Where an MMEL has been established for a particular type of aircraft, an MEL shall not be approved for that type of aircraft unless it complies with the minimum requirements specified in the approved MMEL (see JAR-OPS 1.030).

Finally it is up to each JAA member authority (NAA) to approve the JAA MMEL (or the original MMEL plus the related JAA MMEL Supplement if applicable) as the “reference MMEL” for operators under its jurisdiction.

1.5 Equipment Included in the MMEL / MEL

Most aircraft are designed and certified with a significant amount of equipment redundancy, such that the airworthiness requirements are satisfied by a substantial margin. In addition, aircraft are generally fitted with equipment that is not required for safe operation under all operating conditions, e.g. instrument lighting in day VMC. Other equipment, such as entertainment systems or galley equipment, may be installed for passenger convenience. If these passenger convenience items do not affect airworthiness when inoperative, they need not be listed in the MMEL/MEL. However, if a passenger convenience item has another function related to safety (such as use of the entertainment system for passenger briefings) then this item must be included in the MMEL/MEL with an appropriate rectification interval.

It follows that all items related to the airworthiness of the aircraft and not included in the MMEL are automatically required to be operative prior to flight (see JAR-MMEL/MEL.010).

Chapter 2

Master Minimum Equipment List

2.1 MMEL Responsibilities

The JAA JOEB Chairman for an aircraft type is responsible for ensuring that the MMEL is produced in line with JAA policy and requirements, and then recommended to the NAAs for approval. To assist, a MMEL SG will be established with the responsibility for the processing of the MMEL. The terms of reference of the MMEL SG are shown in Appendix B.

2.2 MMEL Procedures Manual

- a) To assist in the assessment process, JAA has developed this MMEL Procedures Manual. This document is based on the Policy and Procedures manual developed by Transport Canada, TP 9155E. It has been compiled to provide a centralised source of guidance information to facilitate the review and standardisation of JAA MMELs and MELs.
- b) While some MMEL items are generic in nature and identical wording can be used for all aircraft types, other items will differ from aircraft to aircraft. The material provided by the MMEL Procedures Manual and Appendices is to be used for guidance only. Users are encouraged to provide feedback for the correction and amplification of the guidance material and propose additional material which may be included.
- c) An example of a MMEL sample page is included in Appendix C (see Appendix 1 to ACJ JAR-MMEL/MEL.025).

2.3 MMEL Philosophy

This section provides insight into the criteria that govern the determination of an acceptable MMEL item and the methods of justification to be used in the development of a MMEL.

2.3.1 Level of Safety

The MMEL may permit the operation of an aircraft for limited periods of time, with items of equipment inoperative, if an acceptable level of safety, as intended by the applicable JAR or equivalent requirement, can be maintained. To establish MMEL relief for any given operating condition, the MMEL SG must consider various factors relating to safe operation when such equipment is inoperative. These include the consequence to the aircraft and its occupants of the next critical failure, change in crew workload and/or degradation in crew efficiency and degradation in crew capability to cope with adverse environmental conditions.

2.3.2 Maintaining the Level of Safety

- a) The MMEL SG will determine whether a proposal for MMEL relief is to be accepted, based on the substantiated ability to maintain an acceptable level of safety, as intended in the applicable JARs or equivalent requirement, with an item of equipment inoperative.
- b) This substantiation will be achieved by one or more of the following means:
 - 1. Adjustment of operational limitations;
 - 2. Transfer of the function to an operating component;
 - 3. Reference to other instruments or components performing the required function or providing the required information;
 - 4. Change in operational procedures and/or change in maintenance procedures;
 - 5. No change or minimal change in crew workload;
 - 6. Minimum impact on crew training;
 - 7. Flight test demonstration/validation (Simulator (STD) and/or Aircraft);
 - 8. Safety objective demonstrations performed by SSA.

2.3.3 Example of Justification of a MMEL Item

- a) To illustrate this, consider a MMEL proposal requesting that an aircraft be permitted to dispatch with the differential pressure indicator on the cockpit pressurisation control panel inoperative.
- b) *JAR 25.841(b)(5)* requires that the pressurised cabin must have instruments at the pilot or flight engineer station to show the pressure differential between the cabin air pressure and atmospheric pressure.
- c) In order to meet the criteria, the MMEL proposal would have to stipulate that the following conditions be met:
 - 1. the cabin altimeter must be operative; and
 - 2. a chart showing the relationship between the aircraft altitude and cabin altitude for the normal operating pressure differential (e.g. 8 PSI) must be available to the crew in flight.
 - 3. Or the flight is performed in an unpressurised state.
- d) Consequently, if the flight is performed in a pressurised state, the flight crew, with reference to the aircraft's altimeter, the cabin altimeter and the specified chart, would be able to determine that the appropriate cabin pressure differential was being maintained during flight.
- e) Provided that dispatching with the cabin pressure differential indicator inoperative did not significantly impact crew workload and/or efficiency and was acceptable in terms of further failures, this MMEL item would be acceptable.
- f) This acceptability is based on the evaluation of the foregoing factors showing that the level of safety dictated by the minimum requirements specified for the design and operation of the aircraft type would be maintained.

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- g) The continued reliability of an aircraft system and the probability of total system failure, following the dispatch of an aircraft with inoperative equipment, must be considered for some MMEL items.

2.3.4 Methods of Justification of MMEL Items

The assessment of an acceptable level of safety for a MMEL item often involves more than one of the following methods of justification:

- a) the equipment may be considered optional;
- b) the equipment may be considered redundant;
- c) a qualitative analysis;
- d) a quantitative safety analysis; and/or
- e) Flight and/or STD tests, including bench tests.

2.3.5 Optional Equipment (see ACJ JAR-MMEL/MEL.010(c))

When aircraft are operated with optional equipment which is over and above the required equipment, there is no necessity for such equipment to be operative if it is in excess of that required for safe operations for a particular flight condition or route of flight. Inclusion in the MMEL can be accepted on this basis. However, optional equipment for one operator may be required for another operator. (e.g. ACARS data link).

2.3.6 Redundant Items

If the purpose or function can be performed by some other item(s) of equipment, then the inoperative equipment may be accepted on a redundancy basis with the provision that the alternative equipment can be confirmed to be operative. Redundancy cannot be claimed as justification for inclusion of an item if the two (or more) sources of information or function are required by the aircraft type certification basis.

2.3.7 Qualitative Safety Analysis

A qualitative analysis must consider the impact that the proposed inoperative item has on all other aspects of the aircraft's operation. The qualitative analysis must consider the impact on crew workload, the impact of multiple MMEL items, and the complexity of maintenance and/or operational procedures. It may reflect experience with previous MMEL approvals.

Note: A previous MMEL approval of the same item on another aircraft type does not in itself imply that an acceptable level of safety has been met. Factors which must be considered include similarity of system operation and similarity of the aircraft operational role.

2.3.8 Quantitative Safety Analysis

- a) The increasing dependency of modern aircraft on the safe operation of their complex systems has resulted in the development of structured techniques to achieve an acceptable level of safety. This level of safety is based upon the principle that the hazard resulting from an event should be inversely proportional to the probability of its occurrence. Compliance is usually demonstrated by conducting a system safety assessment.

- b) The safety assessment establishes the major, hazardous or catastrophic situations or failure conditions which the system is capable of producing and the allowable probability of occurrence. For those systems whose failure is critical, i.e., results in hazardous or catastrophic situations, a numerical probability analysis is usually required to demonstrate compliance with the allowable probability of occurrence. For non-critical components/systems, the safety assessment may be greatly simplified. The risk of any specific failure condition is a function of failure rate, the number of such systems and the time of exposure to risk.
- c) When items of equipment from systems performing critical functions are included in the MMEL, account shall be taken of their inoperative status in the safety assessment. The additional risk resulting from occasional flights with such equipment inoperative should be established and should be compatible with the allowable probability of occurrence established during the certification process.
- d) If the item cannot be justified by the previous means or criteria, then a safety analysis must be carried out involving a quantitative analysis of the likely risk of the worst effects that can result from additional failures, events and/or environmental conditions occurring during a flight with the particular inoperative item in question. It must be shown that, bearing in mind the reduced exposure time when operating under a MMEL, the probability of a particular hazard has not been increased beyond the levels dictated by the minimum requirements specified for the design and operation of the aircraft type.
- e) Where quantitative analysis forms part of the justification, rectification interval extensions should be considered in this analysis (see JAR-MMEL/MEL.081).

2.3.9 Flight and Simulator/STD Tests

A flight test or a simulator/STD evaluation on an aircraft or STD representative of the type design may be used to evaluate MMEL relief applications.

2.4 MMEL Policy

This section gives details of the JAA policy governing the development of a MMEL. The policy material provided is applicable to aircraft that are certificated under EASA Procedures or to foreign manufactured aircraft where certification has been validated by an EASA Validation team, unless otherwise stated.

2.4.1 Development of a MMEL

If a manufacturer wants its aircraft to be operated with specified equipment inoperative, it must produce a MMEL proposal. Where possible, the approval process for such a MMEL will take place concurrently with the type certification process, but the development of an approved MMEL is not a condition of aircraft type certification. MMEL/MEL approvals must, however, be completed prior to the introduction of the aircraft into revenue service.

2.4.2 MMEL Source

a) “JAA manufactured” aircraft

The development and approval of a JAA MMEL is dependent on the aircraft manufacturer as the primary source of information on any new aircraft and its systems. The JAA MMEL will normally be produced through the JOEB process. EASA, acting on behalf of the JAA will not normally undertake either the origination or production of MMELs.

b) “Foreign manufactured” aircraft

The usual source will be the MMEL approved by the Authority of the State of Design, as modified by a JAA MMEL Supplement recommended by the JOEB for approval by the NAAs, and published by the manufacturer.

2.4.3 MMEL Justification

The MMEL must be supported by appropriate engineering, operational justifications and special procedures as applicable. A rationale showing the engineering and operational justification may include a qualitative and/or a quantitative safety analysis, a rationale showing system redundancy, AFM limitations or any other technical justification supporting an acceptable level of safety.

2.4.4 MMEL SG

The JAA approval process for a specific aircraft type will be coordinated by the MMEL SG Chairman within the JOEB. The composition of the MMEL SG and the terms of reference are described in Appendix B.

2.4.5 Participation of Operators

a) “JAA manufactured” aircraft

Operators of an aircraft type are encouraged to participate in the MMEL development and approval process. This will be accomplished through meetings convened by the MMEL SG Chairman. Requests for changes to an existing MMEL will be considered through application to the MMEL SG. All requests must be accompanied by adequate technical justification forwarded by the manufacturer.

b) “Foreign manufactured” aircraft

To enable the publication of the JAA MMEL Supplement within the time constraints imposed by the validation/familiarisation process, operator input will not normally be sought before initial publication of this JAA MMEL Supplement. After initial publication of the JAA Supplement, aircraft operator submissions may be made to the MMEL SG via the aircraft manufacturer using the procedures noted in paragraph 2.5.4(a).

- c) Aircraft no longer supported by the original manufacturer

In order to continue to qualify for an ICAO Annex 8 Certificate of Airworthiness, the aircraft type must continue to receive Continued Airworthiness support. The Authority of the State of Design will appoint an organisation to carry out this function, and this organisation will act as the aircraft manufacturer in MMEL/MEL matters.

2.4.6 Foreign MMELs

- a) Revisions to foreign MMELs will be reviewed by the MMEL SG, in conjunction with technical justification from the manufacturer. The revision may be accepted by the JOEB, or published as a difference in the JAA MMEL Supplement.

Note: When a MMEL or MMEL Supplement revision is issued an operator will have 90 days, from the date of the revision, to revise the MEL. Reduced timescales for implementation of safety related revisions of an MMEL or MMEL Supplement may be required (see JAR-MMEL/MEL.060).

- b) JAR, or equivalent regulation, interpretations, additional or different airworthiness requirements and operating rules will be addressed by a JAA MMEL Supplement, which will normally be defined by the MMEL SG and produced by the manufacturer. The JAA MMEL Supplement will constitute a mandatory change to the foreign MMEL and will be used in conjunction with it.

2.4.7 MMEL Page Format

- a) MMELs for JAA-certificated aircraft and JAA MMEL Supplements for foreign aircraft will be published in the "five column format" where columns 1 to 5 will contain respectively the name of the item, the rectification interval category, the number installed, the number required for dispatch and remarks or exceptions.
- b) A sample page is provided in Appendix C. Other formats may be accepted for foreign MMELs provided they are clear and unambiguous. Each MMEL will be preceded by an acceptable preamble. An example of a preamble is given in Appendix D and in JAR-MMEL/MEL, Appendix 2 to ACJ MMEL/MEL.025.

2.4.8 MMEL Format

- a) Each MMEL should contain:
 - (i) Cover/approval page
 - (ii) Log of Revisions
 - (iii) Reason for Changes page
 - (iv) List of Effective Pages
 - (v) Table of Contents
 - (vi) Explanation of the symbols used in the MMEL
 - (vii) Definition of any terms having special meaning in the context of the MMEL
 - (viii) A Preamble.

Each item of equipment listed in the MMEL should preferably be described and identified in accordance with the Air Transport Association (ATA) specification 100 or 2200 code system. The number of each item of equipment installed and the number

required to be operative for dispatch should be stated in the appropriate columns. The MMEL should be written in a language acceptable to the Authority.

- b) Any conditions and limitations associated with inoperative equipment, required to maintain an acceptable level of safety, shall be included in the "Remarks or Exceptions" column.

2.4.9 Operational and Maintenance Procedures

Any inoperative item of equipment in the MMEL, which would require an operational or maintenance procedure to maintain the appropriate level of safety, shall be identified by a symbol in the "Remarks or Exceptions" column of the MMEL. This will normally be "(O)" for an operational procedure and "(M)" for a maintenance procedure. (O) (M) means both operational and maintenance procedures are required. (O)/(M) means that the operator can apply an operational and/or a maintenance procedure, as appropriate.

When approval of the item is contingent upon the development of such procedures, the procedures must be completed prior to approval. The procedures themselves are not submitted for approval, however, they may be reviewed by the MMEL SG during the MMEL approval process. The limitations, procedures and remarks for individual MMEL items should consider all intended operations, such as (but not limited to) day, night operations, VMC, IMC, icing, rain, Category II/III, RNP/RNAV, RVSM, and ETOPS operations.

2.4.10 Prohibited Items

- a) The MMEL shall not include any item of equipment which, if inoperative, is likely to significantly affect the take-off, landing or climb performance of the aircraft or associated speeds presented in the approved AFM unless other data acceptable to the MMEL SG specifies the effect and is referenced in the MMEL.
- b) No item shall be included in the MMEL which conflicts with the limitations or invalidates the emergency procedures of the AFM or of an Airworthiness Directive unless the AFM or Airworthiness Directive provide otherwise. In any case, where there is conflict between the MMEL and an Airworthiness Directive or other Mandatory Requirement it is the data or information contained in the Airworthiness Directive or Mandatory Requirement which shall override (see JAR-MMEL/MEL.001(b)).
- c) The MMEL should not address items or components of the aircraft that are included in the Configuration Deviation List (CDL), unless the alleviation sought differs from the performance considerations contained in the CDL.

2.4.11 Equipment Required by Operational Requirements

When an item of equipment is required to be installed and operative under particular circumstances by JAR-OPS, such equipment may be defined in the remarks column of the MMEL by the words "As required by Operational Requirements".

Note 1: See TGL OPS 26 - MEL Policy Document.

Note 2: MMELs approved by FAA or other NAAs may contain phrases such as "As required by FARs". Such phrases should be interpreted to mean "As required by JARs" or "As required by Operational Requirements".

2.4.12 Rectification Interval Categories

- a) The MMEL shall provide Rectification Intervals (A, B, C or D) for each inoperative item. The category of each inoperative item will be determined according to the rectification interval categories specified below.
- b) The category of each item in the MMEL is to be inserted in column 2.

Category A

No standard interval is specified, however, items in this category shall be rectified in accordance with the conditions stated in the MMEL. Whenever the time interval is specified, it shall start at 00:01 on the calendar day following the day of discovery.

Category B

Items in this category shall be rectified within 3 consecutive calendar days excluding the day of discovery.

Category C

Items in this category shall be rectified within 10 consecutive calendar days, excluding the day of discovery.

Category D

Items in this category shall be rectified within 120 consecutive calendar days, excluding the day of discovery. To be considered for placement in Category D, the item must be of an optional nature, or excess equipment which an operator may, at their discretion, deactivate, remove from or install on an aircraft.

To be approved for category D, the item must meet the following criteria:

1. the absence of the item does not affect crew workload;
2. the crew do not rely on the function of that item on a routine or continuous basis; and,
3. the crew's training, subsequent habit patterns and procedures do not rely on the use of that item.

2.4.13 Rectification Interval Extensions (RIEs)

Extensions of the rectification interval B, C and D are normally part of the MEL management procedures and should be assessed during the MMEL justification process.

2.5 MMEL Procedures

2.5.1 General

This section details the procedures to be followed in the development, approval and publication of the MMEL.

2.5.2 “JAA manufactured” aircraft

a) Initial JAA MMEL Approval

1. The draft JAA MMEL will normally be originated by the manufacturer and should be submitted to the JOEB MMEL SG as early as possible in the type certification process. Inputs from an aircraft operator may be made to the originator and, if supported by the manufacturer, should be included in the submission to the MMEL SG.
2. The draft JAA MMEL proposals must be accompanied by appropriate engineering and/or operational justification, ideally with an accompanying page addressing the item, the applicable regulation and/or relevant guidance material and the justification provided by the manufacturer.
3. Approval of the operational and maintenance procedures themselves will not be a part of the MMEL approval process, but rather, the MEL approval process. Nevertheless, supporting documentation must be available in sufficient detail to permit an understanding of the operational and maintenance procedures such that the approval of the item is facilitated.
4. For large aircraft, these procedures are normally contained in a manufacturer's attachment to the MMEL, (e.g. sections 2 and 3 in Airbus and Dassault manuals) or through a Dispatch Deviation Procedure Guide (DDPG), or a Dispatch Deviation Guide (DDG). For some aircraft, where these documents may not be available from the manufacturer; generated MELs, which contain pre-approved maintenance and operational procedures, may be used.

b) JOEB MMEL SG Review

A review of the draft MMEL will be co-ordinated by the MMEL Focal Point, who may be the SG Chairman. Following review by the appropriate JOEB specialists and decisions on individual MMEL items made by the MMEL SG, the required changes, with rationale, will be returned to the originator.

c) Approval and Publication

After agreement, the originator will incorporate any changes required by the JOEB Chairman. The originator will then publish the final version and return hard copies or an acceptable electronic copy to EASA, Certification Flight Standards Department, for posting on the JAA secure website. The originator may also distribute hard copies of the MMEL on request, when justified. The EASA Certification Flight Standards Manager will sign the approval page of the original issue (see Appendix E for an example of a MMEL approval page).

2.5.3 “Foreign manufactured” aircraft

a) Source MMEL

The MMEL should be originated by the manufacturer and approved by the appropriate foreign Authority.

Where the foreign Authority has not approved the MMEL, the JAA approval process may be expanded accordingly.

b) JAA Review

The MMEL, together with appropriate justification and sufficient details of applicable operational and maintenance procedures to permit a full assessment of each MMEL item, must be submitted to EASA, Certification Flight Standards Department, as early as possible in the type certification process. A JAA review of the MMEL will be coordinated by the MMEL Focal Point. The required changes will be incorporated in a JAA MMEL Supplement to the MMEL.

c) Approval and Publication of the JAA MMEL Supplement

The JAA MMEL Supplement will be submitted to the JOEB Chairman and it will be subsequently published on the JAA website. A copy will also be sent to the appropriate foreign authority and the manufacturer. The EASA Certification Flight Standards Manager will sign the approval page of the original issue (see Appendix E for an example of a MMEL approval page).

2.5.4 Revisions to JAA MMELs and JAA MMEL Supplements

Once a JAA MMEL or MMEL Supplement is issued, requests for revisions may be initiated by the aircraft manufacturer.

a) Approval of Revisions

All proposed revisions, together with engineering justification and sufficient details of applicable operational and maintenance procedures to permit understanding of each item, shall be submitted to the MMEL Focal Point.

b) Approval Process — “JAA manufactured” aircraft

Requests for revisions to a MMEL will be reviewed by the MMEL SG. Once the required changes have been approved, they will be passed back to the originator for inclusion in the MMEL and updated on the MMEL status listing on the JAA website. Revisions to the MMEL can be signed by the JOEB Chairman.

c) Approval Process — “Foreign Manufactured” aircraft

Revisions to a MMEL, when issued by the responsible foreign Authority, must be used by an operator within 90 days to amend their MEL, if they are more restrictive than the existing JAA MMEL Supplement. MMEL Revisions originated by this foreign Authority/manufacturer will be reviewed by the MMEL SG and any changes addressed in

a revision to the JAA MMEL Supplement. Revisions to the MMEL Supplement can be signed by the JOEB Chairman.

d) MMEL Revision Status

The NAA may determine the current approved revision status of any MMEL by consulting the MMEL status listing on the JAA MMEL website.

JAA MMEL/MEL Terminology

1. **“Airplane/Rotorcraft Flight Manual”** (AFM/RFM) is the document required for type certification and approved by the Authority.
2. **“Alphabetical symbol”** in Column 5 indicates a proviso (condition or limitation) that must be complied with for operation with the listed item inoperative.
3. **“Approved by the Authority”** means documented by the NAA as suitable for the purpose intended (refer to JAR-1).
4. **“As Required by Operating Requirements”**, means that the listed item of equipment is subject to certain provisions (restrictive or permissive) expressed in the applicable operational requirements..
5. **“Day of discovery”** The calendar day that a malfunction was recorded in the aircraft maintenance record/log book.
6. **“Deactivated and secured”** means that the specified component must be put into an acceptable condition for safe flight. An acceptable method of deactivating and securing will be established by the operator for inclusion in the MEL.
7. **“Engine Indicating Crew Alerting System (EICAS), Electronic Centralised Aircraft Monitoring System (ECAM) or similar systems”** that provide electronic messages refer to a system capable of providing different priority levels of systems information messages (e.g., Warning, Caution, Advisory, Status and Maintenance). An airplane discrepancy message may or may not affect dispatchability. Refer to the specific MMEL for the aircraft type.
8. **“Equipment”** Means item, function, component or system.
9. **“ETOPS”** refers to extended range operations of a two-engine airplane as defined by JAA GAI-20 ACJ 20X6 “Temporary Guidance Material for Extended Range Operation with Two-Engine Airplanes ETOPS Certification and Operation”.
10. **“Excess Items”** means those items installed that are excess to the requirements
11. **“Icing Conditions”** means an atmospheric environment that may cause ice to form on the aircraft or in the engine(s).
12. **“If installed”** means that the equipment is either optional or is not required to be installed on all aircraft covered by the MMEL.
13. **“Inoperative”** means a system and/or component malfunction to the extent that it does not accomplish its intended purpose and/or is not consistently functioning normally within its approved operating limit(s) or tolerance(s).

14. **“Inoperative components of an inoperative system”** Inoperative items which are components of a system which is inoperative are usually considered components directly associated with and having no other function than to support that system. (Warning/caution systems associated with the inoperative system must be operative unless relief is specifically authorised per the MMEL).
15. **“(M)”** symbol indicates a requirement for a specific maintenance procedure which must be accomplished prior to operation with the listed item inoperative. Normally these procedures are accomplished by maintenance personnel; however, other personnel may be qualified and authorised to perform certain functions. The satisfactory accomplishment of all maintenance procedures, regardless of who performs them, is the responsibility of the operator. Appropriate procedures are required to be published as part of the Operator's Manual or MEL.
16. **“Master Minimum Equipment List”** means a document approved by the Authority, that establishes the aircraft equipment allowed to be inoperative under conditions specified therein for a specific type of aircraft.
17. **“Minimum Equipment List”** means a document approved by the Authority, in accordance with JAR-OPS1.030, that authorises an operator to dispatch an aircraft with aircraft equipment inoperative under the conditions specified therein.
18. **“Notes”** Column 5 provides additional information for flight crew or maintenance consideration. Notes are used to identify applicable material which is intended to assist with compliance, but do not relieve the operator of the responsibility for compliance with all applicable requirements. Notes are not a part of the provisos.
19. **“Number Installed”** (Column 3) is the number (quantity) of items normally installed in the aircraft. This number represents the aircraft configuration considered in developing this MMEL. Should the number be a variable (e.g., passenger cabin items) a number is not required; a “-” is then inserted in column
20. **“Number required for dispatch”** (Column 4) is the minimum number (quantity) of items required for operation provided the conditions specified in Column 5 are met. Should the number be a variable (e.g., passenger cabin items) a number is not required; a “-” is then inserted in column 4.

Note: Where the MMEL shows a variable number required for dispatch, the MEL must reflect the actual number required for dispatch or an alternate means of configuration control approved by the Authority.

21. **“(O)”** symbol indicates a requirement for a specific operations procedure which must be accomplished in planning for and/or operating with the listed item inoperative. Normally these procedures are accomplished by the flight crew; however, other personnel may be qualified and authorised to perform certain functions. The satisfactory accomplishment of all procedures, regardless of who performs them, is the responsibility of the operator. Appropriate procedures are required to be published as a part of the operator's manual or MEL.

Note: The (M) and (O) symbols are required in the operator's MEL.

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22. **“Passenger Convenience Items”** means those items related to passenger convenience, comfort or entertainment such as, but not limited to, galley equipment, movie equipment, ash trays, stereo equipment, overhead reading lamps, etc.
 23. **“Placarding”** Each inoperative item must be placarded to inform and remind the crew members and maintenance personnel of the equipment condition.

Note: To the extent practical, placards should be located adjacent to the control or indicator for the item affected; however, unless otherwise specified, placard wording and location will be determined by the operator.

24. **“Rectification Intervals”** Inoperative items or components, deferred in accordance with the MEL, must be rectified at or prior to the rectification intervals established by the following letter designators:

“Category A” No standard interval is specified, however, items in this category shall be repaired in accordance with the conditions stated in the “Remarks or Exceptions” column (5). Where a time period is specified it shall start at 00:01 on the calendar day following the day of discovery.

“Category B” Items in this category shall be repaired within three (3) consecutive calendar days, excluding the day of discovery. For example, if it were discovered at 10 a.m. on January 26th, the three day interval would begin at midnight the 26th and end at midnight the 29th.

“Category C” Items in this category shall be repaired within ten (10) consecutive calendar days, excluding the day of discovery. For example, if it were discovered at 10 a.m. on January 26th the ten day interval would begin at midnight the 26th and end at midnight February 5th.

“Category D” Items in this category shall be repaired within one hundred and twenty (120) consecutive calendar days, excluding the day of discovery.

25. **“Remarks or Exceptions”** (Column 5) in this column includes a statement either prohibiting or permitting operation with a specific number of items inoperative, provisos (conditions and limitations) for such operation, and appropriate notes.
26. **Systems Definitions:** Systems numbers are based on the Air Transport Association (ATA) Specification Number 100 or 2200 and items are numbered sequentially [see also JAR 1 and JAR-MMEL/MEL definitions].
27. **“Type Certificate”** means a Type Certificate, Supplemental Type Certificate, or equivalent, issued by the Authority.
28. **“Type Certificate Holder”** means the holder of or applicant for a Type Certificate, Supplemental Type Certificate or equivalent.
29. A **“vertical bar” (change bar)** in the margin indicates a change, addition or deletion in the adjacent text for the current revision of that page only. The change bar is dropped at the next revision of that page.

30. **“Visual Flight Rules”** (VFR) is as defined in the JARs. This precludes a pilot from filing an Instrument Flight Rules (IFR) flight plan.
31. **“Visual Meteorological Conditions”** (VMC) means the atmospheric environment is such that would allow a flight to proceed under the Visual Flight Rules applicable to the flight. This does not preclude operating under Instrument Flight Rules.
32. **“Visible Moisture”** means an atmospheric environment containing water in any form that can be seen in natural or artificial light; for example, clouds, fog, rain, sleet, hail, or snow.
33. “_” symbol in Column 3 and/or Column 4 indicates a variable number (quantity) of the item installed.

Note: Where the MMEL shows a variable number installed, the MEL must reflect the actual number installed.

JOEB MMEL Sub-Group (SG) - Terms of Reference
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1. Scope

The MMEL SG is established within a JOEB to review the MMEL for either of the following:

- EASA certificated aircraft products (of European manufacture)
- Validation of non-European manufactured aircraft product (e.g. Boeing, Embraer)

2. Composition of the MMEL SG

The MMEL SG is normally comprised of at least the following, all of which are therefore members of the JOEB:

- 1 Operations representative,
- 1 Certification representative, preferably the PCM or other Certification Team specialist,
- 1 MMEL specialist,
- 1 Maintenance specialist (optional).

The chairman would normally be the JOEB Chairman (operations representative).

An MMEL Focal Point will be appointed to coordinate the review and communicate directly with the Aircraft Manufacturer. In some cases this role may be fulfilled by the JOEB Chairman.

The MMEL SG may be advised by:

- EASA Certification specialists on the EASA Certification Team,
- Aircraft Manufacturer,
- Operators.

3. MMEL SG Tasks

The MMEL SG would be required to review and discuss the following:

- New MMEL proposals or amendments to an existing MMEL,
- MMEL (or MMEL Supplement) Preamble,
- MMEL (or MMEL Supplement) Notes and Definitions.

M MEL Sample Page**MASTER MINIMUM EQUIPMENT LIST**

AIRCRAFT:	REVISION NO:	PAGE:
	DATE:	
(1) Systems & Sequence Numbers Item	(2) Rectification Interval Category	
	(3) Number Installed	
	(4) Number Required for Dispatch	
	(5) Remarks or Exceptions	

MMEL Preamble (SPECIMEN)

[Insert LOGO of JAA
Manufacturer]

JOINT AVIATION AUTHORITIES

MASTER MINIMUM EQUIPMENT LIST

(AIRCRAFT TYPE)

PREAMBLE

The following is applicable for authorised certificate holders operating under Authorities Operating Requirements (JAR-OPS). The JAR require that all equipment installed on an aircraft in compliance with the Airworthiness Standards and the Operating Requirements must be operative. However, the Requirements also permit the use of a Minimum Equipment List (MEL) where compliance with certain equipment requirements is not necessary in the interests of safety under all operating conditions. Experience has shown that with the various levels of redundancy designed into aircraft, operation of every system or installed component may not be necessary when the remaining operative equipment can provide an acceptable level of safety.

The JAA Master Minimum Equipment List (MMEL) is developed by the Type Certificate Holder to improve aircraft utilisation and thereby provide more convenient and economic air transportation for the public. The JAA MMEL includes those items of equipment related to airworthiness and operating requirements and other items of equipment which the JAA finds may be inoperative and yet maintain an acceptable level of safety by appropriate conditions and limitations; it does not contain obviously required items such as wings, flaps, and rudders.

The MMEL is the basis for development of individual operator's MELs which take into consideration the operator's particular aircraft equipment configuration and operational conditions. An operator's MEL may differ in format from the MMEL, but cannot be less restrictive than the MMEL. The individual operator's MEL, when approved permits operation of the aircraft with inoperative equipment.

Equipment not required by the operation being conducted and equipment in excess of JAR requirements are included in the MEL with appropriate conditions and limitations. The MEL must not deviate from Airworthiness Directives or any other Mandatory Requirement. It is important to remember that all equipment related to the airworthiness and the operating requirements of the aircraft not listed on the MMEL must be operative.

Suitable conditions and limitations in the form of placards, maintenance procedures, crew operating procedures and other restrictions as necessary are specified in the MEL to ensure that an acceptable level of safety is maintained.

The MEL is intended to permit operation with inoperative items of equipment for a period of time until rectification's can be accomplished. It is important that rectification's be accomplished at the earliest opportunity. In order to maintain an acceptable level of safety and reliability the MMEL establishes limitations on the duration of and conditions for operation with inoperative equipment. The MEL provides for release of the aircraft for flight with inoperative equipment.

When an item of equipment is discovered to be inoperative, it is reported by making an entry in the Aircraft Maintenance Record/Logbook as prescribed by JAR. The item is then either rectified or may

be deferred per the MEL or other approval means acceptable to the competent Authority prior to further operation. MEL conditions and limitations do not relieve the operator from determining that the aircraft is in a condition for safe operation with items of equipment inoperative.

When these requirements are met, an Airworthiness Release, Aircraft Maintenance Record/Logbook entry, or other approved documentation is issued as prescribed by JAR. Such documentation is required prior to operation with any item of equipment inoperative.

Operators are responsible for exercising the necessary operational control to ensure that an acceptable level of safety is maintained. The exposure to additional failures during continued operation with inoperative systems or components must also be considered. Wherever possible, account has been taken in this MMEL of multiple inoperative items. However, it is unlikely that all possible combinations of this nature have been accounted for. Therefore, when operating with multiple inoperative items, the inter-relationships between those items and the effect on aircraft operation and crew workload must be considered.

Operators are to establish a controlled and sound rectification programme including the parts, personnel, facilities, procedures and schedules to ensure timely rectification. This programme should identify the actions required for Maintenance discrepancy messages.

WHEN USING THE MEL, COMPLIANCE WITH THE STATED INTENT OF THE PREAMBLE, DEFINITIONS AND THE CONDITIONS AND LIMITATIONS SPECIFIED IN THE MEL IS REQUIRED.

DEFINITIONS AND EXPLANATORY NOTES

In addition to a Preamble arranged and worded along the lines of this Specimen, the MMEL should contain, as part of the Preamble, sufficient Definitions and Explanatory Notes to provide the user (this is primarily the Operator when compiling the MEL) with a full and proper understanding of the intent and purpose of the items it contains.

While many of the Definitions used will be common to all MMELs, others will be specific to particular or individual aircraft types. Type Certificate holders should, when preparing the MMEL, ensure that all relevant Definitions are included. Likewise Explanatory Notes should be provided in sufficient detail wherever the intent and purpose of a term or phrase or abbreviation etc. is necessary or advisable.

The Type Certificate holders shall provide the following Definitions for Rectification Interval Categories in the MMELs they prepare.

Category A

No standard interval is specified, however, items in this category shall be rectified in accordance with the conditions stated in the Remarks or Exceptions column (5) of the MMEL.

Where a time period is specified in calendar days it shall start at 00:01 on the calendar day following the day of discovery.

Category B

Items in this category shall be rectified within three (3) consecutive calendar days, excluding the day of discovery.

Category C

Items in this category shall be rectified within ten (10) consecutive calendar days, excluding the day of discovery.

Category D

Items in this category shall be rectified within one hundred and twenty (120) consecutive calendar days, excluding the day of discovery.

MMEL Approval Page

**[Insert LOGO of JAA
Manufacturer]**

JOINT AVIATION AUTHORITIES

MASTER MINIMUM EQUIPMENT LIST

(Date of Issue)

(AIRCRAFT TYPE)

(REVISION)

This Master Minimum Equipment List (MMEL) is issued by the Joint Aviation Authorities at the above revision and is recommended for approval as the basis for the preparation and authorisation of individual operator's Minimum Equipment Lists (MELs) for aircraft of this Type, as certificated by and operated under the jurisdiction of JAA Member States Competent Authorities.

.....
(A N O T H E R)
for and on behalf of JAA

Correspondence concerning this document should be addressed to the office listed below:

(Name and address of appropriate
JOEB Chairman or EASA MMEL Project Manager)

[Note: For a JAA MMEL, the logo of the JAA manufacturer should appear on this page, and throughout the MMEL. This does not necessarily apply to JAA MMEL Supplements for foreign manufacturers (e.g. Boeing, Embraer).]