Your Ref. :

Our Ref. : CAAM/AW/MPB/2021/001

Date : 8 January 2024

**Galaxy Aerospace (M) Sdn. Bhd.**
Suite 11-14, Helicopter Centre,
Malaysia International Aerospace Centre,
Sultan Abdul Aziz Shah Airport (MIAC),
47200 Subang, Selangor

**Attn: Tn. Omar Bin Ahmad**
Quality Assurance Manger

Dear sir,

**APPROVAL OF MASS AND BALANCE PROGRAMME ISSUE 2 REVISION 6**

With reference to your letter ref. GAM/CAMO/CAAM-MBP/24-20(005)/ZNZ dated 4 January 2024 and the above subject, kindly be advised that your organisation's **Mass and Balance Programme Ref. GAM/CAAM/MBP Issue 2 Revision 6 dated 4 January 2024** is found satisfactory and hereby approved.

Kindly find the enclosed document for your retention:

i) CAAM Approved LEP.

Thank You.

**"BERKHIDMAT UNTUK NEGARA"**

Yours faithfully,

**(IDEASRUL BIN AB GHANI)**
AIRWORTHINESS DIVISION
*for* Civil Aviation Authority of Malaysia

Galaxy Aerospace
maintenance . repair . overhaul

# MASS AND BALANCE PROGRAMME (MBP)

| | | |
|---|---|---|
| **Organisation** | : | GALAXY AEROSPACE (M) SDN. BHD. |
| **CAMO Approval No** | : | CAMO/2016/03 |
| **Address** | : | Suite 11-14, Helicopter Centre,<br>Malaysia International Aerospace Centre (MIAC),<br>Sultan Abdul Aziz Shah Airport,<br>47200 Subang,<br>Selangor Darul Ehsan |
| **Tel No** | : | +603 7734 7226 |
| **Fax No** | : | +603 7734 7526 |
| **MBP Reference No** | : | GAM/CAAM/MBP |
| **Issue Number** | : | Issue 2 |
| **Revision Number** | : | Revision 6A |
| **Date of Issue** | : | 10 May 2022 |
| **Date of Revision** | : | 29 February 2024 |
| **Copy Number** | : | GAM/MBP/02 |
| **Copy Holder** | : | CAMO PUBLICATION |

Galaxy Aerospace
maintenance . repair . overhaul

# MASS AND BALANCE PROGRAMME (MBP)

| | | |
|---|---|---|
| **Organisation** | : | GALAXY AEROSPACE (M) SDN. BHD. |
| **CAMO Approval No** | : | CAMO/2016/03 |
| **Address** | : | Suite 11-14, Helicopter Centre,<br>Malaysia International Aerospace Centre (MIAC),<br>Sultan Abdul Aziz Shah Airport,<br>47200 Subang,<br>Selangor Darul Ehsan |
| **Tel No** | : | +603 7734 7226 |
| **Fax No** | : | +603 7734 7526 |
| **MBP Reference No** | : | GAM/CAAM/MBP |
| **Issue Number** | : | Issue 2 |
| **Revision Number** | : | Revision 6 |
| **Date of Issue** | : | 10 May 2022 |
| **Date of Revision** | : | 04 January 2024 |
| **Copy Number** | : | GAM/MBP/02 |
| **Copy Holder** | : | CAMO PUBLICATION |

# INTRODUCTION

## I. FOREWORD

This programme defines the organisation and procedures upon which the CAAM approval of GALAXY AEROSPACE (M) SDN BHD – MASS AND BALANCE PROGRAMME (MBP) under CAAM CAD 6805 is based.

These programmes must be complied with to ensure that all the continuing airworthiness activities including weighing activities for aircraft managed by Galaxy Aerospace (M) Sdn. Bhd. Continuing Airworthiness Management Organisation (GAM CAMO) is carried out on time and to an approved standard.

The programme shall be established in compliance with the requirement issued by the CAAM and the requirements for mass and balance control issued by the holder of the type-certificate and supplemental type-certificate and included in the document containing mass and balance data with acceptable method, techniques and practices.

The programme shall not override the necessity of complying with any new or amended regulation published by the CAAM from time to time where these new or amended regulation conflict with the programme. These programmes shall be reviewed and updated as required.

The CAAM reserves the right to suspend, vary or revoke the mass and balance programme approval of GAM CAMO, as applicable, if the CAAM has evidence that procedures are not followed, and the standards are not upheld.

# II. TABLE OF CONTENT

## INTRODUCTION 1



## PART 0 MBP SCOPE AND MANAGEMENT 1



## PART 1 AIRCRAFT WEIGHING 1



## PART 2 MASS AND BALANCE REPORT1

## III. LIST OF EFFECTIVE PAGES

| MBP Part | MBP Chapter | Page No. | Issue No. | Revision No. | Revision Date |
|---|---|---|---|---|---|
| INTRODUCTION | I. FOREWORD | 1 | 2 | 1 | 08 Nov 2022 |
| | II. TABLE OF CONTENT | 2 – 4 | 2 | 6 | 04 Jan 2024 |
| | III. LIST OF EFFECTIVE PAGES | 5 – 8 | 2 | 6 | 04 Jan 2024 |
| | IV. RECORD OF REVISION | 9 – 16 | 2 | 6 | 04 Jan 2024 |
| | V. DISTRIBUTION LIST | 17 | 2 | 1 | 08 Nov 2022 |
| | VI. ABBRIEVIATION & DEFINITIONS | 18 – 22 | 2 | 4 | 18 Oct 2023 |
| 0 | 0.1 | 1 | 2 | 0 | 10 May 2022 |
| | 0.2 | 2 – 8 | 2 | 4 | 18 Oct 2023 |
| | 0.3 | 9 | 2 | 0 | 10 May 2022 |
| | 0.4 | 10 – 12 | 2 | 0 | 10 May 2022 |
| | 0.5 | 13 | 2 | 0 | 10 May 2022 |
| | 0.6 | 14 | 2 | 0 | 10 May 2022 |
| | 0.7 | 15 | 2 | 0 | 10 May 2022 |
| | 0.8 | 16 | 2 | 0 | 10 May 2022 |

| The revised MBP had been internally reviewed for submission to CAAM for final approval | | Approved By: |
|---|---|---|
| Prepared By: | Verified By: | |
| **Continuing Airworthiness Management Manager** | **Quality Assurance Manager** | **Civil Aviation Authority of Malaysia** |
| ZATY NADHIRA BINTI MOHAMED ZUHARI<br>Continuing Airworthiness Management Manager<br>Galaxy Aerospace (M) Sdn Bhd<br>(1040262-D) | OMAR BIN AHMAD<br>Quality Assurance Manager<br>Galaxy Aerospace (M) Sdn. Bhd<br>(1040262-D) | IDEASRUL BIN AB GHANI<br>Senior Assistant Director of Airworthiness<br>Airworthiness Division<br>Civil Aviation Authority of Malaysia<br>(CAAM) |
| Date: 04 JAN 2024 | Date: 04 JAN 2024 | Date: 08/01/24 |

CAAM APPROVAL REF. NO. MBP/2021/001

CIVIL AVIATION AUTHORITY OF MALAYSIA Airworthiness CAAM

| MBP Part | MBP Chapter | Page No. | Issue No. | Revision No. | Revision Date |
|---|---|---|---|---|---|
| 1 | 1.1 | 1 – 2 | 2 | 0 | 10 May 2022 |
| | 1.2 | 3 | 2 | 0 | 10 May 2022 |
| | 1.3 | 4 – 9 | 2 | 4 | 18 Oct 2023 |
| | 1.4 | 10 | 2 | 0 | 10 May 2022 |
| | 1.5 | 11 | 2 | 0 | 10 May 2022 |
| | 1.6 | 12 | 2 | 0 | 10 May 2022 |
| | 1.7 | 13 – 14 | 2 | 4 | 18 Oct 2023 |
| | 1.8 | 15 | 2 | 4 | 18 Oct 2023 |
| | 1.9 | 16 | 2 | 4 | 18 Oct 2023 |
| 2 | 2.1 | 1 – 2 | 2 | 0 | 10 May 2022 |
| | 2.2 | 3 – 4 | 2 | 4 | 18 Oct 2023 |
| | 2.3 | 5 | 2 | 4 | 18 Oct 2023 |
| | 2.4 | 6 – 7 | 2 | 6 | 04 Jan 2024 |
| | 2.5 | 8 | 2 | 0 | 10 May 2022 |
| | 2.6 | 9 | 2 | 0 | 10 May 2022 |
| | 2.7 | 10 | 2 | 0 | 10 May 2022 |
| 3 | 3.1 | 1 – 3 | 2 | 0 | 10 May 2022 |

| The revised MBP had been internally reviewed for submission to CAAM for final approval | | Approved By: |
|---|---|---|
| Prepared By: | Verified By: | |
| **Continuing Airworthiness Management Manager** | **Quality Assurance Manager** | **Civil Aviation Authority of Malaysia** |
| ZATY NADHIRA BINTI MOHAMED ZUHARI<br>Continuing Airworthiness Management Manager<br>Galaxy Aerospace (M) Sdn Bhd<br>(1040262-D) | OMAR BIN AHMAD<br>Quality Assurance Manager<br>Galaxy Aerospace (M) Sdn. Bhd<br>(1040262-D) | IDEASRUL BIN AB GHANI<br>Senior Assistant Director of Airworthiness<br>Airworthiness Division<br>Civil Aviation Authority of Malaysia<br>(CAAM) |
| Date: 04 JAN 2024 | Date: 04 JAN 2024 | Date: 08/01/24 |

| MBP Part | MBP Chapter | Page No. | Issue No. | Revision No. | Revision Date |
|---|---|---|---|---|---|
| 3 | 3.2 | 4 – 5 | 2 | 4 | 18 Oct 2023 |
| | 3.3 | 6 | 2 | 4 | 18 Oct 2023 |
| | 3.4 | 7 – 8 | 2 | 6 | 04 Jan 2024 |
| | 3.5 | 9 | 2 | 4 | 18 Oct 2023 |
| | 3.6 | 10 | 2 | 0 | 10 May 2022 |
| | 3.7 | 11 | 2 | 0 | 10 May 2022 |
| 4 | 4.1 | 1 | 2 | 0 | 10 May 2022 |
| | 4.2 | 2 | 2 | 0 | 10 May 2022 |
| | 4.3 | 3 | 2 | 0 | 10 May 2022 |
| | 4.4 | 4 | 2 | 0 | 10 May 2022 |
| | 4.5 | 5 | 2 | 0 | 10 May 2022 |
| | 4.6 | 6 | 2 | 0 | 10 May 2022 |
| | 4.7 | 7 | 2 | 0 | 10 May 2022 |
| 5 | 5.1 | 1 | 2 | 0 | 10 May 2022 |
| 6 | 6.1 | 1 | 2 | 0 | 10 May 2022 |
| | 6.2 | 2 | 2 | 0 | 10 May 2022 |
| | 6.3 | 3 | 2 | 0 | 10 May 2022 |

| The revised MBP had been internally reviewed for submission to CAAM for final approval | | Approved By: |
|---|---|---|
| Prepared By: | Verified By: | |
| **Continuing Airworthiness Management Manager** | **Quality Assurance Manager** | **Civil Aviation Authority of Malaysia** |
| ZATY NADHIRA BINTI MOHAMED ZUHARI<br>Continuing Airworthiness Management Manager<br>Galaxy Aerospace (M) Sdn Bhd<br>(1040262-D) | OMAR BIN AHMAD<br>Quality Assurance Manager<br>Galaxy Aerospace (M) Sdn. Bhd<br>(1040262-D) | IDEASRUL BIN AB GHANI<br>Senior Assistant Director of Airworthiness<br>Airworthiness Division<br>Civil Aviation Authority of Malaysia<br>(CAAM) |
| Date: 04 JAN 2024 | Date: 04 JAN 2024 | Date: 08/01/24 |

CAAM APPROVAL REF. NO. MBP/2021/001

| MBP Part | MBP Chapter | Page No. | Issue No. | Revision No. | Revision Date |
|---|---|---|---|---|---|
| 6 | 6.4 | 4 | 2 | 0 | 10 May 2022 |
| 7 | 7.1 | 1 | 2 | 0 | 10 May 2022 |
| | 7.2 | 2 | 2 | 0 | 10 May 2022 |
| | 7.3 | 3 | 2 | 0 | 10 May 2022 |
| | 7.4 | 4 | 2 | 0 | 10 May 2022 |
| | 7.5 | 5 | 2 | 0 | 10 May 2022 |
| | 7.6 | 6 | 2 | 0 | 10 May 2022 |
| 8 | 8.1 | 1 | 2 | 0 | 10 May 2022 |
| 9 | 9.1 | 1 | 2 | 0 | 10 May 2022 |
| 10 | 10.1 | 1 | 2 | 0 | 10 May 2022 |

| The revised MBP had been internally reviewed for submission to CAAM for final approval | | Approved By: |
|---|---|---|
| Prepared By: | Verified By: | |
| **Continuing Airworthiness Management Manager** | **Quality Assurance Manager** | **Civil Aviation Authority of Malaysia** |
| ZATY NADHIRA BINTI MOHAMED ZUHARI<br>Continuing Airworthiness Management Manager<br>Galaxy Aerospace (M) Sdn Bhd<br>(1040262-D) | OMAR BIN AHMAD<br>Quality Assurance Manager<br>Galaxy Aerospace (M) Sdn. Bhd<br>(1040262-D) | IDEASRUL BIN AB GHANI<br>Senior Assistant Director of Airworthiness<br>Airworthiness Division<br>Civil Aviation Authority of Malaysia<br>(CAAM) |
| Date: 04 JAN 2024 | Date: 04 JAN 2024 | Date: 08/01/24 |

# IV. RECORD OF REVISION

a. Direct Amendments

| ISSUE NO. | REV. NO. | REV. DATE | AMENDMENT DETAILS | EFFECTIVE DATE |
|---|---|---|---|---|
| 1 | 0 | 04/08/2021 | Introduction of Mass and Balance Programme | 01/09/2021 |
| 1 | 1 | 07/09/2021 | 1. Chapter 0.8<br>a. Update on Definitions<br>2. Chapter 1.8<br>a. Additional on Variation Requirement<br>3. Appendices<br>a. Update on the Mass and Balance Approval list | 20/10/2021 |
| 1 | 2 | 19/11/2021 | 1. Chapter 0.0<br>a. Update para. 0.4.i on notification to CAAM prior such changes to MBP take place and include notification requirement for changes of the contracted CAMO/AMO.<br>b. Include para. 0.4.j. for risk assessment process for changes to the MBP.<br>c. Update para. 0.5.i control form number format GAM/CAMO-038 to GAM/C-038.<br>2. Chapter 4.0<br>a. Update para. 4.1.i control form number format GAM/CAMO-037 to GAM/C-037.<br>3. Chapter 5.0<br>a. Amend title Chapter Appendices to Chapter 5.0.<br>b. Update 5.1 Appendix A and 5.2 Appendix B. | 26/11/2021 |
| 1 | 3 | 01/03/2022 | 1. Chapter 2.0<br>a. Update para. 2.2 Mass and Balance Process Flowchart (General) on the responsibility of preparing the MBR and | 10/03/2022 |

| ISSUE NO. | REV. NO. | REV. DATE | AMENDMENT DETAILS | EFFECTIVE DATE |
|---|---|---|---|---|
| | | | MCGS report may either be by WE or by appropriate CAMO personnel.<br>b. Update para. 2.2 Mass and Balance Process Flowchart (General) on the change phrase "issue" to "certify" on MBR and MCGS report by Weighing Engineer.<br>2. Chapter 5.0<br>a. Update Appendix A on the list of mass and balance approval for Weighing Engineer. | |
| 2 | 0 | 10/05/2022 | 1. All pages<br>a. Reformatting in accordance with CAAM Checklist for Mass and Balance Programme Document (MBPD) CAAM/AW/6805-02<br>2. Chapter 2.4<br>a. Update list of MBR signatory<br>3. Chapter 3.4<br>a. Update list of MCGS signatory | 29/06/2022 |
| 2 | 1 | 08/11/2022 | 1. Chapter 0.2.2 Scope of MBP<br>a. Include aircraft type Airbus Helicopter EC175<br>b. Replace Form Capability Evaluation Checklist (GAM/Q-066) with Form Audit Report (GAM/Q-009)<br>2. Chapter 2.4 List of MBR Signatory and Their Capability According to Aircraft Type<br>a. Include MBR signatory approval for aircraft type Airbus Helicopter EC175<br>3. Chapter 3.4 List of MCGS Signatory and Their Capability According to Aircraft Type | 01/12/2022 |

| ISSUE NO. | REV. NO. | REV. DATE | AMENDMENT DETAILS | EFFECTIVE DATE |
|---|---|---|---|---|
| | | | a. Include MCGS signatory approval for aircraft type Airbus Helicopter EC175 | |
| 2 | 2 | 05/01/2023 | 1. Chapter 0.2.2 Scope of MBP<br>a. Include aircraft type Airbus Helicopters EC155B1 and Robinson R44 II<br>2. Chapter 2.4 List of MBR Signatory and Their Capability According to Aircraft Type<br>a. Include MBR signatory approval for aircraft type Airbus Helicopters EC155B1 and Robinson R44 II<br>3. Chapter 3.4 List of MCGS Signatory and Their Capability According to Aircraft Type<br>a. Include MCGS signatory approval for aircraft type Airbus Helicopters EC155B1 and Robinson R44 II | 18/01/2023 |
| 2 | 3 | 01/03/2023 | 1. Chapter 0.2.2 Scope of MBP<br>a. Specified each aircraft model for every aircraft type listed.<br>2. Chapter 2.4 List of MBR Signatory and Their Capability According to Aircraft Type<br>a. Remove MBR signatory approval GAM W007 WBA.<br>b. Include MBR signatory approval GAM W004 WBA for aircraft type S-76C.<br>c. Include MBR signatory approval GAM W005 WBA for aircraft type EC155B, EC155B1 and EC120B.<br>d. Include MBR signatory approval GAM W006 WBA for aircraft type EC120B and 172.<br>3. Chapter 3.4 List of MCGS Signatory and Their Capability According to Aircraft Type | 17/03/2023 |

| ISSUE NO. | REV. NO. | REV. DATE | AMENDMENT DETAILS | EFFECTIVE DATE |
|---|---|---|---|---|
| | | | a. Remove MCGS signatory approval GAM W007 WBA<br>b. Include MCGS signatory approval GAM W004 WBA for aircraft type S-76C.<br>c. Include MCGS signatory approval GAM W005 WBA for aircraft type EC155B, EC155B1 and EC120B.<br>d. Include MCGS signatory approval GAM W006 WBA for aircraft type EC120B and 172. | |
| 2 | 4 | 18/10/2023 | 1. <u>VI. Abbreviation & Definition</u><br>a. Remove AG, AN, BCAR, CRS and Continuing Aviation Authority of Malaysia.<br>2. <u>0.2 General Information and Scope</u><br>a. 0.2.2.1 – Added aircraft type AS350BB to Aircraft Mass and Balance Control table.<br>b. 0.2.4.4.1 – Added reference to Chapter 3.3 for MCGS signatory.<br>3. <u>1.3 Aircraft Weighing AMO</u><br>a. 1.3.3 – Added Figure 4 and 5 for additional GAM hangar at JBPM Bertam and PGU Ipoh.<br>4. <u>1.7 Aircraft Weighing Procedures for Different Type of Aircraft Managed</u><br>a. 1.7.5 – Amend MBR and MCGS report distribution to CAAM via soft copy.<br>b. 1.7.7 – Remove detailed weighing procedures and make reference to 2nd level, Mass and Balance Procedure.<br>5. <u>1.8 Precautions and Good Practices of Aircraft Weighing</u><br>a. 1.8.3 – Include reference for risk assessment for aircraft | 6/11/2023 |

| ISSUE NO. | REV. NO. | REV. DATE | AMENDMENT DETAILS | EFFECTIVE DATE |
|---|---|---|---|---|
| | | | weighing at GAM hangar UniKL MIAT.<br>6. 1.9 Requirement for Independent Weighing Determination<br>a. 1.9.2 – Include margin consistency of 0.1% from the Maximum Certified Take-Off Mass (MTOM) of aircraft between two consecutive and independent measurements.<br>7. 2.2 Qualification of MBR Signatory<br>a. 2.2.4 – Amend reference to QPM 2.4.<br>b. 2.2.6 – Separate requirement for aircraft general familiarization training for MBR variation application from continuation training in 2.2.5.<br>8. 2.3 Procedures for Approving MBR Signatory<br>a. 2.3.3 – Amend reference to QPM 2.4.<br>9. 2.4 List of MBR Signatory and Their Capability According to Aircraft Type<br>a. Remove MBR signatory approval GAM W006 WBA.<br>b. Include MBR signatory approval GAM W005 WBA for aircraft type S-76B.<br>10. 3.2 Qualification of MCGS Signatory<br>a. 3.2.4 – Amend reference to QPM 2.4.<br>b. 3.2.6 – Separate requirement for aircraft general familiarization training for MCGS variation application from continuation training in 3.2.5.<br>11. 3.3 Procedures for Approving MCGS Signatory | |

| ISSUE NO. | REV. NO. | REV. DATE | AMENDMENT DETAILS | EFFECTIVE DATE |
|---|---|---|---|---|
| | | | a. 3.3.3 – Amend reference to QPM 2.4.<br>12. 3.4 List of MCGS Signatory and Their Capability According to Aircraft Type<br>a. Remove MCGS signatory approval GAM W006 WBA.<br>b. Include MCGS signatory approval GAM W005 WBA for aircraft type S-76B<br>13. 3.5 Procedures to Manage Certification of MCGS Outsourced to Contracted CAMO<br>a. Amend MBR signatory to MCGS signatory. | |
| 2 | 5 | 22/11/2023 | 1. 2.4 List of MBR Signatory and Their Capability According to Aircraft Type<br>a. Include MBR signatory approval GAM W008 WBA for aircraft type AS365 N3, EC120 B, EC155 B, EC175 B, EC155 B1, AW139, AW189, A109E, 172, 208, R44 & R66.<br>2. 3.4 List of MCGS Signatory and Their Capability According to Aircraft Type<br>a. Include MCGS signatory approval GAM W008 WBA for aircraft type AS365N3, EC120 B, EC155 B, EC175 B, EC155 B1, AW139, AW189, A109E, 172, 208, R44 & R66. | 28/11/2023 |
| 2 | 6 | 04/01/2024 | 1. 2.4 List of MBR Signatory and Their Capability According to Aircraft Type<br>a. Include MBR signatory approval GAM W005 WBA for aircraft type AS365 N3, AS350 B3 and AS350 B2<br>b. Include MBR signatory approval GAM W008 WBA for | Refer III – List of Effective Pages for CAAM approval date |

| ISSUE NO. | REV. NO. | REV. DATE | AMENDMENT DETAILS | EFFECTIVE DATE |
|---|---|---|---|---|
| | | | aircraft type AS350 B3 and AS350 B2<br>2. 3.4 List of MCGS Signatory and Their Capability According to Aircraft Type<br>a. Include MCGS signatory approval GAM W005 WBA for aircraft type AS365 N3, AS350 B3 and AS350 B2<br>b. Include MCGS signatory approval GAM W008 WBA for aircraft type AS350 B3 and AS350 B2 | |

b. Indirect Amendments

| ISSUE NO | REV. NO | REV. DATE | AMENDMENT DETAILS | QAM APPROVAL | EFFECTIVE DATE | REMARKS |
|---|---|---|---|---|---|---|
| 2 | 6A | 29/02/2024 | 1. 2.4 List of MBR Signatory and Their Capability According to Aircraft Type<br>a. Replace authorisation no. for MBR signatory approval GAM W008 WBA to GAM W009 WBA due to MBR signatory contracted in accordance with CAGM 6805 para. 4.2.3 provision.<br>2. 3.4 List of MCGS Signatory and Their Capability According to Aircraft Type<br>a. Replace authorisation no. for MCGS signatory approval GAM W008 WBA to GAM W009 WBA due to MCGS signatory contracted in accordance with CAGM 6805 para. 5.2.3 provision. |  | 29 FEB 2024 | |

b. Indirect Amendments

| ISSUE NO | REV. NO | REV. DATE | AMENDMENT DETAILS | QAM APPROVAL | EFFECTIVE DATE | REMARKS |
|---|---|---|---|---|---|---|
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

## V. DISTRIBUTION LIST

a. This Mass and Balance Programme (MBP) and any subsequent revision are distributed according to recipients. Controlled copy holders will receive future revisions and issues. Holder of the controlled copy will ensure that the copy is maintained up to date and is made available to the concerned staff/manager/executive of the department as and when required.

| COPY NUMBER | HOLDER | LOCATION | FORMAT |
|---|---|---|---|
| GAM/MBP/MASTER | Technical Library GAM-CAMO | GAM, Subang | Paper |
| GAM/MBP/01 | Civil Aviation Authority of Malaysia | CAAM, Putrajaya | Paper |
| GAM/MBP/02 | CAMO Publication | Galaxy Aerospace Management System Portal | Electronic copy |

b. Each holder of MBP is personally responsible for the insertion of all revisions. All responsible persons shall have a thorough knowledge with the MBP.

c. Copies are issued to any other agency other than reflected in distribution list or any personnel are considered as un-controlled. These manuals shall be current issue and revision. Un-controlled copy holder will not receive future revisions.

d. GAM Continuing Airworthiness Management Organisation (CAMO) shall advise all necessary personnel, the Civil Aviation Authority of Malaysia (CAAM) and all other relevant persons according to the distribution list of any changes to the MBP, procedures and forms via email and subsequently upload into the intranet within three working days.

# VI. ABBREVIATION & DEFINITIONS

a. Abbreviation

| | |
|---|---|
| A/C | Aircraft |
| AFM | Aircraft Flight Manual |
| AM | Accountable Manager |
| AMO | Approved Maintenance Organisation |
| AO | Aircraft's Operator |
| CAA | Civil Aviation Authority |
| CAAIP | Civil Aircraft Airworthiness Information and Procedures |
| CAAM | Civil Aviation Authority of Malaysia |
| CAD | Civil Aviation Directive |
| CAGM | Civil Aviation Guidance Material |
| CAMO | Continuing Airworthiness Management Organisation |
| CG | Centre of Gravity |
| C of A | Certificate of Airworthiness |
| CAMM | Continuing Airworthiness Management Manager |
| CAME | Continuing Airworthiness Management Exposition |
| CAMP | Continuing Airworthiness Management Procedures |
| CAMS | Continuing Airworthiness Management System |
| EASA | European Aviation Safety Agency |
| FAA | Federal Aviation Administration |
| FAR | Federal Aviation Regulations |
| GAM | GALAXY AEROSPACE (M) SDN. BHD. |
| LAE | Licensed Aircraft Engineer |
| LOEP | List of Effective Pages |
| MBP | Mass and Balance Programme |
| MBR | Mass and Balance Report |
| MCAR | Malaysian Civil Aviation Regulation |
| MCGS | Mass and Centre of Gravity Schedule |
| MM | Maintenance Manual |
| MOC | Management of Change |
| MOE | Maintenance Organisation Exposition |
| OEM | Original Equipment Manufacturer |
| OJT | On Job Training |
| QA | Quality Assurance |

| | |
|---|---|
| QAM | Quality Assurance Manager |
| QAN | Quality Assurance Notice |
| QPM | Quality Procedure Manual |
| PTF | Permit to Fly |
| TC | Type Certificate |
| WE | Weighing Engineer |

b. Definitions

i. **AFM:**

The aircraft flight manual, rotorcraft flight manual or pilot's operating handbook;

ii. **Aircraft:**

Any machine that can derive support in the atmosphere from the reactions of the air other than the reactions of the air against the earth's surface;

iii. **Aircraft Maintenance Organisation (AMO):**

A maintenance organisation approved in accordance with CAD 8601 or CAD 8602.

iv. **Basic Weight:**

Basic Weight is the weight of the aircraft and all its basic equipment, plus that of the declared quantity of unusable fuel and unusable oil

v. **Basic Equipment:**

"Basic Equipment" means the unconsumable fluids (e.g. coolant and hydraulic fluid) and equipment which is common to all roles for which the operator intends to use the aircraft.

vi. **Basic Equipment List:**

Basic Equipment List means the list of basic equipment included in the empty mass.

vii. **Continuing Airworthiness Management Organisation (CAMO):**

An organisation that is approved under MCAR to manage continuing airworthiness of the aircraft.

viii. **Crew:**

Person identified as flight crew, cabin crew or other crew as per operational requirements;

ix. **Disposable Load:**

Disposable load means the mass of all persons and items of load, including fuel and other consumable fluids, carried in the aircraft, other than the Basic

Equipment and variable load.

x. **Empty Mass:**

"Empty mass" means the mass of the aircraft and all its Basic Equipment, plus that of the declared quantity of unusable fuel and unusable oil.

xi. **Mass and Balance Package:**

A set of weighing related documents consisting of the existing approved aircraft Mass and Balance Report, the new approved MBR and MCGS and a copy of work sheet on which the aircraft weighing is certified by LAE.

xii. **Mass and Balance Report (MBR) and Mass and Centre Of Gravity Schedule (MCGS) Report:**

Mass and Balance Report and Mass and Centre of Gravity schedule report is the report which consists of Mass and Centre of Gravity Schedule (MCGS), Mass and Balance Report (MBR), Equipment List and Aircraft Basic Mass and Balance Record.

i. MCGS - It presents the current empty mass, the variable loads and the disposable loads for which the operator intends to use the aircraft for.
ii. MBR - It presents the derivation of the Empty mass and corresponding the CG from the most recent aircraft weighing results and related calculations.
iii. Equipment List- It shows the mass and lever arm of each item fitted on the aircraft during weighing.
iv. Aircraft Basic Mass and Balance Record- It presents current, and continuous record of the mass and CG of each aircraft. Modifications, repairs or other changes affecting either the mass and/or CG of the aircraft is recorded in this section.

xiii. **MBR and MCGS Signatory:**

MBR and MCGS signatory means a person suitably qualified and acceptable to CAAM to certify the report who is approved by the CAMO.

xiv. **Operator:**

A person, organisation or enterprise engaged in or offering to engage in an aircraft operation;

xv. **Third Party:**

An organisation that engaged GAM for their Mass and Balance activities

xvi. **Variable Load:**

Variable Load is the weight of the crew, of items such as the crew's baggage, removable units, and other equipment, the carriage of which depends upon the role for which the operator intends to use the aircraft for the particular flight.

xvii. **Weighing Engineer (WE)**

Weighing Engineer is an MBR and MCGS signatory, a person suitably qualified and acceptable to CAAM to certify the MBR and MCGS report who is approved by the CAMO. These personnel are authorised to supervise during aircraft weighing activity and to certify the MBR and MCGS report according to their personnel approval certificate issued by QA Department.

xviii. **Weight:**

"Weight" means a quantity to mean mass (i.e. the SI unit is kilogram).

# PART 0 MBP SCOPE AND MANAGEMENT

## 0.1 Corporate Commitment by the Accountable Manager

**GALAXY AEROSPACE (M) SDN. BHD.**

**MASS AND BALANCE PROGRAMME**

This programme defines the organisation and procedures upon which the CAAM approval of **GALAXY AEROSPACE (M) SDN BHD (GAM) – MASS AND BALANCE PROGRAMME (MBP)** under CAAM CAD 6805 is based.

These programmes are by the undersigned and must be complied with to ensure that all the continuing airworthiness activities including weighing activities for aircraft managed by GAM CAMO is carried out on time and to an approved standard.

The programme shall be established in compliance with the requirement issued by the CAAM and the requirement for mass and balance control issued by the holder of the type-certificate and supplemental type-certificate and included in the document containing mass and balance data with acceptable method, technique and practices.

It is accepted that these programmes do not override the necessity of complying with any new or amended regulation published by the CAAM from time to time where these new or amended regulation conflict with these programmes. These programmes shall be reviewed and updated as required.

It is understood that the CAAM will approve these programmes and any subsequent amendments whilst the CAAM is satisfied that the programme is being followed. It is further understood that the CAAM reserves the right to suspend, vary or revoke the MBP approval of GAM CAMO, as applicable, if the CAAM has evidence that procedures are not followed, and the standards are not upheld.

I hereby confirm that the organisation will be given the necessary means to follow the rules and procedures established within these publications and that all charges are paid, as prescribed by the CAAM in respect of approved Part M and Mass and Balance Programme approval or contracts and procedures between GAM CAMO and the contracted operator.

Dato' Shamsul Kamar Samsudin
Accountable Manager
GALAXY AEROSPACE (M) SDN. BHD. (1040262-D)
Date: 10 MAR 2023

## 0.2 General Information and Scope

### 0.2.1 Description of the Organisation

0.2.1.1 CAAM has granted approval to GAM after duly examining that the Mass and Balance Programme (MBP) is in accordance with CAAM CAD 6805 – Mass and Balance Programme.

0.2.1.2 This programme forms the basis for Mass and Balance approval of GAM CAMO and shows the necessary procedures for mass and balance activities (weighing personnel, equipment, location, procedures, report writing) in accordance with CAAM Civil Aviation Directive.

0.2.1.3 GAM CAMO is also an approved organisation performing Part M Subpart G and I privileges for commercial and non-commercial aircraft. GAM is authorised to carry out continuing airworthiness management, in addition to make recommendations for the Airworthiness Review Report (ARR) to CAAM and issuance of Permit to Fly for maintenance flight test.

### 0.2.2 Scope of MBP

0.2.2.1 GAM CAMO is approved to perform mass and balance activities for the aircraft type as listed below:

| DESCRIPTION | AIRCRAFT TYPE |
|---|---|
| **Aircraft Mass and Balance Control** | 1. AIRBUS HELICOPTERS SA 365 N<br>2. AIRBUS HELICOPTERS SA 365 N1<br>3. AIRBUS HELICOPTERS AS 365 N2<br>4. AIRBUS HELICOPTERS AS 365 N3<br>5. AIRBUS HELICOPTERS EC 120 B<br>6. AIRBUS HELICOPTERS EC 135 P1<br>7. AIRBUS HELICOPTERS EC 135 P2<br>8. AIRBUS HELICOPTERS EC 135 P2+<br>9. AIRBUS HELICOPTERS EC 135 P3<br>10. AIRBUS HELICOPTERS EC 135 T1<br>11. AIRBUS HELICOPTERS EC 135 T2<br>12. AIRBUS HELICOPTERS EC 135 T2+<br>13. AIRBUS HELICOPTERS EC 135 T3<br>14. AIRBUS HELICOPTERS AS 350 B<br>15. AIRBUS HELICOPTERS AS 350 D<br>16. AIRBUS HELICOPTERS AS 350 B1<br>17. AIRBUS HELICOPTERS AS 350 B2 |

| DESCRIPTION | AIRCRAFT TYPE |
|---|---|
| | 18. AIRBUS HELICOPTERS AS 350 BA<br>19. AIRBUS HELICOPTERS AS 350 BB<br>20. AIRBUS HELICOPTERS AS 350 B3<br>21. AIRBUS HELICOPTERS EC 225 LP<br>22. AIRBUS HELICOPTERS EC 155 B<br>23. AIRBUS HELICOPTERS AS355 E<br>24. AIRBUS HELICOPTERS AS355 F<br>25. AIRBUS HELICOPTERS AS355 F1<br>26. AIRBUS HELICOPTERS AS355 F2<br>27. AIRBUS HELICOPTERS AS355 N<br>28. AIRBUS HELICOPTERS AS355 NP<br>29. AIRBUS HELICOPTERS EC 130 B4<br>30. AIRBUS HELICOPTERS EC 130 T2<br>31. LEONARDO S.p.A HELICOPTERS AW139<br>32. LEONARDO S.p.A HELICOPTERS AW189<br>33. LEONARDO S.p.A HELICOPTERS A119<br>34. LEONARDO S.p.A HELICOPTERS A109<br>35. LEONARDO S.p.A HELICOPTERS A109E<br>36. LEONARDO S.p.A HELICOPTERS A109S<br>37. SIKORSKY S-76A<br>38. SIKORSKY S-76B<br>39. SIKORSKY S-76C<br>40. SIKORSKY S-76D<br>41. ROBINSON R44<br>42. ROBINSON R66<br>43. TEXTRON AVIATION INC 172<br>44. PILATUS PC6<br>45. TEXTRON AVIATION INC 208<br>46. TEXTRON AVIATION INC B300<br>47. TWIN OTTER DHC-6<br>48. BELL 429<br>49. AIRBUS HELICOPTERS EC 175 B<br>50. AIRBUS HELICOPTERS EC 155 B1<br>51. ROBINSON R44 II |
| **Issuance of Mass and Balance Report (MBR) and Mass and Centre of Gravity Schedule (MCGS) Report** | 1. AIRBUS HELICOPTERS SA 365 N<br>2. AIRBUS HELICOPTERS SA 365 N1<br>3. AIRBUS HELICOPTERS AS 365 N2<br>4. AIRBUS HELICOPTERS AS 365 N3<br>5. AIRBUS HELICOPTERS EC 120 B<br>6. AIRBUS HELICOPTERS EC 135 P1<br>7. AIRBUS HELICOPTERS EC 135 P2<br>8. AIRBUS HELICOPTERS EC 135 P2+<br>9. AIRBUS HELICOPTERS EC 135 P3<br>10. AIRBUS HELICOPTERS EC 135 T1<br>11. AIRBUS HELICOPTERS EC 135 T2 |

| DESCRIPTION | AIRCRAFT TYPE |
|---|---|
| | 12. AIRBUS HELICOPTERS EC 135 T2+<br>13. AIRBUS HELICOPTERS EC 135 T3<br>14. AIRBUS HELICOPTERS AS 350 B<br>15. AIRBUS HELICOPTERS AS 350 D<br>16. AIRBUS HELICOPTERS AS 350 B1<br>17. AIRBUS HELICOPTERS AS 350 B2<br>18. AIRBUS HELICOPTERS AS 350 BA<br>19. AIRBUS HELICOPTERS AS 350 BB<br>20. AIRBUS HELICOPTERS AS 350 B3<br>21. AIRBUS HELICOPTERS EC 225 LP<br>22. AIRBUS HELICOPTERS EC 155 B<br>23. AIRBUS HELICOPTERS AS355 E<br>24. AIRBUS HELICOPTERS AS355 F<br>25. AIRBUS HELICOPTERS AS355 F1<br>26. AIRBUS HELICOPTERS AS355 F2<br>27. AIRBUS HELICOPTERS AS355 N<br>28. AIRBUS HELICOPTERS AS355 NP<br>29. AIRBUS HELICOPTERS EC 130 B4<br>30. AIRBUS HELICOPTERS EC 130 T2<br>31. LEONARDO S.p.A HELICOPTERS AW139<br>32. LEONARDO S.p.A HELICOPTERS AW189<br>33. LEONARDO S.p.A HELICOPTERS A119<br>34. LEONARDO S.p.A HELICOPTERS A109<br>35. LEONARDO S.p.A HELICOPTERS A109E<br>36. LEONARDO S.p.A HELICOPTERS A109S<br>37. SIKORSKY S-76A<br>38. SIKORSKY S-76B<br>39. SIKORSKY S-76C<br>40. SIKORSKY S-76D<br>41. ROBINSON R44<br>42. ROBINSON R66<br>43. TEXTRON AVIATION INC 172<br>44. PILATUS PC6<br>45. TEXTRON AVIATION INC 208<br>46. TEXTRON AVIATION INC B300<br>47. TWIN OTTER DHC-6<br>48. BELL 429<br>49. AIRBUS HELICOPTERS EC 175 B<br>50. AIRBUS HELICOPTERS EC 155 B1<br>51. ROBINSON R44 II |

0.2.2.2 Limitation:

a) ARS shall not perform any weighing activities on the aircraft which endorsed under his/her scope of approval as ARS as stated in

CAME Para 5.2 and Company Approval Certificate issued by QA Department.

0.2.2.3 For details on scope of approval for each GAM WE, refer to individual personnel approval certificate issued by QA Department.

0.2.2.4 When there is a need to add new scope of work or change the existing capabilities, the CAMM shall make a request to QAM to initiate the addition or change of capability by raising MOC (GAM/Q-011).

0.2.2.5 The CAMM shall ensure availability of the necessary facilities, tooling and weighing equipment, relevant trained and qualified personnel, provision of technical instructions and manuals and any additional requirements to ensure smooth introduction of the capability.

0.2.2.6 QAM shall evaluate and verify on the following aspects using the Audit Report form (GAM/Q-009)

a) Justification for the proposed change or addition to the existing capabilities through MOC.

b) Execution of mass and balance activities at CAAM approved maintenance facility subject to QA verification.

c) Availability of the approved technical manuals/instructions to perform the task.

d) Adequate tooling and weighing equipment required to perform the task.

e) Availability of qualified personnel: WE as an approved signatory (MBR and MCGS Signatory) and LAE with appropriate type rating to perform the mass and balance activities.

f) Additional requirement for mass and balance activities related to third party aircraft is a letter of intention (LOI) and/or written agreement.

0.2.2.7 Once the Internal Audit Report (GAM/Q-009) is completed satisfactorily, it signifies that all the necessary tooling, equipment, manuals, facilities and qualified personnel are available and adequate to satisfactorily execute the particular task.

0.2.2.8 When satisfied, QAM shall notify and submit the application to CAAM with the revised MBP for (CAAM) approval on organisation (MBP) variation and/or variation to approved signatory.

0.2.2.9 List of documents to be submitted to CAAM shall include but not limited to:

a) Organisation (MBP) Variation

1) Cover Letter

2) MOC (GAM/Q-011)

3) Internal Audit Report (GAM/Q-009)

4) Revised MBP

b) Approved Signatory Variation

1) Cover Letter

2) Application for Renewal/Variation of Approved Signatory Approval (CAAM/AW/0105-02) - for application of approved signatory variation

3) Revised MBP

4) Weighing Engineer Assessment Checklist (GAM/Q-037A) - for application of approved signatory variation

## 0.2.3 List of Applicable Aircraft Covered by the MBP

0.2.3.1 Refer List of Aircraft Managed under GAM MBP Approval (form ref. GAM/C-042) latest revision for GAM CAMO fleets.

## 0.2.4 Relationship with Other Organisation

### 0.2.4.1 Aircraft Weighing AMO

0.2.4.1.1 GAM is also an independent Part 145 approved maintenance organisation performing contracted maintenance, repairs and overhaul activities.

0.2.4.1.2 GAM-CAMO uses GAM-AMO as the maintenance provider for aircraft weighing to meet the requirements of CAD 6805 and also supported by other CAAM Part 145 AMO to ensure that the mass and balance of the aircraft is established correctly.

### 0.2.4.2 MBR Contract

0.2.4.2.1. In absence of a MBR signatory, GAM CAMO may contract another CAMO to certify the MBR if the contracted CAMO could demonstrate:

a) it has the same aircraft type approved in its Mass and Balance Programme; or

b) it has the same airworthiness category of the aircraft approved in its Mass and Balance Programme, and the MBR signatory has attended aircraft mass and balance training for the intended aircraft type.

0.2.4.2.2. A written agreement should be made available between the two organisations taking into account the requirements of CAD 6805 and it should define the obligations of the organisations in relation to mass and balance control of the aircraft.

### 0.2.4.3 MCGS Contract

0.2.4.3.1 In the absence of a MCGS signatory, GAM CAMO may contract another CAMO to certify the MCGS if the contracted CAMO could demonstrate:

a) it has the same aircraft type approved in its Mass and Balance Programme; or

b) it has the same airworthiness category of the aircraft approved in its Mass and Balance Programme, and the MCGS certifying staff has attended the relevant aircraft mass and balance training.

0.2.4.3.2 A written agreement should be made available between the two organisations taking into account the requirements of CAD 6805 and it should define the obligations of the organisations in relation to mass and balance control of the aircraft.

## 0.2.4.4 MBR & MCGS Signatory Contract

0.2.4.4.1 GAM CAMO may contract an MBR and/or MCGS signatory from outside the organisation. In such case, GAM CAMO shall qualify and approved the MBR and/or MCGS signatory in accordance with Chapter 2.3 and Chapter 3.3 of this MBP.

0.2.4.4.2 A written agreement should be made available between GAM CAMO and the MBR and/or MCGS signatory. In case where the MBR and/or MCGS signatory belongs to another organisation or company, GAM CAMO should also establish a written agreement with the organisation or company. GAM CAMO remains responsible for the MBR and MCGS of the aircraft.

## 0.3 Notification Procedure to the CAAM Regarding Changes to the MBP

0.3.1 The following significant changes shall be notified to CAAM:

a) Changes of organisation name and location

b) Changes of MBP scope, staff and technical arrangements

c) Changes of the contracted CAMO/AMO

0.3.2 Accountable Manager or Quality Assurance Manager shall notify to CAAM in writing before such changes take place.

0.3.3 Risk assessment on the above changes shall be conducted and provided to CAAM upon request.

## 0.4 MBP Amendment Procedure

### 0.4.1 Amendments

0.4.1.1 It is necessary to comply with any new or amended regulation published by the CAAM from time to time. New or amended procedures should not be in conflict with the regulation. Regulation changes as well as any relevant changes within the GAM CAMO that affect the approved MBP therefore call for an amendment thereof.

0.4.1.2 The QAM is responsible for the amendments of the MBP. The QAM shall monitor all applicable regulations and shall incorporate all changes which affect GAM CAMO.

0.4.1.3 The amendment of MBP is divided into two amendment procedures:

a) Direct Amendments - Amendments that need prior approval from CAAM

b) Indirect Amendments - Amendments not requiring prior approval from CAAM

0.4.1.4 The Revision numbering system is organised as follows: GAM/CAAM/MBP Issue number, Revision number (Direct) (Indirect, if applicable) where:

a) Issue number: numeric numbering; increased for major changes in the MBP

b) Revision number:

1) Direct Amendment – numeric numbering; increased at every direct amendment; set to 0 at every increase of issue number.

2) Indirect Amendment – alpha-numeric numbering; increased at every indirect amendment; reset at every increase of direct amendment number.

### 0.4.2 Direct Amendments

0.4.2.1 Direct amendments shall be approved by CAAM.

0.4.2.2 The CAMM shall provide the amendment to QAM in order to monitor conformity with requirements and consistency to the procedures. All direct amendments of the MBP shall be submitted either by CAMM or QAM to CAAM for approval after internal acceptance.

## 0.4.3 Indirect Amendments

0.4.3.1 All amendments not covered by paragraph below shall be considered as direct amendments.

0.4.3.2 The following changes in the MBP are considered as indirect amendment:

a) Editorial changes.

0.4.3.3 The indirect amendment shall be proposed by the CAMM and sent to the QAM in order to monitor conformity with CAAM requirements and consistency with the procedures.

## 0.4.4 Amendments Procedures

0.4.4.1 The amendments to the MBP may be due to new or amended CAAM regulations, changes as specified in paragraph 0.3.1 of this MBP or as a result from MBP periodic review.

0.4.4.2 The proposed amendments to the MBP within the organisation shall be submitted to QAM via Management of Change (MOC) form GAM/QA-011.

0.4.4.3 The QAM will check of the amendment is in compliance with CAAM requirements.

0.4.4.4 Amended text passages must be marked with a vertical line at the left side of the page and highlighting the revised portion of the text.

0.4.4.5 The revision and date of the appropriate pages and in the List of Effective Pages (LOEP) has to be changed

0.4.4.6 For direct amendments, CAMM and QAM shall signed the LOEP once reviewed and finalised as internal approval prior submission to CAAM. Once approved by the CAAM, the revision must be added to the exposition by replacing the old pages.

0.4.4.7 For indirect amendments, QAM shall signed on the QAM Approval column of the Indirect Amendments under the Amendment Record page of the MBP. Once approved, the indirect amendments pages shall be issued on blue coloured pages and QAM shall notify CAAM in writing of the amendment.

0.4.4.8 The effective date of the revision is stated on the respective column of the Record of Revision table. The revision pages must be distributed to the recipients according to the distribution list.

0.4.4.9 The staffs must be advised about the changes.

## 0.4.5 MBP Manuals Reference

0.4.5.1 The MBP defines procedures and refers to existing procedures by a reference number.

0.4.5.2 The GAM Documentation Management System for Mass and Balance approval are divided into three hierarchical levels:

a) Level 1 - POLICY (GAM/CAAM/MBP)

b) Level 2 - PROCEDURES

c) Level 3 - FORMS

0.4.5.3 Refer MBP Chapter 0.7 – List of Second Level Documents and MBP Chapter 0.8 – List of Third Level Documents.

0.4.5.4 All mass and balance document level shall be filed and made accessible to GAM CAMO via electronic copy.

0.4.5.5 All mass and balance document level shall be controlled and managed by CAMO. Proposed amendments to these documents shall be submitted to the QAM for review and approval via MOC.

0.4.5.6 All mass and balance document level are controlled by Mass and Balance Master List (form GAM/C-038).

## 0.5 Periodic Review of the MBP

0.5.1 The MBP shall be subject to periodic review, not exceeding one year, and amended as necessary to ensure that the MBP remain relevant, appropriate for the organisation, and comply with any amendment of the applicable CAAM regulations.

0.5.2 The participants for the MBP review shall consist of at least the following:

a) CAMM or his/her delegate

b) QAM or his/her delegate

c) WE representative

0.5.3 The review meeting shall be documented and any required amendments to the MBP arising from the meeting shall be included. The amended MBP shall be submitted to QAM via MOC.

## 0.6 CAMO Surveillance and Audit of MBP Approval under CAMO Quality System

0.6.1 The Quality Assurance Manager (QAM) shall monitor activities carried out and shall at least include the following functions:

a) Monitoring that all activities carried are being performed in accordance with the CAD 6805 and approved MBP;

b) Monitoring the continued compliance with the requirements of this MBP;

c) Monitoring that all contracted maintenance is carried out in accordance with the contract; and

d) Monitoring that all subcontracted MBP tasks is carried out in accordance with the contractual obligations.

0.6.2 The QAM is also responsible to perform an audit in accordance with GAM CAME Part 2 (Quality System) on the:

a) Facility – to ensure that the facility is suitable for aircraft weighing to be performed and approved by CAAM;

b) Weighing equipment – to ensure that the weighing equipment is properly calibrated and familiar to the WE who will perform the aircraft weighing;

c) WE– to ensure that the WE are certified to perform the aircraft weighing where he / she has appropriate knowledge, experience, qualification and training;

d) LAE – to ensure that the LAE is certified to perform the aircraft weighing where he/she has appropriate knowledge, experience, qualification and training; and

e) Maintenance Data – to ensure the maintenance data (e.g. latest OEM manual, previous approved MBR and MCGS report, etc) which to be referred to for performing the aircraft weighing is updated, current and the latest revision.

0.6.3 The compliance monitoring shall include a feedback system to CAMM to ensure corrective action as necessary.

## 0.7 List of Second Level Documents to the MBP

0.7.1 The second level document to the Mass and Balance Programme (MBP) shall be referred to:

a) Mass and Balance Procedure (GAM/CAMO/MBP); and

b) List of Aircraft Managed under GAM MBP Approval (GAM/C-042)

0.7.2 The Mass and Balance Procedure (GAM/CAMO/MBP) are documents defining general functioning rules and detailed operational documents coherent with MBP.

0.7.3 The List of Aircraft Managed under GAM MBP Approval (GAM/C-042) contains the list of applicable aircraft covered under this MBP.

## 0.8 List of Third Level Documents to the MBP

0.8.1 Level 3 documents are forms and checklist which shall be used to document all weighing activities.

0.8.2 The level 3 documents consist of:

a) Mass and Balance Report (GAM/C-037) latest revision;

b) Mass and Balance Master List (GAM/C-038) latest revision; and

c) Weighing Process (GAM/C-039) latest revision.

# PART 1 AIRCRAFT WEIGHING

## 1.1 Aircraft Weighing Requirement

1.1.1 The aircraft shall be weighed/ reweighed at the following occasions:

a) To determined mass and CG of each aircraft prior to issuance of the C of A.

b) Whenever CAAM requires.

c) Whenever required by aircraft TC holder.

d) Whenever CAAM, GAM CAMO or the operator is of the opinion that adequate mass control has not been exercised over an aircraft during the modification or repair embodiment.

e) After a major modification where the new mass and balance cannot be calculated based on mass and balance information in the modification documentation.

f) After installation of equipment where the new mass and balance cannot be calculated based on reliable mass information for the installed equipment.

g) After repainting of the aircraft.

h) Not exceed 4 years intervals consecutively.

1.1.2 By derogation to the para 1.1.1 a) above, an aircraft may not be required to be weighed by the operator prior to the issuance C of A in case of newly manufactured aircraft where the mass and CG has been determined by the manufacturer and recorded.

1.1.3 By derogation to the para 1.1.1 a) above, in the case of a used aircraft, the aircraft may not be required to be weighed by the operator prior to the issuance C of A aircraft if:

a) the operator is able demonstrate that the aircraft has been last weighed in accordance to procedures equivalent to the MBP;

b) the aircraft is unmodified or only minimally modified (i.e. where it is explicitly specified in the modification data there is no appreciable effect on aircraft mass and balance); and

c) any changes to mass computed and recorded in the previous MBR and MCGS report.

## 1.2 Aircraft Reweighing Interval

1.2.1 All aircraft shall be reweighed at intervals not exceeding four (4) years. The empty mass and the corresponding CG position shall be determined and entered in the MBR and MCGS report.

.

## 1.3 Aircraft Weighing AMO

1.3.1 Aircraft weighing shall be performed by a maintenance organisation approved in accordance with CAD 8601 or CAD 8602 as applicable.

1.3.2 GAM CAMO shall ensure that GAM AMO or any other contracted AMO has the appropriate capability and valid for type of aircraft to be weighed.

1.3.3 Refer Figure 1 – 5 for GAM AMO approved maintenance hangar facility layout for aircraft weighing activity.

1.3.4 For aircraft weighing at approved maintenance facility other than paragraph 1.3.3 above shall be subject to authorisation by QA through MOC.

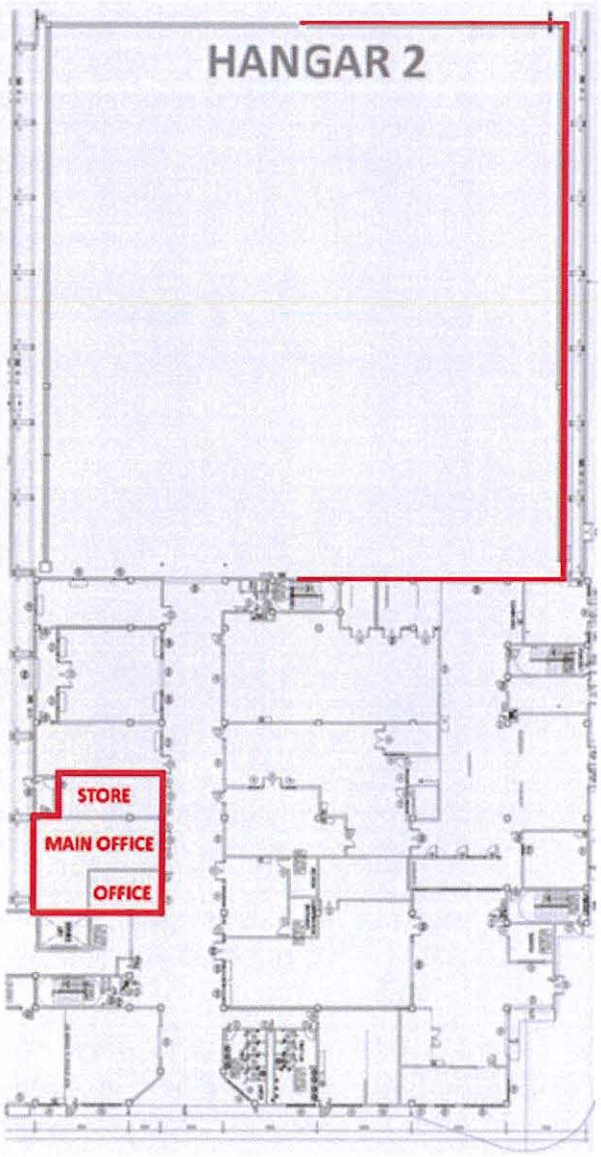


*Figure 1 GAM Hangar at UniKL Miat Hangar 2*


*Figure 2 GAM PGU Hangar at Pasukan Gerakan Udara Pangkalan Kota Kinabalu*

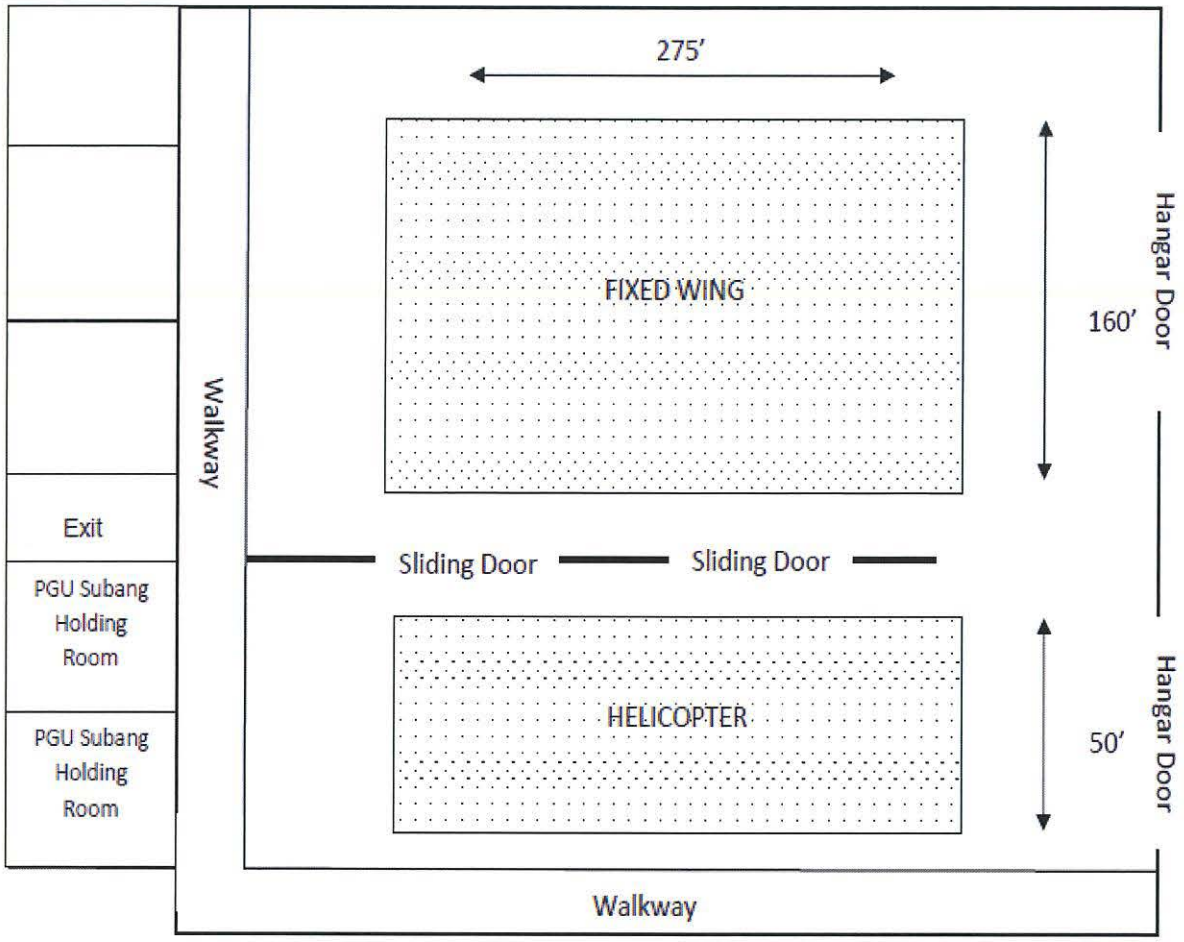


*Figure 3 GAM PGU Hangar at Pasukan Gerakan Udara Pangkalan Subang*

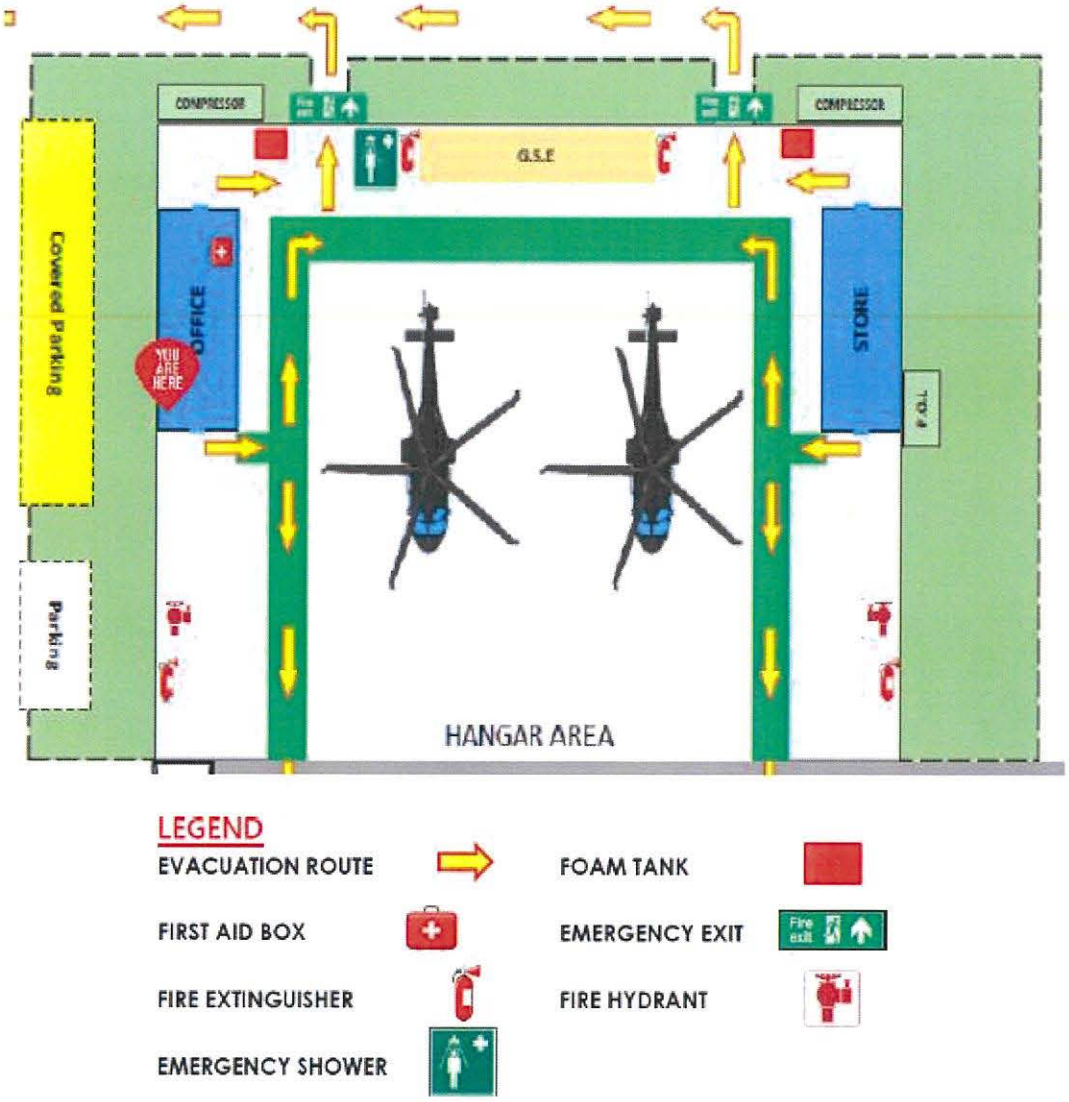


*Figure 4 GAM Hangar at Jabatan Bomba dan Penyelamat Malaysia (JBPM) Bertam*

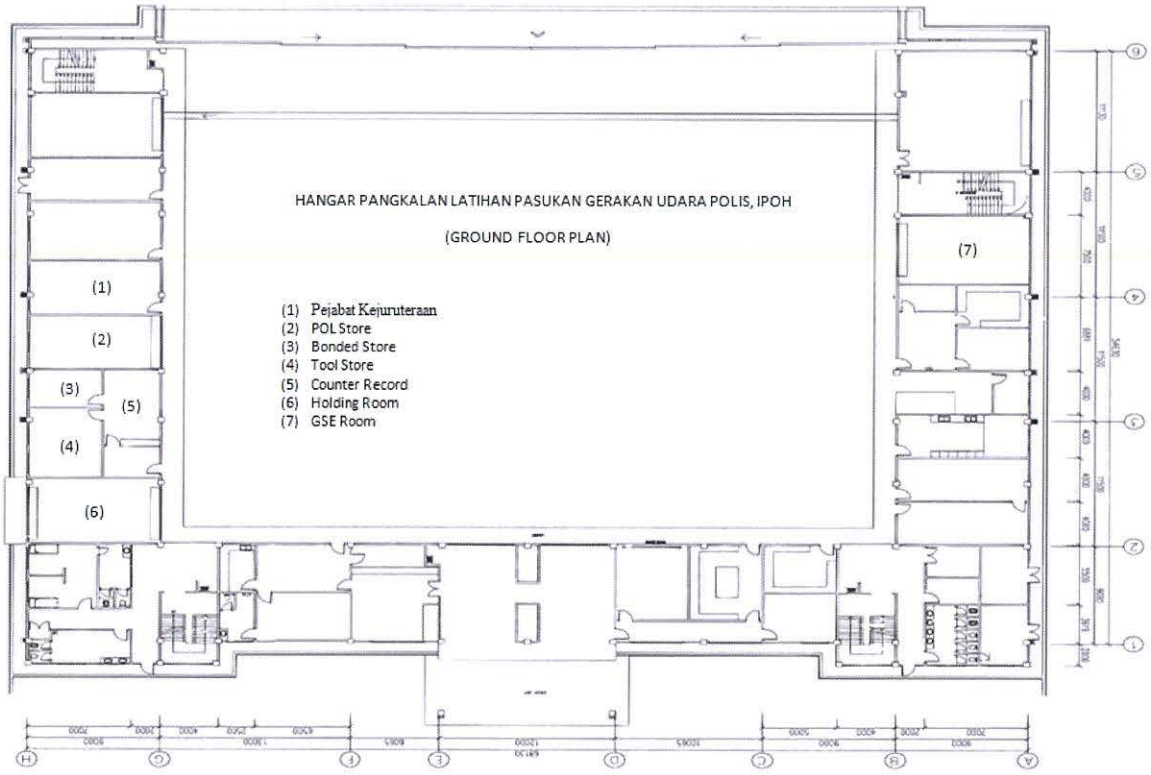


*Figure 5 GAM Hangar at Pasukan Gerakan Udara (PGU), Pangkalan Ipoh*

## 1.4 Aircraft Weighing Supervisors

1.4.1 Aircraft weighing activity shall be supervised by GAM MBR signatories.

1.4.2 Refer Chapter 2.4 of this MBP for details.

## 1.5 Aircraft Weighing Equipment and its Control

1.5.1 WE shall use the weighing equipment as recommended as per AMM or equivalent (Load Cells or Platform Type).

1.5.2 List of weighing equipment available in GAM are listed below:

| List of Weighing Equipment | Details of Weighing Equipment | |
|---|---|---|
| Electronic Aircraft Weighing Scale | Manufacturer | Intercomp |
| | Model | AC125LP-4C |
| | Capacity | 11000 lbs/platform |
| | Type | Weighing scales |
| Jackson Wireless Weighing Kit | Manufacturer | Jackson Aircraft Weighing Systems, LLC |
| | Model | M2400-4-25CS |
| | Capacity | 25000 lbs/cell |
| | Type | Weighing cells |

1.5.3 For weighing equipment not listed in table above shall follow procedure for the application to perform the aircraft weighing with the new equipment as per MOC QAN 001.

## 1.6 Aircraft Weighing Calibration Policy

1.6.1 GAM CAMO shall ensure any equipment used for weighing shall be properly calibrated, zeroed, and used in accordance with the manufacturer's instructions.

1.6.2 Each scale shall be calibrated either by the manufacturer, or by an appropriately authorised organisation within two years or within a time period defined by the manufacturer of the weighing equipment, whichever is less.

1.6.3 WE shall ensure that the weighing equipment used will enable the mass of the aircraft to be established accurately. It shall be properly calibrated, zeroed and used in accordance with manufacturer's instructions.

1.6.4 WE to ensure the weighing accuracy is considered satisfactory if the accuracy criteria in table are met by the individual scales/cells of the weighing equipment used:

| For a scale/load cell | An accuracy of |
|---|---|
| Below 2000kg | ±1 % |
| From 2 000 kg to 20 000 kg | ±20 kg |
| Above 20 000 kg | ±0.1 % |

## 1.7 Aircraft Weighing Procedures for Different Type of Aircraft Managed

1.7.1 Aircraft weighing shall be carried out in accordance with instructions and recommendations of the aircraft type certificate holder, supplemental type certificate holder and weighing scale manufacturer as applicable. If such data is not available. GAM CAMO shall be responsible for developing appropriate weighing instructions for its particular aircraft as may be agreed by CAAM.

1.7.2 GAM CAMO shall be responsible to coordinate the aircraft weighing activity and raise the worksheet accordingly to contracted AMO in accordance with GAM CAME Chapter 1.13.2.

1.7.3 For aircraft type, which is not covered under Chapter 0.2.2, WE may issue the MBR limited to weighing conversion and/or amendment to the previous approved MBR provided CAAM has granted the concurrence in form of writing.

1.7.4 Prior to perform the weighing, WE shall get the details of the aircraft (i.e. empty mass, the corresponding CG position and equipment list) from the previous MBR, details of weighing equipment, and other weighing documents as applicable (i.e. latest revision of AFM, latest revision of OEM manual)

1.7.5 The WE shall issue the MBR and MCGS report accordingly in accordance with MBP Chapter 2.1 and 3.1 respectively. The report shall be distributed as follows:

a) Original copy – CAMO

b) Soft copy- CAAM

1.7.6 If an applicable AFM pages are used as the MBR and MCGS, the applicable pages shall be submitted to the CAAM for approval and incorporation into the AFM.

1.7.7 Refer Mass and Balance Procedure Chapter 1.6 on detailed aircraft weighing procedures.

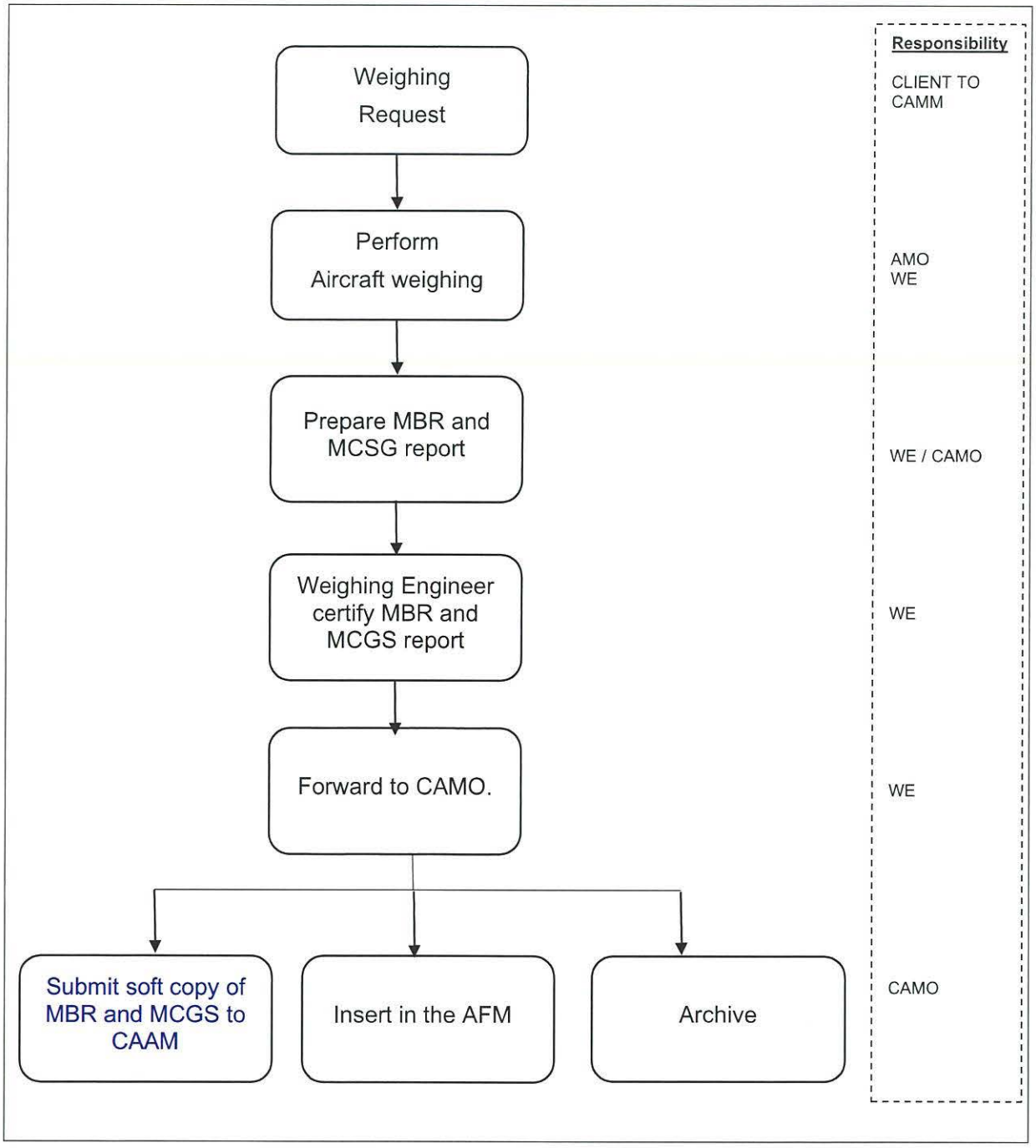


Figure 6 Mass and Balance Process Flowchart (General)

## 1.8 Precautions and Good Practices of Aircraft Weighing

1.8.1 When weighing an aircraft, GAM CAMO shall ensure normal precautions are taken by the AMO consistent with good practices including but not limited to:

a) checking for completeness of the aircraft and equipment as per basic equipment list;

b) determining that fluids are properly accounted for;

c) ensuring that the aircraft is clean; and

d) ensuring that weighing is carried out in a closed building or appropriate location, to avoid the effect of wind, and where possible on firm relatively level ground or surface.

1.8.2 In case where the weighing to be carried out other than in a closed building, a risk assessment shall be conducted prior to the aircraft weighing by GAM CAMO. The assessment shall at least consist of following but not limited to:

a) Mitigation action to minimise the effect of wind

b) Minimum number of weighing reading (at stable value)

c) Weather and wind condition during the aircraft weighing

d) Number of personnel monitoring the aircraft weighing

1.8.3 Refer Hazard Identification and Risk Mitigation reference GAM/SMS/H-025(22) for the risk assessment to perform aircraft weighing at GAM Hangar, UniKL Miat Hangar 2 as per figure 1 in paragraph 1.3 of this MBP.

## 1.9 Requirement for Independent Weighing Determination

1.9.1 When an aircraft is weighed, GAM CAMO shall ensure at least two independent determinations shall be made, and the aircraft longitudinal datum line, unless specified by the aircraft type certificate holder, shall be horizontal. The load shall be completely removed from the weighing equipment between determinations. The aircraft gross mass as determined by the two measurements shall be consistent. If not, the measurements shall be repeated until the gross mass, as determined by two consecutive and independent measurements, are consistent.

1.9.2 The margin of consistency between two consecutive and independent measurements shall be 0.1% from the Maximum Certified Take-Off Mass (MTOM) of aircraft. This is taking into account the weighing equipment listed in paragraph 1.5.2 and weighing equipment accuracy criteria as per paragraph 1.6.4 of this MBP.

# PART 2 MASS AND BALANCE REPORT

## 2.1 Procedures for Issuance / Variance and Certification of MBR for the Aircraft

2.1.1 An MBR shall be issued for every aircraft by the CAMO. The MBR shall be completed and certified by an MBR signatory as identified in MBP Chapter 2.4 by signing the MBR.

2.1.2 The data recorded in the MBR shall be sufficient to enable the empty mass and empty CG position to be accurately determined.

2.1.3 The MBR shall present the derivation of the empty mass and the corresponding CG from the most recent aircraft weighing results and related calculations.

2.1.4 The CAMO shall ensure that the MBR is prepared and checked independently prior to certifying it, or submitting for CAAM's approval

2.1.5 The MBR shall include the current basic equipment list showing the mass and lever arm of each item or make reference to the document in which such a list is included.

2.1.6 The MBR is contain in Section 2 – Mass and Balance Record of Mass and Balance Report (GAM/C-037) latest revision.

2.1.7 The Mass and Balance Report (GAM/C-037) shall include the following information:

a) Reference number and date;

b) Aircraft type and model;

c) Aircraft serial number;

d) Nationality and aircraft registration marks;

e) A statement stating that the report superseded all earlier issues;

f) Shall indicate the landing gear positions (retracted or extended) to which the derived CG position is related;

g) The date and reference number of the MBR upon which the MCGS is based, should be specified; and

h) Report reference number as indicated below:

GAM/MBR/**XX**/**YY**/**ZZZ**

- **XX**: Last two digits of the year when the report is issued.
- **YY**: Running number of the year
- **ZZZ**: Aircraft Registration number without 9M (i.e. ABC for 9M-ABC)

## 2.2 Qualification of MBR Signatory

2.2.1 The nominated MBR signatory should have:

a) an appropriate license issued in accordance with CAD 1801 or relevant engineering degree acceptable to CAAM;

b) at least 2 years of practical experience in preparing aircraft MBR (at minimum 3 aircraft MBR must be prepared);

c) attended relevant aircraft mass and balance training (theoretical and practical); and

d) a comprehensive knowledge on requirements and procedures of mass and balance of aircraft

2.2.2 The MBR signatory should also attend the required training as follows:

a) CAME Training

b) MBP Training

c) Air Legislation Training

d) Safety Management System Training

e) Human Factors Training- Initial

f) Related General Familiarization Training

g) Mass and Balance Training- Training covers both theory and practical aspect of aircraft weighing activities which include but not limited to the element of applicable airworthiness requirements, personnel involved in weighing, weighing equipment, facility and maintenance data related to aircraft weighing.

h) Practical training is conducted 'OJT' basis where candidate is directly involved in weighing aircraft under supervision of WE.

2.2.3 The QAM shall evaluate the approval for each qualified WE at least every two years.

2.2.4 The renewal/ variation of approved WE shall follow the procedure as stated in GAM Quality Procedure Manual (QPM) 2.4 – Issue of Personnel Authorisations.

2.2.5 Continuation Training every two (2) years:

a) CAME Training- Refresher

b) MBP Training- Refresher

c) Human Factors Training- Refresher

2.2.6 Related General Familiarization shall be attended by the nominated WE for variation application.

2.2.7 Withdrawal / Suspension of Qualification-

a) Whenever any condition for revalidation of company approval is not met, or for any reason on rationale after due investigation, company approval granted to the WE can be limited, suspended, or revoked by QAM.

b) Following conditions may lead to limitation, suspension or revocation of company approval.

1) Certification has been performed for an aircraft beyond scope / limitation of authorisation, or

2) The WE approval has expired, or

3) Continuation training has not been provided to the WE.

c) Re-issuance of revoked authorization shall be processed in a similar manner as for the initial issuance of company approval

## 2.3 Procedures for Approving MBR Signatory

2.3.1 For GAM CAMO to issue an MBR in accordance with paragraph 2.1.1 of this MBP, GAM CAMO shall approve a person suitably qualified and acceptable to CAAM to certify the MBR.

2.3.2 MBR Signatory nominated by GAM CAMO must fulfilled the requirements as stated in MBP Chapter 2.2.

2.3.3 An authorisation can only be issued by GAM CAMO in accordance with QPM 2.4 when formally accepted as an approved signatory by the CAAM. The Application for Initial Approval of Approved Signatory (CAAM/AW/0105-01) shall be used for the initial CAAM approval accompanied with prescribed fee.

## 2.4 List of MBR Signatory and Their Capability According to Aircraft Type

| NO. | MANUFACTURER | AIRCRAFT TYPE | ISMAIL BIN SULAIMAN | MOHD ARIFIN BIN MD MATAR | MUHAMMAD IHSAN BIN MASRI | REMARKS |
|---|---|---|---|---|---|---|
| | | | GAM W004 WBA | GAM W005 WBA | GAM W009 WBA | |
| | | | APPROVE MBR REPORT | APPROVE MBR REPORT | APPROVE MBR REPORT | |
| 1 | AIRBUS HELICOPTERS | SA 365 N | - | - | - | |
| | | SA 365 N1 | - | - | - | |
| | | AS 365 N2 | - | - | - | |
| | | AS 365 N3 | - | X | X | |
| | | EC 120 B | X | X | X | |
| | | EC 135 P1 | - | - | - | |
| | | EC 135 P2 | - | - | - | |
| | | EC 135 P2+ | - | - | - | |
| | | EC 135 P3 | - | - | - | |
| | | EC 135 T1 | - | - | - | |
| | | EC 135 T2 | - | - | - | |
| | | EC 135 T2+ | - | - | - | |
| | | EC 135 T3 | - | - | - | |
| | | AS 350 B | - | - | - | |
| | | AS 350 D | - | - | - | |
| | | AS 350 B1 | - | - | - | |
| | | AS 350 B2 | - | X | X | |
| | | AS 350 BB | - | - | - | |
| | | AS 350 B3 | - | X | X | |
| | | EC 225 LP | - | - | - | |
| | | EC 155 B | - | X | X | |
| | | AS355 E | - | - | - | |
| | | AS355 F | - | - | - | |
| | | AS355 F1 | - | - | - | |
| | | AS355 F2 | - | - | - | |
| | | AS355 N | - | - | - | |
| | | AS355 NP | - | - | - | |

## 2.4 List of MBR Signatory and Their Capability According to Aircraft Type

| NO. | MANUFACTURER | AIRCRAFT TYPE | ISMAIL BIN SULAIMAN<br>GAM W004 WBA<br>APPROVE MBR REPORT | MOHD ARIFIN BIN MD MATAR<br>GAM W005 WBA<br>APPROVE MBR REPORT | MUHAMMAD IHSAN BIN MASRI<br>GAM W008 WBA<br>APPROVE MBR REPORT | REMARKS |
|---|---|---|---|---|---|---|
| 1 | AIRBUS HELICOPTERS | SA 365 N | - | - | - | |
| | | SA 365 N1 | - | - | - | |
| | | AS 365 N2 | - | - | - | |
| | | AS 365 N3 | - | X | X | |
| | | EC 120 B | X | X | X | |
| | | EC 135 P1 | - | - | - | |
| | | EC 135 P2 | - | - | - | |
| | | EC 135 P2+ | - | - | - | |
| | | EC 135 P3 | - | - | - | |
| | | EC 135 T1 | - | - | - | |
| | | EC 135 T2 | - | - | - | |
| | | EC 135 T2+ | - | - | - | |
| | | EC 135 T3 | - | - | - | |
| | | AS 350 B | - | - | - | |
| | | AS 350 D | - | - | - | |
| | | AS 350 B1 | - | - | - | |
| | | AS 350 B2 | - | X | X | |
| | | AS 350 BB | - | - | - | |
| | | AS 350 B3 | - | X | X | |
| | | EC 225 LP | - | - | - | |
| | | EC 155 B | - | X | X | |
| | | AS355 E | - | - | - | |
| | | AS355 F | - | - | - | |
| | | AS355 F1 | - | - | - | |
| | | AS355 F2 | - | - | - | |
| | | AS355 N | - | - | - | |
| | | AS355 NP | - | - | - | |

| NO. | MANUFACTURER | AIRCRAFT TYPE | ISMAIL BIN SULAIMAN<br>GAM W004 WBA<br>APPROVE MBR REPORT | MOHD ARIFIN BIN MD MATAR<br>GAM W005 WBA<br>APPROVE MBR REPORT | MUHAMMAD IHSAN BIN MASRI<br>GAM W009 WBA<br>APPROVE MBR REPORT | REMARKS |
|---|---|---|---|---|---|---|
| | | EC 130 B4 | - | - | - | |
| | | EC 130 T2 | - | - | - | |
| | | EC 175 B | - | - | X | |
| | | EC 155 B1 | - | X | X | |
| 2 | LEONARDO S.p.A HELICOPTERS | AW139 | - | X | X | |
| | | AW189 | - | X | X | |
| | | A119 | - | - | - | |
| | | A109E | X | - | X | |
| | | A109 | - | - | - | |
| | | A109S | - | - | - | |
| 3 | SIKORSKY | S-76A | - | - | - | |
| | | S-76B | - | X | - | |
| | | S-76C | X | - | - | |
| | | S-76D | - | - | - | |
| 4 | TEXTRON AVIATION INC | B300 | - | X | - | |
| | | 172 | - | - | X | |
| | | 208 | - | - | X | |
| 5 | TWIN OTTER | DHC-6 | - | - | - | |
| 6 | ROBINSON | R44 | - | - | X | |
| | | R66 | - | - | X | |
| | | R44 II | - | - | - | |
| 7 | BELL TEXTRON CANADA LTD. | BELL 429 | X | - | - | |
| 8 | PILATUS | PC-6 | - | - | - | |

**Legends:**

X – Approval for the aircraft type

| NO. | MANUFACTURER | AIRCRAFT TYPE | ISMAIL BIN SULAIMAN | MOHD ARIFIN BIN MD MATAR | MUHAMMAD IHSAN BIN MASRI | REMARKS |
|---|---|---|---|---|---|---|
| | | | GAM W004 WBA | GAM W005 WBA | GAM W008 WBA | |
| | | | APPROVE MBR REPORT | APPROVE MBR REPORT | APPROVE MBR REPORT | |
| | | EC 130 B4 | - | - | - | |
| | | EC 130 T2 | - | - | - | |
| | | EC 175 B | - | - | X | |
| | | EC 155 B1 | - | X | X | |
| 2 | LEONARDO S.p.A HELICOPTERS | AW139 | - | X | X | |
| | | AW189 | - | X | X | |
| | | A119 | - | - | - | |
| | | A109E | X | - | X | |
| | | A109 | - | - | - | |
| | | A109S | - | - | - | |
| 3 | SIKORSKY | S-76A | - | - | - | |
| | | S-76B | - | X | - | |
| | | S-76C | X | - | - | |
| | | S-76D | - | - | - | |
| 4 | TEXTRON AVIATION INC | B300 | - | X | - | |
| | | 172 | - | - | X | |
| | | 208 | - | - | X | |
| 5 | TWIN OTTER | DHC-6 | - | - | - | |
| 6 | ROBINSON | R44 | - | - | X | |
| | | R66 | - | - | X | |
| | | R44 II | - | - | - | |
| 7 | BELL TEXTRON CANADA LTD. | BELL 429 | X | - | - | |
| 8 | PILATUS | PC-6 | - | - | - | |

**Legends:**
X – Approval for the aircraft type

## 2.5 Procedures to Manage Certification of MBR Outsourced to Contracted CAMO

2.5.1 In absence of an MBR signatory, GAM CAMO may contract another CAMO with appropriate capability to certify the MBR.

2.5.2 GAM CAMO shall ensure an audit is performed on the intended contracted CAMO in accordance with GAM CAME Part 2 (Quality System) prior to outsource the MBR certification. The purpose of the audit is to ensure that the contracted MBR signatory have appropriate capability to certify the MBR where he / she has appropriate knowledge, experience, qualification and training.

2.5.3 Upon completion of a satisfactory audit, a written agreement shall be made between GAM CAMO and the contracted CAMO taking into account the requirements of CAD 6805 and the obligations defined between the two organisations in relation to mass and balance control of the aircraft. The written agreement should at least contain the following scope but not limited to:

a) Facility – facility in which aircraft weighing to be performed

b) Tools & Equipment – weighing equipment to be used

c) Manpower – MBR signatory shall be provided by the contracted CAMO

d) Maintenance Data – maintenance data to be used shall be provided by GAM CAMO

e) Scope of Work – define the scope of work to be carried out i.e., issuance, revision etc.

## 2.6 Procedures to Manage Request for Certification of MBR Received from Other CAMO

2.6.1 In the event of GAM CAMO received request from other CAMO to certify the MBR, a written agreement shall be made between the two organizations.

2.6.2 The written agreement shall take into account the requirements of CAD 6805 and the obligations defined between the two organisations in relation to mass and balance control of the aircraft. The written agreement should at least contain the following scope but not limited to:

a) Facility – facility in which aircraft weighing to be performed

b) Tools & Equipment – weighing equipment to be used

c) Manpower – MBR signatory shall be provided by GAM CAMO

d) Maintenance Data – maintenance data to be used shall be provided by the other CAMO

e) Scope of Work – define the scope of work to be carried out i.e., issuance, revision etc.

2.6.3 Upon completion of weighing as per MBP Chapter 1.7, the WE shall issue and certify the MBR in accordance with Chapter 2.1 of this MBP.

2.6.4 One copy of the MBR shall be distributed to the other CAMO and another copy shall be kept in GAM CAMO archives.

## 2.7 MBR Record

2.7.1 The MBR Report shall be made available to the CAAM, and such records shall be retained as per GAM CAME Part 1.3.3 (Preservation of Continuing Airworthiness Records) and produced to CAAM at any material time.

2.7.2 When the MBR report is reissued/revised, the last issue/revision shall be retained with the aircraft records for at least six (6) months.

# PART 3 MASS AND CENTRE OF GRAVITY SCHEDULE (MCGS)

## 3.1 Procedures for Issuance / Variance and Certification of MCGS for the Aircraft

3.1.1 An MCGS shall be issued for every aircraft by GAM CAMO in accordance with Regulation 43 of MCAR based on the empty mass and empty CG position obtained from the most recent aircraft weighing and its related calculation as established in the latest issue/revision of aircraft MBR under Chapter 2.1 of this MBP. The MCGS shall be completed and certified by an MCGS signatory as identified in MBP Chapter 3.4 by signing the MCGS.

3.1.2 GAM CAMO shall ensure that a current MCGS is kept with the aircraft.

3.1.3 The MCGS shall present the current empty mass, the variable loads and the disposable loads together with their respective CGs in order to determine the operating mass and CG for which the operator intends to use the aircraft for.

3.1.4 GAM CAMO shall ensure that the MCGS is prepared and checked independently prior to certifying it, or submitting for CAAM's approval.

3.1.5 A statement shall be made in the MCGS to the effect that it is a requirement of the MCAR that the pilot-in-command satisfies himself before take-off that the load is of such mass, and is so distributed and secured, that it may safely be carried on the intended flight.

3.1.6 The MCGS is contain in Section 1 – Mass and Centre of Gravity Schedule (MCGS) of Mass and Balance Report (GAM/C-037) latest revision.

3.1.7 The Mass and Balance Report (GAM/C-037) should be identified with following:

a) Reference number and date;

b) Aircraft type and model;

c) Aircraft serial number;

d) Nationality and aircraft registration marks;

e) A statement stating that the report superseded all earlier issues;

f) Shall indicate the landing gear positions (retracted or extended) to which the derived CG position is related;

g) The date and reference number of the MBR upon which the MCGS is based, should be specified; and

h) Report reference number as indicated below:

GAM/MBR/**XX**/**YY**/**ZZZ**

- **XX**: Last two digits of the year when the report is issued.
- **YY**: Aircraft Registration number without 9M (i.e. ABC for 9M-ABC)
- **ZZZ**: Running number of the year

3.1.8 The datum to which the CG limits relate is defined in Part A (see paragraph 3.1.10 a) and this may be different from the datum defined in the aircraft flight manual (AFM). When a different datum is used it should be adequately defined, its precise relationship to the datum in the AFM should be given, and any lever arms and moments which appear in any part of the MCGS should be consistent with the datum so declared.

3.1.9 In the case of helicopters, it may be necessary to present lever arms and moments about more than one axis, depending on the CG limits specified in the AFM.

3.1.10 The MCGS should include:

a) Part A (Basic Weight)

The empty mass and the associated position of the CG of the aircraft as derived from the most recent MBR or other information together with any subsequent mass and CG changes, should be stated. The position (retracted or extended) of the landing gear associated with this information should be stated. Part A should include the list of Basic Equipment showing the mass, lever arm and moment of each item, or should make reference to the document in which such a list is included.

b) Part B (Variable Load)

The Variable Load may be detailed for as many roles as the aircraft operator wishes, but for every role the mass and moments should be given.

c) Part C (Loading Information)

d) This should include (directly or by specific reference to other document) all relevant information so that, knowing the Disposable Load which is intended to be carried, the mass and the position of the CG of the aircraft can be calculated. At least the following should be given:

1) The lever arm of the CG of a passenger in each seat;

2) The mean lever arm of each compartment or area in the aircraft where Disposable Load, such as luggage or freight, may be placed;

3) Any significant change in the CG of the aircraft (change in moment) which will result from a change in configuration, such as the retraction and extension of the landing gear;

4) The lever arm of the CG of fuel, oil and other consumable fluids or substances in each tank, including any significant variation of the lever arm with the quantity loaded;

5) The maximum total usable capacities of the tanks for fuel, oil and other consumable fluids or substances and the mass of fluids or substances when the tanks are filled to their capacities assuming typical densities.

3.1.11 For aircraft the Maximum Certified Take-Off Mass of which does not exceed 5700 kg, a copy of the Mass and Balance Report (GAM/C-037) should be included in the AFM, if a AFM is applicable, or if this is not the case, displayed or retained in the aircraft in a suitably identified stowage.

3.1.12 The mass, distances, moments and quantities may be given in any units, provided that these are used consistently and do not conflict with the markings and placards on the aircraft.

## 3.2 Qualification of MCGS Signatory

3.2.1 The nominated MCGS signatory should have:

a) an appropriate license issued in accordance with CAD 1801 or relevant engineering degree acceptable to CAAM;

b) at least 2 years of practical experience in preparing aircraft MCGS (at minimum 3 aircraft MCGS must be prepared);

c) attended relevant aircraft mass and balance training (theoretical and practical); and

d) a comprehensive knowledge on requirements and procedures of mass and balance of aircraft.

3.2.2 The MCGS signatory should also attend the required training as follows:

a) CAME Training

b) MBP Training

c) Air Legislation Training

d) Safety Management System Training

e) Human Factors Training- Initial

f) Related General Familiarization Training

g) Mass and Balance Training- Training covers both theory and practical aspect of aircraft weighing activities which include but not limited to the element of applicable airworthiness requirements, personnel involved in weighing, weighing equipment, facility and maintenance data related to aircraft weighing.

h) Practical training is conducted 'OJT' basis where candidate is directly involved in weighing aircraft under supervision of WE.

3.2.3 The QAM shall evaluate the approval for each qualified WE at least every two years.

3.2.4 The renewal/ variation of approved WE shall follow the procedure as stated in GAM Quality Procedure Manual (QPM) 2.4- Issue of Personnel Authorisations.

3.2.5 Continuation Training every two (2) years:

a) CAME Training- Refresher

b) MBP Training- Refresher

c) Human Factors Training- Refresher

3.2.6 Related General Familiarization shall be attended by the nominated WE for variation application.

3.2.7 Withdrawal / Suspension of Qualification-

a) Whenever any condition for revalidation of company approval is not met, or for any reason on rationale after due investigation, company approval granted to the WE can be limited, suspended, or revoked by QAM.

b) Following conditions may lead to limitation, suspension or revocation of company approval.

1) Certification has been performed for an aircraft beyond scope / limitation of authorisation, or

2) The WE approval has expired, or

3) Continuation training has not been provided to the WE.

c) Re-issuance of revoked authorization shall be processed in a similar manner as for the initial issuance of company approval

## 3.3 Procedures for Approving MCGS Signatory

3.3.1 For GAM CAMO to issue an MCGS in accordance with paragraph 3.1.1 of this MBP, GAM CAMO shall approve a person suitably qualified and acceptable to CAAM to certify the MCGS.

3.3.2 MCGS Signatory nominated by GAM CAMO must fulfilled the requirements as stated in MBP Chapter 3.2.

3.3.3 An authorisation can only be issued by GAM CAMO in accordance with QPM 2.4 when formally accepted as an approved signatory by the CAAM. The Application for Initial Approval of Approved Signatory (CAAM/AW/0105-01) shall be used for the initial CAAM approval accompanied with prescribed fee.

## 3.4 List of MCGS Signatory and Their Capability According to Aircraft Type

| NO. | MANUFACTURER | AIRCRAFT TYPE | ISMAIL BIN SULAIMAN | MOHD ARIFIN BIN MD MATAR | MUHAMMAD IHSAN BIN MASRI | REMARKS |
|---|---|---|---|---|---|---|
| | | | GAM W004 WBA | GAM W005 WBA | GAM W009 WBA | |
| | | | APPROVE MCGS REPORT | APPROVE MCGS REPORT | APPROVE MCGS REPORT | |
| 1 | AIRBUS HELICOPTERS | SA 365 N | - | - | - | |
| | | SA 365 N1 | - | - | - | |
| | | AS 365 N2 | - | - | - | |
| | | AS 365 N3 | - | X | X | |
| | | EC 120 B | X | X | X | |
| | | EC 135 P1 | - | - | - | |
| | | EC 135 P2 | - | - | - | |
| | | EC 135 P2+ | - | - | - | |
| | | EC 135 P3 | - | - | - | |
| | | EC 135 T1 | - | - | - | |
| | | EC 135 T2 | - | - | - | |
| | | EC 135 T2+ | - | - | - | |
| | | EC 135 T3 | - | - | - | |
| | | AS 350 B | - | - | - | |
| | | AS 350 D | - | - | - | |
| | | AS 350 B1 | - | - | - | |
| | | AS 350 B2 | - | X | X | |
| | | AS 350 BB | - | - | - | |
| | | AS 350 B3 | - | X | X | |
| | | EC 225 LP | - | - | - | |
| | | EC 155 B | - | X | X | |
| | | AS355 E | - | - | - | |
| | | AS355 F | - | - | - | |
| | | AS355 F1 | - | - | - | |
| | | AS355 F2 | - | - | - | |
| | | AS355 N | - | - | - | |
| | | AS355 NP | - | - | - | |

## 3.4 List of MCGS Signatory and Their Capability According to Aircraft Type

| NO. | MANUFACTURER | AIRCRAFT TYPE | ISMAIL BIN SULAIMAN | MOHD ARIFIN BIN MD MATAR | MUHAMMAD IHSAN BIN MASRI | REMARKS |
|---|---|---|---|---|---|---|
| | | | GAM W004 WBA | GAM W005 WBA | GAM W008 WBA | |
| | | | APPROVE MCGS REPORT | APPROVE MCGS REPORT | APPROVE MCGS REPORT | |
| 1 | AIRBUS HELICOPTERS | SA 365 N | - | - | - | |
| | | SA 365 N1 | - | - | - | |
| | | AS 365 N2 | - | - | - | |
| | | AS 365 N3 | - | X | X | |
| | | EC 120 B | X | X | X | |
| | | EC 135 P1 | - | - | - | |
| | | EC 135 P2 | - | - | - | |
| | | EC 135 P2+ | - | - | - | |
| | | EC 135 P3 | - | - | - | |
| | | EC 135 T1 | - | - | - | |
| | | EC 135 T2 | - | - | - | |
| | | EC 135 T2+ | - | - | - | |
| | | EC 135 T3 | - | - | - | |
| | | AS 350 B | - | - | - | |
| | | AS 350 D | - | - | - | |
| | | AS 350 B1 | - | - | - | |
| | | AS 350 B2 | - | X | X | |
| | | AS 350 BB | - | - | - | |
| | | AS 350 B3 | - | X | X | |
| | | EC 225 LP | - | - | - | |
| | | EC 155 B | - | X | X | |
| | | AS355 E | - | - | - | |
| | | AS355 F | - | - | - | |
| | | AS355 F1 | - | - | - | |
| | | AS355 F2 | - | - | - | |
| | | AS355 N | - | - | - | |
| | | AS355 NP | - | - | - | |

| NO. | MANUFACTURER | AIRCRAFT TYPE | ISMAIL BIN SULAIMAN<br>GAM W004 WBA<br>APPROVE MCGS REPORT | MOHD ARIFIN BIN MD MATAR<br>GAM W005 WBA<br>APPROVE MCGS REPORT | MUHAMMAD IHSAN BIN MASRI<br>GAM W009 WBA<br>APPROVE MCGS REPORT | REMARKS |
|---|---|---|---|---|---|---|
| | | EC 130 B4 | - | - | - | |
| | | EC 130 T2 | - | - | - | |
| | | EC 175 B | - | - | X | |
| | | EC 155 B1 | - | X | X | |
| 2 | LEONARDO S.p.A HELICOPTERS | AW139 | - | X | X | |
| | | AW189 | - | X | X | |
| | | A119 | - | - | - | |
| | | A109E | X | - | X | |
| | | A109 | - | - | - | |
| | | A109S | - | - | - | |
| 3 | SIKORSKY | S-76A | - | - | - | |
| | | S-76B | - | X | - | |
| | | S-76C | X | - | - | |
| | | S-76D | - | - | - | |
| 4 | TEXTRON AVIATION INC | B300 | - | X | - | |
| | | 172 | - | - | X | |
| | | 208 | - | - | X | |
| 5 | TWIN OTTER | DHC-6 | - | - | - | |
| 6 | ROBINSON | R44 | - | - | X | |
| | | R66 | - | - | X | |
| | | R44 II | - | - | - | |
| 7 | BELL TEXTRON CANADA LTD. | BELL 429 | X | - | - | |
| 8 | PILATUS | PC-6 | - | - | - | |

**Legends:**

X – Approval for the aircraft type

| NO. | MANUFACTURER | AIRCRAFT TYPE | ISMAIL BIN SULAIMAN<br>GAM W004 WBA<br>APPROVE MCGS REPORT | MOHD ARIFIN BIN MD MATAR<br>GAM W005 WBA<br>APPROVE MCGS REPORT | MUHAMMAD IHSAN BIN MASRI<br>GAM W008 WBA<br>APPROVE MCGS REPORT | REMARKS |
|---|---|---|---|---|---|---|
| | | EC 130 B4 | - | - | - | |
| | | EC 130 T2 | - | - | - | |
| | | EC 175 B | - | - | X | |
| | | EC 155 B1 | - | X | X | |
| 2 | LEONARDO S.p.A HELICOPTERS | AW139 | - | X | X | |
| | | AW189 | - | X | X | |
| | | A119 | - | - | - | |
| | | A109E | X | - | X | |
| | | A109 | - | - | - | |
| | | A109S | - | - | - | |
| 3 | SIKORSKY | S-76A | - | - | - | |
| | | S-76B | - | X | - | |
| | | S-76C | X | - | - | |
| | | S-76D | - | - | - | |
| 4 | TEXTRON AVIATION INC | B300 | - | X | - | |
| | | 172 | - | - | X | |
| | | 208 | - | - | X | |
| 5 | TWIN OTTER | DHC-6 | - | - | - | |
| 6 | ROBINSON | R44 | - | - | X | |
| | | R66 | - | - | X | |
| | | R44 II | - | - | - | |
| 7 | BELL TEXTRON CANADA LTD. | BELL 429 | X | - | - | |
| 8 | PILATUS | PC-6 | - | - | - | |

**Legends:**
X – Approval for the aircraft type

## 3.5 Procedures to Manage Certification of MCGS Outsourced to Contracted CAMO

3.5.1 In absence of an MCGS signatory, GAM CAMO may contract another CAMO with appropriate capability to certify the MCGS.

3.5.2 GAM CAMO shall ensure an audit is performed on the intended contracted CAMO in accordance with GAM CAME Part 2 (Quality System) prior to outsource the MCGS certification. The purpose of the audit is to ensure that the contracted MCGS signatory have appropriate capability to certify the MCGS where he / she has appropriate knowledge, experience, qualification and training.

3.5.3 Upon completion of a satisfactory audit, a written agreement shall be made between GAM CAMO and the contracted CAMO taking into account the requirements of CAD 6805 and the obligations defined between the two organisations in relation to mass and balance control of the aircraft. The written agreement should at least contain the following scope but not limited to:

a) Facility – facility in which aircraft weighing to be performed

b) Tools & Equipment – weighing equipment to be used

c) Manpower – MCGS signatory shall be provided by the contracted CAMO

d) Maintenance Data – maintenance data to be used shall be provided by GAM CAMO

e) Scope of Work – define the scope of work to be carried out i.e., issuance, revision etc.

## 3.6 Procedures to Manage Request for Certification of MCGS Received from Other CAMO

3.6.1 In the event of GAM CAMO received request from other CAMO to certify the MCGS, a written agreement shall be made between the two organizations.

3.6.2 The written agreement shall take into account the requirements of CAD 6805 and the obligations defined between the two organisations in relation to mass and balance control of the aircraft. The written agreement should at least contain the following scope but not limited to:

a) Facility – facility in which aircraft weighing to be performed

b) Tools & Equipment – weighing equipment to be used

c) Manpower – MCGS signatory shall be provided by GAM CAMO

d) Maintenance Data – maintenance data to be used shall be provided by the other CAMO

e) Scope of Work – define the scope of work to be carried out i.e., issuance, revision etc.

3.6.3 Upon completion of weighing as per MBP Chapter 1.7, the WE shall issue and certify the MCGS in accordance with Chapter 3.1 of this MBP.

3.6.4 One copy of the MCGS shall be distributed to the other CAMO and another copy shall be kept in GAM CAMO archives.

## 3.7 MCGS Record

3.7.1 The MCGS shall be made available to CAAM. Such records shall be retained as per GAM CAME Part 1.3.3 (Preservation of Continuing Airworthiness Records). and produced to CAAM at any material time.

3.7.2 Where the MCGS is reissued/revised, the last issue/revision shall be retained with the aircraft records for at least 6 months.

# PART 4 LOADING SCHEDULE

## 4.1 Aircraft Loading Schedule and Instruction

Reserved

## 4.2 Operational Procedures

Reserved.

## 4.3 Organisation Preparing the Loading Schedule

Reserved.

## 4.4 Procedures for Preparing or Verifying the Aircraft Loading Schedule

Reserved.

## 4.5 Competency of Personnel Preparing & Certifying the Loading Schedule

Reserved.

## 4.6 Competency of Personnel Generating Loading Schedule from an Approved Software

Reserved.

## 4.7 The Physical Loading System of the Aircraft

Reserved.

# PART 5 MASS AND BALANCE RECORD SYSTEM

## 5.1 Procedures to Update and Maintain a Current and Continuous Record of the Mass and CG of the Operated Aircraft Including Updating of MBR And MCGS

5.1.1 GAM CAMO shall maintain a complete, current, and continuous record of changes of empty mass, arm and empty centre of gravity limits for each aircraft. Details of modifications, repairs or other changes affecting either the mass and/or CG of the aircraft shall be recorded and listed.

5.1.2 Where a change occurs in the items included in either the empty mass or, if applicable, the operating mass of an aircraft, the appropriate list of equipment associated to the MBR or MCGS, as applicable, shall be amended by GAM CAMO.

5.1.3 GAM CAMO shall ensure that a revised MBR and MCGS is issued in accordance with Part 2 and 3 of this MBP when:

a) the cumulative change to the mass and balance record is more than plus or minus 0.5% of the maximum certified landing mass; or

b) the cumulative change in the CG position record exceeds 0.5% of the mean aerodynamic chord (MAC). In the case of helicopters and airplanes that do not have a MAC-based CG envelope, whenever the cumulative change in the CG position exceeds 0.5% of the total CG range; or

c) prescribed by the type certificate or supplemental type certificate holder of an aircraft (e.g. in the aircraft flight manual or weight and balance manual) if the threshold is lesser than as specified in paragraph a) or b) above.

5.1.4 If CAAM, GAM CAMO or the operator is of the opinion that adequate mass control has not been exercised over an aircraft during the modification or repair embodiment, a new empty mass and empty centre of gravity position shall be determined by weighing for the aircraft.

# PART 6 ON-BOARD MASS AND BALANCE SYSTEM

## 6.1 On-Board Mass and Balance System Equipment and Software Certification Status

Reserved.

## 6.2 Procedure for On-Board Mass and Balance System by Taking into Account Operational Considerations

Reserved.

## 6.3 Procedure to Calibrate On-Board Mass and Balance System Equipment Periodically

Reserved.

## 6.4 Training for Affected Personnel on On-Board Mass and Balance System

Reserved.

# PART 7 OPERATIONAL MASS VALUES

## 7.1 Crew Mass (including hand-baggage)

Reserved.

## 7.2 Procedure When Carrying Crew Whose Masses, Including Hand-Baggage, are Expected to Significantly Deviate From the Standard Crew Mass

Reserved.

## 7.3 Passenger Mass (including hand-baggage)

Reserved.

## 7.4 Procedure When Carrying a Significant Number of Passengers Whose Masses, Including Hand Baggage, are Expected to Significantly Deviate from the Standard Passenger Mass

Reserved.

## 7.5 Baggage / Cargo Mass (Actual Mass)

Reserved.

## 7.6 Mass of Fuel / Fuel Density Values

Reserved.

# PART 8 PASSENGER WEIGHING SURVEY PLAN AND THE STATISTICAL ANALYSIS METHOD

## 8.1 Procedures for Establishing Revised Standard Mass Values for Passengers (Survey Plan and the Statistical Analysis Method)

Reserved.

# PART 9 OPERATOR'S MASS AND BALANCE CONTROL REPORTING SYSTEM

## 9.1 Policies & Procedures with Respect to Operator's Mass and Balance Control Reporting

Reserved.

# PART 10 COMPUTERISED MASS AND BALANCE CONTROL SYSTEM

## 10.1 Procedures for Verification and Validation of the MBP Information Generated from Computerized System

Reserved.