Galaxy Aerospace

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WEIGHT AND BALANCE MANUAL

GAM/WBM
ISSUE 2/19
COPY NO: 01

MASTER COPY

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All chapters in Issue 1/18, 2/18, 3/18, 1/19 and 2/19 are approved by CIVIL AVIATION AUTHORITY OF MALAYSIA:

	Name and position:	Signature:	Date:
Prepared by:	*Nur Farhana Othman.* Weighing Engineer.		05/04/2019
Checked by:	*Ismail Sulaiman.* Technical Services Controller.		8/4/2019
Verified by:	*Salman Abu Zarim.* Quality Assurance Manager.		
Approved by:	*Mr. Lai Menq Woei.* Civil Aviation Authority of Malaysia (CAAM)		

List of Amendments

ISSUE NO. (No./Yr.)	DATE OF ISSUE	REASONS FOR CHANGE
1/18	Jan 2018	Amended and updated as per audit report IAR/2018/004 dated 15/01/2018; 1. Chapter 0.3.2, 0.4.3.4, 0.5.7 & 0.5.8 – Added reference to MOE 2. Chapter 0.4.3.1 – Added Publication Amendment Request form 3. Chapter 0.4.4.2 – Changed Safety Management Manager to Safety Manager 4. Chapter 0.7 Para 7 – Changed from GAM/DCAM/CAME chapter 1.22 to chapter 1.11 5. Chapter 0.7 Para 8 – Changed from GAM/MOE to GAM/DCAM/MOE 6. Chapter 0.7 Para 8 - Changed from 'Calibration of Tools' to 'Calibration of Tools and Equipment' 7. Chapter 0.7 Para 8 – Changed from 'Use of Tooling' to 'Use of Tooling and Equipment by Staff (including alternate tools) 8. Chapter 1.3.3.4 – Deleted 'Maintain company weighing equipment' 9. Chapter 3.1 Para 12 – Changed from 6 months to 3 years minimum of record keeping as per MOE 10. Chapter 4 – Insertion of Compliance Matrix
2/18	Feb 2018	Amended and updated as per audit report GAM/AUDIT/WB/02 dated 30/01/2018; 1. Chapter 0.4.3.1 – Amended on reference form 2. Chapter 0.5.7 – Added information regarding document preparation 3. Chapter 0.8.6 – Added definition "familiar equipment" 4. Chapter 1.2.1 –Added table listing out all weighing equipment for GAM Weighing Engineer. 5. Chapter 1.2.2 – Amended statement regarding approved scope of weighing engineer to perform the weighing. 6. Chapter 1.3.1.1 – Amended on chapter reference 7. Chapter 1.3.3.1 – Added element of maintenance data in audit process 8. Chapter 1.4 – Removed Appendix 1 and added column for task "perform aircraft weighing" 9. Chapter 2.2.3 – Added element of weighing equipment as requirement for basic training 10. Chapter 2.2 to 2.4 - Amendment on training aspect for weighing engineer 11. Chapter 3.2 – Amended title of chart 12. Chapter 3.3 – Added flowchart "Weighing Workpack Process Flow"

ISSUE NO. (No./Yr.)	DATE OF ISSUE	REASONS FOR CHANGE
3/18	Oct 2018	Amended and updated due to significant changes dated 22/10/2018; 1. Front Page - Amended to the new address and doc. ref. no. 2. List of Effective Chapters – Added column for "checked by". 3. Chapter 0.4.2 – Amended statement regarding WBM management from coordination of Technical Services Controller to verification of Quality Assurance Manager. 4. Chapter 0.4.3.5 – Amendment on the method of notification to all necessary personnel by using email or letter. 5. Chapter 0.4.4.1 – Amended statement regarding distribution of controlled copy. Added controlled copy number 03 for Technical Services Office Library as holder. 6. Chapter 0.5.2 - Amendment on doc. ref. no. from GAM/WBM-01 to GAM/WBM and changed from GAM/DCAM/MOE to GAM/CAAM/MOE 7. Chapter 0.7 - Changed from GAM/DCAM/MOE to GAM/CAAM/MOE 8. Chapter 1.1 – Amended to the new address and name of approved weighing engineer. 9. All related words- Substitution for the words: i. Department of Civil Aviation Malaysia (DCAM) to Civil Aviation Authority of Malaysia (CAAM) ii. Director General to Chief Executive Officer iii. JPA-AP7(A) form to CAAM Form 4.
1/19	Jan 2019	Amended and updated due to significant changes dated 22/01/2019; 1. Front Page – Updated issue no. 2. List of Effective Chapters – List updated. 3. List of Amendments – Amendment list updated. 4. Chapter 1.4 – Added capability for R44 and R66.
2/19	Apr 2019	Amended and updated due to significant changes dated 05/04/2019; 1. Front Page – Updated issue no. 2. List of Effective Chapters – List updated. 3. List of Amendments – Amendment list updated. 4. Chapter 1.4 – Added capability for S76C++.

Binding Statement

I. Forming the basis for approval to perform weighing and prepare aircraft weight schedule, contents of this manual shall be binding. In particular, this manual governs the technical and organisational as well as the personnel-related prerequisites for proof of compliance and change of weighing activities under GALAXY AEROSPACE (M) SDN. BHD.

II. These procedures are approved by the undersigned and must be complied with, as applicable, when work is being progressed under GALAXY AEROSPACE (M) SDN. BHD. Weight and Balance approval.

III. All the significant changes in this manual, of the procedures and responsibilities defined shall be submitted to Civil Aviation Authority of Malaysia for approval.

IV. This Weight and Balance Manual is to be updated accordingly to comply with any new or amended regulation published by the Civil Aviation Authority of Malaysia from time to time.

V. Access is permitted to the Civil Aviation Authority of Malaysia to all locations of GALAXY AEROSPACE (M) SDN. BHD., its partners, its subcontractors, and its suppliers for checking whenever deemed required by the Civil Aviation Authority of Malaysia.

VI. All support necessary for the performance of checks and audits will be granted from GALAXY AEROSPACE (M) SDN. BHD. to the Civil Aviation Authority of Malaysia. Weight and Balance Manual will be reviewed at intervals not exceeding 12 months or whenever significant changes occur which affect the content of the Weight and Balance Manual.

VII. GALAXY AEROSPACE (M) SDN. BHD. will assure sufficient and qualified staff as well as education and training of the personnel.

GALAXY AEROSPACE (M) SDN. BHD. (1040262-D)

SHAMSUL KAMAR SAMSUDIN
Accountable Manager

Date: 22/10/2018

CONTENTS

0.0 Introduction

0.1 Preamble

0.1.1 According to Civil Aviation Regulation 2016, Regulation 43, an applicant for a certificate of airworthiness or permit to fly of an aircraft shall subject the aircraft to be weighed and the position of its centre of gravity to be determined at such time and in the manner as the Chief Executive Officer may require for that aircraft.

0.1.2 When the aircraft is weighed, the applicant shall prepare a weight schedule within such time and in the manner as may be determined by the Chief Executive Officer showing—

a) either the basic weight or such other weight as may be approved by the Chief Executive Officer for that aircraft; and

b) either the position of the centre of gravity of the aircraft at its basic weight or such other position of the centre of gravity as may be approved by the Chief Executive Officer for that aircraft.

0.2 Basis of approval

This manual forms the basis for GALAXY AEROSPACE (M) SDN. BHD. and shows the necessary procedures for weight and balance approval (weighing personnel, equipment, location, procedures, report writing) in accordance with Civil Aviation Regulation 2016, Regulation 43.

0.3 Weight and Balance Approval

0.3.1 Civil Aviation Authority of Malaysia granted Weight and Balance approval to GALAXY AEROSPACE (M) SDN. BHD., after duly examining that Weight and Balance Manual and organisation of the applicant is in accordance with applicable regulations of Civil Aviation Regulation 2016, Regulation 43.

0.3.2 All significant organisational and procedural changes (para 0.3.2.1) affecting this approval are to be managed through the Management of Change and shall be forwarded to Civil Aviation Authority of Malaysia for approval prior to their implementation. Refer to MOE Part 1.9.8.

0.3.2.1 The following changes are changes that may affect the weight and balance approval;

a. Changes in the organisation that contribute directly to the approval (weighing engineer, LAE or aircraft type)

b. Change of the management staff (Accountable Manager)

c. Change of facilities which could affect the approval

d. Change of ownership

e. Change of the terms of approval

f. Change to the principles of procedures

0.4 Weight and Balance Manual Management

0.4.1 The Weight and Balance Manual shall be issued with Issue No. x/yy where x indicates running number of the issue year and yy indicates issue year.

0.4.2 All significant organisational and procedural changes affecting this manual are to be verified by Quality Assurance Manager and must be forwarded to Civil Aviation Authority of Malaysia for approval.

0.4.3 Revision Service of Weight and Balance Manual;

0.4.3.1 Amendments to the Weight and Balance Manual will be carried out continuously. Normally they will become necessary due to personnel changes and modifications of valid procedures. Suggestions for additional alterations can be made to the Technical Services Department by each GALAXY AEROSPACE (M) SDN. BHD. employee by using either the Management of Change (form GAM/QA-011) or Publication Amendment Request (form GAM/E-002) as per MOE Part 1.11.3.

0.4.3.2 Minor changes concerning any other editorial changes can be approved by the Quality Assurance Manager.

0.4.3.3 Minor changes shall be issued with Issue No. x/yy_zz where x/yy is the latest manual reference issue and zz is the running number of the minor change to the reference issue. For example, a minor change to reference Issue No. 2/16 shall be revised as 2/16_01.

0.4.3.4 Revisions will always be done chapter wise. The chapters affected by a Management of Change must be exchanged where the previous revision of the chapter revised will be entirely replaced by the new revised chapter. Incorporation of changes must be confirmed in the List of Amendments by the holder of the manual. Revisions will be marked by black bars on the margin of the page. Any changes related to this manual must go through the Management of Change procedure adopted by Galaxy Aerospace (M) Sdn. Bhd. with safety is emphasised as the utmost priority. Reference should be made to MOE Part 1.9.8 and QAN 001 – Management of change procedure for details.

0.4.3.5 The Technical Services Controller will inform all necessary personnel, the Civil Aviation Authority of Malaysia and all other relevant persons according to the distribution list (chapter 0.4.4.1) via email or a letter about the issuance of a change to the manual.

0.4.4 Distribution List

0.4.4.1 Hardcopy

The master copy of the manual shall be kept in the Galaxy Aerospace (M) Sdn. Bhd. library. A controlled copy shall be distributed to Airworthiness sector of Civil Aviation Authority of Malaysia.

COPY NUMBER	HOLDER
01 – Master Copy	Galaxy Aerospace (M) Sdn. Bhd. Library
02 – CAAM Copy	Civil Aviation Authority of Malaysia
03 – Controlled Copy	Technical Services Office Library

0.4.4.2 Electronic copy

Latest revision(s) of this manual shall be distributed to Galaxy Aerospace (M) Sdn. Bhd. intranet (in a dedicated shared server) and the following persons shall be notified by email:

- Accountable Manager
- Quality Assurance Manager
- Engineering Manager
- Continuing Airworthiness Manager
- Safety Manager

0.5 Documentation

0.5.1 The Weight and Balance Manual defines procedures and refers to existing procedures by a reference number

0.5.2 The Galaxy Aerospace (M) Sdn. Bhd. Documentation Management System for Weight and Balance approval shall be divided into three hierarchical levels:

- Level 1 DIRECTIVE (GAM/WBM and GAM/CAAM/MOE)
- Level 2 PROCEDURES (GAM/TS.P01 – AIRCRAFT WEIGHING PROCESS and QAN 001 – MANAGEMENT OF CHANGE)
- Level 3 FORMS (GAM/TS.F.01 – WEIGHT AND BALANCE REPORT and GAM/QA - 011 – MANAGEMENT OF CHANGE)

0.5.3 Directive is a document, describing general principles and rules concerning the organisation.

0.5.4 Procedures are documents defining general functioning rules and detailed operational documents coherent with level 1 and related to a process which may be common to several sectors.

0.5.5 Level 3 documents are forms with standard format or template which will be used to document all weighing related work.

0.5.6 All level 1, level 2 and level 3 documents shall be filed and made accessible to the Galaxy Aerospace (M) Sdn. Bhd. employees via electronic copy.

0.5.7 All Level 2 documents, as well as Level 3 documents, related to weight and balance, shall be prepared by Technical Services engineer / Weighing Engineer and approved by the Technical Services Controller. Amendments to these documents shall be carried out continuously, and suggestions for additional alterations can be made to the Technical Services Department by each employee using the Publication Amendment Request (form GAM/E-002) as per MOE Part 1.11.3.

0.5.8 Any significant changes (other than changes specified in Para 0.5.7) related to Galaxy Aerospace (M) Sdn. Bhd. Weight and Balance Approval shall go through the Management of Change (MOC) procedure adopted by Galaxy Aerospace (M) Sdn. Bhd. with safety is emphasised as the utmost priority. Reference should be made to MOE Part 1.9.8 and QAN 001 – Management of change procedure for details.

0.5.9 Revisions to Level 2 documents, as well as Level 3 documents, will be done document wise, meaning that document(s) affected by a Management of Change (form GAM/QA-011) must be entirely replaced. Revisions will be marked by black bars on the margin of the page.

0.6 Abbreviations

A/C	Aircraft
BCAR	British Civil Aviation Requirement
CAA	Civil Aviation Authority
CAAIP	Civil Aircraft Airworthiness Information and Procedures
CAAM	Civil Aviation Authority of Malaysia
CAMO	Continuing Airworthiness Management Organisation
CG	Centre of Gravity
EASA	European Aviation Safety Agency
FAA	Federal Aviation Administration
FAR	Federal Aviation Regulations
GAM	GALAXY AEROSPACE (M) SDN. BHD.
LAE	Licensed Aircraft Engineer
MCAR	Malaysian Civil Aviation Regulation
MOC	Management of Change

MOE	Maintenance Organisation Exposition
OJT	On Job Training
QA	Quality Assurance
QAN	Quality Assurance Notice
TS	Technical Services
WBM	Weight and Balance Manual

0.7 Reference Documents

Aircraft Scales: Doc. No. 561-281-6179	Wireless Weighing Instructions
British Civil Aviation Requirement	Sub-Section A5, Chapter A5-4 Weight and Balance of Aircraft. Sub-Section A6, Chapter A6-4 Weight and Balance of Aircraft. Sub-Section A7, Chapter A7-10 Weight and Balance Report.
CAP 562 CAAIP	Airworthiness Procedures Leaflet 1-4 'Weight and Balance of Aircraft'
Civil Aviation Regulations 2016	CAR 2016 Regulation 43
FAA AC 43.13-1B	Chapter 10: Weight and Balance
Flight Operations Directive FOD No.: 60CA-16	Section 3: Mass and Balance
GAM/DCAM/CAME	Part 1.6 : Repair Modification Standards Part 1.11: Aircraft Weighing
GAM/CAAM/MOE	Part 2.1: Supplier Evaluation Procedure and Sub-contract Control Part 2.5: Calibration of Tools and Equipment Part 2.6 Use of Tooling and Equipment by Staff (including alternate tools) Part 2.10: Aircraft Maintenance Program Part 2.14: Technical Record Control

	Part 2.16: Release to Service Part 3: Quality Procedures
Revere Transducers Inc.	JetWeigh and Road Runner – Aircraft Weighing System
QAN 001	Management of Change

0.8 Definition

0.8.1 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

0.8.2 Basic Equipment:
Basic Equipment includes inconsumable fluids, and the equipment which is common to all roles for which the Operator intends to use the aircraft.

0.8.3 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.

0.8.4 Disposable Load:
Disposable Load is the weight 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.

0.8.5 Weight and Balance Package:
A set of weighing related documents consisting of the existing aircraft weighing report, the new weighing report and a copy of work sheet on which the aircraft weighing is certified by LAE.

0.8.6 Familiar Equipment:
A set of weighing equipment that is equivalent in terms of spec and/or operation wise and/or has been used (recorded in work experiences schedule as applicable) by the weighing engineer personnel and/or type which has been included as part of training.

1.0 Organisation

1.1 Applicant

GALAXY AEROSPACE (M) SDN. BHD.

The address for issue concerning the approval is

Accountable Manager / Managing Director	Shamsul Kamar Samsudin Email address: sam@galaxyaerospace.my
Quality Assurance Manager	Salman Abu Zarim Email address: salman@galaxyaerospace.my
Weighing Engineer	Nur Farhana Binti Othman Email address: farhana@galaxyaerospace.my
Organisation address	GALAXY AEROSPACE (M) SDN. BHD., (1040262-D) Suite 11-4, Helicopter Centre, Malaysia International Aerospace Centre, Sultan Abdul Aziz Shah Airport, 47200 Subang, Selangor Darul Ehsan, Malaysia. Tel : +603 7734 7226 Fax : +603 7887 0526

1.2 Location / Facilities

1.2.1 An aircraft shall only be weighed by an approved Weighing Engineer and at CAAM approved facility subject to approval by QA through Management of Change or by CAAM for significant findings on the facility.

1.2.2 GAM Weighing Engineer shall only perform aircraft weighing as per his / her scope of approval with calibrated weighing equipment as per listed below;

1.2.2.1 List of Weighing equipment:

No.	Description	Type of Weighing Equipment	Details of Weighing Equipment
1.	List of Weighing Equipment familiar* by GAM Weighing Engineer and acquired through Tools Agreement	1.1 Electronic Aircraft Weighing Scale GAM VS RMPAOF (Royal Malaysian Police Air Operation Force)	Manufacturer: Intercomp Model: AC125LP-4C Capacity: 5000 kg S/N: 25702886, 25702887, 25702888

		1.2 Jackson Aircraft Scales GAM VS AWM (Agusta Westland Malaysia)	Manufacturer: Aircraftscales.com Model: M2400-3-10C Capacity: 10000lbs per cell
		1.3 JetWeigh Electronic Weighing Kit (4 Load Cells) GAM VS AHM (Airbus Helicopters Malaysia)	Manufacturer: Revere Transducers Inc Model: JW100 Capacity: 25000lbs per cell
2.	List of Weighing Equipment familiar* by GAM Weighing Engineer but not acquired by GAM	2.1 Aircraft Wheel Weigher	Manufacturer: General Electrodynamics Corp Model: AN60-6
		2.2 Aircraft Scale	Manufacturer: Weigh-Systems Inc. Model: AWS 211
		2.3 JetWeigh-5™	Manufacturer: Vishay Precision Group (Revere Transducers Inc.) Model: JW-series

NOTE: * Please refer to Para 0.8- Definition; 0.8.6 – Familiar Equipment for further explanation regarding definition of familiar weighing equipment.

1.2.2.2 For weighing equipment not listed in Para 1.2.2.1, follow procedure for the application to perform the aircraft weighing with the new equipment as per Management of Change QAN 001.

1.2.3 Weighing Engineer shall use the weighing equipment as per GAM MOE Part 2.6 (Use of tooling and equipment by staff).

1.2.4 Prior to perform aircraft weighing and / or to include new weighing equipment under GAM, Quality Assurance Department shall follow procedure MOE Part 2.1 (Supplier evaluation procedure and sub-contract control procedures) and MOE Part 2.5 (Calibration of tools and equipment) to ensure that the weighing equipment is well maintained and reliable for aircraft weighing.

1.3 Duties and Responsibilities

1.3.1 Weighing Engineer

A Weighing Engineer, under the Technical Services Department, is responsible to:

1.3.1.1 Perform aircraft weighing on GAM or customer aircraft as per approved scope as listed in Para 1.4.

1.3.1.2 Certify aircraft weighing documentation as applicable.

1.3.1.3 Administer Weight and Balance Report (aircraft weight schedule).

1.3.1.4 Ensure that weighing equipment is calibrated to an acceptable standard (Refer MOE Part 2.5 Calibration of tools and equipment) prior to perform aircraft weighing.

1.3.1.5 Liaison with local Airworthiness Authority (CAAM) on matters related to aircraft weighing.

1.3.1.6 Develop and conduct in-house aircraft weighing where a certificate will be issued by Quality Assurance Department.

1.3.2 Licensed Aircraft Engineer (LAE)

A nominated LAE which approved through the Management of Change, is responsible to:

1.3.2.1 Perform the aircraft weighing in accordance with the OEM maintenance data or the Aircraft Maintenance Programme (AMP) as per GAM MOE Part 2.10 for GAM LAE.

1.3.2.2 Sign the maintenance release to service on the work sheet as per GAM MOE Part 2.16 (Release to Service) upon the completion of the weighing.

1.3.3 Quality Assurance (QA) Department

Prior to approve any changes related to GAM Weight and Balance Approval through the Management of Change, QA department, under GAM Part 145, is responsible to:

1.3.3.1 Perform an audit in accordance with GAM MOE Part 3 (Quality Procedures) 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 weighing engineer who will perform the aircraft weighing.

c. Weighing engineer – to ensure that the weighing engineer is certified to perform the aircraft weighing where he / she has appropriate knowledge, experience and training.

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

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

1.4 Terms of Approval

GAM is approved to perform the following functions:

Perform Aircraft Weighing	1. AIRBUS HELICOPTERS AS365 SERIES 2. AIRBUS HELICOPTERS EC120 3. AIRBUS HELICOPTERS EC135 SERIES 4. AIRBUS HELICOPTERS AS350 SERIES 5. AIRBUS HELICOPTERS EC225 6. AIRBUS HELICOPTERS EC155 7. AIRBUS HELICOPTERS AS355 SERIES 8. AIRBUS HELICOPTERS EC130 9. AGUSTAWESTLAND AW139 10. AGUSTAWESTLAND AW189 11. AGUSTAWESTLAND AW119 12. AGUSTAWESTLAND AW109 13. SIKORSKY S76B 14. ROBINSON R44 15. ROBINSON R66 16. SIKORSKY S76C++
Prepare and Issue Aircraft Weight Schedule (Weight and Balance Manual)	1. AIRBUS HELICOPTERS AS365 SERIES 2. AIRBUS HELICOPTERS EC120 3. AIRBUS HELICOPTERS EC135 SERIES 4. AIRBUS HELICOPTERS AS350 SERIES 5. AIRBUS HELICOPTERS EC225 6. AIRBUS HELICOPTERS EC155 7. AIRBUS HELICOPTERS AS355 SERIES 8. AIRBUS HELICOPTERS EC130 9. AGUSTAWESTLAND AW139 10. AGUSTAWESTLAND AW189 11. AGUSTAWESTLAND AW119 12. AGUSTAWESTLAND AW109 13. SIKORSKY S76B 14. ROBINSON R44

	15. ROBINSON R66 16. SIKOSKY S76C++ * for aircraft type not covered by GAM Weighing Engineer capability, GAM may prepare the aircraft weight schedule and concurrently to apply for addition of aircraft type through the Management of Change to CAAM.

For details on scope of approval for each GAM weighing engineer, please refer to individual personnel approval certificate issued by Quality Assurance Department.

2.0 Approved Weighing Engineer

2.1 Approval Process

2.1.1 Quality Assurance Manager will administer issue of Approval based on recommendation by Technical Services Controller / Weighing Engineer. However, all approved signatories shall be subject to acceptance by CAAM through CAAM Form 4.

2.2 Requirement for Weighing Engineer is as follows:

2.2.1 Basic Qualification;

2.2.1.1 Technical Services Engineer and

2.2.1.2 Holder of Degree in Engineering / Aviation field

2.2.2 Minimum Experience;

2.2.2.1 Completed OJT on aircraft weighing.

2.2.2.2 Endorsement / Certification from Technical Services Manager / Weighing Engineer stating that candidate had satisfactorily completed OJT

2.2.2.3 OJT shall include practical experience on aircraft weighing process and preparation of weighing documentation on at least three helicopters / fixed wing aircrafts.

2.2.3 Basic Training (certified by QAM);

2.2.3.1 MOE Training

2.2.3.2 Air Legislation training

2.2.3.3 Safety training

2.2.3.4 Human factors training

2.2.3.5 Gen / Fam training

2.2.3.6 Technical Services Department conducts aircraft weighing training in-house

2.2.3.7 Training covers both theory and practical aspect of aircraft weighing practices 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.

2.2.3.8 Practical training is conducted 'OJT' basis where candidate is directly involved in weighing aircraft under supervision of Weighing Engineer.

2.2.3.9 Weighing engineer/s shall be provided with all the basic training specified above and continued qualification as per Para 2.4 below to ensure that they remain current and adept in terms of technical knowledge, procedures and human factors.

2.3 The references for theoretical aspects of weighing on tutorial basis are:

2.3.1 CAP 562 CAAIP Part 1 – Airworthiness Procedures, Leaflet 1-4 'Weight and Balance of Aircraft".

2.3.2 CAA British Civil Airworthiness Requirements.

- Sub – Section A5, Chapter A5-4, Weight and Balance of Aircraft.
- Sub – Section A6, Chapter A6-4, Weight and Balance of Aircraft.
- Sub – Section A7, Chapter A7-10, Weight and Balance Report.

2.3.3 FAA Aircraft Inspection and Repair (AC 43.13-1B) – Acceptable Methods, Techniques and Practices. Chapter 10 – Weight and Balance.

2.3.4 Respective Aircraft Weight and Balance Manual as applicable and/or respective Aircraft Maintenance Manual, chapter 7 and 8 as applicable.

2.3.5 Respective aircraft weighing kit instruction manual.

2.3.6 MCAR – Regulation 43 Aircraft Weight Schedule

2.3.7 CAAM Flight Operations Directive Section 3: Mass and Balance

2.4 Continued Qualifications:

2.4.1 Maintaining qualification- The Quality Assurance Manager shall evaluate the approval for each qualified Weighing Engineer at least once a year.

2.4.2 Withdrawal / Suspension of Qualification-

2.4.2.1 Quality Assurance Manager will decide on the follow-up action, including suspension or permanent withdrawal of qualification if any serious negligence has been done by a qualified approved signatory.

2.4.2.2 The Quality Assurance Manager may suspend or withdraw a qualified approved signatory until he / she completed and close the NCR.

2.4.2.3 If a qualified approved signatory is reported to have more than three NCRs on the same item within a year, the Quality Assurance Manager may withdraw his / her qualification permanently and shall inform CAAM regarding this matter.

2.4.3 Training Needs-

2.4.3.1 The Quality Assurance Manager shall identify if necessary additional training is needed to further strengthen the candidate's competencies for his/her job functions.

2.4.3.2 The necessity for training is annually determined and projected in a training plan.

3.0 Aircraft Weighing Procedures

3.1 General

3.1.1 An aircraft shall only be weighed at CAAM approved facility (subject to approval by QA through MOC as per MOE Para 1.9.8) and by a Weighing Engineer.

3.1.2 Customer or CAMO shall submit request to Technical Services Department through email at least one week prior to actual weighing.

3.1.3 For weighing which is to be performed by GAM Part 145, GAM Production Planning shall raise worksheet in accordance with OEM manual where the worksheet shall be certified by the LAE nominated through the MOC. For weighing which is to be performed by other party's Part 145, the Production Planning of the CAMO managing the aircraft shall coordinate with the other party's Part 145 for worksheet issuance.

3.1.4 Production Planning shall be responsible to coordinate the aircraft weighing.

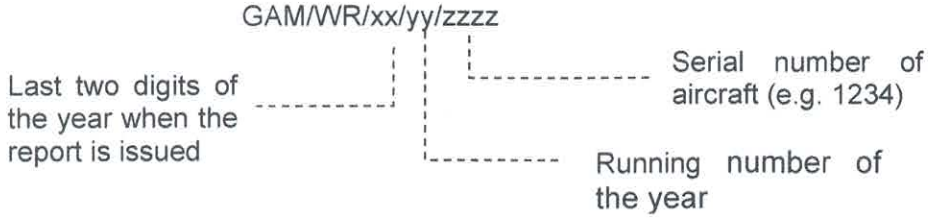
3.1.5 Prior to perform the weighing, Weighing Engineer shall get the details of the aircraft (weight, C.G, date and equipment list) from the previous weighing report, details of weighing equipment, and other weighing related documents (weight and balance manual, aircraft flight manual, worksheet, OEM manual, etc.) shall be accessible by the Weighing Engineer.

3.1.6 Perform weighing in accordance with process stated in Paragraph 3.2, 3.3 and 3.4.

3.1.7 The Weighing Engineer shall prepare and approve the weight and balance report (Form GAM/TS.F.001).

3.1.8 A copy of approved Weight and Balance Report shall be submitted to CAAM.

3.1.9 The Weight and Balance Report shall carry the reference number as indicated below:



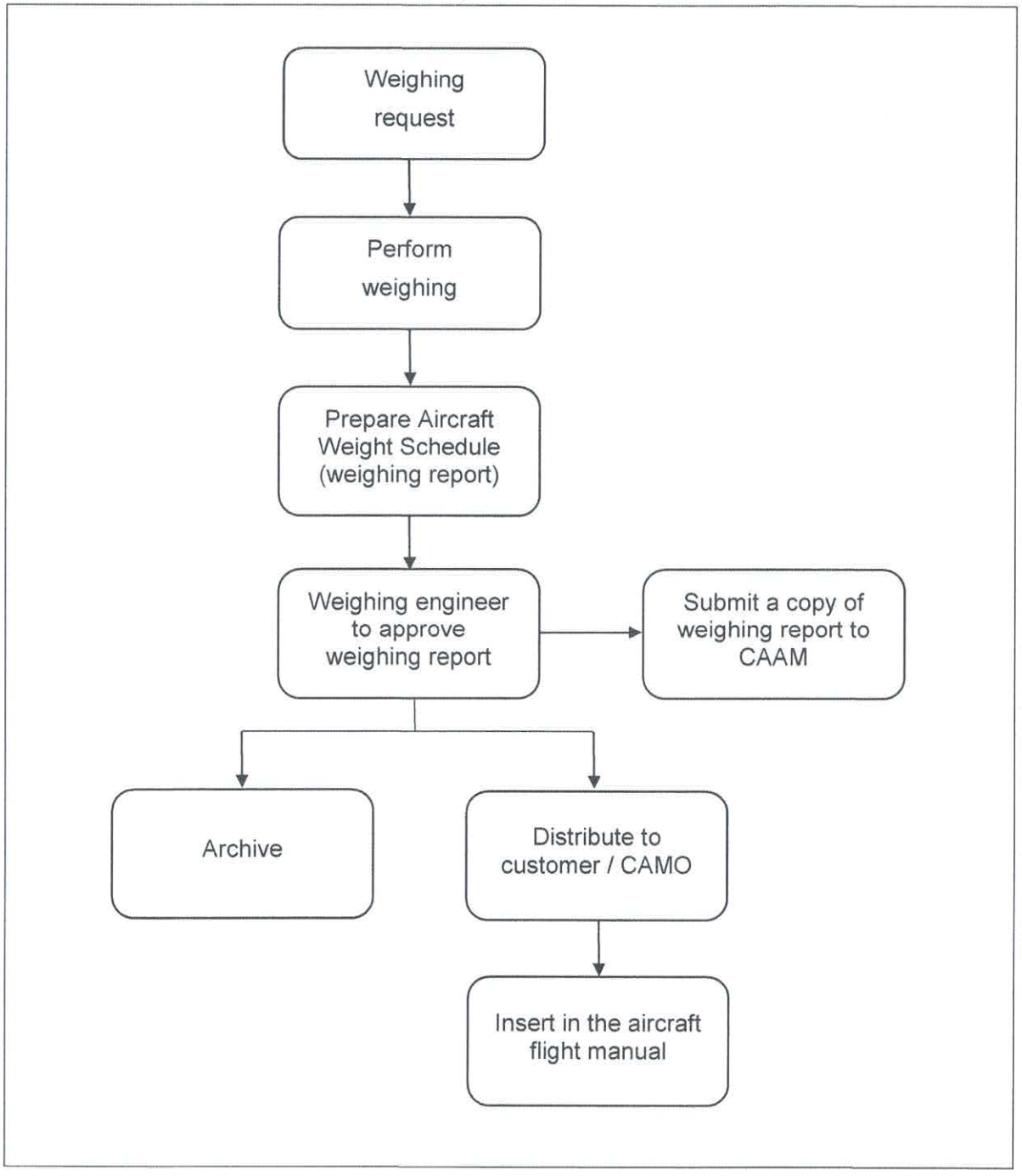
3.1.10 Aircraft can be released to fly with the new Weight and Balance Report approved by Weighing Engineer.

3.1.11 A copy of the completed and certified work sheet of the weighing performed shall be forwarded by the respective Production Planning to the weighing engineer through GAM Production Planning or directly to GAM Technical records (for weighing performed by GAM Part 145).

3.1.12 The approved Weight and Balance Package shall be archived in the library as per GAM MOE Part 2.14 (Technical Records Control). The previous weighing report shall be stamp "SUPERSEDED" and properly preserved for minimum of 3 years.

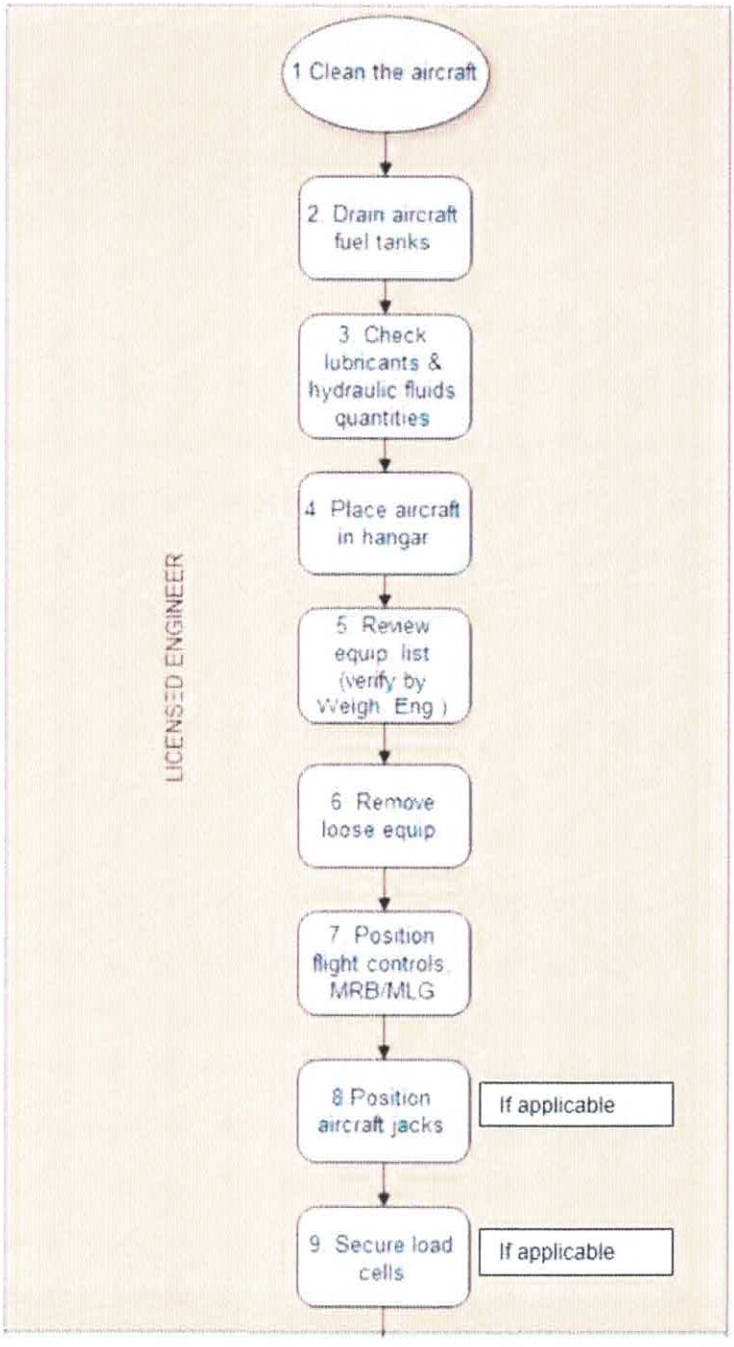
3.1.13 A copy of the approved Weight and Balance Report shall be given to the customer or CAMO who shall place the document in the respective work order, and another copy shall be inserted in the respective Flight Manual in the aircraft(s).

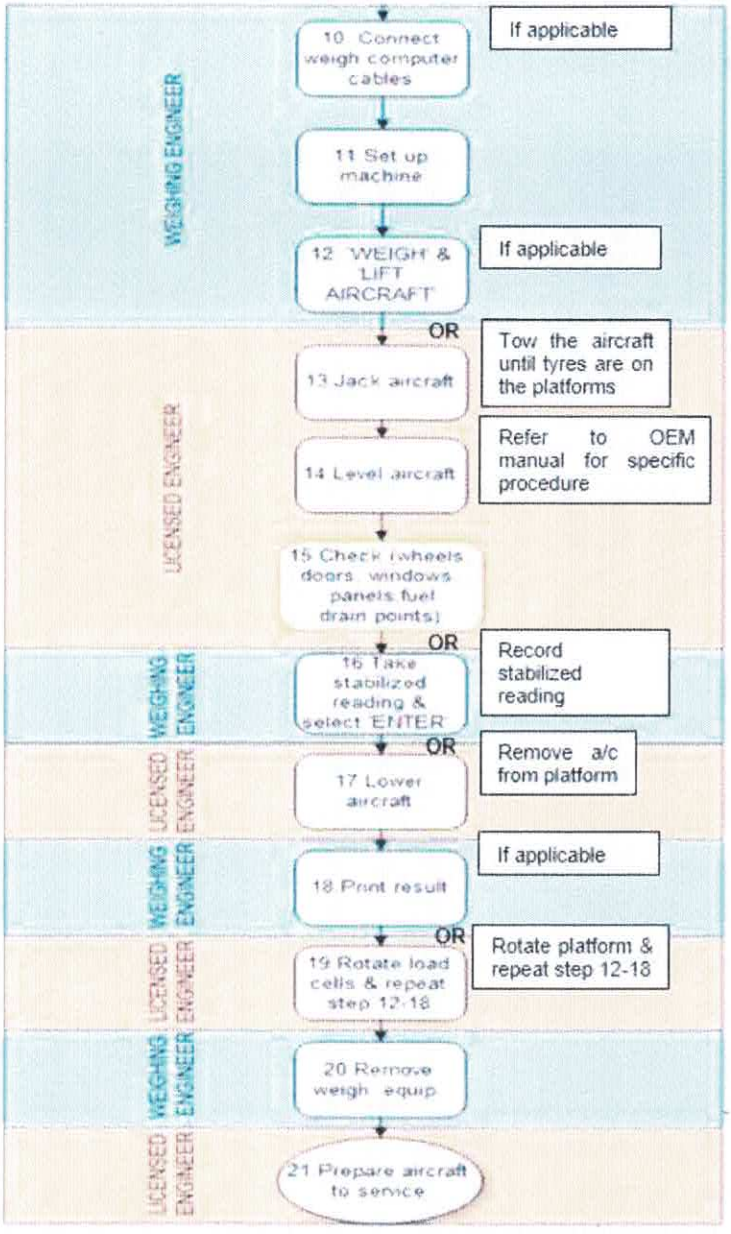
3.2 Weighing Process Flowchart (General)



3.3 Weighing Process Flowchart (Detailed)

3.4 Standard Weighing Process Flowchart





3.5 Standard Weighing Procedures (To be performed by nominated LAE, unless marked with *)

3.5.1 Clean the aircraft.

3.5.2 Drain all aircraft fuel tanks until only trapped undrainable fuel remain

3.5.3 Ensure the prescribed filling quantities for lubricants and hydraulic fluid are observed.

3.5.4 Place aircraft in hangar, where possible on firm relatively level ground or surface.
Note: To avoid any weighing error caused by wind, aircraft should be weighed in a draught free condition where possible and hangar doors are to be closed.

3.5.5 Review basic equipment list of aircraft to be weighed. Check that all equipment's are in their respective locations (as in flight). Update above list to reflect any changes.

3.5.6 Remove all loose articles or equipment which will not be included in above basic equipment list.

3.5.7 Position all Flight Controls and Main Rotor Blades or Main Landing Gear (where applicable) in weighing configuration.

3.5.8 For load cell type weighing scale:

3.5.8.1 Position aircraft jacks under jacking pad. Secure ring jack adapters on aircraft jacks. Ensure the ring adapters are centred flush on ram before tightening set screws.
Note: Ring jack adapters come with weighing computer.

3.5.8.2 Secure three of the load cells (Red, Yellow, Blue or Green) on ring jack adapters.
Note: Ensure that load cells are fully threaded into ring jack adapters and are not touching the aircraft.

3.5.8.3 *Connect weigh computer cables to load cells. Observe cables and load cells according to colour coding.
Caution: *The cables and load cells (colours) are not interchangeable.*

3.5.8.4 *Check power source voltage and connect correct power cable to weigh computer. Power up and update weigh computer "SET UP". Record the calibration date.

3.5.8.5 *Select "WEIGH" mode on the weight computer when aircraft is ready for weighing. When "LIFT AIRCRAFT" message flashes the aircraft is ready for jacking.

Note: Prior to entering "WEIGH" mode, check all load cells are not touching the aircraft, load cells cables are not crossed and aircraft wheels brakes are released before jacking.

3.5.8.6 Jack aircraft up in level attitude to prevent inducing side loads into jack points that could cause jacks to slip off the pads or overload jack points and damage structure.

3.5.9 For platform type, push or move the aircraft with tow truck until each tyre is located on the weighing platform then detach from the tow truck.

3.5.10 Level the aircraft (refer to aircraft manufacturer maintenance data for detail procedure).

3.5.11 Check that all wheels are clear off ground, remove inclinometer or any other measuring equipment if applicable. Check that all doors, windows and panels are closed and check all aircraft fuel drain points for fuel (where applicable).

3.5.12 *Allow weigh computer reading to stabilize.
Note: For JetWeigh JW series weighing scale, select "ENTER". When "REMOVE AIRCRAFT" prompt flashes, the aircraft is ready to be lowered.

3.5.13 For load cell type weighing scale: Lower aircraft in level position slowly until all load cells are completely clear of jack pads or all the tyres are off the platform.
Caution: To obtain error free and good zero return, it is important the load cells or platforms are completely clear of aircraft and related interface hardware (connectors, cables, cells) are not removed, distributed or disconnected.

3.5.14 *Allow weigh computer reading to stabilize.

Note: For JetWeigh JW series weighing scale, a "WEIGHMENT ACCEPTED" prompt will appear at the conclusion of a normal weight. Print out the weighing result.

3.5.15 Rotate the load cells or the platform and note their new locations. Repeat weighing procedure item 3.5.8.5 to 3.5.14, until two sets of error free reading are obtained, and the figures are within tolerance of ± 10lbs or 5kg

3.5.16 Remove all related weighing equipment and prepare aircraft for return to service.

3.5.17 Upon completion of aircraft weighing, LAE shall sign the maintenance release to service on the work sheet.

4.0 Compliance Matrix

Description	GAM/WBM Reference No.	MOE Reference no.
Weight and balance approval	0.3.2.	1.9.8
Weight and balance manual management	0.4.3.1	1.11.3
Weight and balance manual management	0.4.3.4	1.9.8
Documentation	0.5.2	1.9.8
Location/Facilities	1.2.1	1.8 & 1.9.8
Location/Facilities	1.2.3	2.6
Location/Facilities	1.2.4	2.1 & 2.5
Duties and Responsibilities	1.3.1.4	2.5
Duties and Responsibilities	1.3.2.1	2.10
Duties and Responsibilities	1.3.2.2	2.16
Duties and Responsibilities	1.3.3.1	3.1
Approved Weighing Engineer	2.1	1.10.2
Aircraft Weighing Procedures	3.1.1	1.9.8
Aircraft Weighing Procedures	3.1.12	2.14