Civil Aviation Amendment Order (No. R85) 2004

I, WILLIAM BRUCE BYRON, Director of Aviation Safety, on behalf of CASA, issue the following Civil Aviation Order under subregulation 235 (1) of the *Civil Aviation Regulations 1988*.

[Signed Bruce Byron]

Bruce Byron
Director of Aviation Safety and
Chief Executive Officer

12 December 2004

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1 Name of Order

This Order is the Civil Aviation Amendment Order (No. R85) 2004.

2 Commencement

This Order commences on gazettal.

3 Replacement of section 100.7 of the Civil Aviation Orders

Section 100.7 of the Civil Aviation Orders is omitted and a new section substituted as set out in Schedule 1.

Schedule 1 Substitution of section 100.7 of the Civil Aviation Orders

SECTION 100.7

ADMINISTRATION AND PROCEDURE — WEIGHT CONTROL OF AIRCRAFT

2 DEFINITIONS AND ABBREVIATIONS

2.1 Terms and abbreviations used in this section shall have the following meanings:

airworthiness officer means a person employed by CASA as an airworthiness officer (however called).

CG means the centre of gravity position of an aircraft.

empty weight means the weight as determined in accordance with this section of Civil Aviation Orders of an aircraft including all items of fixed equipment and other equipment which is mandatory for all operations, fixed ballast, unusable fuel and total quantities of oil, engine coolant and hydraulic fluid but excluding all other items of disposable load.

fleet means 2 or more aeroplanes of the same model and configuration that are operated by the same operator.

fleet (weight and CG) values means the average operating weight and average CG established for the aircraft in a fleet.

load data sheet means a document prepared in respect of an individual aircraft to provide weight and centre of gravity information for use in the loading system.

loading system means a system for ensuring that an aircraft is loaded within approved weight and centre of gravity limits at all times during flight.

maximum landing weight means the maximum aircraft weight as set out in the flight manual or a type certificate data sheet at which the aircraft may land under normal circumstances.

max T.O.W. means the maximum take-off weight of an aircraft.

operating weight, in relation to a particular type of operation of an aircraft, means the empty weight of the aircraft plus those items of removable equipment and disposable load which remain constant for the type of operation being conducted.

Regulations means the *Civil Aviation Regulations 1988*.

removable equipment means items of equipment which are carried on some or all operations of an aircraft but which are not included in its empty weight.

validation, in relation to an aircraft's weight, means the determination of the aircraft's weight in accordance with paragraph 3.5.

weight control means the determination of the empty weight and empty weight centre of gravity position of an aircraft, the development and approval of loading data, the keeping of a record of weight alterations and the overall supervision of these activities and, to the extent necessary, oversight of the control, maintenance and operation of the aircraft, in such a way as to ensure that at all times the provisions of the Regulations in respect of loading, weight and centre of gravity of the aircraft can be complied with.

weight control officer means a person holding an airworthiness authority issued under paragraph 33B (1) (e) of the Regulations.

3. WEIGHING INTERVALS

3.1 **Initial Weighing**

(1) Except as specified in subparagraph (2) of this paragraph, all aeroplanes, gliders and rotorcraft shall be weighed prior to the initial issue of a certificate of airworthiness.

(2) The weighing of an aircraft, other than a prototype aircraft, prior to the initial issue of a certificate of airworthiness is not required if the empty weight and empty weight centre of gravity position have been established to the satisfaction of a weight control officer.

(3) CASA may require an aircraft to be weighed or reweighed, as applicable, if reasonable doubt exists as to the accuracy of the weight and balance data submitted in respect of that aircraft.

3.2 Subject to paragraph 3.2.1, if:

(a) the weight of an aircraft of a type referred to in column 2 of items 1 to 4 (inclusive) of the following table has been determined under paragraph 3.1; and

(b) the aircraft is used in commercial operations;

the aircraft must:

(c) in the case of an aircraft of a type referred to in column 2 of items 1 and 2 — be reweighed at the intervals set out in column 3 of the item; and

(d) in the case of an aircraft of a type referred to in column 2 of items 3 and 4 — be reweighed, or have its weight validated, at the intervals set out in column 3 of the item.

TABLE

COLUMN 1 **ITEM**	COLUMN 2 **TYPE OF AIRCRAFT**	COLUMN 3 **INTERVAL**
1.	Multi-engine aeroplanes with a max T.O.W. of more than 2 800 kg	The aeroplane must be reweighed at: (a) the first maintenance release inspection; or (b) the first scheduled maintenance inspection; following the third anniversary of the day on which the aircraft was last weighed
2.	Rotorcraft with a max T.O.W. of more than 2 800 kg	The rotorcraft must be reweighed at: (a) the first maintenance release inspection; or (b) the first scheduled maintenance inspection; following the third anniversary of the day on which the aircraft was last weighed
3.	Multi-engine aeroplanes with a max T.O.W. of more than 2 000 kg and not exceeding 2 800 kg	The aeroplane must be reweighed or have its weight validated at: (a) the first periodic inspection; or (b) the first maintenance release inspection; following the third anniversary of the day on which the aircraft was last weighed or had its weight validated
4.	Rotorcraft with a max T.O.W. of more than 2 000 kg and not exceeding 2 800 kg	The rotorcraft must be reweighed or have its weight validated at: (a) the first periodic inspection; or (b) the first maintenance release inspection; following the third anniversary of the day on which the aircraft was last weighed or had its weight validated

3.2.1 Paragraph 3.2 does not apply to an aeroplane with a maximum take-off weight of more than 2 800 kg, if the operator:
(a) includes it in a fleet in accordance with subsection 3A; and
(b) complies with the requirements of subsection 3B.

3.3 An aircraft that:
(a) is used in private operations; and

(b) has not been reweighed, or had its weight validated at whichever interval set out in column 3 of the table to subparagraph 3.2 is applicable to the aircraft;

must not be used in commercial operations unless it is reweighed or has its weight validated before it is used in such operations.

3.4 The holder of the certificate of registration of an aircraft referred to in paragraph 3.3 must ensure that:

(a) the aircraft's log book or alternative document; and
(b) the aircraft's load data sheet;

is endorsed with the following words:

"THIS AIRCRAFT IS RESTRICTED TO PRIVATE OPERATIONS UNTIL IT HAS BEEN WEIGHED IN ACCORDANCE WITH CAO 100.7".

3.5 In the case of aircraft of a type referred to in column 2 of items 3 and 4 of the table to paragraph 3.2, a weight control officer may validate the weight of the aircraft, and issue a load data sheet, as follows:

(a) the officer must:
    (i) examine the aircraft and its log book; and
    (ii) examine the weighing summary and equipment list from the immediately preceding weighing;

    to check if the record of empty weight and centre of gravity changes is an accurate and complete record of changes in the aircraft's weight and balance that have occurred since the aircraft was last weighed or had its weight validated;
(b) if the officer considers that the record is accurate and complete, the officer may declare in writing that the record shows the aircraft's current empty weight and empty weight centre of gravity for the purposes of issuing of a new load data sheet;
(c) after making a declaration under subparagraph (b), the officer may issue a new load data sheet;
(d) if the officer issues a load data sheet under paragraph (c), he or she must make a note:
    (i) on the aircraft's load data sheet; and
    (ii) in the aircraft's log book;

    to the effect that that load data sheet has been prepared by the validation of cumulative data and not by weighing the aircraft.

3A USE OF FLEET WEIGHT AND CG VALUES

3A.1 An operator of an aeroplane to which paragraph 3.2.1 refers may include it in a fleet in accordance with this subsection and operate it using the fleet (weight and CG) values.

3A.2 When first establishing fleet (weight and CG) values, an operator must do so using the current weight and CG of each aeroplane in the fleet.

3A.3 An operator must not include an aeroplane in a fleet unless it has been weighed within the previous 4 years to establish its weight and CG.

3A.4 An operator who operates aeroplanes using fleet (weight and CG) values must have documented procedures for the establishment, review and use of those values. The procedures must:

(a) provide for the identification of aeroplanes in the fleet; and

(b) ensure compliance with the requirements of this subsection and subsection 3B.

3A.5 Subject to paragraphs 3A.6, 3A.7 and 3A.8, an operator must not include in a fleet an aeroplane:

(a) whose actual operating weight varies from the fleet's average operating weight by more than 0.5% of the maximum landing weight; or

(b) whose actual CG varies from the fleet's average CG by more than 0.5% of the mean aerodynamic chord.

3A.6 An operator may include in a fleet an aeroplane whose actual CG exceeds the maximum permitted variation under subparagraph 3A.5 (b), but only if it is operated with its individual CG.

3A.7 An operator may include in a fleet an aeroplane that has, compared to other aeroplanes in the fleet, a physical, accurately accountable difference that causes it to exceed the maximum permitted variations under paragraph 3A.5.

3A.8 An operator who includes in a fleet an aeroplane to which paragraph 3A.7 applies must make appropriate corrections when calculating the weight, CG, or both, of that aeroplane, to take account of the difference referred to in that paragraph.

3A.9 If an operator omits an aeroplane from a fleet and does not include it in another fleet in accordance with this subsection, the operator must:

(a) operate that aeroplane with its individual operating weight and CG; and

(b) reweigh that aeroplane in accordance with paragraph 3.2.

3A.10 An operator may have more than 1 fleet, with different fleet (weight and CG) values, for aeroplanes of the same model and configuration.

3A.11 An operator must only include in a fleet aeroplanes for which a mean aerodynamic chord has been published.

3B WEIGHING AEROPLANES TO ESTABLISH FLEET (WEIGHT AND CG) VALUES

3B.1 An operator must re-establish fleet (weight and CG) values for aeroplanes in a fleet at least every 4 years.

3B.2 To re-establish fleet (weight and CG) values, an operator must in the previous 4 years have weighed, on a sample basis, not less than the applicable number of aeroplanes determined in accordance with the following table:

Number of aeroplanes in fleet	Minimum number to be weighed
2	2
3	3
4 or 5	4
6 or 7	5
8-13	6
14-23	7
More than 23	6, + 10% of the number of aeroplanes over 9, rounded up, in the case of a decimal point, to the next whole number

3B.3 An operator must re-establish the fleet (weight and CG) values by using the weights and CG of those aeroplanes that have been weighed in accordance with paragraph 3B.2.

3B.4 An operator must ensure that the aeroplanes that have not been weighed for the longest time are selected when the weighing of aircraft in a fleet is undertaken for the purposes of paragraphs 3B.1 and 3B.2.

3B.5 Each aeroplane in a fleet must be weighed at least once every 9 years.

4 WEIGHING PROCEDURE

4.1 Aircraft weighings shall be carried out under the control of a weight control officer whose appointment covers the activity.

Note: Subject to compliance with paragraphs 4.1 and 4.7, a person other than a weight control officer may carry out the weighing of an aircraft.

4.2 Aircraft must be weighed on scales that:

(a) have an accuracy over the temperature range for which the scales are designed of:

(i) ±0.2% of the applied load; or

(ii) ±2 kg;

whichever is the greater; and

(b) are of a type approved for the purpose by an airworthiness officer.

4.3 Unless otherwise approved by an airworthiness officer, each scale shall have been calibrated either by the manufacturer or by a State Weights and Measures Authority within a period of 1 year prior to weighing any aircraft.

4.4 Sufficient personnel and equipment, including scales, shall be provided to satisfactorily carry out the weighing.

4.5 The empty weight and empty weight centre of gravity position shall be determined from the results of 2 consecutive and independent weighings. The load shall be completely removed from the scales between each weighing.

4.6 If the difference between the first 2 weighings exceeds 0.2% of the mean weight or 10 kg whichever is the greater, further weighings shall be performed until the results of 2 consecutive and independent weighings agree within that tolerance.

4.7 The empty weight and empty weight centre of gravity position shall be certified as correct by a weight control officer whose appointment covers the activity. Weighing details and the determination of the empty weight and empty weight centre of gravity position shall be entered in an aircraft weighing summary approved by CASA.

4.8 A list of equipment included in the empty weight shall be prepared for each aeroplane and rotorcraft.

5 LOADING DATA

5.1 In those cases where loading data prepared in accordance with this section is approved by CASA, that data shall be deemed to be directions under regulation 235 of the Regulations with respect to the method of loading of persons and goods (including fuel) on aircraft.

5.2 **Preparation and Approval of Loading Data**

(1) A load data sheet shall be prepared for each aeroplane and rotorcraft specifying the empty weight and empty weight centre of gravity position. In addition, if an operating weight is used, the operating weight and operating weight centre of gravity position shall also be specified on the load data sheet and a list of removable equipment and disposable load included in that operating weight shall be prepared. If the aircraft will require re-weighing or will need to have its weight validated under paragraph 3.2, the load data sheet must include the date of the third anniversary of the last re-weighing or validation of the aircraft.

(2) A loading system shall be prepared for each aeroplane, glider and rotorcraft unless it can be shown that the aircraft cannot be loaded in such a manner that the weight and centre of gravity falls outside the approved range while observing all compartment and seating limitations.

(2A) The loading system for an aircraft with a max T.O.W. of 5 700 kg or less may be set out on placards placed at appropriate places on the aircraft if the information relating to the loading system can be readily set out in placard form.

(3) Loading data prepared in accordance with the provisions of this subsection may be approved by a weight control officer whose appointment covers the activity. Where a flight manual page is used as the load data sheet or to specify any required loading system, 2 copies of the same shall be submitted to CASA.

Note: Such flight manual pages will be issued by CASA as a flight manual amendment.

(4) An aircraft's loading data must be stated in kilograms except in the case where the aircraft's flight manual gives the relevant information in relation to the aircraft in pounds and in such a case the loading data may be stated in pounds.

(5) The owner or operator shall keep in a safe place on the ground duplicate copies of all current approved loading data applicable to his aircraft.

6 RECORD OF WEIGHT ALTERATIONS

6.1 A complete, current and continuous record of changes in empty weight and empty weight centre of gravity position and, where appropriate, operating weight and operating weight centre of gravity position, shall be maintained for each aeroplane and rotorcraft and this record shall contain details of all alterations affecting the weight and balance of the aircraft.

6.1A If changes to an aircraft's empty weight or operating weight occur due to changes in the aircraft's equipment, the aircraft's equipment list must be amended in accordance with the equipment changes.

6.2 A new record of weight alterations shall be raised after each weighing.

6.3 Unless otherwise agreed to by CASA, the load data sheet for an aeroplane or rotorcraft shall be renewed before further flight whenever, as the result of a modification or as otherwise shown in the record of weight alterations, changes exceeding the following have occurred:

(a) for aeroplanes:

(i) the empty weight has changed by more than 0.5% of the max. T.O.W. or 10 kg, whichever is the greater; or

(ii) the empty weight centre of gravity position has changed by more than 2% of the maximum permissible centre of gravity range or 5 mm, whichever is the greater; and

(b) for rotorcraft:

(i) the empty weight has changed by more than 1% of the max. T.O.W. or 10 kg, whichever is the greater; or

(ii) the empty weight centre of gravity position has changed by more than 10 mm or 10% of the maximum permissible centre of gravity range whichever is the less.

6.4 Whenever, under the circumstances described in paragraph 6.3 of this section, a load data sheet is renewed the need for the corresponding

introduction of a loading system, or loading system revision, shall be determined in accordance with the provisions of subparagraph 5.2 (3) of this section.

6.5 Further to the provisions of paragraph 6.1 of this section, if CASA considers that adequate weight control has not been exercised over an aircraft, CASA may require that the aircraft be weighed or reweighed, as applicable, and a new empty weight and empty weight centre of gravity position determined.

6.6 A glider shall be weighed or reweighed, as applicable, when, in the opinion of CASA or an authorised person in the Gliding Federation of Australia, such a weighing is necessary. In that case, a new empty weight and empty weight centre of gravity shall be established and the need for the corresponding introduction of a loading system, or loading system revision, shall be determined in accordance with the provisions of subparagraph 5.2 (2) of this section.

6.7 Loading data renewed in accordance with this section shall be based on the new empty weight and empty weight centre of gravity position and shall be prepared and approved in accordance with subparagraph 5.2 (3) of this section.

7 CURRENT EMPTY WEIGHT

7.1 For the purposes of a direction under subregulation 235 (1) of the Regulations setting out the method of estimating with respect to an aircraft at any time the relevant weight and centre of gravity position, the applicable empty weight and empty weight centre of gravity position shall be the empty weight and empty weight centre of gravity position most recently determined and specified in a load data sheet for the aircraft, in accordance with this or previous issues of this section.

Note: CASA publication ‘Weight Control of Aircraft’ provides guidance on acceptable weight control methods.