

# IS THAT A DESIGN CHANGE?

Before installing something new on your aircraft, think about what it means for the aircraft's safety – its airworthiness – and if the installation can be done in accordance with Civil Aviation Rules.

**I**f you're not absolutely clear whether what you propose doing is a 'design change' ask yourself 'did the aircraft leave the factory like this?'

If the answer is 'no', you're probably carrying out a design change.

In most cases a design change will be a modification (the other kind of design change is a repair) that will alter the way in which the aircraft is configured.

Any items to be permanently secured to the aircraft, ie, attachment points, should be regarded as fixed installations and are therefore design changes.

Examples include a bike or kayak rack, spray equipment or even simple items like permanently mounted GPS units and cameras.

Your next question is, 'do I have the acceptable technical data to do this?'

"Installing something in or on an aircraft in accordance with a good idea is not acceptable," says CAA aviation safety advisor, John Keyzer.



// A permanently mounted GPS – an example of a design change.

"Safety can be assured as much as possible by following the instructions in, and using, acceptable technical data."

A list of what is 'acceptable technical data' can be found in Part 21 Appendix D and includes:

- (1) the approval of a modification such as a New Zealand-designed and NZ-produced bike rack, by a Part 146 aircraft design organisation
- (2) data provided by the Director of Civil Aviation in an advisory circular, such as the installation of 'non-aeronautical' electronics equipment such as a cellphone or SAT phone
- (3) supplemental type certificates issued by FAA, CASA, or Transport Canada, such as a firefighting belly tank produced in the USA that meets requirements to be installed on a New Zealand-registered aircraft.

These are only three of the ten instances of what is acceptable technical data. Be aware some have conditions attached, as per paragraph (b) of Appendix D.

Your third consideration is, 'is the modification major or not major'? They will be handled quite differently, depending on your answer. »

# MODIFICATION/REPAIR PROCESS

## Part 1 – Definitions

### Design change

A change to a type design or a change to any other part of a type certificate or type acceptance certificate that if incorporated would require the modification or repair of a product, its components, or an appliance.

### Repair

A design change that is intended to return the product, component, or appliance to its original, or properly modified configuration.

### Modification

A design change that generally results in a change to the configuration of a product, component, or appliance.

## Definition (attached to delegation)

### Major design change

A 'minor change' is one that has no appreciable effect on the:

- weight
  - balance
  - structural strength
  - reliability
  - operational characteristics
  - or other characteristics affecting the airworthiness of the product.
- All other changes are 'major changes'.

## Part 21, Appendix D – Summary

### Acceptable technical data

- NZ type certificate data sheets
- foreign type certificate data sheets used for the issue of a type acceptance certificate
- type design data for type certificated products
- approved design change data under 21.73
- data approved by the director under 21.505
- data provided by the Authority in an advisory circular
- airworthiness directives that give specific instructions for modification or repair
- supplemental type certificates<sup>o</sup> issued by the:
  - FAA
  - CASA
- supplemental type approvals<sup>o</sup> issued by Transport Canada
- manufacturer's specific instructions – ICAs, AMM, SRM, O/HM, CAD, SB etc.
- FAA AC43.13-1B
- data included, and specific to the category of an airworthiness certificate.

<sup>o</sup> Refer to rule for provisos requiring written permission of STC holder.

**NB: All acceptable technical data must be appropriate, directly applicable and not contrary to manufacturer's data.**

## Part 1 – Definitions

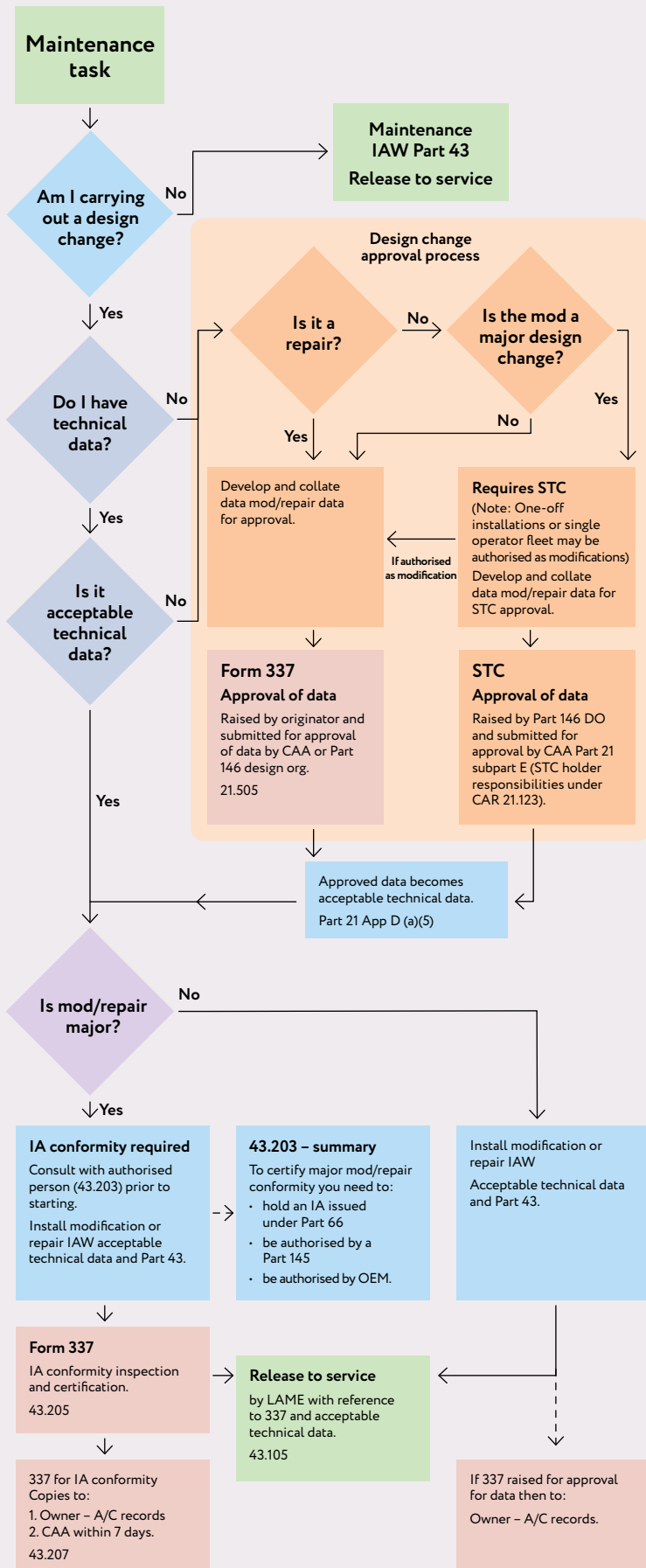
### Major modification/repair

Could embodying a mod/repair that has the potential to affect the safety of an aircraft or its occupants, result in one or more of the following incidents:

- structural collapse
- loss of control
- failure of motive power
- unintentional operation of, or inability to operate any systems or equipment essential to the safety or operational function of the aircraft
- incapacitating injury to any occupant
- unacceptable serviceability or maintainability.

## Use of form 337

Technical data	Design change	337 action
If acceptable	and not major	then no 337 action required
If not acceptable	and not major	then approval
If acceptable	and major	then conformity
If not acceptable	and major	then approval and conformity



Maintenance task

Am I carrying out a design change?

Maintenance IAW Part 43 Release to service

Design change approval process

Is it a repair?

Is the mod a major design change?

Do I have technical data?

Develop and collate data mod/repair data for approval.

Requires STC (Note: One-off installations or single operator fleet may be authorised as modifications) Develop and collate data mod/repair data for STC approval.

Is it acceptable technical data?

Form 337 Approval of data Raised by originator and submitted for approval of data by CAA or Part 146 design org. 21.505

STC Approval of data Raised by Part 146 DO and submitted for approval by CAA Part 21 subpart E (STC holder responsibilities under CAR 21.123).

Approved data becomes acceptable technical data. Part 21 App D (a)(5)

Is mod/repair major?

IA conformity required Consult with authorised person (43.203) prior to starting. Install modification or repair IAW acceptable technical data and Part 43.

43.203 – summary To certify major mod/repair conformity you need to: • hold an IA issued under Part 66 • be authorised by a Part 145 • be authorised by OEM.

Install modification or repair IAW Acceptable technical data and Part 43.

Form 337 IA conformity inspection and certification. 43.205

Release to service by LAME with reference to 337 and acceptable technical data. 43.105

337 for IA conformity Copies to: 1. Owner – A/C records 2. CAA within 7 days. 43.207

If 337 raised for approval for data then to: Owner – A/C records.

» A *not-major* change is one with no appreciable effect on the aircraft's:

- weight
- balance
- structural strength
- reliability
- operational characteristics, or
- other characteristics affecting its airworthiness.

If, on the other hand, the modification could affect the safety of the aircraft or its occupants, it's *major*, and will need an IA certificate holder to carry out a conformity inspection.

Major or not major is a decision usually made by the certifying engineer.

## Non-permanent installations

If you have an iPad®, and it's sitting in a seat pocket in the cockpit and charging via a USB port in the instrument panel, it's obviously carry-on luggage.

If, however, it's affixed in some way to the aircraft and wired directly into the aircraft's electrical system, it's considered a non-permanent fixed installation. As such, it must be installed in accordance with acceptable technical data.

"Sticky tape is not a solution," says John. "That's because if a device is carelessly taped or secured to the aircraft, it could dislodge during turbulence or other manoeuvres, jam aircraft controls, block crew vision, or even injure an occupant.

"Devices affixed in ways such as this make the aircraft un-airworthy and therefore unsafe. It's also a breach of rule 91.101."

In all cases the decision to use or to not use such items, and how they're used, rests with the operator or pilot-in-command.

## Check what the rules say

Part 1 – *Definitions and Abbreviations*

Part 21, Subpart C – *Design Changes*

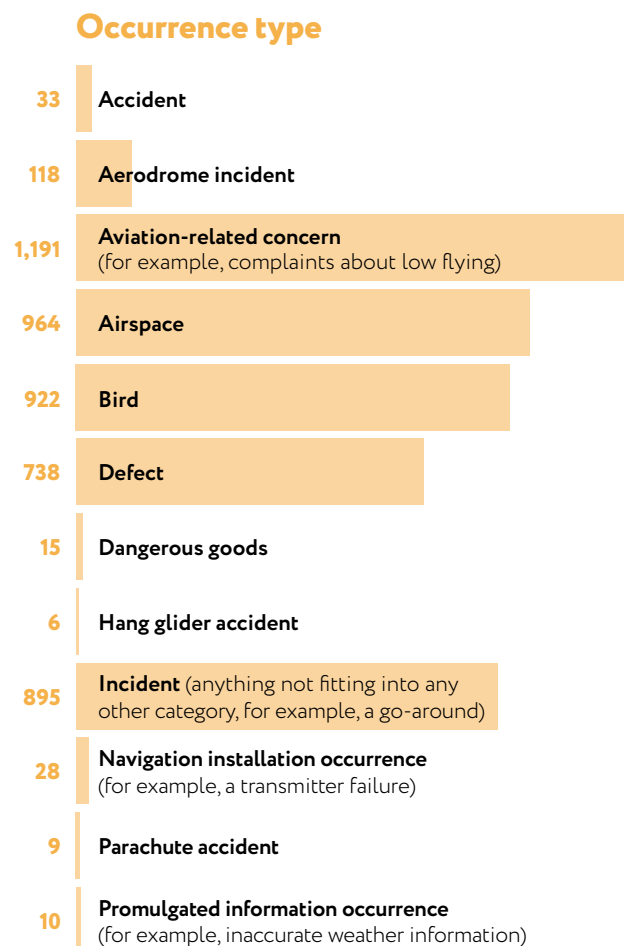
Part 91 Subpart F *Instrument and Equipment Requirements*; rule 91.501 *General requirements*

Part 21, Appendix D – *Acceptable technical data* ≡

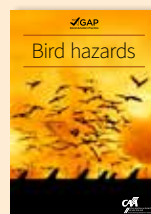
# OCCURRENCES DASHBOARD

The CAA receives thousands of occurrence reports each year. To give you a picture of the number, and types, of occurrences reported, we've created the chart below.

These occurrences were reported to the CAA between 01 January 2020 and 30 September 2020.



## // BIRD HAZARDS



The *Bird hazards* Good Aviation Practice booklet has been revised. Email [publications@caa.govt.nz](mailto:publications@caa.govt.nz) for your free copy of the booklet.