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Information Paper

Topic: Amateur-Built Experimental Aircraft

This information paper provides guidance to prospective members on building, operating and maintaining an amateur-built experimental aircraft in Australia.

1. INTRODUCTION

Australian Civil Aviation Safety Authority regulations permit enthusiasts to construct their own aircraft, fly it, and if desired, to maintain it. Commonly called “Experimental Aircraft” as that is where they fit in the Regulations, the reality is that in most cases, there is nothing “experimental” about them. They are built from well proven professional kits or designer’s plans. The aircraft must be built by the enthusiast themselves, for their own education and recreation. The aircraft cannot be used for commercial purposes, though may be used for flight training of the owner.

An extremely popular kit aircraft range today are those sold by Vans Aircraft in USA, with a range of designs from single to four seats. Thousands of these have been built world-wide, by enthusiasts at home, and they are solid, well-engineered, easy-to-fly, safe aircraft, using “proper” aircraft engines.

Other aircraft are constructed from sets of detailed plans, where the builder must source all of the raw materials and build everything.

Then there are certainly aircraft being built and operated that are truly “experimental” in nature, one-off designs, designed by amateurs, built in the home workshop.





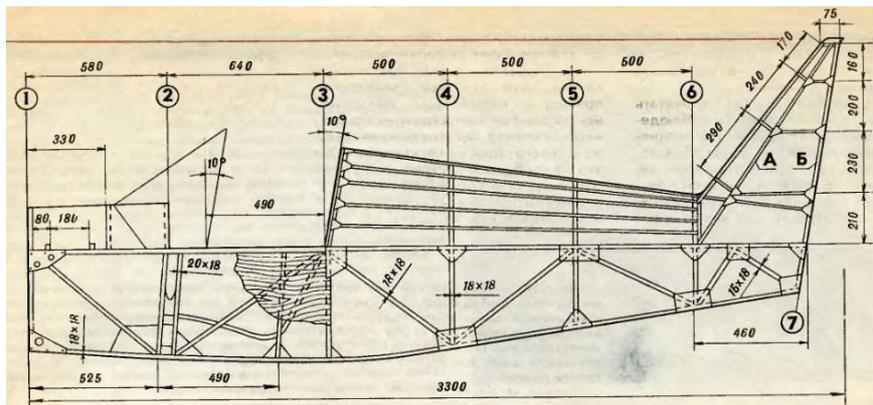
Experimental aircraft rules follow a few simple parameters. To begin with - *“build anything you like, out of anything you like, and power it with anything you like.”*

“How can that be safe?” you may ask. Well, there’s a bit more to the story of course!

During construction of an aircraft, stage inspections may be carried out by Sport Aircraft Association of Australia (SAAA) “Technical Counsellors” who have been through the process themselves, built at least one aircraft, and volunteer to assist others.

Upon completion of the aircraft, it must be weighed, and thoroughly inspected by the builder and the Technical Counsellor (plus other experienced builders and aircraft maintenance professionals if desired) and declared “airworthy” by the builder, who is **solely responsible** for the airworthiness of the aircraft. A Risk Assessment schedule is prepared, to identify any possible risks, with the aim to mitigate them by some means.

Then the aircraft must be issued an Experimental Certificate, which is a type of Special Certificate of Airworthiness. This is issued by an “Authorised Person”, a person who has been nominated by SAAA and appointed by CASA to issue those certificates. The certificate doesn’t declare that the aircraft is “airworthy” - that’s not what it’s about. The certificate is issued on the basis that the aircraft meets all of the requirements of being an eligible amateur-built aircraft within the regulations.



The Experimental Certificate issue occurs in two phases. The first “Phase 1” is for the flight testing period, restricting the aircraft to a nominated area, to follow a prescribed flight testing schedule, and for a nominated number of flight hours. No passengers may be carried on these test flights, and the flights must not occur over populous areas. That is the basis for making it safe. Safe, not for the occupant test pilot, but safe for all other persons on the ground who are not involved in the activity.

Upon satisfactory completion of the flight testing Phase 1, a follow-up Experimental Certificate is issued, called Phase 2 – ongoing operations.



In both cases, Phase 1 and 2, the Experimental Certificate contains operating conditions and limitations. These are not to protect the persons on board but, again, to protect (as far as reasonably possible) all other persons on the ground who are not involved in the activity. The occupants are considered to be “informed participants” to the activity. Passengers, though, must be advised of the experimental nature of the aircraft and advised that they fly in the aircraft at their own risk, as CASA does not set airworthiness standards for experimental aircraft.

Aircraft operating in Phase 2 – ongoing operations, may be eligible to obtain authorisation to fly over the built-up area of a city or town, subject to conditions if necessary. Usually, this will only be given to well proven designs, with a factory built certified aircraft engine and propeller fitted, due to the proven reliability they offer. Aircraft may also be eligible to obtain approval to fly at night (NVFR), or by instruments (IFR), if suitably equipped with the required navigation equipment and lights.

Experimental aircraft are maintained to the same standards as a normal light aircraft with regular maintenance and an annual inspection performed. This may be done by a licenced aviation maintenance engineer (LAME) or the builder, provided the builder qualifies via satisfactory completion of a CASA mandated Maintenance Procedures Course. This covers all of their legal obligations with regard to using appropriate maintenance data and manuals, tools, record keeping and so on. Such a course is offered by SAAA to Members.

Modifications to the aircraft may be made, however, the aircraft cannot be flown after being modified until such time as it is reviewed again by the Authorised Person. This is because the modifications might invalidate the Experimental Certificate as the aircraft is now *different* to that which was originally presented. The Authorised Person will review and may issue a fresh Experimental Certificate, which may include additional operating conditions and limitations.

SAAA has a network of “Chapters” around Australia where Members can enjoy building and flying of their own aircraft with other like-minded enthusiasts.



2. WHAT DO I NEED TO GET STARTED?

Join SAAA! You'll find membership information on our website www.saaa.com

Join your closest SAAA Chapter. You'll find details of our various chapters on our website also.

If you know what aircraft you'd like to get yourself into, see if you can locate one nearby to go have a look at it and sit in, maybe even fly in it. If you don't really know which aircraft, get yourself out and about, make contact with other Members, go visit with them and look at their aircraft, either being built or completed and flying.

There are a few main varieties of aircraft construction to consider:

All metal, all timber, composite (fibreglass or carbon), "**rag and tube**" (meaning, steel tube construction, with fabric covering) or mixtures of any of those.

Aircraft are available as kits, from basic to elaborate, to plans only (with some pre-fabricated parts available from various sources).

Generally, don't select something which does not align with your true flying needs, your abilities and your experience level.

SAAA Members are only too happy to talk about their aircraft. All sorts of advice is available from them – the Members – that is where the expertise is. SAAA *is* the Members.

SAAA Members will be able to advise you how to go about buying a kit, importing (if need be) setting up your workshop, finding the tools you need, and much, much more.

You'll need to keep some construction records and photographs along the way, to prove that *you* indeed built it. Nothing complicated in that, anything from a simple diary or log book, right up to an elaborate builder's journal set up on the computer or your Facebook page.

You'll need to have some technical stage inspections done by SAAA Technical Counsellors (TCs), who's role is to just keep you motivated and on the right track. They don't "pass" anything you've done - as the builder, you retain sole responsibility for everything on and in your aircraft. But the TC will hopefully prevent you from making mistakes, and they certainly can provide valuable how-to advice.

Via the SAAA website Members Access Areas, there is a forum section where you can ask questions on a whole range of topics. Various internet aircraft type groups exist also, where you can join with builders around the world to share your building journey.

We hope to see you sometime!