SASKATCHEWAN AVIATION MUSEUM

Avro Anson Project

Following the Second World War, stripped airframes were sold as surplus for very little money; hundreds were bought by prairie farmers who used the sheet metal, wiring, tires, fasteners and tubing for the innumerable fixes and odd jobs around a farm. Over a period in the late twentieth century aircraft restorer Harry Whereatt (Whereatt's Warbirds, Assinibioa, Saskatchewan) collected a number of Anson airframes from farms around southern Saskatchewan. In 2007 he transferred three of these airframes to fellow restorer Tom Coates (TC Aviation, Saskatoon). In 2021 Tom donated the airframes along with the large collection of Anson parts he had gathered to the Saskatchewan Aviation Museum and Learning Centre. The Saskatchewan Aviation Museum acquired our Mk I Avro Anson in October, 2021:

Airframe on the move

Arrival at the museum

Project planning began in the spring of 2022. Our overall goal at the end of the project is to have a restored Mark I Avro Anson in taxi condition. This means a non-flying aircraft with operational engines and systems representing the Anson trainers that flew in Saskatchewan as part of the British Commonwealth Air Training Program (BCATP) during the Second World War.

May 2022 – In early 2022 we acquired a dozen or so PDF copies of various Anson manuals to go with our print copy of the A.P. 1525 Anson general information manual. We also have a CD with 36 photocopies of original A.V. Roe blueprints.

The first task (on a VERY long list of tasks) is to inventory the many parts that came with the Anson. In addition to an airframe crammed full of parts:

Airframe + parts

there are four Armstrong-Siddeley Cheetah Mk IX engines, one of which is still mounted in its shipping frame and is rumoured to be a zero hour engine:

New-in-box Cheetah IX?

plus a spare nose and cockpit, a complete never used tailplane with elevators and rudder, 3 ailerons, 2 sets of flaps, seven landing gear, 3 engine mounts, a half acre of sheet aluminum (engine cowlings, fairings, fuselage panels, etc.), window frames, instrument panels, seats, innumerable brackets, clips, linkages, piping, stowage bins, fixtures, etc. that go into an airplane, plus several hundred pieces of woodwork in various stages of decay. Let the cataloguing begin!

June 2022 – Spent the month sorting a 40 foot storage container crammed full of a disarray of Anson parts into some semblance of order. Because parts were collected from more than one aircraft, there are duplicates of many pieces. Also some parts are from later model Ansons, which may or may not be compatible with our Mark I – old aircraft restoration can be like an archaeological dig.

Sorting parts

More parts

Instrument and electronics panels

Engine cowlings and landing gear parts

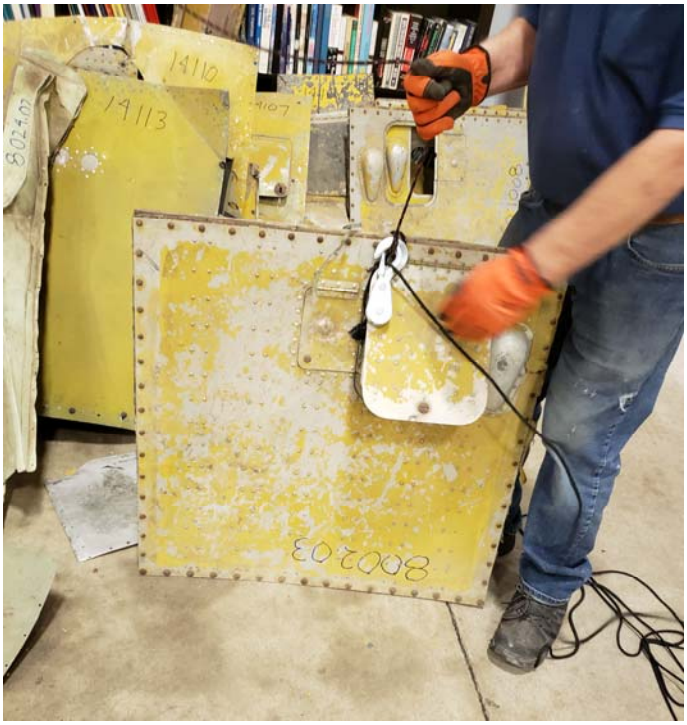
Shelves filling up

Fuel tanks

July 2022 – When the Anson was brought into the museum a lot of unattached parts were crammed into, under and on top of the airframe as there was no space to store them.

Airframe full o' parts

Obviously before any work can be done on either the airframe or these parts they will need to be removed, catalogued and stored somewhere. Fortunately there is some underutilized space in a loft above the hanger offices. We start with the aluminum panels; for a supposedly "stick and fabric" airplane the Anson has an amazingly large amount of sheet metal.



A fuel tank cover panel ready to be winched up to the hanger storage loft

Fairing

Not all the sheet aluminum is in pristine condition. Looks like somebody was using this engine cowl for step dance practice. Fortunately we have duplicates:

Damaged cowl

Even badly damaged pieces are kept for use as patterns or as reference. For instance, this weathered fragment of wing leading edge may not look like much:

Wing fragment

But it reveals a great many important construction details, including how the laminates of the rib flanges are fabricated, how reinforcement blocks and stringers fit together through the rib, the location and fit of the hole reinforcement pieces, attachment of the bonding (the electrical ground strap) and even the location of the vent eyelets for relieving the pressure differential between inside and outside the wing.

Wing fragment interior

August 2022 – finished cataloguing and storing all the sheet metal that was crammed into the airframe when it was moved into the hanger at the museum:

Sheet metal stored in the loft

Spend the next couple of weeks cleaning many kilos of bird droppings out of the airframe – for several years prior to our acquisition it was stored in a hay shed where hundreds of swallows nested. Inspection of the frame finds the only major damage is a broken frame tube just behind the rear wing spar:

Frame damage

September 2022 – the plan is to strip and repair the airframe over the winter to have it ready for media blasting and painting in the spring. We begin taking parts off only to discover that most of the many thousands of nuts and bolts are not British Standard sizes (BS is a variation of Whitworth sizing, which we have tools for), but are instead the smaller British Associated thread sizes; happy days when the order of BA wrenches and sockets arrives from England and work can continue. Amazingly, even though most of the fasteners are corroded, they (mostly) come loose with no problem (so far – fingers crossed this continues to be the case). Need to find the best way to remove rust from fasteners.

We also have a spare nose that is in better shape than the one currently in place, so that too will get stripped for painting prior to replacing the existing nose.

Replacement nose section

While cleaning the airframe we discover the manufacturer's serial number stamped into a solder plate on the right hand frame tube just above the front spar; a clue in the search for our Anson's true identity:

Airframe serial number

October 2022 – We move some large pieces in outside storage (unfortunately our limited hanger space doesn't let us keep everything inside). This fuselage centre section is from a Mk V Anson but still has many cockpit, wing and engine nacelle parts we can use:

Spare centre section

Included in our spares is the rear part of an airframe (cut off behind the wings). We cut out the section of tubing needed to replace the damaged part on our frame (see August post) plus some lengths of spare tubing (never know when you might need a frame tube) and strip the remainder of any usable brackets, clips and pulleys.

Partial airframe (that's a T-33 wing under the frame – spares for another plane at the museum)

Made a start at cataloguing parts in the steel storage container but it's getting cold and dark in there so will pick it up when the warmth and light return next year.

Winter is coming; the engines get wrapped in tarp and will go under a covered awning adjacent to the hanger. Hope to work next spring toward getting these in running condition.

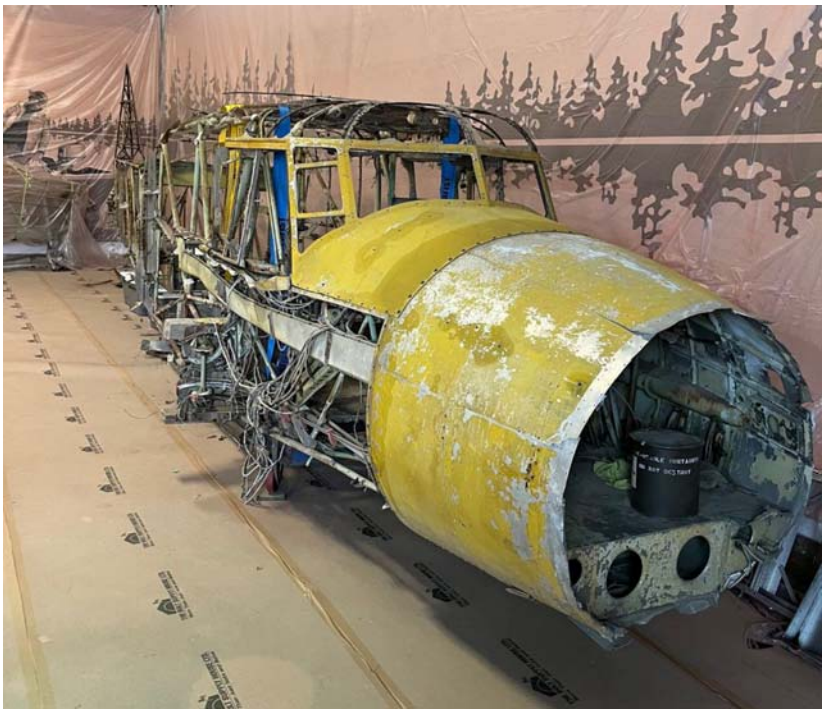
Armstrong Siddeley Cheetah engine

Engines under wraps

November/December 2022 – Big move; now that the airframe has had all the extraneous parts that were stacked in, on and around it moved into storage and an cursory cleanup done, it's time to move from the cramped space at the side of our main display hanger into the restoration hanger.

Moving day!

Of course it snows the night before the move and we have to pull 4 or 5 aircraft out of the hanger to get at the Anson, but it all goes smoothly.



Airframe in the restoration hanger

At our new home in the restoration hanger. Our roomies are the Noorduyn Norseman, which is ready to have its fabric skin installed, and the Tiger Moth, in for its winter maintenance prior to next year's flights.

Restoration Hanger – Tiger Moth, Norseman and Anson

Restoration work can now begin in earnest. The goal for this winter is to strip the airframe down to the bare tubes to have it ready to weld in the repair pieces in the spring and (hopefully) prep and paint sometime in the summer 2023.

January/February 2023 – Happy New Year! Work progresses removing and cataloging parts (the joys of bookkeeping). Our band of volunteers working on the project continues to grow – many hands make lighter work (but it's still going to take a lot of years to do this restoration).

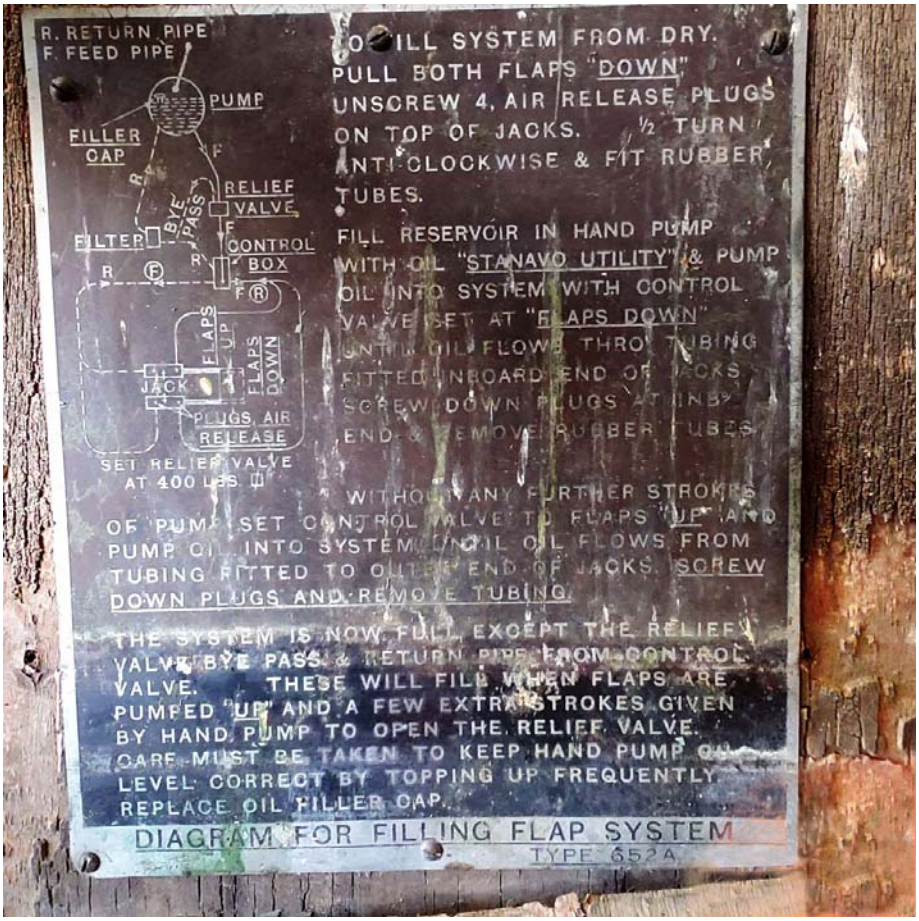
Frame tube replacement

Of course as we start taking pieces off we get a closer look at the frame members and discover a number of additional spots that will need repair – not unexpected. Each of those pink ribbons is a location that will require a welded repair:

Repair weld spots

Most of the repairs are pretty minor, mainly attachment tabs for formers that have been broken off, but a few tubes have corroded through or been cut out years ago for duty on a farm somewhere.

Always making fun little discoveries as we strip and clean. Here's a plate attached to the main spar with directions for priming the manual hydraulic system that raised and lowered the flaps:



Priming instructions for the hydraulic system

March/April 2023 – Stripping continues. Most of the airframe behind the cabin has now had the removable parts taken off and inventoried. Progress on getting the electrical system unraveled and stripping the cabin has begun.
Here's a shot of the main cable tray situated on the right side of the cabin (with lots of cables and wires hanging around it). Most of the wiring between the cockpit controls and the electrical panel at the back of the cabin is routed along this tray.

Main cable tray

The big news is that the airframe is now mounted on its new cart, design and fabrication by Greg at Brandt Engineered Products, thanks Greg!

New airframe cart

May 2023 – Frame tubes are repaired and ready for welding in place. The replacement nose has been moved into the hanger and we have begun removing parts:

Replacement nose

The aluminum/Elektron skin is in quite good shape. But, oh man! Those hundreds of tiny, tiny nuts and slot head screws (Number 6 British Associated) in the window framing to hold all the glazing in place! They look fairly corroded (as one would expect from decades out in the elements), but amazingly most come apart with little fuss.

The front panels of the existing nose are just about ready to be removed:

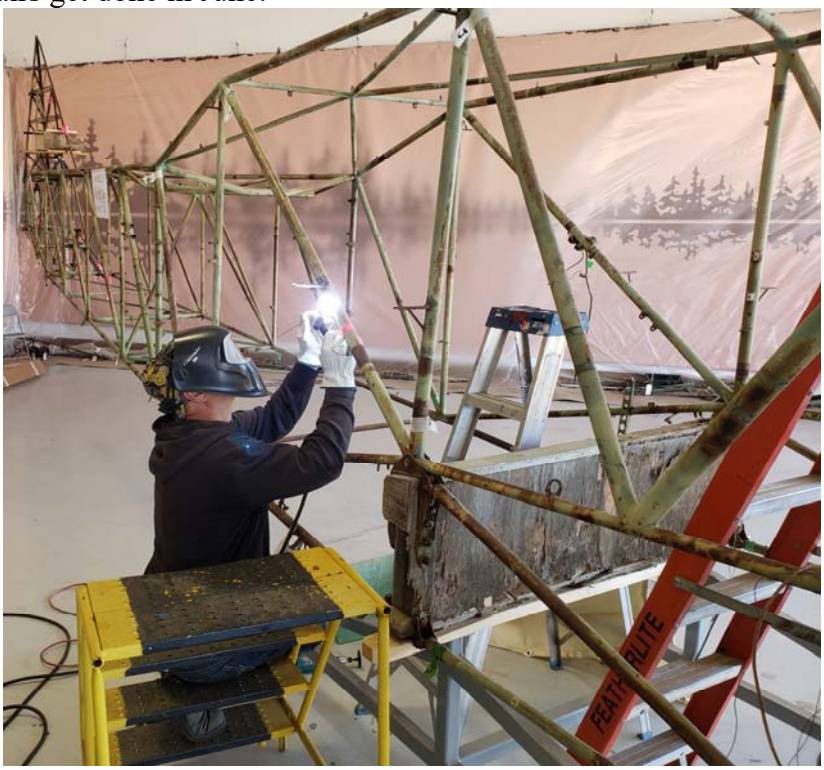
Damaged nose coming off

Still plenty of bits and pieces to take out of the cockpit before we begin prep for painting. Hopefully having the old nose off will make that easier.

June-July 2023 – Stripping the frame continues, working on the instrument panels, control columns and the equipment under the cockpit floor. Just the cockpit floor itself, a bit of wiring, some brackets and the rudder controls to remove now:

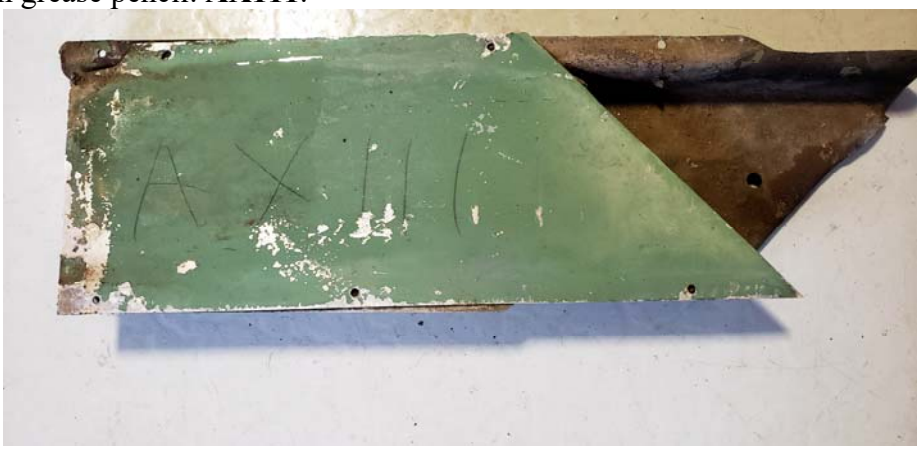
Airframe nearly stripped

Welding repairs get done in June:



Welding a new shelf bracket in place

BIG NEWS!!! The true identity of our Anson has been discovered! From the airframe serial number and records from the Avro Heritage Museum, we knew our aircraft was from a production block of four delivered to the RCAF: AX110, AX111, AX114, AX116, and that it was most likely AX111 or AX116 as these two had been sold from dispersals in southern Saskatchewan. From the amount of wear and some nose damage it seemed that AX116 was the most likely candidate. But in early July when the cover for the landing gear chain was removed from the underside of the cockpit floor, we found marked in grease pencil: **AX111**:



AX111

So we finally know for certain the serial number of our Anson.

By mid July all the major pieces are out, just cleanup now before we can begin prep for painting:

Stripped airframe

In celebration of our landmark accomplishment the Snowbirds arrived to commemorate the occasion:

Snowbirds mark Anson milestone

OK, maybe they were coming to do a show in Saskatoon anyway, but we certainly appreciate them stopping in at the museum and drawing a very enthusiastic crowd.

August 2022 – A milestone, the last piece is disassembled from the airframe (the undercarriage crank on next to the pilot's seat). It's all uphill from here ☺! Sanding the bare airframe begins. Another month or two until painting happens?

Sanding the airframe

The Cheetah engine in its nacelle gets moved into the hanger so we can clean it up and begin planning engine work. In my spare time I start reading up on aircraft magnetos; quickly come to the realization that their operation is comprised of roughly equal parts blacksmithing, Voodoo and quantum mechanics! Head hurts, back to sanding frame tubes. Whole new respect for the amazing inventors who dreamt up the incredibly complex operation of these devices in the late 1800s, long before computers, oscilloscopes or signal analyzers.

Cheetah Mk IX and nacelle

Lots of interest in the project at our annual museum Aviation Days (and hopefully some new recruits for our pool of volunteers).