



Hawker Hurricane MK IIA – Z3055

RESTORATION STORY

The Malta Aviation Museum's Hawker Hurricane Mk IIA Z3055 was recovered from the seabed off Wied iz-Zurrieq (Hamrija Bank) during the summer months of **1995**. It had been ditched there on the 4th of July 1941, by Sgt/Pilot Thomas Hackston following engine seizure. The wreckage of the submerged aircraft had been discovered by scuba-diver David Schembri in 1993. Cassar Enterprises kindly offered, at no cost to us, the use of an A-frame barge to enable the lifting of the aircraft to take place. Scuba divers helping out were David Schembri, Charles Tanti and Michael Gauci.

The initial phase of restoration by the Malta Historic Aircraft Preservation Group was sponsored by Frank Salt of Frank Salt Real Estate Limited in memory of his father Flt Lt J H Salt and the ground crews that served with him during the WWII.

It had been decided at the beginning of the reconstruction project that we were to aim for a static restoration but as matters unfolded, and the group gained experience, it was agreed that the final goal should be to have the aircraft completed to taxiing condition. Such a task was to be a great challenge and undertaking for a small group of volunteers, which involved hard physical work, and the sourcing of funds required to foot the bills!

The first step was to remove fifty-four years of barnacles and encrustation from the structure, followed by its dismantling and cleaning of each separate item. By **1999**, the airframe, consisting of a Warren Truss structure, was essentially completed.

As the Hurricane has a fair amount of wooden framework, this work was entrusted to Lorry Borg, an experienced wood turner by profession, and a member of our group. Luckily we were gifted at that time a newly-built wooden cockpit 'dog kennel', coming all the way from the USA. The time had come to start the trial fitting of the woodwork that gives the Hurricane its very distinctive 'hunchback' shape. At the same time, David Polidano, the museum's engineer, was working on the cockpit area, which involved the sourcing of appropriate period instrumentation and controls that still worked, or could be brought to working condition. An instrument panel was also manufactured.

The engine cooling system, oil cooling system, braking and pneumatic system also needed sorting out. While all this 'plumbing' was being looked into, we also had to bear in mind the requirements of the fuel, hydraulic and electrical systems.

During **2000**, Lorry Borg had permanently installed all woodwork. The rudder and elevator with control cables, had been rigged and were functioning properly. Ray Ebejer, the group's fitter-turner entrusted with all precise engineering, worked on the complicated elevator trim mechanism.

The Millennium 2000 was the year that work was started on the aircraft's proposed 'new' power-plant, the Rolls Royce Merlin. Andrew Cilia was entrusted to lead this project. He was joined by Mario Zammit, John Hawkins, James Watson, Ray Ebejer and David Polidano. A close look was had at the various Packard Merlin 224 parts that were on hand, to determine the feasibility of getting a Merlin up and running.

The engine restoration group was lucky to benefit from the expert advice of Hedley Griffiths of Jersey Aviation. In February 2000, Mr Griffiths was invited to come to Malta specifically to coach the group on the workings of the Rolls Royce Merlin



engine. Asked to assess the feasibility of the project he confirmed that most of the required parts to complete the job were available.

It was decided to start off with the overhaul of two cylinder heads. After several months of hard work results were showing. This period was not without obstacles, ranging from punctured water passages to bent valves to missing rocker gear. The group is greatly indebted to Maurice Caruana Engineering for helping out with aluminium welding and the loan of specialized tooling during this trying time.

Around November of that year, Paul Cardona donated a complete but non-running Merlin 224 engine. With this addition, it was certain that enough parts were now in hand to make up one complete serviceable engine.

2001 saw the fuselage structure virtually complete and close to be fabric covered. The cockpit area was also 90% complete. A few minor adjustments to the woodwork were required and by Easter, it was time to have the fuselage covered. This undertaking was entrusted to Vintage Fabrics UK, headed by Clive, Linda and Andrew Denney. During the Easter holidays Linda, Andrew and David Polidano were hard at work covering the many wooden panels, tail surfaces and fuselage with fabric. After a fortnight of non-stop work, all the fabric work was completed and it was then time to start adding the rib tapes. Clive came over from the UK to carry out this very precise task. The next step was the application of red dope.

2001 also saw the continuation of the Merlin engine rebuild, which by now was looking brand new. We were kindly assisted in this task by a generous donation from Sir Ralph Robbins, chairman of Rolls Royce Plc.

Ray Ebejer next constructed a test bench for trial engine runs following the fitting of the super charger. Plumbing the engine to instrumentation was next. By **October, 2001**, a date had been set to ground-run the engine for the first time. The 8th of December saw an attempt to start the engine but due to several snags, the engine failed to start. After repairing a faulty magneto switch and improving the P leads, it was decided to have another go on the **13th December, 2001**.

Again, the engine failed to start on that day and after a couple of backfires (and very noisy ones too!) Mr Griffiths was consulted and it was determined that the timing was incorrect and the group set out to rectify the problem. It was found that the timing was 180 degrees out! Once this was sorted out, the engine just needed a final check to ensure that everything was



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in order. The engine was primed twice, the booster coil pressed, magnetos on, the starter button pushed and the Rolls-Royce engine roared to life with that spine-tingling melody that only a Merlin can produce! Struck by a mixture of euphoria and panic, the first reaction of the group was to switch the monster off!!! - a job they managed to do safely! Out came the champagne followed by congratulations.

This was a very significant moment for the Museum as from then onwards Malta has a resident working Merlin for the first time in over fifty years. Moreover, the group proved to themselves that they were able to accomplish tasks that were believed to be beyond them. The Merlin was run every weekend of **December 2001**, to make sure that everything was working to satisfaction.

January 2002, and it was time to offer up the engine to the airframe. A Saturday morning date was set and the workshop was cleaned and tidied beforehand (a historic occasion in itself!). The fuselage was rolled to the front of the workshop in readiness to receive the engine. The engine then was winched into place and secured; an operation that took the best part of a morning. Hurricane Z3055 now had a fully functioning engine once again.

The project now started to look more like a Hurricane. February saw the museum restorers plumbing the engine to the airframe. A radiator including oil cooler was obtained from the Cambridgeshire Bomber and Fighter Society in exchange for a two-bladed wooden Watts propeller made purposely in our workshops by our director Ray Polidano, and ably assisted by Lorry Borg, Tony Spiteri, John Hawkins and Sandro Magri.

This radiator/oil cooler obtained was in a very poor condition and required re-coring and repair work to its tanks. Somebody capable of reinstating it had to be found. Following enquiries, John Rummery of Replicore Radiators, New Zealand, was contacted. He had past experience with Hurricane radiators and is the only known supplier that produces the original Serck hexagon tube pattern used on the Hawker Hurricane radiators. This special core had been specifically designed for use on the Hurricane. This improved cooling efficiency by 21%, which is especially important in ground-running an aircraft. It was therefore decided that Replicore's package deal was best suited and the radiator was shipped to New Zealand for rebuilding to serviceable condition.

Another important aspect of this restoration project was the propeller overhaul. At first a three bladed wooden Dowty Rotol propeller was contemplated for the fighter. This idea was eventually dropped owing to the high costs involved. At this stage it was beginning to look as though the whole project would stall for want of a propeller. A de Havilland propeller hub (to match our 'new' engine) was located purely by accident within our stores – this got the ball rolling once again. A brand new set of Hamilton Standard propeller blades could now be used to assemble a Hamilton Standard propeller as was built under license by de Havillands.

The aircraft's front cowlings were beyond the capability of manufacture by our group as these involved curves all over. Therefore they were specially ordered from an overseas

workshop for our aircraft. During **May 2002** the cowlings, manufactured to a very high standard, were delivered to our workshop. These and other cowlings and fairings were fitted during the following month with the help of James Watson.

In **September 2002** the radiator was returned from New Zealand. It was then fitted to the aircraft and the cooling system was then complete.

The electrical installation was capably handled by Andrew Cilia while Ray Ebejer was kept busy manufacturing several complicated hydraulic components. Ray managed to manufacture an automatic-cut out, a flapjack, a catch gear jack, a variable flow valve, and several other items required for the completion of the hydraulic system. The last major item to be added to the aircraft during that year was the freshly overhauled de Havilland propeller.

By March **2003** the focus turned to the completion of the windscreen and canopy. The canopy gave the group some trouble to fit properly and took a bit longer than initially expected, however the end result is an original and free running canopy that seals well with the windscreen.

By this time the hydraulic components were completed and individually tested, so they were installed in the aircraft as a complete system. After the hydraulics were in place the centre section flaps were manufactured and essentially the external appearance of the fuselage was complete.

It was now time to have the aircraft prepared for its camouflage paint scheme, so preparation work, such as painting the fabric covered parts in silver dope and priming the front aluminium panels were taken in hand. All this work was completed by end July and it was time to ask the Vintage Fabrics team to return and spray-paint the aircraft in its final wartime scheme. The fuselage still lacks fuel tanks and brakes. These will be fitted to the aircraft once the wings are completed and fitted to the aircraft.

Work commenced on the construction of the wings during **2004** and a new set of the main spars of the wings, from patterns taken from the wreckage of a Hurricane which crashed in Russia, was taken in hand. By the end of **March 2005** work on one wing was completed whereas work on the second wing are about half way through.

September 2005 saw Hurricane Ila Z3055 (although not yet complete) placed within the Air Battle of Malta Memorial Hangar for public display.

As one may appreciate, the amount of money required to complete this project is substantial. The Malta Aviation Museum Foundation has managed to get this far thanks to a number of sponsors, benefactors and volunteers. There is still some way to go before realising the dream of having a taxiing Hurricane.

The search for more sponsors and benefactors is an ongoing process. It is only with such help that this dream can become reality.