

Excavations, Surveys and Heritage Management in Victoria

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Front cover:

Participants at the zoom webinar panel discussion by Traditional Owners at the 2021 Colloquium. Top row: Darren Griffin, Liz Foley, Dave Wandin—Wurundjeri Woiwurrung; bottom row: Racquel Kerr—Dja Dja Wurrung, Tammy Gilson—Wadawurrung, Ben Muir—Wotjobaluk and Jardwadjali. (Screenshot by Caroline Spry)^e

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Editorial note

The papers included in this 10th issue of *Excavations, Surveys and Heritage Management in Victoria* were presented at the annual Victorian Archaeology Colloquium held on-line via zoom webinar between 1 and 4 February 2021. This allowed even more than our usual number of people to register as participants, including some from interstate and overseas: their commitment and involvement testifies to the importance of this fixture within the local archaeological calendar. Many were fortunate to be able to meet in person, under appropriate protocols, for an outdoor boxed lunch at La Trobe University on 5 February.

We have taken the opportunity of celebrating our 10th anniversary by looking back over the last decade, both through a more formal analysis and through a less formal panel discussion of the history of the Colloquium and this publication. Another panel discussion transcript allows space for some Traditional Owners to reflect on particular examples that they feel have been of value in the complex process of cultural revival through a form of experimental (perhaps better experiential) archaeology.

The other papers published here deal with a variety of topics and approaches that span Victoria's Aboriginal and European past. While some papers report on the results of specific research projects others focus on aspects of method, approach, education and the social context of our work and approach. These all demonstrate how our Colloquium continues to be an important opportunity for consultants, academics, managers and Aboriginal community groups to share their common interests in the archaeology and heritage of Victoria.

In addition to the more developed papers, we have continued our practice of publishing the abstracts of other papers presented at the Colloquium, illustrated by a selection of the slides taken from the PowerPoint presentations prepared by participants. These demonstrate the range of work being carried out in Victoria, and we hope that many of these will also form the basis of more complete studies in the future. Previous volumes of *Excavations, Surveys and*

Heritage Management in Victoria are freely available through La Trobe University's institutional repository, Research Online <www.arrow.latrobe.edu.au:8080/vital/access/manager/Repository/latrobe:41999> and through Open at La Trobe (OPAL) <<https://doi.org/10.26181/601a321a11c0d>>. We hope that this will encourage the dissemination of ideas and information in the broader community, both within Australia and internationally. We have also now set up a website for the Colloquium <<https://victorianarchaeologycolloquium.com>>

For the first time we have included an obituary to mark the passing of a member of our community: David Rhodes of Heritage Insight, a long-time supporter of our activities. Here we should also mention that we have also lost Ron Vanderwal who made important contributions to archaeology and the curation of heritage, although he was unable to participate in the Colloquia.

Once again we have been fortunate in the support given to the Colloquium by many sponsors: ACHM, Ochre Imprints, Heritage Insight, Biosis, ArchLink, Christine Williamson Heritage Consultants and Extent, while La Trobe University continued to provide facilities and a home for our activities, even if this year it was a virtual one. We would like to thank them, and all others involved for their generous contributions towards hosting both the event and this publication. Yafit Dahary of 12 Ovens was, as always, responsible for the catering, despite the limitations on her usual spread.

All papers were refereed by the editorial team. This year Deb Kelly managed this process and the sub-editing of this volume. Layout was again undertaken by David Frankel. Preparation of this volume was, like so much else in the last year, undertaken during the severe restrictions imposed because of the COVID-19 pandemic. We hope that 2022 will be a better year for all.

The presenters, editors and authors acknowledge the Traditional Owners of the lands and heritage discussed at the Colloquium and in this volume, and pay their respects to their Elders, past, present and emerging.

Mapping Victoria's Second World War defensive air power and early warning system

Daniel J. Leahy¹

Abstract

With the outbreak of the Second World War in the Pacific beginning in December 1941, came the legitimate threat of an aerial offensive by Japan upon Australia. The Melbourne area had been overflown by a Japanese aircraft as early as February 1942. To combat the threat, a network of Royal Australian Air Force (RAAF) radar stations and a series of Volunteer Air Observer Corps (VAOC) observation posts were established. This intricate system was co-ordinated by the No. 7 Fighter Sector, RAAF, whose headquarters were located in the Melbourne suburb of Preston. From there, RAAF fighter aircraft could be ordered to 'scramble' and intercept any enemy attackers if and when required. However, in addition to its defensive purpose, the web of VAOC observation posts were also used to help friendly aircraft which had become lost, with such facilities across Australia being credited for helping 2,000 aircraft in 1944 alone. This paper presents details of the Victorian components of a current research project that involves mapping Second World War aviation sites across Australia, to gain a greater understanding of the country's air power capabilities at the time. The preliminary results of this study indicate that a state-of-the-art early warning system was in place across Victoria, yet despite this, analysis of historical records suggest that if any enemy aerial attack on Melbourne was made during December 1942 it would have gone almost completely unchecked.

Introduction

Air power has been defined as 'the ability to project military force by or from a platform in the third dimension above the surface of the earth' (Armitage and Mason 1983:4). Throughout the Second World War, Australia's strategic position changed greatly (Palazzo 2013:59) and with it, the nation's air power capabilities also evolved. The study of this system through the investigation of surviving sites and artefacts aligns with studies associated with the field of 'aviation archaeology', which has been broadly defined as, 'the investigation of material remains associated with the act of flying' (Shanahan 2018:1) within the Earth's atmosphere.

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Today, the first two air raids on Australian soil (those that took place at Darwin on the morning of 19 February 1942) are well known by the general public. Since 2011, the events of that day have been commemorated as a national day of observance (Fitzgerald 2021). While it is often reported that Darwin was attacked 64 times during the Second World War (e.g. Coulthard–Clark 2002:36; Owen and James 2013:92; Stanley 2021), few people are aware that over 200 Japanese attacks and reconnaissance flights actually took place over northern Australia (including sites in Western Australia, the Northern Territory, and Queensland) between 1942 and 1944 (Lewis 2017:11). Fewer still are aware that Japanese reconnaissance flights occurred as far south as Melbourne and Hobart in early 1942 (Dunn 2020). In response the Australian military and civilian services put in place an early warning detection system and aerial defensive measures to counter any further Japanese incursions in the southern states.

This paper aims to discuss the sites relating to Victoria's defensive air power and early warning system that have been identified as part of a larger project investigating the archaeology of Second World War air power in Australia. This is achieved by presenting the results of a desktop study to locate such sites within the modern landscape, and by discussing the history and current status (or ultimate fate) of each. Using historical information regarding how this air power system was tested during December 1942, it will consider that if Japan were to have launched attacks on Melbourne, (similar to those launched on Darwin) they would have gone almost completely unchallenged by Australian Defence Forces.

Methods

The results presented in this paper are largely based on a desktop study conducted during 2020. To date, this research has included finding references to addresses stored in archival material, such as RAAF unit Operations Record Books, and historical charts of RAAF facilities. It has also involved identifying sites in wartime and modern photographs, including aerial imagery. Such methodology is known as 'aerial archaeology' has been used to locate and identify archaeological sites for over 100 years (e.g. Crawford 1923; Reeves 1936:102). Once

identified, these sites are recorded in a Microsoft Access database, the data from which is planned to be made freely available to the public through a dedicated website from March 2022. The study by Ford (2006) while focussing on airfields failed to include the majority of the site types covered in this paper, suggesting avenues for additional studies in both aviation and conflict archaeology within the state of Victoria.

In 2020 it was planned to conduct reconnaissance surveys at a number of the sites discussed within this paper in the hopes of 'ground-truthing' what has been identified in aerial imagery, the historical record and for the purpose of photographing any remaining structures. Unfortunately, the recent coronavirus disease (COVID-19) pandemic brought about a number of border closures and travel restrictions between Victoria and New South Wales throughout the year (e.g. Boseley 2020; McGowan 2020). This has limited the author's ability to conduct such fieldwork, as such, this has restricted the project to being mostly a desktop study.

Historical background

Fighter aircraft in Australia 1939–1942

In late August 1939, just days prior to Australia joining Britain in declaring war on Germany, the closest thing that could be considered as a fighter aircraft force for the RAAF were a series of 54 antiquated Hawker Demons and seven newly acquired Wirraways (Gillison 1962:57). The Hawker Demon was a British-made biplane, of which deliveries to the RAAF began in 1935 but by the outbreak of war, the survivors had been 'relegated to roles such as training, communications, and target towing' (RAAF History and Heritage 2021:51–52). The Wirraway, built by the Commonwealth Aircraft Corporation (CAC) located at Fishermans Bend, was a two-seat monoplane built to meet the RAAF's 'general purpose and training aircraft' needs (RAAF History and Heritage 2021:114–116). Five of these Wirraways were immediately sent from Victoria to Darwin in September 1939 as part of No. 12 Squadron, RAAF, and in the process quite literally became Australia's frontline of defence against any aerial aggressor (Eaton 1939).

For the next two years the war seemed a 'distant disturbance' (Palazzo 2013:59). Australian air power was primarily used to train aircrew under the Empire Air Training Scheme (EATS). These personnel would then go on to fight Britain's enemies in the skies above Europe and North Africa (Leahy 2018:8). As part of the EATS, Wirraways were used as trainers by numerous Service Flying Training Schools across Australia. As war with Japan grew more inevitable, the RAAF sent Wirraways and personnel from No. 21 Squadron to assist in the defence of Malaya and Singapore. No. 24 Squadron supplied personnel and Wirraways to defend Rabaul, on the island of New Britain in what is now Papua New

Guinea (RAAF History and Heritage 2021:116). On 20 January 1942, the Wirraway aircrew at Rabaul put up a valiant defence against Japanese carrier-borne aircraft but were ultimately annihilated (Claringbould and Ingman 2017:63–71; Gamble 2010:27–30; McAulay 2007:111–114). As a result, the following day the RAAF ordered that Wirraways were no longer to be used as fighters in air-to-air combat (Walker 1942:92). This left the RAAF with nothing resembling a fighter to defend the Australian mainland against attacking Japanese aircraft and is why those at Darwin remained grounded during the first bombing attacks there in February 1942.

Throughout 1942, American fighters such as the Curtiss P-40 Warhawk (known as the Kittyhawk in British Commonwealth service), were shipped to Australia before being ferried to United States Army Air Forces (USAAF) and RAAF units, in the north of Australia, and the islands of the Southwest Pacific (Hess 2004:9–24; RAAF History and Heritage 2021:154). More obsolete fighters were also arriving, many as 'refugee aircraft' from the Netherlands East Indies (now Indonesia) as the Japanese took further control of that colony (Boer 2020). Some of these were operated as rear echelon 'hack' aircraft and crashed in Victoria (e.g. Aitchison et al. 2020; Leahy 2019). Between August and November 1942, a total of eight Republic P-43 Lancers were delivered to the RAAF from USAAF stocks and were intended for use as photographic reconnaissance aircraft (RAAF History and Heritage 2021:239). By 1942 the Lancer was already considered obsolete as a fighter aircraft and, as such, a total of just 273 aircraft were built (Wilson 1998:148). As of late 1942, some of these aircraft were undergoing various modifications at No. 1 Aircraft Performance Unit, located at RAAF Station Laverton (**Figure 1**), prior to being flown to No. 1 Photographic Reconnaissance Unit in the Northern Territory. It was this type of aircraft that would be 'scrambled' into flight to defend Melbourne that December.

Radar in Australia

During the late 1930s, radio detection and ranging (radar) was originally developed in Britain as a method of detecting enemy aircraft over friendly territory (Hobbins 2019:44). With the release of information from Britain and the establishment of research centres in both Britain and Australia, came the foundation for the development and manufacture of radar equipment in this country (Mellor 1958:430). It was determined that if Japanese aircraft could be detected at a distance of 100 miles (160.93 km), then sufficient warning could be given to enable fighter aircraft to intercept the enemy formation (Mellor 1958:434). Within two weeks of the Japanese attack on Pearl Harbor in December 1941, the Postmaster General's (PMG) Department had established its own air raid warning system, including radar, covering the Sydney area (MacLeod 1999:412).

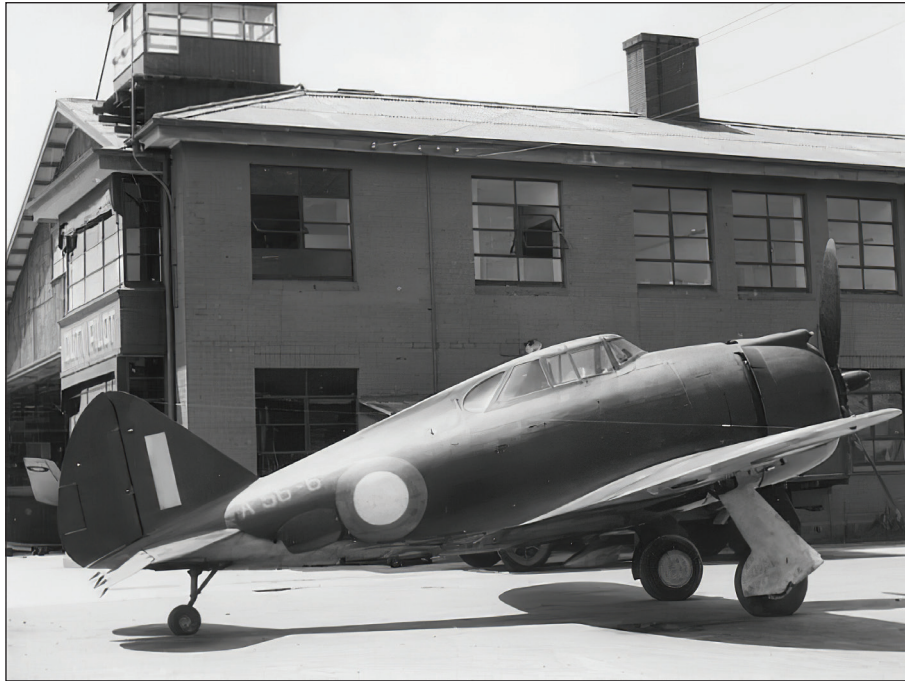


Figure 1. Republic P-43 Lancer A56-6 at RAAF Station Laverton, September 1942 (RAAF; via ADF-Serials)

Although radar equipment had been sent to Darwin, it had not been erected prior to the first air raid there on 19 February 1942 (Mellor 1958:435). It was not until the sixth attack on Darwin, which took place on the morning of 22 March, that No. 31 Radar Station at Dripstone Cliffs was used to detect enemy aircraft and then to successfully direct P-40s of the 9th Pursuit Squadron, 49th Pursuit Group, USAAF to intercept (Clayton 1986:40–41; Hess 2004:12; Lewis 2017:57–58; Minnett 1999:440–443).

During the conflict, 130 radar stations were established at sites around Australia, the majority along its coastline (e.g. Hobbins 2019:44–47; McKellar 2004:3; Owen and James 2013; RAAF Historical Section 1995b:25–47). These stations were mostly used to search for shipping and aircraft seaward and were often of little use searching for aircraft over land where a network of civilian observers was used.

Volunteer Air Observers Corps

In late 1941, the Volunteer Air Observers Corps (VAOC) was established as part of Australia's aerial defence plan for the interception of Japanese aircraft. The VAOC was modelled largely on the British Royal Observer Corps made famous during the Battle of Britain for its reporting of German aircraft positions to the Royal Air Force's Fighter Command (*The Kiama Reporter* 13 Dec. 1944:4). Articles appeared in local newspapers seeking the enrolment of suitable personnel (men or women) to form air observation posts within their local districts (e.g. *The Numurkah Leader* 28 Jul. 1942:2; *Portland Guardian* 5 Jan. 1942:2). Ideally, such observation posts

were to be located approximately 10 to 15 miles (16.09 to 24.14 km) apart, each with eight observers and their own connection to regional control rooms that would, in turn, relay reports back to a central headquarters (*The Argus* 21 Jan. 1942:3; *The Kiama Reporter* 13 Dec. 1944:4). It was reported that Melbourne was to be surrounded by two rings of observer posts, and that this 'double ring of eyes' would provide a level of backup if an enemy aircraft went unobserved by one post (*The Argus* 21 Jan. 1942:3).

A Japanese aircraft over Melbourne

On the morning of 26 February 1942, Nobuo Fujita and Shoji Okuda boarded their Yokosuka E14Y float plane (given the Allied reporting name 'Glen') that had been erected on the deck of Japanese submarine I-25, then located in Bass Strait (Jenkins 1992:140). The aircraft took off and set course for Melbourne, where it conducted a reconnaissance of Melbourne's suburbs and Port Phillip Bay. The aircraft was identified by service personnel and civilians as being Japanese (Egging 2017; Jenkins 1992:141). Gunners operating the anti-aircraft artillery positions at Williamstown requested permission to fire on the aircraft, however, by the time this was approved, the aircraft had departed the area unscathed (Jenkins 1992:141). Three Wirraways from No. 5 Squadron, RAAF, were deployed from their base at Laverton to the training airfield at Bairnsdale as a striking force against the Japanese but intercepted neither the aircraft nor its submarine and returned the same day (Charlton 1942).

Fujita conducted a similar reconnaissance of Hobart and the Derwent River on 1 March, before reconnoitring

the New Zealand cities of Wellington and Auckland in the following weeks (Dunn 2020; Jenkins 1992:143–148). Despite some public knowledge of these overflights occurring, they were not reported in Australian media until after hostilities had ended (*The Argus* 20 Aug. 1945:3).

No. 7 Fighter Sector Headquarters

In order to control Victoria's air power system, No. 7 Fighter Sector Headquarters, RAAF, was formed at Preston Town Hall on 4 May 1942, with the unit's first major activity being reported on 2 July 1942 (Brookes 1942:2; Davison 1942:5). Observations made by the radar stations on Victoria's coastline, or by the VAOC observation posts, would be reported back to the headquarters where they would be positioned on a plot table showing a map of the state (**Figure 2**). An appropriate response to any threat would then be determined and which could include scrambling interceptor aircraft or instructing anti-aircraft artillery units under the control of the Australian Army to open fire.

In October 1943, the unit was renumbered as the No. 107 Fighter Sector Headquarters (Brookes 1943:26), before being renamed as the No. 107 Fighter Control Unit in March 1944 (Heath 1944:32). The unit's Operations Record Book held by the National Archives of Australia abruptly ends on 31 December 1944, though the unit continued to function at Preston. Curiously, the unit was not covered in the RAAF's official unit histories (see RAAF Historical Section 1995b).

Results

RAAF airfields

At least 12 airfields were established or utilised by the RAAF in Victoria throughout the Second World War (RAAF Museum 2010). The majority of these were for specialised purposes, such as housing schools of the Empire Air Training Scheme (e.g. Benalla and West Sale) (Ford 2006:34–35; Leahy 2018:100–112), RAAF Operational Training Units (e.g. Mildura and East Sale) (Ford 2006:34–35; RAAF Historical Section 1995c:62–67), or for the facilities that constructed or erected military aircraft (e.g. Fishermans Bend) (RAAF History and Heritage 2021:77, 115). In addition to these, relief landing grounds (RLGs) were established with little-to-no infrastructure in fields and paddocks across the state, while civilian airfields were also identified as places to land military aircraft in the event of an emergency. The Units operating aircraft capable of defending Melbourne's skies during the Second World War were primarily based at one airfield (Laverton) and deployed to other airfields across the state when necessary. In 1989, the site was amalgamated with that at Point Cook to form RAAF Williams (RAAF Historical Section 1995a:143). The runways at Laverton have since been demolished and built over with the Melbourne suburb of Williams Landing (RAAF n.d.). Despite this, parts of the Laverton site continue to be used by the Australian Defence Force today and the location of this site has been mapped in **Figure 3**.



Figure 2: A member of the VAOC at the plot map inside Preston Town Hall, c.1944 (State Library of Victoria, H99.201/3044)

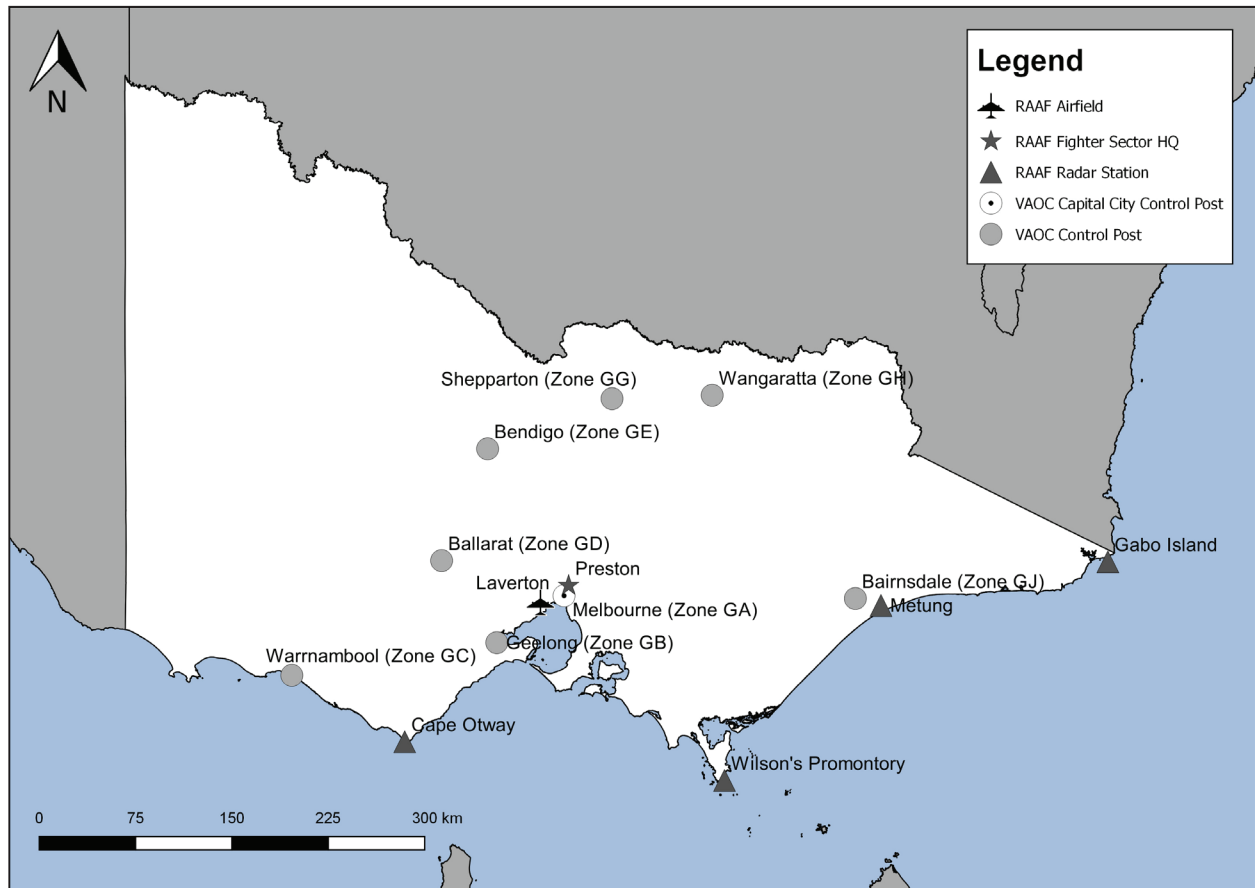


Figure 3: The locations of Second World War defensive air power and early warning system sites in Victoria (drawn by D.J. Leahy 2021).

RAAF radar stations

A total of four radar stations were established along Victoria's coastline, three of which were built alongside existing lighthouses, a common practice when siting radar stations in Australia and New Zealand (Hobbins 2019:44–45). These were No. 13 Radar Station at Cape Otway from May 1942, No. 14 Radar Station on Wilsons Promontory from June 1942, and No. 16 Radar Station on Gabo Island also from June 1942 (McKellar 2004:3; RAAF Historical Section 1995b:76–78). The three radar stations established at the sites of existing lighthouses are now listed on the Victorian Heritage Database (VHD). The fourth site (No. 15 Radar Station) was established at Laverton in April 1943 before being moved to Metung in Gippsland the following month (McKellar 2004:3; RAAF Historical Section 1995b:77). During ideal weather conditions, each of these sites could detect shipping up to 150 miles (241.40 km) away (McKellar 2004:3). The approximate locations of these sites have been mapped in Figure 3.

Two additional radar units were reportedly located in Victoria during the Second World War. No. 163 Radar Station was briefly stationed in Melbourne from November 1944 until January 1945 (RAAF Historical Section 1995b:95). Although a display in Aircraft Hall

at the Australian War Memorial also suggests that No. 131 Radar Station was stationed in the Mildura area for a time, no historical reference to this has yet been found by the author.

VAOC observation and control posts

Photographs of various types of individual VAOC observation posts across Victoria can be found within the Australian War Memorial collection. These range from purpose-built towers to makeshift huts built on top of hills and large buildings. Due to the sheer number of observation posts that were constructed, it has been impossible to determine the location of each observation post across the state.

It has however been possible to identify the general locations of where VAOC control posts were established across Victoria. These sites are those to which the dispersed observation posts reported, which in turn reported to the central headquarters in Melbourne. According to Hyland (1942:3–4), the sites and the VAOC 'Zones' they controlled comprise:

- Melbourne (Zone GA)
- Geelong (Zone GB)
- Warrnambool (Zone GC)
- Ballarat (Zone GD)

- Bendigo (Zone GE)
- Wangaratta (Zone GH)
- Bairnsdale (Zone GJ)

These general locations have also been mapped in **Figure 3**.

No. 7 Fighter Sector Headquarters facilities at Preston

When the RAAF No. 7 Fighter Sector Headquarters was established, it commandeered a number of buildings in the suburb of Preston. The Headquarters itself was based in the Preston Town Hall, located on Gower Street, which is now listed on the VHD. The nearby Scout Hall on Townhall Avenue, now housing the Northside Boxing Gym, was utilised as a Sergeants' and Airmen's mess (Brookes 1942:2). Members of the Women's Auxiliary Australian Air Force (WAAAF) serving with the unit were housed in the Sports Pavilion at the Preston City Oval (Brookes 1942:2). The RAAF Officers' Mess was initially established at unknown premises located at the corner of High Street and Showers Street, which is believed to have been demolished and built over in the post-war era (Brookes 1942:2). On 4 July 1942, the Council Club, formerly located on the corner of High Street and Cramer Street, was taken over as the RAAF Officers' Mess (Darebin Libraries n.d.; Davison 1942:5). These sites represent an important yet understudied aspect of Australia's Second World War military heritage, in that not all sites occupied by military personnel (particularly those in urban areas) were specifically built for military purposes. The location of No. 7 Fighter Sector Headquarters has been mapped in **Figure 3**, while the individual sites have been mapped in **Figure 4**.

Discussion

Mapping these defensive air power and early warning system sites on a state level (**Figure 3**) clearly shows the important role that Melbourne played in Australia's strategic planning during the Second World War. Unlike areas that were attacked in the north of the country, it was impossible for Japanese land-based bombers and flying boats stationed in what are now the countries of Indonesia and Papua New Guinea to attack sites within Victoria. This meant that any potential attack had to come from aircraft launched from nearby shipping and approaching from the south or east. Additional radar stations and observation posts located at sites in South Australia and New South Wales helped protect the fringes of the state.

In December 1942 this early warning system was tested through both deliberate drills and a number of false positive detections. On the afternoon of Saturday, 5 December, personnel from the Air Raid Precautions (ARP) organisation conducted a 'demonstration' in the Melbourne area that was to simulate a full-scale air raid by Japanese carrier-borne aircraft (*The Argus* 5 Dec. 1942:8). In total, over 5,000 wardens, auxiliary

firefighters, first aid, ambulance, and ancillary personnel took part in '722 incidents' over a three-hour period (*The Argus* 7 Dec. 1942:5). The incidents involved the rescue of personnel from large and small buildings, including using a flying fox from the roof of the Commonwealth Bank building in Bourke Street, the removal of unexploded bombs, the extinguishing of demonstration fires set using thermite, and the removal of simulated casualties from damaged areas (*The Argus* 7 Dec. 1942:5). Similar exercises, though on a smaller scale, were also conducted at Bendigo on the same day (*The Argus* 7 Dec. 1942:5). Although these tests were simulating an attack by aircraft launched from aircraft carriers, we now know that four of Japan's six main fleet carriers (which had taken part in the raids on both Pearl Harbor and Darwin) were sunk at the Battle of Midway in June 1942 and posed no threat to Melbourne that December (Stille 2010:92).

At the time, however, Japanese submarines operating off the east coast of Australia were continuing to sink allied shipping (Jenkins 1992:254–260), so it would have been more probable for another reconnaissance flight, or perhaps a so-called 'nuisance' bombing attack, to have occurred from a lone submarine-based aircraft. It is likely that the potential for such a flight would have been in the minds of those taking care of the early warning system that December. On 2 December, a formation of unidentified aircraft was located off Geelong and the

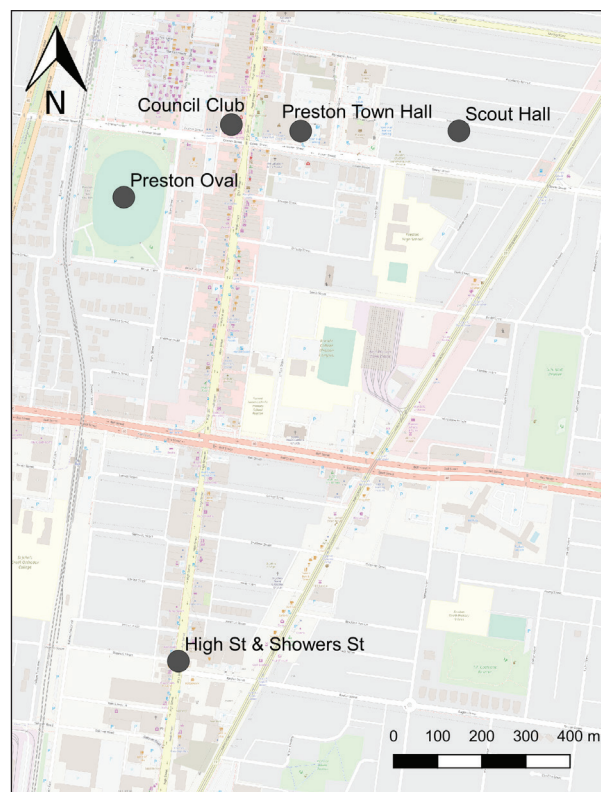


Figure 4: The locations of facilities in the suburb of Preston utilised by No. 7 Fighter Sector Headquarters, RAAF (D.J. Leahy 2021; after OpenStreetMap)

sole P-43 Lancer based at Laverton was scrambled to intercept. The formation turned out to be three RAAF Oxford training aircraft that had strayed off course (Keenan 1942:14). The following day, two unidentified aircraft were reported over Yallourn, and anti-aircraft artillery positions were given the order to open fire (Keenan 1942:14). It is not known what the outcome of this incident was, but it is believed that the aircraft were once again identified as friendly trainers. On 9 December, an unidentified aircraft was reported by No. 14 Radar Station located on Wilson's Promontory, and the Lancer was readied to intercept. The offending aircraft was then identified as a civilian airliner (Keenan 1942:14). Finally, on 21 December, plots of unidentified aircraft were reported heading for Melbourne, and an Air Raid warning was issued. These aircraft, once again, turned out to be friendly training aircraft that had become lost (Keenan 1942:14). It is interesting to contemplate what may have happened if the obsolete P-43 Lancer based at Laverton had actually intercepted a Japanese submarine-based seaplane during any such incidents.

As the war continued, the perceived threat of Japanese aerial attack declined, and many radar stations were wound down. A number of these early warning systems continued to be utilised, for the purpose of assisting friendly aircraft. Overlapping radar coverage had inadvertently transformed a significant portion of the Australian sky into controlled airspace (Hobbins 2019:45). Additionally, the VAOC continued to assist where needed, and in 1944 alone it was credited with 'helping 2000 aircraft' (Kelly 2000:23). This assistance ranged from redirecting aircraft that were identified as being off course, to directly helping personnel involved in aircraft crashes.

Conclusion

Despite a state-of-the-art air power early warning system being established in Victoria during the Second World War; it was not tested by enemy aircraft like similar systems employed in Australia's northern states and territories. Instead, the system put in place for defensive purposes became a model of aviation safety, assisting numerous pilots and aircrew who were lost, or force landed. Through mapping this system, it has been possible to learn how each of its components functioned, reporting back to the main headquarters in Preston, which in turn controlled the appropriate response. At least four of the sites discussed in this paper are now listed on the Victorian Heritage Database, but often for reasons in addition to their Second World War use. From a purely archaeological point of view, many of the sites referred to in this paper have not already been documented and have since deteriorated or been demolished altogether, leaving little material evidence for further investigation of individual sites. It is hoped that this research may

assist or inspire heritage practitioners to record and protect what remains of Victoria's Second World War air power infrastructure.

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References

- Aitchison, M.L., L. Byrne, T. Green, J. Kightly, and D.J. Leahy 2020 A crowd-funded aviation archaeology survey. *Excavations, Surveys and Heritage Management in Victoria* 9:109.
- Armitage, M.J. and R.A. Mason 1983 *Air Power in the Nuclear Age, 1945–82*. London: The Macmillan Press.
- Boer, P. 2020 *Refugee aircraft of the NEI Army Aviation Corps in Australia and British India*, Academia Edu. Retrieved 6 April 2021 from <<https://www.academia.edu/43963998/>>.
- Boseley, M. 2020 *Border closes between NSW and Victoria as southern state records largest ever jump in Covid-19 cases*, The Guardian. Retrieved 7 April 2021 from <<https://www.theguardian.com/australia-news/2020/jul/06/border-closes-between-nsw-and-victoria-as-southern-state-records-largest-ever-jump-in-covid-19-cases>>.
- Brookes, W. D. 1942 National Archives of Australia, RAAF Unit history sheets (form A50) [Operations Record Book- Forms A50 and A51] Number 100 Squadron Mar 42- August 46, A9186, No.7 Fighter Sector Headquarters, RAAF.
- Brookes, W. D. National Archives of Australia, RAAF Unit history sheets (form A50) [Operations Record Book- Forms A50 and A51] Number 100 Squadron Mar 42- August 46, A9186, No.7 Fighter Sector Headquarters, RAAF.
- Charlton, A.D. 1942 National Archives of Australia, RAAF Unit history sheets (form A50) [Operations Record Book- Forms A50 and A51] Number 100 Squadron Mar 42- August 46, A9186, No.7 Fighter Sector Headquarters, RAAF.
- Claringbould, M. and P. Ingman 2017 *The Fall of Rabaul, December 1941–March 1942. South Pacific Air War*,

- Volume 1. Kent Town: Avonmore Books.
- Clayton, M. 1986 The North Australian Air War, 1942–44. *Journal of the Australian War Memorial* 8:33–45.
- Coulthard–Clark, C. 2002 Air war over Australia. *Wartime* 17:36–41.
- Crawford, O.G.S. 1923 Air Survey and Archaeology. *The Geographical Journal* 61(5):342–360.
- Darebin Libraries n.d. *Council Club Hotel*, Darebin Heritage. Retrieved 7 April 2021 from <<https://heritage.darebinlibraries.vic.gov.au/article/861>>.
- Davison, R.A. 1942 National Archives of Australia, RAAF Unit history sheets (form A50) [Operations Record Book- Forms A50 and A51] Number 100 Squadron Mar 42- August 46, A9186, No.7 Fighter Sector Headquarters, RAAF.
- Dunn, P. 2020 *Japanese reconnaissance flights over Australia during WW2*, Australia @ War. Retrieved 5 April 2021 from <<https://www.ozatwar.com/japrecce/japrecce.htm>>.
- Eaton, C. 1939 National Archives of Australia, RAAF Unit history sheets (form A50) [Operations Record Book- Forms A50 and A51] Number 100 Squadron Mar 42- August 46, A9186, No.7 Fighter Sector Headquarters, RAAF.
- EGGING, K. 2017 *Woman recalls night during World War II enemy spy plane flew over her Port Melbourne house*, Herald Sun. Retrieved 23 March 2021 from <<https://www.heraldsun.com.au/leader/inner-south/woman-recalls-night-during-world-war-ii-enemy-spy-plane-flew-over-her-port-melbourne-house/news-story/ccdbb8541e179712cc39a7b1e7cb6064>>.
- Fitzgerald, R. 2021 *79 years on, Darwin bombing remembered*, The Canberra Times. Retrieved 5 April 2021 from <<https://www.canberratimes.com.au/story/7132714/79-years-on-darwin-bombing-remembered/>>.
- Ford, J. 2006 *WWII Aviation Archaeology in Victoria, Australia*. Flinders University Maritime Archaeology Monographs Series number 1. Adelaide: Department of Archaeology, Flinders University.
- Gamble, B. 2010 *Fortress Rabaul*. Minneapolis: Zenith Press.
- Gillison, D. 1962 *Royal Australian Air Force, 1939–1942*. Canberra: Australian War Memorial.
- Heath, W.P. 1944 National Archives of Australia, RAAF Unit history sheets (form A50) [Operations Record Book- Forms A50 and A51] Number 100 Squadron Mar 42- August 46, A9186, No.7 Fighter Sector Headquarters, RAAF, December 1942
- Hess, N. 2004 *49th Fighter Group: Aces of the Pacific*. Oxford: Osprey Publishing.
- Hobbins, P. 2019 Unearthing airspace: the historical phenomenology of aviation artefacts. *Australasian Historical Archaeology* 37:43–55.
- Hyland, C.W. 1942 National Archives of Australia, RAAF Unit history sheets (form A50) [Operations Record Book- Forms A50 and A51] Number 100 Squadron Mar 42- August 46, A9186, No.7 Fighter Sector Headquarters, RAAF.
- Jenkins, D. 1992 *Battle Surface!: Japan's Submarine War Against Australia, 1942–44*. Milsons Point: Random House Australia.
- Keenan, W. A. 1942 National Archives of Australia, RAAF Unit history sheets (form A50) [Operations Record Book- Forms A50 and A51] Number 100 Squadron Mar 42- August 46, A9186, No.7 Fighter Sector Headquarters, RAAF.
- Kelly, R.J. 2000 *Going My Way: The Story of the Mysterious Crash of a Beaufort Bomber*. Mitta Mitta: Russell J. Kelly.
- Leahy, D.J. 2018 Airfields of the Commonwealth: The archaeology of the Empire Air Training Scheme of World War II. Unpublished BA(Hons) thesis, School of Humanities, University of New England, Armidale.
- Leahy, D.J. 2019 A Buffalo aircraft in the high country, Victoria. In C. Spry, D. Frankel, S. Lawrence, E. Foley, I. Berelov, and S. Canning (eds), *Excavations, Surveys and Heritage Management in Victoria* 8:49–56. Melbourne: La Trobe University.
- Lewis, T. 2017 *The Empire Strikes South: Japan's Air War Against Northern Australia, 1942–45*. Kent Town: Avonmore Books.
- MacLeod, R. 1999 Introduction: Revisiting Australia's wartime radar programme. In R. MacLeod (ed.), *The 'Boffins' of Botany Bay: Radar at The University of Sydney, 1939–1945*, pp. 411–418. Canberra: Australian Academy of Science.
- McAulay, L. 2007 *We Who Are About to Die: The Story of John Lerew—A Hero of Rabaul, 1942*. Maryborough: Banner Books.
- McGowan, M. 2020 *States and territories reinstate Covid border restrictions for NSW, throwing Christmas plans into disarray*, The Guardian. Retrieved 7 April 2021 from <<https://www.theguardian.com/australia-news/2020/dec/17/queensland-western-australia-south-wa-sa-border-restrictions-nsw-covid-coronavirus-outbreak>>.
- McKellar, I.C. 2004 *History and Memories of 14 Radar Station, Wilsons Promontory*. Heathmont: Ian and Margaret McKellar.
- Mellor, D.P. 1958 *The Role of Science and Industry*. Canberra: Australian War Memorial.
- Minnett, H. 1999 Radar and the bombing of Darwin. In R. MacLeod (ed.), *The 'Boffins' of Botany Bay: Radar*

- at *The University of Sydney, 1939–1945*, pp. 429–455. Canberra: Australian Academy of Science.
- Owen, T. and S. James 2013 The history, archaeology and material culture of 105 Radar Station, Cox Peninsula, Northern Territory. *Australasian Historical Archaeology* 31:92–98.
- Palazzo, A. 2013 The overlooked mission: Australia and home defence. In P.J. Dean (ed.), *Australia 1942: In the Shadow of War*, pp. 53–69. Melbourne: Cambridge University Press.
- PORTLAND GUARDIAN
- RAAF Historical Section 1995a *Introduction, Bases, Supporting Organisations*. Units of the Royal Australian Air Force: A Concise History, Volume 1. Canberra: Australian Government Publishing Service.
- RAAF Historical Section 1995b *Radar Units*. Units of the Royal Australian Air Force: A Concise History, Volume 5. Canberra: Australian Government Publishing Service.
- RAAF Historical Section 1995c *Training Units*. Units of the Royal Australian Air Force: A Concise History, Volume 8. Canberra: Australian Government Publishing Service.
- RAAF History and Heritage 2021 *Aircraft of the Royal Australian Air Force*. Newport: Big Sky Publishing.
- RAAF Museum 2010 *RAAF bases*, RAAF Museum. Retrieved 7 July 2021 from <<https://www.airforce.gov.au/sites/default/files/minisite/static/7522/RAAFmuseum/research/bases.htm>>.
- Reeves, D.M. 1936 Aerial photography and archaeology. *American Antiquity* 2(2):102–107.
- Royal Australian Air Force [RAAF] n.d. *RAAF Williams—Laverton*. Royal Australian Airforce. Retrieved 7 April 2021 from <<https://www.airforce.gov.au/about-us/bases/victoria/raaf-williams-laverton>>.
- Shanahan, F. 2018 Aviation archaeology. In C. Smith (ed.), *Encyclopedia of Global Archaeology- living edition*, Cham: Springer. Retrieved 6 April 2021 from <https://doi.org/10.1007/978-3-319-51726-1_2531-1>.
- Stanley, P. 2021 *Remembering Darwin and...*, Pearls and Irritations: John Menadue's Public Policy Journal, Retrieved 7 April 2021 from <<https://johnmenadue.com/remembering-darwin-and/>>.
- Stille, M. 2010 *Midway 1942: Turning point in the Pacific*. Campaign number 226. Oxford: Osprey Publishing.
- THE ARGUS
- THE KIAMA REPORTER
- THE NUMURKAH LEADER
- Walker, B.R. 1942 National Archives of Australia, RAAF Unit history sheets (form A50) [Operations Record Book- Forms A50 and A51]Number 100 Squadron Mar 42- August 46, A9186, No.7 Fighter Sector Headquarters, RAAF.
- Wilson, S. 1998 *Aircraft of WWII*. Fyshwick: Aerospace Publications.