Image: Peter Recketts

The CAC Wirraway

By Kim Dunstan

Built in Australia under licence, the Wirraway was obsolete by the time Navy took delivery - but it served the newly-formed Fleet Air Arm well, and became a worthy part of our heritage.

In 1948-9, the newly formed RAN Fleet Air Arm (FAA) took delivery of four surplus Mk11 Wirraways, with further deliveries in 1952 and 1953. Although obsolete, these rugged piston-engine aircraft operated from the Naval Air Station at Nowra as training and general-purpose aircraft until disposed of in 1957. They played a valuable support role in the development of post-WW2 naval aviation in the Royal Australian Navy (RAN).

The Naval Aviation Plan

On 4 June 1947, the Minister for Defence, Hon. J.J. Dedman MHR, stated in Federal Parliament that the first stage of a naval aviation plan would be implemented in 1947-48. The plan included ordering two light-fleet carriers with aircraft, the recruitment and training of pilots and maintainers and the establishment of stores and shore bases. He said Australia's experience in WW2 demonstrated the need for maritime control in our defence, and that the lessons of the Pacific War proved the value of aircraft carriers in a modern balanced fleet.

As the RAN already had a plan for a post-WW2 fleet, which included aircraft carriers, action commenced immediately. With government approval a disused RAAF airfield at Nowra, south of Sydney, was transferred to the RAN as the main base for the FAA on 15 December 1947. It was subsequently commissioned on 31 August 1948 as HMAS *Albatross* [HMAS *Nirimba* at Schofields became the second base]. The priority was to start training ex-RN, RANVR, RAF, RAAF and RNZAF pilots who enlisted in the RAN FAA (or were on loan) ready for the arrival of the brand new Sea Furies and Fireflies in May 1949. The Wirraways that began arriving at Nowra from November 1948 were well-suited to this early training task.

CAC Wirraway details

The Wirraway was produced by the Commonwealth Aircraft Corporation (CAC), at Fishermans Bend, Melbourne. It was a licence-built variant of the North American NA-33 advanced trainer. Production of CAC Wirraways MkI, II & III ran from 1939 to 1946 with a total of 755 built.

The Wirraway was a two-seater monoplane with stressed-metal wings, tube-steel airframe, metal-covered fuselage with removable fabric-covered side panels, and retractable undercarriage. It was powered by a 600 hp Pratt & Whitney Wasp R-1340 S1H1-G, 9-cylinder air-cooled radial engine; driving a three-blade de-Havilland/Hamilton Standard variable-pitch propeller. The tandem cockpits were fully enclosed with flight controls in both positions (the rear cockpit control column was detached and stowed when not in use). Radio equipment included the TR5403 / SCR-522 transmitter/receiver.

The RAN's Wirraways had a maximum speed of 191 knots (354 km/h, 220 mph); Range: 625 nm (720 miles, 1,158 km), with a service ceiling of 23,000 ft, (7010 m). Machine guns and under wing bomb-racks were removed, but a light series bomb-carrier point was centred under the cockpit. The pilot's cockpit had a signal pistol and cartridges; the rear cockpit had an F24 camera mount, and bomb-sight equipment.

Because RAN FAA aircrew were required to wear a life vest and dinghy pack, some modifications to the Wirraway seat 'Q' type harness/webbing was necessary. The RAAF silver paint scheme continued with the word NAVY on the fuselage, and code NW on the tail. In other respects, the aircraft remained the same including the RAAF serial numbers. The first Wirraways were delivered to Nowra's Station Flight.

Wirraway Assignments

When the Wirraways arrived at NAS Nowra in 1948/9 their main role was aircrew training. With the influx of ex-RN, RANVR and other pilots who had transferred to the RAN FAA, the Wirraways would refresh flying skills before they converted to the Hawker Sea Fury or Fairey Firefly. Observers, prior to joining a Firefly squadron, utilised the Wirraway's rear cockpit to perform Radio, RT and navigation training. In 1954, at the behest of 723 Squadron's CO, some Observers gained experience using the Wirraway's dual controls.

On 07 April 1952 **723 Squadron** was commissioned at NAS Nowra. The Wirraways and other aircraft joined 723 Squadron to form a Fleet Requirements Unit (FRU). This gave the Wirraways the opportunity to be involved in various roles including aircrew refresher and instrument flying courses, radio and radar tracking exercises and Search and Rescue. They also assisted the Australian Joint Anti-Submarine School (AJASS) – the joint RAN/RAAF facility based at NAS Nowra specialising in anti-submarine warfare (ASW) exercises.

When **724 Squadron** was commissioned on 01 June 1955 as the fixed-wing training squadron, the Wirraways moved there. 724 Squadron was equipped with a range of aircraft, including

One of the first of four Wirraways delivered to the RAN in 1949. Note the "W" on the tail, an early designator for Nowra. It was changed to "NW" around 1953.

Hawker Sea Furies, Fairey Firefly AS6s, and Vampire T.34 jet trainers. Part of 724 Squadron's role involved assisting RAN ships near Jervis Bay, doing radar and radio calibrations. At other times aircraft would work with the Radar Plot Branch at HMAS *Watson,* based at Sydney's South Head, conducting interception exercises.

RAN trainee pilots joining 724 Squadron (having flown Wirraways *ab initio* at the RAAF Flying Training School at Point Cook) found conversion to the more powerful Sea Fury and Firefly aircraft was eased by a having access to the Wirraways at Nowra. Overall, the main tasks for the Wirraways at 724 Squadron were Instrument Flying (IF) training, General Flying Practise (GFP), and re-qualification sorties for pilots not attached to squadrons to maintain their flying hours. The Wirraways also played an important part in maintainer training.

Other Training Aircraft

Responding to the RAN's call for spare RAAF aircraft for training purposes, the Air Board approved more aircraft for NAS Nowra in June 1948. These additional ex-RAAF aircraft included two Dakota C-47s, which the RAN converted to flying classrooms for aircrew training; three DH Tiger Moths and 14 (non-airworthy) Supermarine Spitfires for maintainer training. They latter were

***Above**. Wirraways under construction at the Commonwealth Aircraft Corporation plant, circa 1940. The fuselage comprised a welded framework, constructed from four separately produced sections bolted together during final assembly. The sides of the fuselage featured fabric covering while the underside and decking had metal coverings instead, consistent with the rest of the aircraft. (Image: AWM)*

also used by aircraft handlers to practise marshalling aircraft (with engines running) on the 'Dummy Deck' – a mock flight-deck.

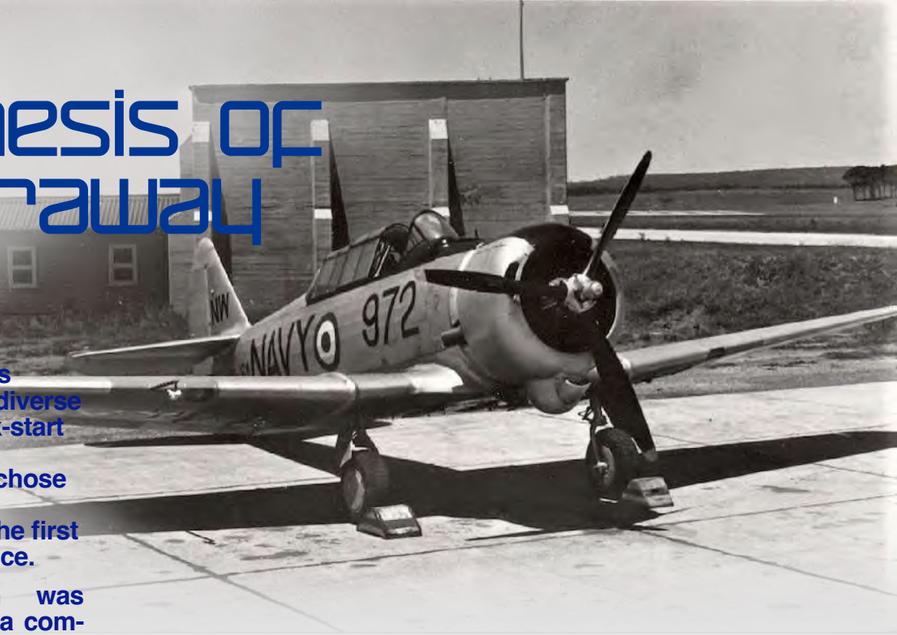
Some of the Spitfires were used for fire-fighting exercises. The end fate of the Spitfires is uncertain although rumour has it, they were bulldozed into the ground.

Four delisted Vultee Vengeance aircraft were also sent to NAS Nowra to train fire-fighting crews. In the 1968 two additional surplus Dakota C-47s were provided for VIP transport, general utility work and aircrew training.

The RAN Wirraway Legacy

The CAC Wirraways transferred to the RAN were dispatched from RAAF Tocumwal or No 2 Aircraft Depot Richmond – free of charge. The Wirraways were selected for post-war use and

The Genesis of the Wirraway



The Wirraway was built by the Commonwealth Aircraft Corporation (CAC), which was formed in October 1936 by a diverse group of shareholders to kick-start an Aviation manufacturing capability in Australia. They chose the North American Aviation company's NA-19 trainer as the first aircraft to be built under licence.

North American Aviation was founded in 1928, initially as a company that bought and sold interests in airlines. In '34 it went into manufacturing, with a focus on training aircraft, one of which was the NA-16. War brought rapid diversification, however, and the company went on to build such classics as the B-25 Mitchell bomber and the P-51 Mustang fighter. By VJ day North American had 8000 orders on its books. A few months later that had dropped to just 24. Nevertheless, it persevered and contributed to both the jet and the Space age. It is now part of Boeing.

The NA-16 was a conventional tandem-seat trainer. It first flew in April 1935 and had many variants, one of which became the Harvard.

In 1935 Lawrence Wackett, who was at the time the General Manager of Tugan Aircraft Ltd, led a team of 3 to England, Europe and the USA. They were looking to evaluate modern aircraft types within Australia's capability to build, including its power plant. They recommended the North American NA-19 (known in USAAC service as the BT-9, an upgraded version of the NA-16) in combination with the Pratt & Whitney R-1340 "Wasp" radial engine. CAC also built some experimental propellers, becoming one of the very few manufacturers who manufactured both engines and props.

The Wirraway featured some modifications to the NA-33 design, such as provision for two forward-firing guns and the strengthening of the wings and tail to facilitate dive-bombing. Other modifications included the adoption of a single gun set on a swivelling mouth to the rear of the cockpit, and installation of cameras and radio sets.

The first Wirraway model CA-1 made its maiden flight on 27 March 1939 and was retained by CAC for trials until 30 August 1939. The first three production aircraft were loaned to the RAAF on 11 July 1939 for comprehensive service trials, and the first official deliveries were four aircraft received by the RAAF on 30 August 1939 – by the beginning of the war four days later, seven had been delivered. When it entered service the Wirraway was the fastest and most heavily armed aircraft in the RAAF.

Forty Mark I Wirraways were constructed under the CA-1 contract before Mark II variants were introduced under the CA-3 contract. There were numerous changes to the design, including wing modifications to allow a heavier bomb load to be carried. Wirraways produced under the CA-5, CA-7, CA-8 and CA-9 contracts were all Mark II models very similar to the CA-3. The addition of dive-brakes to enhance dive-bombing performance was made with a retro-fit program. The final Mark III variant, introduced with the the CA-16 contract featured an enclosed rear canopy.

The designation CA-20 was reserved for a future dive-bomber variant but this was cancelled. Some writers have suggested this was a contract for reconditioning aircraft for RAN (Fleet Air Arm) service, but this is not the case – all RAN Wirraways were surplus and passed directly from RAAF storage, so they did not pass through CAC for rework.

Two Wirraways on the tarmac with a Sea Fury in the distance at RANAS Nowra – we don't know the name of person in the picture, but gives an indication of the size of the aircraft and its 600 hp Pratt & Whitney Wasp R-1340 engine.

had been held in storage. They were delivered ex-stock and not reconditioned by CAC as noted in some reports. A total of 16 airworthy Wirraways served at NAS Nowra, variously between 1948 and 1953, with one additional unsuitable airframe held in storage.

The RAN FAA found the Wirraways to be sturdy, reliable aircraft and a valuable asset at NAS Nowra, serving as a training and general support aircraft until disposed of in 1957. The fact that only one RAN Wirraway was written-off during their time at Nowra (in June 1953) shows how well the Wirraways performed – a worthy workhorse indeed.

The RAN Wirraways were replaced by De Havilland Vampire T.34 & T.22 trainers at Nowra. In 1957 the 15 remaining Wirraways were sold to Lund Aviation Inc. of New York.

Surviving CAC Wirraways

None of the RAN Wirraways survive because all airframes were sold or disposed. But several ex-RAAF Wirraways are located in Australian aviation museums, with some airworthy examples, and others under restoration. CAC Wirraways may also be found at the PNG Museum at Port Moresby, and at Fantasy of Flight, Polk City, Florida, USA.

Postscript

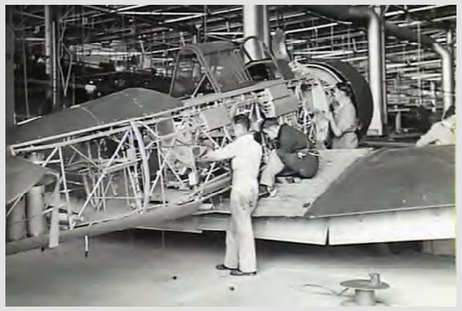
On Sunday 30 May 1999, during an Air Show organised by the Australian Naval Aviation Museum at NAS Nowra, a privately owned Wirraway was conducting a demonstration flight when it nose-dived into the ground. The 1950s restored Wirraway made several passes along the runway when it appeared to lose power and crashed. Both the civilian pilot and passenger were killed – the Air Show was then closed.

References:

National Archives of Australia
ADF Serials
723 & 724 Histories
NLA Trove
Slipstream archive
Wikipedia

With grateful thanks for advice and assistance to Derek Buckmaster, Fred Lane, Norman Lee, John Champion, Toz Dadswell, John Harrison, Jim Parsons and Richard Kenderdine.

Who Was the CAC?



Although the purpose of this article is to tell the story of Wirraways from a Fleet Air Arm perspective, it is worth capturing its broader historical perspective – and that of the Commonwealth Aircraft Corporation (CAC), which constructed them.

CAC was a consortium of companies that included such names as BHP, General Motors Holden, Imperial Chemical Industries and the Orient Steamship Company, which worked together to form the company in 1936, in anticipation of a war in Europe. Its purpose was to boost manufacturing capabilities, and in particular to bolster aircraft production in the event they would not be available from 'traditional' sources should conflict arise.

By September 1937 a factory had been completed in Port Melbourne. By then a small team had been overseas to select a modern aircraft type to produce under licence. It was the North American NA-16, and it went into production as the CAC Wirraway – with the first aircraft rolling off the new assembly line in March 1939, just six months before the outbreak of WW2. The Wirraway was therefore not only the first aircraft of the newly-formed CAC, but also the very first mass-produced aircraft built in Australia.

Navy To Get Air Arm, 2 Carriers

CANBERRA, Tuesday.—A fleet air arm is planned for the Royal Australian Navy following adoption by the Federal Cabinet today of a £250 million five-year defence programme.

Sources close to the Government said tonight that two modern aircraft carriers would be bought from Britain at a cost of £2,750,000 each for the R.A.N. from the Navy's five-year allocation of about £75 million.

The Defence Council, it was stated, would be asked later to decide whether the proposed fleet air arm should be controlled by the Navy or the Royal Australian Air Force.

The carriers would carry about 40 aircraft each.

Cost of the aircraft had not yet been estimated, because they would be of an advanced design, possibly jet-propelled, decided after the completion of the carriers.

The carriers would embody the latest developments and scientific weapons, but were unlikely to be delivered for at least two years.

To provide skilled officers as a nucleus it is expected that officers from the Royal Navy will be sought for the Australian Fleet Air Arm.

Allocation Basis

It was reported to-night that the total of £250 million adopted by Cabinet represented a reduction of proposals from the Defence Council, but conformed with the 50 million annual limit expenditure laid down some weeks ago by the Prime Minister (Mr Chifley).

Qld. : 1933 - 1954)

Why Did We Need Wirraways?

The newspaper cutting to the left tells of the two new carriers for the RAN, marking the very beginning of our Fleet Air Arm. The first, HMAS Sydney, unloaded its new Sea Furies and Fireflies at Jervis Bay in May of 1949.

They represented the latest in air power, but had no dual seat training capacity, so the Navy asked the RAAF for a number of Wirraways. You can read all about the beginnings of the FAA here.

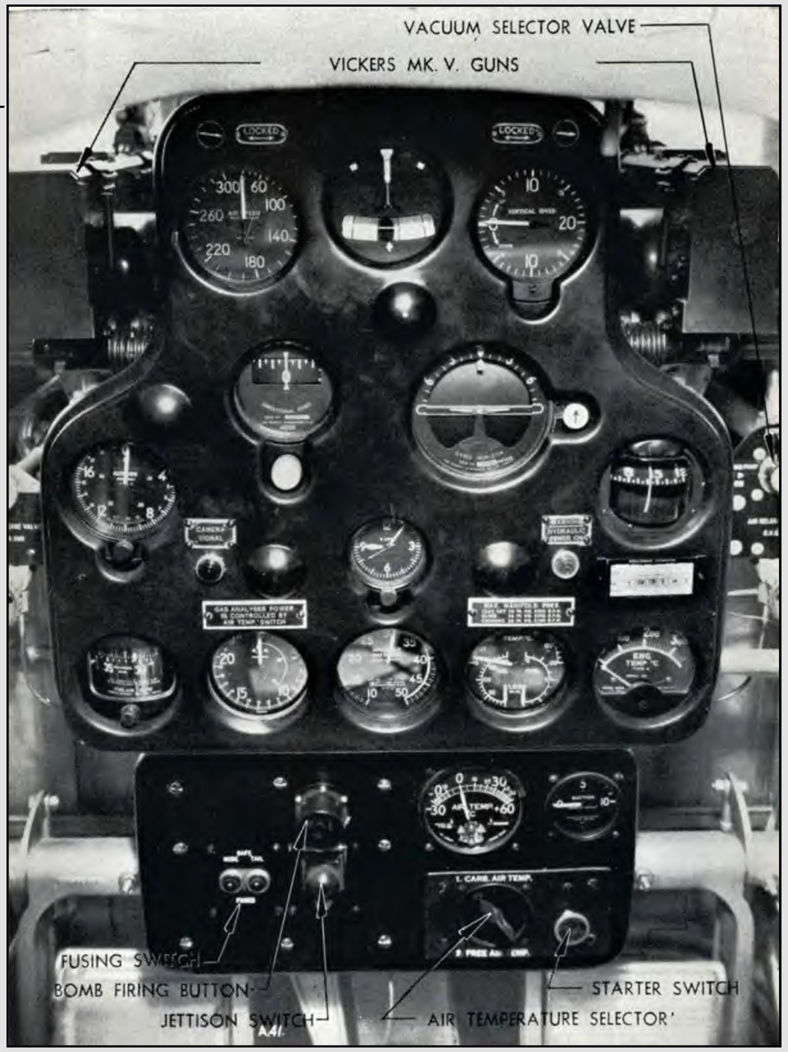
Read "Carriers for the Commonwealth" here.

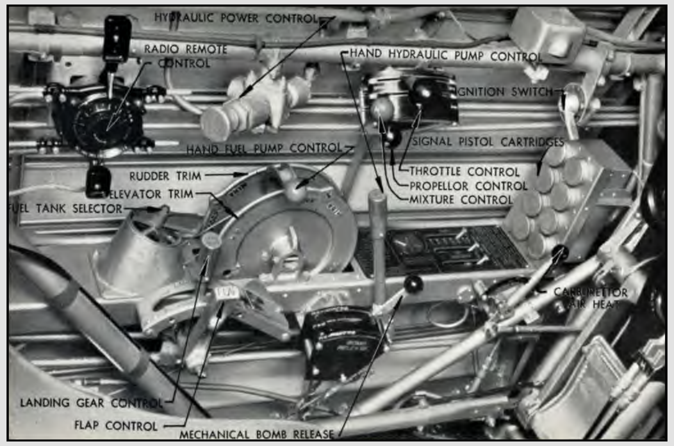
A new Sea Fury being loaded aboard HMAS Sydney. The fledgling RAN had no training aircraft of their own, so the Wirraways were a vital component of the FAA.

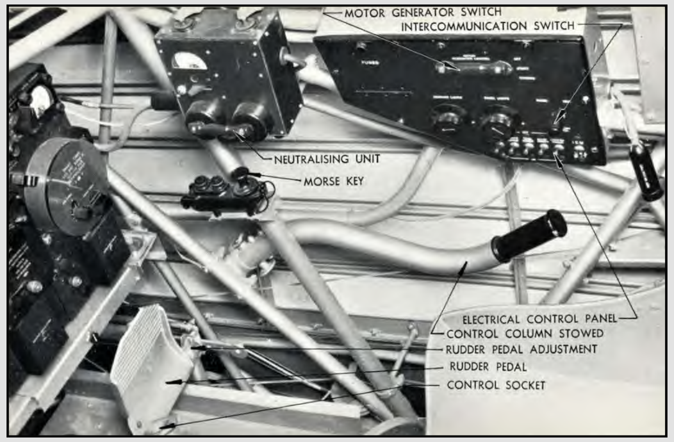
History in Photos

***Right**. Another manufacturing shot (how many men does it take to make a Wirraway?). This shows the final operation, which is affixing the fabric covering to the sides of the fuselage. The engine cowling, wings, centre section and part of the fuselage cowling were covered with Dural Alloy. (Australian War Memorial).*

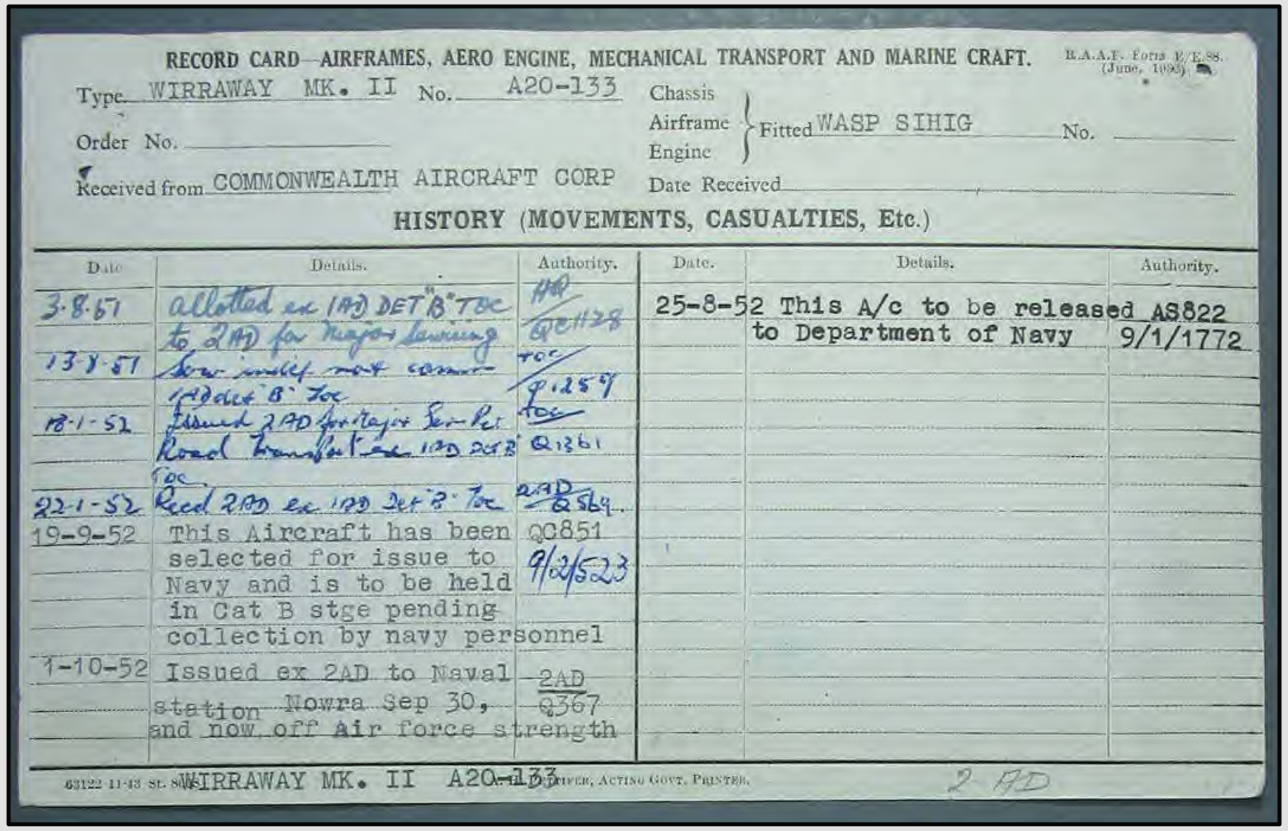
RAN Wirraways were all designated model CA-20 but this appears to have been purely an administrative nomenclature as they were transferred directly from storage without modification or rework. In fact, the RAN aircraft were a mixture of model numbers: 1xCA-1, 9xCA-7, 1xCA-5, 2xCA-8, 2xCA-9 and one CA-16. You can see a pop-up of the Record Card for A20-138 to the right and below, which is indicative of the transfer process. Immediately below: The Wirraway's main instrument panel, which was reasonably well ordered and equipped. Either side of it, on the cockpit bulkheads, were ancillary controls such as the throttle, mixture etc, and various electrical boxes. These were mounted on the skeleton of the aircraft, with the skin just beyond typical of a wartime design where any kind of trim was an unnecessary luxury.







***Above**: The Wirraway trained hundreds of Army, RAAF and RAN pilots. Here, No. 12 course graduates at RAAF Point Cook on 12 May 1954 – the Navy trainees are in the front row and many went on to fly Sea Furies Gannets or Fireflies in the Fleet Air Arm. Left to right: Phil Rowe, John Champion, Murray Douglas, Haddon Spurgeon, Jim Van-Gelder and John "Cal" Pain. (via FAAM). Van Gelder lost his life just a year later when his Gannet crashed into the sea off the Isle of Wight, UK.*



RECORD CARD—AIRFRAMES, AERO ENGINE, MECHANICAL TRANSPORT AND MARINE CRAFT.

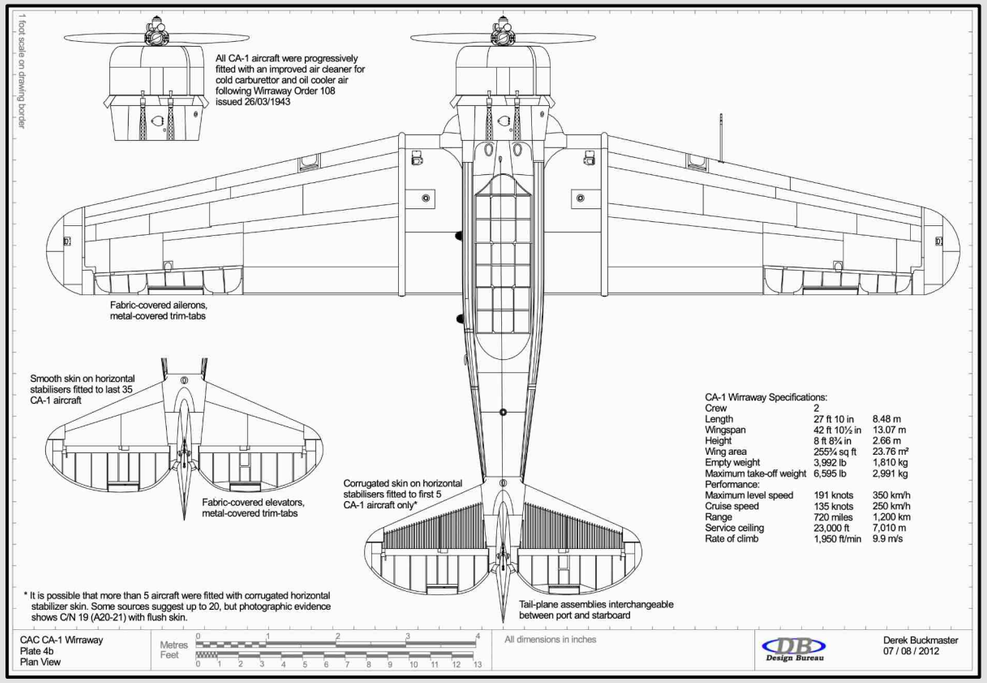
Type WIRRAWAY MK. II No. A20-133
Chassis / Airframe / Engine } Fitted WASP S1H1G No.
Order No.
Received from COMMONWEALTH AIRCRAFT CORP Date Received

HISTORY (MOVEMENTS, CASUALTIES, Etc.)

Date	Details.	Authority.	Date.	Details.	Authority.
3.8.51	allotted ex 1AD DET "B" TOC to 2AD for major servicing	HQ QE1128	25-8-52	This A/c to be released to Department of Navy	AS822 9/1/1772
13.8.51	Sow [illegible] 1AD Det "B" Toc	Toc Q1259			
18-1-52	Issued 2AD for major Ser. Road transport ex 1AD Det B	Toc Q1361			
22-1-52	Recd 2AD ex 1AD Det "B" Toc	2AD Q1569			
19-9-52	This Aircraft has been selected for issue to Navy and is to be held in Cat B stge pending collection by navy personnel	QC851 9/2/5/23			
1-10-52	Issued ex 2AD to Naval station Nowra Sep 30, and now off Air force strength	2AD Q367			

WIRRAWAY MK. II A20-133 2 AD

Above. *Neither of these aircraft served in Navy, but their photos show useful features. On the left, this wreck near Mildura gives a good impression of the solidarity of the Wirraway's construction. On the right: one of the few images we've seen with the gunner's position in the aft cockpit manned. (via FAAM). Below. A20-139 parked alongside a Sea Fury at NAS Nowra, circa 1950. The hangar under construction in the background is still in use to this day. (via FAAM).*



Left. *If you are into immense detail about the Wirraway you can't go past Derek Buckmaster's "Designbureau" website, which you can find here. It gives pages of drawings of the Wirraway build, each one beautifully rendered. It also gives a much more detailed account of various aspects of the aircraft, including how CAC evaluated it before deciding to build.*

You can find Derek's website here.

Only one Navy Wirraway came to grief: A20-145 which crashed following an engine failure on take off at Nowra on 18 June 1953. Details of the accident are scarce but we know the pilot (Nunn, RN) survived but the aircraft was dismantled for spares (insets) and then scrapped.

None of the ex-Navy Wirraways survived, so vintage shots are not possible of the actual airframes. This photo is the closest we could find: the aircraft is marked with an old RAN serial number, but is actually another airframe. It's painted in old RAAF camouflage colours which may have been the case when it was in RAAF service. The aircraft is part of the 'Wirraway Aviation Museum' collection at Pokolbin, NSW. Note also the rear mounted Vickers machine gun.

Norman Lee. (Extract from a transcript of an interview regarding his career in the RAN, conducted by UNSW Canberra 23 September 2003).

"It was quite an experience. It was quite a big jump from the Tiger Moth to the Wirraway. Not that I think any of us had any problems with it, except it was vicious in the stall. It would drop a wing. A few held-off trying to achieve a three-point landing and would hold-off too high and stall the aircraft. It would drop a wing very rapidly. The correct technique is opposite rudder, unless the wheel is on the ground when it's the same rudder. I speak as an old QFI [Qualified Flight Instructor]. Quite a lot of people had trouble with it.

But the Wirraway had a rather peculiar way to operate the undercarriage and flaps. You had what was called a powered button, which you hit with your elbow. You'd select the control and then hit the button, that would hydraulic power the undercarriage circuit. If you wanted flaps and you selected flap, and you hit the button.

Very early in my checking out an aircraft, I was on short finals, I had undercarriage down and I selected flap to land and was sent around, and unthinking selected the undercarriage up and hit the button. And of course my undercarriage came up half and my flap went down because I had it selected. And both were going at half the rate they normally do. I froze on the throttle. What do I do now? Obviously, I survived. It was a bit scary for a moment.

The Wirraway was good for aerobatics. We did cross country in it. We did night flying in it. In fact my father was at RAAF Laverton with No, 1 Aircraft Depot. We went over to Laverton to do our night flying there to ease the pressure on the circuit at Point Cook. He went out to watch the flying going on and he spoke to one of the instructors and said, 'Who's that' and the instructor said, 'That's young Lee'. Quite a proud moment for him

Fred Lane.

Because we had no dual seat Firefly then and never a dual seat Sea Fury, RAN Wirraways were used primarily for checkout and local familiarisation flights for the early pilots returning from RN Operational Flying Schools. Until the Firefly Trainers came along, the Wirraways were also used for white and green card instrument flying training (e.g. A-20 903 23 September 1953 with Col Wheatley), squadron hacks (Mascot, Bankstown) occasional Fleet Requirement Unit (radio, radar calibrations, etc.) and "flying pay requalification" sorties for non-squadron, mainly RN, pilots.

Since not flying for six months, and never having flown a Sea Fury, my first flight in a RAN Wirraway (A-20 901) was with Nat Gould on 4 December 1950 before my first Sea Fury flight later that day. I ended up with probably more Wirraway hours than most RAN pilots, with nearly 500 hours flown as captain, including 70 solo hours in RAAF Wirraways during AFTS training at Point Cook and later time at Central Flying School, East Sale and as a QFI at AFTS RAAF Point Cook. I qualified as Firefly Trainer QFI on 14 May 1956, but Wirraways kept flying in the RAN long after this.

The Wirraway was a delight to fly provided you stuck by the rules. These included its bad habit of dropping a wing during a moderate or greater cross wind landing. Then, instead of the usual reflexive correction of full opposite rudder and brake, the Wirraway trick was to apply full "same" rudder and brake until the other wheel touched back down then full opposite brake and rudder to straighten up on the runway. A better trick was to select only half flap for a crosswind landing. This made the wing drop less likely. The Wirraway also had a delightful trick for a roll off the top aerobatic. Instead of maintaining height and direction using conventional aileron, elevator and rudder, a quick short back stick tap then opposite rudder for a gentle flick half roll and recovery would give the desired flight path.

Wirraways Transferred to the RAN

(Listed by date of transfer)
Courtesy of Derek Buckmaster

Aircraft	Date transferred	RAN Side Number(s)	Date Disposed	Comments
A20–145	24/11/1948	901, 904		Issued to RAN against issue voucher 1100/48. Crashed at Nowra on 18/6/1953
A20–479	25/02/1949			
A20–176	20/04/1949			
A20–139	10/05/1949	902		
A20–141	22/08/1949	904		
A20–752	25/08/1952	971		Sold to Lund Aviation
A20–28	30/09/1952	904	01/01/1957	Sold to Lund Aviation
A20–168	30/09/1952	972		Major service at No 2 Aircraft Depot before transfer to RAN
A20–133	01/10/1952			Major service at No 2 Aircraft Depot before transfer to RAN
A20–238	01/10/1952	904		
A20–469	01/10/1952	902		Sold to Lund Aviation
A20–412	22/07/1953			Unsuitable for Navy use, returned to RAAF 11/1/1954.Sold to Willsmore Aviation Services on 15/07/1954.
A20–567	22/07/1953			Unsuitable for Navy use, returned to RAAF ownership 27/11/1953.Sold to Willsmore Aviation Services on 15/07/1954.
A20–579	06/08/1953			Unsuitable for Navy use, returned to RAAF ownership 27/11/1953.Sold to Willsmore Aviation Services on 15/07/1954.
A20–18	12/10/1953			Unsuitable for Navy use, returned to RAAF ownership 11/01/1954.Sold to Willsmore Aviation Services on 15/07/1954.
A20–73	12/10/1953			Unsuitable for Navy use, returned to RAAF ownership 27/11/1953.Sold to Willsmore Aviation Services on 15/07/1954.
A20–190	12/10/1953			Unsuitable for Navy use, returned to RAAF ownership 27/11/1953.Sold to Willsmore Aviation Services on 15/07/1954.
A20–209	30/11/1953			Replacement for unsuitable aircraft. Sold to Lund Aviation.
A20–211	30/11/1953			Replacement for unsuitable aircraft. Sold to Lund Aviation.
A20–214	30/11/1953			Replacement for unsuitable aircraft. Sold to Lund Aviation
A20–225	30/11/1953			Replacement for unsuitable aircraft. Sold to Lund Aviation
A20–250	30/11/1953			Sold to Lund Aviation
A20–490	30/11/1953			Replacement for unsuitable aircraft.

An additional group of 6 stored airframes were transferred to the Navy for spares.

Read the ADF Serials Newsletter on the Wirraway **here**.