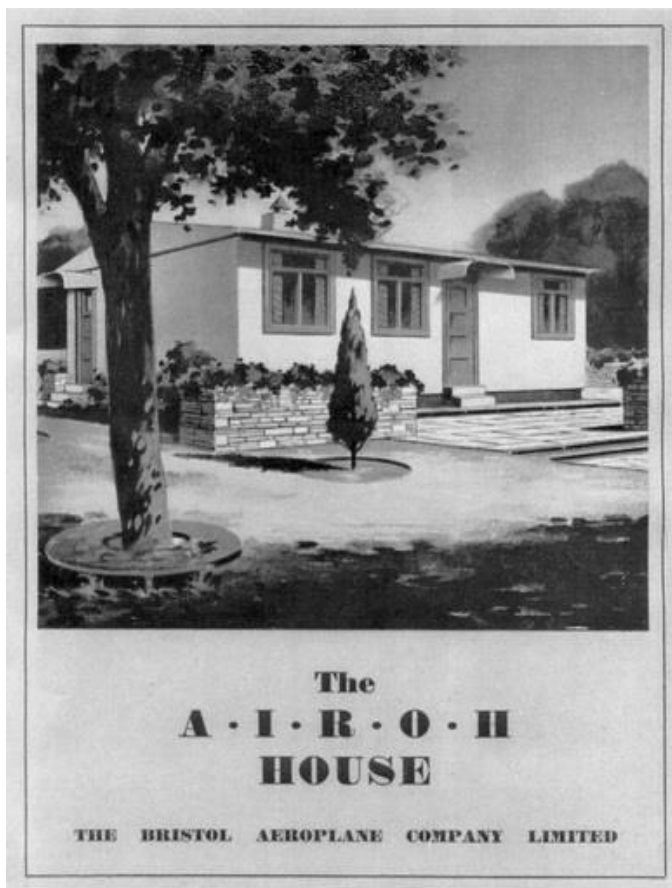


AIROH aluminum temporary bungalows

Peter Lobner, 15 June 2020

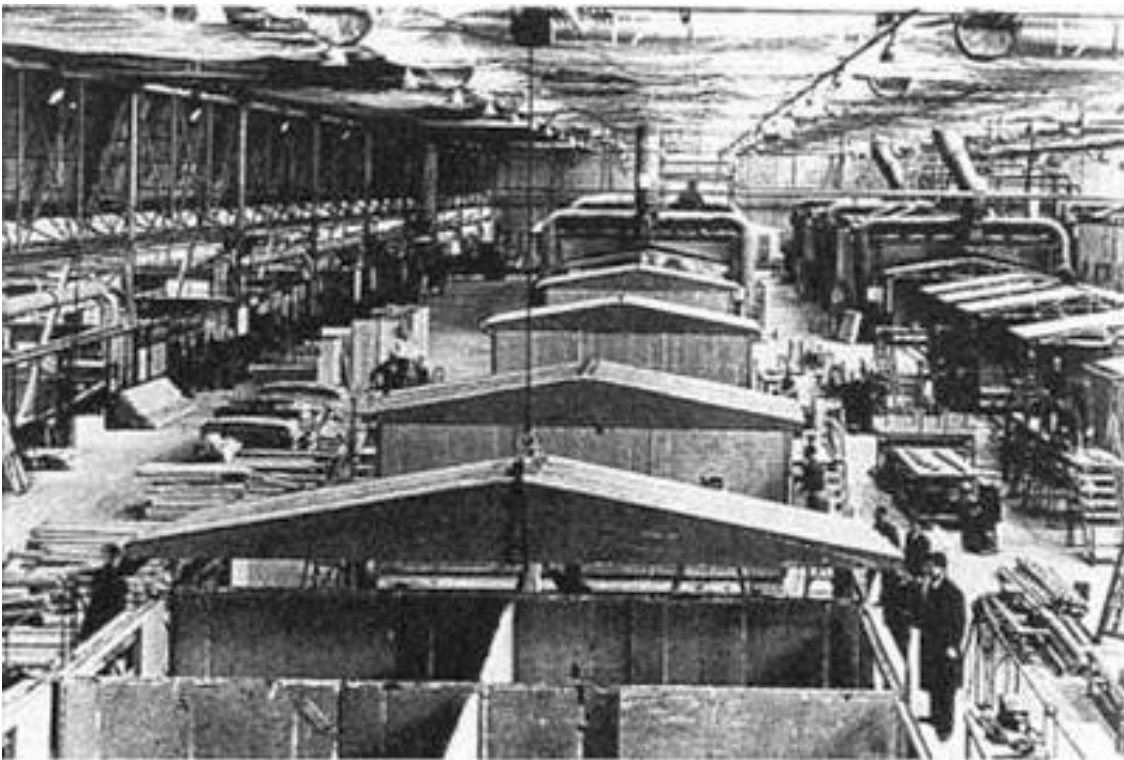
In 1942, the UK Ministry of Aircraft Production (MAP) established the Aircraft Industries Research Organization on Housing (AIROH), representing 13 British aviation firms, to develop and implement plans to sustain the aircraft industry's production capabilities through an expected post-war economic downturn. AIROH collaborated with Morrisons Engineering Company and architects A.F. Hare and Partners to design an aluminum bungalow. AIROH would have access to aluminum, including a particularly desirable high-strength alloy called Hiduminium (**High duty Aluminium**), from a large stockpile salvaged from scrapped WW II aircraft. Aluminum house manufacturing also would create some post-war demand for new material from the UK's aluminum industry.



This design became known as the AIROH aluminum bungalow, which was one of the prefabricated temporary house designs to qualify under the UK's Emergency Factory Made (EFM) housing program. AIROH houses were manufactured by four aircraft firms: Bristol Aeroplane Company's Weston-Super-Mare factory, two Vickers-Armstrong factories in Chester and Blackpool, the Blackburn Aircraft Company's factory at Dumbarton, and AW Hawksley's factory in Gloucester.

Source: <https://peterdewrance.files.wordpress.com>

A 10-tonne (10,000 kg, 11 tons) prefab package for an AIROH house contained about two tons of aluminum. The house consisted of about 2,000 components from many suppliers. These components were assembled in an aircraft factory into four sections that were fully furnished, including the curtains. Because of the relatively small number of individual parts in an AIROH house (about one-tenth of the number of parts in an aircraft), manufacturing the house was relatively simple and a high production rate was achieved. A production rate of one house every 12 minutes yielded 40 houses per 8-hour work day and 200 houses per 5-day work week.

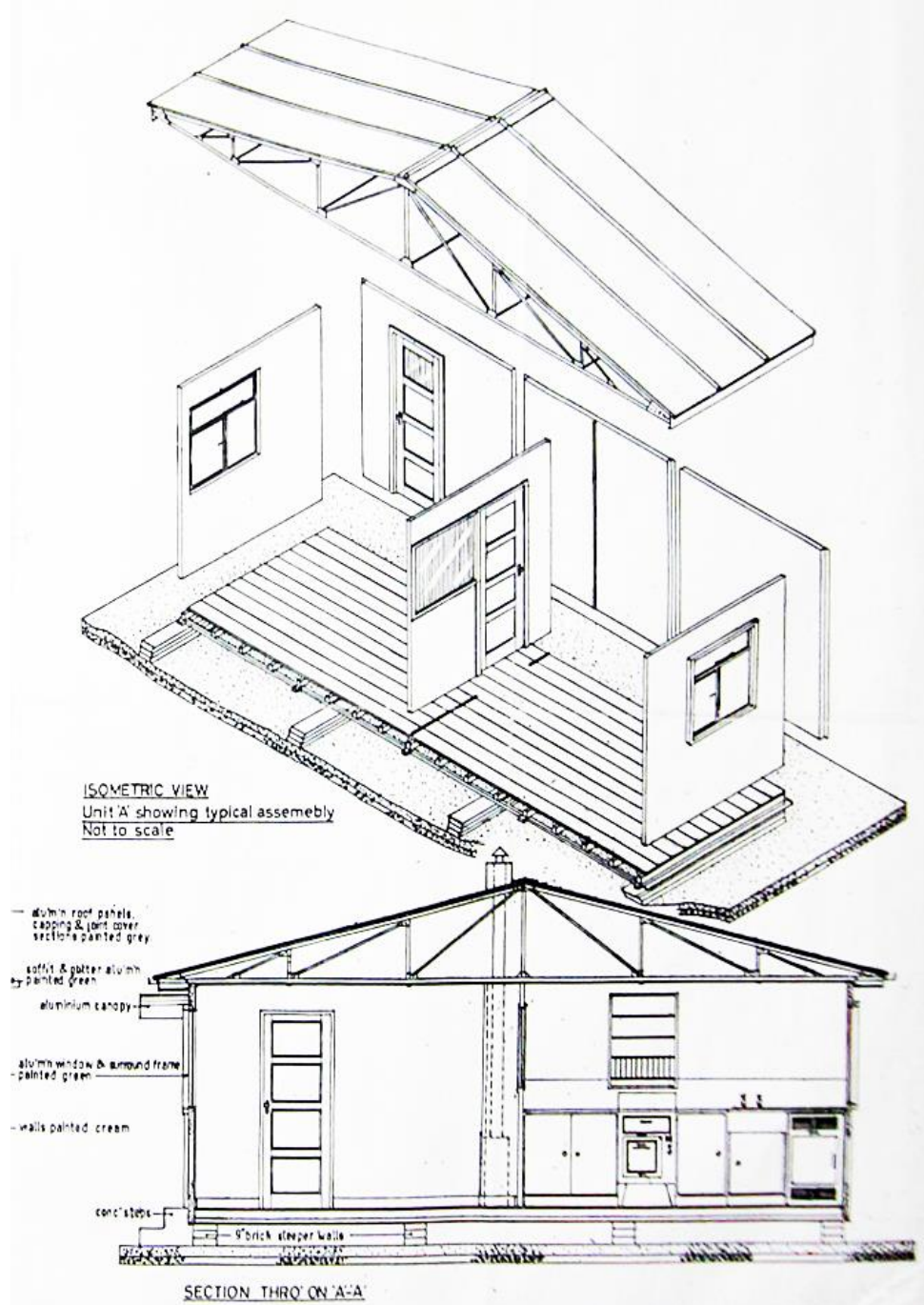


A factory production line for AIROH bungalows. Source:
<http://dgnbx.blogspot.com/2013/09/a-brief-romance-with-production-line.html>

An AIROH prototype was one of the prefabricated temporary bungalows displayed in 1944 at the Tate Gallery exhibition in London.

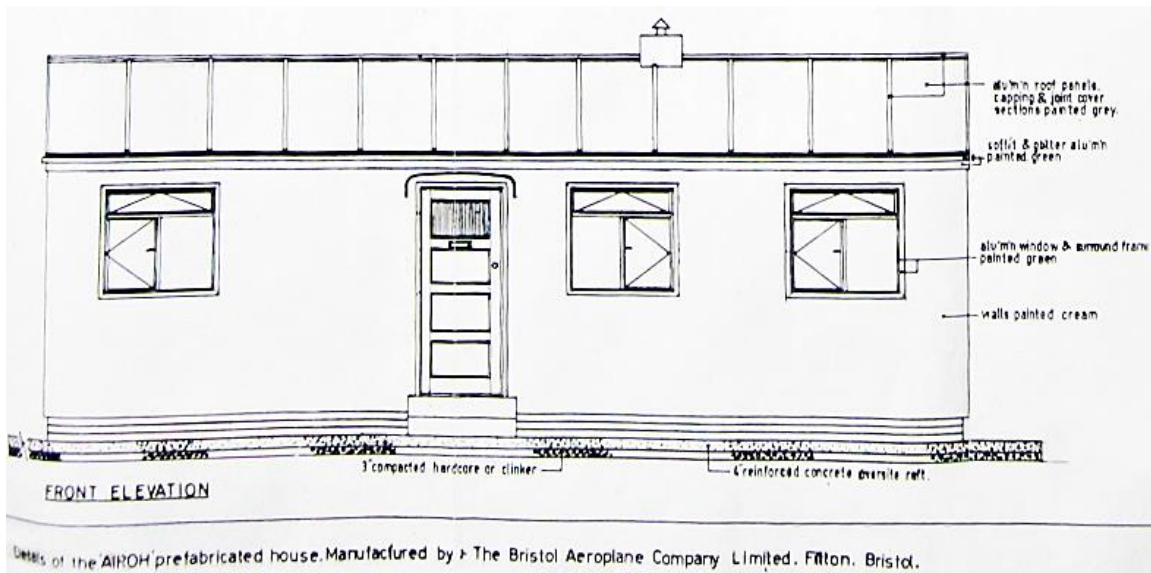
Author Brenda Vale, in her book “Prefabs: A History of the UK Temporary Housing Programme,” describes the construction of an AIROH house as follows: “The house was constructed out of extruded aluminum sections forming the frames of the floor, wall and

roof trusses, with external aluminum sheets riveted to the aluminum frame performing as cladding. The roof was finished with 61 x 15cm (2' x 6") wide aluminum sheet made with an inner corrugated sheet finished with a bitumen layer, and faced externally with 20g aluminum sheet." The interior was finished with plasterboard walls and ceiling.



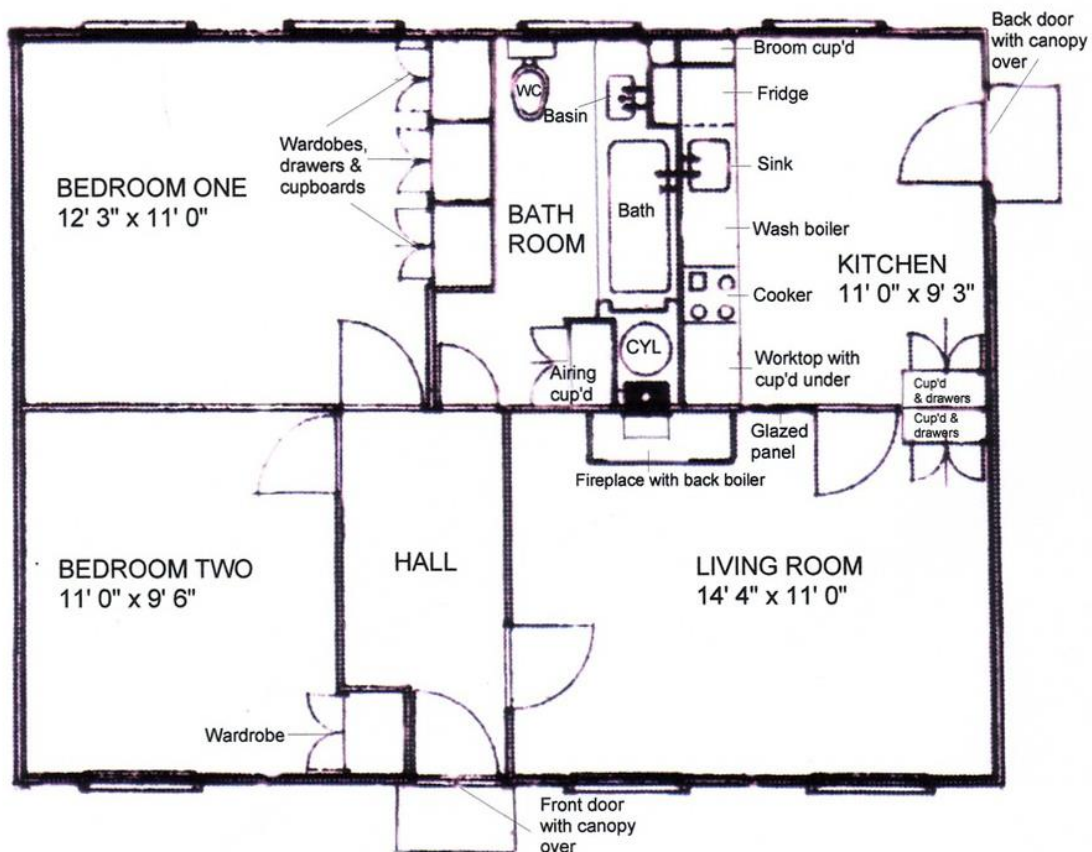
AIROH bungalow basic structure.

Source: Adapted from <https://medium.com/@briancpotter/englands-aluminum-houses-the-airoh-house-2d029a6a6bb6>



AIROH bungalow front elevation..

Source: Adapted from <https://medium.com/@briancpotter/englands-aluminum-houses-the-airoh-house-2d029a6a6bb6>



AIROH floor plan.

Source: <https://peterdewrance.files.wordpress.com>

The fully equipped AIROH bungalow provided 675 ft² (62.7 m²) of living space, including an entry hall, a living room with fireplace, a master bedroom and a smaller second bedroom, each with built-in wardrobes, a fully equipped kitchen with refrigerator, gas or electric cooker and copper (for washing), and a full bathroom. The kitchen and bathroom were placed back-to-back, implementing the Ministry of Works “service unit” design concept to simplify plumbing and electrical installation. The kitchen table folded into the wall when not in use. A characteristic feature of an AIROH is the flat aluminum canopy with curved down sides above the front door.

Each AIROH house section was delivered by truck to a pre-prepared site, where a crane lifted the section into position and the assembly crew bolted the sections together to form the completed house. Then water, electricity and sewer services were connected. In a May 1945 demonstration, an AIROH house was erected on a bombed site in London’s Oxford Street in just four hours. Historic England reports that a construction team erected an AIROH in just 41 minutes in Whitehawk, Brighton in November 1946.



*AIROH service unit module
(kitchen side in photo)
arriving at a building site.
Source: Architects' Journal,
vol. 101, 1945 Apr. 19, p.
452*



*AIROH module being moved into place at a building site.
Source: Historic England Archive P/H00042/003*



*Completing the assembly of an AIROH house.
Source: <http://dgnbx.blogspot.com/2013/09/a-brief-romance-with-production-line.html>*



AIROH prefab on Arbutus Drive, Combe Dingle, Bristol.
 Source: <https://www.bristolpost.co.uk/news/history/pictures-show-how-bristol-rebuilt-1224808>



AIROH kitchen. Source: Bristol Archives 40307/1/73



A row of AIROH prefabs on Camberley Road, Hough End Estate, Manchester in 1954. Source: Manchester Evening News Archive.



AIROH prefab estate. Source: Photo by Maeers, Getty Images



A remaining prefab AIROH bungalow at Craigmillar, Edinburgh, Scotland in 1964. Source: Scotsman Publications, Ltd., Photo 99995398, Scran 000-000-054-687

By the end of the EFM program in 1949, 54,500 AIROH aluminum temporary bungalows had been produced, significantly more than the competing steel-framed Arcon and wood framed Uni-Seco bungalows. The largest estate of AIROH prefabs was at Belle Vale, Liverpool with over 1,100 bungalows.

You can visit an AIROH B2 prefab at St. Fagans National Museum of History in Cardiff, South Wales. Their AIROH B2 was originally built near Cardiff in 1947, dismantled and moved to its current museum site in 1998, and opened to the public in 2001. You can see this AIROH B2 here: <https://museum.wales/stfagans/buildings/prefab/>



The AIROH B2 house at St. Fagans National Museum of History, Cardiff, South Wales. Source, both photos:
<https://museum.wales/stfagans/buildings/prefab/>



AIROH B2 kitchen at St. Fagans, Cardiff, South Wales.

In his 1985 evaluation of the AIROH program, author Brian Finnimore stated: “The aluminum house started as the most expensive, entered production as the most expensive, and finished as the most expensive. In fact, the disparity in cost widened at each stage. In 1944, it was 29% more expensive than the estimate for the Portal house; in 1945, it was 25% more expensive than the Arcon house and 33% more expensive than the Uni-Seco house; by 1947 these figures widened to 33% and 43%, respectively. The soaring cost of the AIROH house arose from the fact that it was the most prefabricated house in the program.”

For more information, see the following resources:

- Peter Dewrance, “Prefab Days,” 14 August 2015: <https://peterdewrance.wordpress.com/2015/08/14/prefab-days/comment-page-1/>
- Brian Potter, “England’s Aluminum Houses: The AIROH House,” Medium.com 21 August 2017: <https://medium.com/@briancpotter/englands-aluminum-houses-the-airoh-house-2d029a6a6bb6>
- Brian Finnimore, “The A.I.R.O.H. house: industrial diversification and state building policy,” Construction History, Vol. 1, pp. 60-71, The Construction History Society, 1985: <https://www.jstor.org/stable/41613606>
- “A brief romance with a production line,” DesignBox Architecture, 27 September 2013: <http://dgnbx.blogspot.com/2013/09/a-brief-romance-with-production-line.html>
- Eugene Byrne & Joseph Wilkes, “Pictures show how Bristol rebuilt after the Second World War, Bristol Live, 19 February 2018: <https://www.bristolpost.co.uk/news/history/pictures-show-how-bristol-rebuilt-1224808>
- “The Prefabs of Clerk’s Piece, Beccles,” <https://clerkspieceprefabs.weebly.com/construction--demolition.html>
- “The BAC AIROH ‘Pre-fab’ — from Beaufighters to Bungalows,” build your own AIROH bungalow paper model, Bristol Aero Collection 2008: <https://www.ideasfestival.co.uk/wp-content/uploads/2019/04/Prefab-1.pdf>

Videos:

- “It Happened in Norwich - Operation Prefab” (1:32), East Anglian Film Archive, Norwich, Norfolk, 1947:
<http://www.eafa.org.uk/catalogue/118>
- “The AIROH prefab at St. Fagans Museum, Cardiff” (2:32 minutes), The Prefab Museum, September 2017:
<https://vimeo.com/294566712>
- Dave Bregula, “Prefabs – Palaces for People” (1:58 minutes), 30 March 2016:
<https://www.facebook.com/dave.bregula/videos/10209398644791644/UzpfSTQ3NjYyODM0OTA0NDc2ODoxMTg4NjY1OTQ0NTA3NjY4/>