

Jim Meachen (ZL2BHF), located in Nelson, New Zealand, is shown operating his AREC Mark 1 transceiver during an annual NZART AM-only contest ('H-Night').

AREC Mark 1.
Country of origin:
New Zealand

REMARKS

Several years ago, I received a request—accompanied by photographs—to identify a small, battery-powered hybrid shortwave transceiver discovered in Australia. The only clue to its origin was a possible manufacturer: EDAC. The unit was professionally constructed, incorporating subminiature D70 series valves in the transmitter and germanium transistors in both the modulator and receiver. Most components were identified as Philips-manufactured.

With no definitive link to its origin, the device was eventually listed as a 'mystery' set on the WftW website under the 'Other Topics' tab. Then, in June 2025, an email from Aidan Barnsdale (ZL3APB) in New Zealand revealed the set to be an AREC Mark 1. Developed in the late 1950s by radio amateurs, it was produced by EDAC in Wellington for AREC (Amateur Radio Emergency Communications) in New Zealand.

AREC

AREC is an organisation that provides essential communication support during search and rescue missions, natural disasters, and civil defence emergencies. It was established in 1932, following the devastating Napier earthquake of 1931. Originally named REC (Radio Emergency Communications), the group was allocated an exclusive frequency band of 2.85 to 3.00 MHz.

Membership comprised licensed radio amateurs affiliated with NZART (New Zealand Association of Radio Transmitters). Prior to World War II, emergency communications and training exercises were conducted using members' own homemade radio equipment.



Pre-war REC members with their portable equipment.

Operations were suspended during World War II. In 1949, REC added the word 'Amateur' to its name, becoming AREC, while remaining part of NZART. Following the war, surplus New Zealand military ZC1 and Australian WS No. 208 Mk.I radio sets became available and were actively used during emergencies and training exercises. However, both sets proved too heavy for portable field operations.

In response, AREC members began designing a lightweight transceiver using miniature battery valves—this became known as the Franklin prototype. When transistors became more affordable, Roy Needham (ZL1KG) developed a new design based on the Franklin prototype, known as the AREC Mark 1. The initial version used DL94 valves in the transmitter. After extensive field trials, series production was undertaken by EDAC Ltd., a subsidiary of Philips New Zealand.

DATA SUMMARY

Organisation: Amateur Radio Emergency Communications.

Design: Roy Needham (ZL1KG) and supporting team.

Manufacturer: EDAC, Wellington, New Zealand.

Year of Introduction: June 1961.

Purpose: AREC search and rescue communication.

Transmitter:

Frequency coverage: 3-6MHz. CW and AM.

Circuit features: Master oscillator/doubler, RF output amplifier, transistorised AM modulator.

RF output: 1W

Valves/Semiconductors: DL70, DL73, OC71, OC72 2x, OC22.

Receiver:

Frequency coverage: 3-6MHz. CW and AM.

Circuit features: LO/mixer, IF stages 2x, Detector, AVC, AF amplifier, AF output, BFO.

Intermediate frequency: 465kHz.

Semiconductors: OC170, OC45 3x, OC71 2x, OA79, OA70.

Aerial: Wire 60-100ft and optional counterpoise.

Power Supply: DC input: 12V from 4x 6V No. 744 dry batteries, wired in series-parallel, or alternative.

Transmitter power supply output: 150V HT and 1.2V LT.

Consumption: Receive 11mA; transmit 1.1A.

Semiconductors: OC29, OA211, OA31, OA51 2x.

Dimensions (in.) and weight (lb):

AREC Mark 1: Height 5, length 5, width 9½; 7lbs 8oz.

Batteries: Weight of four dry batteries 5lbs 2oz.

Acknowledgements

Many thanks to Aidan Barnsdale (ZL3APB), who identified the 'mystery' set on the WftW website as the AREC Mark 1. He kindly provided photographs of his set, a scan of the manual, and articles on the AREC Mark 1 published in Break-In, the magazine of the NZART.

I am indebted to NZART historian Craig Crawford (ZL3TLB) for his assistance in locating historical details of the AREC Mark 1, and for granting permission to publish photographs and his PDF presentation on the history of AREC.

Jim Meachen (ZL2BHF) generously gave permission to publish photographs of his restored AREC Mark 1, along with an image of himself operating the set, which may have been a prototype.

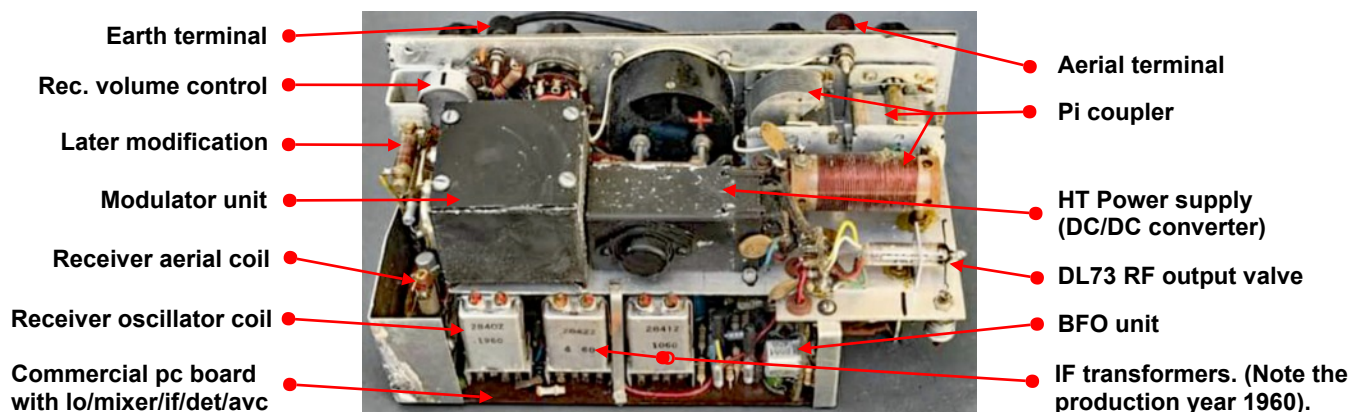
Without their help, this chapter would never have come to fruition.



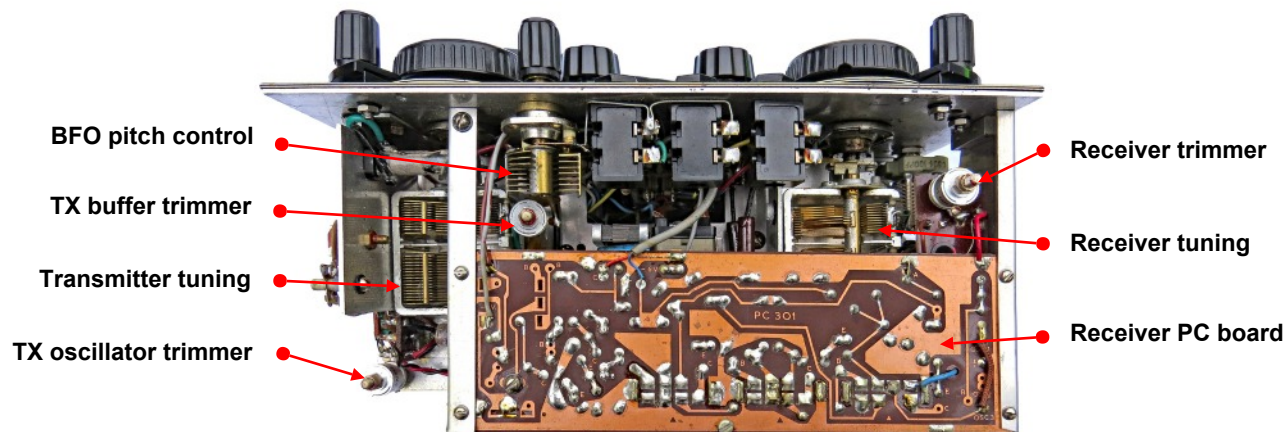
This is the front panel of Jim Meachen's (ZL2BHF) AREC Mark 1. It bears no manufacturer's name or serial number and is believed to be a pre-production model used during field trials.



This is an AREC Mark 1 production model (serial no. 016), featuring a simplified meter switch and smaller Philips-type knobs for receive/antenna tuning, pitch adjustment, and dial lock.



This is the rear and top view of the production AREC Mark 1.



This is the bottom view of the production AREC Mark 1.

A selection of portable radio equipment used by Amateur Radio Emergency Communications (AREC).
 (Based on 'Nine Decades of Service,' a PowerPoint presentation by Craig Crawford, ZL3TLB).



An example of a pre-war portable transmitter-receiver, home made by REC member ZL4CF.



AREC members operating an Australian No. 208 Mk. I.



Australian Army Wireless Set No. 208 Mk.I. This set was modified by REC to include AM operation. In use from 1947 to 1958.



Commercial Pye (Aust) Type TRP-1, a crystal controlled three channel transceiver for AM only (Used 1950-1966).



Army Wireless Set NZ ZC1 Mk.I: 60 sets were donated by the War Assets Realisation Board to AREC. They were used from 1949 onwards, operating on AM and CW.



AREC Mark 1. AM and CW. (Used from 1960-1966).

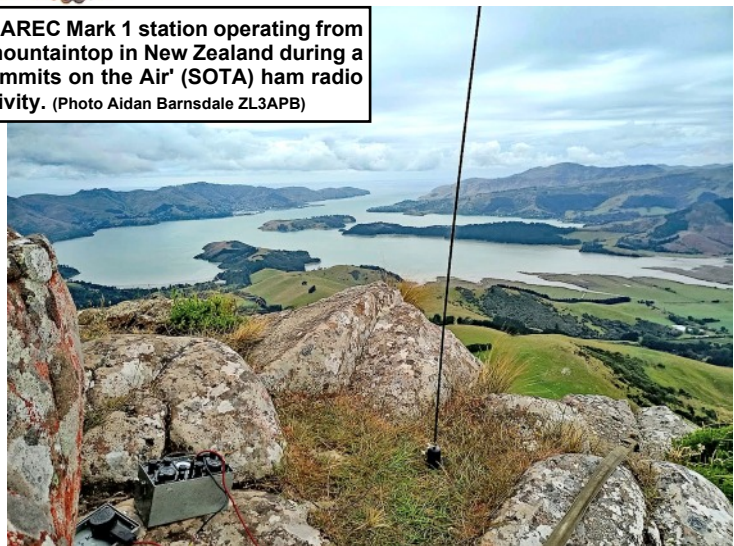


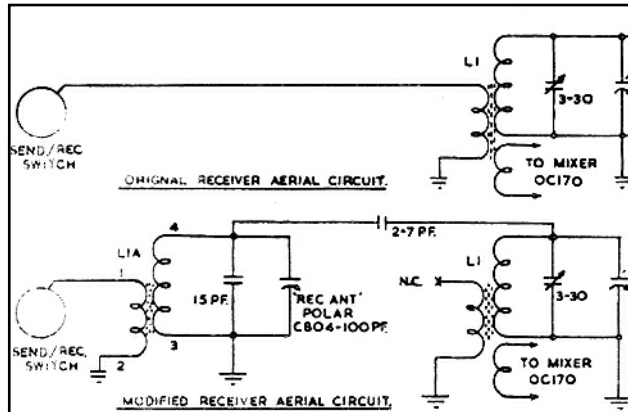
Commercial AWA Teleradio 3. Single channel, AM only. (Used from 1967-1978).



Commercial AWA Teleradio 105: A six channel single-sideband (SSB) transceiver. In use from 1979 to 1990.

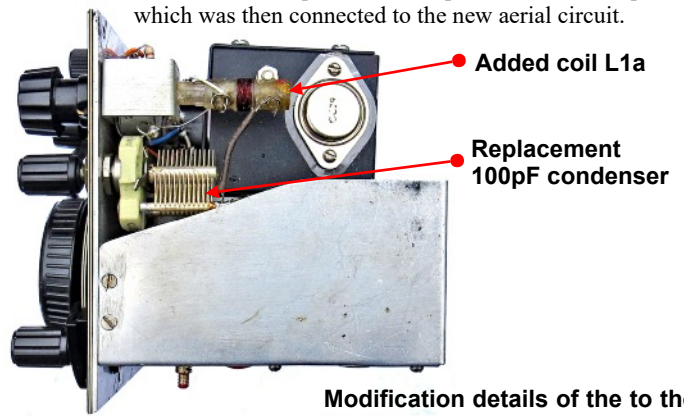
An AREC Mark 1 station operating from a mountaintop in New Zealand during a 'Summits on the Air' (SOTA) ham radio activity. (Photo Aidan Barnsdale ZL3APB)





Later modifications.

The original AREC Mark 1 design suffered from image signals and spurious responses in the receiver. A modification to the front end resolved these issues. As part of the modification, an additional tuned aerial coil, L1a—mounted on a bracket behind the AF gain potentiometer—was loosely coupled to the existing coil, L1. The original Receive Ant. Tune variable capacitor was replaced with a 100pF unit, which was then connected to the new aerial circuit.



Modification details of the to the AREC Mark 1 receiver front end.

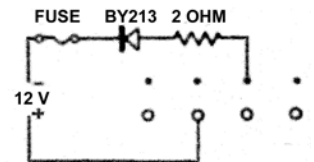


A newspaper clip from 1961.

This small, new, transistorised radio receiver and transmitter maintained a radio link for sometime between Wellington and Raetihi, during a power failure at Raetihi during the weekend storms. The men holding the set are (from left), Mr RB Glassey Chairman of the Search and Rescue communications sub-committee, and Messrs. FRW Andrews and WD Gorman of the Amateur Radio Emergency Communications. The new set was received only in June and when power failed at Raetihi, it maintained a radio link with Wellington to handle urgent Post Office traffic. The sets are worth between 100-120 Pounds and have an output of only 1 watt compared to the 100 watts of the usual type of receiver and transmitter. The set is powered by nine transistors and two valves and can operate in any conditions.

Car battery power adapter.

The issue of the input voltage drop to 8.5V when using dry batteries, excluding the use of a 12V car battery, was later resolved by a simple external unit. This unit consisted of a 2Ω resistor, a reverse-polarity silicon diode, and a fuse connected in series with the car battery.



Epilogue.

What began in 1932 as a small group of NZART-licensed radio amateurs providing emergency communication when conventional methods failed eventually grew into a national service. From simple home-built equipment in the pre-war years, it evolved into today's professional organization, utilizing modern communication facilities to provide nationwide emergency communication.

Due to its primary focus on the technical description, development, and utilization of the AREC Mark 1, Chapter 21 of the WftW Various series does not cover this broader evolution. More recent applications of communication technology at AREC can be found on the AREC website, as listed in the References.

References:

- Articles published in 'Break-in', the NZART magazine:
- The AEC Portable transmitter receiver, FRW Andrews, ZL2IJ.
- Operational prototype, MFW Taylor, ZL2PX.
- AREC Mark 1 Battery tests, N.Miller, ZL2CR, Oct. 1963.
- AREC Mark 1 Modifications, May 1963, Nov.1970 and June 1971.
- 'Nine Decades of Service', a power point presentation by Craig Crawford, ZL3TLB.
- 'Wireless set AREC Mark 1', Instruction manual, n.d.
- Correspondence with Aidan Barnsdale, ZL3APB.
- Correspondence with NZART historian Craig Crawford, ZL3TLB.

Additional reading and further information:

- AREC website: <https://arec.nz/>
- New Zealand Association of Radio Transmitters website: <https://nzart.org.nz/>
- 'Schoolhouse in the Clouds', by Sir Edmund Hillary, 1964. ASIN: B0007E07BQ2.

EDAC Ltd.

Following development and extensive field trials in the late 1950s—which led to significant construction changes—the AREC Mark 1 was ready for production in 1960 by EDAC (Electronic Development & Applications Company Ltd) in Wellington, New Zealand. Funding for production had already been successfully secured. Although the exact number of AREC Mark 1 sets produced remains uncertain, the serial number 049 found on one of the surviving units suggests that at least fifty were manufactured.

EDAC Ltd., a subsidiary of Philips Electrical Industries of New Zealand, was established in Wellington in 1954 and operated until its closure around 1980. Among its diverse range of products, the company designed and built radiocarbon dating equipment, television sets, and taxi meters.

One particularly notable project was the radio communication equipment EDAC developed for Sir Edmund Hillary's Himalayan Schoolhouse Expedition in 1963. This expedition continued Hillary's earlier efforts during the 1960–61 Silver Hut expedition. The humanitarian mission focused on building schools, installing water systems, providing medical aid, and improving education for Sherpa communities in Nepal.