How the Transatlantic Test of 1921 Initiated International Amateur Radio Communication

This one-way transmission test has greatly impacted the advancement of amateur radio techniques, technologies, and discoveries over the past 100 years.

Carl Luetzelschwab, K9LA

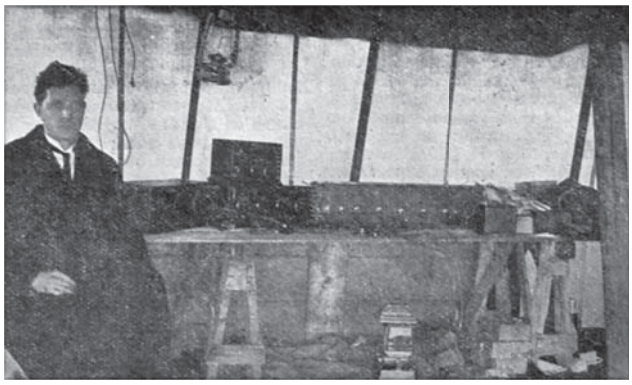
In 1921, signals from huge VLF stations in the US reached across the Atlantic Ocean to Europe, and amateurs communicated from the east coast of the US to California. Many amateur radio operators believed that they, too, could span the Atlantic, even with modest stations.

ARRL strongly believed in this endeavor, and sent Paul Godley, 2ZE, a seasoned operator and accomplished receiver designer, to the UK via the *Aquitania*, to be an auxiliary to the British efforts to listen for American hams. The December 1921 Transatlantic Test was the second to be completed, following the first unsuccessful test held earlier that year. The December test was a one-way transmission. European hams listened for American hams, and successfully received the signals of many US hams in Ardrossan, Scotland, where Godley was, as well as in England, Holland, Germany, and France. Two-way transatlantic contacts weren't completed until 1923.

Here are some of the ways this successful test was the first step forward in the progression of amateur radio.

The Radio Act of 1912

Because of interference to commercial and naval radio operations, the Radio Act of 1912 relegated amateur radio operators to wavelengths of 200 meters and shorter (frequencies of 1.5 MHz and higher). At that time, it was believed that these frequencies were only useful for relatively short distances, and therefore considered to be a "wasteland." Fortunately, the 1921 Transatlantic Test dispelled this myth, and led to greatly increased use of shortwave frequencies for transoceanic contacts.



The Ardrossan station with Inspector E.D. Pearson of the Marconi International Marine Communication Co., who was the checking operator throughout the test. [February 1922 *QST* photo]

Understanding the Ionosphere

The Transatlantic Test of 1921 was one of many factors that brought about new research of the ionosphere. Although American electrical engineer Arthur Kennelly and English mathematician Oliver Heaviside independently postulated the existence of the ionosphere in 1902 from Italian electrical engineer Guglielmo Marconi's transatlantic feat in 1901, it wasn't until 1924 that English physicist Sir Edward Appleton proved the existence of the ionosphere.

We now have a much better understanding of the ionosphere, and realize that our HF frequencies can easily allow long-distance contacts with modest stations.

The Beginning of DX Operation

Although the 1921 Transatlantic Test was only a one-way transmission because of severe restrictions on transmitter power and antenna size for British hams, it set the stage for late 1923, when the first two-way contacts were completed between the US and Europe.

When ARRL sent Godley to the UK to listen for signals from American radio amateurs, it was essentially the first-ever DXpedition. Thus, the Transatlantic Test, and other tests that followed, gave rise to the practice of making DX contacts, as well as hams traveling for DXpeditions.

The Emergence of Receive Antennas

In 1920, the Radio Corporation of America (RCA) tasked Harold Beverage with developing receiving systems (receivers, antennas, and interference reduction techniques) for transoceanic communications. In June 1921, Beverage obtained a US patent for his radio receiving system: the Beverage antenna.

Fortunately, Godley met Beverage aboard the *Aquitania*. Godley tried Beverage's new invention, hoping to improve his reception of signals from America. This was a critical factor for Godley's success during the 1921 Transatlantic Test. This type of antenna is now used by many 160- and 80-meter operators around the world, to improve the signal-to-noise ratio (SNR) on those bands with higher noise levels. The invention of improved receiving antennas emerged from the Transatlantic Test, although radio amateurs didn't use them in meaningful numbers for more than 50 years.

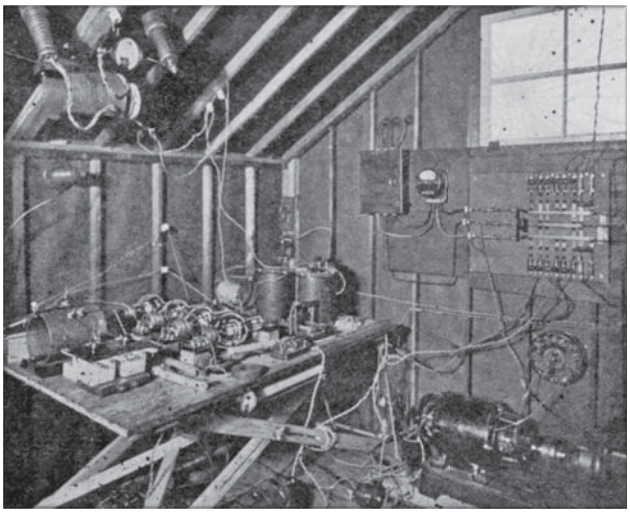
A Rise in CW Transmissions

As reported by The Editor of *QST* in "The Story of the Transatlantics" in the February 1922 issue, Godley, the British, and a few other countries heard many American stations during the 1921 test. Most of these American signals used CW transmissions, and only a few spark transmitters were heard. These results set the stage for the increased use of CW and the demise of spark.

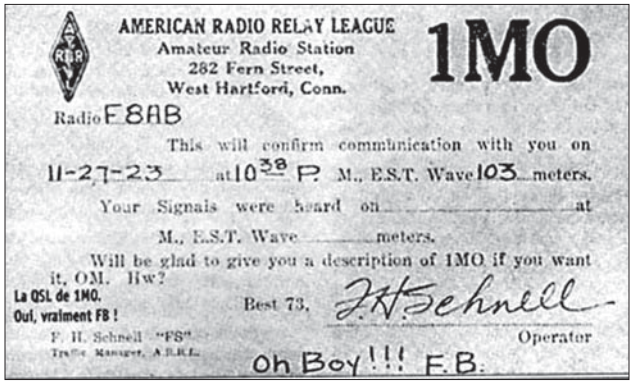
The majority of the American stations that Godley heard used CW, and Godley used a superheterodyne receiver, invented by American electrical engineer Edwin Armstrong in 1918. This sent amateur radio on its way to improved CW transmitters and superheterodyne receivers capable of operation at much higher frequencies.

Summary

The Transatlantic Test of 1921 was a great step forward for amateur radio operators. I'd like to thank those who participated in both the one-way and two-way tests all those years ago for their efforts. They ushered in the dawn of international amateur radio. I'd also like to thank Frank Donovan, W3LPL, for his contributions to this article.



The 1BCG transmitter, organized by members of the Radio Club of America in Greenwich, Connecticut, was the strongest of many stations in the east coast of the US heard by Paul Godley, 2ZE, during the December 1921 Transatlantic Test. It ran about 1,000 W input, and it took up the entire corner of a small building. Now, a modern transceiver with a 1 kW input amplifier would easily fit on a desktop. [Radio Club of America photo]


AMERICAN RADIO RELAY LEAGUE
Amateur Radio Station
282 Fern Street,
West Hartford, Conn.

1MO

Radio E8AB

This will confirm communication with you on 11-27-23 at 10 38 P. M., E.S.T. Wave 103 meters.

Your Signals were heard on _____ at _____ M., E.S.T. Wave _____ meters.

Will be glad to give you a description of 1MO if you want it, OM. Hw?

La QSL de 1MO.
Oui, vraiment FB !

Best 73, J H Schnell

F. H. Schnell "FS"
Traffic Manager, A.R.R.L.

Operator

Oh Boy!!! F.B.

A QSL for one of the first two-way transatlantic contacts. [**www.hamgallery.com** photo]

For more information on the Transatlantic Test of 1921 and commemorations of its anniversary, visit **http://arrl.org/transatlantic**.

Carl Luetzelschwab, K9LA, started his radio career as a shortwave listener in the late 1950s, using a National NC-60 receiver. After discovering amateur radio, he received his Novice-class license in 1961. He selected K9LA as his call sign in 1977. Carl enjoys propagation, DXing, contesting, playing with antennas, and fixing/using vintage equipment. He's a graduate of Purdue University (where he earned his Master's degree in electrical engineering) and worked for Motorola (in Schaumburg, Illinois, and Fort Worth, Texas), and for Magnavox (now Raytheon) in Fort Wayne, Indiana, as an RF design engineer. Carl retired in October 2013. He can be reached at **k9la@arrl.net**.

For updates to this article, see the *QST* Feedback page at www.arrl.org/feedback.

Celebrate the Transatlantic Tests with ARRL and RSGB

ARRL and the Radio Society of Great Britain (RSGB) have planned a series of joint events to celebrate the centenary of the successful 1921 Transatlantic Tests by radio amateurs, which spurred technological advances in long-distance and global two-way radio communications. Watch for further information about these events in 2021 and 2022.

160-Meter Transatlantic Centenary QSO Party 0200 – 0800 UTC Sunday, December 12, 2021

Commemorating the very hour 100 years ago, when the first transatlantic message from amateur radio station 1BCG in Connecticut reached the listening station of Paul Godley, 2ZE, in Ardrossan, Scotland, ARRL and RSGB will activate CW-only special event stations for 6 hours.

A team of stations from GMDX Group, a Scotland-based DX society, will share the operations as GB2ZE in Scotland, while ARRL will activate W1AW from Newington, Connecticut. Operations will commence at 0200 UTC and continue until at least 0800 UTC. If propagation conditions across the Atlantic permit, operations will continue beyond 0800 UTC.

GMDX Group will award a *quaich* (a traditional Scottish two-handled drinking cup that commemorates friendship) to the first stations in North America and the UK to complete contacts with both W1AW and GB2ZE during the QSO party. ARRL and RSGB will jointly publish successful contacts, and will offer a downloadable certificate to stations that contact one or both activated stations.

More Events and Commemorations

For more information, visit **www.arrl.org/transatlantic** and **www.rsgb.org/transatlantic-tests**.

Transatlantic Centenary DX Marathon December 2022

ARRL and RSGB will commemorate the centenary of the Transatlantic Tests held between 1921 and 1923 with a DX marathon in December 2022. All radio amateurs will be encouraged to mark these historic events by making contacts throughout the month. Full details will be available closer to the date.

W1AW Commemorative Transatlantic QSL Card

Stations making contacts from December 11, 2021 to December 31, 2022, may request a commemorative W1AW QSL card. US stations send a self-addressed stamped envelope; international stations request a QSL card via the ARRL QSL Bureau.

2021 ARRL 160-Meter Contest

From 2200 UTC Friday, December 3 to 1559 UTC Sunday, December 5, this annual CW contest is most like the Transatlantic Tests of the early 1920s. Visit **www.arrl.org/160-meter** for contest rules and information.

Special Event Call Sign GB1ØØ2ZE

From December 1 to December 26, 2021, the Crocodile Rock Amateur Group (CRAG), based near Ardrossan, Scotland, will activate the special event call sign GB1ØØ2ZE, to commemorate the successful reception of amateur transatlantic signals by Paul Godley, 2ZE. In tribute, RSGB will encourage stations in the UK and Crown Dependencies to add the suffix "/2ZE" to their normal call sign throughout the period.

"A Glorious Page" in the History of Amateur Radio

Bruce Godley Littlefield, grandson of Paul F. Godley, 2ZE, contributed this image of a document that ARRL presented to his grandfather to commemorate the success of the Transatlantic Tests.

Bruce told ARRL, "It is the resolution presented to my grandfather by ARRL, dated February 17, 1922. This is roughly 18" × 28" and a magnificent work of art…I have had it re-matted and re-assembled with archival materials, though the frame and glass remain original. It was professionally scanned at high resolution so that copies could be made as desired, at the request of the other Godley grandchildren and their descendants."

The resolution commends and thanks Godley, who "accepted the invitation of the American Radio Relay League and at Ardrossan, Scotland, in the face of great physical discomforts, unfavorable climatic conditions, and technical handicaps, set up his apparatus and wrote a glorious page in the history of the American Radio Amateur by the unprecedented reception in Europe of twenty-six United States and Canadian amateur stations." It is signed by ARRL President Hiram Percy Maxim, ARRL Traffic Manager Fred H. Schnell, and ARRL Secretary K. B. Warner. [Used with permission; from the collection of Bruce Godley Littlefield, grandson of Paul F. Godley, 2ZE]

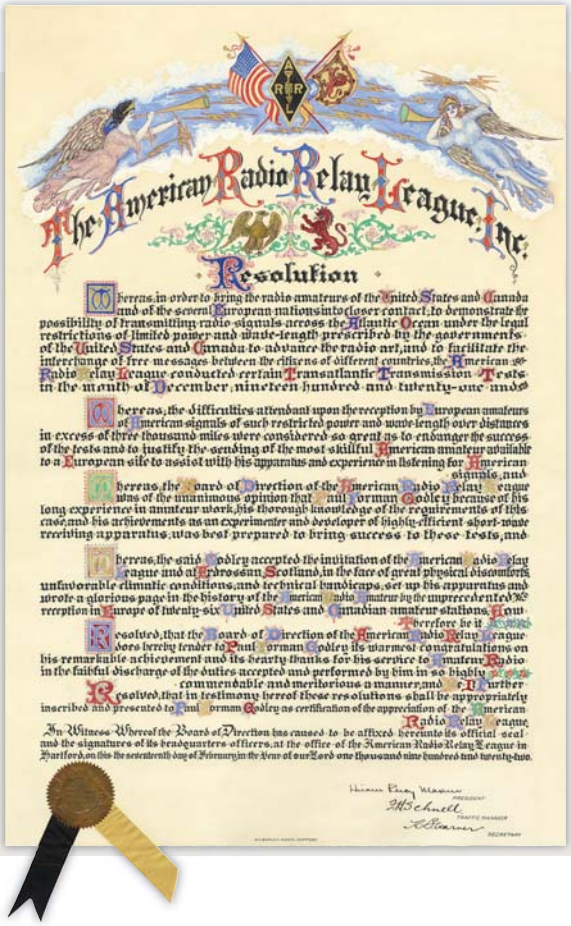
A Wager Won, An Ocean Spanned

An unusual artifact from ARRL's museum collection attests to high spirits at the time of the Transatlantic Tests.

In 1921, during the excitement leading up to the Transatlantic Tests, ARRL Secretary K. B. Warner, W1EH, offered to bet "a hand-painted derby hat" that US signals would be heard in Europe during the tests. W. W. Burnham, a well-known manufacturer of ham radio gear, accepted that bet.

As we know now, ARRL's representative in Ardrossan, Scotland — Paul Godley, 2ZE — heard many US signals during the tests. The success of the tests meant that Burnham owed Warner a hat. The use of the term "derby" baffled the British hatmakers (what we call a "derby" in the US is known as a "bowler" in England), so they made their best guess and painted a hat of the type traditionally worn at derby races.

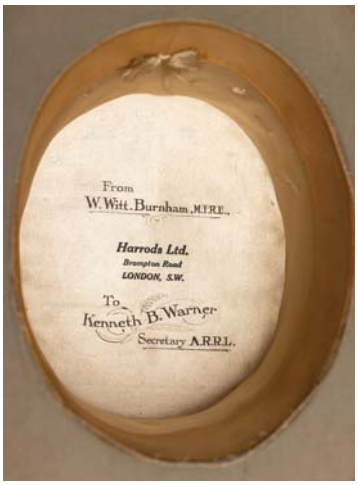
Warner eventually donated the congratulatory topper, which features a hand-painted US flag on one side and a UK flag on the other, to ARRL. The cover of this issue of *QST* shows both sides of the hat and both flags, in honor of what hams on both sides of the Atlantic achieved in the Transatlantic Tests 100 years ago.



The UK flag adorns the left-hand side of the hat.

The US flag flies on the right-hand side of the hat.

The hand-painted inscription on the hat reads, "In Commemoration of the Success of The Anglo-American Wireless Test Organized by The A.R.R.L., 1921."



The interior of the hat features an inscription from W. W. Burnham to K. B. Warner, along with a label indicating that the hat came from Harrods, a famous London department store.