

The Temple Air-Chrome Speaker – Jerry Proc and Gerry O’Hara¹

Background

I was contacted recently by someone selling a Marconi ‘Therm-I-Onic’ Model 13 radio (photo, right). Some of the photos that accompanied the enquiry showed that this model was fitted with an unusual loudspeaker type – and a label secured to this noted that it was a ‘Temple Air-Chrome Speaker’. At first glance, it looks like a typical late-1920’s [reed armature](#) drive type, which it is, but there is a little more to this design that meets the eye.

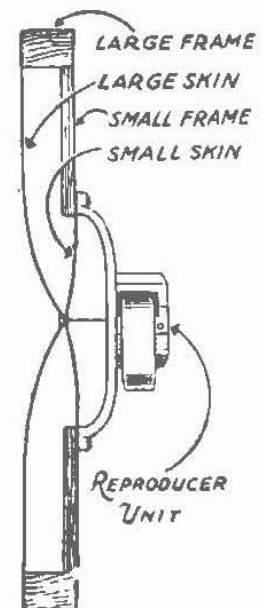
An advert in ‘Radio Retailing’ by the Air-Chrome Division of Temple Inc. of 1919 So. Western Ave., Chicago, Ill. provides some insight into the speakers’ construction and operation.

The main claim by Temple Inc. is that this particular ‘open radiator’ speaker design is able to better-



cover the range of audio frequencies by the driver (reed armature mechanism) being coupled to two low-mass diaphragms of differing sizes: a larger one covering the lower frequency range and a smaller one covering the higher frequency range.

The light-weight construction and tautness of the diaphragms is also claimed to result in increased sensitivity. The advert also notes that “...*climatic changes have no influence in that no paper is used* [in the construction]...”. Interestingly, there is no mention in the advert as to what material is used in place of paper for the diaphragms, other than using the word ‘skins’ in the technical description sidebar (see below), or why the name ‘Air-Chrome’ was adopted as the name for the design.



How it Works

The advert also has a ‘technical’ description insert included on how the Air-Chrome speaker works:

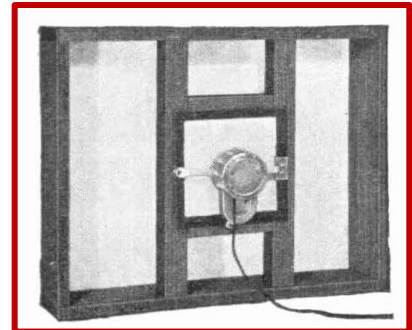
“The Air-Chrome principle, while it is new, is so logical that the efficiency of this type of construction is readily appreciated. In Air-Chrome construction, two tightly-stretched skins, chemically treated, form the diaphragm [sketch, right]. This diaphragm is so arranged that the large front half is tuned to the lower frequencies and the smaller, or back half, to the higher frequencies. Both halves are balanced at the centre. At

¹ Colour photos of the Marconi ‘Therm-I-Onic’ Model 13 in this article courtesy of Cameron Willis

this balanced centre, the driving unit operates, and, as there is no dead weight to overcome because of the balanced feature, it is easy to understand how the slightest impulse on the driving unit is instantly transmitted to the taut diaphragm. The result is a sensitivity, a frequency response and a handling capacity in undistorted volume that is a revelation in speaker design."

Construction

Three standard sizes of the Air-Chrome speaker were manufactured: Model F, 18" x 23", Model J, 24" x 24", and Model K, 14" x 14", retailing at \$23, \$25 and \$20 respectively. The design is described as "plain but business-like in appearance...", with the square or rectangular frames offering both protection for the unit and providing ease of installation, with the available sizes lending themselves to many cabinet and console designs (illustration, right). The frame supporting the larger diaphragm of the Air-Chrome speaker is actually the dark wood frame in the colour photo, right (within the large red rectangle in the photo): compare with the black and white illustration from the advert, above right - with the driver and smaller diaphragm behind (circled red) in the photo, right, and shown in the close-up photo, below.



Marketing Hype

Some of the wording in the advert reveals that the marketing guys ability to hype-up something was alive and kicking in the late-1920's, eg.:

"The inherent factors of the Temple Air-Chrome, plus the performance of a specially-developed, powerful Temple Double Action



Unit [photo, left] accounts for its handling

capacity – for its enormous volume- its brilliancy-its full response to all audible frequencies. That's why the Temple Air-Chrome will not chatter- why its suited to every kind of power output."

Geez – where can I buy one! But wait, somehow the illustrations on the advert do not match up with the mental image the text portrays – it looks like a piece of canvas stretched over a flimsy

wooden frame with a diminutive and rather crude-looking gadget at the centre – somewhat resembling a spider sitting in the middle of its web... photo of the 24" x 24" unit fitted into the Marconi Therm-I-Onic' Model 13, right.

More information on the Marconi 'Therm-I-Onic' Model 13 can be found [here](#), the advert from 'Radio Retailing' is



TEMPLE

New Temple Air-Chrome Speakers

Manufacturers' Types—for use in Console Cabinets



Pat. Pend.

This is model F of the ordinary model. May be obtained in other suitable positions or suspensions. The speaker is made for simple and easy installation. Temple Air-Chrome speakers are located under the following information.

Model F
18" x 23"
\$23.00

Model J
24" x 24"
\$25.00

Model K
14" x 14"
\$20.00

Three Standard Sizes

All Light in Weight

As can be seen from the illustration, Temple Air-Chrome speakers are plain but business-like in appearance. The square or rectangular frames not only offer maximum protection for the entire unit, but make possible an ease of installation which set builders will appreciate. The three standard sizes lend themselves to a multitude of cabinets and console designs.

Special Temple Double Action Unit Employed

The inherent factors of the Temple Air-Chrome, plus the performance of a specially developed, powerful Temple Double Action Unit, accounts for its handling capacity—for its enormous volume—its brilliancy—its full response to all audible frequencies. That's why the Temple Air-Chrome will not chatter—why it is suited particularly to every kind of power output.

Temple Air-Chrome Speakers Will Move Quickly

Professional set builders and radio enthusiasts will include the Temple Air-Chrome in their specifications—they are waiting for it—they already are sold because of the advanced principles employed—they are assured of the finest possible tone quality for the output of their receivers.

May we send you further information? Also write for complete data on Temple Air Column Speakers and the powerful Temple Double Action Units.

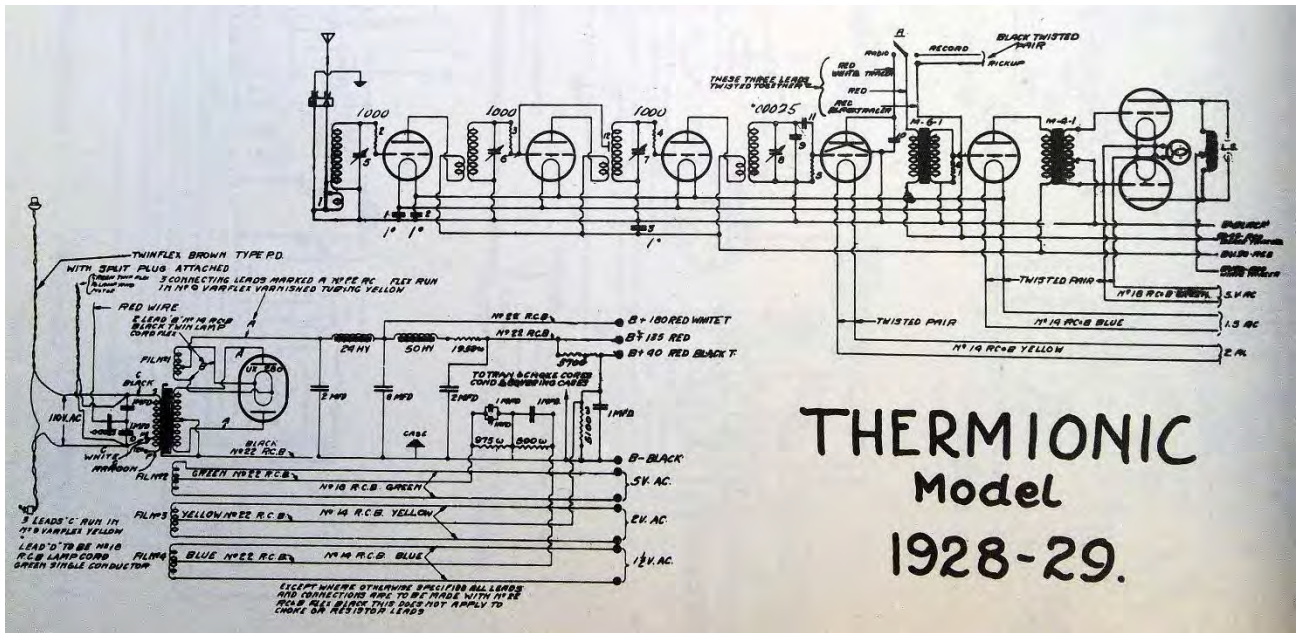
Air-Chrome Division
TEMPLE, Inc.
1919 So. Western Ave.
Chicago, Ill.

LEADERS IN SPEAKER DESIGN

reproduced left – a little illegible in parts, but interesting all the same, and another advert for 'stand alone' speakers using these drivers is presented at the end of this article.

Closure

A question posed by one of the authors of this article was "Can the Air-Chrome speaker be replaced with a permanent magnet speaker if found to be defective? since the Marconi 'Therm-I-Onic' Model 13 has a push-pull audio output stage [see schematic below], the Air-Chrome speaker may need more drive than a regular permanent magnet speaker - this might be valuable to know if someone is faced with a defective Air-Chrome speaker."



Examination of the schematic shows that the Air-Chrome speaker driver is not fed from the secondary of an output transformer, rather the armature coils are connected directly to the plates of the output tubes, with the plate supply voltage being fed to a centre-tapped choke, the ends of which are also connected to output tube plates – a rather unusual arrangement. It is therefore difficult to muse on the comparative sensitivity of the Air-Chrome driver to that of a typical electro-dynamic speaker of the 1930’s, or later, permanent magnet ones, which themselves had greatly-varying sensitivities. However, it is likely as sensitive, or more so, the reason for the push-pull output stage reflecting more on the early stage in the development of power output tubes in the late-1920’s, needing a push-pull stage to develop sufficient power that the radio was audible in a medium-sized room. The ‘technical description’ on page 2 of this article also suggests high sensitivity of the Air-Chrome speaker, noting that "...as there is no dead weight to overcome because of the balanced feature, it is easy to understand how the slightest impulse on the driving unit is instantly transmitted...". Perhaps the only way to find out would be to undertake a comparative test, though to do so, the output stage plate circuit would need to be modified accordingly using a suitable audio output transformer.

In conclusion, the Air-Chrome speaker ‘technology’ was a short lived offshoot of the reed-armature speaker design, itself a modified headphone driver unit. Within two or three years, electro-dynamic speakers had become the dominant speaker technology until the development of alnico permanent magnets in the late-1930’s and the subsequent dominance of permanent magnet loudspeakers thereafter.



On With *the* Dance



Model 15
Temple Air Column Speaker \$29

TINKLING feet will not be denied. The rhythmic swing of the modern dance has taken hold—happiness seeks expression to the strains of a pleasing melody. So roll up the rug, move back the couch—for youth will dance to the tune of busy fingers.

Choose as you will—a lively one-step, a black bottom or an old-fashioned waltz—a Temple Speaker will give you an appreciation of dance music that you have never had before. Clear and true ring its tones above the murmur of the conversation. Volume, plenty of it, is yours—even enough for a small auditorium—and all without the semblance of distortion.

On with the dance—let a Temple Speaker unfold the tantalizing tunes of your favorite orchestras or the captivating airs of world-famed recording artists.

Temple Speakers are yours in two outstanding models.

Model 15 is the refined and improved exponential air column speaker—the speaker upon which Temple success was founded—but now better than ever—price \$29.00.

Model 20 Temple Air Chrome represents a sensational new development in loud speakers. The open radiator consists of two sections instead of one, driven by the powerful Temple Double Action Unit, thus substantially increasing the volume and tonal range. Price \$29.



Model 20
Temple Air Chrome Speaker \$29

TEMPLE, INC.
CHICAGO AND NEW YORK

TEMPLE SPEAKERS

AIR COLUMN *and* AIR CHROME

SEE THEM AT THE NEW YORK SHOW