Atwater Kent 768Q

Atwater Kent Manufacturing Co.
Philadelphia, Pennsylvania

1935 model year.

A challenge to preserve and properly exhibit this seldom seen 'farm radio'.

By: Robert Lozier – Monroe, NC; USA

Containing their highest performance chassis design for use with the *Eveready* 2 Volt *Air Cell* 'A' Battery technology.

The old gentleman that acquired this and other vintage radios back in the 1980's apparently did not make any attempts to contact other collectors or join in any club activities. Otherwise he might not have used 'barn brush' applied heavy polyurethane varnish to 'fix up' a dull looking cabinet. This created a plastic film encased horror for the eyes of any experienced historian. I think that if he had been aware of the waterless hand cleaner/ touch-up/ boiled linseed oil/ paste wax method of cleaning, the original finish would have looked very good.

At this point I had to consider what should be done to best preserve this artifact for the best interests of future generations. In my experience, I see that the term 'restoration' when applied to electrical/electronic artifacts has a broad scope of interpretation. This prompted me to categorize my own perceptions of what 'restoration' means to me and to the fraternity as a whole.

Antique Electronic Device Restoration – Definitions

By: Robert Lozier - 2013

Restored to operating condition.

Chassis and other parts not visible from the front of the device….

1. Generally no regard to the value of conserving original internal components if they no longer work adequately.
2. Sub-par or non functioning parts are most often replaced with components made with more modern/advanced manufacturing techniques and materials.
3. A small percentage of these parts replacement projects may employ hiding the new parts within the carcasses of the old components.
4. Sub-par wiring is replaced with modern wiring.
5. Tube types in scarce supply may be replaced with more common tubes.
6. Loudspeakers may be changed.

7. Circuits may be changed to improve performance.
8. The internal components may or may not be cleaned.
9. There may or may not be protective coatings applied to protect from continuing deterioration.

Net result: It works until it malfunctions again…

Enclosure….

1. The enclosure may be refinished with modern materials.
2. The pores of open grain solid wood and veneers that had originally been filled may or may not be filled.
3. The opaque stains or lacquers used originally to hide end grain and grain in secondary woods or plywood laminations may or may not be applied.
4. Multiple coats of finish in excess of the original manufacturing process may be applied to produce a result believed to be more pleasing to the modern eye.

Net result to the majority of restorers in our fraternity:

A working device visually pleasing to the modern eye is good because it makes it more marketable to the majority of potential consumers and it is fun 'to get her going'.

There is little harm in performing such work on artifacts that are:

1. Relatively common.
2. Are in extremely bad condition presenting far too many challenges for museum grade restoration or conservation.
3. Have already been through repair and refinish cycles where preservation of historical information or actual work performed was not part of the operation criteria.

The device can no longer be considered a valid artifact of the existing technology of its date of manufacture. It is a hybrid; almost always without any provenance documenting what has been changed or why.

Restored to preserve historical value.

1. Surface contamination is removed from all exposed surfaces of the internal components.
2. Cleaned surfaces may be given protective coatings if they can be removed without damage.
3. Missing original components may be replaced with original components for that design or with accurately constructed replicas. These components do not have to be functional.
4. Structural components if badly damaged may be refinished or replaced with accurate replicas.
5. Enclosures and components may be refinished using materials and techniques available at the date of manufacture. Attention is given to replacement of any grain filling, use of opaque stains or colored coatings to hide end grain, secondary woods or plywood laminations. The thickness of finish coatings are comparable to the original finish.
6. The steps taken to preserve the artifact are documented.

Net result: Further deterioration of the artifact is delayed. Severe flaws that detract from the overall appreciation of the historical merit remaining in the artifact are corrected. The device remains a valid artifact of the existing technology of its date of manufacture.

Conservation

1. Surface contamination is removed.
2. Cleaned surfaces may be given protective coatings if they can be removed without damage.

3. The steps taken to conserve the artifact are documented.

Further deterioration of the artifact is delayed. Severe flaws that detract from the overall appreciation of the historical merit remaining in the artifact are <u>not</u> corrected. The device remains a valid artifact but may not be suitable for exhibition or present a coherent historical record of the day of manufacture.

With the criteria given above, I made the following observations and decisions.

1. This Atwater Kent model 768Q is not a common radio and is an excellent example of how designers went about obtaining the maximum performance available using *Air Cell* battery technology circa 1933/35.
2. Radios designed to use the Eveready *Air Cell* for filament supply are even scarcer than 6 and 32 Volt vibrator supply radios of the same vintage.
3. While several hundred thousand 'Air Cell' radios were made from 1931 to about 1940 they have rarely been placed on exhibition in modern times.
4. In general, radios designed for rural locations do not survive in relatively good condition.
5. Restoration to preserve historical value would further enable my long term goal to write about the importance of broadcast radio use in rural America during the 1930's.
6. The fact that this radio has a unique filament power source in the form of the patented Eveready *Air Cell,* presented an exceptional challenge. To my knowledge, there exists no known complete example of the <u>full size</u> Eveready *Air Cell* of the 1930's even though something over one half million batteries must have been manufactured. As a part of this project I decided that I would build museum grade replicas of the *Air Cell* and the large 'B' batteries necessary to power this radio.

Restoration of the radio…

Many photos of the existing state of the finish were taken. This cabinet has walnut veneer with most of the secondary wood painted with black Japan color rather than the more common Van Dyke opaque brown.

The only practical remedy for removing the heavy polyurethane coating was to use the strongest grade of MEK solvent based paste stripper I could obtain. The bad news is that it takes everything off !!! The good news for me was that the cleaned wood did present a uniform coloration that absorbed mineral spirits uniformly. This told me that I would have little trouble in getting the wood to take stain and filler properly.

The open grain walnut veneer was filled using traditional mineral based walnut toned filler in a vehicle thinned with mineral spirits. After rub out of excess filler, I decided that no additional staining of the walnut was necessary.

In order to keep the black Japan color from looking too built-up, I decided to use a Van Dyke opaque stain on all the trim that was to be colored black (I did not have a black stain.). That added a great deal of opacity to these surfaces without adding depth to the finish.

The cabinet was sprayed with lacquer based sanding sealer and the finish was leveled using 400 grit sandpaper.

Two days later I applied blue painters tape and paper to cover all the areas that were to retain the natural walnut coloration. The wait was to make sure that the sanding sealer and filler were hard enough so that they would not be pulled off when the painters tape was removed.

The lacquer based finish I used will attack the acrylic adhesives in the painters tape. You have to make sure that you are not saturating the tape or it may stick to your finish. To minimize that, I used a small air brush to apply the black Japan color in the lightest and 'driest' spray possible. The black pigment has a slight amount of burnt umber pigment to keep it from looking 'hard black'. (This was evident in the original finish.) Within 20 minutes of finishing the spraying, I pulled off all the tape and paper masking. There appeared to be no evidence of adhesive transfer to the sanding sealer coating. (That's good!)

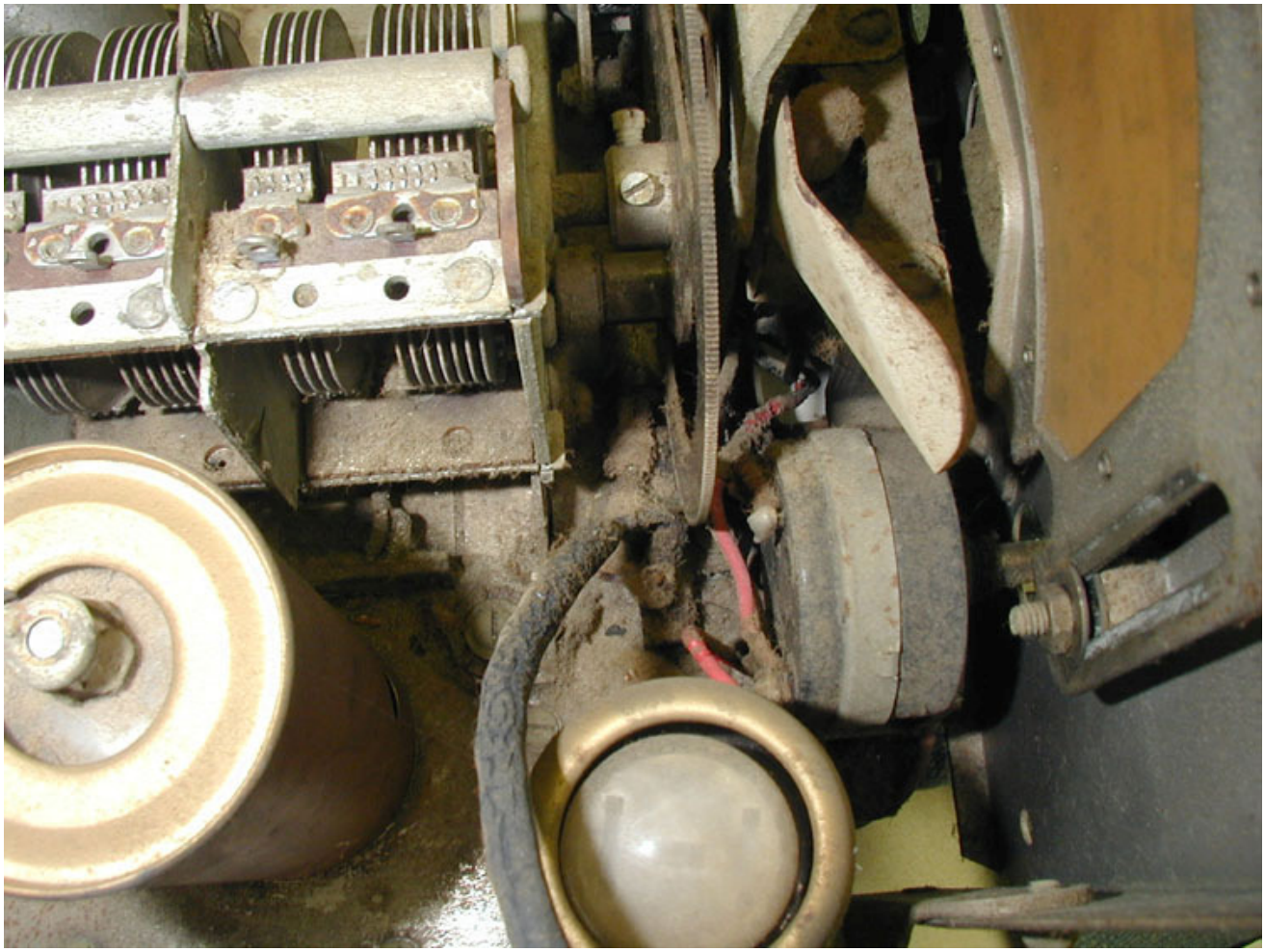
In order to spray the cabinet I attach a temporary mounting with clamps. In this case, it is clamped to the bottom of the cabinet and has a ¾" diameter hole at the center of the bottom.

This allows me to slip the cabinet onto this crude wood stand fitted with a horizontal ¾" diameter pipe. With this arrangement, I can easily rotate the cabinet so that I am always spraying on a horizontal surface.

The cabinet was then sprayed with two full coats of satin lacquer. (Gloss clear lacquer not being available at the time.) I will not commit this 'sin' again! On close inspection, knowledgeable people can tell that the sheen, while pleasing, is simply not as authentic as it could be. After several days to allow the coats to become fully hardened, the entire cabinet was rubbed down with rottenstone and then waxed.

The original multicolor grill cloth has deteriorated to an almost uniform flat, dark yellow. The feather-like arcs in the weave are almost invisible in normal room light. They only show up at all when the cloth is rotated 90 degrees from the norm With such a deteriorated cloth returned to a newly finished cabinet, the contrast of old and new would be extreme. Too my knowledge; there is no similar cloth available today. I have installed a replacement grill cloth insert. I specifically selected a harmonious, understated fabric pattern that is not easily identifiable as being used by, for example, Zenith, Philco or RCA. This, if properly done, helps to prevent a focus on things that may be wrong with the artifact. However this attendant documentation does record and explain this deviation from the original.

In my opinion, it is mandatory to clean the chassis and other components completely. All this 'mystery soil' when combined with humidity will slowly eat away anything. But you have to make sure that cleaning agents do not leave their own reactive residues that can do their own damage over time.



You must always be aware that vintage equipment will most likely be loaded with hazardous oxides of heavy metals such as cadmium, zinc, lead and also asbestos insulation. The use of a dust mask and Nitrile gloves are all always recommended.

Cleaning begins with using a vacuum cleaner and small brushes to remove gross contaminants. Follow this with a blow-down using low pressure compressed air. Even with low pressure air take care not to damage mica insulators used in compression trimmer capacitors of tuning capacitors and IF transformers. Also the low pressure air stream can cause paper labels and painted features to flake off in an instant.

Vanes of tuning capacitors can be cleaned using small chenille craft stems (A.K.A. – pipe cleaners.) Some varieties of craft stems are better than old style pipe cleaners because their fibers are not as dense. Therefore they are easier to pass between vanes without distortion.

Use alcohol or other solvents to remove water resistant materials such as cooking grease, shellac, tar, varnish, etc. before using cleaners to remove water soluble soil.

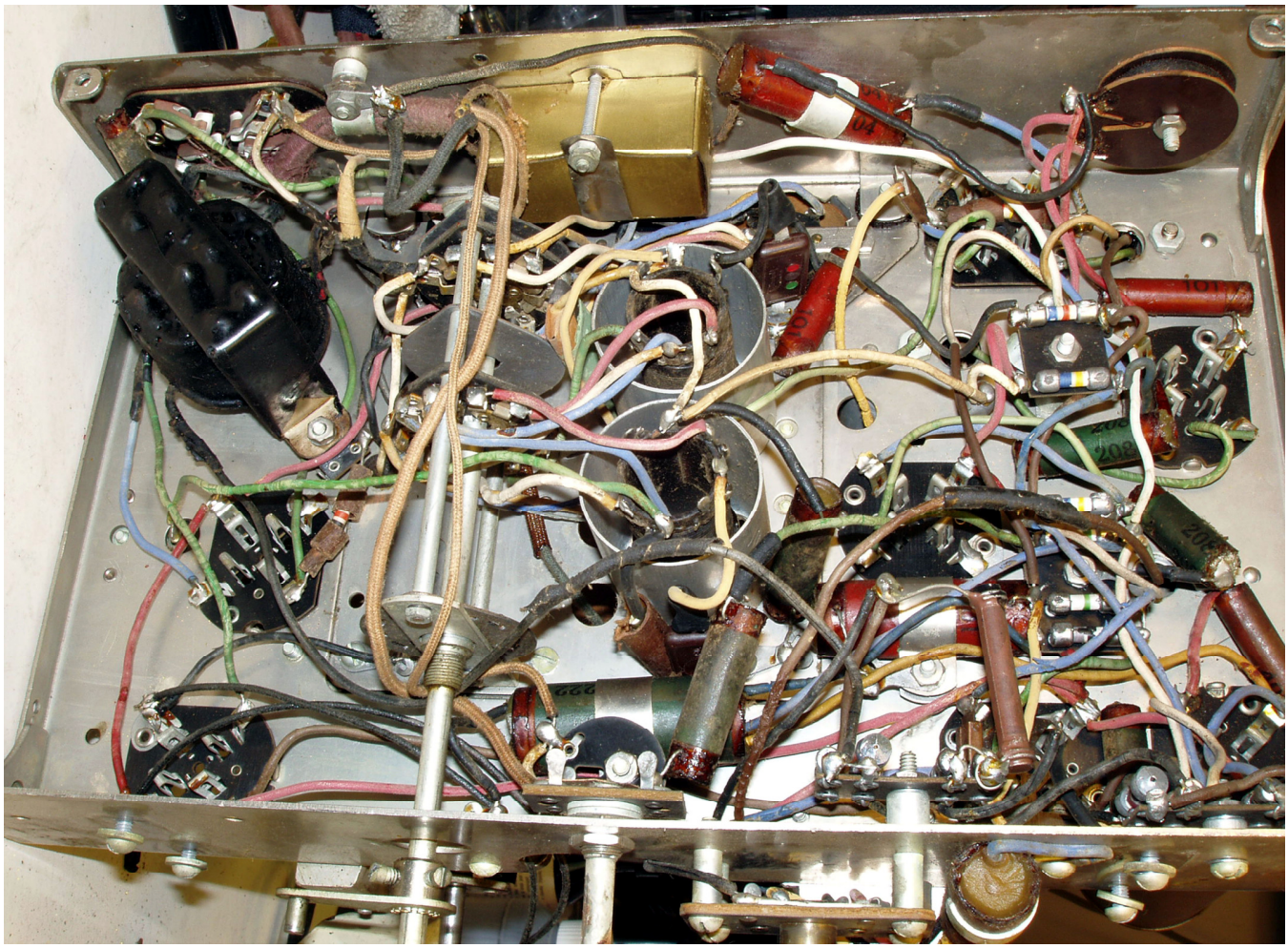
Atwater Kent used nickel plated steel chassis. Spots of rust can be removed by applying a small amount of cream type waterless hand cleaner to a hardwood craft stick and rubbing. The rust particles are not hard enough to cut into the nickel plate when they become embedded in the wood. This technique also works well on cleaning aluminum RF & IF cans. Wire brushes would leave marks.

For small areas of more severe corrosion, you should have in your tool box pencil style scratch brushes that are common to the clock making and jewelry trades. The better tools have refillable brushes of steel, brass, fiberglass and nylon.

The cleaner is removed with alcohol and forced dried with warm air. The surface is then sprayed with a good grade of clear acrylic lacquer.

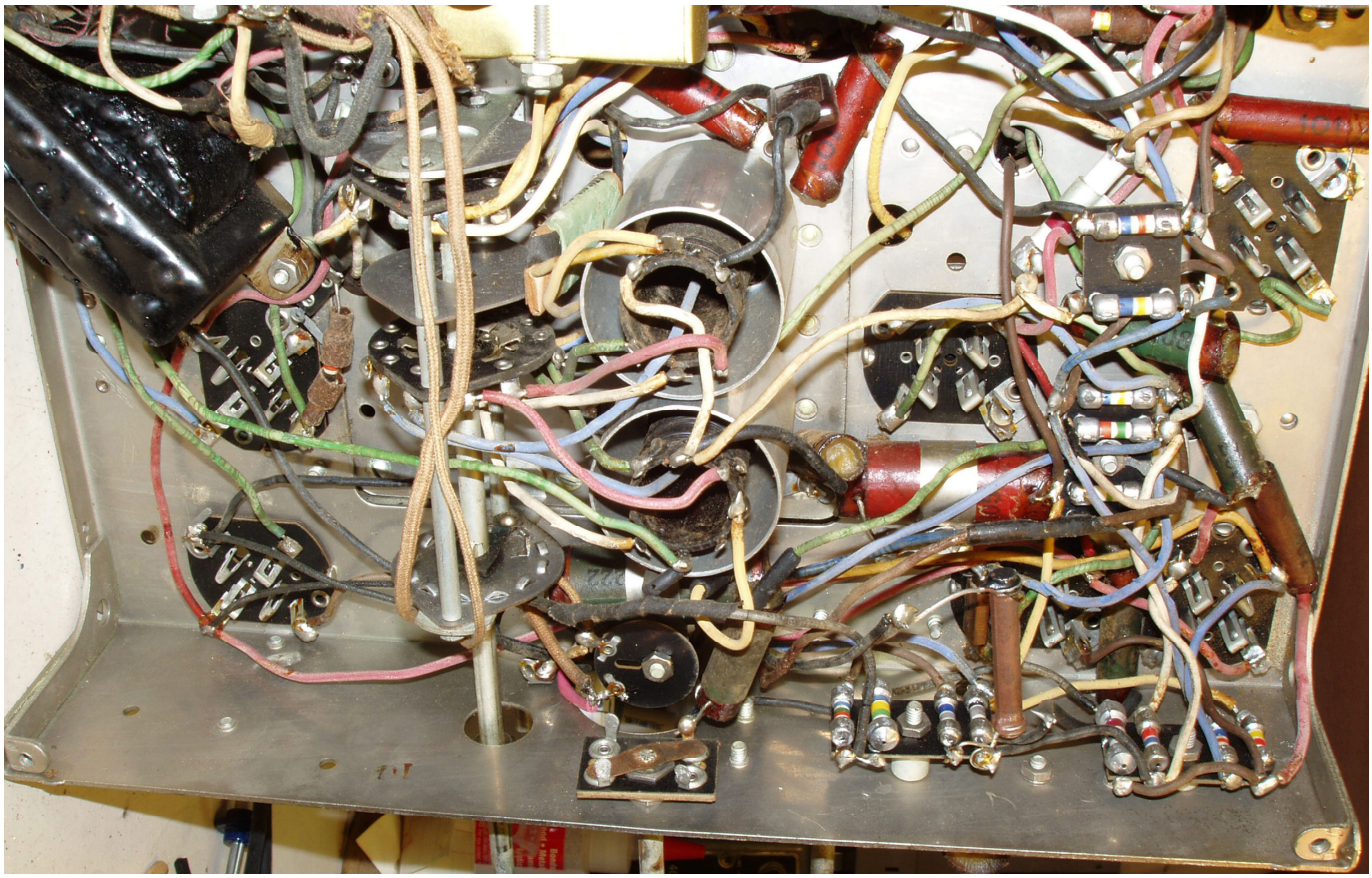
Rubber insulated wiring…..

This series of Atwater Kent radios are notorious for having wiring with extruded rubber insulation that hardens over time to the consistency of hard plaster. It cracks and flakes off at the slightest provocation. On this particular chassis, the under-side wiring is almost completely intact and appears unchanged since the day it left the production line; while some of the top-side wiring is destroyed.



A near perfect example of what the chassis wiring looked like on the day of manufacture.

The underside wiring looks so good, in part, because this was a very low power dissipation battery powered chassis. A similar AC powered chassis would have left the wiring looking much worse for time.



Imagine the consequences of rebuilding this chassis to operating condition.

Virtually any attempt to remove defective parts for rebuilding or replacement would result in destroyed wiring at every component attachment point. Tests with a multimeter indicate that virtually all the resistors of high value are double the indicated value to near open circuit. All paper dielectric capacitors would either be leaky or have high ESR due to corrosion between the foils and the leading-out wires. All 'dry' electrolytics would indeed be dry and therefore exhibit greatly reduced capacity. It would require a wholesale scrapping, rebuild and new wiring operation with a radical loss in historical value just to make this radio functional for a few more years.

In light of my analysis of the significance of this artifact, I chose to maintain as much of the historical accuracy as possible. Therefore the radio remains silent.

In order to make this radio more presentable, the most damaged wiring on the top side of the chassis was replaced with very similar looking rubber insulated wiring. In actuality, only five lengths of wire were replaced. A fellow collector, Steve Geary, was able to send me a photograph of the way the Antenna and Ground wires were terminated with Fahnestock Clips in Atwater Kent radios of this vintage so I could make replicas.

There was only a fragment of the NRA sticker remaining on the chassis.

There are variations on these stickers but a fellow collector, Ron Lawrence, sent me a photo of a complete sticker on another Atwater Kent radio of the same vintage that proved to be an exact overlay of my sticker fragment. From that information, I used Photoshop 7.0 to create an exact replica.

From Wikipedia I found this description of the NRA:

The **National Recovery Administration** (**NRA**) was the primary New Deal agency established by U.S. president Franklin D. Roosevelt (FDR) in 1933. The goal was to eliminate "cut-throat competition" by bringing industry, labor and government together to create codes of "fair practices" and set prices.

Restore mechanical operation…

The tuning mechanism has three black rubber tire drive wheels. It is not a durable design. The rubber becomes useless probably in the first 10 years and must be replaced. I fabricated replacement tires with a modern rubber formulation that looks exactly like the old material but should remain stable for a very long time in moderate environments.

The replacement of these parts makes it possible to demonstrate the operation of the wave change linkage and the dual ratio tuning drive.

The loudspeaker found with this set is not the one shown in the AK service literature. The service literature shows a center tapped high impedance balanced armature (pin driver) speaker. I have seen this radio's *Perm-O-Flux* brand speaker advertised in 1936 issues of *RADIO TODAY*. Since the applied working voltage of this design was a surprising 160 Volts, it could be that the original high impedance balanced armature speaker did not last long in this service since these speakers were commonly used in circuits with 90 Volts 'B' Battery. It is obvious that any replacement, if made, was done many years ago and with the same workmanship exhibited in the wiring of the chassis.

It is thought that this radio, though advertised as a 1935 model, could have had production runs in the first half of 1936 since the new 1936 model *Air Cell* chassis was not as an ambitious design having only one IF stage, one less short wave band and lower power output.. Atwater Kent was well known for making many production run changes in their chassis so they could have changed to the new speaker design because of failures seen in 1935.

So how does this maximum performance “Air Cell” radio work today? I cannot tell you because, except for replacement of the wire, rubber parts mentioned above and questionable speaker; this unit is an accurate historical record of how it was manufactured in 1935. It is almost impossible that the resistors and coupling capacitors are good enough to make this set operate properly. The manufacturing technology of the day simply could not endure the decades of changing atmospheric exposure in the same way as more modern components.

34 COUNTRY

ATWATER KENT
World-Wave
RADIO
FOR AIR-CELL BATTERY POWER

SHORT-WAVE broadcasting overseas adds a thrill to radio that you don't want to miss. But it is one thing to get foreign stations—and quite another to enjoy their programs. Be sure that the new radio you buy does more than "bring in" those distant stations. Be sure it brings them in truthfully—clearly—enjoyably. Be sure it is an Atwater Kent world-wave Radio.

And in addition to foreign reception . . . these short-wave radios open another, and often better, way to hear American broadcasting. Short-wave programs from distant American stations come in clearly on many days when regular broadcast waves are marred by electrical disturbances.

Remember: the precision workmanship, the accurate engineering, and the fine materials that make a radio really good are HIDDEN. You can't see them. You can't hear them in showroom demonstrations. But they prove themselves by years of trouble-free service—by the long-lived *truthful* tone for which Atwater Kent Radios are famous.

FOREIGN SHORT WAVE and BROADCAST—Model 655Q[E]—(above at left) 5-tube superheterodyne, 8 tuned circuits—3 tuning bands from 540 to 1600 kilocycles, 3.6 to 8.3 megacycles, and 8.3 to 18 megacycles—illuminated airplane dial shows which tuning band is in use. Reaches all American broadcasting, including police, airplane, etc., and foreign broadcasting. 8-inch speaker, 2-speed tuning control. Battery requirements are 2-volt A battery (the Air Cell battery made by National Carbon Company is recommended). Three 45-volt B batteries and one 22½-volt C battery. Less batteries **$57.50**

ALL WAVE—Model 970Q[K]—(above at right) It is our sincere belief that this is the finest battery-powered radio ever put on the market. Tuning range in 4 bands covers everything between 540 kilocycles and 22½ megacycles—complete world-wide reception. It is an 8-tube superheterodyne with 9 tuned circuits, 6-section gang condenser, 11-inch speaker, 4-point tone control, 2-speed tuning. Battery requirements are 2-volt A battery (the Air Cell battery made by National Carbon Company will be found most satisfactory) and four 45-volt B batteries. Less batteries **$84.50**

Model 760Q (in front at left) same radio as Model 970Q[K] in compact cabinet. Less batteries **$69.90**

Model 665Q[E] (in front at right) same radio as Model 655Q[E] in compact cabinet. Less batteries **$44.90**

ALSO FOR 32-volt power, Models 1215E, 872-30 (in same cabinet as Model 655Q[E]) and Model 135, $59.50 (in same cabinet as Model 665Q). Will operate directly without batteries, on 32-volt lighting systems.

Prices quoted (subject to change without notice) are *f. o. b. factory*, without batteries.

ATWATER KENT MANUFACTURING COMPANY *A. Atwater Kent, Pres.* PHILADELPHIA, PA.

It appears that large format advertisements for ‘farm radios’ of the 1930s are relatively scarce. Publications such as *The Country Gentleman, Capper’s Farmer, American Agriculturist, Progressive Farmer* appear to be in short supply for examination today. This is the only image I have. It is from an old eBay listing, found by Jeff Aulik that does not identify the publication date but is most certainly for the 1935 product line since some round dial models are shown.

A large percentage of the major American manufacturers built at least one chassis to make use of the *Eveready Air Cell* ‘A’ Battery technology. Certainly more than 100,000 sets of this type were built (many not so elaborate) but very few examples still exist, probably because there was no economical way of converting them to AC operation when the ‘High Line’ came to your farm. This is the primary justification for not rebuilding the chassis with modern components just to make it work for the amusement of the current owner.

Within 3 years of this radio introduction, a series of ‘1 Volt’ octal tubes would be available in the US market. They were even more power thrifty on the filament circuit and fewer tubes were required to yield the same performance. This made it practical to use conventional carbon-zinc ‘A’ batteries and combine them in the same cardboard carton with the ‘B’ battery. The effective cost to operate such a set was cut in half.

Now to prepare the Atwater Kent model 768Q for exhibition.

The rest of the story….

The Eveready A-600 Air Cell

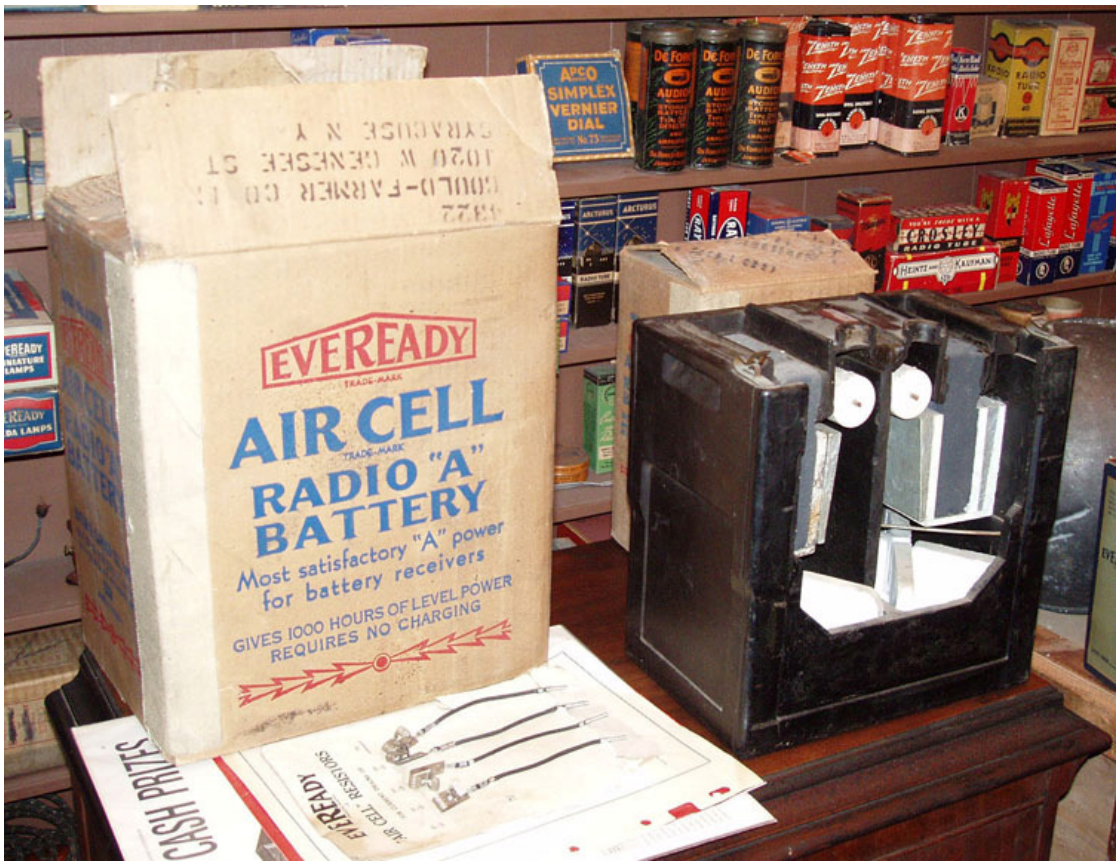
They made more than a half million in the 1930's and now there may not be a *complete one* left.

Project to build an accurate looking replica.

Back in the early 1970's I started making a concerted effort to find 20's vintage radio magazines like *RADIO NEWS, POPULAR RADIO, RADIO*, etc.; and then moved into finding similar 30's vintage magazines.

I remembered that there were articles about the *Air Cell* and mentions of various manufacturers that had developed sets to make use of the technology. No other primary (not rechargeable) battery technology of the day could come *close* to the energy density per unit volume of this *Air Cell*. They claimed that their *Air Cell* could light the tube filaments of *approved radios* for a full year of ordinary use.

In 2005 I was enjoying a visit to the Radio & Technology Museum in Huntington, West Virginia and saw a cut-away display model of the A-600. It belongs to Geoff Bourne. Cool! I even decided that I should find one for my collection. I set a search on eBay and NOTHING shows up for 6 years…



Even back in the 1970's The Carolinas was a desert for vintage radio collectors…. I don't ever recall having seen a "2 Volt" set in anything like restorable condition.

Fast forward to 2010 and I have the opportunity to acquire an Atwater Kent Model 768Q *Air Cell* receiver from the son of a deceased 'closet collector' in a sparsely populated area of my home county.

So now I needed to go back to the old magazines and read again the information on this technology. Great! I could restore the radio; and wouldn't it be cool if I could exhibit the set with one of these *Air Cells* and all the other required 'B' & 'C' batteries? I had B & C batteries of the proper vintage to copy…. All I needed to find was the *Air Cell*…. And so I redoubled my efforts to find one.

Letters and e-mails to the editors of various regional & state vintage radio clubs produced no results. Posts on various Internet forums produced only one bit of feedback… One person had made a replica of the 1938 vintage *half-sized* Model A-2300 *Air Cell* battery. While an interesting effort, I had to judge it not at all the quality of replica necessary for a museum grade exhibit.

In late 2011, my eBay search criteria finally returned a hit! A person in Ohio had the bottom case of the battery. This seller specializes in automotive memorabilia and was not aware that this battery had anything to do with vintage radio. He therefore did not know to list it in the vintage radio categories. It turned out that I was the only bidder on the item!

This is one of the photos he posted on eBay.

With the bottom case as reference and having the opportunity to measure the sales cutaway model, I was reasonably sure I could make an accurate looking replica for exhibition. Research shows that my example dates from 1936/37. The key elements fixing the date are the fact that the battery has both Fahnestock clips and their new 2-pin power receptacle. The 1938 version of the battery was renamed the A-2600 and eliminated the Fahnestock clips and completely changed the color scheme of the paper label.

Note: The first version of the A-600 battery available from 1931 to sometime into 1934 has a different height/width ratio. Wider but not as tall…. There are no known surviving examples.

I prepared an 84 slide PowerPoint documented narrative on how I solved a myriad of problems in order to produce this replica. The presentation of this material was made at the Antique Wireless Association annual conference in August of 2012 as part of the *Moonlight Restoration Forum*.

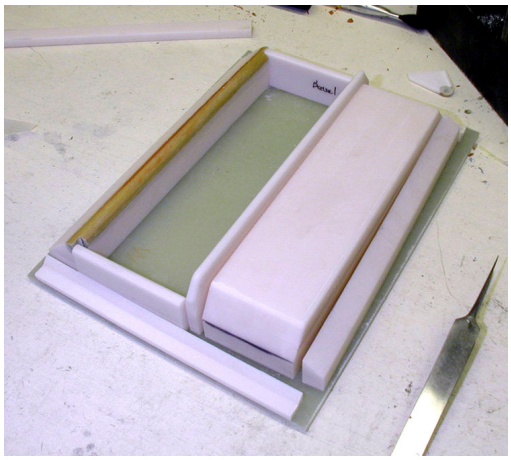
The presentation is available for download at my website.
Just follow this link. http://kd4hsh.homestead.com/A-600-ppt.html

I have completed three of these replicas and have the parts for a fourth replica.

The key tasks in the creation of this replica
***Eveready* A-600 *Air Cell* are:**

Create a 3D CAD model of the battery with *SolidWorks* software using dimensions obtained from the surviving bottom case and cut-away sales model.

Build a multi-part silicone rubber mold from which to cast the bottom case of the battery using urethane resin.



Fabricate a dimensionally accurate model of the top cell cover using fiberglass, wood and *CORIAN* polymer matrix. From this model, a silicone rubber mold was made from which replica top covers were cast in urethane resin.

Fabricate additional models of the power receptacle, filler caps and filler holes in order to produce silicone rubber molds for these parts.

Find a source for porous carbon and fabricate electrodes.

Fabricate contacts and wiring so that the terminations of the replica can be connected to small cells or power supply concealed in the hollow interior.

There are no known examples of this multi-color graphic pasted on one side of the battery. Fairly high resolution black and white photos were located in trade magazines such as *Radio Retailing* and *Radio Today*. Eveready advertised in a number of popular magazines such as *The Saturday Evening Post* and rural focus magazines such as *The Country Gentleman*. Some of these advertisements for the earlier version of this battery are in color. The B&W image became a perspective corrected template within a Photoshop image project and colors were chosen for use in the project. Traces of glue on the surviving case told me the exact size of the graphic.

Fortunate for me, I was able to identify that the majority of the text in the image was either Cooper Black, Times New Roman or Arial (with slight deviations). All these fonts within Photoshop 7.0 are fully customizable so that each character could be made to fit exactly over the text in the template image.

The logos are of course hand drawn images as well as a few large text words. These images were isolated to serve as templates and traced over on new layers to produce crisp images.

The geometric color fields were created using SolidWorks and imported as image layers.

The template is then turned off and layers are placed in order to generate the .jpg output file.

The ideal next step would be to reproduce the graphic using traditional lithographic methods but the set-up costs and minimum run charges are far too expensive for such a project. The most viable solution was to resort to using laser color copies. There are indications that the pigments used in thermo-set laser copies are superior to the pigments used in ink-jet printers.

An interesting observation one might make is that the B&W image above does not suggest any use of red or slate blue/green but there is a reason for that. And it can be confirmed in many Eveready advertisements going back to 1924 and the surviving batteries made by the company. The printers were aware that a half tone image of the true color scheme would look very poor in B&W printed pages. So the advertising art for B&W pages always substituted white for the red and most always did the same for the blue/green.

The Eveready No. 770 large 45 Volt 'B' Battery

Far more than a million were made from 1924 into the 1940s but very few examples remain.

Project to build an accurate looking replica circa 1936.

The first range of radio ‘B’ batteries introduced by The National Carbon Co. under the *Eveready* brand name were designed to power radios having one to three tubes. By 1924 TRF and superhetrodyne radios were being built using 5 or more vacuum tubes. Eveready introduced a higher Ampere/hour ‘B’ battery for that service.

It was given the part number ‘770’. It consisted of 30 ‘D’ size flashlight batteries soldered in series with a voltage tap in the middle. With proper ‘C’ bias on the tubes, two of these large batteries in series could operate a 5 or more tube radio for more than 6 months of typical listening time. (500 hours.)

Over time the construction details and graphics of the battery case changed considerably. By 1935 *Eveready* changed from *Fahnestock* clips to a 3 pin receptacle for making connections. I have an example of the No. 770 battery that is stamped “Place in service before September 1937”

This battery would be entirely appropriate for use with my *Atwater Kent* model 768Q that was no more than two years old at the time. I would have to make four replica batteries.

The key tasks in the creation of this replica *Eveready* No. 770 ‘B’ Battery were not nearly as challenging as making the replica of the *Air Cell*.

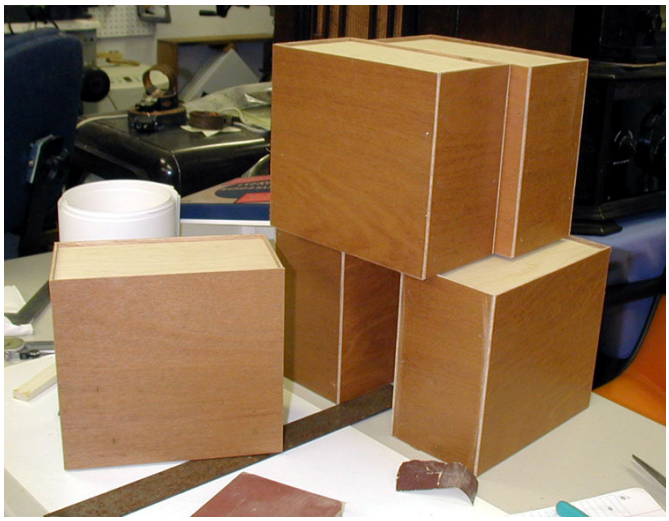
The original battery was placed on a flat bed scanner and each face scanned at 1200 D.P.I. The reason for scanning at such high resolution is that much of the graphic is hand drawn text. It makes it easier to zoom in on the image and make precise determinations of the true boundaries between the text and the backgrounds.

Again the scanned image becomes only a template for new layers containing the various text and logo images. The concentric rings were created in SolidWorks and imported to their own layer in the image.

The determination of colors to use with this battery was not easy in that severe yellowing of the graphics had taken place and I have not seen any color advertisements for this battery. I reasoned that the red and royal purple colors were consistent with other Eveready batteries. Only the selection of the neutral gray was in question. It certainly was not the slate blue/green color that Eveready had been using for over ten years. After making these replicas, a photo appeared on eBay of a very rough #770 point-of-sale model. The photos were quite good and seem to reinforce my selection of the neutral gray color.

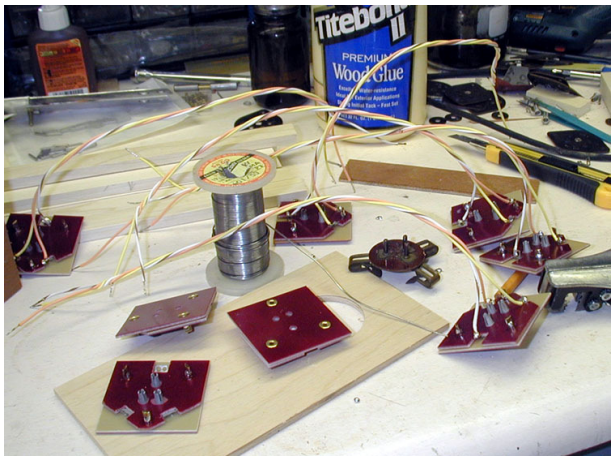
After new artwork was created for each side they had to be assembled into a master graphic that could be cut and folded like the original. The original was lithographed on about 80 lb. clayed card stock. The set-up charges and minimum print run for a lithograph would be far too expensive for this project. My only viable alternative was to have it printed on a commercial ink jet printer. This results in an image that is a little more flat than a litho print. I have yet to find a spray coating for this type of print that would add a little gloss to the image.

Making a poplar and birch plywood box frame was relatively easy.



Recreating the 3 pin power receptacle was a little more of a challenge. Thanks to some new-old-stock specialty tube sockets given to me by Gary Schneider I was able to design a receptacle assembly that fits perfectly into the box.

Since the box is hollow, small batteries or a power supply could be concealed in the box.



The receptacle is mounted and the graphic folded for gluing.

Go to next page.

The Project Completed

More than 250 hours of labor and over $400 dollars in materials were spent on this project spanning more than two years.

Probably for the first time in many decades, viewers at a vintage radio exhibition were able to see and learn about an *Air Cell* technology home broadcast receiver complete with museum grade replica batteries as were required to power the set. This technology brought the wonders of radio broadcasting to well over 100,000 families in rural America during the 1930's.

They were reminded that since the earliest days of electrical communications technology electrochemical batteries were a near absolute requirement for operation into the 1920s and even beyond in certain circumstances. And that, by their nature, these devices were not designed to endure for long. i.e. They were disposable.

The old adage, 'out of sight, out of mind' came to me and many viewers. It is not just a pretty or interesting box that dispenses voice, music and other sounds. This cannot happen without, in this case, the additional support of items that rarely or no longer exist today.

See next page for exhibit photos.

My Project Exhibition Photos

I was able to place my 1935 model Atwater Kent 768Q on exhibit along with its required batteries in replica form at the March 2013 regional conference known as *Antique Radio Charlotte* sponsored by the Carolinas Chapter of the Antique Wireless Association.

At that time the radio had not been restored to preserve historical value.

In June 2013 I placed this radio, now restored, into the exhibition at the regional conference known as *Radioactivity 2013* sponsored by the Mid-Atlantic Antique Radio Club. I was given an invitation to submit my project to the International Restoration Contest created and hosted by the Société Québécoise de Collectioneures de Radios Anciens (SQCRA)

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