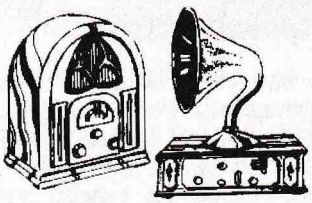
Vintage Radio

by PETER LANKSHEAR



Two different centennials, one for Atwater Kent

Be it a cricket score, an anniversary or a birthday, a century calls for special recognition. We have our own century this month, for this is the Vintage Radio column's one hundredth appearance. Our topic is also appropriate: the 100th anniversary of the founding of Atwater Kent.

In casting around for an appropriate topic for this, my 100th column, I discovered that this year there has been a centenary which although little publicised, has considerable significance for radio historians. It was in 1896 that American college dropout Arthur Kent started working full time in a modest manufacturing business that he had started between classes the previous year.

When he retired 40 years later Arthur was a multimillionaire, and his radio receivers, made over a period of some 13 years, many of them in what was at the time the world's largest radio factory, carried one of the best known and respected brand names. As my own vintage radio collection is centred around some two dozen of his receivers, I have a special interest and pleasure in devoting this column to the man and his products.

Unfortunately, by 1931, Australian importation of Atwater Kent receivers had ceased. However some later models have found their way into Australian collections, often obtained from New Zealand — which did import a good range from 1926 to 1936. New Zealand vintage radio enthusiasts have indeed been fortunate in having access to a good representation of these fine receivers.

Arthur Kent was born on December 3rd 1873 in Burlington, Vermont to Prentice J. and Mary E. (nee Atwater) Kent. Prentice's occupation was that of a machinist, and no doubt this was an important factor in young Arthur's formative years. Even today, Burlington has little industry.

In 1881 the family moved to Worcester, Massachusetts for what we can assume were better prospects. 1895 saw Arthur, then 22, enrolling in the Worcester Polytechnic Institute. Apart from excelling at mechanics and drawing, his academic achievements were somewhat abysmal — largely, it would seem, due to his preoccupation with the Kent Electric Manufacturing Company, maker of small motors and generators, a modest sideline that he had established the back of his father's shop. The following year Arthur abandoned all pretence at studies and concentrated on full time business activities.

It was in 1902 in Philadelphia, Pennsylvania, that he founded his second company: the Atwater Kent Manufacturing Works, making batteries, testers and domestic telephones. It would seem that with his good marketing sense he reasoned that adding his mother's name gave distinction to the firm's title. Business must have been good, for in 1905 he purchased his first motor car.

Improved ignition

Problems with Arthur Kent's car led him into his first major achievement, the single spark coil ignition system. Early petrol engine ignition was by either magneto or trembler coil. Arthur found that with increasing engine speeds, the trembler coil system was inefficient in that only the first of each train of sparks did any work and its timing was imprecise.

The single spark of the magneto was much superior, so he designed a new coil system, which he called the Unisparker. This was in effect a stationary magneto with an internal electromagnet. The Unisparker kit incorporated contact breaker points and condenser, coil, a centrifugal advance mechanism and a distributor.

If this sounds familiar, it should, for it is the standard 'Kettering' automotive ignition system that only in recent years has been displaced by electronic ignition. Just how Boss Kettering of General Motors came to have his name attached the Kent invention has not been explained, and presumably there was some form of licensing agreement with Kent. For this achievement, in 1914 Arthur Kent was awarded the John Scott Legacy Medal and Premium by the Franklin Institute.

Unisparker components, along with Atwater Kent self starters and car lighting systems, were sold through a national network of dealers and agents. Atwater

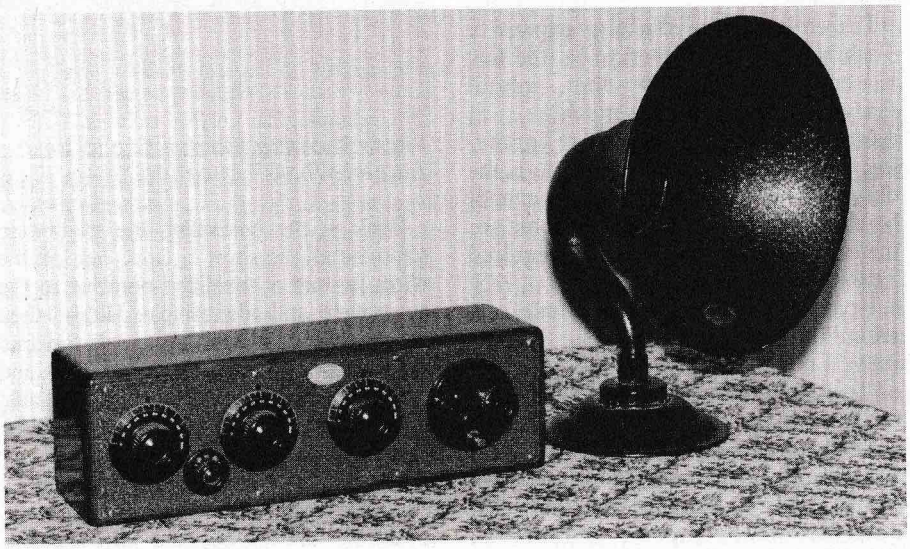


Fig.1: The attractive little 1926 model 20C was a hit with the ladies, and is the oldest A-K model commonly found in Australasia. Whereas contemporary loudspeakers commonly had aluminium or paper-mache flares, Atwater Kent made his of heavy gauge steel!

Kent Manufacturing grew into a thriving enterprise, and was granted World War I Government contracts for supplying precision gun sights and fuse setters.

Arthur Kent was one of those rare individuals who had more than his share of the gifts that make for a business genius. He was a friendly workaholic, a good employer and a perfectionist with an uncanny instinct for marketing and finance. In addition, he had an artistic eye and was a first rate inventive engineer. (He eventually took out a total of 93 patents). Put these all together, and you have the ingredients for an industrial giant.

Phenolic moulding and deep drawing of steel pressings were in their infancy, and Kent became a master of these technologies. In 1928, he claimed to have the largest privately owned Bakelite moulding plant in the world. A comparison of an Atwater Kent moulding, such as a tuning knob, with one of its contemporaries reveals a clearly superior finish and finer detail.

Similarly, his metal fittings and pressings were well finished and accurate in size. To him appearance was most important and later, standard cadmium plating was not good enough for his radio chassis. His were heavily nickel plated, and the brass badges used on early receivers were gold plated. Restorers please note — NEVER use Brasso on A-K badges!

A new venture

By 1921, the Atwater Kent war contracts were finished, business was depressed and automobiles were now being factory fitted with single spark coil ignition, electric lighting and self starters. It was time to look around for new products to make...

By good fortune, the right opportunity presented itself and at the right time. A new craze, radio, was just taking off and Arthur Kent was on the spot to satisfy the demand for high quality components. The situation was ideal, for his plant was capable of turning out precision phenolic mouldings and metal parts, and had wire winding facilities. Furthermore, he already had a country wide distribution network.

A photo of Arthur Atwater Kent, from the frontispiece of the Company's 1928 catalog.

The Atwater Kent factory duly tooled up, and in mid 1922 was producing a series of well designed components including variometers, RF and audio transformers and two-stage audio amplifier modules. Not only did these work well, but they were superbly finished in attractive colour schemes. Experience gained in making reliable automotive electrical equipment must have paid off too, because I have never encountered an open circuited or green spotted Atwater Kent RF or IF coil winding.

With the success of the component line assured, the move to complete receivers was inevitable. At the beginning of 1923, sets of components were being assembled on mahogany 'breadboards'. These complete receivers too were a hit, and no wonder. With their polished wooden bases and gleaming components, the Atwater Kent receivers looked a picture. It is no surprise that today, Atwater Kent Breadboards are amongst the most sought-after collectables in the radio world, and can command astronomic prices.

During 1923 and 1924, a series of increasingly more elaborate Breadboards was produced, culminating in several versions of the model 10 — a five valve, three knob TRF.

Progressive design

One of the great attractions that Atwater Kent receivers have for me is the steady progression of design and components from one model to the next. Many manufacturers have discovered to their cost that revolutionary model changes can be disastrous. However, each new Atwater Kent receiver had proven features and components from its predecessors, yet was still at the forefront of technology.

Arthur Kent — by now calling himself Arthur Atwater Kent — had no hesitation in employing the best staff available. One notable member of the team from 1925 onwards was John Miller, discoverer of the Miller Effect whereby the characteristic of the grid input impedance of a valve is dependent on the stage gain and anode load.

Arthur did not think small. Even in 1924 he was spending $1 million annually on advertising, growing to something like $4 million in 1927. In 1924 he built a new $2 million facility, covering five acres. Eventually this was to grow to two plants covering 15 acres, at the time the world's biggest radio factory!

Attractive as the breadboards were to enthusiasts, Kent realised that they did not necessarily appeal to the ladies. In 1925 he put the model 10 into a cabinet. The model 20, as the new set was called, was typically innovative. Whereas the standard 1925 radio still looked very technical, frequently with black engraved panels, the Atwater Kent approach was to use a much cheaper but visually attractive grey/brown fine wrinkle finish on a steel panel, set off by a polished

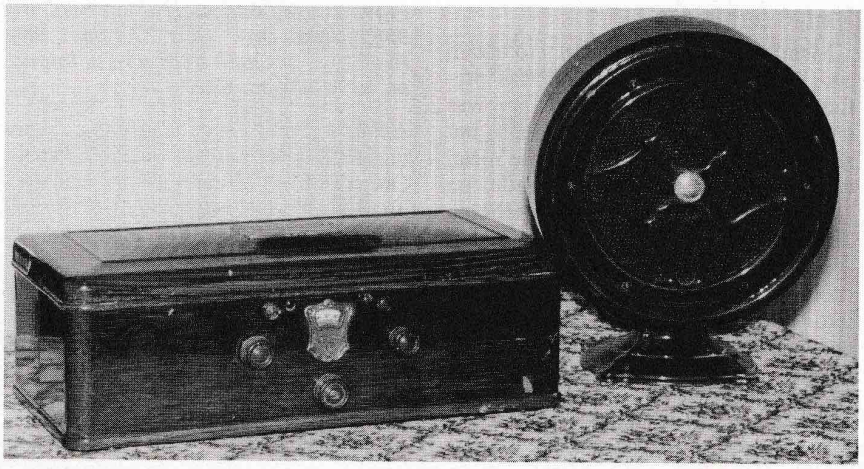


Fig.2: Atwater Kent convinced the public that radios should be in metal cabinets. This 1929 model 55 TRF with two RF stages used the new 224 screen grid and type 245 output triodes. The pressed steel casing houses a 12" moving coil speaker, and with typical A-K precision, more than a single coat of lacquer will prevent the two halves fitting together !

mahogany cabinet.

This proved to be a winning combination, but Arthur Kent had yet another trick with the 20, again calculated to gain the approval of the ladies. The contents were shoehorned into a cabinet only half the height of the model 20. Again the Kent instinct proved correct, and the little model 20C (C for compact) was another best seller.

The 20C has a special significance, for it introduced the Atwater Kent label to New Zealand — and it appears, Australia, where A.G. Healing were the distributors. The New Zealand distributors were the C.& A. Odlin Company, building supplies and hardware merchants whose first shipment arrived at the beginning of 1926. Odlins continued as the agents until Atwater Kent's closure 10 years later, and it is their active promotion that has left us today with the legacy of a good range of models.

Radio competition was keen, and the next move was to gang the tuning capacitors for single knob tuning. This was not easy, as with the tuning systems then in use, connection of an aerial upset the tracking of the input RF stage tuning.

John Miller came to the rescue and with the 1926 model 30, single control tuning was achieved by adding an extra valve as an untuned aerial isolating stage. The existing pattern of tuning capacitor was retained, but the units were ganged by means of phosphor bronze belts.

Several related models were produced during 1926. I have one, a model 32 with four belt coupled tuning capacitors, and a string of seven '01A valves! The cabinet is the same pattern as the model 20C, but nearly 60cm long! Metal framed tuning capacitors were adopted shortly after, but a more significant change came with the adoption of metal cabinets late in 1926.

Metal cabinets

Metal was a cheaper material to obtain and fabricate than wood, and was preferred by Arthur Kent. The change was an innovation, and a bit of a gamble, but as usual, it paid off. One of these metal cased sets, a model 35, made on December 3 1926, was the one millionth Atwater Kent receiver.

Not only did the public accept metal cabinets, but other manufacturers came into line and by 1929, quite a few receivers were being installed in 'tin trunks' as they are now known. Atwater Kent even turned out receivers in metal mini consoles, about table height!

It was also common practice for Atwater Kent to supply bare chassis for installation in custom made cabinets. One well known fine furniture manufacturer was Pooley, who installed Atwater Kent receivers in various pieces including writing desks and tables!

Fig.5: The eight-valve 708 of 1933 is a remarkable set for its size. A very early all wave receiver, coverage is continuous from 550kHz to 20MHz, with the RF stage used on all bands, and there are two 472.5kHz IF stages.

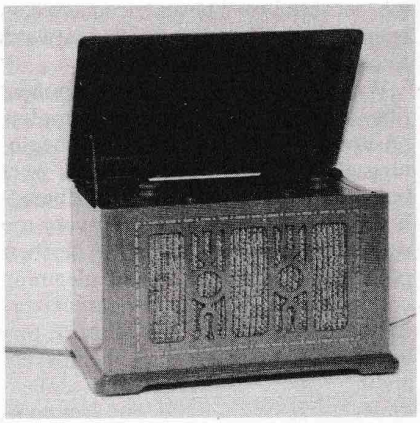


Fig.6: A very popular 1933 model, the 555 'Jewel Box' — a compact little five valve set with a lift up lid, intended for bedroom use.

The late 1920's were a period of rapid developments in radio technology, one of the most significant being in 1927 with the viable solution to the problem of mains powering of receivers. Our November 1995 column dealt in depth with these developments and you may recall that with the release of the model 36 in October 1927, Atwater Kent was only a month behind RCA in introducing their first AC set.

The 36 was actually a modified battery powered model 33 with a separate power pack. But on Christmas Eve 1927, Atwater Kent revealed their winner, the model 37. The 37 was a new design, although of course still all-triode and with a production rate of 3000 a day. By mid February 1928, 100,000 had already been made.

It is interesting to note that Atwater Kent never used neutralisation — not officially anyway. On paper, stabilisation of his receivers was by means of stopper resistors in the grid leads of the RF valves. But the reality was that there was some crafty orientation of the unshielded tuning coils, to provide hidden neutralisation.

Given the production rate of their receivers, Atwater Kent would have had to pay out enormous neutralisation royalties to the Hazeltine Corporation, and Arthur was too good a businessman not to try avoiding that possibility. Even the mighty RCA had to compromise over the question of patent royalties from Atwater Kent, who was too important to run the risk of losing a case against, and Arthur had very good patent attorneys.

However the Hazeltine Corporation finally did manage to obtain a judgement against Atwater Kent on February 19, 1934 for $680,000. This was several years after Atwater Kent had ceased using triode RF amplifiers anyway, and was probably only a fraction of the real royalties due.

Screen grid valves

The next year, 1929, saw significant new developments in the 224 mains powered screen valve and the 245 power output valve. Again Atwater Kent were to the forefront, and by late 1929 had a range of screen grid TRF receivers including the metal cased 55 and 60, with pushpull output stages and moving coil speakers. As usual, the bare chassis was available for the customer's own choice of cabinet.

During 1930 development of the TRF continued, and receivers were now available in Atwater Kent's own wooden cabinets. The best known here was the handsome model 70, available with a choice of four chassis for 60Hz, 25Hz and DC mains power, and also battery operation. There are pictures of this set and its chassis on page 12 of

Fig.4: In production for only two years, the Atwater Kent cathedral receivers are very popular with the public and collectors. from the left are a model 84 'Golden Voice', a model 80, a 567, an NZVRS 'badge' model 627 and finally a battery powered 387.

Discovering Vintage Radio, volume 1.

At the end of 1930 came a most significant event in the history of radio production. RCA was obliged to give up its monopoly on the superheterodyne. Immediately the TRF was obsolete and, the American radio industry, already in bad shape because of the Depression, had to restructure with many firms going under.

Atwater Kent survived intact, but for much of 1931 there were no new models released. The L2 TRF chassis from the model 70 was modified as the model H superhet, but was at best a compromise and few were sold, although I do know of one in New Zealand.

By the end of 1931, a major part of the output comprised inexpensive superhets known variously as 'miniature', 'compact', 'gothic' and later 'depression' radios, the first being the model 84 Golden Voice. These sets, made for a period of only two to three years, are now much sought after not only by radio collectors but also the antique fraternity.

Atwater Kent managed always to produce distinctive and attractive cabinets, slightly ornate with some quite innovative designs such as the pair in Fig.5 and 6. As well, for the top ranking receivers, there were consoles with handsome cabinets, often with six legs. Unfortunately for Australasian collectors, Atwater Kent continued to export bare chassis for installation in locally made consoles which lacked the 'class' of the American product.

There were now three broad ranges of Atwater Kent receivers, all in continuing development. There were the prestige sets just referred to, with up to a dozen valves, and some with two speakers. Next were the mantels, first in cathedral cabinets, and after 1933, increasingly in flat topped 'modern' cabinets. Finally, there were the miniature sets, one of which the 555 'Jewel Box' in Fig.6 is today a great favourite.

Technical design of Atwater Kent equipment reached its zenith in 1934, and a good example of this is the model 447 whose chassis is shown in Fig.7. The same front end subchassis as used in the 447 was used in several of the top line models for 1934.

Metal valves

The next year, 1935, saw the introduction by RCA of metal valves. Atwater Kent was quick off the mark to use them, although in reality the conversion from the older valve series entailed little more than changing the valve sockets.

Things were changing, though. In 1936, Arthur Atwater Kent was now approaching his mid 60s and the radio market had changed. Technical design had matured and was now standardised. In fact, until the end of the valve era some 30 years later, there were to be few significant new developments. There weren't the challenges any more, and according to some accounts, labour unions were becoming stroppy. It was time to retire.

In an unusual move, he refused to sell his business, although some of his senior staff pleaded to purchase it from him — he didn't want there to be any chance that the good reputation of the Atwater Kent name would be compromised. Instead he paid off his staff, sold the plant and shut his factory doors. It is reported that some

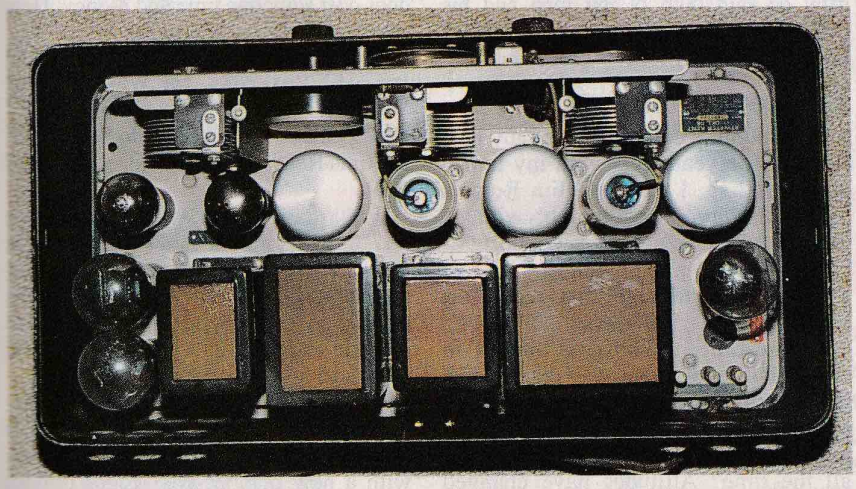


Fig.3: The interior of the model 55 with the valve cover removed. Of special interest are the belt coupled tuning capacitors, a transition between the earlier independent controls and the familiar common capacitor shaft. One of the belts is visible at top right.

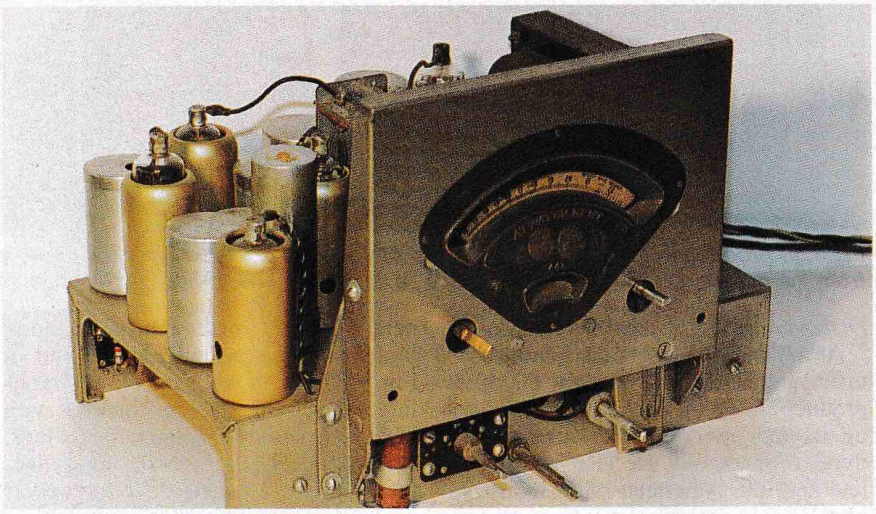


Fig.7: The 1934 model 447 chassis has some features found more often in a communication receiver, including continuous coverage from 550kHz to 23MHz in four bands. The RF stage is used on all bands and each band has an oscillator padder, ensuring accurate dial readings and tracking.

time later, the Bendix Corporation bought one of the factories.

After the closure Arthur Atwater Kent established a real estate business in Florida and then moved to Bel Air, California. There he built a 32-room mansion on top of the highest hill in Los Angeles, called appropriately Cappo de Monti. Here he lived in what he referred to as 'the simple life on a grand scale'.

He was a vegetarian, but entertained lavishly. Ever the technician, he also loved tinkering with his large fleet of cars. It is said that he never liked to use the same vehicle two days in succession! He died worth $8.5 million in 1949. It can truly be said both of the man and his radios, that they don't make either of them like that any more!

It's farewell, too...

This month's column will be my last. Nearly nine years ago, with my retirement pending, I accepted Jim Rowe's invitation to produce a monthly vintage radio series. I welcomed the opportunity to present to a wide range of readers some of the heritage that radio has acquired in just 100 years.

At one time, to show an interest in early radio equipment was regarded as being a little eccentric. Why worry about obsolete technology, when exciting new developments were appearing all the time? Attitudes have changed during the last decade and there is now a general appreciation of the significance of our industrial history.

An indicator of the active growth of interest in our radio past is the increase in membership of our vintage radio societies during recent years. In 1988, the Historical Radio Society of Australia had a membership of 300. Now it has more than doubled to over 700, and in the same period an encouraging growth has been registered by the New Zealand Vintage Radio Society.

I have mentioned previously that membership of these societies has benefits, These include receiving their quarterly magazines and access to data and circuit copying services. Do remember though, that when making inquiries please include an SAE and that photocopying does cost someone time and money. Here once again are the addresses:

Historical Radio Society of Australia Inc., PO Box 2283, Mt Waverly, 3149 Victoria.

New Zealand Vintage Radio Society, c/- 20 Rimu Road, Mangere Bridge, Auckland 1701.

Well, that's about it. I have derived a lot of satisfaction in presenting this series. I have been very encouraged by all the many readers who have taken the trouble to correspond with me and to provide material, and offer my grateful thanks to all concerned.

Next month Roger Johnson, a prominent member of the Adelaide Group of the HRSA, will take over the column with a new perspective. Roger is both knowledgeable and dedicated, and I am sure that readers will find his Vintage Radio columns both interesting and informative. ❖