

John Logie Baird's

TELEVISION DEMONSTRATIONS AT SELFRIDGES

BY IAIN LOGIE BAIRD AND MALCOLM BAIRD

SELFRIDGE'S

*Present the First Public
Demonstration of Television
in the Electrical Section (First Floor).*

Television is to light what telephony is to sound—it means the *INSTANTANEOUS* transmission of a picture, so that the observer at the “receiving” end can see, to all intents and purposes, what is a cinematographic view of what is happening at the “sending” end.

For many years experiments have been conducted with this end in view; the apparatus that is here being demonstrated, is the first to be successful, and is as different to the apparatus that transmits pictures (that are from time to time printed in the newspapers) as the telephone is to the telegraph.

The apparatus here demonstrated is, of course, absolutely “in the rough”—the question of finance

It has been 100 years since John Logie Baird's historic demonstrations of television at the Selfridges department store. Its founder, the American retail magnate Harry Gordon Selfridge, was primarily interested in selling the latest fashions and consumer products but he was also willing to go beyond the ordinary and sell almost anything. Selfridge had built a reputation for creating spectacle in the store by exhibiting the latest technological developments, for example, in 1909—just one year after the store opened—Blériot's monoplane was put on display soon after he had crossed the English Channel. An estimated 150,000 visitors viewed the plane over four days.

It may surprise readers that the first television system demonstrated at Selfridges was not John Logie Baird's. In 1914, an inventor-cum-journalist called Archibald M. Low had been invited to demonstrate his 'Televista' system which used a matrix of selenium cells on rollers as camera, while at the receiver, an array of bimetallic strips opened light paths.

The apparatus functioned but the photo-electric response of selenium was not fast enough to enable the system to produce moving pictures, thus it was more like a fax system than television. The lag of photosensitive elements was a problem that had plagued television scientists and inventors for years, and it was first solved by Baird, at least in practical terms.

At the time of his television demonstrations at Selfridges in March 1925, Baird was still seven months away from achieving what he considered 'true television'. The purpose of this article is to tell the story of Baird's television demonstrations at Selfridges, including some new material not previously published.

Chronically short of funds, Baird had been trying to get industrial interest from the radio manufacturers and from the BBC ever since he had started serious experimental work in television in early 1923. These efforts had mixed results, but his broader public approaches bore fruit, despite the fact that his invention was still under development. The Selfridges demonstrations brought the added bonus of a fee which helped Baird's research financially, as he had been under pressure from his chief financier, cinema owner Wilfred Day, to provide an immediate return on investment.

BAIRD'S LABORATORY AT 22 FRITH STREET

In November 1924, Baird returned to London from Hastings where he had spent the past two years recovering from a serious illness, and where he had done most of his television experiments. His decision to return was due to a combination of problems with his Hastings landlord, Mr. Tree, and the desire of his officious business partner, Will Day, that Baird work nearby. Day was based in London at 19 Lisle Street, Soho. He arranged premises for Baird to use as his makeshift laboratory—the attic rooms of 22 Frith Street, also in Soho.

The television apparatus that Baird was using at this time was electro-mechanical. The camera consisted of a rotating transmitter disc, fitted with sixteen glass lenses to collect the light. The receiver was based on a second disc of similar size, punched with sixteen rectangular holes. This spinning disc acted to rapidly align the variations of light with their position to form a coherent picture for the human eye. In early 1925, this apparatus was described in detail by Baird himself in an article in *Wireless World*.² Chris Long notes that this article is in the same issue as Cyril Elwell's article on the reproduction of optical film soundtracks in the DeForest Phonofilm system. Long writes:

The DeForest London studio at Clapham used Theodore Case's 'Thalofide' photoresistive cell, far faster in response than any earlier photoresistive cell, and I believe it was this element that led Baird, in October 1925, to attain the first practical achievement of 'true television'—the reproduction of a recognisable human face, in movement, by reflected light. Since reading these two articles I've checked for any mention of Baird's presence at DeForest's Clapham studio, and now have

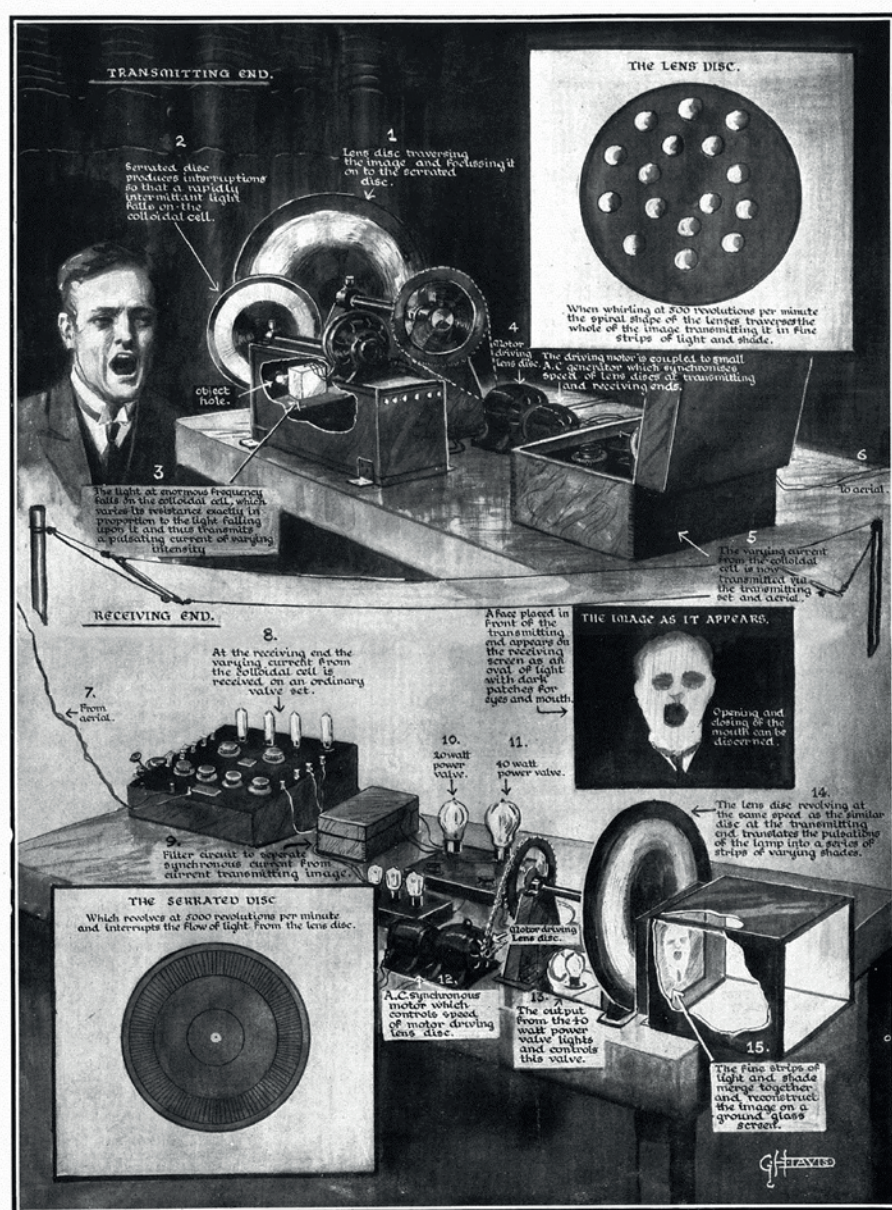
two accounts of it—by the later military wireless expert Dr. Alan Butement, and by A.F. Birch [an engineer who worked with Baird from 1928–30].

In his *Wireless World* article, Elwell wrote:

The cell we use, and which must be used for talking motion pictures, must be instantaneous in its action, and the photo-electric cell invented by Mr. T.W. Case, and known as the Thalofide cell, is used. It consists of a deposit of thallium and sulphur on a quartz disc, 3/4 in. diameter. It is very sensitive in action but of very high resistance, sometimes as much as 500

megohms. The current from the cell is taken through an amplifier and amplified sufficiently to enable it to actuate the loud speaker.

From the label (3) in the G.H. Davis drawing below, it is suggested that the cell that would be used at Selfridges was not Case's Thalofide cell, but one which Baird described for *Wireless World* as 'neither a photo-electric nor a selenium cell, but a colloidal (fluid) cell of my own invention, of which I hope to give particulars at a later date'. Such a cell is described in a letter from Baird to Day dated 13 October 1924. Long suggests that this cell may have been



Drawn by G. H. Davis

A SUCCESSFUL ATTEMPT TO SEE BY WIRELESS

Mr. J. L. Baird, who demonstrated the transmission of moving Shadow-graphs by wireless early this year, is now perfecting a machine designed to transmit actual images. In the Baird system of television the light is projected on to a sensitive cell by means of a system of lenses revolving on a disc at 500 revolutions per minute. Passing through a serrated disc whirling round at 5000 revolutions per minute, the light is interrupted, and next falls on a colloidal cell invented by Mr. Baird, and is

converted into a current of varying intensity. The pulsating current is then transmitted in the ordinary way to the receiving station, and, being amplified, controls a lamp whose light, passing through the lenses of another revolving disc, traverses a ground glass screen on which the image is reproduced by a series of fine strips of varying shades. At present the invention is in its infancy, but already it is possible to note the person at the transmitting end winking or opening his mouth—a distinct advance.

G.H. Davis' drawings of Baird's apparatus in early 1925. Image source: *The Graphic* (28 February 1925)

an application of the Becquerel effect. A.E. Becquerel had observed the photovoltaic effect for the first time in 1839 by detecting small currents when silver chloride was illuminated. Baird was experimenting concurrently with different types of cells, and Thalofide may have been tried as far back as June 1924. Burns was first to suggest that such a cell may have been the one that helped make possible the first true television images in October of 1925 and subsequently used for the first public demonstration of television in January 1926. However it is reasonable to conclude, from Baird's own accounts and from the Davis drawing, that a colloidal cell was used by Baird for the Selfridges demonstrations.

Another detailed written account of the apparatus Baird was using during the time just before the Selfridges demonstrations can be found in The Illustrated London News of 14 March 1925.

In his [Baird's] recent experiments, the transmission was from one room to another but as the sending and receiving instruments were entirely separate, with transmission entirely by radio, longer ranges may be possible with radio waves of greater power.

The instruments are rough and purely experimental at present, but they have demonstrated the possibility of actually seeing the representation of a living object by radio. The human face appears only as a blurred white oval with dark patches for the eyes and mouth but it is possible to note, on the ground-glass screen of the receiver, the effect of eye-winking and opening the mouth by the person at the transmitting end. Most of the apparatus has been constructed of makeshift materials—improvised wireless gear not really suitable for the purpose, and even a number of lenses from bicycle lamps. The next stage in development of the system will be the construction of properly built instruments to overcome the flickering indistinctiveness and lack of detail inherent in the experimental receiving machine.

In the Baird system of television, light is projected onto a sensitive cell through a system of lenses fitted to a disc that revolves at five hundred revolutions per minute. The light next becomes interrupted by passing through a serrated disc turning five thousand revolutions per minute, and then falls on a colloidal cell invented by Mr. Baird, and is converted into a current of varying intensity.

The television 'camera' apparatus used a double-8 interlaced lens configuration, in other words, 16 lenses in total fitted close to the outside edge of the disc broken into two 8-lens semi-spirals, not a single spiral as erroneously interpreted in Davis' drawing entitled 'The Lens Disc' above. The actual lens configuration's use in the apparatus has been correctly described in numerous other historical sources and in considerable detail by Don McLean in his recent article. The description in the Illustrated London News also included a description of the receiver apparatus:

This pulsating current is then transmitted through space to the receiving station, where it is amplified for controlling a lamp whose light, passing through the lenses of another revolving disc, impinges upon a ground-glass screen on which the image is reproduced by a series of fine strips of varying shades. However crude the results of the present experiments may seem, it must not be forgotten that the early experiments in wireless signalling were of a very simple nature, notably that of Hertz, who discovered that an electric spark discharged at one end of a room caused his 'resonator' to respond at the other end.

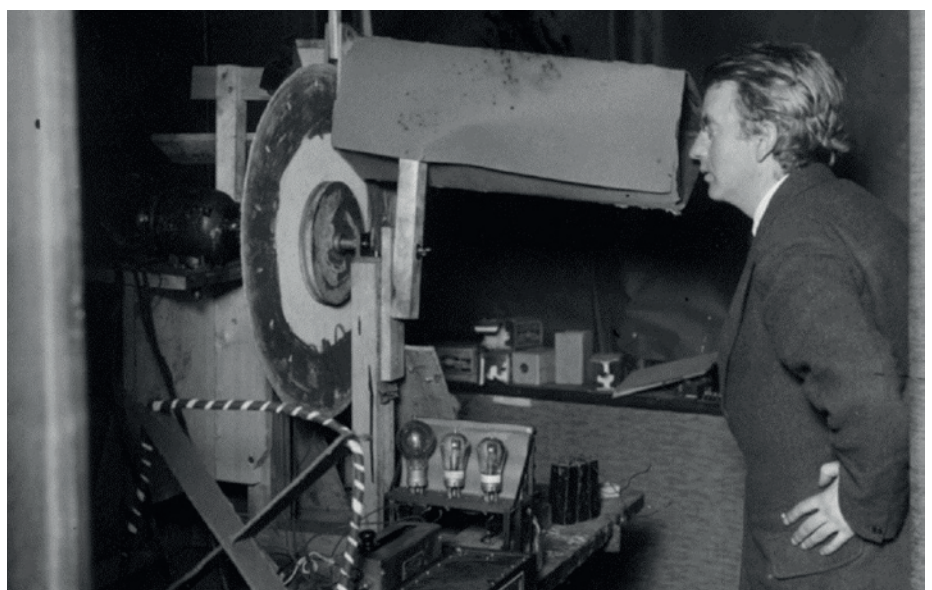
Crucially, the apparatus demonstrated in early 1925 and at Selfridges was divided into two sections, as in Baird's account in Wireless World, as illustrated in the Davis drawings, in the Illustrated London News just above, and in other accounts (to be discussed). This would have removed any doubts that the pictures were travelling via wireless.

Baird was giving regular demonstrations at 22 Frith Street at this time. The Westminster Gazette reported: 'From a Soho room yesterday a Westminster Gazette representative saw the likeness of a man's face transmitted by wireless to a neighbouring room. ... Mr. Baird has spent two years working continuously upon his invention. "Consequently," he said, with an apologetic smile, as he surveyed his laboratory "I have had to be economical with my materials. A 'junk' merchant would probably give me £5 for the lot".'

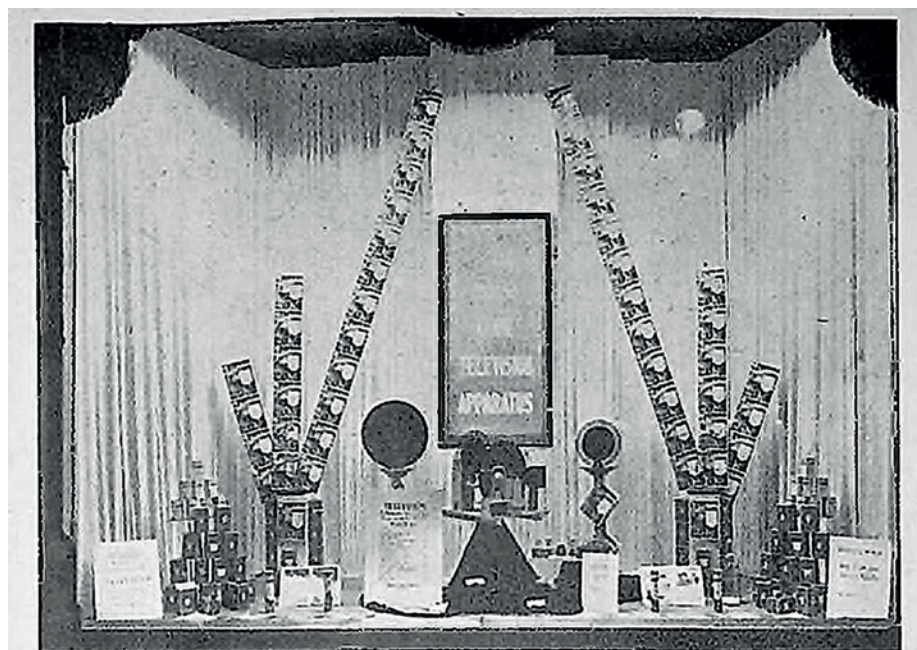
WELCOME VISITORS AT 22 FRITH

Baird would recall: 'I continued to work away in my Frith Street attic transmitting crude outlines of letters and figures anxiously watching the cash getting less and less. One day I had two visitors. One was Mr. Gordon Selfridge, junior, the other had visited me in Hastings and was interested in my work. He had mentioned it to Selfridge and Selfridge, who was on the lookout for an attraction for his [the store's] Birthday Week celebrations, had thought that television would be a startling exhibit.'

The visitor who had visited Baird's laboratory in Hastings was Count Anthony Herbert de Bosdari, who was a friend of Gordon Selfridge junior. They had both attended Winchester College, and Bosdari had been working in Selfridges marketing department. Bosdari thus deserves credit as the go-between who occasioned the Selfridges demonstrations. He was the son of the Italian banker Count Maurizio de



Baird's receiving apparatus in 22 Frith Street, 4 Mar 1925. Note the triangular viewing tunnel and the large Nipkow disc, made of thick cardboard, and punched with 16 rectangular holes. In the foreground is a radio aerial. The three valves are for amplifying the synchronisation signal from the transmitter apparatus. Image source: Royal Television Society, Westminster Gazette



The world's first window display of television at Messrs. Selfridge's recently. The Simple Televisor described in our first issue has a prominent place.

A Simple Televisor can be seen at centre, with discs displayed on either side. Above is a sign that reads BUILD YOUR OWN TELEVISION APPARATUS. Television magazines (the debut March issue) are arranged vertically. Image source: Television, April 1928

Bosdari, allowing Anthony and his brothers to use the title of Count. Bosdari later became the General Manager of British Brunswick Ltd., giving a demonstration of the Panatrope the following year. The Panatrope was one of the earliest fully-electric gramophones, as distinct from the traditional mechanical and acoustic wind-up models. It featured an electric tonearm with a magnetic pickup head, which converted stylus vibrations from a gramophone record into electrical signals, allowing for amplified sound playback through a loudspeaker.

In Baird's demonstration for Selfridge and Bosdari, he used a paper mask as the test subject. This was made to wink by covering the eyeholes with white paper, and it could be made to open and close its mouth by covering and uncovering the slot corresponding to the mouth opening.²⁵

The television transmitter apparatus in operation at 22 Frith Street in early 1925 as would have been demonstrated for Selfridge and Bosdari. The 'mask' is visible at centre. To the right of it is the large double-8 lens disc, a smaller light interrupter disc, and the large 'monitor' disc, white at its outer edge, that was perforated with 16 rectangular holes. In the foreground is a wooden box with what looks like a drainage tube. Image source: Tiltman, Baird of Television, 1927

THE SELFRIDGES DEMONSTRATIONS

With Selfridge and Bosdari both having apparently been impressed by the demonstration in the cramped Frith Street rooms, a formal arrangement was made with Selfridges. Baird recalled:

I was offered twenty pounds a week for three weeks to give three shows a day to the public in Selfridges store. I accepted the offer and spent a very tiring three weeks demonstrating to long queues of spectators, most of them ordinary shoppers, but also a number of scientists who had come specially to see the show. By looking down a funnel arrangement they were able to see outlines of shapes transmitted only a few yards by a crude wireless transmitter.

The demonstrations commenced at 11.30, 2.30 and 3.15. Baird would also answer questions from the public. The television demonstrations were part of a series of various other special birthday displays. A newspaper announced: 'The biggest free show in London this week and next is Selfridges, Oxford-Street, where the 16th anniversary of the foundation of this giant store is being celebrated simultaneously with the opening of the new building at the corner of Orchard and Oxford-streets.'

The first day of demonstrations was Monday, 16 March. The same newspaper reported: 'There was given yesterday the first public demonstration by the inventor, Mr. John L. Baird, of an experiment in television. The demonstration, which was watched by hundreds of people in the Palm Court, was entirely successful and created a great deal of interest.' Only one person at a time could look down the funnel and see the images transmitted by means of the apparatus which to the non-expert appeared to be constructed largely of cardboard and powered by means of a bicycle chain. Three visitors in particular recorded their impressions...

The first seems to have been Dr. Alexander Russell, F.R.S., principal of Faraday House and past president of the Institute of Electrical Engineers, who contributed an anonymous article about the invention in the distinguished scientific journal *Nature*, in which he concluded, 'Mr. Baird has overcome many practical difficulties, but we are afraid there are many more to be surmounted before the ideal television is accomplished.' The description of the apparatus includes a new feature at the receiving end, a neon tube which 'causes light to appear on a screen in positions corresponding to the part of the object being dealt with.'

The second visitor was a stunningly attractive, dark-haired music student from South Africa. Just turned eighteen, she had been dragooned into attending the demonstration by her authoritarian mother. Margaret Baird recalled:

My mother and I were in London at the time I was a student at the Royal College of Music. My mother read about the demonstrations in the paper, as she was always interested in anything new, and we went to Selfridges. I must have seen John Logie Baird and his invention. ... Of him at that time I have no recollection. The invention had the effect which all mechanical things have on me and gave me a feeling of bewilderment and faint nausea.

The third visitor was P.R. Bird, assistant technical editor of the *Popular Wireless and Radio Review*, who gave a full account of the demonstration in the issue of 23 May 1925, illustrated with cutaway drawings of the system. He wrote:

At first the inventor was invisible hidden behind his invention, which was spread out over half a dozen tables, and overflowed a floor space about the size of an ordinary room. Across the middle of the space

provided an artificial wall had been erected. It was about a foot thick with the transmitter on one side of it, and the receiving apparatus on the other. There were accumulators, arc lamps, switches, H.T. batteries, Ford coils, P.O. relays, neon tubes, chokes two or three dozen L.F. transformers, a big biscuit tin (Rich Mixed), and several small electric motors which bore a strong family resemblance to electric fans, from which the blades had been detached. Evidently, financial difficulties had not deterred the inventor, and when his resources were low his resourcefulness was unbounded.

A breakthrough that was debuted at Selfridges was the use of a neon tube as the light source for the received pictures instead of the filament lamps that he had been using previously. The use of neon was noted by Bird, in the account in the journal *Nature*, with its debut later highlighted by Burns. Neon lamps' quicker response to the variations of the television signal meant a significant improvement to the pictures.

Bird continues: "How does it work," I asked Mr Baird, when he was able to disengage himself from some interested old ladies, one of whom had incautiously touched the wiring, and almost succeeded in connecting 3,000 volts across herself. ... "It's a long story," he said".

The article goes on to describe the system for the interested layman. 'Then by way of demonstration, Baird produced the paper mask. ... "I'll make it wink," shouted the inventor, covering and uncovering one of its eyes. The uncanny, flickering image at my end promptly winked at me in unison, shutting and opening one eye in the most flagrant and uncommonly knowing fashion.'

It has recently been discovered that one of the people who seems to have assisted JLB was Samuel John Squire (1867–1947). He had left the Merchant Navy to become an optical glass worker and developed a fascination with radio which would lead him to working with Baird for what now seems to have been over seventeen years. His granddaughter and the authors believe that he is the older man standing behind JLB in the iconic photograph of the Selfridges demonstrations (see top right opposite). This indicates that Squire's acquaintance with Baird goes back eight years earlier than previously recorded. Starting in 1933, Squire officially joined Baird Television Limited and also assisted Baird in his research laboratory at 3 Crescent Wood

Road. Squire was also on the team who worked on a big screen television system for London's Dominion Theatre in December 1936. This mechanical system was a permanent installation and projected a picture of roughly 8 feet by 6¼ feet. During the early years of World War II, Squire was one of Baird's volunteer helpers, along with Richard Head and Geoffrey Bernard, who was waiting to be called up. There is a single mention of Squire in one of Baird's 1940 diaries.

Will Day was delighted by this ability of Baird's work to generate income and he planned that the Selfridges demonstrations were to be followed by a similar run at Whiteley's, a large department store in Bayswater. Day wrote to Baird on 4 April, 'I have been expecting a visit from you regarding the settlement of Whiteley's, and to know what has been done with the prospect to forming a projected company. I sent a large number of friends to Whiteley's from here, so that something should certainly transpire.' This did not transpire. Baird later recalled: 'The strain of giving three shows a day on this rickety apparatus was too much for me and I was ill for several weeks after it. The apparatus went back to Frith Street and with a little more money to go on with, the research continued'. Day took it upon himself to dun Selfridges for the money due to Baird for the demonstrations, half of which he seemed to feel was owed to him. Baird was eventually allowed to keep the proceeds.

A TRADITION OF TELEVISION AT SELFRIDGES

The second collaboration of Selfridges and Baird happened in early 1928. At a lunch on the 20th of February to celebrate the opening of a television department at Selfridges, Baird announced that basic kits would be on sale. These kits would enable a wireless amateur enthusiast to build a rudimentary televisor, which could then be upgraded to receive transmissions on a wavelength of 45 metres. Also at this time, Selfridges installed their first window display of television featuring the kit, entitled 'The Simple Televisor' and described in the first issue of *Television* magazine (March), the 'official organ of the Television Society', with a second model described in the May 1928 issue.

The Simple Televisor was not so much a kit of parts as a set of instructions, requiring the technically-inclined amateur to purchase, seek out or fabricate all of the necessary components separately,

including a selenium cell, a neon bulb, an electric motor, and Meccano parts, provided they agreed to apply for a television constructor's sub-licence available for a small fee from the Baird Company. A full-size blueprint of the discs was also available for a small fee. For the first model, the pictures were transmitted and received on opposing sides of the same main disc, which was punched with two spiral sets of holes.

Television magazine stated: 'There would seem to be no outstanding reason why the ordinary amateur should not build for himself a similar device and enjoy the unparalleled pleasure of exploring for himself this new branch of science. There is always something infinitely fascinating in exploring a completely novel field, and we propose to give in this article constructional details which will enable the amateur to build for himself a simple machine which will show the transmission of outlines in a crude form.' With the introduction of the second model, which enabled television to be sent to a separate receiver in another room, the resourceful amateur could follow in the footsteps of Baird's experiments conducted only three years earlier.

By October of that year, the Baird Model A and Model B televisors were for sale at the store, for £20 and £40 respectively. These expensive ready-made sets, manufactured in small numbers by the Baird Company at its Long Acre premises, had the lens, lamp, disc and motor enclosed in a sturdy wooden cabinet, ready for connection to a fairly standard wireless set, and thus were aimed at a less technically-minded customer, one more interested in viewing television programmes. Unfortunately, broadcasts (using Baird's 30-line system) did not finally begin until September 1929 after a great deal of difficult negotiation with the BBC for the use of its radio transmitter. Six months later, a second transmitter was added, so that vision and sound could be broadcast simultaneously.

In 1930, the first BBC-produced television play, Pirandello's *The Man with the Flower in his Mouth*, was received at Selfridges, where one of Baird's employees, Philip Hobson, set up and tested in the morning two of the latest 'tin stove'-type Plessey-built televisors for the public, and one for Gordon Selfridge himself in a separate room.⁴⁸ Two different kits based on the Plessey design were also offered around this time.

A limitation on television had been the use of radio transmitters designed for sound transmissions, which did not have enough



Selfridges radio and television department circa early 1928. The apparatus at the right is a Simple Televisor. It includes a large square viewing tunnel, a large Nipkow disc, and a smaller light interrupter disc. Image source: Selfridges Ltd., Royal Television Society RTS 36-86

bandwidth to handle high-definition images in quick succession. Baird and his colleagues had thus started to work with Ultra Short Wave transmitters operating on 6.3 metres. A demonstration for scientists and experts was arranged, billed as 'Television by Ultra Short Waves. A New Departure. First Public Demonstration in the World'. It took place on 29 April 1932, between a transmitter installed on the roof of the Baird Company premises at Long Acre and a receiver installed in a hut on the roof of Selfridges. Two actors were televised, Marie (later Dame Marie) Tempest and Leslie Mitchell. Tempest, who still had the figure of a girl of sixteen, was especially known for her starring roles in comedy. Mitchell (twenty-six), who in 1936 became the BBC's first full-time television announcer, had played the lead role of Captain Stanhope in R.C. Sheriff's *Journey's End* on tour in South Africa and also in a BBC radio broadcast. Although a fairly standard mirror-drum televisor was used, depicting a 30-line image on a ground glass screen 9 by 4 inches, the main advantage of ultra-short-wave transmissions was that they could accommodate 180-line pictures.

For two weeks in August of 1932, television was demonstrated nine times per day in the radio and television department on a large screen 3 feet wide by 7 feet tall featuring performances by artists from the Savoy Folies.

In 1936, when the BBC television service began from Alexandra Palace, Selfridges became one of the largest retailers of 240/405-line television sets in London. In March 1939, Selfridges operated its own television studio in the store, (equipped with 405-line EMI 'Emitron' cameras) to help sell television sets, while the threat of war with Germany began to escalate. For many thousands of customers, the store would be the first place they would see television. The flagship Selfridges store is still in business at the same Oxford Street location today and still sells television sets.

CONCLUSION

As well as providing more understanding of one of the most well-known events in Baird's life, the Selfridges part of the story reflects most of the earliest stages of television set retailing in Britain, from the struggling inventor demonstrating a new technology, to inspiring the amateur constructor, to the first ready-made home receivers. The latter were optimistically made available in small numbers prior to the beginning of regular programmes—but nonetheless symbolic of the public's dream of seeing as well as hearing by wireless in the foreseeable future. Another year would pass before the concept of purchasing a home televisor to use for watching regularly-scheduled broadcasts would become a reality.

The broad range of positive effects that various demonstrations had on Baird's ongoing efforts are addressed in the many past and recent books about Baird and early British television. It is made clear here that the Selfridges demonstrations were similarly successful in terms of generating a great deal of publicity, both face-to-face within the store and in newspapers, and in a few popular, specialist and academic publications. The numerous inventions and innovations exhibited at Selfridges now included Baird's television among them. What is also made clear was that Baird still had much more work to do before he could demonstrate recognisable moving pictures of a human face, what he had always considered would be the foundation of 'true television'.

As P.R. Bird would write of his experience at Selfridges, '...I am certain of one thing. However fair to behold the wireless pictures of the future may be, and whatever beauties Television may bring in time to come, I shall never forget the grinning gargoyles that Mr. Baird showed me—the first face I had ever seen by wireless.'