

Wireless sets of the 1920's

Although dedicated amateurs had been monitoring the radio waves since the early 1900s there was little of interest for the general public until regular programmes broadcast by the BBC which started in 1922. This spawned the mass manufacture of commercial crystal sets.

The earliest radio on my website is a crystal set made in 1923. This made me realise how much things have changed since I was a ten year old constructing my own crystal set. My father gave me some of the parts that he had used as a boy and I used these together with a government surplus diode designed for use in radar equipment. This meant the end of fiddling with the cat's whisker on a piece of galena. With a long aerial I could then listen to the Home Service on a loud speaker.

Valve radios were becoming available though expensive. This one which has two valves was made by W.G.Pye of Cambridge is housed in a walnut case which could also contain the batteries. You will see from the following that owning a valve radio was only for the very wealthy.

The "Wireless World" magazine of 1926 lists this model at £8.5s.0d and £14.5s.3d for the set complete with valves batteries and speaker. This equates to over £872 today. On top of this one would have to pay an annual licence fee of 10 shillings (50p) which was first introduced in 1923 and counted until 1971. Remember that 1926 was the year of the General Strike in Britain when the **average male weekly wage** for those in work was about £5.

Perhaps you may have noticed the "BBC" label by the crystal set I shown above. In those early days of broadcasting, listeners could only legally listen in after buying a licence and

then only by using a set with the BBC label. Part of the price of these sets would go to the BBC and part to Marconi who held the broadcasting patents. This was based upon the number of valves, so crystal sets were exempt. Of course this led to many people constructing their own receivers and the growth of magazines such as "Wireless World" devoted to the theory and construction.

A receiver such as this was in no way a "plug and play"



Connections to Aerial and Earth.
The Aerial should be alternatively attached to the Terminals marked **Æ1** and **Æ2**. Should the Aerial be very short it may be necessary to connect **E** and **Æ1** together, and the Aerial to **Æ2**.
The Terminal marked **E** must be connected to either a water supply pipe, or to a metal plate about 2 ft. square buried in coke 3 or 4 ft. down, choosing the dampest place available.

Connections to Batteries.
These connections should be made as shown in the diagram, care being taken that in every case the + (or red) lead of the batteries and phones goes to the Terminal marked + on the instrument.
H.T. BATTERY (total 108 volt.)—Connect up as shown in diagram.
Black in negative (-) end of the battery.
Red 50 volt from the negative end of the battery.
Open in the positive (+) end of the battery.

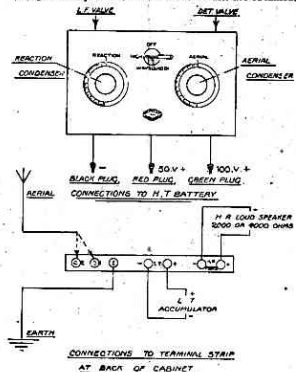
Valves.
It is IMPORTANT that only the valves recommended below be used, as these are suitable for the fixed resistor in the receiver.

FILAMENT VOLTS	Detector		Low Frequency (L.F.)	
	Maker	Type	Maker	Type
3	Osram	D.E.R. (L.F.) Osram	Osram	D.E.4 Mullard Osram
4	Osram	R. Osram	Mullard	P.M.4
6	Osram	D.E.3 (L.F.) Osram	B.T.H. Osram	Ba. D.E.3 (L.F.)

Instructions to operate.
To tune in a station place wave-length switch in required position. The "LOW" position gives the main B.B.C. stations and covers a band from 300 to 600 metres. The "HIGH" range band is from 1000 to 2800 metres. This includes Daventry and Radio-Paris. Set the **Æ** tuning condenser at 180 on the dial. Move the Reaction condenser from 0 towards 180 until a click is heard; the receiver is now oscillating, rotate the **Æ** condenser slowly towards the zero until a continuous whistle is heard.

INSTRUCTIONS FOR 2-VALVE SET, TYPE No. 720

This is the carrier wave of a transmitting station. Adjust the **Æ** condenser to obtain the lowest possible pitch note, reduce the reaction until the whistle entirely disappears, and make final slight adjustments to both condensers (using small top knobs) until the best results are obtained.



future occasions the **Æ** condenser dial should be set exactly as noted and the Reaction dial two or three divisions nearer the zero end of scale. Use care while increasing the reaction not to go too far and cause the receiver to oscillate. Immediately before oscillation starts the telephony will lose its natural quality and become raucous, as soon as this symptom is evident slightly decrease reaction.
The position of the dials will not alter if the same aerial is used. Should any difficulty be experienced either in starting or stopping the receiver oscillating, increase the Red plug H.T. voltage will make it oscillate more readily and the reverse will stop it.

TUNING CHART.

Station	Æ Term.	Tune Æ	Reaction
Cardiff	-		
London	-	40	34
Manchester	-		
Bournemouth	-		
Newcastle	-		
Glasgow	-		
Belfast	-		
Birmingham	-		
Aberdeen	-		
Croydon	-		
Daventry (5XX)	-	105	80
Radio Paris	-		
		57	80



device, like the crystal set it requires a long outside aerial and also some skill in adjusting the tuning and reaction controls to get a decent signal. A card with a set of helpful set of instructions is mounted in the lid of this model. Even after 90 odd years this old timer can be put in action to render Radio 5 live and a couple of others stations. "Steam Radio" is not quite dead yet!

Loudspeakers were initially based upon the universal gramophone horn of the period attached to what was essentially a headphone earpiece. However by the time this Pye radio was made a loudspeaker of a more familiar size and shape was common.

Radio sets of the 1930's

The 1930's were a time of great change after the Great Depression of the post WW1 period. Approximately 4 million homes were built in the UK between 1919 and 1930. Nearly 3 million of these were owned by the occupiers, an unprecedented change from the 750,000 of the early 1920s. You could buy a new build 3 bedroom semi detached house for £825.

This rapid change saw the number of wireless licences rise from 3 million to 9 million by 1939. People had the opportunity, and were urged to discard their crystal sets and battery powered wireless in favour of the new breed of 'all in one' mains powered radios. However, for many, the luxury of mains electricity was still some time in coming so versions of battery operated ones were also available. The most striking change to the casual observer was the external appearance; from being a piece of scientific equipment it became a piece of furniture that would blend in with your modern home.



The technology inside the cabinet changed as well. Apart from the BBC stations there were ones in Europe that listeners wanted to hear (Radio Luxembourg for instance started in 1933). The wavebands were becoming crowded, more sensitive and selective designs were needed to pick up these signals without them impinging upon one another.

This 1933 restored and working mains operated Marconiphone 4 valve radio covers both long and medium wave broadcasts. It also has the facility to amplify and play the output from a gramophone pickup on its powerful internal loudspeaker.

This 1938 Burndept radio which cost £13.13s (about £975 today) is a good example of the progress made in just a few years. It has a magic eye tuning indicator and eight valves, covers Long, Medium and 2 short wavebands as well as having a gramophone input.

It was purchased by my father in 1938 and I believe it was the first commercial radio that he bought (the previous ones would have been home made). He subsequently made some modifications, including a headphone jack, to improve its performance so that he could continue listening on short waves.

As a young boy I remember this radio, which was in the front room, was on constantly. The news of course was about things I really did not understand, speeches by Churchill and Roosevelt, Workers Playtime at lunchtime and the comedy programme ITMA (It's That Man Again). The radio continued being used daily until 1983 and still works today.

Radio sets of the 1940s

The 1940s were a time of great change. When war broke out in 1939 all the British radio manufacturers switched to producing a wide range of military radio equipment for the armed forces. Soon there was a shortage of radio repairmen as they had all been called up to maintain vital radio and radar equipment. Similarly there was a shortage of spare parts, particularly valves, as all production was for the services. This meant it was very difficult to get a radio repaired and with very few new sets available there was a desperate need to overcome the problem. Some people

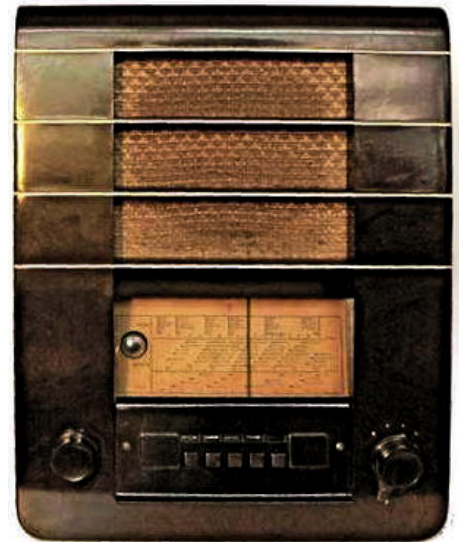
resorted to resurrecting discarded crystal sets and others attempted do-it-yourself repairs.



With materials in short supply, and virtually no new domestic radios available, many people couldn't keep up with the latest news. The government belatedly came up with a plan to get several radio manufacturers to produce a standard affordable radio to cover the medium waveband. The initial design was undertaken by Murphy Radio Ltd. and they were made to a standard design (with very slight variations) by 44 different manufacturers, identified by the code marked on the chassis. The original cost of this **Civilian Wartime Radio** when first introduced in June 1944 was £12 3s 4d.

Radio manufacturers had to meet exacting military requirements for reliability and ruggedness. This required extensive development and improvement of many components and materials, making them smaller and more reliable. By the end of 1945 the industry was getting back to satisfying the demand with designs which were on the drawing board back in 1939, like this **Ekco A21** five-valve mains-operated table radio housed in a brown Bakelite case. This was one of the first valve radios manufactured after WW2. It was released in November 1945 and cost £16 16s

plus £3 12s 3d purchase tax. It has three tuneable wave-bands and five preset pushbuttons (three medium wave and two long wave).



Other manufacturers soon followed and this one of the more expensive models, the **Murphy U128** push-button 8 waveband valve radio was released in January 1948 priced at £41 6s. 8d. Murphy advertised it as 'The set for the short-wave enthusiast'. It covers six shortwave bands as well as long and medium wavebands. Each is brought into operation by depressing the

appropriate button below the dial. £40 in 1948 would be equivalent to about £1500 today!

It has been estimated that by 1946/7 about 80% of UK households owned a radio, so the next marketing opportunity would be to produce battery/mains operated portable radios using the miniature valves developed for military equipment. The **DOUBLE DECCA** shown here is a later model of a mains/battery set first introduced in 1946 which incorporates four miniature B7G valves. It is housed in a plywood case covered in an embossed "leatherette" type fabric; the front panel is of pressed aluminium sheet sprayed white.



Radio sets of the 1950s

The early 1950s was a period of austerity. Fourteen years of food rationing in Britain only ended in 1954. Many goods were still in short supply, purchase tax stood at 33⅓ % and there were still bomb sites in many towns and cities. Britain was involved in the now almost forgotten Korean war which once again put a strain on manufacturing resources and resulted in the doubling of purchase tax to 66% which lasted until 1953 when it was reduced down to 50%.



There were bright spots: the Festival of Britain in 1951, of course the Coronation of Queen Elizabeth II in 1953 and then big technological improvements.

As I mentioned in the last article there was an emerging market for small portable radios of which this cheerful **EKCO MODEL UI22**, which cost £12 1s 7d plus purchase tax and came out in 1950, is an example. This was Ekco's first portable radio housed in a polystyrene case and is in a style often referred to as a 'toaster radio'. Several manufacturers made AC/DC sets of this basic shape designed for portability and destined predominantly for use in the kitchen as a second

radio. The term is generally assumed to be because of the shape, though cynics say that it is because of the heat dissipated by the dropper resistor and the valves in such a confined volume. Like others of this type it incorporated the 'tea cosy' concept, i.e. the case was placed down over the chassis which was secured from the underside.



The **Ultra R786 Coronation Twin** is another example of portable radio suitable for mains or battery operation. This is a classic battery mains portable that typifies the design of Ultra in the 1950's, launched to celebrate the coronation of Queen



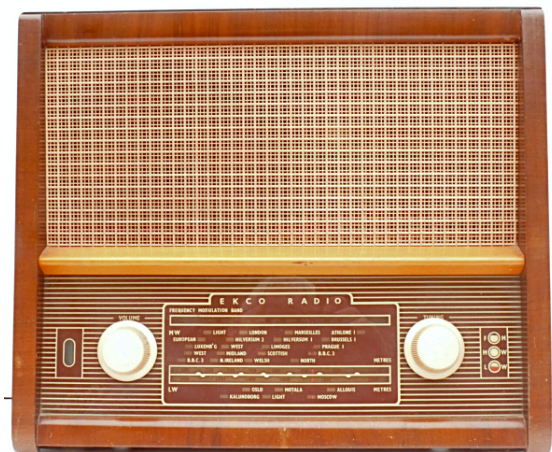


The transistor which had been invented in 1947 was first produced commercially by the American company **Raytheon** in 1952. The first radio to use these commercially was the pocket sized **Regency TR-1**, which was also manufactured in America and went on sale in November 1954. The one shown here on the left is a slightly later one, which though complete, unfortunately no longer works.

FM sound broadcasting on **VHF** began in the United Kingdom in 1955 when the **BBC** started broadcasting the Light Programme, the Third Programme and the Home Service to the southeast of England. The main advantages of this method of broadcasting are the better sound quality and immunity to interference. Unfortunately existing radio receivers were unsuitable for this new service and radio manufacturers came up with table top radios with the additional circuitry to tune in to the new services on VHF.

This **Ekco Model U243** table top seven valve (including tuning indicator and rectifier) radio is fairly typical of this new breed of radios. It covers the medium and long wavebands as well as the VHF FM 87-100 MHz waveband.

Interesting snippet. The UK government announced in 2020 that analogue radio station licences will be extended for another 10 years. Commercial radio stations will be allowed to renew their existing licences for another decade, meaning your old radio could keep you listening until at least 2032.



Radio sets of the 1960s

The 1960s was a period of optimism after the dark days of the previous decade; it was a time of innovation, as well as cultural and technical change. There was growth in British fashion, cinema and popular music. The Beatles and The Rolling Stones were at the height of their popularity and so the decade became known as the 'Swinging Sixties'. The unemployment rate was at a record low, people became better off and many bought cars and other consumer goods. It was also the decade that saw the first man in space, ending with the first man on the moon and, as every one knows, the one in which England won the Football World Cup. The phenomenal growth in the pop music industry caused manufacturers to quickly move to making record players and cheap radios to satisfy a new market fuelled by record producers and pirate radio stations such as Radio Caroline. Many radios were imported from Japan and Hong Kong but UK manufacturers also jumped on the bandwagon.

Electronically, this was the start of the transistor age - it was the time when I made my first transistor radio in a plastic sandwich box purchased from Woolworths using just four transistors. Then compare that with the latest iPhone which has **nearly 12 billion!** That radio has long since been dismantled but these are some of my transistors from this period.



Sanyo model 6L-P4N This is one of the earliest Sanyo Transistor radios sold in the UK. When new in 1962 it cost £17.0s.0d including purchase tax. Today, this would be in the region of £350.

The early transistors were low power devices with poor performance at high frequencies so their use in domestic radios was confined to portables covering the medium and long wavebands. To listen to the better quality broadcasts on FM a valve radio was needed, such as this **Bush VHF81** which had LW/MW and VHF wavebands using miniature valves.

To cater for the portable market **Bush**



produced this **TR82B** Seven Transistor LW/MW radio where the internal construction is very similar to that used for valve radios of the time. Like many transistor radios of this era it has a socket for a car aerial in the back panel.

The following is an interesting snippet from the operating instructions:

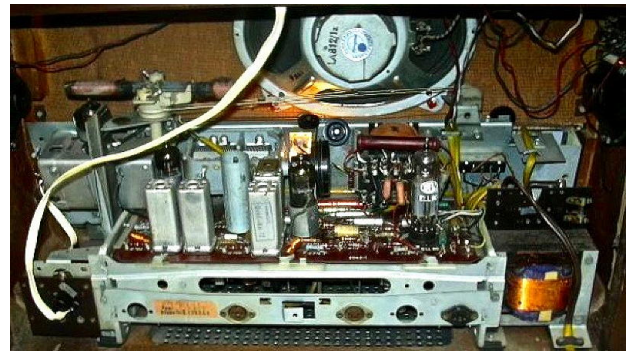
Transistors may be expected, under normal operating conditions, to have a much longer life than valves. If, however a transistor should need be replaced, this must be done by your dealer. Transistors cannot be plugged in like valves and for the purposes of servicing they must be treated in the same way as other components.

There was an almost insatiable demand by fans for the music of the popular icons such as the Beatles, Rolling Stones and so on. This fuelled the sales of vinyl singles and record albums. By the mid 1960s there were a number of pirate radio stations such as **Radio Caroline** which broadcasted popular music feeding the demand that the **BBC** had initially ignored, though by 1964 they had relented and started '**Top of the Pops**'. Fans played their vinyl disks on record players such as the '**Dansette**' and those who had the means would record their favourite tracks on reel to reel tape recorders.



The better quality radios, which took advantage of the improved audio quality of the FM broadcasts with decent loudspeakers, included sockets at the rear for the connection of tape recorders and record players as well as external loud speakers.

This top quality '**Nizza**' table top piano key pushbutton valve radio Made by **Blaupunkt** in



Germany was first produced in 1965. The push buttons enable it to cover long, medium, short and VHF ranges as well as connecting to a tape recorder and record player. It has one main loudspeaker and two smaller high frequency ones mounted on the sides. It has a magic eye tuning indicator and like most transistor radios uses a printed circuit. This radio is still in excellent condition and works well.

The Regency pocket radio mentioned in a previous edition of the Beacon was imitated by many manufacturers and millions have probably been made world wide over the years but all suffered from having a small loudspeaker. **Roberts Radios** used their experience in producing valve portable radios to transition into the transistor age with this **R200** Long and medium wave portable transistor radio made in 1960. This model, which sold for £19 when first introduced, is one of the first of a long line of transistor radio model made by **Roberts Radios**. The style is still popular today, with the various models housing modern DAB circuitry marketed under the '**Roberts Revival**' range.

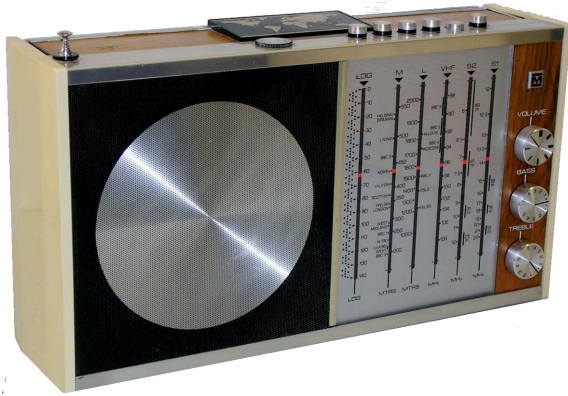
By the end of the decade the advances in transistor technology were such that the valve era for domestic radios had effectively ended. The public was then able to listen to VHF broadcasts on a transistor radio such as this **Roberts R600** portable transistor radio made in 1969.

Radio sets of the 1970s

The 1970s was a time of strikes by postal workers, miners and dustmen. It was the decade in which Britain went decimal and joined the European Union. It was the

time of rising inflation due to increasing oil prices which tripled in the 1970s. This was also the era of Abba, flares, Rubik's cube, the Ford Cortina, Raleigh Chopper bikes and the cassette recorder.

The era of the valve radio ended in the 1960s and by the mid 70s all-transistor television sets were available but valves continued to be used in public address amplifiers and in equipment for hi-fi enthusiasts. Integrated circuits were slowly being introduced. Radios of this period took on a more functional and technical appearance as illustrated in these examples.



The **Murphy 'Overlander'** was designed to give world wide listening as well as reception of BBC broadcasts. It has a fine tuner to home exactly onto shortwave stations. Unusually for a portable radio it has separate bass and treble tone controls.

This **National Panasonic** had long, medium, short and FM (VHF) wavebands and could be battery or mains powered. This is an interesting radio as it has a small LED indicator on the tuning pointer which glows when the radio is correctly tuned. It incorporates eight transistors and one integrated circuit. This Japanese radio stays in our bathroom and is used almost daily.

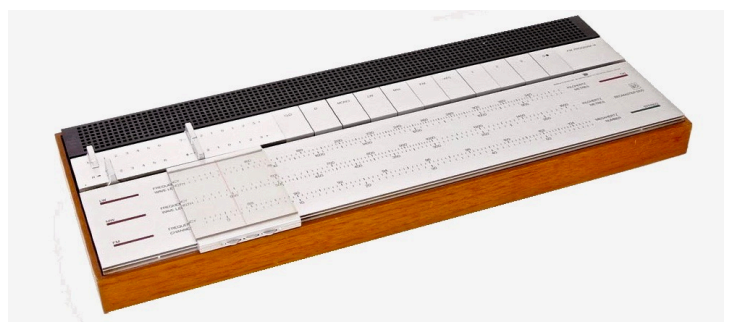


Although the cassette recorder had been invented in 1962 it took several years for it to be capable of the reproduction quality of reel-to-reel recorders. The youth of the 70s could now record
Top of

The Pops directly from the radio with one of many such combined radio cassette players of this period. This Japanese **Hitachi radio cassette** with medium and FM(VHF) wavebands and battery/mains operation is a typical example.



To take advantage of the high quality stereo broadcasting, which had been available for some time, good quality loudspeakers were required so the radio became a separate item as it was back in the 1930s but this time with two speakers. The Bang and Olufsen design icon **Beomaster 1200** was one of the first of this concept.



This was purchased by my brother in law in 1971 together with loudspeakers and a record deck.

Radio sets of the 1980s

The 1980s saw the wedding of Prince Charles and Diana, the Falklands war, the Chernobyl disaster, the murder of John Lennon and the introduction of the one pound coin. On the technology front, home computers such as the Sinclair ZX81, brick size mobile phones, microwave ovens, Sony Walkmans, and elementary games such as Pacman were on people's wish lists. The progress of computer technology and the inclusion of integrated circuits enabled radios to offer greatly enhanced functionality and versatility, Digital displays and push buttons became the more common features of radios of this era, as you can see from these examples.



Philips D2924 portable, microprocessor-controlled, frequency synthesised receiver LW, MW, SW 5950-15450 kHz AM, 87.5-108 MHz, FM (VHF). It has a digital display, a frequency keypad and 6 memories. Powered by 110 - 220 V AC mains or eight 1.5 V 'AA' cells. This set was purchased new in 1984 and cost £54.50 and is

still in regular use. It was first made in 1981.

This later more advanced radio, the **Sony** ICF-7600D, covered a wider frequency range (153 kHz to 26.100 MHz), continuous coverage of LW, MW and short-wave as well as FM 76 to 108 MHz. At the time of its introduction in 1987 it was the smallest digital receiver on the market.



Sonatel 'Touch-Me' model CR319 bedside transistor clock radio.

The radio and alarm functions can be operated by two touch sensor pads and it is mains operated. The receiver portion has one integrated circuit and three transistors. The clock section has six transistors and one integrated circuit. It was also marketed under the **Morphy Richards** brand,



Roberts R24 AM-FM portable model with push button wave change selection. It has 2 integrated circuits and 3 transistors. The 9 Volt battery was claimed to provide about 80 hours of listening for 4 hours a day at normal volume. This model, though keeping the Roberts design style, is considerably lighter than previous models. It was introduced in 1983.



The **Toshiba** KT-S1 is a stereo cassette player introduced in 1981 and was a top-end player in the style of a Sony Walkman. It is extremely well built with a robust metal chassis and cassette compartment. One interesting feature is that it comes with a tuner



module (in the shape of a cassette) that fits into the cassette compartment to provide radio reception. This was purchased new in 1982 and cost £59.99 including the radio tuner.

Radio sets of the 1990s

The 1990s saw the divorce of Prince Charles and Diana and then her death in 1997, as well as a change in government from that of John Major to that of Tony Blair. On the technology front, Photoshop, the photo editing application, was first marketed in 1990 and the Nokia mobile phone with text messaging came on the market in 1992. The internet in the shape of the World Wide Web started in 1993 and Yahoo and Google arrived a year or two later. DVDs to store software and video files came along in 1995. By the mid-90s email became widely available and by the end of the decade more messages were sent that way than by conventional post.

The BBC carried out its first digital audio broadcasting (DAB) for Radio 1, 2, 3, 4 and 5 in 1995 and by 1998 Classic FM, Talk Radio and Virgin Radio were also on air. Radios capable of receiving this new format were expensive and slow to come to market until several years later so the majority of the radios made in the 90s were little different to those of the 80s.

Morphy Richards model CR300 This bedside transistor radio uses three AA cells one of which solely powers the LCD alarm clock, unlike the mains operated 1980s equivalent, with an LED display.



Roberts 701A portable model with push button wave change selection introduced in 1993, using six R14 alkaline cells or a mains adapter. The batteries should provide about 80hrs of listening for 4 hours a day at normal volume. It covers the FM, MW and LW wavebands.



This model has 3 integrated circuits, an 8 ohm speaker and, as can be seen, apparently very little else.

This Roberts Revival R250 has a cabinet design based on the 1960 Roberts R200 model. Like the model 701 it uses three integrated circuits and covers the FM, MW and LW wavebands. The revival range was started with the Revival 200 in 1993; this model dates from some time after 1996.





This JVC Model CA-C550 stereo system with speakers, CD player, 6 disc changer, tape recorder and AM/FM radio is a typical 1990s design.

Radio sets of the 2000s

The start of the new millennium saw the completion of the Millennium Dome (now the O2 Arena) and as the decade continued there was the 9/11 attack on the twin towers in New York and then the wars in Iraq and Afghanistan. In 2000 on the technology front the Nokia 3310 was the 'must have' mobile phone with the Apple iPod coming out just a year later. By 2007 the first Apple iPhone was on the market.

As mentioned last month, digital audio broadcasting (DAB) was slow to take off as radios capable of receiving this new format were expensive and took a while to come to market. By 2000 there were a number of relatively affordable DAB radios available but many also included FM as this often provided a better quality sound. By the end of the decade the internet, computers and mobile phones were increasingly being used to listen to what we had been used to refer as radio broadcasts of news, music etc. The following examples show how the old technologies were trying to catch up with the new. Today, some would say a radio set is redundant; we can have any number of devices in the home which will obey your voiced commands, surf the internet, play any piece of music you desire and switch off lights etc.



The **Pure Evoke 1** which went on sale in 2001 was the first high volume, mains powered portable DAB radio that sold for under £100. It was, and indeed still is, the best selling DAB radio to date. With its stylish retro looks, the Evoke One still appears fresh and the build quality is a cut above most rivals with the casing veneered in real wood. As you'd expect from this best seller, the sound quality is excellent, with the small size being little hindrance to a large, expansive sound.

This **Ferguson FRG121** DAB/ FM clock/alarm radio from 2007 was designed to deliver excellent sound quality at budget prices. It was made in China but was prone to component failure and poor quality control. This one did not work properly when inherited but once repaired lived in our bedroom for over 15 years.



The **Roberts WM201** Wifi internet stereo radio and media player also dates from about 2007. Is this really a radio as we have been used to or a device which uses a broadband internet connection to enable you to listen to radio stations from around the world? It can receive more than 6000 radio stations (over 600 from the UK). You can also listen to previously broadcast material.

This **Teac SR-3DAB** stereo radio dating from 2009 sits

in our kitchen. It is full of features we never use! It has an iPod or iPhone dock, a CD player, a DAB/FM radio and a clock with dual alarm. You can plug in other portable audio devices and play MP3s from USB flash storage devices or SD cards. It has outputs for headphones TV or video monitor. The only problem is that Apple now use a different connector on their devices so one of its main

attractions cannot be used.



Our Ferguson bedside radio made in 2007 had given sterling service but the display had become unreadable. So in 2023 I decided to splash out and purchase a replacement, nothing too fancy but one to be able to receive digital broadcasts as well as FM.

This is the replacement at our bedside. It can store up to ten DAB and ten FM stations or stream music easily from a smart device with Bluetooth connectivity. It includes a 5 watt speaker dual alarms, sleep and snooze functions, all controlled by the button wheel on the top. However, it is rarely used today as one can listen to almost anything one might desire through a pocket device in the shape of a mobile phone.