Vintage Radio

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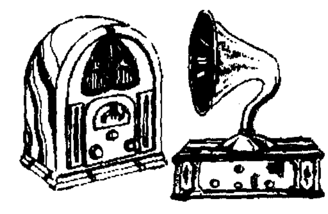


The value of vintage sets & components

This month I'm tackling a couple of topics with the intention of helping newer enthusiasts. One is how you judge the original prices of sets and components made long before Australia changed to decimal currency — were they cheap, or expensive? The other is valves: how to understand them, how to acquire them, sort and identify them.

Peter Lankshear, the late Neville Williams and other writers on vintage topics have sometimes alluded to the original price of equipment and components — which was the price of the item at that time in history. But quoting past prices and trying to relate them to today's values is a different matter.

Prior to decimal currency, Australia's currency was based on 'Sterling' the English currency, but ours had a different value from that of the UK. The elements of Sterling were pounds, shillings and pence, abbreviated as '£', 's' and 'd' respectively. (Why the letter 'd' to signify pence? It was an abbreviation of the Latin *denarius*, an ancient Roman coin of small value.)

The most common denominations were £10, £5 and £1 notes, and a 10-shilling note. The nickname for a pound was a 'quid' or, in rhyming slang, 'fiddley-did'. The silver coins were two shillings (two bob), a shilling (a bob or a dina), sixpence (zac) and threepence (trey bit); the copper coins ('coppers') were pennies and half-pennies (ha'pennies). There were 12 pence to the shilling, and 20 shillings to the pound. The pound, therefore, was 240 pence.

On 14th February 1966, Australia converted to decimal currency. The conversion eliminated the middle category of the former currency. Twelve pence became 10 cents, and one hundred cents, or the old 10-shilling note, became one dollar. The pound note became a two-dollar note. The fractional parts of the old shilling were converted accordingly to the nearest value of decimal coinage. Hence a five cent piece was equivalent to the old sixpence.

Why this lesson in numismatics? It is to relate to values, and hence purchasing power, rather than just comparing the prices of the 1920s, 1930s and 1940s to today's prices — when to the uninitiated they seem absurdly low.

Average earnings

Most readers will have heard the term 'average male weekly earnings'. The most current figure is now $693.00 per week, not including overtime (why is it that I'm missing out?). Does such a figure exist for past years? The answer is yes, of course, and examples of weekly wages are tabulated in Table 1 by courtesy of the National Institute of Labour Studies, Flinders University, Adelaide.

TABLE 1: Weekly Earnings

Year	Weighted Average	Engineering Industries	Women
1925	$9.47	$9.70	$4.97
1935	$8.22	$8.38	$4.35
1948	$14.62	$14.99	$9.38

Yes, wages went down in the early 1930s because the Government of the day reduced wages across the board by 10% to 20%, as a measure to combat the great depression. By about 1936, they were back to levels of a decade earlier. 1948 is an example of post war prosperity.

Keeping things relative

We can now see that a radio set advertised complete with valves, speaker and batteries, for £28 (which converts directly to $56) in 1925, represents about six weeks' wages — or, by comparison, $4100 in today's money! So in reality those early sets were incredibly *expensive*, when we consider what they were. Think of what $4000-odd will buy today in the way of electronics and home entertainment!

Radios of the 1930s were not only cheaper in comparison to the 1920s, but you got far more for your money.

So when prices are seen or quoted from yesteryear, keep in mind the conversion factors, and also relate the prices quoted in terms of weekly earnings at the time. Only then can the relative cost can be seen in a valid and realistic way.

Finding valves

The newcomer to vintage radio is often concerned about the availability of valves. Valves can usually be obtained via auction sales, swap meets and advertisements conducted by the Wireless Institute of Australia or the Historical Radio Society of Australia for the benefit of members. Equivalent overseas societies no doubt hold similar sales.

The valves can often be purchased by the sugarbag or shoe carton, for sometimes very modest amounts. But the catch is that valves purchased in this way are sight unseen, or pot luck. They may well not be worth even the modest sum you pay for them.

It's important to know more about valves, in order to be able to make more informed decisions and purchases.

Let's look first at valve numbering systems. What do those numbers mean? Can you tell what a valve is by the number? A leprechaun might well answer "Well now, it 'tis and it 'tisn't!"

With any luck, the number will be intact somewhere on the glass envelope, usually about half way down from the shoulder to the base. If it not easily visible, it needs to be identified.

By the way, resist all temptation to clean the valve with detergent and a cloth or paper towel. This can

remove all trace of the original identification markings!

To identify the older style valves with very faint numbers you often need a cool morning and a bottle of methylated spirit-based glass cleaner such as 'Windex'. Spray a fine mist of the glass cleaner around the valve and then breathe on it. The combination of cold glass, hot moist breath and the glass cleaner will make the number momentarily appear! If at first you don't succeed, try again on a different part of the envelope. Having identified it, I write the number on the base with a felt tipped pen.

The American system

The very early American made valves had a numbering system that composed of firstly, two letters which were either 'UV', 'UX' or 'UY', followed by three digits. The letters defined the base. UV was for the small four-pin base, UX the standard four-pin base like that used for the type 80 rectifier, and UY is for the standard five-pin base.

The first of the three digits identified the manufacturer. For example, '2' was for RCA made valves and '3' was for valves made by Cunningham. The second and third digits actually defined the valve itself!

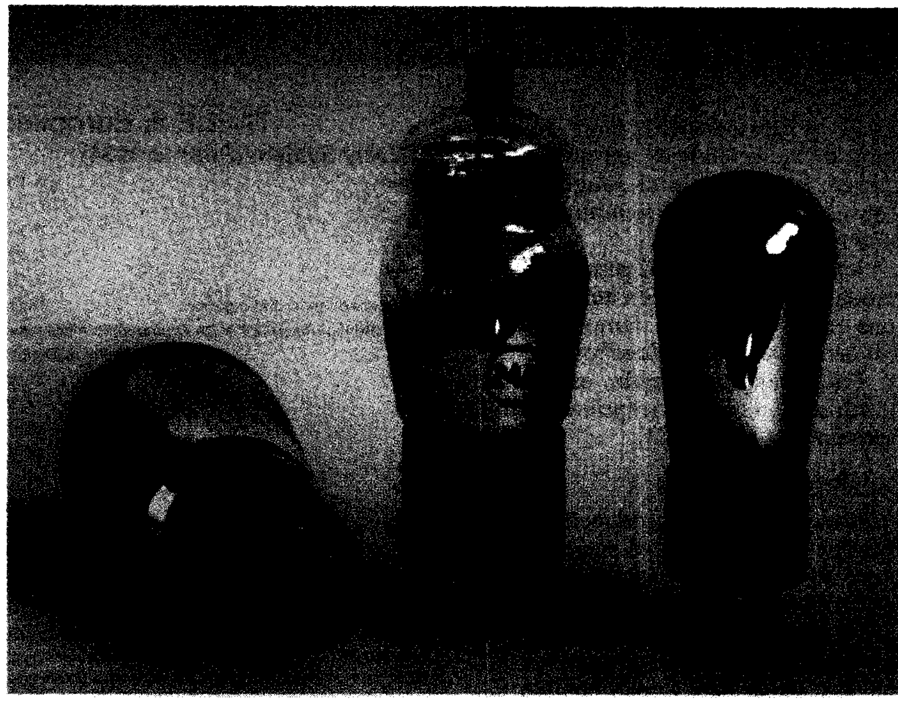
Eventually, in about 1933, all of the preamble was scrapped from the numbering system such that only the last two digits appeared as the type. For example, what had been a 'UY 235' merely became a type '35', and a '327' became a type '27' and so on.

With the later, i.e., post-1934 'American' system, the first figure indicates the heater or filament voltage. So '1' is for 1.4 volt or 2.0 volt battery valves, '2' is for 2.5 volt AC types, '6' is for 6.3V AC types and so on. The second identifier is a characteristic letter (i.e., the particular type), and the last identifier refers to the number of elements within the valve. The heater is considered as one element only, with the cathode regarded as a separate element. With octal based glass valves, the last letter(s) 'G' or 'GT' refer to the size of the bulb.

However, as more valves were released, there were many exceptions to the rule, and the American system gives absolutely no indication of the type of valve or the use to which it may be put.

The European system

The European, or sometimes called 'Philips' system, is more organised. The first letter indicates the filament/heater voltage, the next one or two characteristic letter identifiers define the actual type of valve that it is, the next one or two numbers determine the construction and base, and also the variant of the valve type, as defined by the identifying letters. This nomenclature was for valves from 1935 onwards.



Three relatively early American valves. On the right is a type 30 battery triode with a 'UX' type four-pin base, while in the centre is a type 24A indirectly heated 2.5V RF tetrode and at left a type 47 directly heated 2.5V output pentode — both using the 'G' envelope with a five-pin base.

The early European system was different again. Many enthusiasts are familiar with the Philips four-pin triodes, such as A 415. Here the letter indicated the filament current. The last two digits indicated the amplification factor in the case of a triode, and the first, (or in the case of a four-digit number, the first two, digits) indicated the filament voltage. Hence, an A 415 is a 4.0 volt type with an amplification factor of 15.

In the case of a multigrid type, the last two figures indicated the classification. This numbering system held good for many of the Philips 'gold series' valves, and the identifying numbers and letters are tabulated elsewhere.

In the pre-war years, there were a plethora of British valve manufacturers — all of whom had a particular numbering system devoid of both rhyme and reason. Indeed, there are cases where a valve might have been given the same number by two different manufacturers, and the valves are totally different!

In order to become familiar with a valve, and to be able to test it and to determine if it is working within specification, you will need to know something about how a valve works, and also the characteristic data.

The *Philips Miniwatt Technical Data* book (7th edition) — often called the 'Philips valve data book' — or the *RCA Receiving Tube Manual* are both very good reference books. Both books, where applicable, give direct equivalents to different versions of the same valve (yet another story in itself!).

Characteristic curves

The RCA manual has the distinct advantage that it publishes characteristic curves for the types currently in production as at the time of printing, but is limited to valves made only by the RCA company. The best versions to get for the RCA manual are around about editions 14 - 18. The RCA manual also has an excellent technical section explaining what characteristics and their curves mean, and how to use and interpret the information.

The 'Philips' data book has, with consent, been re-printed and is available to members of the Historical Radio Society of Australia. The RCA book can sometimes be obtained at swapmeets and the like. Of the two books, the RCA manual contains more information about a given valve, but it is harder to acquire.

There are other books which will become known to the newcomer as he or she progresses with their hobby. Some of the references are quite specialised, are scarce and sought after, such as Babini's *International Radio Tube Encyclopedia*.

A very good source of general information on valve operation and applications is of course the famous AWV *Radiotron Designers Handbook* edited by Fritz Langford-Smith, especially the 4th edition of 1952 (reprinted many times until at least 1963).

Equivalent types

Some valves were produced with a different filament voltage and/or a different base. It is beyond the scope of this article to tabulate or give by way of example what valves had octal-based equivalents and what valves did not. The valve data books contain all that information, and many old hands have also committed it to memory.

Fortunately, most of the radios and equipment produced in this country used valves with either the American pre-octal bases or octal bases. Reference was made earlier to 'Philips four-pin triodes'. Valves with the 'Philips' label were made for export only, and the triodes and other valves of the early 1930's mainly had American, and not European type bases.

European bases were generally asymmetric arrangements of common diameter pins, and look quite different to the American bases. They are easily recognisable.

Summary

In summary, the newcomer is most likely to find fairly easily the valves that conform to, and were used by the radios that were made in Australia. That is, pre-octal and octal valves of the common varieties, both 'European' and 'American' types. The foregoing is but one paragraph of the introductory chapter of the story of valves, and includes generalisations for which no apology is offered.

Testing, repairing and determining substitutes for hard to get types will be the subject of future articles and will require a little understanding and knowledge of valves on the part of the reader. No mention of British manufacturers, valves with British bases and military valves has been made, and these will have to wait for another time. ❖

TABLE 2: European Valve Nomenclature

1. Early System (Prior to 1934)

Letter:	A Filament current of 60 - 100mA
	C Filament current of 200 - 400mA
	D Filament current of 400 - 700mA
	E Filament current of 700 - 1250mA
	F Filament current of 1.25A and over
1st Figure or 1st & 2nd Figures:	Filament or heater voltage (nominal)
2nd & 3rd Figures or 3rd & 4th Figures:	(i) For triode valves, amplification factor for published operating conditions
	(ii) For multi-grid valves —
	41, 51, 61, etc.: Tetrodes with space charge grid
	42, 52, 62, etc.: Radio frequency tetrodes
	43, 53, 63, etc.: Output pentodes
	44, 54, 64, etc.: Diode triodes, diode tetrodes
	45, 55, 65, etc.: Remote cutoff RF tetrodes
	46, 56, 66, etc.: RF pentodes
	47, 57, 67, etc.: Remote cutoff RF pentodes
	48, 58, 68, etc.: Hexode mixers
	49, 59, 69, etc.: Remote cutoff hexode mixers

2. Later System (after 1934)

The later system used a number of capital letters followed by either one or two figures (e.g., EBC3, EL33). The first letter indicates the filament or heater rating, whilst the remaining letters give the type classification. The figures indicate both individual type identification and the valve base and/or type valve construction used. In some cases a letter suffix is used to indicate a minor constructional or characteristic change (e.g. EL33 - EL33A). The key to this system is given below:

1st Letter (Filament/Heater Ratings)	A 4V AC type
	B 180mA DC type
	C 200mA AC/DC type
	D Battery types up to 1.4V DC
	E 6.3V AC type
	F 13V car radio type
	G 5V AC type
	K 2V battery type
	P 300mA AC/DC type
	U 100mA AC/DC type
	V 50mA AC/DC type
2nd & Subsequent Letters (Type Classification)	A Single diode
	B Double diode
	C Triodes, except output triodes
	D Output triode
	E Tetrode
	F Pentodes, except output pentodes
	H Hexode or heptode
	K Octode
	L Output pentode
	M Tuning indicator
	P Secondary emission valve
	W Half wave gas-filled rectifier
	X Full wave gas-filled rectifier
	Y Half wave high-vacuum rectifier
	Z Full wave high-vacuum rectifier
Number Sequence	1-10 Pinch type construction valves fitted with European 5-pin (V base) or 8-pin (P base) side contact bases, or international octal bases with European basing connection sequence.
	11-19 European type metal valves and glass valves fitted with European metal bases.
	20-29 All-glass valves fitted with 8-pin Loktal type American bases.
	30-39 Pinch type construction valves fitted wth International octal bases with American basing connection sequence.
	40-49 All-glass miniature valves fitted with 8-pin Rimlock base.
	50-59 Special construction types fitted with bases applicable to design features used.
	60-61 All-glass valves fitted with 9-pin base.
	65-79 Sub-miniature all-glass valves with or without bases.
	80-89 All-glass miniature valves fitted with 9-pin American 'Noval' type base.
	90-99 All-glass miniature valves fitted with 7-pin American 'Button' type base.

Exceptions to the above

(a) DAC21, DF21, DF22, DK21, DL21, DLL21 were of pinch type construction fitted with international octal bases with European base connection sequence.

(b) ECH3G, ECH4G, EK2G, EK2G/GT, EL3G, EL3NG, KF3G, KK2G, KL4G were of pinch type construction fitted with international octal bases with American base connection sequence.

(c) KK2 (Cap E) was of pinch-type construction fitted with a medium 7-pin American base.

(d) EBF2G, EBF2GT/G, EBF35 were of pinch-type construction fitted with international octal bases with European base connection sequence.