

The RCA Electron Tube Handbook HB-3 on CD

1. The sources.

This project started with two well treated RCA Handbooks and a large stack (about six inches high) of obsolete pages, all from one source.

The contents of the two handbooks were very similar. The many obsolete pages offered a lot of tube types no longer available in the regular set of binders.

Some time later, two more handbooks became available. From these, extra tube types could be added to the existing database. These two handbooks were quite different in their contents.

A limited number of tube types was added from a fifth (incomplete) handbook, although, from these binders came an additional 80 extra picture tube types also.

It is my belief that each HB-3 now available has its own history. None of them is identical to another. Even after handling more than four handbooks, plus a pile of obsolete pages, I have to conclude that this CD is not complete in its coverage. Despite that, it offers a lot more information than any single handbook HB-3.

The oldest pages are dated 1935, 1937. These give the two digit types like 00-A (a vapor tube), the type 10, 32, 40, etc.

The latest pages are dated 1971 and 1972. These recent data appear in several sections, like Receiving, Transmitting, or Photosensitive Devices.

2. Data presentation.

Data on this CD are presented in much the same way as in the original handbook.

Tube data are contained in sections (folders on the CD) such as, Cathode-Ray tubes, Receiving tubes, Transmitting tubes, etc.

The General section offers data applicable to all sections of the handbook.

Most important of these are envelope drawings, base- and cap-drawings.

Also in the General section is the document "Tube Ratings". It dates from 1943, but was still applicable in 1963.

The original handbook contains a section Receiving and a section Industrial Receiving. This separation could not be reconstructed (lack of data) and is therefore omitted. Only one section Receiving is implemented, containing both commercial and industrial tube types.

As in the original handbook, each section has a 'Front' chapter (folder on the CD).

Many tube data sheets refer to information '... at the front of this section'. I have not checked all, but most of these references are contained in the Front chapters on this CD. See under 5. 'The use of this CD' for more details.

Individual data sheets are combined to data-sets, a set for each tube type. Such a set is presented as a .PDF file, ranging in size from one page to over 20 pages.

(In the unlikely event that your computer has no .PDF reader go to the Adobe website to obtain a free download.)

A file-name consists of the tube type, followed by a space and the year of release of the particular data-set, as indicated at the bottom end of the first page.

For some tubes two data-sets are available. Precise criteria whether a tube type has one or two data-sets cannot be given. The most obvious one is, that two complete

sets had to be available. As a general rule the most recent one is adopted, but if there is a long time lapse between the two, both have been added. (See for instance the Multiplier Phototube 931-A. One set is dated 1948 and has nice schematics, the recent one is dated 1969.)

Another reason might be that a recent data sheet is shortened in order to save space.

Again, like the original handbook, within each section, data-sets have been put in numerical-alpha-numerical order.

No attempt has been made to make separate folders for Rectifiers, Power tubes, etc. As a result, Voltage Regulators are found between Thyratrons and Ignitrons.

Sorry, but that is the way it was.

For a more speedy look-up, a number of folders have been created, each one containing some 60 tube types. In a few cases about 90 types are contained.

In case you don't like the folder structure on the CD, you might create your own.

This is an advantage of not adding any sophisticated links from a table to a data set.

Please accept, this can only be done on the hard disk of your own computer, for your own use. (OK, you knew that already).

3. General Index.

An 'Index of Tube types' (for all sections) has been made. It resides next to this file in the same folder.

Any original index could not be used, because this CD contains much more tube types than any existing 'State-of-the-Art' HB-3.

It is strongly recommended to use this Index.

It offers not only the section where to find a particular tube, it also gives the number of pages in a file. The meaning of the letters 'T' and 'R' behind the year of issue is explained there too.

The last page of the Index offers some statistical information about the CD contents.

4. Observations made.

Some historical developments of the original data sheets.

- On top of the early data sheets a combined 'RCA - Radiotron / Cunningham' logo was printed. It was replaced in 1938 by the well known circular RCA logo only.
- The characteristic page layout with the tube type at the top corner turned through 45° was in use until 1960. The thin-line rectangle around the contents was replaced by two bars, close to the top and bottom of each page, the bold printed tube type on top.
- Around 1968 a minor change was implemented. The circular RCA logo at the bottom end of the page was replaced by the 'open three letter' logo.
- Nomenclature was changed around 1958. Kinescope became Picture Tube, a Super-Control Pentode was changed in Remote-Cutoff, etc.
Multiplier Phototube became Photomultiplier. I doubt if this was an improvement.
The new name suggests multiplication of photons, which is not the case.

Observations with regard to the scanning process.

Printing errors are hardly noticeable on the original data sheet but when scanned, the printing sometimes appeared to be rotated, skewed or barrel distorted.

On a computer screen some of these errors become irritating. Optimizing image quality has been a major effort during this project. Most graphs have been scanned many times, rotating them on the scanner glass until the desired quality was obtained. Although time consuming, it took several attempts to determine that this was the most effective way for an optimum end result.

5. The use of this CD.

Put the CD in the CD-DVD reader of your computer.

Start your PDF reader, or activate it, by clicking one of the PDF files.

Open the 'Index of Tube Types' in the folder '0 Index and ReadMe' and locate the section where the tube of interest is to be found.

If the tube type is not contained in the Index, you will not find it on the CD.

More experienced users might go straight to the particular section. Bear in mind, that a few tube types reside in an unexpected section.

Don't forget to browse the Front chapters/folders.

They contain a lot of general information.

Some documents are 'dated'. I mean, they reflect the status at their date of issue.

I have tried to overcome this a little, for instance to add more than one Application Guide, as far apart in time as possible. For that same reason there are two 'Resistance-Coupled Amplifier' documents in the Receiving Front chapter.

6. Printing data.

The standard page size is 136 x 257 mm (about 5.5 x 10 Inches) at 300 dpi.

Only a few documents in some Front chapters are twice that size (folded originals).

The Adobe Acrobat Reader offers the flexibility of printing one or more pages on a sheet. I would recommend to make a couple of prints on a good quality printer.

Such prints offer a superior quality to that obtained on a monitor.

7. Acknowledgement.

This project was started to make the RCA tube data easily available for many people interested in the history of electronics and electron tubes especially.

My sincere thanks go to the thousands of RCA employees who worked on tube design, tube production and marketing. Millions of reliable electron tubes became available through their combined and continuing effort.

This CD is meant to pay homage to all these individuals.

Wishing you much pleasure in using this Digital RCA Handbook HB-3,

Adri de Keijzer
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Without the unlimited patience of my wife Anja this project would have never been completed.