ELEKTORACADEMYPRO

Tube Amplifier Circuits

From SRPP and Mu-Follower to OTL Designs

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Preface

In 2004 Elektor published my first book:
'Theorie en Praktijk van Buizenversterkers'.

The book was a success and soon it was translated into French and into German.
'Théorie & pratique des amplificateurs audio à tubes' was the French title.
The German name was 'Theorie und Praxis des Röhrenverstärkers'.

I wrote the book because in those days knowledge on tubes was not easily available.

In a German Elektuur book 'Audio en HiFi-buizen', the author Rainer zur Linde described an SRPP driver invented by K. Anzai in 1969. I asked myself why such an SRPP would be better than a classic anode resistance amplifier.
I started doing calculations on the design.
It was wrong. I found out about the most infamous mistake (the cathode elco).
I got interested and later on I learned that the design had three of the errors mentioned in this SRPP book in it.
Although the design was wrong, the idea was inspiring. I did research and one of the designs in my first book had such an SRRP but now without the errors.

In the following years I did more research on SRPPs but also on mu-followers and OTLs.

In 2009 Elektor published my second book on these matters.
It was immediately translated into German.

Today Elektor and I still get requests for a reprint. The books are out of stock. Elektor decided no to do another reprint but instead to translate the book into English thus reaching a much larger readers community.

The result is this book. It has been revised a bit. The Dutch version contained a few little errors and my knowledge has grown in the past years.
I consider this version to be much better than the Dutch and the German ones.
It is consequent in style and much more accurate in the details.

I want to thank Jan Didden who inspired Elektor and me to accept the translation and the publishing job. I got in contact with him and he made me publish the article ‘Myths in Tube Circuit Design’ in the audioxpress magazine in May 2023.

I thank Menno van der Veen for his inspiring words and friendship during the past many years.

I thank Elektor’s Patrick Wielders for having transformed the manuscript into a good looking book.

Introduction

Tube amplifiers suffer from distortion.
Fortunately, there exist SRPP amplifiers, μ-followers, β-followers etcetera.
All these produce a minimal distortion even with output voltages of 50 to 100 V_t.

Often these designs are published with errors in them.
It shows to be easy to make a wrong design when we do not have a good understanding of the theory.

In the first section of this book we investigate the origin of the distortion and after that the design of an SRPP and of a μ-follower.

On the internet we can find the most exotic designs. Evaluating them teaches us that these designs often make things worse than they are by nature. In the chapter on wrong SRPPs and μ-followers we sometimes see bizarre but also misplaced designs where a simple, one triode amplifier would perform much better.

There exist push-pull end stages. These are investigated and the similarity with the SRPP are looked at. This is done especially with the theory behind the OTL based on the 'mother' of all OTLs, the Philips HF303.

Finally attention is given to the frequency characteristics and technical matters like the supply voltage and the power supply of the filaments.

In order to illustrate things there are a few designs that describe the discussed subjects.

This book describes much new theory that has not been published before. Often it is an eye opener as it shows that most things have a beautiful and unexpected simplicity.