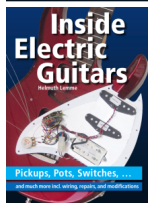
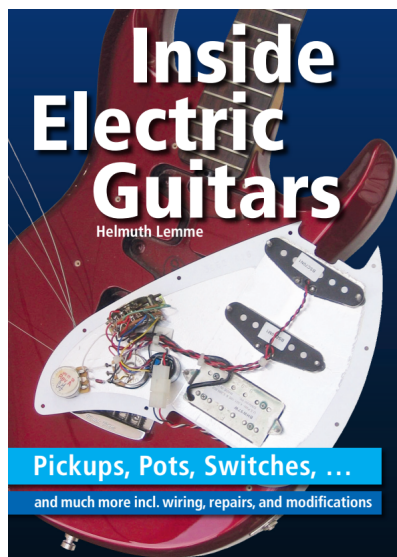


Inside Electric Guitars - Helmuth Lemme (eBook)



Pickups, Pots, Switches, ... and much more incl. wiring, repairs, and modifications

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Preface:

Looking for creative, independent minds

To play the electric guitar or bass - what a fascinating passion of our times that can be. That soaring feeling when just the small movement of a finger makes the sound thunder through the concert hall and lets the audience go crazy. And it's not only the auditory event that elicits the flow of adrenalin – already the sight of the instrument delights the connoisseur und stirs the blood. Guitars have become cult objects.

Of course, every player seeks to get the best sound possible. How can this desire be met? Buy an instrument as expensive as possible, the retailer will say ... which is not a problem if you have access to that well endowed bank account. However, in particular musicians are often not that well off. They will scrimp and save their very last penny to be able to afford the "axe" of their dreams. Does it indeed have to be that way? Wouldn't something less expensive do? Couldn't we maybe upgrade a midrange instrument in some clever way?

The answer is: that's not always possibly but it's in fact often the case. Rather than prematurely spend a lot of money, it is more purposeful to first invest in know-how. Many run-of-the-mill guitars can still be spiced up significantly without that process costing an arm and a leg. Most of these guitars are holding back more tone than is recognizable when first listening to them.

Good sound can be traced back to a number of sources. First come – obviously – the strings. Then there are pickups, electric components, cables, hardware (in particular the mechanical design of bridge, frets, tailpiece and tuners), and workmanship. Over the years, books and other instruction material has become abundantly available – written and posted by often highly experienced luthiers who frequently create true pieces of art from precious timber. If for a moment we do not consider the endless stream of Fender and Gibson plagiarisms, many of the above contributors have come up with a significant amount of ideas relating to shapes and designs. To begin with, writing about this and communicating it is a good thing. High-class workmanship indeed is the basis for a great sound. Still, all those marvellous photos published in those coffee-table books and posted on the websites generally only show the exterior of the instruments. Rarely do we find a behind-the-scenes look, let alone truly competent reports in that direction.

Without doubt there are a lot of good intentions – however, most of these expert "wood-workers" fail to have any deeper knowledge with respect to the electrical side of the equation. Typically, in their writing they copy from one another; rarely will anybody carry out their own systematic experiments. It appears that amongst 100 luthiers/instrument builders, 90 or more seem not have been able to build any real relationship to electricity. Thus they do not form a big-time source for new ideas regarding this field. On more than a few occasions the result is an amateurish "all show and no substance". The controls fail to satisfactorily meet the requirements, and the possibilities with regard to sound are far from being fully exhausted. Additionally, the sound is subject to interference in many cases. On the other side, the players have settled for the inadequacies and frequently do not even think about them anymore. In fact, they demand much too low standards. We still find too many thinking barriers that we wouldn't need to have in this area we. Much could be done in a better way. Despite the abundance of information on electric guitars and basses, truly useful technical support is hard to find.

So, for these reasons – and for a change – it is the electrical engineer who will speak out in the present book. The intention is to close the still existing knowledge gaps – so many erroneous opinions continue to wander about within the scene. Much needs to be set straight. This book is not meant to be in competition to the others as mentioned above, but a purposeful supplement.

Thus, our main theme here will be the electrical part of the instruments: pickups, controls, switches, etc. The circuits of the most well-known instruments are presented – including a discussion of their advantages and disadvantages, and in many cases also possibilities for modifications are laid out. The latter are not meant to be introduced in cookbook fashion but should be taken as a stimulus for independent experimentation. Once the principles have been understood, creativity can be allowed to run free.

This is not widely known: most instruments allow for much more variations in sound than has been foreseen ex-factory – if we do not remain glued to the original configuration. The latter is certainly not under "protection due to history". Many guitar builders of the 1950's had little insights into electronics; many technical avenues were not explored. Conversely, the functioning of pickups and circuits is very well understood today, and it would be an unnecessary restriction to continue to unreflectingly adopt wiring approaches about as old as a Model T Ford. Often it is highly advantageous to modify specific details, the result being better sound, more variety, more comfortable control, and less interference. Plus: this might not even be expensive at all.

The opinions presented here do not always correspond to what is the prevalent opinion in the musical scene. Some insights could even be seen as heresy – but then they are based on 40+ years of practical experience. Advertising and marketing do like to try to switch off the customers (in this case: the musicians) common sense in order to increase turnover. It is high time to re-deploy that common sense so that some lively and healthy discussion may ensue. I myself have suffered long enough from that "electric guitar fever"-illness but in the end could recover. My critical intellect did return.

My internet page "www.gitarrenelektronik.de", and my previous books would have never seen the light of day had I not very precisely scrutinized the electrical inner workings of a large number of electrical guitars and basses over a period of now more than 4 decades. In many of those instruments, defects had to be repaired. For others, the owners requested improvement of the sound, or a more user-friendly control layout. Many more instruments I could get on loan from music shops or acquaintances for a few days in order to study them in detail. Represented were the most diverse quality categories, from the shoddiest to the most exquisite guitars and basses. I could extensively play them all and examine them all, and for many I have established electrical measurements - leading over time to a mountain of experience and knowledge. I do not want to keep this to myself but seek to make it available to the public – as a repository as much for private DIY'ers as for professional repair experts.

In any case I wish you lots of success with modifications and repairs inspired and encouraged by this book!

Special thanks to Tilmann Zwicker for the translation from German into English.

HELMUTH LEMME