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	Department: **Elektronische und Technische Informatik** Educational focus: **Wireless- & Embedded Systems**

DIPLOMA THESIS
DOCUMENTATION

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Topic	Active Bluetooth-Speaker
Co-operation Partners	-

Assignment of Tasks	A 2.1 speaker system should be developed. The input signal comes either from a Bluetooth connection or a phone connector. The circuits for the amplifiers and the audio crossovers are developed by us, except for the subwoofer amplifier. The system is portable due to an integrated accumulator, which is charged by a switched-mode power supply. With the external power supply, a higher power level should be possible. The volumes of the cases should be adapted to the speakers.

Realisation	The amplifiers are realised with the Hi-Fi-Amplifier TDA2030. Various circuits including additional transistors or a bridge-circuit are used. The audio crossovers include active Butterworth-Filters of the 2nd order, implemented with operational amplifiers. The supply of the amplifiers can be switched with a relay from the accumulator to the switched-mode power supply. Both inputs are added to one signal with an adding circuit. To find the optimal volumes for the speakers, several measurements must be made.

Results	Functioning components: • Amplifier and audio crossover circuits • Supply, including the switched-mode power supply • Bluetooth and phone connector inputs • Speaker boxes for subwoofer and satellite speakers (Tweeters & Woofers)

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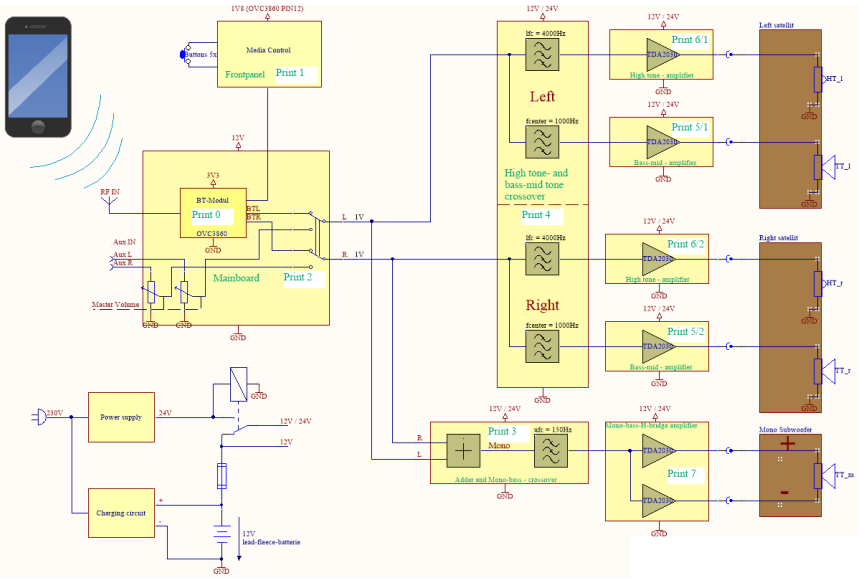
Illustrative Graph, Photo (incl. explanation)	 The stereo signal is generated in the Bluetooth-Mainboard. It gets split up in the audio crossovers (for tweeters, woofers and the subwoofer). The signal gets converted to a mono signal for the subwoofer. After the amplifiers, the signal is played on the speakers. The accumulator is charged by the internal charger. The electronics are supplied by 12 V. However, the amplifiers can be supplied with 24 V when the system is plugged into a socket.

Participation in Competitions Awards	-

Accessibility of Diploma Thesis	HTBLuVA St. Pölten, Waldstraße 3, 3100 St. Pölten

Approval (Date / Signature)	Examiner	Head of College/Department