



Supporting A' level Electronics

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Questions

- What is A' level electronics?
- Why support A' level electronics?
- How can A' level electronics be supported?



A' level changes

- All A' levels are changing, new A' levels in all subjects this year
- First year of A' level called "AS" examined from Summer 2009 (grades A - E)
- Second year called "A2" from examined from summer 2010 (grades A* - E)
- Students can stop at end of first year



Electronics A' level

- Common core of content determined by QCA
- Three out of the four Awarding Bodies (exam boards) offer A' levels Electronics
- All three have similar content beyond QCA core



AS Electronics subject criteria

- Logic including Boolean algebra
- LDR and thermistor as inputs with graphs
- Diodes including LEDs and zeners
- Transistors as switches
- Op-amp as comparator and amplifier
- Monostable and astable
- Sequential logic with timing diagrams, ripple counters



A2 Electronics subject criteria

- Microprocessor systems
 - Description
 - Interrupts
 - Application
- ADC and DAC
- Communications theory
 - Bandwidth and data rate
 - Multiplexing (TDM or FDM)
 - Noise and distortion
 - Schmitt trigger as regenerator for digital
- Radio
 - Spectrum
 - modulation technique
- Radio receiver
 - Simple receiver block diagram
 - Sensitivity and selectivity
 - Superhet block diagram



Practical work

- Students should have plenty of practical experience through A' level course (circuits built on breadboards)
- Testing, building, programming coursework in each year (~30%)
- All students specify, design, build and test their own project in A2 year (about 6 weeks work)



Microcontrollers

- Students will have practical experience of microcontrollers
- Microcontroller circuits built on breadboards
- Students will have programmed in assembly
- Programming likely to be in manufacturer's IDE (MPLAB or AVR studio)



Further information

- QCA subject criteria:
http://www.qca.org.uk/libraryAssets/media/qca-06-2864_science.pdf
- AQA
http://www.aqa.org.uk/qual/gce/electronics_new.php
- OCR
http://www.ocr.org.uk/qualifications/asa_levelgceforfirstteachingin2008/electronics/index.html
- WJEC
<http://www.wjec.co.uk/uploads/publications/1669.pdf>



Numbers

- About 3000 AS students per year
- About 1500 A2 students per year
- Minority of schools and colleges offer A' level electronics ($\ll 10\%$)
- Often just one teacher per school/college



Destinations

- Where do these students go?
- We think a lot go to electronic engineering
- Admissions tutors would know
Can we collect this information?



Students

- Have already chosen to do electronics (sometimes travelling some distance to study)
- Know what electronics is about
- Have learnt a reasonable amount of electronics
- May not understand the mathematical demands of a degree
- May not be studying A' level maths
- May expect to do a lot of practical work



Teachers

- Often just one teacher in school/college
- Teachers often not specialists
- May be isolated from other electronics teachers



Possible support needs

- Physical resources
- Training
- Technical advice
- Progression advice
- Interviews
- Visits
- Industrial links
- Meeting other teachers



Discussion
