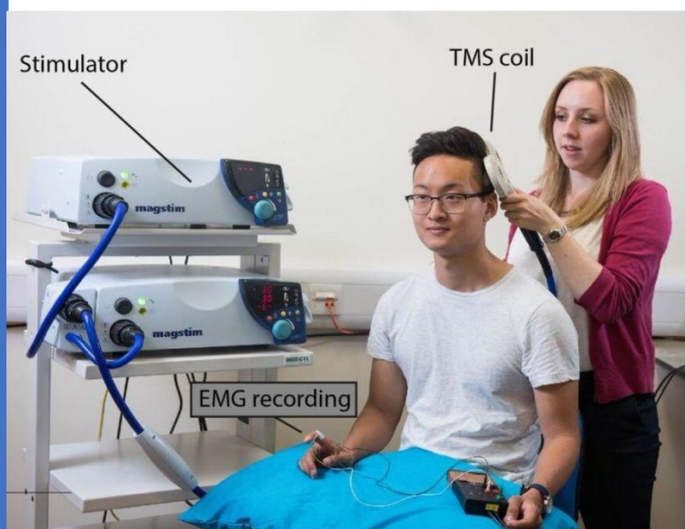


Major Project Presentation 2

by Michael Lewis

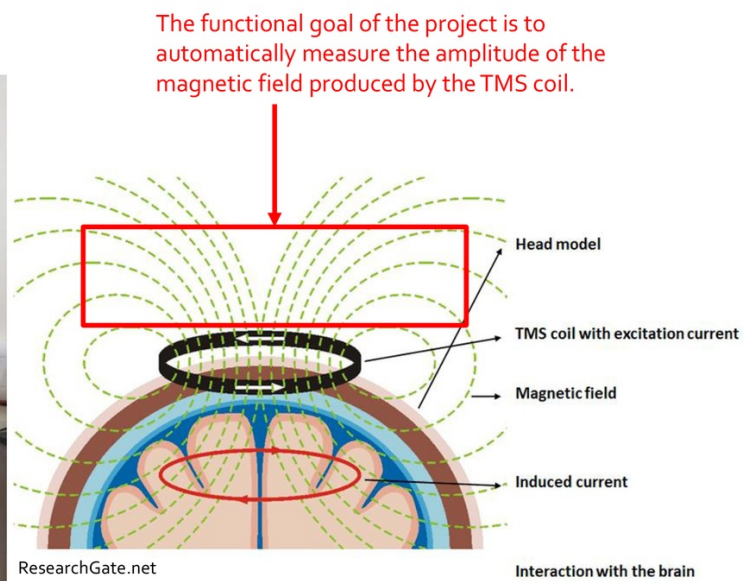
FILE	5293_MICHAEL_LEWIS_MAJOR_PROJECT_PRESENTATION_2_165701_1617460836.PDF (855.17K)		
TIME SUBMITTED	10-MAY-2019 03:06PM (UTC+0100)	WORD COUNT	238
SUBMISSION ID	106921896	CHARACTER COUNT	1293

Introduction



<https://www.ohba.ox.ac.uk/>

Example of TMS coil and stimulator being used to stimulate the brain



The effect the magnetic field from the TMS coil has on the brain

FDS

The FDS is what the machine tests are based on

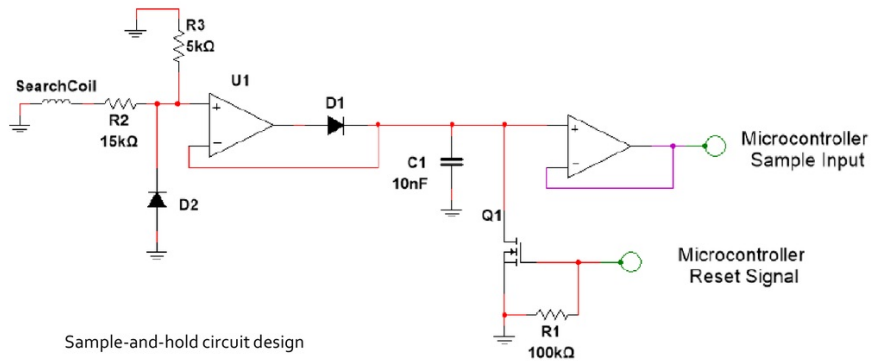
10 criteria set out in the FDS

The final product will pass if the machine meets all FDS requirements

Technical requirements

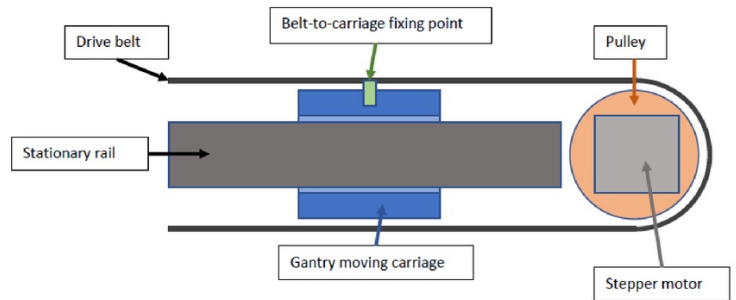
1. Supply voltage: 240VAC single phase
2. Motor rating 12-24V, 50W each
3. Overall power consumption must not exceed 1KVA
4. IP rating – IP44

Design details

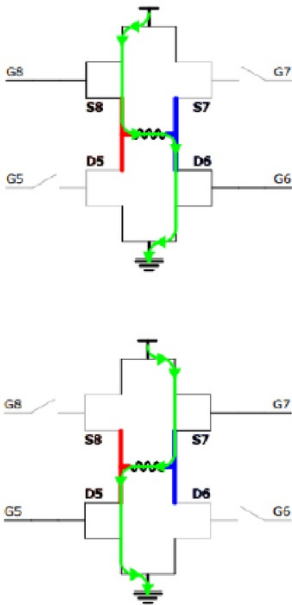
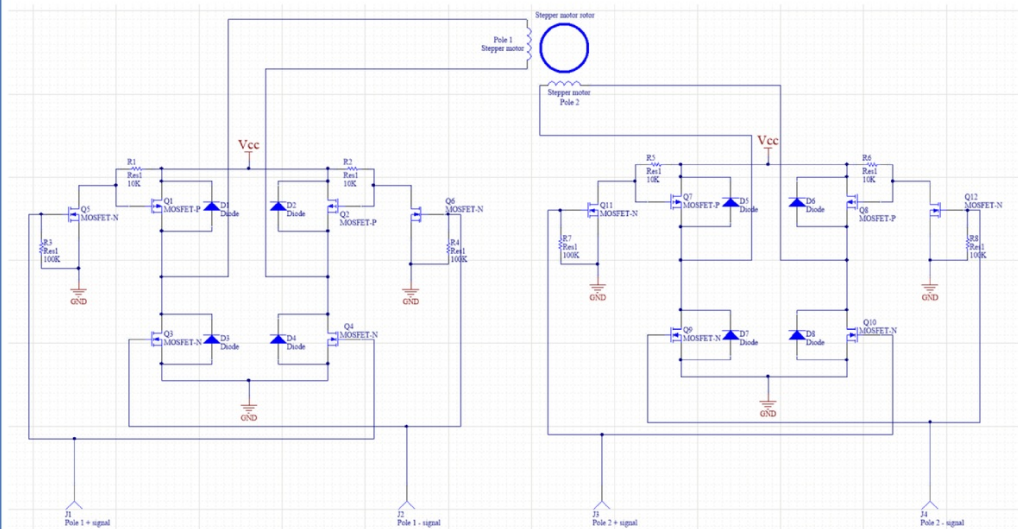


```
A)Manual Control
B)Semi-Auto Control
C)Auto Control
D)Monitor System
E)Home
F)Service Menu
```

Main menu design

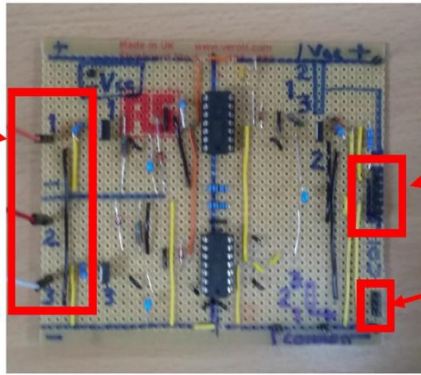


Design details continued



Construction phase

Capacitor-dump
terminals

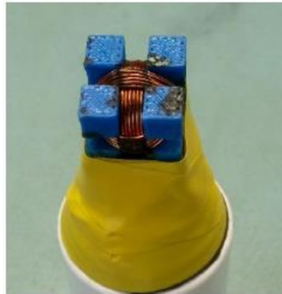


Sample-and-hold circuit implementation

Search coil
input terminals

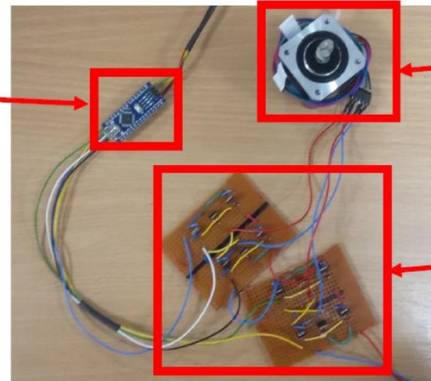
ADC input to
Microcontroller

Microcontroller



3-Axis search coil implementation

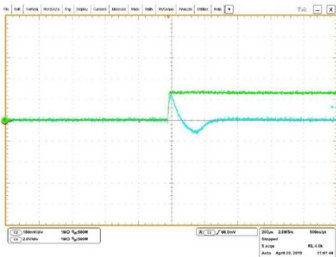
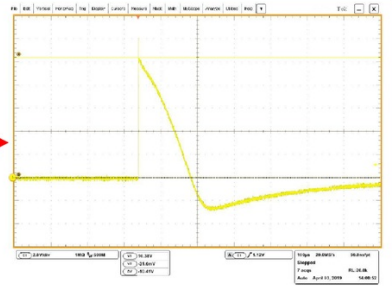
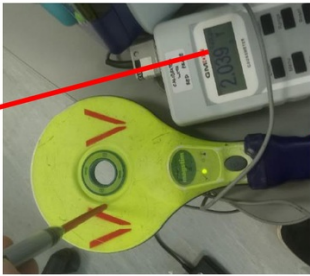
Motor driver implementation



Stepper motor

Stepper motor
driver

Testing the solution



Critical evaluation

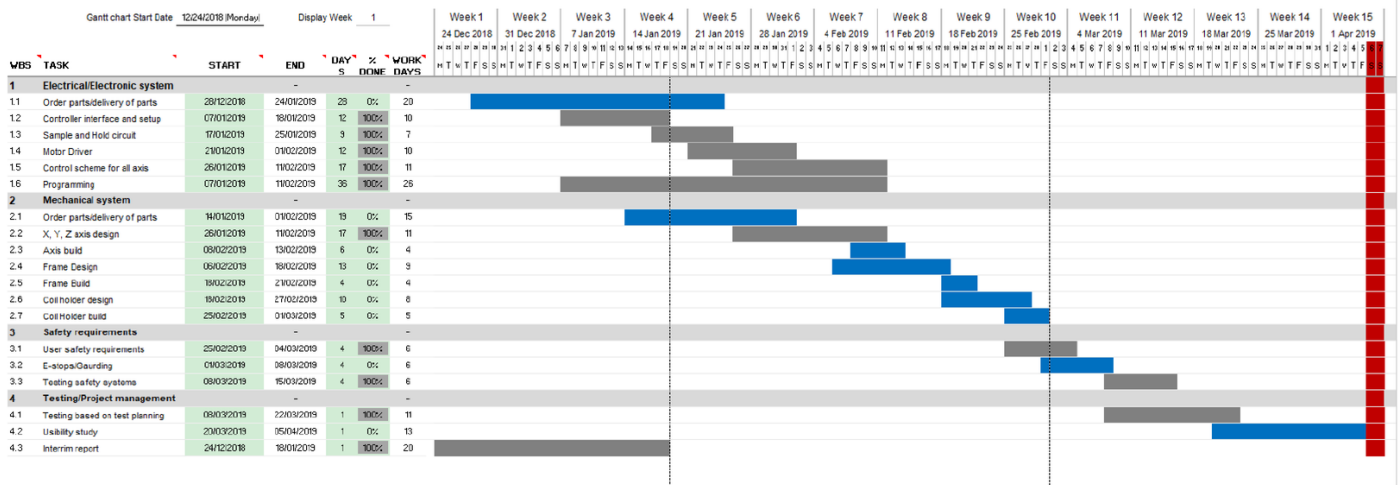
Tests created from initial FDS

3/10 tests passed
7/10 tests failed

Overall the Project fails to meet the initial FDS

**Steps have been taken to build parts of the design to show
that the chosen solution is viable to upper management**

Management Techniques and Planning



Conclusion and Recommendations

More time was needed

Underestimated complexity of tasks

Underestimated time needed to complete tasks

Didn't consider time needed to make individual systems work together

Recommendations:

The scope of the project should have been smaller

Plan time better

Correctly estimate the complexity of implementing the designs

Major Project Presentation 2

GRADEMARK REPORT

FINAL GRADE

GENERAL COMMENTS

51 /100

Instructor

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GRADING FORM: NEW CSG-RUBRIC

MICHAEL LEWIS

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1. ENGAGEMENT WITH LITERATURE

 Evidence provided in the form of the stepper motor data. Datasheets were referred to for individual components in the design phase, however there didn't appear to be any references to test data and limitations set by regulatory bodies. (2/5)

2

2. KNOWLEDGE AND UNDERSTANDING

 Briefly stated but overall aims were generic and not specific to the project being solved. Explained the context of the project, but didn't really give an overview of the technical design; a block diagram would have been really useful. Some detail provided verbally and some on screen. However, it was not clear how the objectives had changed since the original presentation and assignment 1. Given the amount of issues that the project encountered, it wasn't clear how these would be compensated for. A good understanding of the project design demonstrated with search coil output, the sample and hold circuit, stepper motor driver but little explanation provided for the PC communications and user display. Knowledge of the intended project was evident, however much of the intention failed to materialise in practice so demonstrating a critical understanding was only partially achieved. Some good answers provided for most of the design and some understanding demonstrated. (18/30)

18

3. COGNITIVE AND INTELLECTUAL

 Some evidence provided of testing of search coil with useful waveforms showing the input and output

13

of the sample and hold circuit. Much of the testing was not possible due to problems encountered during the implementation phase. The components that were completed could have been tested more vigorously through simulation or the construction of a test bed. Project outcomes were clearly evaluated and a percentage completion stated with reasons which were mainly put down to factors outside the control of the student. The actual costs were stated as an approximate value and compared to the budget. However, there was too much emphasis on what went wrong. Could have focused more on what was achieved rather than why things weren't. Conclusions were offered and recommendation given for progressing the project. However, the initial recommendations were mainly a personal reflection on what had gone wrong. (13/30)

4. PRACTICAL APPLICATION

-  Good solutions provided for sample and hold circuit with a good explanation of stepper motor driver circuit. A flow chart of the program would have helped to understand the operation of the software code. No evidence provided for design of the PC communications but some reference was made to the user screen and that these were explained in the report as part of the C code. The design solution appears to be the best of the 3 options and is suitable for the problem in theory, but given the lack of progress this could not be confirmed. Clear evidence of use of equipment in the design and construction of the project. No evidence provided of programming tools used. Construction was limited to the veroboard circuits. The images of the prototype showed a reasonable level of quality for development. However, the final product could have been a PCB but this stage had not yet been reached. No parts of the mechanical system had been constructed other than the stepper motor itself. (12/25)
- 12

5. TRANSFERABLE SKILLS

-  Very good, clear diagrams. Some slides however, contained too many words and there were some diagrams left out such as a flow chart for the software and an overall block diagram of the system showing the microcontroller. Generally good but there was some over reliance on reading from notes. Was clearly disappointed with the project and this showed in his mannerisms and body language. (6/10)
- 6