Test Project ES2010
3090 ELECTRONICS
Module D_Final

For the execution of EuroSkills Competitions
Submitted by:

Name: Vincent Maione **Member/Organisation: MCAST, MALTA**

INTRODUCTION TO TEST PROJECT DOCUMENTATION

This part of the test project is divided in three different phases and each phase has its own relevant section in this document. These sections are:

D1 Fault Finding
D2 Repair
D3 Electrical Measurements

Moreover the Robot Technical Manual is also an essential document to accomplish the tasks. Circuit diagrams referred to in the task documentation are all actually found in the Technical manual.

BRIEF DESCRIPTION OF PROJECT TASKS

This task carries an overall weight of 20 points of which 10 points are assigned to the fault finding part, 4 points for the repair and 6 points for the measurements.
The competitors are first given a non functional robot with a known number of faults. For the first phase they are expected to locate and report on the nature of the fault. They will then in the second phase have to repair the fault and test the robot for functionality. In the third phase the competitor will be asked to take some measurements and report on the validity or otherwise of the measured values.

D1 AND D2 FAULT FINDING AND REPAIR

The competitors will start this task with the robot switched off. Once the task starts they will switch on the robot making sure that the original testing software is loaded in the AVR microcontroller board. They should immediately notice that the robot is not functioning properly. They will be expected to note the observations and deduce as much as possible from them. The competitors can then start testing and fault finding. It will be up to the competitors to decide whether to find and repair a fault before trying to find the next one or to try to determine all the faults before they start the repair process. The competitors must report their findings and methodology using the appropriate forms provided and using appropriate fault symbols as shown in the sample below. **Once a fault is detected and before any repair task is started the competitor is to call an expert who will verify whether the detected fault is the correct one**. The marks allocated for these two parts are shown in the CIS attachment below.

D3 ELECTRICAL MEASUREMENTS

In this phase of task D the competitors are expected to show good skills in measuring and testing. Measurements can be either direct (just read the value from the instrument) or

indirect (involving both reading and some simple calculation). Competitors are to report and comment on validity of measurement or otherwise.

Measurement 1:

On the interface card locate the 12V supply circuit. On U2 measure the oscillator frequency on pin 11

Measurement 2:

On the same board locate zener diode D2 on the 9V supply circuit. Take appropriate measurements to determine the maximum power dissipation of this diode and explain the reasoning behind your measurements.

Measurement 3:

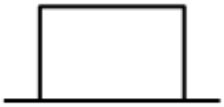
On the same circuit as for measurement 2 above locate the 7809 linear regulator ic. By taking suitable measurements determine what is the power dissipation of this ic under normal loading conditions i.e. with the robot running the test software. Explain all the measurements taken and show your calculations.

OTHER NOTES AND INSTRUCTIONS TO COMPETITORS

In carrying out the Task, particularly D1, please consider the following:

1) Competitor has to find faults and fill in the specified columns of the supplied forms, the defective component(s) as well as the fault symbols..
2) Finding the faults, competitor is to fix them. Competitor will be provided with the part(s) upon request. The part(s) should be in the part list.
3) Competitor is to reduce part demand as much as possible.
4) When you fulfill the task make sure the project is operating properly.

The list of the fault symbols:

Fault symbol	Description	Fault symbol	Description
	Open (Part or Wire)		Incorrect Polarity part
	Short (Part or Wire)		Defected part

↕	Part with wrong value (Resistor, Capacitor, etc)		

If the value of R1 was too large,

	Defective part	Fault symbol
Fault1	R1	↑

If an open circuit was occurred,

	Defective part	Fault symbol
Fault1	IC1 (PIN 1) IC2 (PIN 2)	

CIS ATTACHMENT SHOWING MARKING SCHEME

[redacted]