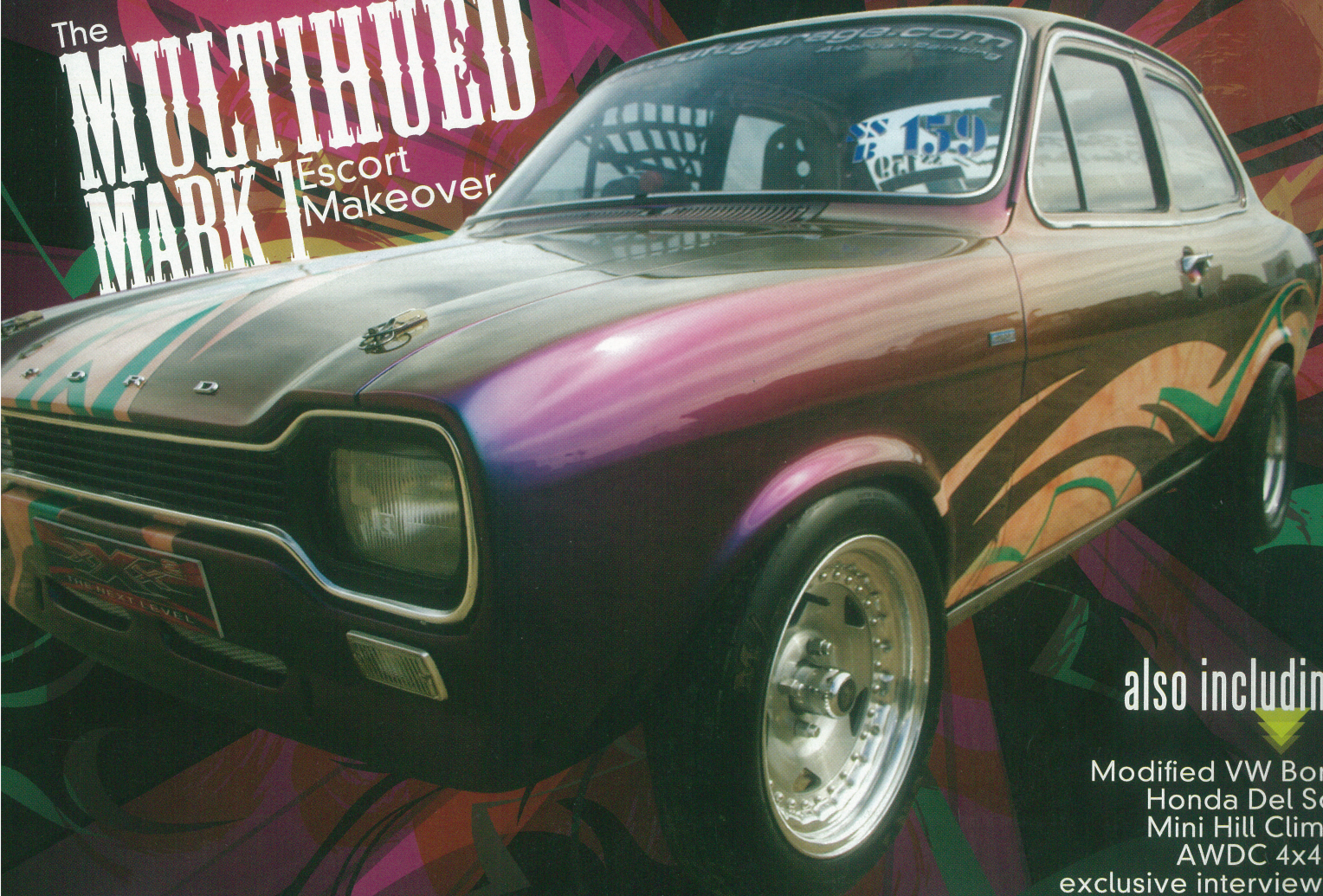


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FREE

THE UNIVERSITY OF MALTA DESIGNS & BUILDS A RACING CAR

by Charles Belia

CAR PROFILE

Model:	Formula SAE car, open wheel chassis
Year of Manufacture:	2007
Engine:	Kawasaki ZX600R, 600cc
Chassis:	Space frame, designed and built in house
Brakes:	Willwood: two front, one diff mounted on rear
Suspension:	Double wishbone, designed and built in house
Wheels & Tyres:	19.5x6.5-10" Hoosier R25A
Differential:	Quaife, limited slip
ECU:	Reata Engineering



The University of Malta has competed with its own designed and built open wheel racing car at the Formula SAE competition held in the Ferrari Fiorano race track. The Formula SAE competition is an international competition between universities that is organized in various countries by SAE (Society of Automotive Engineers). The purpose of such a competition is to challenge the students in using the academic tools and skills while producing a racing car. Competitions are held annually at various locations namely: two in USA, England, Australia, Brazil and Italy.

The competition rules are detailed in a 124 page document and detail engine, chassis and safety requirements. The maximum engine displacement is 610cc and a 20mm air intake restrictor must be employed downstream of the throttle body. Turbochargers can be used, however the 20mm restrictor must still be used upstream of the compressor. Chassis rules dictate a minimum wheelbase of at least 1525mm and a suspension system with at least 50mm of vertical travel. Chassis construction can be of tubular space frame type or monocoque type. Vehicles can use dry and/or wet race tires. Safety rules dictate the roll hoop envelope, side impact structure and frontal impact attenuator. These are just a few of the rules, the full rules are available at <http://students.sae.org/competitions/formulaseries/>

A group of mechanical engineering students devoted countless hours in designing and building the car from scratch. The mental design ideas were first put into a three dimensional computer drawing. Then a mock-up chassis was built from cane, with the real chassis built from TIG welded solid drawn hydraulic steel tubing. The engine used was a Kawasaki ZX600R engine with a Reata Engineering ECU. Engine testing was performed on a water brake dynamometer at the Mechanical Engineering Thermodynamics Laboratory. All fabrication and machining was performed fully in house in the laboratories of the Mechanical, Industrial and Manufacturing, Metallurgy and Materials departments.



TEAM PROFILE

President:	Ryan Curmi
Vice-President:	David Oscar Vella
Treasurer:	Samuel Zerafa
Auditor:	Luke Micallef
Faculty Advisor:	Dr Mario Farrugia
Members:	Prof Robert Ghirlando Maurizio Fenech Jonathan Cauchi Marlon Chiroop Clayton D'Amato Josef Camilleri Olen Terribile



The competition at the Ferrari Fiorano track was held between the 21st and 23rd of September. A technical inspection of the vehicles was done to check compliance with rules. The University of Malta's car passed tech inspection after a few mandated changes were performed. The car was then tested on the tilt table at 60 degrees to check stability and leaks. The brakes were tested to lock on all four wheels under hard braking while the noise level was tested to be lower than 110dBa at 10,500rpm. The dynamic events of the competition include a 75m acceleration, skid-pad, autocross and an endurance test. The car completed all heats including the 22km endurance test. The endurance test is a demanding test proven by the fact that typically

only half of the competitors finish this test. The team from the University of Malta received the Best Endeavour Award sponsored by FISITA.

This race car project was heavily supported by the University of Malta in many aspects including financial, facilities and technical resources. However vital financial support was also donated by many institutions and compa-