

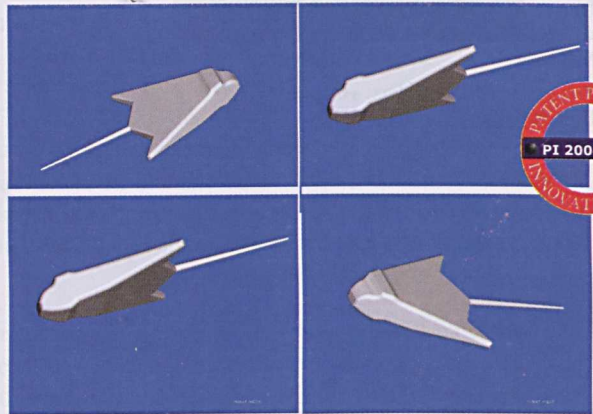
## PARI-Z— Underwater Unmanned Vehicle for Maritime Intelligent/Surveillance



PARI-Z is an underwater unmanned vehicle, defined as a self-propelled submersible whose operation is either fully autonomous or under minimal supervisory control.

Its primary mission is to collect various intelligent data across the entire spectrum while remaining undetected having modular platform approach whereby other types of sensor could be deployed for additional data collection.

The vehicle will specifically extend the reach into denied areas, and enabling missions in water to deep or shallow and hazardous for conventional platforms, with the objective to collect various intelligent data. It will adapt itself to the environment with the built-in intelligent systems while collecting data to avoid any threats or difficulties. Information collected will be transmitted back to the host platform (either in real-time or batch). At time where absolute detection avoidance is required from the effect of the communication systems, the vehicle may be in simple mode where data will be recorded and sent back to the control station or transmit from an appropriate area close to the control station.



*PARI-Z: Prototype design*

The project was an initiative by Hitech Macro Sdn. Bhd. PARI project is still in Research and Development phase located at Institute of Advanced Technology, UPM via funding of approximately RM 1.9 million from Ministry of Science, Technology and Innovation (MOSTI), Industrial Research and Development Grant Scheme (IGS). The company hopes to commercialize and contract out the final prototype upon completion by end of June 2005.

Some of PARI capabilities including pre-programmed full autonomous or remotely operated mode, underwater data collection, i.e. telemetry information, imaging information, ocean currents velocity and status measurements, vehicle velocity over ground measurements, bottom-track velocity and status, vehicle compass / tilt data, coordinate mapping, barriers avoidance forward / downwards sonar, wireless underwater communication with 2-5km radius and 100 meters in depth. It has a weight of approximately 30 kilograms and could be operated within 24 hours mission hours using rechargeable power supply.

Request of interests on the vehicle already started and targeted agencies are from Government agencies, i.e. Department of Environment, SMART, Fisheries Department, etc., while private sectors mainly from the Oil and Gas Industries before moving forward to international market by end of 2006.

Some of the key factors of the project are enhancement via R&D to achieve new potential technology and acquire components-off-the-shelf for economical approach, as a kick-start for the overall project engagement. Furthermore, systems and solutions integration of PARI back-end software algorithm to existing customer database plays an important role for data sharing reliability and modular concept of design for straightforward enhancement. Finally, trouble-free enhancement is essential for additional payload mounting as an add-on is based-on capabilities and requirements as the payload need increases. PARI Project is open for any collaboration and could be reached at [www.pariproject.org](http://www.pariproject.org).

**For further information, kindly contact:**

Assoc. Prof. Dr. Abdul Rahman Ramli  
Intelligent Systems and Robotics Laboratory  
Institute of Advanced Technology  
Universiti Putra Malaysia  
43400 UPM, Serdang, Selangor  
Malaysia

Tel: +603 8946 7532, Fax: +603-8656 6061

E-mail: [arr@eng.upm.edu.my](mailto:arr@eng.upm.edu.my)