Chapter 9

Control and Navigation

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Stories From Real Life: Human Torpedoes and Midget Subs

Chapter Outline

Chapter Learning Outcomes

- Give examples of control systems used in ROVs and AUVs. Discuss the advantages and disadvantages of open-loop versus closed-loop control and of simple versus complicated control systems.
- Explain the purpose and function of the navigational instruments and motor control switches used on a simple ROV like *SeaMATE*.
- Explain what a microcontroller is and what role it can play in the control systems used for ROVs or AUVs.
- Explain how a microcontroller can get commands from a pilot through buttons, knobs, and joysticks or from various navigational sensors.
- Explain how a microcontroller can operate thruster motors, video lights, gripper arms, and other systems on a vehicle.
- Give examples of common control algorithms; list some possible causes and solutions for common control system malfunctions.

Figure 9.1.cover: Piloting an ROV on an Offshore Oil Rig Mission

When an ROV is out of sight, working deep beneath the surface, control and navigation become major issues. A successful mission depends on accurate information about the ROV's position, effective remote control, and a skilled pilot.

In this photo, a pilot operates a VideoRay Deep Blue ROV on a natural gas rig in the middle of the Black Sea.

Image courtesy of Steve Van Meter, VideoRay LLC