Motion primitive in airboat control system

Introduction (Motion primitive)
My understanding on motion primitive is it's some kind of "open-loop test" data input-output relationship based on experimental data from the environment which can be used to control a robot, e.g. the airboat. The motivation for using motion primitive is needed to address the nonlinear dynamics of the airboat system since the airboat model is very difficult to rewrite. The advantage of motion primitive is it makes the control "simple and robust" as it does not rely much on the approximated model but is from the real-world data.

Objective
1. Building a motion primitive library
2. All the elements should begin and end with the same velocity.
3. Applying motion primitive in the airboat's control system.
4. Adding the close loop feedback to fix the deviation made by disturbance.

Design strategy
- Since each motion primitive element should have the same velocity and the element begins with only X velocity assuming the boat facing X-positive, the latter half of the trajectory must be a straight line.
- X’s straight line the entire will finally affect the Y velocity.
- In the first half the boat will turn a round to find the desired direction.

Structure of airboat

- Trajectory of different control signals
- Once the direction of the boat corresponds the angle between the local and desired path is zero then the boat stops. In order to change the control signal is to make the boat move in a straight line.
- The same (hard-coded) movement commands are repeated again and again to achieve the desired path.