

# NSPR Portable Welding Robot Panel Project Update

- Introduction
- Goals & Objectives
- Status
- Schedule

# Background

- Project Approved Fall of 2007
- Officially started mid January after contract signed.  
Project ends December 2008
- Technical adviser is Bruce Halverson from Marinette Marine
- Three participating shipyards are Marinette Marine, NGSS and GDEB

# Goals and objectives

- Develop a portable multi-process robot built in North America
- Include the ability to upgrade from the standard “teach & play” programmable system without vision to one with laser vision sensing for seam tracking & inspection

# What is a Portable Robot?

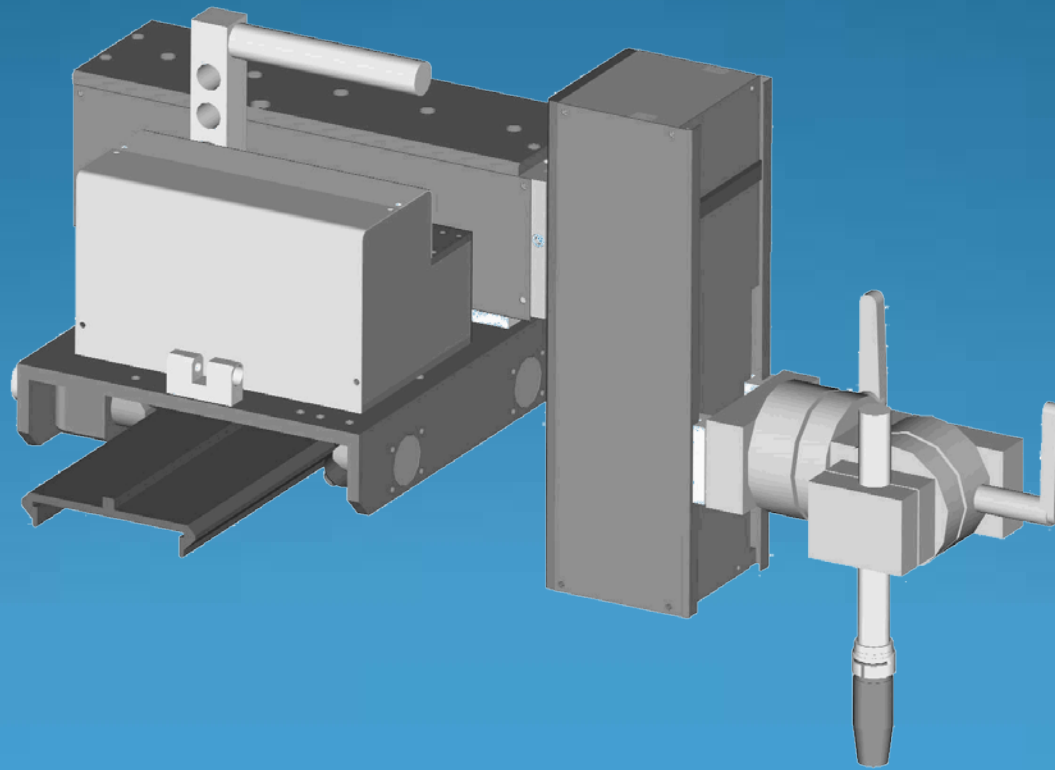
- It is a computer controlled, **programmable**, mobile machine with required payload and accuracy to carry a tool in several degrees of freedom and to control the parameters of a manufacturing process such as welding, cutting etc...
- The portable robot can be equipped with sensor and vision systems to adapt to changing industrial environments or manufacturing parameters.



# What does multiple process mean?

- Welding with and without laser vision
  - Processes include GMAW, FCAW, SAW
- Plasma cutting and gouging
- Automatic visual weld inspection

# NEW SHIPBUILDING MULTI-PROCESS PORTABLE ROBOT CONCEPT



# Benchmarking Test Done At GD Quonset Point June 2008

- The existing Servo Robot Navi-21 system was tried for 4 weeks in the module welding dept.
- Focus was on ease of use, ability to get access to tight areas and determination of potential benefits
- About 10 welders and a couple engineers were involved in the test

# Results of Benchmarking Tests

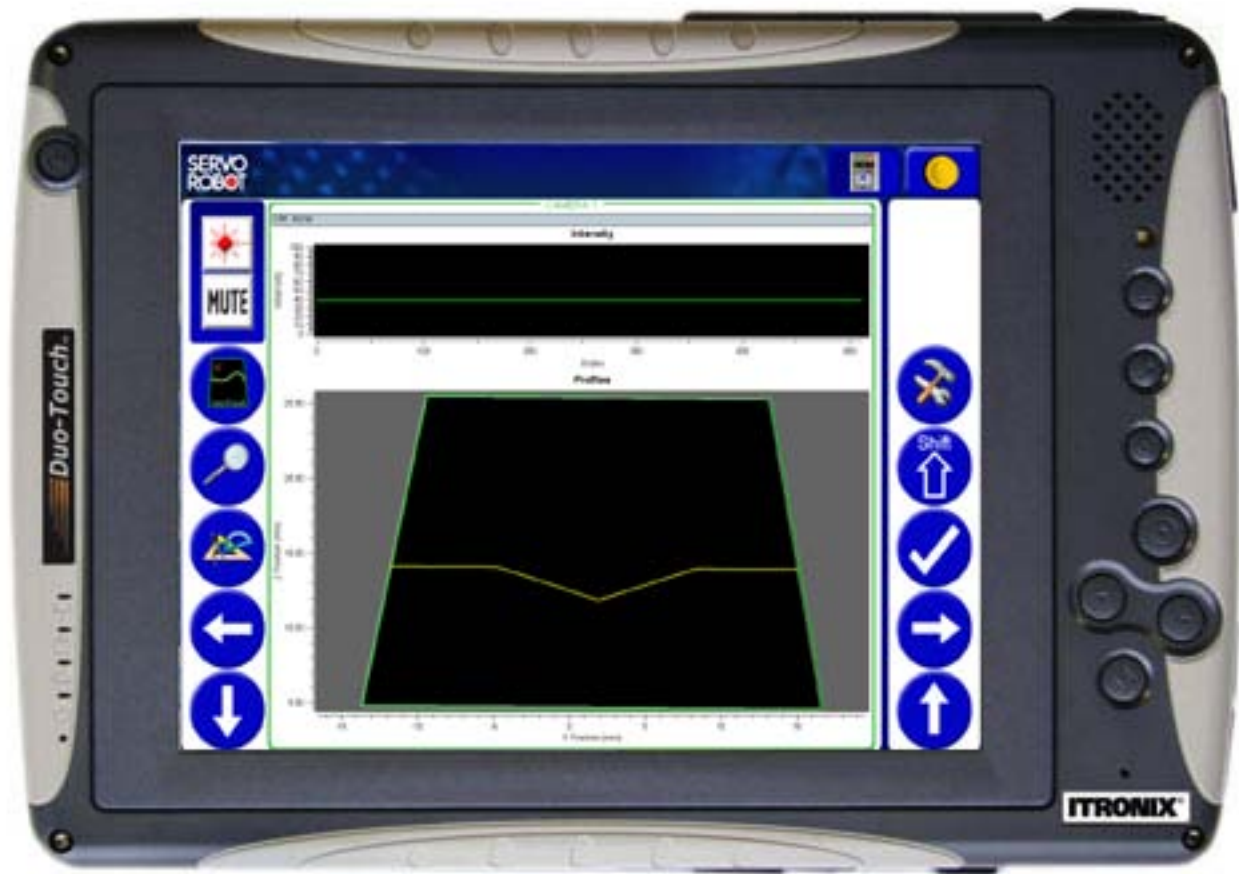
- Teach pendant was easy to use but buttons need to be bigger & raised up so welders using gloves can know that they are working without having to check
- Need to add ability to save programs (position & welding parameters) when power is turned off to the system thus saving re-programming time
- Protection for pendant from spatter required, a magnet needs to be added for hanging the unit and a dark shield will be added on top to allow easy viewing of weld process

# Progress on New Design

- Work progressing on mechanical robot body. Main effort on making it lighter and stronger while adding full AC servos instead of stepper motors to increase accuracy
- New controller being designed
- Different teach pendants being evaluated (see next slide for leading candidate which is GD Itronix model). Ruggedness, ease of use and price are main factors
- Programming of pendant with new software has begun

# GD Itronix Teach Pendant

- Pendant



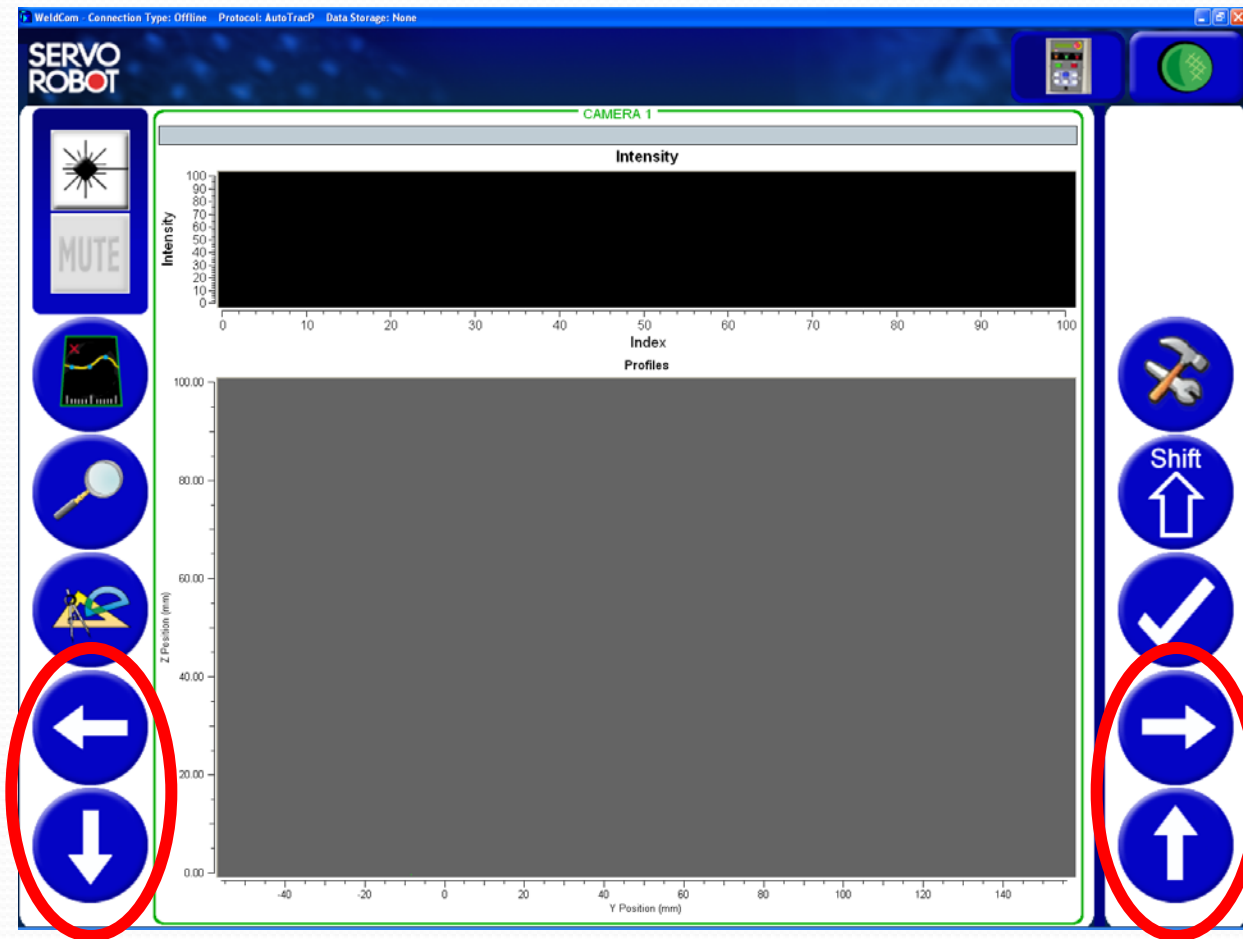
# Portable Robot Teach Pendant

Seven new buttons appear in the teach pendant configuration of the WeldCom interface.



# Portable Robot Teach Pendant

Arrows are used to jog the torch up/down and left/right.



# Deliverables

- Portable robot designed (electrical and mechanical) for North American build
- Prototype portable robot built
- Demonstration of the prototype robot December 2008 to three participating yards and ATI at Servo Robot Inc. in Montreal