

# Steering Robots

## From *Anthony Best Dynamics*

### OUTLINE SPECIFICATION – ISSUE 1

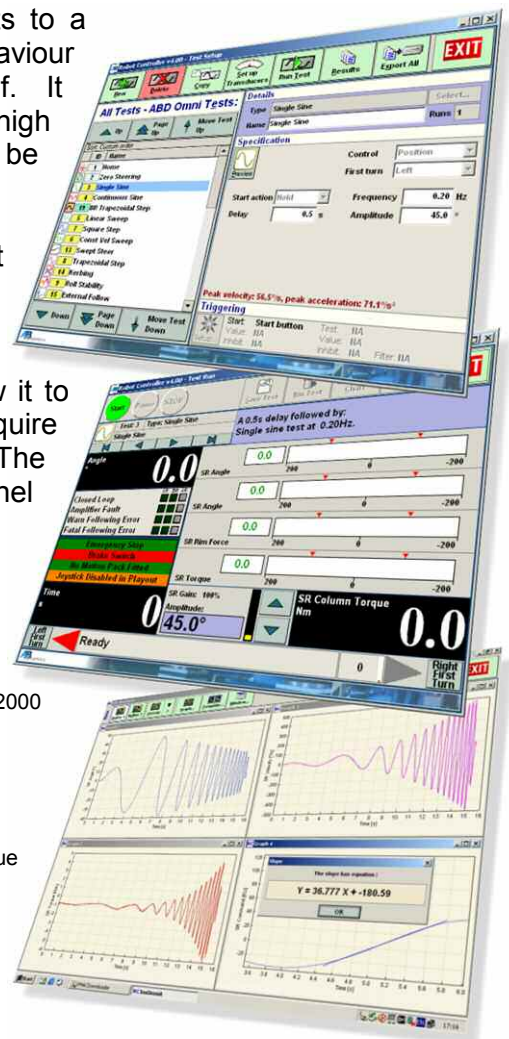


The SR range of steering robots is designed to apply inputs to a vehicle's steering system for testing its transient handling behaviour on the test track, or for evaluating the steering system itself. It allows a wide range of steering inputs to be applied with high precision and repeatability, to enable high quality data to be gathered quickly.

A range of motor sizes are available to suit all types of test applications. ABD robots can be used with an external data capture system, or alternatively, can be fitted with built-in multi-channel capture to minimise the total hardware required in the vehicle. The *Omni* controller can be upgraded to allow it to drive multiple actuators, so that it can be used for tests that require simultaneous control of steering, braking and accelerator. The SR30 steering robot can be supplied with the single-channel *Mono* controller as a low-cost alternative to the *Omni*.

#### Standard features of the steering robot range:

- Compact direct-drive motor unit
- Integral transducers for steering wheel angle (0.00075° resolution) and torque
- Easy to install with fully adjustable fittings
- Fully programmable and easy-to-use control software running under WindowsXP/2000
- Standard test profiles to meet ISO 7401
- Joystick for manual correction of vehicle's directional drift during testing
- Vehicle can be driven normally when robot disabled
- Integrated electronics package powered from vehicle's 12 or 24V supply
- Data capture of up to 30 analogue input channels
- Analogue outputs, configurable to output data such as hand-wheel angle and torque
- 1 spare incremental encoder input
- Inputs and outputs for test and data capture triggering functions
- Multiple safety features and CE compliance
- Upgradeability to control steering, braking and accelerator functions simultaneously.
- The system can be upgraded to perform path-following tests (see ABD specification SP6008)



## Hardware

A range of steering robot motor sizes is available:

<b>SR30 (brushed motor)</b> Maximum torque: 33Nm at up to 850°/s Max. continuous torque: 30Nm at up to 1000°/s Max. speed: 2350°/s at up to 7Nm Motor mass: 10kg	<b>SR60 (brushless motor)</b> Maximum torque: 70Nm at up to 580°/s Max. continuous torque: 60Nm at up to 1000°/s Max. speed: 2500°/s at up to 24Nm Motor mass: 12.5kg
<b>SR150 (brushless motor)</b> Maximum torque: >175Nm at up to 375°/s Max. continuous torque: >150Nm at up to 500°/s Max. speed: 1000°/s Motor mass: 22kg (approx.)	Note: The holding times for rated and maximum torque levels are limited by motor's thermal capacity (refer to ABD for details).



Steering robots can be supplied with a range of torque reaction mechanisms (contact ABD to discuss which is the most suitable for your requirements):

- Standard torque reaction strut (as shown on previous page)
- "T" reaction mechanism (*left*)
- "S" reaction mechanism (*right*)



## Software

The steering robot's user interface software runs on any standard PC running Windows. The software enables the driver to define and run new tests quickly and easily by choosing from a library of standard tests. These include sine, sine sweep, step and ramp inputs. A range of special tests is also provided, such as roll stability (used for fish-hook, J-turns etc), catch-up, flick, and spin-out. In addition, test profiles can be recorded from direct driver input using a learn mode, or played out from data stored in an ASCII file. The robot can also follow an external input signal.

Results can be viewed immediately after a test has been completed using the built-in quick plotting facility. The plots can show any captured channel plotted against any other channel or time and have zoom and slope calculation functions. Results from different tests can be overlaid.

## Options

A wide range of options is available to complement the ABD steering robots. This includes:

storage cases • sensors (GPS-equipped motion packs, accelerometers, gyroscopes, wheel lift sensors, steering column torque sensor, road-wheel encoder) • steering wheel adaptor (allows the robot to be mounted onto existing steering wheel) • low-inertia steering wheel • activate switch for high-g testing • control PC (laptop or tablet format) • transducer mounting strut

**For more detailed information on this and other related products contact:**

Dr Steve Needs  
Director, Suspension test systems  
ANTHONY BEST DYNAMICS  
Holt Road, Bradford on Avon  
Wiltshire, BA15 1AJ, England  
Tel: +44 (0) 1225 860200  
Fax: +44 (0) 1225 860201  
Email: sales@abd.uk.com

ABD has representatives throughout the world.  
For details please refer to our web site:  
[www.abd.uk.com](http://www.abd.uk.com)