

S2

Scribbler 2 (S2) Design Notes

December 2009 Preliminary Release Information for Parallax Customers

Background

Parallax's popular Scribbler robot has sold over 10,000 units and has been adopted into academic programs around the world. Today Parallax announces a Propeller-based redesign of the Scribbler, named S2. This advance information is offered in order to communicate with our Scribbler customers ahead of time, and to address an anticipated supply gap while S2 is manufactured.

Original BASIC Stamp 2 Scribbler:
Available while inventory lasts!



Meet the new S2:
Propeller robot available in August 2010



S2 Design Goals

The most important design goals applied for S2 include the following:

- Propeller P8X32A-Q44 support for true robotic multi-core processing, enabling the convenient compartmentalizing of sensor and drive routines into objects and processor COGs;
- Backward-compatibility with the existing Scribbler GUI;
- Wide-access "hacker port" with many I/Os and a substantial power supply;
- Compatibility with existing third-party hardware designs, such as the Georgia Tech IPRE Fluke; and
- Improvements to motor drive system with wheel encoder feedback, stronger motors and a straight-steering robot.

But there's so much more as you'll see down below. The Propeller enables highly capable robots with many more features. Consider parallel processing, speech synthesis and the expanded hacker port, not to mention the variety of programming languages now available for the Propeller!

What does S2 lose in this redesign compared to original Scribbler? Coding in PBASIC, since the S2 uses Propeller. Perhaps this won't even be an issue since several third parties are now developing BASIC compilers for the Propeller. We're also dropping the consumer product safety commission (CPSC) testing for the under-13 audience since we market and support S2 to a more mature group. This has two additional benefits of being able to use a louder amplifier and speaker and more powerful motors!

Supply Considerations

- Existing Scribbler Robot inventory will be depleted by March 2010 If you have a program designed around the original Scribbler robot please contact Jim Carey (jcarey@parallax.com), Sales Manager, and ask about holding some inventory for your program purchases. We are aiming to minimize impact on established programs at educational institutions and summer programs. The reason we are not bridging the supply gap between Scribbler's out-of-stock date and the release of S2 is because our factory is gearing up for S2. Our collaboration with the factory brought much excitement towards S2 with its many improvements, and the momentum took over as the team focused on the S2. Original Scribbler also poses some very challenging manufacturing issues with motor matching and stall sensors which we will avoid with S2.
- S2 Release is August 2010 Parallax's Scribbler design team has been working since July 2009 on S2. This same team successfully designed Scribbler and is approaching S2 with the same enthusiasm. We are already collaborating with our factory on test fixtures and small bill of materials choices as we finish S2 prototypes.

S2 Specifications

S2 specifications are preliminary until the last prototype and first production articles are approved. As of December 2010 we are designing with the following general specifications:

- P8X32A-Q44 Processor
- Powerful motors: accessible encoder feedback (480 counts/rev) and higher speed will allow closed-loop control (i.e., drawing of more precise words and art)
- Bi-color LEDs
- Red enclosure
- Improved stall sensor on rear wheel
- Hacker port includes (8) eight I/Os and 1A power supply
- Louder speaker speech synthesis
- Microphone input for speech or sound recognition
- Improved line following sensors with analog output
- Code-compatible GUI or Propeller IDE programming interface

Specifications continue on following page.

Battery	
AA cell quantity	6
Battery supply	6.00 - 9.60 VDC
Digital Logic	
Supply voltage	3.17 - 3.43 VDC
Supply current	150 mA
Hacker Port	
Supply Voltage	4.80 - 5.17 VDC
Supply Current	1,500 mA
Motor	
Torque	10 - 35 g-cm
Current	180 - 470 mA
Voltage	3 to 12 VDC
Kt (torque constant)	0.074 g-cm/mA
Microphone Analog Input	
Frequency response (-3dB)	100 - 3,000 Hz
Light Sensor Analog Input	
Sensitivity (0-200 Lux)	8 mV/lux
Frequency response (-3dB)	700 Hz
Motor Current Analog Input	
Sensitivity (0-500 mA)	5 mV/mA
Speaker Output	
Frequency Response (-25 dB)	700 – 10,000 Hz
Wheel Encoders	
Counts per wheel revolution	480 cnts/rev
Linear distance per count	0.520 mm/cnt

S2 Design Team

Parallax thanks the Scribbler team for their efforts on this project. This team includes Ben Wirz (Element), Phil Pilgrim (Bueno Systems), Asian manufacturing partners and the Parallax staff who will diligently prepare manuals, packaging, and support/marketing programs around S2.

If you have any additional questions we could answer about the S2 please contact Parallax via e-mail.

