

Skills Canada National Competition

SCOPE DOCUMENT	
Competition Year	2012
Competition location	Edmonton, AB
Trade Number	16
Trade Name	Electronics
Level	Secondary and Post-Secondary

1. INTRODUCTION

1.1 Purpose of the Challenge.

To evaluate each competitor's skills and to recognize outstanding students for excellence and professionalism in the field of Electronics Technology.

1.2 Duration of contest.

12 hours

1.3 Skills and Knowledge to be tested.

The contest will cover the theoretical and practical aspects of current state of the art electronic industry standards. The competitor may be asked to demonstrate abilities in the following areas:

- Interpret electronic schematic diagrams, pictorials, manufacturers technical specifications and component data sheets.
- Identify common electrical and electronic components.
- Construct, analyse and troubleshoot DC circuits including series resistance, parallel resistance, series-parallel resistance and solid state switching circuits.
- Construct, analyse and troubleshoot AC circuits including capacitive, inductive and complex RLC circuits.
- Construct, analyse and troubleshoot analog circuits including discrete amplifiers, operational amplifiers and comparator circuits.
- Construct, analyse and troubleshoot digital circuits including TTL/CMOS gates, timers and optical devices.
- Apply the appropriate test equipment to a given situation.
- Interpret the observed values from the test equipment. (AC/DC voltages, currents and waveforms and circuit resistance)

2. CONTEST DESCRIPTION

2.1 List of documents produced and timeline for when competitors have access to the documents.

DOCUMENT	DATE OF DISTRIBUTION VIA WEBSITE
Schedule	March 02,2012
Component Data Sheets	March 02,2012
Additional Notes	March 02,2012
Competition Examples	March 02,2012

2.2 Tasks that may be performed during the competition

- Hand - solder through-hole mount components on a printed circuit board to acceptable industry standards.
 - Hand - desolder through-hole mount components on a printed circuit board.
- Assemble a circuit from a kit of components and PCB.
- Assemble a circuit from a kit of components on a breadboard.
- Set-up and demonstrate use of common test equipment including multimeters, power supplies, frequency generator and oscilloscope.
 - Troubleshoot simple electronic circuits having a preinstalled fault.
 - Draw a schematic diagram (reverse engineer) from a simple electronic circuit.

3. EQUIPMENT, MATERIAL, CLOTHING

3.1 Equipment and material provided by Skills/Compétences Canada

- Fluke Scopemeter c/w accessories (minimum 40 MHz)
- Fluke Digital Multimeter c/w test leads and temperature probe
- Triple Power Supply fixed 5 Volt @0.5 amp, +/- 15 Volts @ 1 amp c/w leads and clips
- Waveform Generator c/w BNC to alligator cable
- Solder will be supplied. No Lead Sn99.3/Cu0.7. . Please consult the additional notes for exact type.
- Breadboard and project wire
- Additional equipment specific to the competition
- Projects, electronic components and documentation
- Desolder braid. Please consult the additional notes for exact type.

3.2 Equipment and material provided by the competitor

- Solder Iron suitable for use with no-lead solder types, stand, tip cleaner, tips of choice. Butane solder devices will not be allowed.
- Hand vacuum solder extractor
- Long nose pliers
- Side Cutters
- Wire Stripper
- Screwdrivers (including precision set)
- “Third Hand” including magnifying glass. (optional)

- Magnifier
- Power bar, 4 or more outlet (3'/1m or more cord length and must be CSA approved)
- Pens, Pencils, Eraser, Ruler
- Safety Glasses with side shields or Goggles
- 2 breadboards, minimum size each, 2"x 6" (wire will be supplied)
- Desk Lamp
- Stand alone calculator. Non programmable. Example TI-30Xa
- Stand alone personal music player during some sessions of the competition. The sessions where music is allowed will be determined by the judges.
- It is the responsibility of each competitor to supply the aforementioned tools and supplies. Failure to supply the required tools and supplies may result in competitor not being allowed to participate.
- Safety glasses with side shields or goggles must be worn when soldering, desoldering and circuit assembly. Failure to comply with this regulation may result in disqualification from the competition at the discretion of the NTC members on site.

3.3 Required clothing (Provided by competitor)

- Competitors are to be dressed in a clean and safe manner. (long pants and closed toe shoes)
- No jewellery on hands or wrists.

4. SAFETY REQUIREMENTS

4.1 List of required personal protective equipment(PPE) provided by competitors

- | | | |
|--|--|--|
| <input checked="" type="checkbox"/> Safety Glasses with side shields | <input type="checkbox"/> CSA approved Safety shoes | <input type="checkbox"/> Latex gloves |
| <input type="checkbox"/> Safety Gloves | <input type="checkbox"/> Welding helmet | <input type="checkbox"/> Dust Mask |
| <input type="checkbox"/> Hard Hat | <input type="checkbox"/> Welding gloves | <input type="checkbox"/> Leather gloves |
| <input type="checkbox"/> Hearing protection | <input type="checkbox"/> Respiratory protection | <input type="checkbox"/> No PPE required |

Note: Competitors will not be allowed to compete if the above items are not brought and used

4.2 List of required personal protective equipment(PPE) provided by Skills/Compétences Canada (SCC)

- | | | |
|---|--|--|
| <input type="checkbox"/> Safety Glasses | <input type="checkbox"/> CSA approved Safety shoes | <input type="checkbox"/> Latex gloves |
| <input type="checkbox"/> Safety Gloves | <input type="checkbox"/> Welding helmet | <input type="checkbox"/> Dust Mask |
| <input type="checkbox"/> Hard Hat | <input type="checkbox"/> Welding gloves | <input type="checkbox"/> No PPE required |
| <input type="checkbox"/> Hearing protection | <input type="checkbox"/> Respiratory protection | <input checked="" type="checkbox"/> No additional PPE will be supplied by S/CC |

5. ASSESSMENT

5.1 Point breakdown

POINT BREAKDOWN (Secondary)	/1000
Theory	150
Construction	200
Reverse Engineer	150
Breadboard	150
Cable Assembly	100
Fault Finding	150
Desoldering	100
POINT BREAKDOWN (Post Secondary)	/1000
Theory	150
Construction	200
Reverse Engineer	150
Breadboard	350
Fault Finding	150

6. ADDITIONAL INFORMATION

6.1 Consecutive translation

If consecutive translation is required on site, the Skills/Compétences Canada Provincial/Territorial offices must advise Skills/Compétences Canada National Secretariat a minimum of 1 month prior to the competition or this service might not be guaranteed.

6.2 Software requirements

If French software is required the Skills/Compétences Canada Provincial/Territorial offices must advise Skills/Compétences Canada National Secretariat a minimum of 1 month prior to the competition or this software might not be guaranteed.

6.3 Computer keyboard requirements

English Keyboards will be provided, if a French keyboard is required the Skills/Compétences Canada Provincial/Territorial offices must advise Skills/Compétences Canada National Secretariat a minimum of 1 month prior to the competition or this keyboard might not be guaranteed.

6.4 Tie (No ties are allowed)

In the event of a final evaluation showing a difference of less than 2%, the placement will be determined by the mark achieved on the following project sections:

- First determinant – breadboard project
- Second determinant – fault finding
- Third determinant – reverse engineering

6.5 Competition rules

Please refer to the competition rules for all general SCNC information.

7. NATIONAL TECHNICAL COMMITTEE MEMBERS

Region	Name	Email address
Pacific Region	Al Green Expert	alanrgreen@gmail.com
Western Region	Lionel Ogg	ogg.lionel@brandonsd.mb.ca.
Ontario	Tom Franks	tfranks@bell.net
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