

Contest Description

COMPETITION DATE: April 15 - 16, 2021	CONTEST AREA NAME: Electronics Secondary and Post -Secondary
CONTEST AREA NUMBER #: 16	LEVEL: S and PS
DURATION OF CONTEST: 8 Hours over 2 Days	LOCATION: Virtual via College of the North Atlantic Ridge Road Campus

CONTEST INTRODUCTION

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.

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 suppliers' catalogues.
- 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 (voltages, currents and waveforms, and circuit resistance)

CONTEST DESCRIPTION

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

DOCUMENT	DATE OF DISTRIBUTION VIA WEBSITE
Schedule	February 12th
Additional Notes	February 12th

Tasks that may be performed during the contest

- 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.
- Set-up and demonstrate use of common electronic measuring equipment including multimeters, power supplies, frequency generator and oscilloscope.
- Assemble a circuit from a kit of components and PCB.
- Design and assemble a circuit on a breadboard (PS only).
- Troubleshoot simple electronic circuits having a preinstalled fault.
- Draw a schematic diagram (reverse engineer) from a simple electronic circuit.
- Theory Exam
- Cable assembly to color code specification
- Design, troubleshoot and measure electronic circuits using Multisim simulator

EQUIPMENT, MATERIAL, CLOTHING

Equipment and Material supplied by Skills Canada-Newfoundland and Labrador

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- Fluke 40MHz Scopemeter c/w accessories
- Digital Multimeter
- Dual Power Supply 0 to +/- 15 Volts @ 1 amp minimum c/w leads and clips
- Waveform Generator c/w BNC to alligator cables
- 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.
- Temperature controlled solder station, stand, tip cleaner, and suitable tips.
- Hand vacuum solder extractor
- Long nose pliers

- Side Cutters
- Wire Stripper
- Screwdrivers
- Vise
- Power bar, 4 or more outlet (3'/1m or more cord length and must be CSA approved)
- Breadboards

Equipment and Material Competitor must supply:

- Magnifying glass
- Computer: Windows PC with required SW Installed
 - NI Multisim
 - Arduino IDE(latest version)
- Pens, pencils, eraser, ruler
- 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.

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, wrists or neck.

SAFETY REQUIREMENTS

The health, safety and welfare of all individuals involved with Skills Canada NL are of vital importance. Safety is a condition of participation and shall not be sacrificed for the sake of expediency. At the discretion of the judges and technical committees, any competitor can be denied the right to participate should they not have the required proper safety equipment and/or act in an unsafe manner that can cause harm to themselves or others.

List of required personal protective equipment (PPE) supplied by Competitor:

- Safety Glasses

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

EVALUATION/JUDGING CRITERIA

Point breakdown (Points in **RED** include proposed virtual fault finding for Secondary Competitors)

POINT BREAKDOWN				
Coding (70min)	Day 1	9:00-10:10	25	25
Construction/Solder/Fab (70min)	Day 1	10:40-11:50	25	30
Circuit Design PS only (40 min)	Day 1	1:00-1:40		
Bread boarding S only (40 min)	Day 2	9:00-9:40	25	25
Fault Finding (40 min)	Day 2	10:20-11:10	25	20
Total			100	100

ADDITIONAL INFORMATION

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:

Post-Secondary:

- First determinant – Construction
- Second determinant – Fault finding
- Third determinant – circuit design **PS** and Bread boarding **SEC**

Competition rules

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

PROVINCIAL TECHNICAL COMMITTEE MEMBERS

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