Electronics Shop Services:
The following is a list of services that the Electronics Shop personnel can provide to researchers.

1. Consulting:
   A) General electrical and electronic implementation and design
   B) Equipment selection with regard to function, specifications, alternatives
   C) Discrete circuit design and part selection with respect to mechanical considerations, electrical parameters, limitations, alternatives, etc.
   D) Grounding, shielding, or isolation of devices or systems
   E) Troubleshooting of faults in set-ups or equipment
   F) Connectivity of parts or equipment with regard to matching and noise reduction
   G) Examination and identification of safety issues and standards

2. Custom analog and digital design and fabrication:
   A) Measurement devices such as conductivity, rpm, voltage, current, flow, temperature, field strength, etc.
   B) Transducer amplifiers for low level voltage or current signals such as strain gauges, moving coil devices, liquid sensors, voltages levels in living tissue, etc.
   C) Research apparatus or instruments
   D) Automated apparatus for data acquisition
   E) Microcontroller based products employing Motorola, Microchip, or other microcontrollers.
   F) Products for use with microcontroller based targets
   G) Personal Computer based devices for connection via parallel, serial, or alternatively indirect connection through data acquisition boards.
   H) Construction of Printed Circuit boards in-house or externally processed with plated through holes and silk screening

3. Software Design:
   A) Computer and microcontroller programming using LabView, Visual C++, Visual Basic, Java, low-level machine code, etc.
   B) Analysis of electronic devices using MicroCap, Workbench
   C) PCB layout using Eagle or Circad with ViewMaster Gerber analysis
   D) Documentation for construction, reference, safety authorities

4. Fabrication or modification of equipment:
   A) Construction of equipment from existing schematics or drawings
   B) General interconnection of electrical devices or objects
   C) Modification of equipment to meet ESA safety standards
   D) Functional testing and calibration of new, existing, or fabricated equipment
5. Documentation:
   A) Creation of equipment manuals for operation or service
   B) Mechanical CAD drawings using AutoCAD, SolidWorks

6. Equipment Repair:
   A) General and specialized equipment maintenance and repair

7. Miscellaneous Services:
   A) Interconnect cable construction
   B) Electrical connection of small surface mount components
   C) Procurement and sales of electronic parts and supplies

Examples of Fabricated Equipment:

1. Auto-zeroing microcontroller based wideband multi-channel strain gauge
   amplifier to existing remote data acquisition system
2. Power/ rpm meter with simultaneous display of voltage, current, power, and
   motor rpm. The unit incorporates dual high voltage isolation channels
3. Construction of a motor control panel, creation of schematics and wiring diagram
   for surgical robot
4. Conductivity meter with synchronized selectable multiple frequency sine wave
   current drive. The unit uses synchronous nature of waveform to perform
   sinusoidal averaging and detection for noise reduction
5. Microcontroller based dual channel high side current sensing module for high
   voltage current measurement. The digital SPI formatted data line is transmitted
   over a single fibre optic cable with the receiver reconstructing the word and clock
   lines. Being a battery driven module the sustaining voltage is related to length of
   the fibre and is considered capable of sensing to unknown levels of HV
6. Phase locked frequency generator to sustain high power resonance transducer for
   the purpose of levitating highly corrosive particles
7. Wide band, ultra high impedance sensor/ amplifier for use in brain voltage
   measurement in small animal medical research
8. Electrostatics based equipment such as field mills, relaxation time instruments,
   balanced current output HV generator research
9. Robotics modules employing accelerometers, stepper and DC motor drives, optical
   distance sensors
10. PC controllable soccer robot platforms with integral 2.4GHz communications
    transceivers
11. Dual processor autonomous micromouse robots with motor control feedback
    systems, auto-calibration multi-channel optical distance sensors, diagnostic 433
    MHz RF transmission systems, integral maze search algorithm, fault protection
    networks, etc.
12. Transistor curve tracer with serial port computer controlled data acquisition
    system programmed in Visual C++
13. Heart rate monitor programmed in Visual C++ through on-board sound card