

Procurement of Parts

Introduction

- For a large project, acquiring parts is often the responsibility of a team of individuals.
- Product knowledge is not only important in specification of the parts, but in ordering as well.
- You will need to practice patience while learning your institution's ordering process.

Manufacturers and Distribution

- Many component manufacturers do not sell their wares directly.
- Instead, *distributors* are used as an intermediate.
- Further, many distributors do not provide service to walk-in clients.

Manufacturers and Distribution

- Each distributor has a “line card” which outlines the manufacturers whose products they “handle”.
- Many distributors have no product in stock -- lead times can be lengthy!

Part Samples

- As previously mentioned, it may be possible to acquire a limited number of samples to help in project development.
- If a manufacturer does not have a sampling policy, the distributor may still be able to negotiate samples on your behalf.
- The ability to get samples often depends on the number of units you will be producing.

Part Lists

- Deriving a comprehensive list of project components is important!
 - Electrical components
 - Mechanical components
- Most CAD packages (Electrical and Mechanical) allow export of a BOM: a Bill of Materials.

Part Prices

- Parts are almost always much cheaper when purchased in large volume.
 - The prototype cost will be much higher than a mass-produced product.
- As an example, the PIC16F877A in a 40-pin DIP package is:
 - \$10.20 each for 1
 - \$5.97 each for 10 (Digikey.ca)

Part Technology

- It is important to acquire parts that you can handle appropriately.
- Surface-mount devices are becoming more and more prevalent – and are relatively difficult to use.
- Another trend is the manufacture of devices that reduce environmental impact:
 - lead-free devices, recycling deposits, recycling facilities

Part Substitutions

- It is, of course, wise to develop your system with parts that will certainly be available.
- Manufacturers do, however, drop manufacture of (usually old) parts from time-to-time.
- The lifespan of the part of should be considered prior to making a decision to proceed with it.

Part Substitutions

- Remember, a project that will be used for years needs to be supported for years.
- It is up to the designer to make a call as to whether a substitution is viable.
- External factors may impose a substitution:
 - “We have 10,000 LM741 Op-amps on hand from the last job. Can we use these instead?”

Hidden Costs

- Every time an order is placed, there is usually a great deal of paperwork that must be completed.
- Shipping fees, customs, and customs brokerage fees are usually on a per-order basis.
- Thoroughness helps avoid these hidden costs: derive a complete list prior to ordering.

EE Capstone Design Procurement: First Order

a) Derive your parts list:

- Be sure it is as complete as possible.
- Include all components, even those that you suspect are in the lab, the exception being the resistors and capacitors that are accessible in the unlocked lab cabinet.
- Specify complete part numbers.
- Specify through-hole components where possible (and applicable, of course).
- Where surface mount devices are required, be sure to prepare for breadboarding by, for instance, specifying adapter boards as another part.

EE Capstone Design Procurement

a) (continued)

- Ensure that the vendor is reputable (see the form on the course web site for suggested vendors).
- Ensure parts are immediately available (have no lead-time).
- Determine part cost.
- Do *not* pad orders: order only what you need.
- Ensure that you are within your budget.

EE Capstone Design Procurement

b) Have your advisor review this list.

- . Parts substitutions may be made at this stage.
- . The purpose is to provide a general vetting of the order.

c) If the parts are to be ordered using the course budget, please complete the form (spreadsheet) provided on the course web page.

- . Since the form is vendor/supplier-specific it is likely you will need to complete more than one form.

If the parts are to be ordered via your client, please discuss the ordering process they would like to use. You could optionally have the list verified by the course technician to determine if the course has parts on-hand. No further submission to the course instruction personnel is required in the situation that the client is ordering parts. Please note, however, that parts either coming from course/Departmental stocks or ordered on behalf of your client will require reimbursement by your client. In other words, parts from the Department are property of the Department.

EE Capstone Design Procurement

- d) If the parts are to be ordered using the course budget, please ZIP the spreadsheet form(s) (created in the last step) and submit via the course submission resource. (Zipping files is required, even if only one form is being submitted.)
- e) The course technician will review the order.
 - Stock that is on-hand will be provided to your group.
 - Parts substitutions may be made.
 - Order numbers may be adjusted.
- f) The vetted (and possibly modified) orders are passed to Rick McGregor by the course technician, the parts stores technician, for actual ordering.

In some situations, you may be asked by the technicians to order certain parts yourself. Do so only if you have been asked to do so in writing.