Cost & Manufacturing
S 2.1 Cost and Manufacturing Objective

S 2.1.1 The objective of the cost and manufacturing event is to evaluate the team’s understanding of the manufacturing processes and costs associated with the construction of a prototype race car.

This includes trade off decisions between content and cost, make or buy decisions and understanding the differences between prototype and mass production.
Positives
• Fewer technical errors in documentation
• Better understanding of cost packs

Areas for Improvement
• Real world cost understanding
• Some teams still underselling themselves
• Not interested in doing cost (“Let’s Race...”)
New for 2020

Summary: Lots...

• 20% more points for Cost
• Online tool for creating BOM (TBC)
• Slight diversion from European rules
  1. Same principle as 18/19 but...
  2. Potential to include development and fixed assets costs in to CBOM
  3. BOM / DBOM / CBOM
     • DBOM and CBOM at Formula Student, Silverstone
The Cost Event Facts:

- You can’t escape it, it will own you... Accept this horrible fact
- “If it doesn't hurt it’s not doing any good”
  (Ms Condon – My A-level maths teacher, circa 1996)
- Start early and the pain will be less...
- I will laugh and publicly shame you if you message/tweet me the day before submission and tell me all the reasons why you are having problems. **Screw up early, learn, get help and fix it...**
- Doing Cost right will make you:
  a) Awesome in general
  b) A much better Engineer and immensely more employable
  and
  c) In the real world, you will own the accountants rather than the other way around (which is unfortunately the case in 90% of roles)
Building the Cost Pack (CRD)

• Pre-submission
  • BOM/DBOM (Bill of Materials)
  • CBOM (Costed Bill of Materials)
  • Support File
  • Cost Explanation File

• Style and Content
  • Units and basic engineering principles
  • PDF (A4, Portrait)
  • Hard Copy – Colour, bound (make it look good)
  • Branding
  • Quality and flow
  • Correct document size (Page Count and Mb)
Cost Event

Patrick Nicholson
FSUK Participant, 2019
Cost Event Submissions

Bill of Materials

Cost Explanation File

Supporting Material File
Cost Event Submissions

Bill of Materials

Cost Explanation File

Supporting Material File
Cost Explanation File

- Materials
- Fasteners
- Processes
Cost Explanation File

- Cost per kg
- Quotes from suppliers
Cost Explanation File

Materials

Fasteners

Processes
Cost Explanation File

- Parameter of interest
- Example: Length of a bolt

Fasteners

\[ y = 0.0018x + 0.0418 \]
Cost Explanation File

Materials

Fasteners

Processes
Cost Explanation File

- Hourly rate
- Cost of labour, tools, etc.
Cost Explanation File

Prototype vs mass production

Make or buy decisions

Resource and cost planning

Environmental consideration

Financial planning
BOM, DBOM & CBOM

BOM Submission

BOM
List of parts and equipment

DBOM
Include manufacturing processes, materials and tooling

CBOM
Include the actual costs incurred for the prototype vehicle
Supporting Material File

- Include drawings and exploded views
- Match BOM structure
Completing Each Section

Bill of Materials
114 pages
~ 1 week

Cost Explanation File
18 pages
~ 1 week

Supporting Material File
139 pages
Less time intensive
Tips from 2019

Consistency is key

Practice makes perfect

Don’t leave it to the last minute
Thank you for listening

Good luck for FSUK 2020
2020 Submissions

- 2019 vs 2020
  - Move to online tool (details TBC)
  - Don’t assume anything – there will be a learning curve for both parties.

- Use today wisely...
  - Talk to the judges upstairs, go and look at the example CRDs in order to make 2020 submission as slick as possible...
  - Make sure you submit the right documents

- Ask questions with time to spare
  - Ask sensible questions...
At the Event

• Have intimate knowledge of your Cost Documents
  • Make sure the wider team know the basics too
• Don’t lie... You can’t cheat a cheater and we are better at it.
• Cost Understanding
  • It’s obvious we will ask you certain things, you need a “Stump Speech”
    • BUT..... Also have something ready that we haven’t heard before
  • Cost build up: Labour rates, buildings and machine costs (realism)
  • Manufacturing process understanding
    • Mass vs Prototype Production
Don’t screw up...

- Being late (to the event or for submissions)
- Having too much or too little confidence
- Forgetting to tell the judges about the good stuff
- Show that you have learnt from your mistakes
- Not asking the judges what they think and how would they do it
- Try and make it look natural. Play it cool, try and have fun with the process and the judges.
Questions ???
and other memes I wanted to use....