



**Sustainable Design in  
Telecommunications.**

**Loughborough University  
and  
Nortel Networks.**

**Dr. Allen Clegg and Dr. Ken Snowdon.**

# Case Study- Telephone Re-Manufacture.

- **Economic/Legislative Background.**
- **Recycling- Handsets, KSU, Squarial.**
- **Degrees of recycling- cleaning, mechanical and electrical repair, upgrades hardware and software.**
- **Technological progress.**
- **Transport Packaging.**
- **Practical Disassembly.**
- **Processes and Design Pointers.**
- **Ist year Design and Manufacturing students.**

# As “received” Telsets.



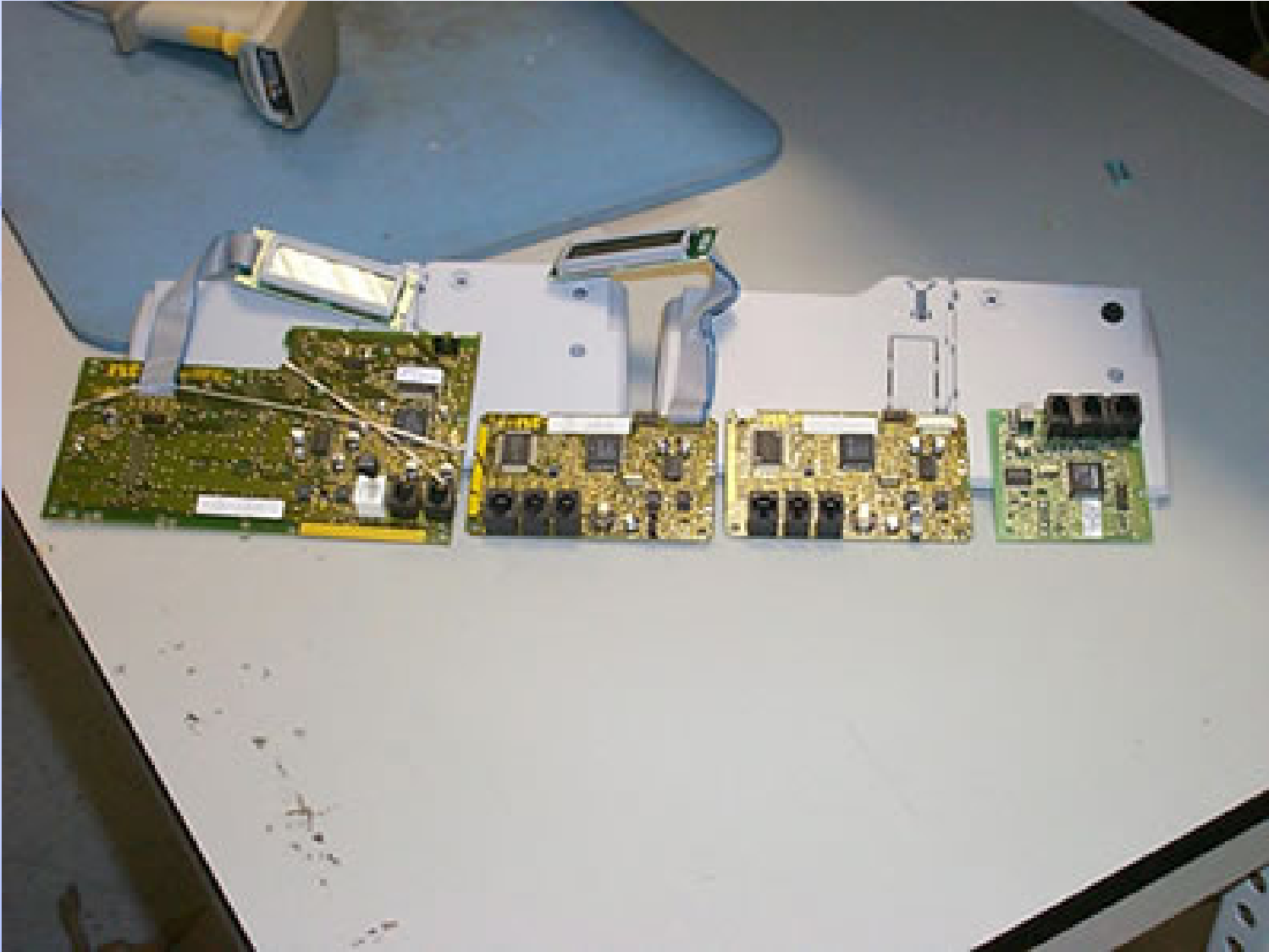
# Key Switch Unit.



# Fixed Wireless Access Squarial.



# Printed Circuit Boards from Telsets.



# Case Study- Environmental Management Systems

- **5 Scenarios. Different size companies, industries, philosophies,needs.**
- **Group work. Students took the role of managers of the companies. Identify env. Impacts, improvement plans, proposals for action.**
- **Real life experience from Hadleigh Castings and Nortel Networks laboratories.**
- **Delivered to final year Design students.**

# **Case Studies in progress or planned.**

**Life Cycle Assessment. Look & Feel panels. Software needed. Info. being gathered.**

**Haz. Mat replacement. Pb free interconnect material being collected.**

**Compulsory 1 week MSc module on Engineering Design course being prepared. Module also to be used as an elective on CIM Management 3<sup>rd</sup> year course.**

**Manufacturing for the Environment module  
COMPULSORY for undergraduate students 2001/2002.**

**B .Eng, 4 hour lecture contribution in Mechanical Engineering to be devised.**

# Delivery Format to Students.

- **By lecture and practical disassembly of old equipment.**
- **Close coupling between VP and academic with visits to Nortel facilities.**
- **VP suggested approach to MSc student for DFE of a power tool.**
- **Case study material in varying states completed, web site launched and being planned.**

# Assessment of Outcomes.

- **Students seemed to enjoy telephone disassembly-  
via questionnaire scores.**
- **University recognises importance in move from  
voluntary to COMPULSORY exams.**
- **Teachers willing to deliver eco-story but, timetable  
is already crowded.**
- **Engineering Institutions seen to be key in making  
sustainable development compulsory in the  
Syllabus.**