

# The Daily Telegraph

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## ELECTRICAL WIRING APPLICATIONS

The benefits to be gained from computerising many electrical wiring design and manufacturing operations can be considerable. However:

- The potential difficulties tend to be greater than those encountered in the more common CAD/CAM applications;
- The market for computer aided wiring design and manufacture systems is small relative to such applications as 2D draughting. It is also a market where requirements vary considerably and off-the-shelf systems are rarely found to fulfil all the requirements of a particular company.

Hence many limit their use of CAD/CAM to simple 2D drawing where the benefits are relatively insignificant. This is a great pity as the general purpose CAD/CAM systems used by many electrical engineering companies can usually be adapted to provide the necessary analysis functions.

### Analysis and Outputs required

All the analysis and outputs required should be identified at the outset so that the data and the inter-relationships needed to achieve these results can be determined. Obviously, extra benefits will accrue with every added use made of data already held in a CAD/CAM system. For example, from a drawing showing the physical layout of a wiring harness or cable tray system and a circuit diagram, a routing program can determine the shortest route for each wire, from which may be derived:

- Length of each wire
- Wires running through each individual harness leg or cable tray
- Circuits which cannot be made through the physical routing
- Comparisons of wire routes before and after design modifications
- Drawings of selected wire routes

### Methods of Data Input

The volumes of data involved can be quite high, especially in comparison to many mechanical engineering applications. Therefore, it is important to choose the most effective combination of input methods so as to minimise the tedium of data entry and number of errors. There are three principal alternatives:

- A CAD/CAM command or digitising facilities can be used to enter circuit diagrams, wiring routes and dimensions.

- B** VDU's or PC's provide a cost effective method of entering textual data such as wire size and type, signal names, component references and pin names. Suitably designed screen forms together with data verification checks can provide an ergonomic user interface.
- C** Transferring data from other computer systems. This should be exploited wherever possible to avoid unnecessary work and errors.

## Data Storage

The key options regarding where the data is held are:

- A** CAD/CAM drawing files. The key advantage of this alternative is the ease with which design modifications may be made. The key disadvantage is that most CAD/CAM systems impose quite a small limit on the size of wiring system which can be handled before response times begin to suffer.
- B** Structured database. This alternative provides faster and more flexible reporting facilities, but interactive response times when editing geometry will generally be slower.
- C** A combination of the drawing and database methods. It is possible to increase the size of wiring system which can be handled and improve reporting speeds by linking a database to the CAD/CAM system. The link between the systems is critical and, as there is often an overlap such that some data is held in both systems, very well defined procedures for processing design modifications are needed to avoid conflicts in the data.

## Conclusion

The CAD/CAM systems used in many electrical engineering companies could be exploited to much greater effect. Often all that is required is a little customised software to tailor the system to the particular requirements or to link the CAD/CAM system with a database or design analysis programs.

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for the CAD/CAM92 Show and was prepared by Roger Billsdon of the Cambridge based CAD/CAM Consultancy and Software House ADE Analysis & Design Engineering Ltd, who may be contacted on 0480 66209 or 0638 741788.

The CAD/CAM EXHIBITION is the definitive event for the design and manufacturing industry.

*For further details contact:* EMAP International, 12 Bedford Row, London WC1R 4DU. Tel: 071-404 4844