the end product must be acceptable'.

In my opinion we have just passed through the equivalent of a Neanderthal age, as far as colour control is concerned, where primitive man has been wrestling (literally) with the problems of how to control colour in order to achieve an imprecisely defined result. We are now entering a more 'Neolithic' age where we are beginning to comprehend some of the basic principles of colour control.

Should anyone doubt this analogy, I would point out that we still know more about the problems of colour control than we know answers, as witness Pira's Literature Review (PR/170) on this subject.

At present what we can do is:

1 Prepare 'proofs', 'targets', 'artwork', 'layouts' or other reference data which we hope the printer will reproduce with facsimile precision.

2 Pre-set an ink duct to allow a controlled ink flow varying subtly across the width of the duct.

3 Determine the 'carry over' of ink from the duct to the ink roller train by remote control.

4 Measure the 'density' (ink film thickness) of the ink film finally deposited upon the substrate at certain locations.

5 Use these density readings to initiate a correction procedure.

At present we cannot, automatically:

1 Tell whether differences in observed colour quality values are positively attributable to (a) ink variation or (b) damp variation.

2 Quantify variables attributable to different types of inks or ink manufacturers, or to different types of substrates and substrate properties such as absorbtion, gloss, grammage, etc.

3 Control the metering of ink around the printing cylinder as well as across it.

4 Allow for temperature variations as the press warms up or cools down, which affects ink flow and consequently the quantity of ink deposited on the substrate, as well as its recorded density. (Some presses do have water-cooled steel cylinders in their inking systems, but none of these will guarantee a consistent temperature of the applied ink.)

5 Include allowances for tack values of inks (which will be affected by temperature variations) to predict the effect of overprinting of any given combination of colours.

6 Compensate for press variables such as blanket hardness, pressures, plate wear, and changes in damping solution. Even running the press at a different speed will result in subtle differences in the observed copy.

The current range of ink control systems comprises a number of discrete parts which can be purchased as a total system, or built up in sections to form the complete system or part system. The parts can be grouped as follows:

1 Remote-controlled ink ducts and overall ink transfer mechanisms.

2 VDU or LED display of ink key settings.

3 Densitometer scanning of printed sheets.

4 Ink key correction from densitometer scanning.

5 Recording of data on tape, disc or card for use in a management information system or for presetting the press in the event of a reprint of a production of a similar nature.

6 Plate scanning, which enables a profile of the duct key settings to be obtained and a projected reference for the ink transfer mechanism.

7 Film scanning, which enables predictions to be made one stage earlier than platemaking.

8 Multi-press control.

The market for these systems and sub systems would appear to be limitless. Most of the major manufacturers are developing their own complete systems, and Heidelberg reports that 85 per cent of its Speedmaster presses are sold with CPC control.

Below: Planeta prefers a continuous blade.
Right: Koenig & Bauer Colortronic programming unit.