

**Client** Burrups Ltd

**Date** 1995

**Project** Remote Proofing for a Financial Typesetter

**Role** Project Manager, Hardware and Software Designer

**Background** Burrups Ltd was a financial printing company with a history spanning 370 years. A large part of the company's activity was fast turn-around overnight typesetting and printing of financially sensitive documents such as flotations, take-over bids and rights offerings. Financial typesetting was performed using Data General Miles 33 computers and Autologic photosetters with slaved Xerox laser printers for proof printing. Typically, there would be fifty jobs in progress, with five being active at any one time. The demanding schedule of overnight city printing could require ten proofing cycles for each active job in as many nights. Documents could be hundreds of pages long so several staff would work together on updating a single document. Revised versions of the documents would be proofed, photocopied and then couriered or faxed to clients for the start of the next business day. With complex financial deals, dozens of lawyers, bankers, accountants and consultants would need to see fresh proofs each morning. In many cases the financial deal had an international aspect, so clients in New York, Tokyo, Frankfurt or elsewhere would be supported by a local Burrups office or an affiliate. In these cases, changed pages would be transmitted as Autologic coded files to the nearest local office, photoset, copied and couriered to clients from there.

There were a number of problems:

- Data or fax transmission was very slow and its international communication costs were huge
- The quality of fax was inadequate and could result in mistrust of the text by the client
- The complex manual procedures for proofing, faxing and photocopying meant that there were frequent errors such as missed pages caused by fax machine paper jams
- Labour costs were high due to the manual processes for document transmission
- Fax machines in remote unattended client offices were prone to paper out and security issues

**Investigation of potential solutions** One of our USA affiliates had developed a system using a DEC MicroVAX minicomputer to communicate via modem to an Apple LaserWriter installed into the client's office. We discussed licensing this system from them but adaptation of their system to our needs proved impracticable because the UK market required flexibility beyond the capabilities of the USA system.

I investigated the possibility of Burrups developing its own managed remote laser proofer. Burrups had used Macintosh and PostScript DTP systems for a number of years for documents that required a layout design and graphics. It was apparent that the Macintosh/PostScript platform was the way forward and new financial typesetting software was under development but there would be a number of years before it could fully replace the Miles 33 typesetting system, so a transitional and future proof solution was needed. This would have four key areas:

- Software would need to be developed to convert the Autologic typesetting code output by the Miles 33 typesetting system to PostScript for the laser printer
- Autologic fonts would need to be recreated as exactly matching PostScript fonts
- Methods of reliable data transmission, audit logging and remote management of the laser printers would be needed
- The remote site equipment would need packaging suitable for air freight and installation by the client.

**Software development** I wrote a prototype Autologic to PostScript code conversion utility in Symantec C. This proved a most effective tool and was put into live service even though it was intended to be just a basic demonstration. Following user feedback from sales and production colleagues, I developed a more user friendly and feature rich package using Apple C++. This had a user interface that complied with Apple standards and included audit logging and font download facilities. The first release development took 10 weeks, most of the effort being to create a suitable multithreaded object oriented application framework.

A Macintosh communications package, Microphone Pro was identified as being ideal for the data transmission, requiring just the addition of some short scripts for Burrups' purposes.

PostScript fonts that closely resembled the Autologic fonts were identified and were modified to match the Autologic fonts using the Macromedia Fontographer font utility. This was a labour intensive task as the character outline and width parameters were adjusted by hand for each of the 144 characters in each of the 40 fonts. In the case of Pi symbols (equivalent to dingbats) there were no close PostScript equivalents, so vector outlines were hand drawn over Autologic bitmap templates to create entirely new PostScript fonts.

**Hardware development** A QMS 860 A3/A4 laser printer was selected for its robust and compact construction, high resolution and reasonable speed. A Multitech 9600bps modem and Quantum 170MB SCSI font disc were chosen. To simplify client installation these needed to be packaged with the laser printer. There was insufficient empty space inside this printer to accommodate the modem and font disc, so a slim pod was designed to bolt on the back of the printer. This replaced the printer's rear cover and required no modifications that would have invalidated the printer's warranty or would make the printer more difficult to service. A consultant mechanical design engineer was employed to design the pod's steel chassis and moulded structural foam cover. The cover was styled and powder-coated to match the finish of the original laser printer. I designed a small printed circuit board to accommodate the interface electronics and simplify the interconnecting ribbon cables.



CP Cases, a company specialising in the manufacture of air freight cases was engaged to manufacture an airline-approved transit case made of vinyl-covered plywood with steel reinforced corners and clasps. The interior was lined with resilient foam, laser-cut to fit the laser printer and its paper tray.

The hardware design process took 15 weeks, the critical path being the design and tooling of the epoxy resin moulds for the structural foam cover. Hardware design costs were £19,000.

**Operations** An initial batch of six laser printer proofing systems was constructed in Burrups' IT workshop. These proved an immediate success and a second batch of twelve was constructed straight afterwards. In total, forty systems were deployed in the field over the following two years.

When the Data General computers and Autologic phototypesetters were eventually replaced by Macintosh DTP and PostScript imagesetters, the remote proofing solution continued to be of benefit, although the Autologic conversion software and modified fonts were no longer needed.