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<tr>
<th><strong>Title</strong></th>
<th>Trends in technology for newspaper presses.</th>
</tr>
</thead>
<tbody>
<tr>
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</tbody>
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Trends in technology for newspaper presses

Comments by

Lawrence J. Bain
Rockwell Graphic Systems
Rockwell International is a diversified technology company with leadership positions in such products as:

- Fax Modems
- Commercial and Military Avionics
- Factory Automation
- Global Positioning System Technology
- Space Exploration
- Heavy Duty Truck Components, and
- Web Offset Printing Presses.

Rockwell is a company with annual sales of 13 billion U.S. dollars. Rockwell has 82,000 employees in 26 countries around the world. I am among the more than twenty percent of Rockwell employees who are scientists and engineers.

Rockwell Graphic Systems is a business with historical roots in the manufacture of printing presses that date back to 1885, and we are the world leader in the sale of high-speed web offset equipment. We are also the only major printing equipment supplier with manufacturing facilities in North America, Europe, and Asia.

Rockwell Graphic Systems products include:

- Single and Double Width Newspaper Presses,
- Insert and Directory Presses,
- Commercial and Publication Presses, and
- The Controls to Operate These Presses.

These products are engineered and manufactured on a global basis at our facilities in the United States, the United Kingdom, France, Japan, and the People's Republic of China. Consistent with Rockwell as a corporation, approximately twenty percent of the employees of Rockwell Graphic Systems are engineers and scientists.
SHAFTLESS/GEARLESS DRIVE

Shaftless drives for printing presses are a technology shift. This means that the benefits and the costs of the new technology accrue from the technology itself, the manner in which the technology is used, and the culture into which it is thrust. New technology usually creeps into the applications to which it is best suited, rather than making a giant leap. This is because the true capability of a technology is not sufficiently well understood in its early years for people to accurately forecast its ultimate value.

Today, conventional shafted press drives have:
- Known Performance,
- Known Costs,
- Known Reliability,
- Known Limitations, and
- Minimum Risk.

Rockwell believes that introduction of the technology upon which shaftless drives are based should take the form of what are called distributed drives. Distributed drives are configured so that the multiple motors in a unit through which a single web is run are connected together with shafts and clutches, but shafts are not present between units not running the same web. The distributed drive concept provides:
- Increased Operational Flexibility,
- Lower Energy Consumption,
- Conservative Exposure of Operators and Maintenance Personnel to New Technology, and
- Acceptable Risk with respect to Press Reliability and Print Quality.

Fully shaftless drive arrangements do offer the greatest potential operational flexibility and the greatest potential reduction in energy consumption. But these potentials come at the cost of reduced reliability. For example, there is no \((N - 1)\) motor redundancy to provide a fail-operational capability as there is in conventional and distributed drives. In addition, the technical skills needed to recover from power outages of various kinds may be beyond the capability of available maintenance personnel.

Most importantly, there is no proof that the technology now available is capable of maintaining the tolerances on cylinder velocity demanded by the requirements of today’s high quality offset printing, let alone tomorrow’s. This is a very serious concern, the tolerances on dot fidelity are at least ten times tighter than the tolerances on register. A press that does not print a round dot is not an acceptable press.
Among all the advantages that can be attributed to the tower concept in newspaper printing, none are even close to the fact that this concept enables a publisher to print more quality color, more cost effectively. The demand for color has grown tremendously in the past two decades. In North America, for example, more than 55 percent of all printing couples sold in 1994 were for color, as compared to less than ten percent in 1974.

The tower enabled newspapers like the Greensburg Tribune-Review, the Sarasota Herald-Tribune, and the Chicago Tribune to add color capacity to existing presses by factors as great as three.

The tower enabled newspapers like the Cleveland Plain Dealer to buy new presses with the capability to put process color on every page of the paper.

If there is a global view of towers in newspaper presses it is that the timing of the demand for color differs in different regions of the world. When the demand manifests itself, the tower has proven to be the best response. So this discussion is not about a fad.

Nor is it about a new concept. Rockwell built the first tower units in 1978, the single-width Community. Since then we have installed more than 800 single and double width towers around the world for back-to-back process color. The other manufacturers represented on today's panel have installed towers as well, so the total count is in excess of 1,000 towers or 4,000 printing units.

It would have to be said that this is surely a trend, and we would say that it has gone beyond that. If there is a real trend, however, it is that newspapers are beginning to take on many of the attributes of commercial printing. For example, the subject of driers comes up much more frequently when newspaper press purchases are being discussed. Put into the context of towers and unit-to-unit color printing this does not fail to remind one that commercial printers walked away from satellite units two decades ago.

Are there disadvantages to tower units in newspaper presses? When compared to the benefits already accrued by publishers around the world, I would have to say no.

TOWER vs SATELLITE PRESSES
I believe that the issues which relate newsprint to increasing demand for color, higher press speeds, and longer web leads fall into two categories.

- Paper Printability and
- Paper Runability.

The printability properties of paper are driven by the advertising market and the economics of the marketplace. In other words, printability properties are revenue issues from the newspaper's point of view. As newspapers have to compete harder for the color advertiser's business, paper will become a more important part of the equation. And that equation has a term in it called "quality". As a point of reference, you can look at magazines and catalogues and begin to imagine what kinds of attributes newspapers might have in the future and how the quality of paper might come into play. Paper suppliers already know how to make the right kind of paper to give you the printability you need, what they don't know yet is exactly what kind of paper you will need.

More appropriate to the present session are the issues related to paper runability. The runability properties of paper are driven by productivity issues. In other words, paper runability determines part of your cost of operation.

The key word in any discussion of paper runability has to be "uniformity". Within a roll, and roll to roll, paper has to be uniform for a press to operate at its highest level of productivity.

- Uniform in Basis Weight,
- Uniform in Caliper, and
- Uniform in Moisture Content.

Paper mills are quite capable of producing paper with uniform properties, modern papermaking machines incorporate some of the most sophisticated process control systems available. However, all the critical properties can, and do, change between the time the paper leaves the mill and the time the paper is spliced into your press. This happens because the environment to which the paper is exposed changes, so the paper sees differences in temperature and relative humidity.

The first action to be taken as far as newsprint goes is to examine, improve, and control the environment to which you expose your newsprint. Read the reports on the effects of temperature and humidity on paper properties, learn how long it takes a roll of paper to come to full equilibrium with its environment, and reap the benefits of conscientious management of your most costly raw material.
Keyless offset would make a good topic for a future academic study of the process of technology development and technology-based competition. A student could start his or her paper by noting that lithography, as it was practiced by Alois Senefelder in 1789, originated as a keyless process. It was not offset, but it could have been. Reading on in this student's paper you would learn that printing technology moved away from keyless as people discovered ways to gain other needed benefits, like efficiency. Skipping ahead to see how it all comes out, you would read that in the latter years of the twentieth century the industry was making a concerted effort to recover some of the simplicities practiced by Senefelder without losing the efficiencies introduced by those who followed him.

So the reason that this topic is on today's agenda is not that keyless inking is a radically new concept or that it isn't well developed in certain applications such as flexography. The reason keyless offset is on the agenda is that "offset" is a euphemism for offset lithography, and in many respects keyless lithography still hasn't reached the level of performance achieved by Senefelder 200 years ago.

The guidelines provided to us for today's discussion included the point that the pros and cons of the several contemporary approaches to keyless offset were of interest. These guidelines also included the point that product pitches were to be avoided. These two points are incompatible. Every manufacturer has a unique offering, no optimum scheme has yet emerged. Each manufacturer, myself included, who wishes to sell you a keyless offset press will present data that explains why his particular offering is superior to all others. And each manufacturer who wishes to sell you a keyless offset press will present data that explains why alternative approaches to keyless offset are inferior to his offering. I submit to you that the state of development and implementation of keyless offset is such that there is no objective reality in all these data.

The country from which I come prides itself on its pioneers, the winning of the West as we call it. Keyless offset is still the stuff of pioneers, the trails are still being broken. But as is true of pioneering, the settlers come in droves after the trail is blazed. Two years from now there will be at least twice as many keyless color presses in daily operation than there are now. They will have been supplied by several manufacturers. Twenty of these presses will have Rockwell nameplates on them. It will be much clearer to see what is proven and what is not.

What is the last sentence in my hypothetical students' paper on the development of keyless offset? It is not yet written.
Lawrence J. Bain

Lawrence J. Bain is the Director of Printing Technology at Rockwell Graphic Systems. Mr. Bain is responsible for printing process development and process control technologies for Rockwell's Newspaper and Commercial Products. His current activities also include direction of research projects in the physical chemistry of lithographic materials and printing applications of advanced imaging technologies being conducted at the Rockwell International Science Center.

Mr. Bain has served on the Board of Directors of the Technical Association of the Graphic Arts and is a graduate of the University of Colorado and the Massachusetts Institute of Technology.
Per your request dated 8/11/95 please find attached my short biography.

Our requirements for the panel session will be a slide projector and for our workshop meeting both a slide and overhead projector.

If you require further information please do not hesitate to call me.

Best regards

Mike Stevenson
Mike Stevenson’s Biography

Director of Newspaper Press Projects.

Mike Stevenson joined the Harris Corporation in 1961 and trained as an engineer at the UK operation of Harris Intertype, involved in the manufacture of hot metal line composing machines and sheet fed printing presses.

During 1967, in pursuit of further engineering experience, Mike joined the Ministry of Defence specializing in the quality control and project management of guided weapon and space vehicle propulsion units.

A move into sales in 1974 saw a return to the printing industry where Mike worked for two other press manufacturers, traveling extensively in Africa.

Mike rejoined Harris in 1979 as UK Sales Manager Newspaper Presses for Web Press Europe. He has held various positions in sales including Director Newspaper Presses and has for the last seven years been located at the North American Headquarters of HEIDELBERG HARRIS as Vice President International Sales.

In August this year Mike relocated to France to be responsible for Newspaper Press Projects.