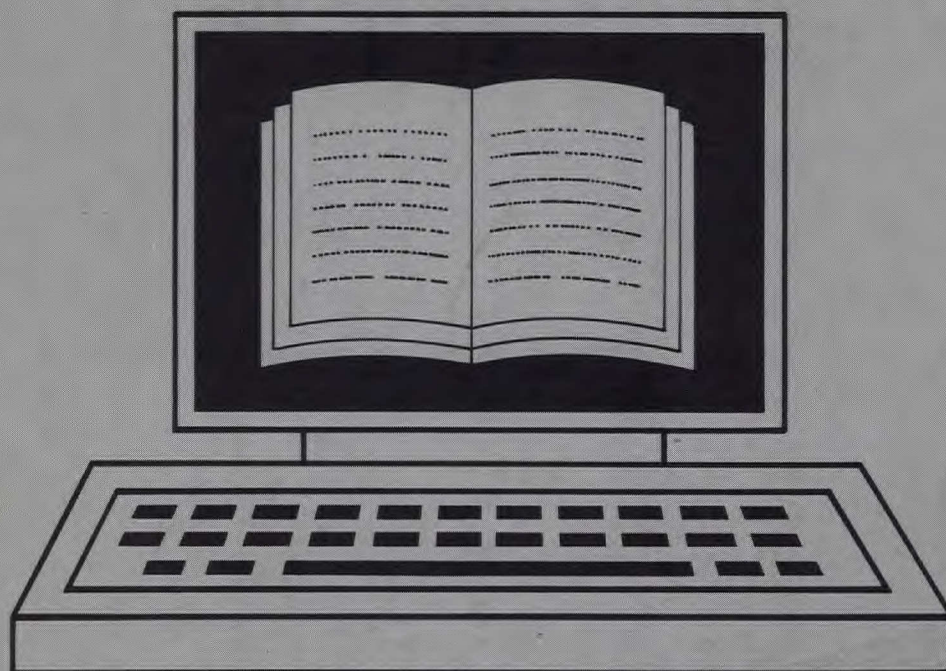


AN ASSESSMENT OF ELECTRONIC PUBLISHING PRODUCTS & INDUSTRY

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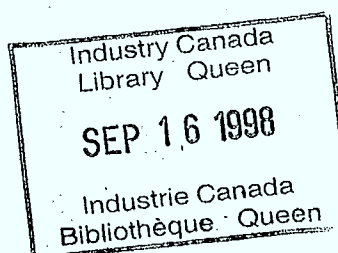


Prepared For
The Department of Communications
Government of Canada

Derek Murray Consulting Associates Inc.
In Association With:
Evans Research Corporation, and
Stevenson Kellogg Ernst and Whinney

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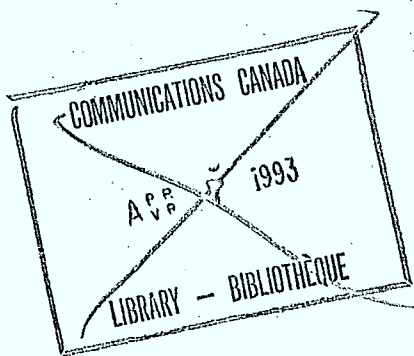
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**AN ASSESSMENT OF
ELECTRONIC PUBLISHING PRODUCTS
AND INDUSTRY IN CANADA**
**— REGIONAL AND REMOTE PRINTING —
IN NORTH AMERICA**

**A Report Prepared for the
Department of Communications,
Government of Canada**

February, 1988



**Derek Murray Consulting Associates Inc.
Evans Research Corporation and
Stevenson, Kellogg, Ernst & Whinney**

This image shows a blank, aged, cream-colored page, likely an endpaper or flyleaf of a book. The paper has a slightly textured appearance with some minor discoloration and faint, illegible markings, possibly from a previous page or a stamp. The left edge of the page shows the binding structure, including what appears to be a metal clip or staple used to hold the page in place. The overall tone is warm and slightly yellowed, characteristic of old paper.

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EXECUTIVE SUMMARY

Remote printing involves the transmission of complete pages of typeset text and graphics from a central location to regional or remote sites for printing and distribution to readers. Remote printing on a large scale generally involves the use of some form of electronic data transmission. Although competing technologies such as microwave, land lines, and fibre optics are available, satellite transmission is preferred for reasons of economy, reliability, and flexibility.

By collapsing the lead time required to get a publication into the hands of distant readers, remote printing allows a publisher to combine timeliness with in-depth analysis. Other benefits include the inclusion of more late-breaking news, faster and more efficient production, and greater latitude to meeting editorial, advertising and distribution deadlines.

Regional printing is not yet a widespread phenomenon. In the United States, where the practice is most extensive, there are only two periodicals and five daily newspapers with remote printing facilities. In Canada only The Globe and Mail has a satellite-based regional printing operation.

There are two major reasons for establishing remote printing operations. The first, and by far the most important, is to increase revenue by building circulation. The second reason for adopting a remote printing strategy is to reduce the cost of getting the publication into the customers' hands. Justifying remote locations on distribution costs is strictly incidental to the market-driven rationale.

The three main elements of a remote printing plant are:

- (1) the printing equipment
- (2) the laser scanners or facsimile machines for digitizing data
- (3) the transmission equipment.

In building a plant from scratch, the largest single expenditure is for the press units, electronic pre-press equipment and peripherals. Reliable estimates place the cost of purchasing and housing this hardware at \$25 million (Canadian). A single high-end laser scanner costs approximately \$75,000 (U.S.) making the cost of outfitting a single remote plant with two scanners about \$200,000 (Canadian). Satellite transmission costs include charges for the terrestrial stations at the remote sites, the central office facilities, and the leasing of the transponder capacity.

In the future, remote printing will become a possible option for more publishers as costs fall and new technologies come on stream. The main breakthroughs will be advances in software for paginating and typesetting, reductions in transmission costs because of new technologies like fibre optics and VSATs (very small aperture terminals), and cost and feature improvements in laser scanners.

Five interrelated and interdependent criteria must exist before remote printing becomes a viable alternative. These criteria are:

- (1) A National Product
- (2) Distance from Target Markets
- (3) Adequate Circulation Levels
- (4) Time/Deadline Sensitivity
- (5) Physical Mass of the Publication

No existing Canadian publication as presently constituted (except the The Globe and Mail) can meet all three criteria. Most general interest daily newspapers in this country are too closely identified with their own cities or regions to be of mass interest in other parts of the country. On the other hand, publications which do have a national constituency are generally focused at narrowly-defined trade, industry or special interest audiences.

1.0 INTRODUCTION

1.1 Objectives

In fulfilling the mandate received from the Department of Communications, Evans Research Corporation completed the following objectives:

1. Documented the current status of regional printing both in Canada and elsewhere in terms of end-users, technologies, systems, costs and benefits.
2. Compared regional printing with traditional distribution patterns in terms of costs and performance.
3. Identified the future trends of the technologies and systems involved in regional printing in terms of their functionality and cost.
4. Quantified the potential opportunities for regional printing in Canada relative to cost and market size.
5. Documented the impact of regional printing on publishers' operations, on suppliers of communications facilities, and on other related industries.
6. Identified the issues and impediments which relate to the future diffusion of regional printing in Canada.

1.2 Methodology

The research was conducted during April and May 1987. The first stage of the research involved an extensive literature search of material available within the Evans Research Corporation database, from the Metropolitan Toronto Reference Library, and from a number of private sector Special Libraries in the Toronto area. This task provided data on the major issues, players and personalities.

The next stage of the process involved approximately fifty interviews with sources in day-to-day contact with both the printing and satellite transmission marketplaces. These sources included newspaper association officials; printing industry officials; representatives of satellite service vendors; representatives of printing equipment suppliers; consultants; journalists; government and regulatory officials; and decision-makers and production staff in five North American newspapers which use a remote printing strategy.

2.0 REGIONAL AND REMOTE PRINTING

2.1 Introduction

Over the last fifteen years, remote printing has become an attractive, cost-effective distribution option for some of North America's largest newspaper publishers. Under a remote printing regime, complete pages of typeset text and graphics are composed at a central location and then transmitted to regional or remote sites for printing and distribution to readers. Remote printing on a large scale generally involves the use of satellites or some other form of electronic transmission to send the data. For smaller operations, publishers often use couriers or land transportation of some kind to send material for printing.

Remote printing helps publishers to increase circulation in far-off or hard-to-reach areas by providing measurable improvements in service to both readers and advertisers. By collapsing the lead time required to get a publication into the hands of distant readers, remote printing allows a publisher to combine timeliness with in-depth analysis. Other benefits include the inclusion of more late-breaking news, faster and more efficient production, and greater latitude to meet editorial, advertising and distribution deadlines.

Satellites are the most commonly used transmission mode for remote printing. Although competing technologies such as microwave, land lines, and fibre optics are available, satellite transmission is preferred for reasons of economy, reliability, and flexibility. It is a distance-insensitive medium especially suited for the simultaneous delivery of large amounts of data to geographically dispersed locations.

Regional printing is not yet a widespread phenomenon. In the United States, where the practice is most extensive, there are only two periodicals (Time, Newsweek) and five daily newspapers (The Wall Street Journal, The New York Times, The Christian Science Monitor, USA Today, Los Angeles Times), with remote printing facilities. The International Herald Tribune and three British publications, The Economist, The Manchester Guardian, and The Financial Times of London, use satellite technology to print their overseas editions. In Canada only The Globe and Mail has a regional printing operation, and in Mexico, El Nacional, a Mexico City daily, has recently begun nation-wide printing at remote locations.

2.2 Remote Printing Rationales

There are two major reasons for establishing remote printing operations. The first, and by far the most important, is to increase revenues. The objective of the newspaper business is to build circulation because the more newspapers delivered, the higher the rates for advertising space. Due to the perishable nature of current public affairs information, the only way for a non-local publication to increase circulation is to provide same-day, on-time delivery -- to get the news to the public while it is still news. An inability to accomplish this task consistently leads to frustrated customers, canceled subscriptions, and ultimately, reduced revenues.

The second reason for adopting a remote printing strategy is to reduce the cost of getting the publication into the customers' hands. This involves cutting the long-distance freight and/or postage charges. For the North American publications interviewed for this report, justifying remote locations on distribution costs is strictly incidental to the market-driven rationale.

2.3 Necessary Conditions

In the eyes of North American newspaper executives, five interrelated and interdependent criteria must exist before remote printing becomes a viable alternative. These criteria are:

1. A National Product

The publication must have a national profile and national demand characteristics. If this condition does not exist, the marketing strategy must focus on the promotion of the publication as a national product. This was the approach taken by the publisher of USA Today.

2. Distance

In North America, this is almost synonymous with national demand. The markets for the publication must be at such a distance from the central editorial offices that physical distribution methods are somehow inadequate to ensure timely and reliable delivery. There are many national publications in Europe, but because European countries often fall within a single time zone there is no need for remote printing.

3. Circulation

This too is closely related to the need for national demand. The publication must have a minimum level of circulation in the major markets it is trying to address. Circulation must be of a size to permit an adequate return on investment on the costs of production and distribution. For The Globe and Mail, this amounts to a minimum of 15,000 copies per day in each of its major non-Ontario markets.

4. Time Sensitivity

There is no justification for adopting a remote printing strategy unless time is a factor. The publication must operate under rigorously-enforced deadline pressure. Under this condition, the longer that printing can be delayed, the greater the chance the reader will receive a timely and current product. If time is not a consideration, a publisher can always use a courier to send page proofs overnight. This criteria all but rules out any publication that is not a daily.

5. Physical Mass

Due to freight costs, page volume of the publication is a consideration, especially if many copies are being sent to distant markets. This condition is immaterial, however, if the other criteria do not exist.

2.4 Technologies Used

Beyond printing equipment, which is an obvious necessity, a remote printing operation requires a means of transporting the data. A satellite-based system includes at least one laser scanner or high-end facsimile machine at both the mother site and each of the remote sites, a transmitter at the mother site, and a receiving earth station at the remote locations.

Electronic scanning involves the transformation of images and copy into digitized data that can be transmitted by satellites or land-lines to be reconstituted at remote locations. At The Globe and Mail's Toronto offices, two flatbed scanners with red lasers are used to convert full page layouts of the National edition into digital data. One scanner is loading or unloading while the other is scanning. Each page contains 140 Mb of information and takes approximately one minute to transmit. Transmission speed is 3 Mb per second.

The digitized data is transmitted to Telesat Canada's Anik "D-2" satellite which simultaneously relays the signal to each of five remote printing plants. At each plant the signals are received and translated into full-page negatives by two blue (argon) scanners acting in tandem -- one is loading or unloading while the other is scanning. Resolution at the receive end is 1,000 dots per inch.

Two scanners are used at both the mother site and at each of the remote sites because of the tight deadlines in the newspaper business and because of the high transmission costs. The time to scan and transmit each page is critical and by using two scanners in each location, the Globe is able to process a full broadsheet page in less than sixty seconds. Two units also provides protection against systems downtime, a necessity because a newspaper is a highly perishable commodity.

At USA Today, drum scanners rather than the more conventional flatbed scanners are used. Assembled pages are etched onto thin polymer sheets which are then laser-scanned on drums turning at thousands of revolutions per minute. Colour pictures and graphs, a USA Today trademark, are transmitted four times (for the four colours that make up a colour image in printing) in various combinations and are reconstituted at the receive sites using coloured inks.

Once the decision is made to establish remote printing plants, a key concern is the type of telecommunications channel to employ. To resolve this problem, three critical and interrelated issues had to be addressed: (1) the speed of transmission, (2) the cost of transmission, and (3) the resolution and clarity of the final product.

Speed of transmission is important because the reality of news deadlines demands that pages be held back for as long as possible prior to transmission. The cost of transmission is related to transmission speed. A daily newspaper is a broadsheet product containing vast amounts of data, especially when graphics are included. Since the meter is running when

data is transmitted long distance, it is necessary to maintain as small a transmission window (i.e., number of pages/minute) as possible in order to keep costs down. The resolution issue is significant because part of a newspaper's (or any publication's) appeal is visual. If the remote editions were blurred, poorly formatted, or otherwise unattractive in any significant way, any gains made by timely and reliable delivery can be lost at the point of sale.

Although terrestrial telephone lines can be used to transmit data for remote printing, satellite technology has emerged as the transmission medium of choice. With leased lines, costs rise with the number of sites and the increase in distance from the central site, independent of the amount of information transmitted. In addition, the average cost per site remains relatively constant regardless of the number of sites so a large network has no built-in economy of scale incentive. Furthermore, connect charges from the local telephone company are rising and with a multi-site, multi-jurisdictional operation it is often necessary to deal with more than one local telco.

Other benefits of a satellite system include:

1. **Reliability:** a satellite system does not use either switching nodes or repeaters so the points at which signal loss and noise can be introduced are minimized.
2. **Control:** whether the transponder is leased full-time or on an occasional use basis, carriers guarantee availability at previously scheduled times. Because the channel is dedicated to the customer, there never is a problem with too much traffic or overloaded circuits.
3. **High Capacity Bandwidth.**
4. **Low Bit Error Rate.** Modern satellite technology has a bit error rate of less than one bit in 10 Megabits versus one bit in 10,000 bits for dedicated leased circuits.

In Canada, The Globe and Mail had a choice between conventional telephone land lines and a satellite network. The newspaper discovered that to transmit using conventional means was "horrendously time-consuming", and because charges are levied by the minute, "the cost was just enormous". In contrast, with a satellite system "you just blast it up there and can transmit at a page per minute." A satellite system also proved superior on the resolution issue because a satellite link is a clear channel subject to very low levels of atmospheric interference. Microwave or conventional land lines, on the other hand, degrade too much over long distances.

At the receive site, a full turnkey data communications system is composed of a five-metre dish, down converter, modem and high-powered amplifier. The mother site has either an on-site 11-metre-diameter uplink station or a backhaul link to the satellite carrier's transmitting centre. The signal is sent to a transponder aboard one of the satellites stationed in geosynchronous orbit above the equator. The signals use 56-kilobit (56,000 bits per second) wide-band channels multiplexed into 1.5-Mb channels. From a fixed location relative to the earth's location, the satellite receives signals and retransmits them back to earth stations.

Transmission by satellite is simultaneous point-to-multi-point. Transmission on uplink is about 6,000 megahertz (the same as a satellite television transmission) while the signal going to the receiving dish is converted by the satellite to 4,000 megahertz. The antenna on the satellite beams the signal in an expanding cone-shaped field called a foot-print.

2.5 Costs Involved

The three main elements of a remote printing plant are:

- (1) the printing equipment
- (2) the laser scanners of facsimile machines for digitizing data
- (3) the transmission equipment.

In building a plant from scratch, the largest single expenditure is for the press units, electronic pre-press equipment, and peripherals. Reliable estimates place the cost of purchasing and housing this hardware at about \$25 million (Canadian). A web press, which is the type of press conventionally used by large daily newspapers, can cost in the neighbourhood of \$5 to \$8 million. A remote printing location does not need special presses but it is preferable to have presses identical to those at the mother site.

The laser scanners of high-end facsimile machines are the most critical pieces of equipment used in remote printing. They are used to prepare the data for transmission at the mother site and to capture it at the remote location. Of necessity, these machines must provide resolution in the neighbourhood of 1,000 dots per inch (dpi). A single high-end laser scanner costs approximately \$75,000 (U.S.), making the cost of outfitting a single remote plant with two scanners about \$200,000 (Canadian).

There are three major elements to the cost of satellite transmission: the terrestrial stations at the remote sites, the central office facilities, and the leasing of the transponder capacity. The cost of terrestrial stations is dropping as designs improve, manufacturers' production volumes

increase, and competition grows. At present they can cost anywhere from \$2,500 to \$20,000 each depending on the extent and nature of peripherals and on whether they are receive-only or interactive. Outfitting a central hub station is considerably more expensive, running in the area of \$750,000 to \$1.5 million. Capital costs can be reduced if use is made of shared facilities like Telesat Canada's new Teleports, but then arrangements must be made with the local telephone company for a dedicated backhaul link. Transmission costs are a variable cost. They will probably begin to decrease in the near future for both full-time and occasional use customers. Canadian Satellite Communications Inc. of Montreal has begun to lease transponders from Telesat and is offering one-way and two-way communication systems in competition with Telesat.

When the New York Times was contemplating establishing a remote operation they were faced with a "rent or buy" decision with respect to the regional printing plants. Ultimately, the newspaper decided to lease capacity from existing plants because of uncertainty regarding the long-term success of the project. The Times estimates that it would now cost approximately \$18 million (U.S.) to purchase the printing, digitizing, and transmission equipment necessary to establish a single company-owned remote plant. The heaviest investment would be in the printing equipment.

When The Globe and Mail developed its remote operation, it cost the company approximately \$750 thousand per site to outfit existing printing plants to receive data by satellite. The bulk of this cost was for the two laser scanners that transform the digitized data into negatives, and the estimated payback period was approximately three to five years.

Although the Globe now owns the satellite receiving dishes at the remote sites, initially they were forced to rent them at a cost of \$1,125 per site per month. Payback on the company-owned earth stations is estimated to be two years. Satellite transmission charges amount to \$733 per hour.

3.0 COMPARISON WITH TRADITIONAL DISTRIBUTION

3.1 Introduction

The cost of such traditional distribution methods as freight and the mail service was not a significant consideration for any of the North American publishers who have adopted a remote printing strategy. According to one source "transportation costs are a minor issue that can almost be set aside".

Performance considerations relative to newspaper circulation were far more important, especially remote printing's capacity to reduce circulation, a crucial concern because, "if you're in the newspaper business, you have to deliver newspapers on time."

3.2 Cost

For The Globe and Mail, transportation costs did not pose a major problem so long as the number of newspapers to be delivered remained small. Once the Globe was delivering more than 50,000 daily newspapers outside of Ontario, however, the up-front costs of establishing a satellite network became very attractive. It would have taken the Globe much longer to reach this conclusion if the Globe was only 32 pages long instead of its current 48 to 64 page size.

Although cost savings were also a secondary issue to the New York Times, the newspaper does realize substantial savings with remote printing because it has completely eliminated air freight charges to regional markets. These were not a trivial expense, especially considering the size and weight of the Sunday Times! Savings were also made on newsprint because the national edition of the daily Times is smaller than the local New York edition.

3.3 Performance

In terms of performance, The Globe and Mail found both second class mail and airplane service supplemented by local delivery systems to be unreliable and therefore, unacceptable. If the press run was late, the Toronto originating flight and all connecting flights were missed. When snowstorms occurred or when airplanes were overloaded with freight or with passengers, newspapers were assigned a low priority and would often be bumped off the flight. The result was missed deliveries, a low level of service, and a correspondingly low level of consumer confidence. In some weeks, The Globe would miss deliveries on three out of six days a week in Winnipeg.

With remote printing, data is transmitted on a C band (6/4 GHz) satellite channel on an occasional use basis. The Globe transmits the Report on Business at 8:00 P.M. Toronto time and the front section, containing late breaking news and sports scores, is sent three hours later. Telesat Canada guarantees 98 percent network availability. In six years there have been no major transmission problems and the Globe has never missed a printing deadline.

4.0 FUTURE TRENDS

4.1 Introduction

In the future, remote printing will become a possible option for more publishers as costs fall and new technologies come on stream. The main breakthroughs will be advances in software for paginating and typesetting, reductions in transmission costs because of new technologies like fibre optics and VSATs (very small aperture terminals), and cost and feature improvements in laser scanners. Despite the opportunities provided by these changes, the major trends will be new applications of existing technologies.

4.2 Remote Advertisement Transmission

One new application of satellite technology to the printing industry involves the transmission of national advertisements from a central site to widely dispersed newspapers. This application is still in its infancy in the United States, with only a dozen sites currently in the network. It is estimated that a hundred sites will be linked by September 1987.

Adsat, a New York company owned by Maxwell Communications Inc. of Britain, is spearheading the network creation. The concept was developed by the American Newspaper Publishers Association (ANPA) and the technology was designed and built by Matsushita Graphics Communications, Inc. of Japan.

Satellite transmission of advertising copy had its seed in a more generalized use of satellites to transmit wire service copy, proposed in the mid to late 1970s. The idea was first

proposed in the wake of the 1974 deregulation of satellite dish locations by the Federal Communications Commission which essentially marketed the start of the U.S. domestic satellite era. The initial reaction from Associated Press and United Press International, the American wire services, was indifference. At that time the news wire services were using land lines to transmit copy. With receive-only dishes costing in the range of \$75,000, using satellite transmission solely for this application was not considered economically feasible. Soon after, however, AT & T almost doubled their data transmission rates and the wire services were ready to reconsider. Now all major American newspapers use satellite facilities to receive all text-based AP and UPI feed.

The sophisticated, computer-based Adsat system was designed with both advertising and satellite transmission in mind. Advertisers have terminals in their offices which they use to reserve space on both the satellite (which is on 24-hour lease) and in the receiving newspapers. The advertiser first indicates in which newspapers he wants the full or partial page ad to run. Once the camera-ready copy is received at the New York transmission headquarters, the computer plugs in the receive addresses, and the ad is scanned at a rate of 1200 dpi by one of two \$125,000 laser readers. At 1200 dpi, the resolution is superior to normal newspaper quality of 890 dpi but transmission takes slightly longer. The ad is then simultaneously transmitted in under four minutes to all the designated sites.

The equipment at the receive sites is designed to produce copy ready for use. The receive dishes cost a relatively inexpensive \$5,000 - \$6,000 but the scanners are in the

neighbourhood of \$75,000. Because advertising requires intermittent delivery, the system is designed to operate without constant attention at the receive sites. There is a message system on the terminal to let the receiving newspapers know what advertisements they should have received.

For advertisers, the primary benefit is the reduced cost of physically distributing advertising copy to all parts of the United States. Satellite transmission is considerably cheaper than using a courier. A secondary benefit is reliability. Soon after the system began running the east coast of the United States was inundated by a massive snowfall. While physical distribution links were disrupted, Adsats were able to deliver its clients' ads to distant newspapers. A third benefit for advertisers is the greater flexibility that comes from extended deadlines for camera-ready copy.

Adsats have targeted the newspapers in 100 major markets as defined by advertisers according to such criteria as population, income and other demographic parameters. The service is available to all the major circulation newspapers in these centres. Once Adsats have representation in these cities, it plans to start penetrating the next 200 cities. Eventually the company hopes to get state newspaper associations to act as receiving/distribution sites for smaller newspapers within their jurisdictions. Another future Adsats strategy involves convincing major retailers like Sears and K-Mart to establish uplink facilities at their regional headquarters and piggy-backing on the Adsats facilities to print media within their selling area.

In Canada, a committee has been formed by the Canadian Daily Newspaper Publishers Association (CDNPA) to investigate

introducing the concept in this country. The current system of distribution for national advertising copy is a "nightmare" for advertisers as 75 copies of original material must be sent by courier to 75 newspapers. The infrastructure exists to establish an Adsat-like system in Canada because most dailies have a satellite dish to receive the Canadian Press news feed.

4.3 Commercial Printing Trends

Among the new trends affecting the printing industry in general (as opposed to the newspaper business in particular) are faster presses, reduced costs of colour separation/printing, and the rise in volume printing. Other trends include the shift towards flexographic printing, a type of printing offering higher resolution and lower production costs than conventional printing techniques. Although some newspapers are adopting flexography, the transition period will be lengthy because many publishers will have to outgrow their existing technology.

Among the potential users of a remote strategy are the colour trade shops, the typesetting (pre-press) trade shops, the printers, and the specialized services that assist these groups. However, remote printing for these operations will be the opposite of conventional remote printing. Content, rather than presses will be distributed, and customers will use telephone lines and modems to transmit their data from home or office to be printed. Some printers are already using this system, and Alphagraphics -- Print Shops of the Future is contemplating a continent-wide, satellite-driven network based on this concept.

5.0 POTENTIAL OPPORTUNITIES IN CANADA

5.1 Introduction

As previously identified, the five major criteria necessary for justifying a remote printing operation are:

1. A National Product
2. Markets Distant from the Central Editorial Offices
3. Adequate Circulation
4. Time Sensitivity
5. Physical Mass of the Publication

The two most important elements are a national product, which implies the criteria of distance and circulation, and timeliness.

5.2 Opportunities for Daily Publications

Upon examination, it is clear that no existing Canadian publication as presently constituted can meet all these criteria. Most general interest daily newspapers in this country are too closely identified with their own cities or regions to be of mass interest in other parts of the country. Examples include Le Droit, the Halifax Chronicle, the Ottawa Citizen, or any part of the other major newspapers in any of the provinces. On the other hand, publications which do have a national constituency are generally focused at such specific trade, industry or special interest audiences that it would be difficult for them to ever attract the mass market necessary to develop profitable circulation figures. The Daily Commercial News, which covers the construction industry on a daily basis, is one example of such a special interest publication.

If no existing daily publication is an obvious candidate for remote printing, the possibility exists for a new player to enter the Canadian market with a new, untried product. This, of course was the USA Today strategy. Given the vagaries of popular taste, it is likely that such a candidate would have to come from one of the following categories:

1. A general interest daily, a la USA Today, with lots of pictures, graphics and news from all the regions. As The Globe and Mail has selected the serious, business-type reader as its primary niche, such a publication would probably have to appeal to a more general audience.
2. A daily financial newspaper which is larger and more comprehensive than the ROB. This would be a strategy fraught with risk, however, because the ROB is a well-established, highly-regarded business publication. It also advertises extensively and would undoubtedly up the marketing ante if any interloper attempted to steal market share with a competing daily.
3. A daily sports newspaper like those popular in Europe. There is no similar daily sports publication in North America although USA Today has made a determined effort to capture the heart of the die-hard sports fan with a detailed and extensive sports section.

5.3 Opportunities for Weekly Publications

It is unlikely that a remote printing strategy would make as much sense for a Canadian weekly (i.e., Macleans Magazine) as it does for a daily newspaper because the same time constraints do not exist under a weekly publishing regime. In the first place, people tend to buy weeklies for their news round-up and analysis. The "news" contained in a weekly is almost always stale relative to that carried in a daily newspaper and weeklies do not have to compete to be the first to break a news story. In the second place, advertisers have much more flexibility and lead time with a weekly publication.

A magazine could adopt a remote strategy but the economies of remote printing suggest it would be wiser to compose and make up the pages at a mother site and then send them overnight by courier for printing at the remote site. This method is, to quote one respondent, "a hell of a lot cheaper than trying to set up a satellite network".

6.0 IMPACTS

6.1 Impacts on Publishers Operations

6.1.1 — The Wall Street Journal

The remote printing pioneer in the United States is the Wall Street Journal (WSJ). Dow Jones and Company, WSJ's parent, was the first private company licensed to own and operate a satellite transmitter in the U.S. The WSJ is printed in five separate editions. Each edition has identical news content but advertising differs according to regional demands. The eastern edition has the largest circulation, followed by the midwestern edition, the western and the southwestern.

In 1962 the WSJ began using facsimile and microwave transmission to transmit from a composing plant near San Francisco to a printing plant in Riverside, CA. In 1969 a similar system was established between Chicopee, MA and South Brunswick, NJ. Because the cost of microwave transmission was prohibitive, the WSJ mounted a satellite feasibility study in 1973 in association with Comsat and Intelsat. By 1975, after cost savings in the order of 20 to one were discovered, the WSJ began transmitting full-page images by satellite on a daily basis.

Printing for the more than two million copies currently sold each day is done in seventeen company-owned remote plants. WSJ is in the process of building an eighteenth. The sites are organized into the following three basic levels of production:

- **Master Plants** where pages are processed and composed. There are two of these at Chicopee and Dallas, and either one is capable of getting the paper out in case of a system failure at the other.

- **Mother Plants** where the composed information is sent electronically to be typeset. The mother plants are in Palo Alto, CA, Orlando, FLA, Napierville, ILL, Dallas and Chicopee.
- **Regional Printing Plants** where the pages are actually printed. There are seventeen of these, including the five mother plants. Palo Alto serves Riverside, Denver and Seattle; Dallas serves Beaumont, TX, and the new plant in Oklahoma City; Napierville serves Des Moines, IND., Highland Bowling Green, KY, and Sharon, PA; Chicopee serves South Brunswick and White Oak, MA; and Orlando serves Charlotte, NC and La Grange, GA.

In addition to the five daily domestic editions, Dow Jones publishes daily editions of The Asian Wall Street Journal and The Wall Street Journal/Europe.

The WSJ satellite system is more than just a means of transmitting news content at high speeds to the regional plants. It is a fully meshed two-way digital communications network that is also used to transmit all administrative information. The company has its own transponder capacity and is contemplating selling excess capacity although no marketing effort has been yet established.

The major benefit of the WSJ's satellite system has been an increase in circulation attributable to better service to subscribers. Better service is the result of reliable same-day delivery, improved quality control, and the ability to include more late news in the earlier editions. Complete circulation figures were not available, but a WSJ spokesman estimated that since the advent of remote printing in the Denver market, circulation there has increased from 30,000 papers a day to over 100,000.

Another benefit of the satellite network is the ability of the WSJ to expand newspaper operations with only incremental increases in communication costs. Prior to installing the network, the addition of new microwave facilities involved "outrageous costs" that effectively prevented expansion. A third benefit, due more to WSJ production methods than to the satellite system per se, is an increase in production economies. Prior to the institution of satellite printing, each of the regional plants was fully-configured, requiring a press-room, composing operation, mail-room, etc. With satellites, staffing requirements are reduced and only pure production people remain at each plant.

6.1.2 -- The New York Times

In August 1980, the New York Times opened its first remote printing plant in a Chicago suburb, the centre of a circulation area normally served by plane from New York City. Since then the newspaper's remote sites have grown to resemble a chain encircling the continental United States, with the addition of locations in Tacoma, WA, Walnut Creek, CA, Torrance, CA, Austin, TX, Sarasota, FLA, Atlanta, GA and Lorraine, Ohio.

The Times' remote printing sites were selected for their proximity to key metropolitan markets according to distribution patterns dictated by the newspaper's circulation department. The Times had conducted a market research study which determined that the New York Times had a national product profile among consumers with certain age, income and occupational demographics and that these consumers were clustered in certain markets.

Another consideration for the Times was the nature of the remote printing plants themselves. A business decision was made on financial grounds to sub-contract printing services from existing plants rather than to buy or construct company-owned facilities. The Times wanted to deal only with independent newspapers at the remote locations and required facilities with compatible types of press equipment, adequate press capacity, and guarantees that press time would be available to print to the Times' requirements.

At the Times a microwave system is used to transmit the fully composed newspaper to the company's satellite uplink facility in Carlstadt, New Jersey. The average number of pages transmitted daily for the Monday to Saturday edition is between 40 and 48. The Sunday Times averages between 90 and 112 pages. The Times has been using satellite transmission since August 1980 and has yet to miss an edition.

For the Times remote printing means being able to guarantee home delivery anywhere in the United States by 6:30 A.M. local time. The logic of the newspaper business is such that timely delivery translates into increased circulation. This in turn results in more advertising, leading to increased revenue and profits.

6.1.3 — USA Today

Probably the most well-known exponent of the remote printing philosophy is USA Today, the general interest daily newspaper launched in 1982. The USA Today concept was the brainchild of Alan H. Neuharth, chairman of the Gannett Company, and it initially met with widespread skepticism. Today the paper

has a daily paid circulation of approximately 1.5 million copies and is distributed in all fifty of the United States. It is written and typeset in Washington, D.C. and velox pages are sent via satellite to thirty remote stations throughout the U.S. It is also printed in Switzerland, for the European edition, and in Singapore, for the Asian one.

USA Today's nation-wide printing program includes facilities in Chicago, Denver, Detroit, Houston, Los Angeles, Miami, New York, Philadelphia and Milwaukee. Scanning time is three to three-and-a-half minutes per page for black and white; colour takes longer. Gannett selects remote print sites that have four-colour process capabilities and then coordinates the USA Today press run with the local newspaper print run. Personnel at remote sites are trained to receive the electronic pages and to ensure proper colour printing quality control.

USA Today supplies each remote site with three recorders to receive and reconstruct the signals transmitted from the mother site. One recorder receives while another is unloaded or loaded. The third recorder is a back-up unit used when one of the others breaks down. Each site also has a dedicated telephone line connecting it to the central station in Washington.

USA Today began publishing in September, 1982 and within eight months had achieved an average daily net paid circulation of 1.1 million. After five years "The Nation's Newspaper" was claiming 4.8 million daily readers. The paper has positioned itself as a national newspaper and has aggressively approached national advertisers.

6.1.4 -- The Globe and Mail

The Globe and Mail is Canada's only national daily newspaper. It is often described as a combination of The New York Times and The Wall Street Journal because of its editorial focus on national and international news and its special emphasis on business issues. For The Globe and Mail, remote printing became a viable option when it decided that it wanted to be a truly "national" newspaper. The only way it could establish a coast-to-coast presence was with modern technology and remote site printing. The newspaper's executives reasoned that if they could reach their targeted audience -- upscale Canadians primarily in the business marketplace -- then advertisers would want to buy into their product.

The Globe's first two remote locations were established in 1980 at the North Hill Press in Calgary and in Montreal. In 1981, the Montreal site was moved to the offices of Le Droit in Ottawa and a new relationship was forged with College Printers for Vancouver production. In 1982, Web-Offset Ltd. built a plant in Moncton to specially accommodate The Globe and Mail's Maritime distribution. The last remote site was brought on stream in 1983 when an arrangement was reached with the Brandon Sun in Brandon, Manitoba.

Globe and Mail executives anticipated four major benefits from a remote printing strategy. These included:

- (1) increased circulation which would lead to more advertising revenue;
- (2) an increased span of circulation which would make the Globe a better vehicle for national advertising;
- (3) lengthened deadlines which would ensure that the daily news was current; and
- (4) reduced distribution costs.

For The Globe and Mail, the decision to establish remote printing sites has been an unqualified success. It has allowed the newspaper to fulfill a historic dream stretching back to the days of its first publisher, George Brown -- to provide Canada with a national newspaper.

In so doing the Globe has also achieved dramatic circulation growth. In 1980, the newspaper was selling approximately 12,000 copies a day (five percent of total circulation) outside of the Toronto trading area. By 1986, the circulation of the "National Edition" has risen by 925 percent to about 135,000 copies a day, accounting for over forty percent of total circulation. This figure was achieved even though sales growth has been dampened by a 100 percent price increase in the newsstand price of the paper (from 25 to 50 cents per copy per day). The growth in circulation has been paralleled by advertising revenue that has grown by leaps and bounds. From 1980 to 1986, advertising revenue in the ROB alone has doubled to over \$50 million per year, one-third of the Globe's total revenue.

This success has allowed the Globe to select an appropriate mix of offensive and defensive strategies -- to capitalize on the competition's vulnerabilities and to overcome the competition's strengths. Printing the National Edition at far-flung locations not only made a clear statement that the Globe was serious about being a national newspaper but also permitted the Globe to significantly increase advertising in the daily Report on Business (ROB) vis-a-vis the weekly Financial Post. The ROB, a separate 16-page section reflecting the paper's special emphasis on business and finance is the "guts" of the national edition. It has positioned itself as Canada's only authoritative business daily.

Because uniqueness is a marketing strength, remote printing has allowed the Globe to defend the niche it has carved out among an upscale, primarily business audience, both in Toronto and across the country. It has forced its major Toronto competitor, the Toronto Star, to concentrate its resources on being a Toronto mass circulation newspaper. Similarly, it has undercut the Financial Post, which used to justify itself on the basis that it consistently outsold the ROB outside of Ontario. This is no longer the case and the ROB is widening the gap.

6.2 Impacts on Printing Contractors

As The Globe and Mail did not have the volume to justify building its own plants at the remote sites, it found it cheaper to contract local printers on a three-year basis. For these printers, the Globe contract is an extremely reliable form of revenue. The newspaper has never missed a publishing day since the system went in May 1980, although there have been a few near misses. Even though the printers do not realize a great deal of revenue from the relationship with the newspaper, the contract provides them with a nice income to cover overhead costs as well as a base from which to look for other kinds of business. Furthermore, because the Globe is demanding in terms of quality, the contract is perceived as a prestigious one providing credibility and goodwill in the local market. In both Calgary and Moncton, the printing sub-contractors built brand new plants to the Globe's specifications, justifying the capital expenditure on the basis of having The Globe and Mail as an anchor.

7.0 ISSUES AND IMPEDIMENTS

7.1 Telecommunications Regulation

As The Globe and Mail attempted to establish a satellite network in 1980, one of the major impediments it faces was the fragmented nature of the Canadian telecommunications regulatory environment. Although the situation has recently changed, at that time Telesat Canada could not sell satellite services directly to the Globe; it could only wholesale services to the various telephone companies belonging to Telecom Canada who would then resell the services. The newspaper had to get permission and purchase service from each of the various telcos and regulatory bodies with jurisdiction in the provinces where a remote printing site was contemplated. For the Globe, having to deal with the regulatory bureaucracy was a time-consuming and frustrating "horrorshow" that almost killed the project.

Another problem was the fact that there was no competition for Telesat. Although this situation has also change, in 1980 the Globe could only lease and not buy satellite dishes from Telesat and it was very much a seller's (or lessor's) market. The newspaper wanted a shared transmitting dish, not a dedicated one, but Telesat was not too sympathetic to putting a shared dish on The Globe and Mail site. As a result the newspaper was forced to take a dedicated transmitter at a steep cost for one hour a day worth of transmission.

7.2 Electronic Transmission Standards

One thorny problem standing in the way of a network of print-shops is the issue of standards for the transfer of information. As the situation currently stands, owners of one type

of equipment cannot electronically "talk" to users of other brands of equipment. Six of the major vendors of colour separation equipment (Scitex, Hell, Crosfield, DX, 3M, and Icotex) and the U.S. Bureau of Standards are investigating the issue of Direct Digital Electronic Standards (DDES). They are attempting to implement data exchange standards to provide users with the benefit of an automatic interface.



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