APPENDIX E

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BODY:

Navigating Main Street: A User's Experience with Interactive TV On the way to the information superhighway, interactive television can be seen as the noncomputer user's on-ramp. Home entertainment, we believe, will be one of the major motivations for developing and using the "infobahn." Consumers will pay to get interactive games, movies on demand, educational fare and convenient services. Producers are already building systems to deliver these services, and planning better systems for fancier services. GTE Main Street has developed an early entry for this arena and, despite the embryonic state of current interactive technology, it seems to confirm this expectation.

Broadly speaking, there are two models, or paradigms, for using a cable system to bring the information highway to us. One is computer-centric: using the tv cable as a high-bandwidth conduit to bring online computing services, such as CompuServe and the Internet, into the home. (There have also been experiments in running lan protocols over the cable_using the cable as a kind of overgrown Ethernet_that would allow professionals at home to log into servers at their offices.) The second way is television-centric: adding interactive functions to tv programming. The interactive features require lots of computing, but none of that is noticed by the customer. The services are aimed primarily at noncomputer users, although there may be some separate, independent computer-oriented offerings.

Main Street is an example of this second kind of service. It represents a publishing opportunity that is quite separate from the current "publishing on the Internet" craze, and one that bypasses most of the Internet's problems about how to pay for products purchased and services rendered.

For the past few months, one of our associate editors has subscribed to Main Street. The story that follows is based partly on her day-by-day observations and experiences as a customer. As we shall describe, many of Main Street's features are primitive, either in concept or implementation. GTE Main Street was one of the first to enter this field, and part of the price has been that it had to make do with the technology that existed at the time. These are still very early days for interactive tv; producers and customers alike are still trying to figure out what works and what doesn't. But it is already clear that interactive tv can become a much richer medium than broadcast tv ever was.

A walk along Main Street

Main Street is an interactive television service_the only real product in the interactive tv market today, we believe. All the others are experiments or field trials. It is delivered to subscribers' homes through an existing cable system, where it coexists with all the other free and extra-cost channels. However, from the subscriber's viewpoint, it is not just another channel. It uses its own special remote control, and the viewer must intentionally turn it on by pressing the on button. Main Street offers an assortment of services: games, news, home banking and shopping, etc. About the only thing these have in common is that the user is able to respond to the images on screen by picking choices from menus using the remote control. Like other premium cable channels, Main Street involves a fee that appears on the monthly cable bill. Fees are not, however, the only revenue stream. Local merchants pay to have the opportunity to hawk their wares and_what is unique to the interactive medium_to close sales with cable subscribers who want to buy.

Advertising. This doesn't mean advertising, however. Director of marketing Deborah Myrick points out that because users are paying a monthly fee for the service, the Main Street management wants to be very careful about separating services from advertising. This doesn't mean preventing customers from seeing vendor information. It means, rather, that management is careful to present advertising as information the user can choose to access. The key is to keep away from the Prodigy model, where users were (for a time) forced to see an ad on the screen.

The Lobby Cards selection in the Games/Movie Quiz area shows just that kind of tightrope walk. The quiz is put together by the authors of the book Lobby Cards. One of the choices on the Main Street menu lets you place an order directly with the book publisher. The quiz promotes the book, but without the kind of "in your face" insistence that characterizes broadcast television.

Accessible. One thing that distinguishes Main Street from the computer-based online services is its accessibility for those who aren't computer users. As Myrick points out, television is installed in close to 95% of American homes, and cable tv now serves about 60% of the tv users. Publishers who are eyeing the cd-rom market, which has finally grown large enough that it now makes financial sense to publish in that medium, might want to note that cable tv's market penetration has been much higher for two decades. Main Street, which costs the user $9.95 per month, can offer a much wider market. As a publishing medium, it offers its own set of economics and its own saturation points.

A key fact is that GTE Main Street uses today's technologies, with all their inherent limitations, and does what it can to design around them. It combines audio, still images and telephone-based gateways to online services into a bevy of services for the home market. There are, of course, plans to incorporate more video and other advanced services as the technology becomes available. Because its technology is primitive, pundits may dismiss Main Street as not "the real thing." But we see Main Street as proof of a concept and as evidence that you don't need the whole enchilada to have an effective solution.

Background

GTE Main Street is located in Needham, MA, and Santa Monica, CA. (The division management is in Stamford, CT.) For the past few years, production has been done in Needham, though much of it is being moved to Santa Monica. GTE Main Street's Tom Grieb got the idea for the product 18 years ago, long before there was any talk of an information superhighway. Active development began seven years ago at Main Street's Waltham labs. Three years ago, the company figured it had put together enough content to start. It rented two channels from Continental Cablevision, which has the cable franchise for Newton, MA; designed an interface box that connected to the cable decoder and the phone line; and started advertising to cable customers via the second channel. It gradually acquired 650 Newton users, though numbers have fluctuated over time as users have added or dropped the service. Last year, GTE Main Street expanded into Cambridge, MA, and another 50 homes signed on. In California, it is working with Daniels Cablevision in the Fallbrook area. Currently 750-800 customers are on Main Street. Since July, Main Street has been selling to a growing number of communities in New England via Continental Cablevision. These include Brockton, Avon, Revere, Saugus, Watertown, Wilmington, Woburn, Stoneham, Burlington and Billerica, in Massachusetts; Londonderry, Dover, New Castle and Salem, in New Hampshire; and Berwick, in Maine. A big part of the reason for selecting a community is channel capacity. As Continental upgrades its cable services for a given town, GTE Main Street considers whether to market the service there. (Clearly, demographics also enters into the decision.) In all, it expects that 6,000-10,000 paying customers will have signed on by next July.

Getting wired

When you call the 800 number to sign up, the staff makes an appointment for an installer to come to your home and connect an interface box to both your cable decoder and your phone line.

Settop box. The interface contains a 4.8-kbps modem, a jpeg chip and a frame store that holds a single video frame. Oddly, although the modem is capable of 4.8 kbps, it actually runs at 1.2 kbps. GTE Main Street says it has done this to assure clean transmissions, but we suspect that a deeper reason is to limit the computational load on Main Street's servers. The whole box, which costs about $125 to manufacture, is produced by GTE Main Street. However, plans for mpeg-2 transmissions are in the works, so the company must either design a new box or adapt its services to conform to the emergent cable standards, allowing it to use mass-produced cable boxes from Scientific Atlanta and other makers.

Using the service ties up the phone line, so users are advised either to have "call waiting" or a second phone line. With call waiting, when a second call rings, Main Street alerts you with a text message on the tv screen, and you can take the

call without interrupting your service. Main Street charges are not based on time, but to minimize needless burden on the telephone switching system, the system will hang up after a five-minute period of inactivity.

For security, a password is entered_preferably during the installation process, but, in any event, before a purchase can be made through the system. When you purchase a product, the data that you enter on the order screen are transmitted from GTE Main Street's Data General computer to the merchant. Although the Main Street computer could keep full credit information on subscribers and send it to vendors automatically, the firm has intentionally steered clear of this, thereby avoiding any fights about privacy and credit-rights issues.

Remote control. The remote-control module is used to communicate with Main Street. As the only input device for a variety of required functions, it can take on more importance than all the other clickers in your living room. Hardly the most elegant design, it was chosen by company engineers from the variety available from cable equipment manufacturers. Ergonomically, it is flawed.

Keyboard functionality is awkward, designed around dividing the alphabet into four columns. New arrangements are under consideration, we were told, including one with a qwerty keyboard, one with a joystick and a third with a flying mouse. Given the expected increase in usage next year, GTE Main Street may be able to offer its customers a choice. A household with children might prefer the joystick, while an office employee would probably opt for the keyboard.

User interface. In general, the user interface is far from admirable. So says Etan Rozin of Scitex, a designer of user interfaces. He notes that sometimes the user is asked to punch in only a number, such as at the main menu (see photo on p. 3); sometimes a number plus the enter key, such as in the news section (see photo on p. 8); and sometimes only an arrow key. In some services, such as Easy Saabre, text needs to be entered (see picture on p. 9). For others, such as QB1 football, color-coded buttons are used (see photo of QB1 football, p. 6). Such inconsistency promotes confusion and slows learning.

However, not all the blame for this should be placed on Main Street. When a subscriber chooses one of the third-party services that the company offers, system control is turned over entirely to that service and Main Street conventions no longer govern. The only exception is that all services have agreed to preserve Main Street's use of the asterisk (*) key, which is the signal to return to the Main Street main menu. When a service receives that keystroke, it passes it back to Main Street, which then terminates the service session.

Despite the interface inconsistencies, using any of these services is easier on Main Street than on a computer. For example, bill paying can be done on Main Street via CheckFree, which is the same service offered to anyone with a modem and computer. Main Street takes care of dialing, logging on and password security via subscriber id; users don't even know they're doing it. No local software is needed; the background frames, controlled by Main Street's media server, are changed by cues from the service. The same is true for trading stocks, for flight reservations via Easy Saabre and for news via UPI's live feed.

Just before we went to press, a new service navigation scheme was adopted. Its cleaner design (see p. 6) makes it easier to find desired choices. For example, some of the menu choices are repeated in other menu hierarchies. Updates. This change points up a difference between computers and cable services. When CompuServe completes an upgrade (such as the recent one of MacCIM), disks have to be mailed (at user expense) and installed. When Main Street is upgraded, customers simply receive the new functionality. Unlike a software company, GTE Main Street has no incentive to save all of its service improvements until the next release; it implements updates as it develops them. It does have to interrupt service to make the changes, which currently is done in the early morning hours.

Some users have requested finding a way to make these upgrades without preventing them from logging on. The company is attempting to accommodate them.

Services

Money. The first group of services to be put together was financial: bill paying via CheckFree, Wall Street news via Comtex News, and stock and option quotes and trading via Trade Plus, with which you can create and manage portfolios. Main Street also offers an on-screen mortgage-loan calculator that works like a financial calculator.

The CheckFree service lets you specify vendors to be paid. To start, you must supply a voided check and a password. For each payment, you specify the amount and the date the vendor is to be paid. Fixed payments can also be entered, which will automatically be paid from your account every month. If the vendor is not online for electronic bill paying,

CheckFree will mail a check in your name.

None of this is new to computer users. But for noncomputer users or computer owners without online access, Main Street makes the services available and easy to access.

Education. Smart Box, the education area on the system, includes the Grolier Encyclopedia, which is stored remotely on Grolier's own server. There is no full-motion video; it is primarily text. GTE Main Street has worked with Grolier to enhance a few of the offerings. For example, still images of the famous JFK inaugural speech and a story about the sun have been developed and are stored locally in Needham and Carlsbad for better delivery.

The rest of the encyclopedia is accessed online. We asked why Main Street doesn't use more of the images and audio from the multimedia cd, and were told that this is on the list for future upgrades.

In the reference area are the U.S. History database, the Monarch Notes library (where was this when we were growing up?), the Mobil Travel Guide and the American Heritage dictionary, with a built-in thesaurus and a crossword solver from Houghton Mifflin.

Also in the Smart Box are the College and Career guides, Barron's SAT practice tests, a hangman game (presumably for spelling practice) and a Visual Vocabulary game that illustrates words by a still image and defines them in spoken text.

While these offerings together don't add up to the resources of a full library, they are more than would be found in the typical home. Games. The game area garners plenty of interest and requires the most complex programming and engineering. Offerings include the movie quiz mentioned above, a trivia quiz, a stock-market game licensed from Comtex (the goal is to buy and sell stocks for a hypothetical portfolio), children's word games and the QB1 interactive football game.

From a technical viewpoint, QB1 and the new Press Your Luck games are the most interesting, in that they make use of full-motion video and allow user participation during the showing of the game. QB1 lets you play along with the NFL game being broadcast nationally, but you watch it on a Main Street channel (via NTN Communications satellite) instead of a broadcast channel. Using the remote control, you enter your guess as to whether the next play will be a pass or a run, long or short, and right, middle or left. An overlay on the tv screen displays your call and cumulative score alongside the scores of other logged-on contestants. QB1, which is popular in bars around the country, now brings interactive play calling to the home.

Main Street's game-show offering promises similar interaction with other players and adds the hope of winning prizes. The first game (which hadn't started as we wrote this, but was expected imminently) was scheduled to run from December through February. Prizes will be based on the total scores that players rack up over the three-month period. (See discussion of Press Your Luck, p. 9, for more information.)

While the game show and QB1 attract the most interest, card games such as poker and blackjack and board games such as checkers and reversi require the most complicated software. GTE Main Street generates these games locally, rather than purchasing services through gateway hookups. Its computer generates the card and table images that go to each individual user (up to six players can join a virtual game table), keeps track of scoring and keeps the game moving, allowing only 20 seconds before a time-out.

Smaller children. Adults may think that storytelling with still pictures and audio wouldn't keep today's Nintendo generation occupied. But it does. The stories, adapted from such well-known sources as Weston Woods, typically arrive at the studio on 16mm film and are stripped of the audio. Stills are selected, and four-second chunks of audio are set to them. Educators develop questions for the children to answer about various points in the story. The children respond, with parents' assistance, using the remote control. Stories are added or changed every week.

We invited some friends and their two children to play with the Main Street service. The kids, aged 6 and 8, took to it readily, but it wasn't until we selected a story game that they were captivated. While their parents quickly got bored with the slow pace of the still-frame graphics, the children stayed interested and wanted to continue, even into dinnertime. Some games and stories are meant for even younger children. One of the interactive stories teaches the use of the 911 emergency telephone number. There also are helpful hints for parents in aiding this process. Other services include alphabet and number games.

Shopping. Purchase opportunities within Main Street are located in the Shopping section. As mentioned above, a local flower shop online to the service shows a still image of each of the bouquets or arrangements available. Ordering flowers

this way offers a new twist. When we order flowers in person, we tend to specify a general type of flowers and a price range, hoping the florist will come up with something appealing. On Main Street, the available selections are displayed so you can see exactly what you're ordering.

Other Main Street vendors tout books from the bestseller list (at 30% discount) and the Svend Jensen glassware collection.

When you want to order something, the choice is usually the "1" key on the keypad. You enter your password and the order particulars, and the system sends them to the vendor automatically.

Shopper's Advantage_the same service that credit-card companies sell_is available for price comparisons and direct product orders. Easy Saabre, the American Airlines schedule and reservations system, is also offered. The newest addition is something GTE Main Street has developed with local merchants: The Flyin' Diner offers a choice of clambake and lobster meals, which it will deliver anywhere in the U.S. (The concept is intriguing, but we think the prices are bargains only outside of New England.) Omaha Steaks and S. Wallace Edwards & Sons offer premium cuts of meat. (Not being from the Midwest, we thought the prices were pretty reasonable.) And a local bakery peddles the traditional fruitcakes for this time of year.

Other services include a UPI news feed, U.S. Weather Service forecasts, daily horoscopes, movie reviews (both current and on file), cartoons and travelogues of Paris (courtesy of MIT's Project Athena) and the national parks. Lest this start to sound like a daily newspaper, we must point out that Main Street has its own set of advantages and disadvantages.

New services

New choices are developed through a combination of focus-group feedback, subscriber requests, internal ideas and pitches from vendors. Besides the new user interface, the Flyin' Diner and the tv games described above, November's additions included the Best of Boston Cookbook Tour. The original Best of Boston show has been going to the restaurants that win the contest in the Cambridge area; it interviews the chefs, displaying pictures of favorite dishes and a map of how to get there. The new Cookbook Tour features the recipes of winning chefs and demonstrates how to cook them.

Several catalog publishers have approached the company, looking toward the day when the subscribers number in the thousands, not hundreds. What is more interesting to us, however, is the opportunity for small establishments to get involved. Since GTE Main Street does all the production work, the cost to a merchant is minimal, compared with other media alternatives. At the same time, because the audience numbers are small, large companies don't find Main Street useful yet. The result is a protected niche for businesses of all types to get involved, relatively risk-free.

What's useful?

As we note above, the games and the children's stories provide interactive entertainment and even some educational value. For older students, the Monarch Notes and the Barron's SAT practice tests are cheaper equivalents to books we would otherwise have to buy. While the bill paying is arguably the most timesaving of Main Street's functions_and to our reporter's mind repays the cost of the service_many people are still wary about giving away withdrawal access to their checking accounts. As for home shopping, catalogs are already making that a reality, and interactive tv seems very similar. Of course, for catalog merchants, tv presents another delivery option, one that is easy and cost-effective to update.

Does Main Street compete with local newspapers or tv news? We don't think so, at least not in its current implementation. In fact, we'd like to see a hookup with the Atlanta Journal Constitution or the Los Angeles Times to provide more online news in a better format. Why? A newspaper, as we all know, is designed for quick browsing. On Main Street, the UPI headlines can be seen, but not at a glance; the user must wait for the head to scroll by, choose the story, and again wait for the text to scroll by. It's slow. Tv news, on the other hand, can be treated as background entertainment, something to have on while we are doing other things. We often don't look at the picture unless a story requires it and it piques our interest; most don't. However, with Main Street's scrolling text, the user must pay attention. Nevertheless, when news is breaking, a wire service is the fastest way to stay up to date. We recall that on the day the sale of Ziff Communications was announced, our UPI feed carried the details many hours before the business press could react (and, we might add, some hours before Ziff management briefed its employees through internal channels).

One thing seems clear: Tv can serve as the delivery vehicle for services we have previously associated with computers, and it can offer an easier user interface and faster delivery of online graphics.

Basic operation

When a user clicks the "on" button on the Main Street box, the box dials the Main Street Data General Aviion computer, a Unix machine that acts as a traffic cop for all service requests. It handles the log-on procedure, getting the background screens from the media server. Next to the server is a proprietary teletext inserter and video switcher, which handles the communications switching between channels for access to the video games and switching between users for executing requests. The Aviion also acts as the gateway to the various services GTE Main Street resells, such as Easy Saabre and Comtex news.

Time-outs. Automatic time-outs of varying lengths are employed to prevent unused, but still active, sessions from tying up system resources. For general Main Street usage, we found time-outs occurring after approximately 15 minutes. In contrast, one gateway service we tried timed out in only 1-2 minutes. However, GTE Main Street has found that users playing interactive games with each other get frustrated if the time-out is that long. So, for example, to keep a poker game moving, the time-out is set at 20-30 seconds. Computer configuration. The Aviion doesn't act as the media server itself, although it does run the relational database that keeps track of all of the frames. In fact, we were rather surprised to learn the configuration of the digital media server. It consists of a '486 pc with less than 20 mb of ram. However, attached to that pc is a 6-gb disk array of jpeg-compressed screen-resolution images. The media server is the only resource that is mirrored for uninterrupted service.

The media server is supplemented by a series of pcs_'386es and '486es, typically with 200-mb drives and 20 mb of ram_that are dedicated to particular services. For example, the poker and blackjack games require their own machines to generate the screens for each player and to keep track of scoring. There are eight different tables, with up to six people that can be playing at a time. Each player requires his own screen frames to be generated anew every time around. Other dedicated computers handle reversi and checkers (also played against others logged in), AccuWeather and QB1.

QB1 is licensed from NTN Communications, which sends images as full-motion video. Users who select this service are switched transparently to the second of Main Street's two channels, where full-motion video is broadcast to all those logged on to that game. User scores are tabulated locally and displayed in an overlay section on the tv screen.

The newest game, Press Your Luck, runs from a vcr hooked up to the Aviion computer. Acquired on beta videotape from NTN Communications, the tapes are first stripped of their commercials (thank you) in Main Street's av production studio. In a similar setup to QB1, users play against the contestants in the reruns, as well as against other logged-on users. Phone lines send users' choices back to the Aviion, which tracks the users and controls the deck. Because of the lack of commercials, playing both shows takes only a half-hour.

What, then, is stored on the media server? All of the audio navigation screens are stored there, as are the accompanying audio and background frames for dial-in services, children's stories and locally built items, such as Hangman, Best of Boston, shopping screens and soundtracks.

In all of the above, we have been describing the Newton site. Main Street's Carlsbad location has a complete duplicate system and manages its own service locally.

Transmission

Telephone lines. There is no single provider of telephone services. Instead, GTE Main Street uses several long-distance companies for the live-feed services via X.25-protocol lines. Included among these are the UPI, stock indexes, Comtex news, horoscopes, sports hotline and Shopper's Advantage. Very little customer information is stored locally in Needham or Carlsbad; everything except the subscriber's name must be entered on screen at the time of purchase. (However, in the case of the CheckFree bill-paying service, some information is stored in the service provider's database.) With the consequent heavy reliance on phone lines comes the inevitability of service interruptions. For example, when the Mississippi River flooded last year, it was impossible to get any lines through the affected areas.

Service transmission. Still images are sent from the media server to users in the form of uncompressed frames on cable channel 63. The transmission process works somewhat like Ethernet: All frames are received by all users, but each frame is tagged for a specific Main Street box. Boxes decode only to the frames addressed to them, ignoring all other cable traffic.

Sending frames in uncompressed form means that the system can transmit up to 30 frames per second. Typical Main Street users have been found to issue roughly one request every four seconds during system navigation (an average that takes into account system response time), so the system could handle roughly 120 subscribers without any perceived slowdown. In fact, engineers say that the Main Street system has operated successfully with 150 simultaneous users, and

they expect that the current design could handle 300 concurrent users before serious degradation in response is felt. And, of course, customers don't all hit the system at the same time, but stagger their usage throughout the day. Thus far, there have been no major access problems.

Each transmitted frame actually contains only one video field. (Ntsc video frames contain two interlaced fields, each 1/60 of a second long, which helps reduce flicker and motion artifacts.) Main Street uses the other field of each video frame to send a highly compressed audio signal, which the settop box expands to four seconds of uncompressed audio. The result is that if one still image is sent every four seconds, the customer will receive continuous audio.

Text with error detection is sent in a subcarrier either above or below the video frame carrier frequency.

Expansion options. As noted above, GTE Main Street hopes to multiply its customer base during 1995, which will clearly require more transmission capacity. Technical director Joe Damiecki says there are two options. The first is to lease more channels from the cable company to handle the increased load. The second_preferred by Damiecki's staff_is to compress the video signal. Every settop box already has a jpeg chip; in addition, GTE Main Street owns patents on compression and dispensation of video that should affect Main Street's delivery speeds.

Material generation

Finding material to put on the air is only half of the battle. The other half is to turn it into Main Street's unique format. For example, the Weston Woods children's materials come in on 16mm film. In the Main Street production studio, film is transferred to tape and stripped of the audio; stills are selected and identified in Edit Decision lists; and the corresponding frames are grabbed and enhanced using a Quantel Paintbox. Then the audio is paired with the stills in four-second sound bites and the text is inserted on the Chyron title generator.

Other material follows different production paths. The game shows come in on videotape. For the Best of Boston, the staff takes its own photographs and records its own audio. The Word Blazers and Hangman games are created directly on the Paintbox. Some of the material for small children has been custom-programmed for Main Street by outside firms.

Problems

Because of its hybrid architecture, there are three sources of problems: the phone system, the cable system and GTE Main Street's own equipment. This presents a lot of variables to deal with. Because users can't fix things themselves (as they might attempt to do with computers), they must rely heavily on customer-service staff. On the other hand, once it has diagnosed a flaw, the staff can sound a direct alarm to the engineering department, which is rarely feasible in the computer industry. The upshot is that problems are often fixed quickly, sometimes in an hour or two.

(We were told that the customer-service department is often called for explanations outside its realm. For example, its staffers sometimes are asked for advice about CheckFree or Comtex's stock-market game, even though those are products that GTE Main Street itself does not produce, but relays from outside providers.)

Technical flaws. Although, in general, Main Street runs satisfactorily, we have noted some technical flaws.

Synchronization. The audio is often out of sync with the video still frames, a mismatch that can be quite annoying. Either part of the audio is cut off, or its start is delayed. The company has acknowledged the problem but has not yet been able to track it down; the Carlsbad location, although it has the same equipment, doesn't suffer in this fashion. We have also noted that when navigating a known area, we tend to hit the next key faster than the system can respond, and this often results in delayed audio, though it catches up when we slow down.

Access delays. At times, access to certain services is not available. Sometimes this is the result of phone lines; often it is because of network congestion. For instance, for a while we had trouble accessing Shopper's Advantage. It was determined that one of the routers was down and was providing only intermittent access.

Abortive commands. Sometimes it seems that commands get lost or confused, with the only way to recover being to start the sequence over again.

As we noted at the beginning, these are early days for commercial interactive tv. Main Street is an example of a system architecture that has already been superseded by new technology. That is the price for being one of the first to field a system.

In Perspective

A view of the market

GTE Main Street is both a creator of content and a packager of content licensed from others. It is always looking for more material. Myrick has found, and we concur, that in the first week of service, new users are excited by the variety of programming available. But by the third week, the sheen has worn off and users look for more. The company is thus counting on providers of databases and live programming, especially those that can offer unique and novel programs, to keep user interest high. GTE Main Street sees itself in competition with other tv channels_CNN, the weather channel, QVC, the Home Shopping Club, etc. What it offers is instant access to the content it carries, whereas others fit it in during their broadcast day.

Newspapers might view interactive tv as competition, but we think the two media can be complementary. A tv channel is great for delivering summaries of the information the paper provides, or for a visual interface to a newspaper's database of editorial content. A newspaper (accessed through the tv) can provide follow-up depth, specialty information services and even some level of public archives.

Myrick says that many catalog publishers_including Sears and JCPenney_have expressed interest in being Main Street providers, though most have said they want to wait until the audience is larger. Magazines, in contrast, have not shown much interest. Myrick suspects this is because the economic model doesn't work for them.

GTE Main Street is developing products for the community information area. It wants to become the primary and authoritative local information service. For example, it is currently working with schools to incorporate such information as school calendars, lunch menus and community event listings. It has also consulted librarians and teachers about the selection of offerings; Grolier was picked through such consultations. Local governments are also on the product development list.

The company is actively investigating several technologies that will let it integrate full-motion video. It is eager for the day when two-way cable becomes viable, and is looking at a new service Continental is testing for Internet service delivered on cable. (We hope to be one of the early users.) Beyond that, it has no further comments at this time about its plans.

Getting from here to there

Compared with the elaborate schemes that media giants such as Pacific Bell and CableLabs are hatching for the next century, Main Street is a primitive, early attempt at making television interactive. Its technical limitations_still frames with no compression, four-second sound bites, only one video channel_are the direct result of the decision to enter the market early, before the technology was mature and before anyone knew what really worked and what didn't. Like all pioneers, Main Street has suffered for the privilege of breaking new ground. But the company can hope to reap some of the rewards, too.

It is clear that for Main Street to grow, the physical plant must be revamped to support more concurrent users, using technologies that were not around when Main Street was conceived. Until this is done_and while the subscriber base remains small_major service providers will be hard to attract, and subscribers will be less than satisfied with the limited material that is offered. Getting from here to there, we think, will require catering to local businesses; an audience of 800 means more to a small shop, where color depictions of its products could help sales a lot, than to a national organization.

Is $9.95 per month the right price? We think a higher price would make it harder to get people to try the service. But the real key to getting people interested in Main Street is an expanded roster of services. Sports games, for example, are high on the list of features subscribers want. (Uppercut, a boxing game, is currently being hinted at in Main Street's menus. We imagine that it will work somewhat like QB1.) This plays right into the national pastime, namely betting pools, albeit without real money. Game shows fall into the same category, especially when the home viewer can win real prizes.

Staying within the capabilities of the current system, we would like to see more offerings of a practical or even mundane nature. R.R. Donnelley could provide electronic yellow pages that help search for places to eat or shop and give directions to get there from a user's house. An aid to students would be the addition of databases giving access to diverse information resources. We also note that there is an enormous body of "audio literature" originally designed for radio, going right back to FDR readings over the radio. Why not revive the concept for the very young and very old who can't read?

Whom it's for. We are hardly typical Main Street customers. We signed up to gain firsthand experience with the new services and technologies of interactive tv. The real question is whether we would buy the service if it weren't for the purpose of researching a story. If we had small kids in the house, our answer might be yes. If we felt comfortable with electronic funds withdrawal, we'd answer yes. If we were managing a stock portfolio, also yes. If we were among those who have tried home computers and found them intimidating, we might be attracted by Main Street. If it offered enough additional services, definitely. Looking beyond our interests, we think that Main Street's best market comprises computerphobes, sports fans, game players and little kids. That's a large number of people_even if it isn't us.

As Myrick states, Main Street is "at the dirt road before the entrance ramp to the information superhighway." That is, we submit, not only a lot closer than most of us have had the opportunity to be, but also a necessary first step. While two-way cable or video dial tone may be the system architecture of the future, Main Street is in operation right now; experience and a base of both services and subscribers are accruing. We look forward to seeing how the product evolves.

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