TIME TELETEXT - PRESENT AND FUTURE

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ABSTRACT

Time selected full channel over VBI teletext on the basis of technical and business considerations. Full channel provides the tools for a very extensive service, and the support for insertion at the local level without interference with the national component of the service. Content is managed by the editorial staff, using the concept of magazine as a logical group of related material. Access times are adjustable separately for each magazine.

The editorial tools provide for effective integration of written material and graphics, with automated input sources and a computer archive of reference material.

Telesoftware is used as an integral part of the editorial content, and designed to promote system interactivity with the user. Time's leading role includes the development of new encoding techniques for telesoftware and microprocessor operating environment.

Insertion into the video signal is provided by a specially designed inserter, based on dual microprocessors, under control of the master editorial host computer. Transmission to the local markets is achieved via satellite and full video NABTS. Current design of cable networks is adequate for teletext distribution provided proper maintenance is maintained.

A low cost decoder is being developed, which will support both VBI and full channel, and in addition will be capable of running telesoftware. Ultimately, the acceptable configuration of teletext will be determined by the consumer's perception of value, and the economics of the CATV industry.

INTRODUCTION

Two and a half years ago, the Video Group of Time Inc. set out to develop a teletext service so compelling and encompassing that it could stand alone as a major business activity for the Video Group. Until that time, teletext activities were focused on using about 1% of a television signal known as the vertical blanking interval, or VBI. We decided that, by using the entire television signal to carry teletext data, a total content in the order of 5000 screens instead of 100 could form the basis of a comprehensive service.

But quantity wasn't enough. It was clear that content would be the characteristic that would give the service its appeal. Technology, on the other hand, would be the foundation upon which innovation and versatility would be built. To this end, we initiated several technical projects designed to give our editorial staff the maximum flexibility in designing the service, and to simplify the technical process necessary to construct the business.

FULL CHANNEL TELETEXT

The Potential of Full Channel

In May, 1981, Time and Norpak of Ontario, Canada, began to develop the first full channel encoder for the NABTS (North American Broadcast Teletext Specification) teletext standard. The encoder had to accept teletext screens from a Host computer, store them, identify them for broadcast, organize them into logical groups of content called MAGAZINES, synchronize them for transmission with a video signal, and insert the data onto the video at a rate of over 5 million bits a second. In addition, a proprietary technique was developed to allow the insertion into our national feed, of teletext screens generated in local markets by, say, a newspaper. Such insertion should be possible without the need for complex computers, and without compromising the integrity of the national feed.

But full channel teletext had to somehow be more than just 50 times more content than VBI teletext. We set out to balance breadth of content with depth of content. Also, we cut the cycle time in half from 20 seconds, which is typical of VBI teletext services, to 10 seconds

for the Time teletext service. An additional characteristic of the Time service is the ability to create different cycle times for different magazines on the service. As an example, the News section might have a worst case access time of 3 seconds while the Weather pages might be accessed in 10 seconds at worst. We have the ability to balance access time, magazine size and the overall size and content of the service.

All of this versatility, however, must be managed. The teletext screens are identified during transmission as PAGES, each with a unique number and placed into a MAGAZINE by an editor, with the magazine being identified by a number. Technically, this process is very straight forward, but from the point of view of the user at home it could have been a clumsy and confusing task to navigate the full channel teletext service. Our Editorial team developed a technique of on-screen REFERING to allow the user a simple, logical method for traversing the thousands of pages available on the service (Figure 1).

In addition, the local content produced by The Copley Press in San Diego and the Orlando Sentinel in Orlando, our test markets, use the same software to present both a technically and editorially integrated service to the user at home. Finally, we have developed a method to allow, in the future, the ability to tier or package different groups of magazines should market conditions warrant.

The Full Channel Inserter

The basic difference between full channel insertion and VBI stems from the very short time available in full channel to manage the insertion process.

The insertion process itself is handled by a dedicated microprocessor, which reads data directly from RAM. System housekeeping and administration is performed by a separate "master" microprocessor, which is responsible for the interfacing with the editorial Host, and for managing the disk resident database (Figure 2).

Again, Time is looking at alternative distribution techniques, and ways of taking advantage of other existing or developing technologies which may be in the interest of the marketplace or of the cable systems.

TELESOFTWARE

The inclusion of telesoftware in Time's service is to be taken in a different light from what has been done by other organizations. The emphasis is not in the software itself, but rather in a totally integrated service. The goal is not to distribute software to run in general purpose computing machines, but rather to enhance the capabilities of the user terminal in the home.

In other words, telesoftware is a tool rather than an end in itself. Its use greatly increases the degree of interactivity possible between the user and the service. It brings to the home some of the power otherwise available only to "two-way" systems, without the need for expensive two-way plant or expensive remote computing hosts serving a multitude of users.

Examples of what is currently being offered by Time's teletext include, amongst others:

- Interactive computer games with full graphic capability using the PLPS standard, as well as locally generated sound (PLPS is the North American Presentation Level Protocol Standard);
- Automatic computation of a user-definable portfolio of stocks and/or commodities (the user specifies his own interests, the terminal "remembers" and captures only the items of interest);
- Local generation of user dependent data and graphs, upon request (e.g. biorythms).

The possibilities are limitless, and Time is and will be experimenting with a variety of offerings.

The currently implemented software is (for the time being) heavily dependent upon the microprocessor used on the home decoder (Intel 8088). In order to achieve processor independence, Time has developed an encoding technique based on the PLPS proposed use of G-sets. It is expected that such work will lead to a universally acceptable encoding technique with all the corresponding benefits of program transportability and decoder-independence of a teletext service.

The current telesoftware development environment (for the production of an integrated editorial product) includes (Figure 3):

- A number of microprocessor based software development stations (IBM PC);
- Facilities for the more "conventional" creation of ancillary PLPS graphics pages (Norpak IPS-2);
- A full channel inserter, which generates the same video signal to be expected in the field (Norpak TES 2);

- A home user decoder, running the same TVIS operating system as the target decoders. (Developed in co-operation by Time, Norpak, Zenith, and Owl.)

This environment has proven very satisfactory for the development of editorial telesoftware, and in general, very little on-line debugging has been required. On-line debugging tools, such as Intel MDS, have been used extensively to help develop the operating system.

THE TELETEXT NETWORK

The Editorial Center

The central piece of hardware is a DEC-VAX computer, running editorial software provided by Infomart of Toronto. Writers compose their stories directly at their VT100 terminal; in the process, they have access to wire services input directly into the host computer, and to a "morgue" library of archival material (Figure 4). Any required graphics will be prepared using special "Page Creation Terminals", supplied by Norpak (alternative graphic stations, developed by AT&T and by Cableshare, are currently under evaluation).

The development of telesoftware is considered part of the editorial operation, as described before. The output of the process is channelled through the Host, before being output into the system.

Automatic capture of wires is not limited to news for further editorial work: it also includes Sports, Weather and TV data information of relevance to the local markets addressed by Time's teletext service, as well as financial information. The latter is supplied in a pre-processed form which allows for smooth integration with Time-developed telesoftware running in the home decoders.

The VAX Host controls the video insertion process occurring in the Full Channel Inserter through an error-protected RS232 serial link. Due to networking requirements, some of the information to be transmitted is separately fed into a VITL encoder supplied by Video Data Systems.

The inserter is fed by a conventional video source, and the signal is cascaded through the VITL encoder.

Transmission

The output of the inserter/encoder combination is fed to the uplink to SATCOM-F4, and received at the local market ground station, operated by the local cable partner (Figure 5).

Baseband video is fed into the local inserter, which is under control of the local Host. This is operated by the newspaper partner, who is responsible for local content and features.

The editorial tools and operation of the local newspaper are similar to the national ones, with the exception of telesoftware development, which is limited to Time's national centre, at least for the time being.

It should be stressed that the current setup was designed with expediency in mind, the goal being the early availability of the tools for market testing of Time's concepts, and its refinement where necessary. Time is constantly reviewing the technological tools to be used in the near and far future, with the basic idea of reducing capital costs and operational expenses.

Cable Plant

Time's teletext is using previously existing plant, some of which is of rather old construction. The fears voiced by some people as to whether it would be feasible to transmit data at the 5.72 MHz rate have been proven unfounded by Time's experience so far.

Nothing inherent to the current design of cable networks precludes their use for the transmission of NABTS teletext. However, it should be strongly emphasized that proper maintenance of the system is essential in order to keep error rates within the limits of what is acceptable to the paying subscriber.

Time is carrying further investigations into the optimization of certain components, such as head-end modulators, for the specific purpose of passing teletext signals (as opposed to conventional video).

THE FUTURE TERMINAL

In December of 1982, Time announced a major co-development effort with Matsushita Electric Industrial of Osaka, Japan, to produce a reliable, low-cost teletext terminal for the CATV market. The terminal will meet all fundamental specifications of NABTS and will be available in three different forms to meet various interface situations in the CATV home. The terminal will not only decode Time's full channel teletext service but will also decode broadcast originated NABTS VBI teletext services.

Time and Matsushita are adding a few innovations to this product. First, we have developed a protocol for the transmission of telesoftware in a defined, terminal independent manner that will work in concert with the NABTS standard to expand the nature of the service far beyond static screens of information. Second, our method of tiering the teletext service will be supported by the terminal.

Perhaps the most interesting aspect of the terminal is its expandability. The terminal allows for the optional addition of more memory for telesoftware, joysticks and interfaces to other devices such as printers, modems and other computers in the home.

But, as in any consumer product, the allowable cost and its assbciated performance will be determined by the marketplace. For it will be the consumer's perception of value of teletext and the economics of the CATV industry which will need to be understood to optimize the service. Time is undergoing this process right now, and at the same time we are also planning for the future.

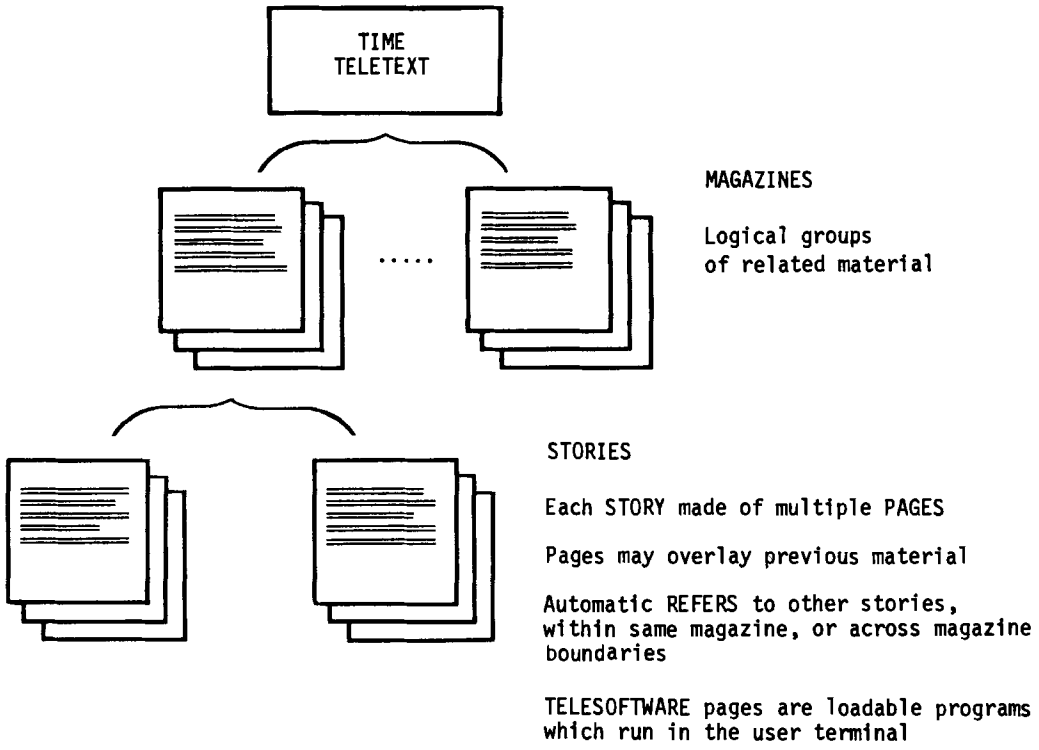

FIGURE 1 - TIME TELETEXT CONTENT STRUCTURE

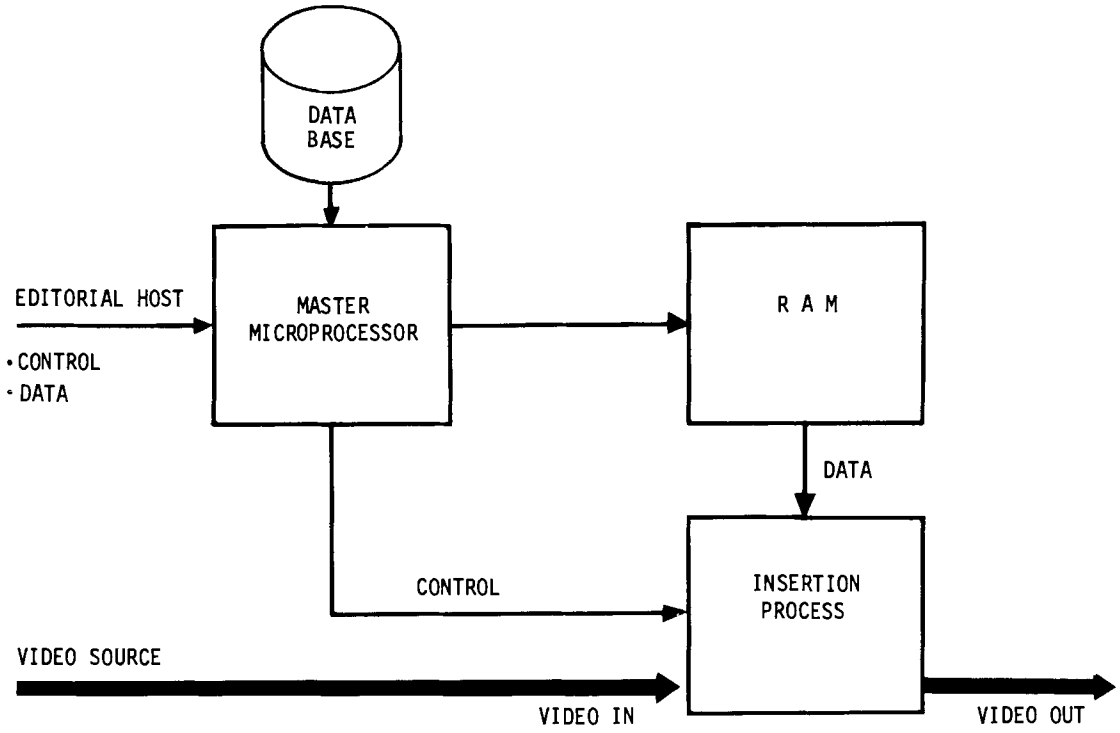

FIGURE 2 - FULL CHANNEL INSERTER

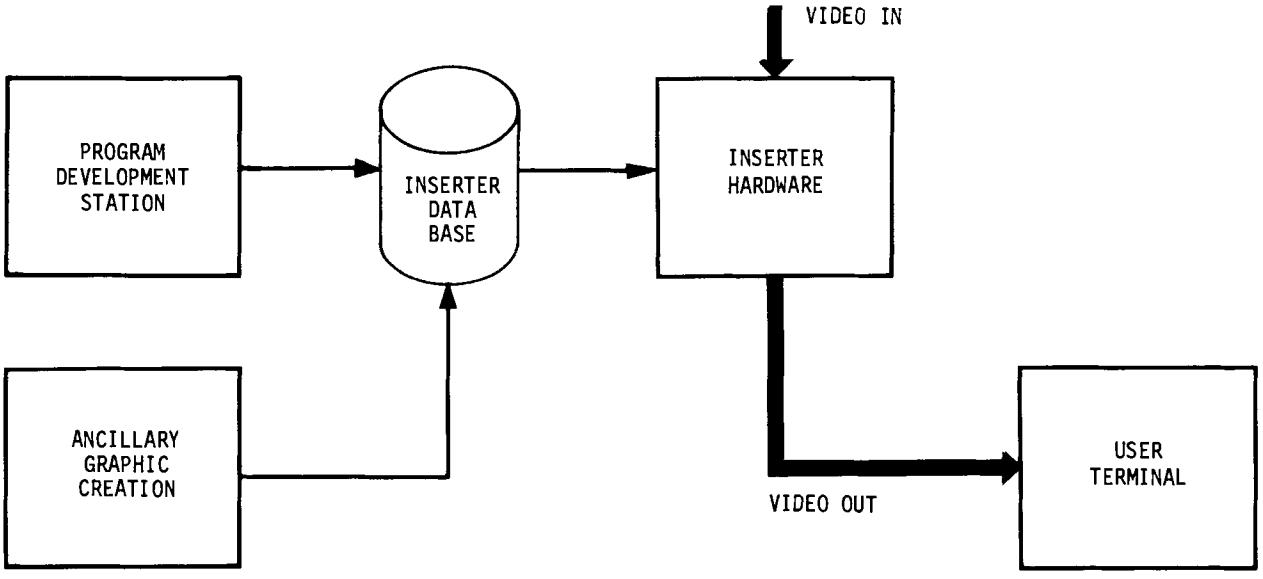

FIGURE 3 - TELESOFTWARE DEVELOPMENT ENVIRONMENT

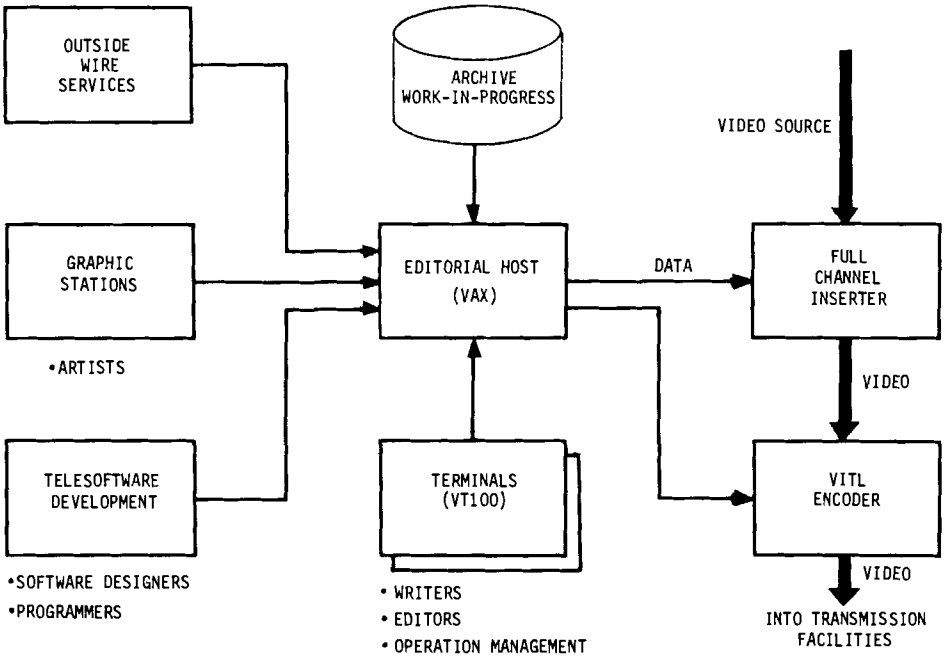

FIGURE 4 - EDITORIAL CENTRE

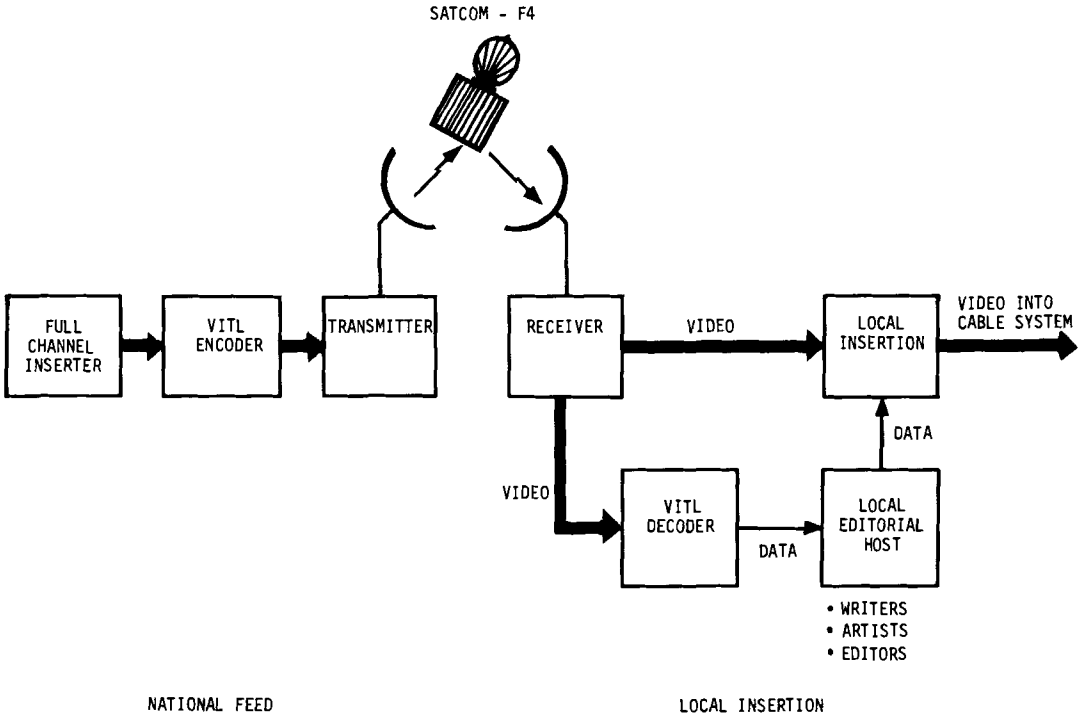

FIGURE 5 - TELETEXT TRANSMISSION