Profile

Graphics Creation for Television Using the Sony SMC-70G Microcomputer

Ross Mutton

Abstract: Carleton University operates an instructional television channel across the Ottawa cable companies. There was a need to modernize the equipment used for feeding course and University activity information over the channel when not broadcasting telecourses. This article examines the selection process and describes the attributes and limitations of the microcomputer system eventually selected.

Carleton University operates an instructional television channel, ITV, feeding the two cable companies serving the Greater Ottawa area. This channel broadcasts both live lectures from a classroom equipped for television transmission, and pre-packaged telecourses of credit courses offered by the university. This accounts for an average of 30 hours of programming per week during the academic year, leaving considerable time per week when the channel can be used for providing information to the telecourse students and the general public on both messages associated with courses and details of activities occurring at the university.

This function was performed using a *Message Wheel,* a device manufactured by Tele-mation consisting of a large drum capable of holding 24 three-by-five cards which rotated past a black-and-white camera. Thus, it was necessary to manually type messages on cards and insert them into the drum. If not all slots were filled, there was a digital clock mounted behind the wheel which would show through the empty slots, displaying the time.

There were two major problems with this system, besides the fact that it was a museum piece. The system was limited to a total of 24 messages, not enough for the number of activities through most of the academic year. Also, the equipment was not reliable enough to operate unattended. For the bulk of the available time we were unable to run the information system.

Selecting an Electronic System

It seemed appropriate to upgrade to an electronic system with more storage and 24-hour

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reliability. An initial choice was a character generator. But, it was useful to investigate new technologies such as micro computers and Telidon which permitted not only text display, but also the creation of colour graphics, providing a more interesting and pleasing display.

At the time of this search (Autumn 1983), there were two serious contenders for the system: the Sony SMC-70G graphics creation package and the Apple-based Formic system employing Telidon technology. Our criteria were: 1) the production of a broadcast standard genlockable signal that could be integrated with other video sources and transmitted, 2) availability of font styles and sizes that were legible through cable transmission, 3) the capacity of the system to store electronic pages, and 4) the capability to produce graphic images.

The comparison between the two systems broke down as follows by criteria:

1) The Sony system was designed as a television system tool that produced a standard broadcast NTSC signal that could be easily adjusted and integrated with existing video equipment. The Formic required a special Telidon decoder in conjunction with an RGB/NTSC encoder, an expensive addition.

2) Both systems had a variety of font styles and sizes. The basic font with the Formic system was a small block-style upper case font. Additional fonts were slower to create and display.The Sony system incorporated five basic fonts which were easy to create and display.

3) The Formic system had more than enough capacity to store the required number of pages within the micro. The Sony required a hard disc option. However, continuous 24-hour access from a floppy disc was not as reliable an alternative as hard disc access.

4) The Formic system produced excellent graphics, with a palette of over 4,000 colours, 16 available at one time. The Sony system produced medium resolution graphics with a palette of 16 colours, all available at the same time.

The Sony system was selected because of its ability to produce broadcast standard video, its ease of producing a variety of fonts, and its flexibility to incorporate into an existing studio production facility.

The system purchased consists of the following:

A graphics creation work station (see Figure 1 on next page)
- 1 Sony SMC-70G micro computer, complete with dual micro floppy disc and NTSC Superimposer
- 1 Sumagraphics Bit Pad
- 1 Panasonic Monitor
TOTAL COST - $8,400.00

A graphics display station
- 1 Sony SMC-70G micro computer, complete with dual micro floppy disc and NTSC Superimposer
- 1 Corvis Winchester type 5.9 MB hard disc
TOTAL COST - $9,800.00

Figure 1.
Graphics Creation Workstation Consisting of Sony Microcomputer, RGB Monitor and Graphics Tablet.

The display station is the heart of the system, available for feeding the channel on a 24-hour basis. The 5.9 MB hard disc is used to provide adequate capacity (up to 120 pages of information) and reliability in a continuous 24-hour operation. The work station permits creation of graphics while the display station is in operation. It includes a bit pad which artists find more versatile than the keyboard for free-hand drawing and tracing. The work station also feeds genlocked video into the production switcher plus key level video into the downstream keyer so that it can be used as a video source or character generator in production, when it is not being used for the creation of graphics.

System Operation

The system on ITV is used to display information concerning registration, ITV course information, and non-academic and academic-related events that are of interest to students and the general public. The system runs on the channel whenever we are not broadcasting course material. Most of the material is text. We have thus designed a variety of simple but attractive backgrounds identifying Carleton University, over which we can print the text. The creation of such pages averages about 10 minutes each. Permanent pages referring to services, plus pages regarding special events are designed with graphic enhancement. They provide a visual highlight and hopefully draw attention to special events. We can select the display time and sequence of pages.

Production '

The SMC-70G has been used in two ways for television production. By feeding the key output to the switcher, it is used as a character generator with six to eight available fonts. In addition, we can record the video from the SMC-70G as another video source through our switcher. We have used it for the production of high-tech computer style graphics (See Figure 2), and for graphs and charts. An advantage of using this system for producing graphics for television is that through designing successive overlays of information, the graphic material can be built up on the screen through editing and the use of wipes or dissolves through the switcher. This is particularly effective with graphs and charts.

Figure 2.
*Sample of High- Tech Computer Graphics.*

The Sony SMC-70G is CPM based. We use two software packages, primarily in the production of graphics. The first is Credit, or Graphics Editor. This program permits the creation of the illustrated graphics including a choice of 16 colours. The program is designed so that this creation occurs within the safe title area of the television screen. A coloured border completes the image to the outer limits of the scanning area. The software permits the creation of graphic images through the ability to produce lines, boxes, filled boxes, circles and filled circle functions. Through the use of the bit pad with either a mouse or a light pen, graphics can be drawn free-hand and coloured using the fill function. The artwork can be "cleaned up" by expanding the scale of the work, manipulating the individual pixels, and reducing the image once again to original scale. The graphics may be composed of 16 different colours, capable of simultaneous display. Any portion of the material may be

moved, rotated (See Figure 3), copied or scaled up or down in size. Through overlay, you may superimpose one image over another.

Figures.
Sample of Rotated Graphic.
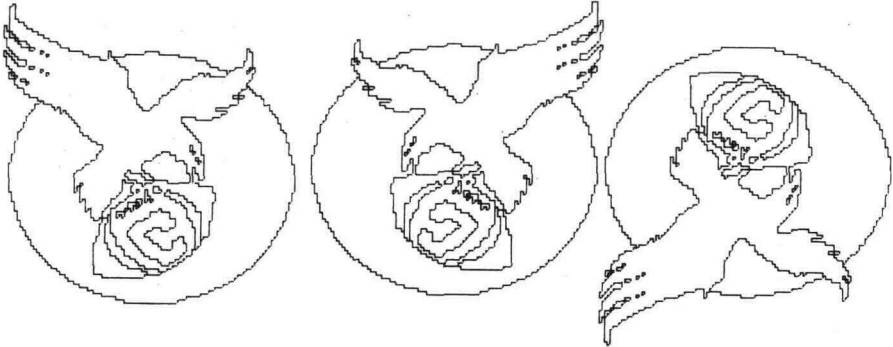
The other software package is Videotitler which permits the creation of text. The package comes with six pre-designed fonts (See Figure 4), five of which have three sizes, the sixth has only one size. The typefaces compare to Letraset's Century Schoolbook, Helvetica, Rockwell and Helvetica Italic. In addition, it is possible to create your own fonts and store them in the software. There is space for two fonts over and above the six fonts produced by Sony. It is possible to determine the spacing between each letter, outline or drop shadow a letter to a given thickness, and determine the colour of the letter and the shadow or outline independently. You may move and centre lines. By using a combination of Credit and Videotitler, we are able to produce pages with both visual graphics and textual information.

Operational Considerations

In working with this system, we have learned a few operational *do's* and *don'ts*. When

Figure 4.
Sample of Six Fonts.

creating pages, always look at the final result on video before deciding the work is complete. There are differences in both colour and resolution between the picture on an RGB monitor and that on a standard video monitor. Since these graphics are going to be seen in the video mode by 1QO% of our viewers, that must be the final test. The same applies to use in video production. Secondly, don't get carried away with the graphic creation ability when displaying text information. The graphics should enhance. Overuse results in a very busy display (See Figure 5) that detracts from the text, or in some cases makes the text almost impossible to read. The system works best with short and concise information, as is true with any textual information on a television screen.

Figure 5.
Sample Graphic That is Too Busy.
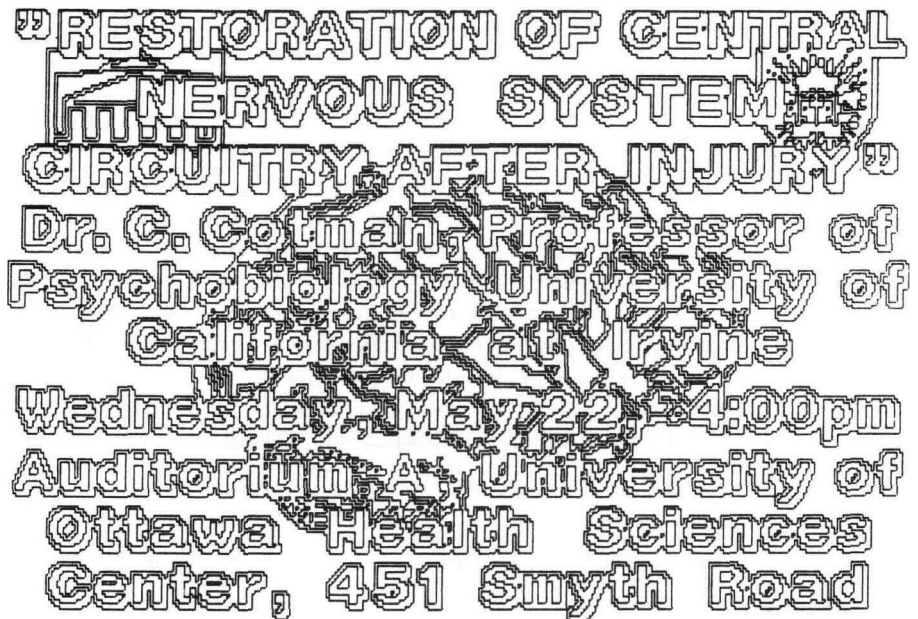
In comparison to a character generator, the Sony SMC-70G has some drawbacks. It is more time consuming when producing pages of text for short term storage and use. Its access time from page to page is not as fast. Close inspection of the curved edges of the character will reveal a jaggedness. However, the system does permit long term storage of numerous pages of text in a variety of fonts. Through the superimpose mode, the user is able to superimpose multicoloured text over video so that there is no need to tie up a switcher to insert keys. The system provides considerable flexibility and storage capacity at a moderate price. And of course, it offers much more than a character generator in the capability to produce graphic displays.

In comparison to Telidon technology, it does not have the finite detail nor the almost limitless variety of colours available in the NAPLPS (North American Presentation Level Protocol Syntax) standard. It does produce RGB, and genlockable video, making it a production tool. At the time of our purchase, to produce video from Telidon required special

equipment. To produce Telidon fonts with a drop shadow effect is a time-consuming process.

Summary

In summary, we have perceived the following benefits of the Sony SMC-70G system:

1) the use of the various fonts for text production is easy and versatile;
2) the entire system is simple to operate;
3) both broadcast standard RGB and genlocked video are available for use in television production and distribution;
4) software is continuing to be developed, permitting interface with a variety of Sony video hardware;
5) the storage of information is easy and reliable; and
6) the system is relatively economical.

In addition, we have the following criticisms:

1) page production is a slower process than with a television character generator;
2) the quality of the video from the NTSC encoder could be better, though this unit provided respectable quality considering price;
3) in the display mode, the border surround does not wipe in with the rest of the video information; and
4) it is limited in the number of colour choices and graphic resolution, understandably a function of its cost.

For our purposes at Carleton University, we have found the system to be particularly useful and effective in displaying information about events occurring at the university to approximately 125,000 homes in the Greater Ottawa area. In addition, we have found it to be a useful production tool, and look forward to future software developments such as editing control software. Because we are dealing with software as well as hardware, unlike previous video equipment, this technology is capable of becoming even more versatile with age.