

TOWARDS INEXPENSIVE COMPUTER GRAPHICS

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This paper presents some findings of a system study underway to reduce the cost of computer graphics. It also describes a pilot system currently being constructed, to test some of these ideas.

The basic hypothesis of the study are (i) Computer Graphics can be integrated with other video information features; such as, moving pictures, and (ii) The Traffic pattern permits demand assignment of equipment. Based on the above hypothesis, we are currently studying a video information dissemination system. Some of the major questions being studied are:

- (1) Centralized vs. Distributed storage.
- (2) Demand Assignment.
- (3) Firmware vs. Software.

The other aspect of the study is to examine means of improving interaction. In particular, the pilot system will examine the effect of resolution; and, two approaches to improving resolution without incurring high cost.

We feel that the approach described here, will lead to a new system configuration which will substantially lower the cost of computer graphic communication systems.

PROBLEM STATEMENT

It is our hypothesis that cost of computer graphics systems can be minimized in two ways:

1. By designing a network which can accommodate a wide range of applications instead of designing individual systems for different services.

2. By sharing as much of the equipment as possible among a number of users with access on a demand basis.

In order to accommodate the wide range of applications suggested, the network/system should support:

1. moving frames
2. still frames
3. computer generated graphics and text
4. hard copy
5. facsimile
6. microfilm reading
7. document encoding
8. person to person modes of communication such as face-to-face or scribble-phone

GENERAL SOLUTION

It is evident that neither an all digital nor all analog system is likely to provide all these capabilities and that perhaps a hybrid approach is indicated. For this reason we were led to consider a combination of computer (digital) and TV (analog) technology.

A hybrid system which can accommodate a wide range of services would look something like the one sketched in Figure 1.

Table 1 is a comparison of the hybrid digital-TV approach with standard CRT and narrowband distribution in terms of both the basic and extended capabilities. From the table we see that the shared-hybrid approach offers by far the greatest potential that further study is desirable.

SPECIAL STUDIES

The key research areas are as follows:

1. System Configuration
 - (i) Storage at terminal vs. central storage.

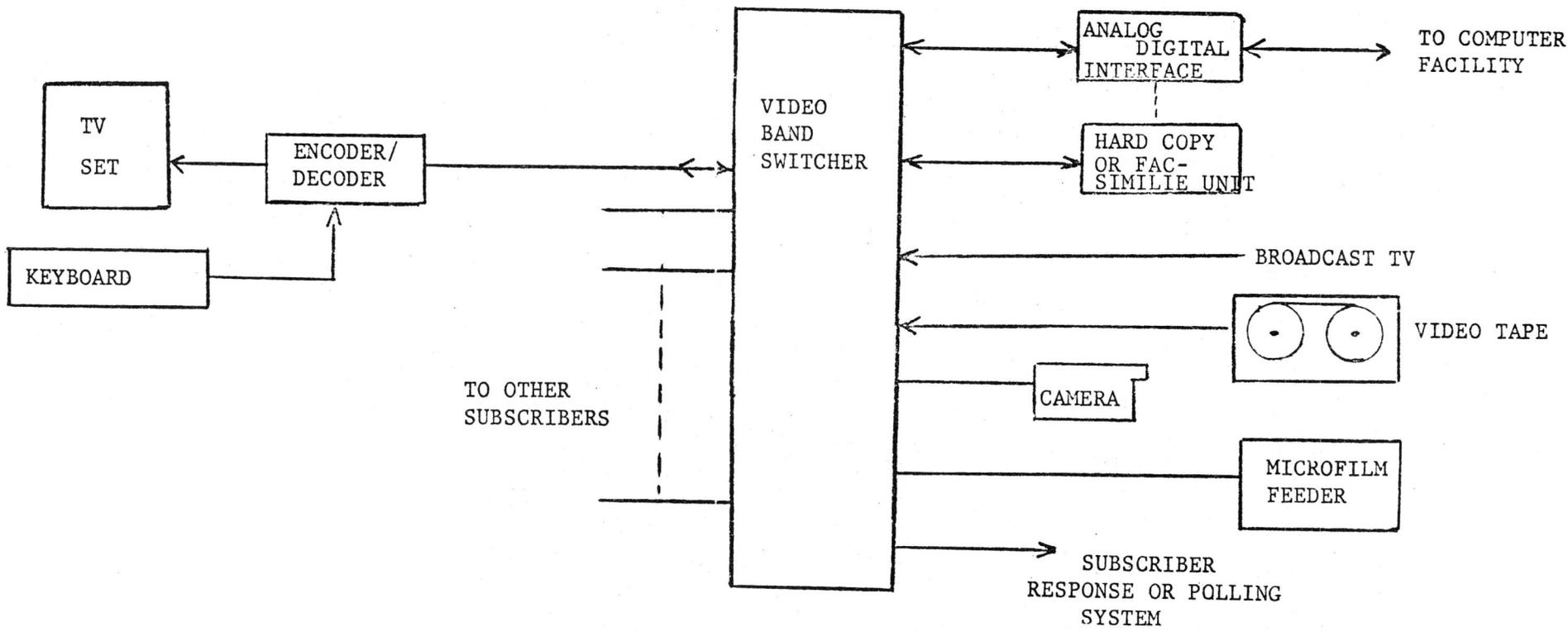


FIGURE 1

- (ii) Central storage at (a) computer centre (b) Central office (c) PBX (business customers).
- (iii) Wideband distribution vs. narrowband facilities.
- (iv) Dedicated vs. demand assignment distribution systems.
- (v) Transmission modes - (a) digital (b) analog (c) hybrid.
- (vi) Analog/digital interfacing.

2. Usage Characteristics

- (i) User adaptation and interaction.
- (ii) Content.

TABLE 1

Comparative Capabilities

System	(A) CRT Terminal	(B) TV Terminal
Basic Capability of Terminal	<ul style="list-style-type: none"> -Alphanumeric I/O -Text retrieval -Central Hard Copy of Text 	<ul style="list-style-type: none"> - Alphanumeric Input - Alphanumeric and/or Graphic Output - Central Hard Copy
Same Basic Terminal - Extended System Capability	<ul style="list-style-type: none"> -Local Hard Copy of Text -Local Digital Tape Store 	<ul style="list-style-type: none"> - Grey Scale - Moving Pictures - Microfilm Retrieval - Local Hard Copy of Images - Face-to-Face - "Scribblephone"