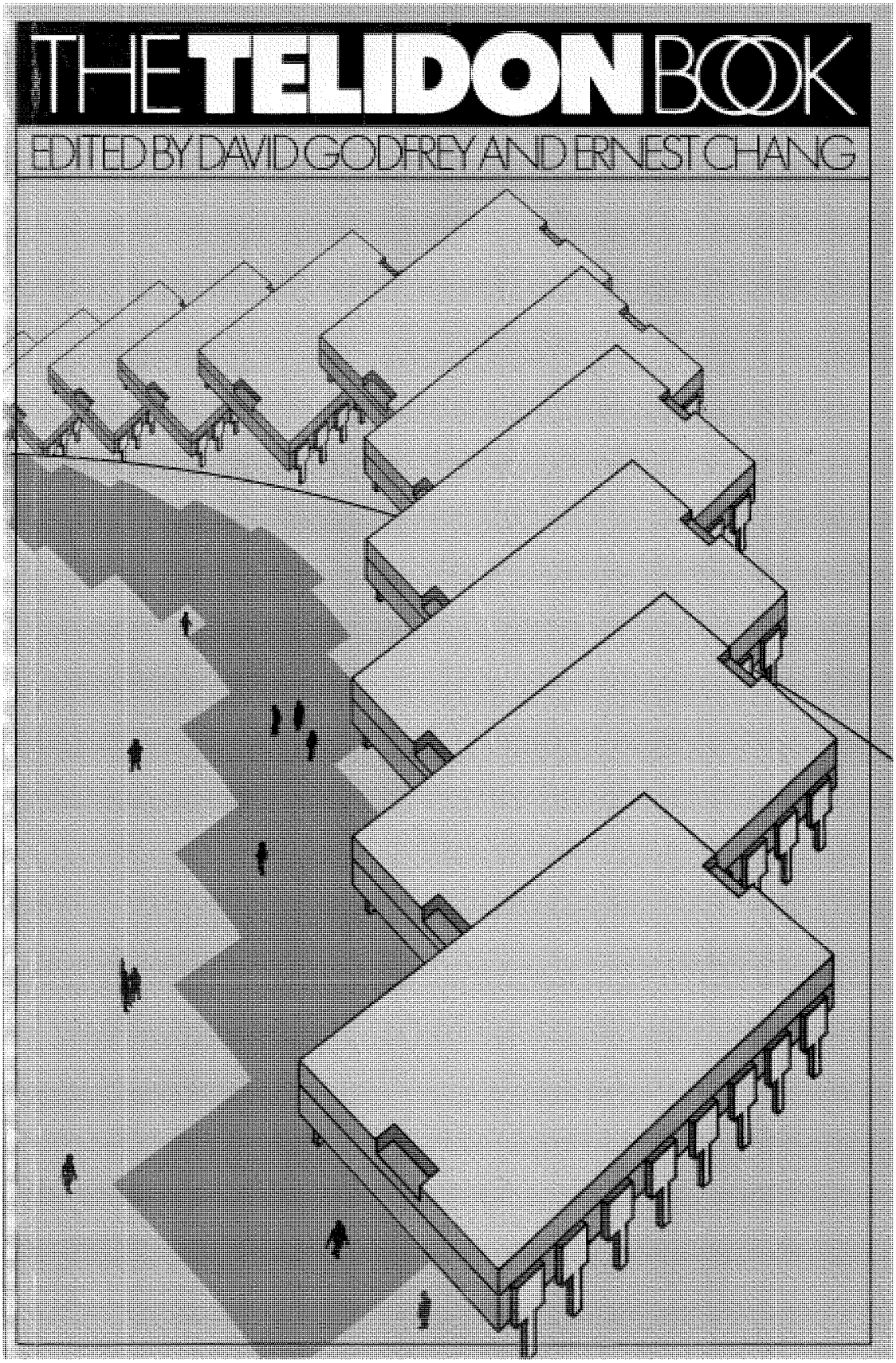
THE TELIDON BOOK

EDITED BY DAVID GODFREY AND ERNEST CHANG



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10 IMPLEMENTING THE TERMINAL

David Godfrey, Ernest Chang

1 INTRODUCTION

Since TELIDON is essentially a presentation level protocol, the presentation device is a crucial factor in the economic success or failure of TELIDON.

It is unlikely that very many firms or individuals will wish to become involved in this aspect of TELIDON. Many will make images and pages, a fair number will work on software to drive the terminals in "non-standard" ways, some will provide alternative database software and help establish networks, but few will actually construct or manufacture terminals.

Nonetheless, a general understanding of the terminal is useful for all TELIDON practitioners, especially for artists. In addition, there are a number of crucial factors which could help make or break TELIDON as an international standard and hardware unit.

2 THE BASIC PRINCIPLES

In terms of function, we can look at the hardware implementation as consisting of five units.

- The terminal must receive the string of ASCII code which constitutes the PDI.
- For convenience, it stores this ASCII code in local memory while processing is going on.
- Local processing consists of translating this ASCII code into a form suitable for display via a TV screen. This is done using a standard microprocessor which draws on a ROM-stored program to perform the translation.

- Since the TV screen display must be refreshed 30 times per second, the display patterns are stored in 32K of local memory while the current image is active.
- These display patterns are transmitted to the TV screen in a suitable manner for proper interpretation by the specific TV unit.

The next five sections contain further details on these five units, beginning with the end-product, the displayed image, and move "backwards" through the process that creates that image from a stream of transmitted ASCII code.

2.1 TV Driver

The TV image is produced by the emissions given off from phosphor coatings on the screen when struck by electrons given off from the cathode ray tube (CRT). Signals fed into the CRT control the red, green and blue (RGB) tones which are produced by the screen. It is the combination of these hues, in various intensities, which produce all the spectrum of colors seen on a TV tube. Thus, it is the job of the TV driver to generate the signals which will cause the proper emission of electrons to the screen at the right time for a given composite picture to appear. In standard TV systems, the picture is formed by the beam scanning across the screen from top to bottom in 525 lines (in North America) at the rate of at least 30 times a second. Standard hardware devices are available to perform this function.

2.2 Bit Plane Memory

In a computer generated image, each point which is shown on the TV screen must be represented by information stored in the computer's memory. This is usually memory which is dedicated to the task of providing information to the TV driver, and is called a "bit plane". The memory is connected to the video generating circuit in a way which allows the elements which hold the information for each displayable point to be examined simultaneously, and produce a "scan line" of video signals to the TV beam control system. Furthermore, the memory is connected to the computer and peripheral devices in a manner which facilitates the transfer of new information into the bit plane. As soon as an element in the bit plane is changed by the computer, the corresponding change appears on the TV screen.

2.3 Decoder CPU, ROM and Software

The TELIDON graphics system is based on a host computer sending