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SEMINAR M-1:

ELECTRONIC INFORMATION DISPLAY PERSPECTIVE (Addressing, Addressing, Addressing)

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Summary

This seminar is intended to serve as an introduction to the more detailed CRT and flat-panel topics which follow in the other seminars, application seminars, applications sessions, and symposium. It is intended to provide both the novice and serious display technologist a snapshot in time as to the relative status, features, and limitations of each of the major direct-view display technologies. The technologies covered include conventional CRTs, electroluminescence, plasma, flat CRTs, and LCDs. Current status, features, fundamental strengths and weaknesses, and an overview of the most recent developments in each technology will be presented. Technology trends and prospects for the future will also be reviewed.



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NOTES

ELECTRONIC INFORMATION DISPLAY PERSPECTIVE

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Introduction

Display devices¹ play a very important role in today's information-dominated societies. This is because designers of electronic information systems almost always implement the human interface visually. **Figure 1** depicts the range of common electronic display technologies in a two-dimensional display phase space, where the degrees of freedom are the display diagonal and the pixel count, with some other non-electronic image formats.² Most printers have higher resolution than all displays, so it seems clear that display technology is still a work in progress. In fact, many displays are still in use that have less than one million pixels. Direct-view displays have also rarely been produced much larger than 40-inches in diagonal.

PRODUCT SEGMENT	1990 (MILLION)	1997 (MILLION)	CAGR (%)
CRT Television	93.0	167.0	8.7
Desktop PC	20.4	65.5	19.5
Mobile PC	3.6	13.4	20.8
Electronic Camera	8.6	11.4	4.1
Handheld PC	NA	3.0	NA
Electronic Projector	0.4	1.6	23.8
Word Processor	2.0	0.4	-21.7

Table 1. World Production of Display-Enabled Products (multiple published Sources)

Table 1 gives recent unit volumes for electronic display products broken into seven market segments. Of course, cathode-ray tubes (CRTs) have the lion's share of the two biggest market segments, direct-view television and desktop personal computers. According to the Consumer Electronics Manufacturer's Association (CEMA)³, sales of direct-view televisions in the US *dropped* 5% between 1996 and 1997. However, sales of large-screen (30-inch and up) models climbed 4%. CEMA also estimates that sales of unbundled personal computer monitors to dealers rose 9.8% in 1997. At the same time, the average selling price increased 1.7%, owing to the transition from 14-inch to 15-inch screens.

Company	Date Reported	New investment (billion Yen)	Construction	Production (1000/month)	Diagonal (inches)
Matsushita	2/23/98	20	1999	2	42
Fujitsu	2/18/98	40	1999	10	42
Pioneer	11/20/97	NA	NA	NA	40
NEC	11/6/97	10	NA	2 (as of 5/97)	42
Mitsubishi	11/6/97	10	NA	6	40

Table 2. Recent Level of Investment in Production of Large-Area Plasma Displays

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