

4-16-82

Dr. Steve Kragney

Bill Pargell

Bob
Ralph?

GROUND RULES FOR EECO/MATTEL TECHNICAL DISCUSSION

The objectives of the discussion are to assure Mattel:

- A. We have a breakthrough in invention
- B. A factory costs of \$100 is achievable
- C. FCC transmission regulations implications

Class A
RS 170

To accomplish these objectives:

- 0.5 We will review summaries of the inventions
- 1. We will review the background of the inventions including our research looking for preceding inventions.
- 2. We will review generally how things are accomplished.
- 3. We will show the burst transmission.
- 4. We will show feasibility hardware.
- 5. We will explain how factory cost estimates were developed.
- 6. We will relate the estimates to the feasibility hardware.

We will avoid detailed technical disclosures such as:

- 1. Schematic diagrams
- 2. Detailed block diagrams
- 3. Voltage waveforms
- 4. Detailed theory of operation
- 5. No photographs
- 6. No video tape samples



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1. Television Burst Service
Filed: April 1, 1981

This is a visual service that employs the full facilities of a television communication channel on an intermittent basis. The user chooses certain still picture television frames that contain subject matter of interest to him. This information is conveyed to a central transmitting facility. The desired frames are subsequently stored at the user's location and can be viewed as often as desired.

2. Television Compressed Audio
Filed: May 18, 1981

An interval of audio frequency, such as 10 seconds or more, is sampled, digitized, and stored in a memory. It is then read out very many times faster, say 400 times faster, is converted to analog, and transmitted as a single television frame of a television channel. It is received and then reconverted and read out at an audio frequency rate to thereby recover the original sound.

4/12/82



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3. Television Digital Data Frame
Filed: August 24, 1981

Digital data is transmitted during a least one whole frame in television format for displaying the same in alpha-numeric characters at a receiver. Checks for accuracy are made at the end of each television line. Micro processors and memories are used at both the transmitting and receiving locations. Each frame is coded for identification.

4. Method and Apparatus for Plural Kinds of Television Information
Filed: September 21, 1981

Plural kinds of television information are available to a user from a central library such as still frame pictures of subjects, initially compressed and subsequently decompressed audio that may accompany such pictures, and alpha-numeric text with or without sound, and the usual moving image television service. The desired kind and item of information is selected by the user from indexes that are presented to him.

4/12/82

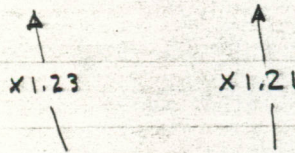
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2-3amp @ 5V
also ±12V

A. FEASIBILITY MODEL 9/81
NO ATTEMPT AT OPTIMIZATION

VIDEO CODE READER A	24 I.C. + 84 COMPONENTS
" " " B	31 " + 50 "
16K Byte RAM + PROM GEN.	3T " + 9 "
μ PROCESSOR	12 " + 6 "
VIDEO CHARACTER GEN.	17 " + 44 " (CHARACTERS ON SOLID COLOR BACKGROUND ONLY)
VCR INTERFACE	15 " + 6 "
TOTAL FEAS. MODEL	130 I.C. + 199 COMPONENTS



B. FACTORY COST ESTIMATE 9/81 105 I.C. + 165 COMPONENTS

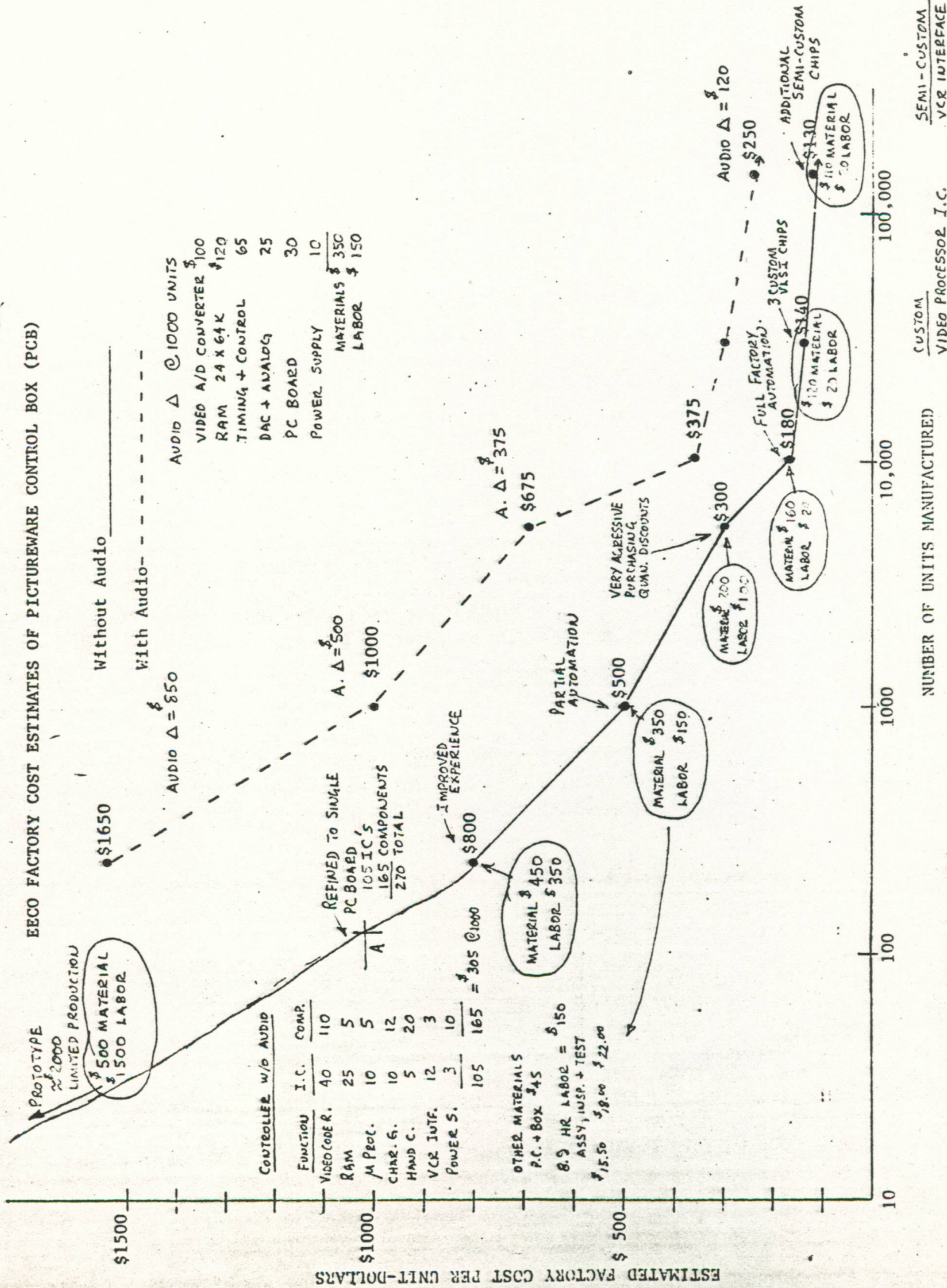
C. IMPROVED VIDEO CHAR. GEN. 3/81 28 I.C. + 197 COMPONENTS (COLOR CHARACTERS ON PICTURE)

D. REVISED FEAS. MODEL WITH NEW C.G. 141 I.C. + 352 COMPONENTS
(x1.34) (x 2.13)

E. PART PRICES USED IN 9/81 ESTIMATE

14 PIN LS TTL	.35	UV EPROM 2K X 8	4.00	MISC. COMP.	
16 " " "	1.25	RESISTORS	.075		.25
20 " " "	1.85	10% CAPAC.	.50		
ANALOG I.C.	1.50	CERAMIC CAP.	.25	POTENTIOMETER	
MICRO PROCESSOR	10.00	ELECTROLYTIC CAP.	.60		2.00
SUPPORT CHIP	5.00	DIODES	.125		
16K DYNAMIC RAM	5.00	INDUCTORS	1.00		

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POINT A CROSS CHECKS WITH INDEPENDENT ESTIMATE BY EECO COST-ESTIMATING GROUP \$1044 IN QUAN. OF 100 TO 200 UNITS

SEMI-CUSTOM: VCR INTERFACE, MICROPROCESSOR SUBMIT

CUSTOM: VIDEO PROCESSOR I.C., CODE PROCESSOR I.C., CHARACTER GENERATOR I.C.

	<u>LBR \$</u>	<u>MTL \$</u>
CHASSIS ASSEMBLY	15.53	123.53
LOGIC BOARD ASSEMBLY	57.76	507.10
FRONT PANEL ASSEMBLY	5.69	32.29
FINAL ASSEMBLY	4.10	2.64
RF COVER	1.35	.75
MISC. CONTINGENCY	2.00	10.00
FINAL TEST	8.06	—
MFG NON RECURRING (LESS TOOLING) \$ 515.40		<u>676.31</u>
PLANNING	3.42	
MFG ENGINEERING (NO ENG. SUPPORT) S/T	<u>13.45</u> 11.36	
0.1% @ 200%	222.72	
MATERIAL	676.31	
5% ATTRITION ON MTL	<u>33.82</u>	
		104421

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Ken Miller

INDEPENDENT DERIVATION OF FACTORY COST ESTIMATE
FOR THE PICTUREWARE CONTROLLER

BASED ON INFORMATION FROM AN ARTICLE APPEARING IN EE TIMES 11/23/81 PAGE 39 WHICH STATES " MOST INDUSTRIES REDUCE THEIR COSTS BY 20 TO 30 PERCENT EACH TIME THEIR ACCUMULATED EXPERIENCE DOUBLES. THE SEMICONDUCTOR INDUSTRY HAS CONSISTENTLY OPERATED AT THE HIGH END OF THIS RANGE, ABOUT 28 PERCENT. "

APPLYING THIS MODEL AND ASSUMING ONLY 20% REDUCTION AT EACH DOUBLING OF EXPERIENCE AND ALSO ASSUMING A FACTORY COST OF \$1100 AT 100 UNITS THE FOLLOWING PREDICTION RESULTS.

<u>UNITS</u>	<u>FACTORY COST</u>
100	\$1100
200	880
400	704
800	563
1600	450
3200	360
6400	288
12800	230
25600	184
51200	148
102400	118

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Canada's Norpak Ltd., A Videotex Producer, Gets Strong Backing

WSJ 6/24/81

By a WALL STREET JOURNAL Staff Reporter

OTTAWA—Norpak Ltd., a main manufacturer of equipment for Canada's videotex system, has received strong backing from the federal government and private industry.

The company, which is privately owned, said Maclaren Power & Paper Co., a wholly owned subsidiary of Noranda Mines Ltd., has agreed to invest a further \$30 million (Canadian) in Norpak.

Maclaren Power currently owns about 25% of Norpak's shares outstanding. Its new investment will be made in stages and will depend on Norpak meeting certain objectives, said Adam Zimmerman, Noranda's executive vice president.

The companies declined to say how much of Norpak's equity will be acquired by Maclaren. Maclaren will become a "major shareholder" in Norpak, but "effective control" of the company will continue to be exercised by the present operating team, headed by the Norton family, which founded Norpak in 1975, Norpak said.

Mark Norton, Norpak's president, said Norpak eventually intends to offer its shares to the public.

Since its inception Norpak has been closely involved with Canada's videotex system, known as Telidon, which was developed by the federal government. With such systems, subscribers can summon a wide variety of information stored in computer data bases for display on slightly modified TV screens. The information is called up by punching a key pad the size of a pocket calculator.

Mr. Norton said two senior officials of the Federal Communications Department who were involved in the development of Telidon will join Norpak's management. Herbert Brown will be vice president, corporate development, and John Smirle will be assistant vice president, market development.

Also, Industry, Trade and Commerce Minister Herb Gray announced a \$1.7 million (Canadian) award to Norpak for development of Telidon equipment.

Mr. Norton predicted that with volume production and expected technical developments, the cost of its equipment per videotex terminal will decline to \$150 (Canadian) within a year or two from about \$1,500 currently. The cost estimate doesn't include the TV set.

Bob
Ralph

CONFIDENTIAL

April 20, 1982

TO: Stav Prodromou
cc: Dave Chandler
Wayne Pfannkurch
FROM: Hugh Barnes
SUBJECT: Visit - Summary EECO 4/16

Met with: Bob Pargee - Engineer - Inventor
Gary Ware - Engineer - Implementor
Bill - Engineer - Recently joined EECO
Leo - Engineer - Manufacturing

1. FCC regulations review:

- A. They plan initial use in industrial applications and in the cable broadcast service - this avoids the need to obtain a new service authorization or an experimental license.
- B. They were aware that an equipment authorization would be required. Their plan is to apply under the most lenient of the Computing Device rules (Class A). EECO has no knowledge of the specifics involved in equipment authorization - neither technical nor procedural.

Conclusion: There is a high risk that additional passes (PCB & shielding) would be required in order to satisfy the FCC rules, especially the Class B regulations applying to consumer equipment. A six month schedule impact is likely.

2. "Invention" review: Four patent abstracts were reviewed (see attached). It is certainly not clear that the patents will be granted; I would expect a lengthy prosecution if they are granted.

In general the "invention" claimed is the use of the full bandwidth of the channel on an as required basis to deliver the data necessary to later present a television picture or passage of audio. Other systems either use only a limited BW or a bandwidth much greater than the TV channel allocation, according to the searches performed by EECO.

Dave Chandler asked if EECO ^{WERE} ~~was~~ aware of Playcable - they were not. Playcable does have many of the characteristics described by the EECO "invention". Program data is analogous to picture or sound data, the full channel ~~B/W~~ is used

during transmission, and the play of the game corresponds to the selection of a picture.

Conclusion: I think the patent position is a weak one- the patents may or may not be valid and they are years from culminating the patent process (4-6 yrs). I think a serious competitor would go to litigation; I suspect there are several people working on similar ideas.

3. Cost review: The costing was done on the basis of IC and component count at low volumes and extrapolated to higher volumes (see pages 4&5, attached). I think the extrapolations are suspect and probably have a tolerance of $\pm 30\%$ EECO readily admitted no experience in high volume manufacturing/purchasing and they were not confident of the extrapolations. Pages 7&8, attached, show a couple of recent articles that did boost EECO's confidence somewhat.

In any event it is interesting to look at the cost spread based on EECO's numbers and a $\pm 30\%$ tolerance.

<u>+ 30%</u>	<u>EECO Projected Cost a 100K PCS</u>	<u>- 30%</u>
	<u>with Audio</u>	
\$325	\$250	\$175
	<u>Without Audio</u>	
\$169	\$130	\$ 91

We indicated to EECO that we could not assess the cost potential based on the information we had received. Without considering the impact of custom IC's, it is necessary that we receive a full parts list so that a high volume costing could be done. From the parts list and a simple styling/assembly drawing a $\pm 10\%$ costing could be done. If custom IC's were to be considered, a schematic would be necessary so that a partitioning exercise could be made with subsequent die size estimates and costs.

Conclusion: I think there is a high risk in the attainment of \$100 manufactured cost. Based on the slight info received, I think further integration would be required (custom) and manufacturing in the far east would be necessary. This is a complex product that would require specialized test equipment.

Thank you,

Hugh

GROUND RULES FOR EECO/MATTEL TECHNICAL DISCUSSION

FILE
EECO

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- A. We have a breakthrough in invention
- B. A factory costs of \$100 is achievable
- C. FCC transmission regulations implications

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1. Television Burst Service
Filed: April 1, 1981

Patent Abstracts

This is a visual service that employs the full facilities of a television communication channel on an intermittent basis. The user chooses certain still picture television frames that contain subject matter of interest to him. This information is conveyed to a central transmitting facility. The desired frames are subsequently stored at the user's location and can be viewed as often as desired.

*Playable??
- burst digital data
- full BW of channel.*

2. Television Compressed Audio
Filed: May 18, 1981

An interval of audio frequency, such as 10 seconds or more, is sampled, digitized, and stored in a memory. It is then read out very many times faster, say 400 times faster, is converted to analog, and transmitted as a single television frame of a television channel. It is received and then reconverted and read out at an audio frequency rate to thereby recover the original sound.

*Compression techniques - however
used for discs - however
all info to date of the
disc (~ 8 MHz)*

EECO only needs 3 MHz.

COMPLIES w/ RS 170

COMPOSITE WAVEFORM

*Info in the BK to white
BW requirement in 3 MHz area
Coding in the vertical retrace
(similar to captioning service, teletext etc.)*

1st Application thru the cable T.V. service, avoid service authorization, problem becomes one of equipment authorization only.

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3. Television Digital Data Frame
Filed: August 24, 1981

Playcable
Cited 6 refs.
• noise, dropout & Bw
• redundancy - sent 4 times
• Check sum

Digital data is transmitted during a least one whole frame in television format for displaying the same in alpha-numeric characters at a receiver. Checks for accuracy are made at the end of each television line. Micro processors and memories are used at both the transmitting and receiving locations. Each frame is coded for identification.

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Filed: September 21, 1981

System using 1,283.

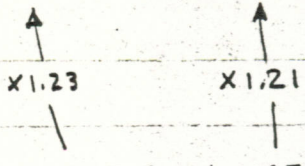
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RAM/ROM	37 " + 9 "
μ PROCESSOR (8085)	12 " + 6 "
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VCR INTERFACE	15 " + 6 "
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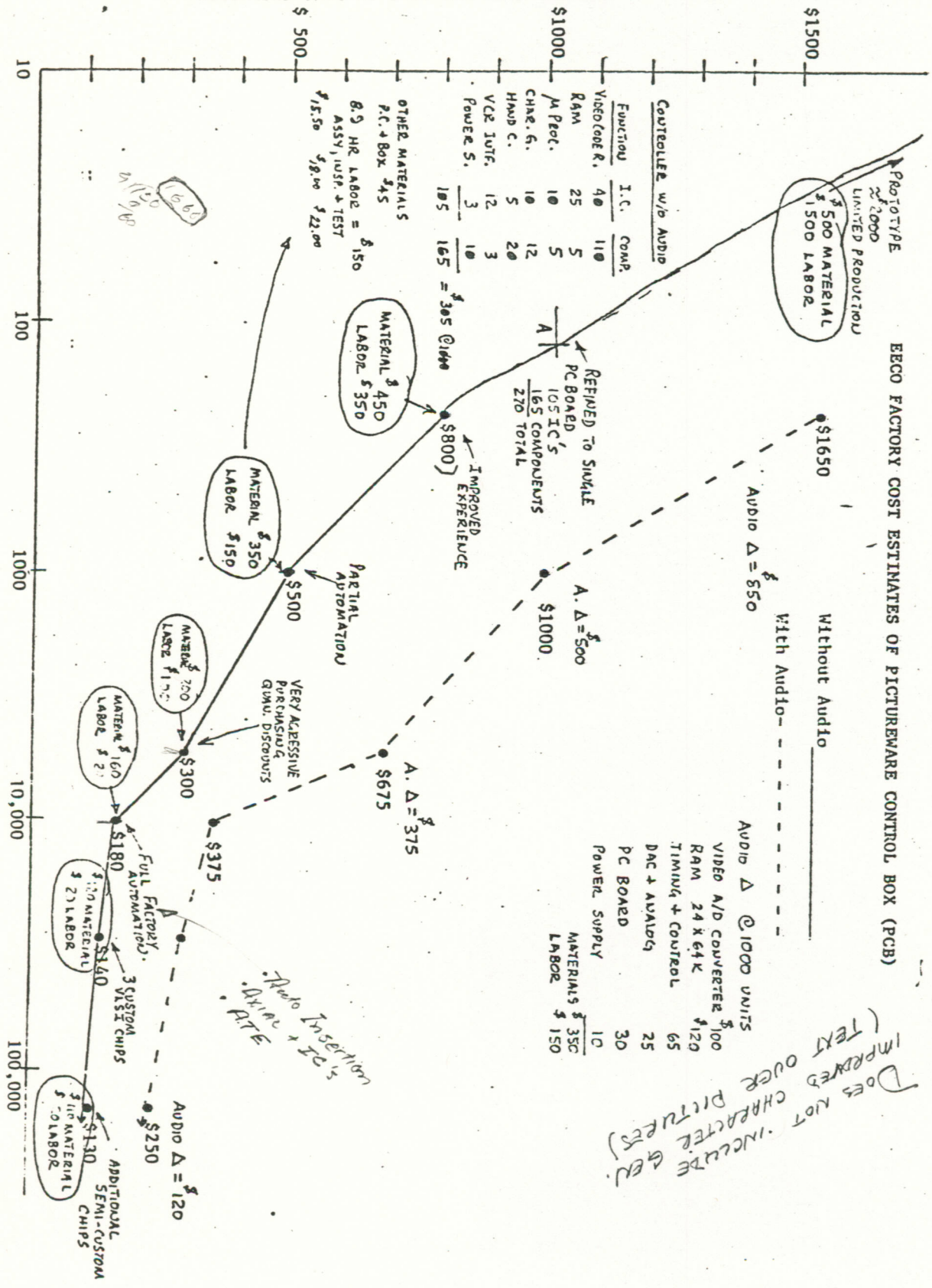
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16K DYNAMIC RAM	5.00	INDUCTORS	1.00		

ESTIMATED FACTORY COST PER UNIT-DOLLARS

5



ECCO FACTORY COST ESTIMATES OF PICTUREWARE CONTROL BOX (PCB)

Without Audio _____
 With Audio - - - - -

Does not include gen. improved over pictures (text over pictures)

POINT A CROSS CHECKS WITH
 INDEPENDENT ESTIMATE BY ECCO COST-ESTIMATING GROUP
 \$1044 IN QVAN. OF 100 TO 200 UNITS

CUSTOM
 VIDEO PROCESSOR I.C.
 CODE PROCESSOR I.C.
 CHARACTER GENERATOR I.C.

SEMI-CUSTOM
 VCR INTERFACE
 MICROPROCESSOR SUPPORT

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	<u>LBR \$</u>	<u>MTL \$</u>
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MATERIAL	676.31	
5% ATTRITION ON MTL	<u>33.82</u>	
	1044.21	

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Ken [Signature]

(6)

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FOR THE PICTUREWARE CONTROLLER

BASED ON INFORMATION FROM AN ARTICLE APPEARING IN EE TIMES 11/23/81 PAGE 39 WHICH STATES " MOST INDUSTRIES REDUCE THEIR COSTS BY 20 TO 30 PERCENT EACH TIME THEIR ACCUMULATED EXPERIENCE DOUBLES. THE SEMICONDUCTOR INDUSTRY HAS CONSISTENTLY OPERATED AT THE HIGH END OF THIS RANGE, ABOUT 28 PERCENT. "

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Canada's Norpak Ltd., A Videotex Producer, Gets Strong Backing

WSJ 6/24/81

- By a WALL STREET JOURNAL Staff Reporter

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April 23, 1982

TO: Hugh Barnes
Dave Chandler
Richard Chang
Gary Moskovitz
Stav Prodromou
Paul Rioux

FROM: Dennis Hightower

SUBJECT: Pictureware--Letter of Intent

Yesterday, I reviewed the attached draft letter of intent between Mattel and EECO with John R. Stahr, Partner, Latham & Watkins, Attorneys at Law, legal counselors to EECO. Stahr did not foresee any problems with the wording, timing or general direction, although he is aware that Pat Cadigan had wanted to make some sort of an announcement at the EECO shareholders' meeting on April 26. Stahr agreed, however, with my comment that if a joint venture is the correct thing to do, then spending the time necessary to answer the questions that we have will represent time well spent if the decision is to proceed. Stahr also brought up the possible issue of whether EECO would have access to any of the analyses if a decision is reached not to proceed. I responded that while that is not something I could comment on definitely, it did seem reasonable to assume such access since virtually all of the information would be developed on a joint basis. (This could defuse a potential issue of "compensating" EECO for any opportunity loss between now and mid-June.)

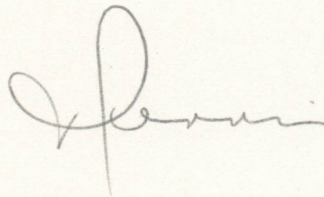
Stahr is intimately familiar with EECO and the nature of the Mattel/EECO discussions. Aside from being their legal counsel, he is also the son-in-law of Burgess Dempster, EECO's Chairman and founder.

I expect to hear from Stahr no later than Monday, April 26, regarding any revisions that EECO would care to make.

DFH:nt

Attachment

cc: (w/attachment)
K. Creed
J. Denham
R. Ferris
T. Reames



April ____, 1982

Mr. Patrick F. Cadigan
President & Chief Executive Officer
EECO Incorporated
1601 East Chestnut Avenue
Santa Ana, CA 92702-0659

Re: Pictureware

Dear Mr. Cadigan:

During the last several weeks, representatives of EECO Incorporated and Mattel Electronics have been discussing areas of common interest regarding the development and future utilization of Pictureware. Based on these preliminary discussions, it has been concluded that further exploration of areas of common interest should be undertaken. To this end, EECO and Mattel Electronics each will designate technical and operating representatives who, subject to appropriate disclosure agreements, will consider various aspects of the development and utilization of Pictureware. So that Mattel's representatives are able to recommend a course of action to its senior management (on or before June 10, 1982), a more detailed assessment must be made which would include the following:

1. The technical information, patents, and related information developed to date and the value thereof;
2. The future development requirements of Pictureware and related timing;
3. The potential market size and consumer and non-consumer applications for Pictureware;
4. A jointly developed detailed product cost analysis;
5. The cost of future development and proforma financial results during start-up and initial market introduction;

April __, 1982

Mr. Patrick F. Cadigan
President & Chief
Executive Officer
EECO Incorporated
1601 East Chestnut Avenue
Santa Ana, CA 92702-0659

Re: Pictureware

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1. The future development and applications of Pictureware;
2. The cost of future development and the time required for such development;
3. The responsibilities of the respective parties in developing and marketing Pictureware;
4. The technical information, patents, and related information developed to date and the value thereof;

5. The method of financing the costs of developing and marketing Pictureware;
6. The type of organization to be utilized if we proceed, the management of that organization and related factors.

In consideration for each party agreeing to commit the necessary time and effort to conduct the above reviews, it is agreed that for a period of ninety (90)/sixty (60)/thirty (30) days, neither party will undertake similar discussions with any unrelated party and each will continue, in the same manner as in the past, in the spirit of cooperation.

If this letter correctly sets forth your understanding of how we should proceed, please execute a copy in the place provided and return it to me. For your protection and ours, except as provided in the preceding paragraph, this is not considered to be a binding agreement on the parties but merely an expression of intent to further explore potential opportunities.

Very truly yours,

AGREED TO THIS _____ DAY OF _____, 19__.

BY _____

EECO PICTUREWARE SYSTEM
EECO-MATTEL TECHNICAL REVIEW

1. Pictureware
 - o Technical overview of the system and achievements
 - o The patents which have been filed as they relate to Pictureware (overview of the patents)

2. Detailed review of the patents
 - o Status of filings/searches and Patent Office actions

3. Preliminary product designs/functional circuitry/integrity
 - o Decoders
 - o Prototypes 10 units
 - o Costs now/future
 - o Functional Components
 - o Compressed audio
 - o Digital data codes
 - o Text over video
 - o IR Keypad
 - o Software/Microcode

4. Production System
 - o Overview
 - o Information flow/simulation/assembly
 - o Proprietary processes

5. Future plans/problems/strategies

- o Scrambling
- o FCC
- o UL
- o International standards
- o Additional patents
- o Modems
- o Modulators

MATTEL ELECTRONICS

5150 Rosecrans Avenue
Hawthorne, California 90250
Telephone (213) 978-5150
TWX-910-325-7162

June 11, 1982

Mr. Lewis Solomon
Senior Vice President and
Executive Assistant to the
Chairman
GENERAL INSTRUMENT CORPORATION
1775 Broadway
New York, New York 10019

Dear Lew:

Following up on our meeting of Thursday, June 10, I am enclosing a complete copy of our Analysis of the Pictureware (EECO, Inc.) venture.

I will be calling you on Monday, June 14 to discuss a meeting with Mr. Larry Hill, including a Pictureware demonstration and discussion at EECO, Inc., in Santa Ana.

I thoroughly enjoyed our meeting and was quite impressed with the strategic positioning of General Instrument.

I am certainly looking forward to working with you and GI on this and other future projects.

Best regards,

MATTEL ELECTRONICS

Clare Leahy for Gary S. Moskowitz
Gary S. Moskowitz
Marketing Director

GSM:e1

cc: S. Prodromou
P. Rioux
W. Gillis
P. Pirner
J. Denham
D. Chandler

Encl.

Dictated but not read

RECEIVED
JUN 17 1982
D. CHANDLER

TO: Distribution

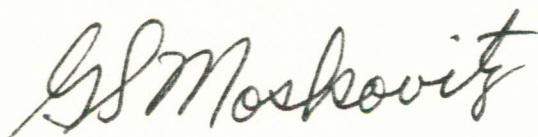
DATE: June 14, 1982

FROM: Gary S. Moskovitz

SUBJECT: "Home of the Future" Planning Service

We have become a member of the Yankee Group "Home of the Future" Planning Service (see attached copy of brochure).

I have added your name to the list of Mattel Electronics' personnel receiving the newsletter series.



GSM:e1

att.

cc: R. Baumbusch
J. Denham
P. Pirner
W. Gillis
J. Hanson
S. Prodromou
P. Rioux
D. Chandler
R. Chang
M. Doepke

RECEIVED

JUN 17 1982

D. Chandler

JUN 09 1982

the YankeeGroup

89 Broad Street, 14th Floor, Boston, Massachusetts 02110, (617) 542-0100

June 4, 1982

Mr. Gary S. Moskovitz
Marketing Director
MATTEL ELECTRONICS
5150 Rosecrans Boulevard
Mail Stop 111-14
Hawthorne, CA 90250

Dear Mr. Moskovitz

We at the Yankee Group are pleased to have Mattel Electronics as a new member of our Home of the Future Planning Service. Enclosed please find the materials introducing you to your new subscription. I would like to take this opportunity to explain a little more in detail about the benefits of your new Planning Service.

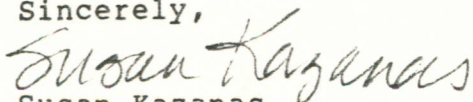
Enclosed you will find a newsletter form for you to return to us listing individuals with-in Mattel Electronics who would like to receive our periodic newsletter series. You will automatically be receiving a copy, so you need not add you name. The coupons for your attendances at Yankee Group seminars are also enclosed.. These may be used by yourself or your colleagues for individual attendances at any of the upcoming Yankee Group seminars within your subscription period. If you need additional coupons they may be purchased at a discounted bulk rate.

Your subscription period runs from June 1, 1982-May 31, 1983. Your first report will be "Segmentation Strategies, Part II." The reports are being sent directly to you, if this needs to be changed please contact me. Previous reports are available to you at a fee if you are interested.

To utilize your call-in/call-out service you can contact Ms. Michelle Corbeil. Ms. Corbeil will be contacting you in the near future to identify the areas of interest to you.

If you have any questions regarding your subscription, please feel free to contact me. Again, welcome to the Home of the Future Planning Service. We look forward to providing you with the analysis and insight that will assist you in meeting your business objectives.

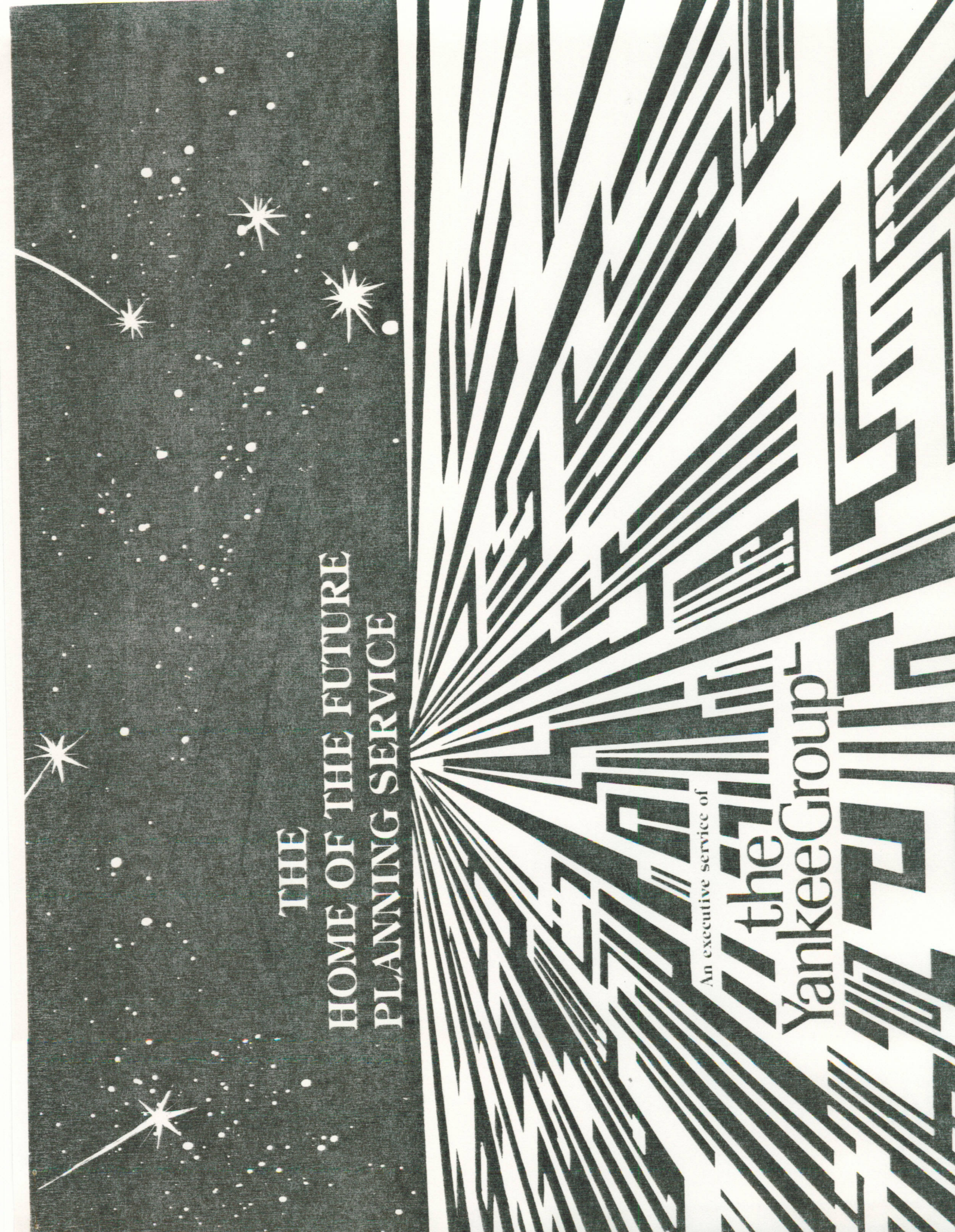
Sincerely,



Susan Kazanas
Coordinator, Client Services

/sk
Enc.
cc. Client Services

Yankee Ingenuity.



THE
HOME OF THE FUTURE
PLANNING SERVICE

An executive service of

the
YankeeGroup

Three Specific and Uncompromising Trends Are Converging To Shape The Home Of The Future

Sociological Trends

By the end of the decade, 65% of American Women will have full-time jobs. Average age of the population rises while family size falls. Even in 1982, 60% of all metropolitan households are unattended during school hours. Yet a new phenomenon — a baby boomlet — redivides and then recrystallizes the two-income family. While the major investment for most Americans has been their homes, the cost of keeping secure and

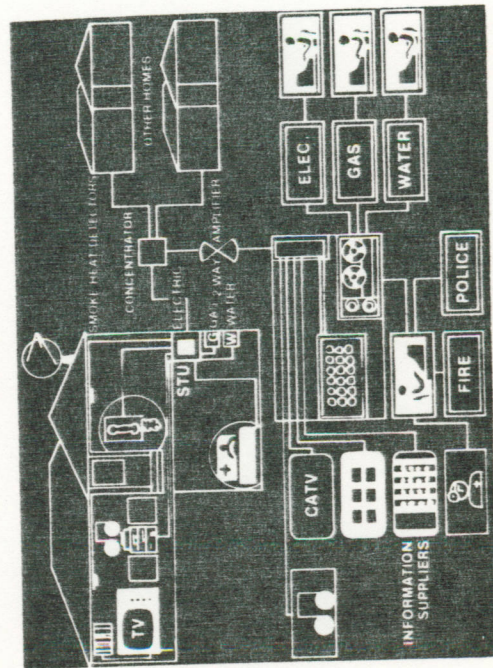
maintaining the home is rising even faster than its market value. On the way to their newfound wealth in their houses, homeowners are going broke paying for energy to run them.

Impact: The Home of the Future is today's house — not some space-age design. With housing starts at their lowest level since World War II, The Home of the Future will be retrofitted to bring consumers new levels of control, interaction, entertainment, and education.

Technology Trends

The declining cost of machine intelligence will culminate in the first mass market home computers — "commodity computers" with **anticipatory** intelligence that are sold like toaster ovens. Personal handheld television, or "electronic jewelry," a dramatic shift to **super wideband** optical fiber, and High Definition Television are further examples of the new technologies that are The Home of the Future. As Atari goes from \$100 million (1977) to \$1.8 Billion (1982), IBM discovers the importance of the home market to low cost manufacturing. Entertainment and computer software blur as the cost of unprecedented homeowner options plummets.

Impact: As the cost of computer intelligence drops below \$1.00/chip, every appliance selling for over \$40 becomes a partial computer. The obvious next step: these "computer devices" communicate in intra-house and then inter-house networks.



Competition

The ex-Bell Operating Telephone Companies begin to discover selling "third party" services over coax/fiber while the broadcasters counter by channel splitting. All aimed at the upscale home. Financial services compete head to head in teleshopping. The cable industry pushes for a future that is 1/3 entertainment, 1/3 transaction services, 1/3 voice/data telecommunications.

Impact: The Home of the Future becomes a "No Man's Land" between the consumer electronics, communications, computer, publishing, and broadcasting industries.

These three factors — Sociological Trends, Technology Trends, and Competition — combine to make the Home of the Future market a kind of mudpuddle. It is difficult for a company to see how deep the mudpuddle is, how wide, what rocks are hidden under the surface, what diamonds, and even who else is playing in the mudpuddle.

The planning service provides a **unified view** of what the future will be — a future that includes the electronics industry, the cable industry and the communications industry.

The macro-level view integrates not only technological trends, but the **economic and sociological trends as well**. Only by including these factors can we sort through the many technologically feasible products to find those few which will ultimately succeed in the marketplace.

Home of the Future Planning Service subscribers have extensive access to the Yankee Group's research directors for analysis, competitive evaluations and recommendations. This access is aimed at helping firms learn of new developments, candidates for joint ventures and important technological advances.

Howard Anderson
The Yankee Group

Features of the Service

The Home of the Future Planning Service offers five **unique components** designed to aid companies in dealing with the great upheavals now affecting many marketing channels into the home:

1. A series of six bimonthly, 200-page Industry Research Reports. A New Product and Services section appears in each report.
2. Call-In/Call-Out Program...providing two-way question and information flow with each subscriber.
3. An In-House Seminar/Consulting Program.
4. A bimonthly Newsletter Series.
5. Four registrations at Yankee Group seminars.

Industry Research Reports

In a series of six bimonthly, 200-page reports, the Planning Service will give subscribers an overview of six major components of The Home of the Future market. The reports **will ask such questions as:**

- A. Where is the **technology** going?
- B. What are current **companies, products, and market shares?**
- C. What will be the future course of **consumer demand?**
- D. What **regulatory constraints or standards problems** exist?
- E. How will **economic and sociological trends** affect these markets?

The Yankee Group's answers to these questions will be integrated into a series of **conclusions** about The Home of the Future market — and **what strategies should be pursued to succeed in that market.**

In a special section of each Research Report, subscribers will gain proprietary access to Yankee Group recommendations as to new products and services which appear viable to The Home of the Future market.

These findings will be derived from our analysis of technological developments and market-demand factors. Each report identifies the product types, functional characteristics, user interfaces and the price/demand elasticity of these new product areas.

2 Call-In/Call-Out Program

This feature of the Planning Service allows the subscriber to call The Yankee Group with questions on any facet of the industry. Our client services staff will answer questions over the phone, if we have the data or analysis at hand; if we must do additional research, we will call you back with the desired information.

From time to time there are major industry announcements and events that we feel will affect your business. Under the "Call-Out" program, the Yankee Group will call and discuss with you the impact of these events — while they are happening, in a "real time" mode of information transfer.

This year we will start up "YankeeNet," which will provide this information to all clients electronically.

3 In-House Seminar/Consulting Program

In addition to the Industry Research Reports, the Home of the Future Planning Service recognizes that each subscriber has specific areas of interest requiring more detailed information. As part of the Planning Service, The Yankee Group will provide consulting, a presentation, or some other form of interaction as part of an in-house meeting. This unique program will allow several client personnel to participate and will encourage a high degree of interaction within the group.

4 Bi-monthly Newsletter Series

Every two months Planning Service subscribers receive a comprehensive newsletter containing updates on major product announcements (followed by The Yankee Group's analyses), insights into developing trends in The Home of the Future, changes in governmental/regulatory policies and other timely information. This series is designed to provide one more communications channel for keeping subscribers abreast of unexpected advances in technology, new competitive offerings — and opportunities.

5 Attendance at Yankee Group Seminars

A significant part of the Service is free attendance at four Yankee Group seminars of your choice. These intensive two-day meetings, led by industry experts, bring together a well-balanced group of equipment manufacturers, service providers, and industry analysts.

The Home of the Future does not exist in a vacuum. Computing, semiconductor, communication, and advanced office automation products and technologies are often **developed for the business market and exploited in The Home of the Future market.** An understanding of these developments will often lead to a **cross-fertilization of applications and ideas.**

The topics focus on the latest technological and marketing trends influencing industry direction. The seminar format encourages a sharing of information and experiences with fellow attendees. The list of 1982 seminars includes:

1982 Seminar Schedule

Seminar Topic

The Future of IBM
 Marketing Strategies in the Computer/Communications Industry
 Beyond Baseband: The Next Generation of Local Nets
 The Next Generation of Consumer Electronics
 Beyond the Advanced Workstation
 The Uncommon Carrier: New Opportunities in Carrier Services
 The Future Factory
 The Future Home
 Plenary Technology

New York City

February 16, 17, 1982
 March 9, 10, 1982
 April 13, 14, 1982
 May 11, 12, 1982
 June 1, 2, 1982
 August 10, 11, 1982
 September 14, 15, 1982
 October 12, 13, 1982
 December 7, 8, 1982

Palo Alto, CA

February 23, 24, 1982*
 April 20, 21, 1982
 May 18, 19, 1982
 June 15, 16, 1982
 August 17, 18, 1982
 September 28, 29, 1982*
 October 19, 20, 1982
 December 14, 15, 1982
 *Sunnyvale California

Europe and Japan Seminar Topic

The IBM Evolution
 The 4th Annual Symposium on Electronic Mail
 Local Communication
 The New ICL
 Impact Japan
 The Home of the Future
 Strategies in Advanced Computing and Communications
 Integrating Advanced Office Automation
 Digital Communications in Europe
 Home of the Future

Date

February 4, 5, 1982
 March 22, 23, 1982
 April 26, 27, 1982
 May 10, 11, 1982
 May 24, 25, 1982
 June 14, 15, 1982
 June 23, 24, 1982
 September 20, 21, 1982
 October 20, 21, 1982
 June 24, 25, 1982

Location

London
 London
 Amsterdam
 London
 Brussels
 London
 London
 London
 London
 London
 London
 Tokyo

Cost of the Service

The cost of a one-year membership in The Home of the Future Planning Service is \$10,500. This fee includes the six Industry Research reports, New Product Profiles, In-House Consulting Program, Call-In/Call-Out Program, Six bimonthly Newsletters, and four Registrations at Yankee Group Seminars. Service subscribers may also

take advantage of additional Yankee Group seminars and other services at reduced costs.

To enter your subscription, or for further information call:

the
YankeeGroup

89 Broad Street
 Boston, Massachusetts 02110
 Telephone: (617) 542-0100

1982 Industry Research Reports

January-February 1982 SEGMENTATION STRATEGIES, PART I

Major Home of the Future industries — broadcast and cable TV, publishing, consumer electronics, banking, and telecommunications — are undergoing rapid transformations. Part I analyzes evolving strategies, strengths, weaknesses, and possible alliances of companies like **IBM, American Express, GE, Time Inc., Sears, Citicorp, Tandy,** and **CBS**. The report ranks these super-companies by various measures such as financial resources, ability to innovate, and control of pipelines into the home. Given their power to dominate, the report surveys strategic options of smaller players, including alliance formation and targeting specific mini-markets.

March-April 1982 PERSONAL COMPUTERS IN THE HOME

This report provides a valuable analysis of the strategy and products of Apple, Atari, Tandy, IBM, Texas Instruments, Sinclair, and Japanese contenders. It also examines the role of telcos, leading cable MSOs, and other players in the interactive home terminal market.

Major issues:

Identification of personal computer market segments, evolving product lines, pricepoints, distribution channels, and marketing techniques.

The software market.

Changing role of data base and electronic mail services like The Source, CompuServe, and Tandynet.

"Friendliness," 8-bit vs. 16-bit, and standards issues.

May-June 1982 SEGMENTATION STRATEGIES, PART II: AT&T EX-BELL, AND THE HOME SERVICE BUREAU

At the center of the Home of the Future are **AT&T, the ex-Bell companies,** and the **telecommunications** industry, which will control delivery of entertainment "product" and information-based services, as well as provide computer facilities and much of the customer premises equipment. This report assesses, in the context of Bell's restructuring into regulated and deregulated entities, the relative competence of AT&T and its rivals (including GTE, Western Union, United Telecom, ATC, Warner Amex, Cox, Tandy, Tymshare, MCI, ADP and others) in building the **"Super Home Service Bureau."** It highlights AT&T's residential market field trials in Ridgewood, N.J., Charlotte, N.C., southern Florida, and elsewhere as well as new networking configurations and advances in local loop architecture.

July-August 1982 SUPERTEX: THE ENHANCED INFORMATION UTILITY

Home videotex per se is not a viable business. The next generation of videotex must move to broadband pipelines, and add other "data types" such as sound (audiotex) and high resolution video — plus a friendlier user interface going beyond keypads/keyboards to touch-screens, voice control, etc. This report is a realistic look at the ability of major videotex systems like **Viewtron, CBS, Indax, Time Teletext, Telidon, Bildschirmtext** and **Prestel** to make the necessary enhancements. It also examines prospects for smaller, targeted videotex systems.

September-October 1982 JAPAN AND THE NEXT GENERATION OF CONSUMER ELECTRONICS

Japanese consumer electronics companies have demonstrated that they will innovate — rather than merely copy — to retain their market dominance in the U.S. This report offers an in-depth appraisal of key Japanese players and their strategies for shaping the next wave of consumer electronics.

Major issues:

Market innovation vs. market development as alternative approaches to the consumer electronics field.

Product R&D in the U.S. and Japan.

The trend toward U.S.-based production facilities.

Local distribution and servicing strategies.

Entry of other Asian manufacturers, the rise of protectionism, and probable regulatory responses.

November-December 1982 HIGH-DEFINITION TELEVISION, DIRECT BROADCAST SATELLITES, AND CHANNEL-SPLITTING

Broadcasters like CBS and Japan's NHK are countering the cable industry's challenge by widening and reconfiguring their pipelines to the home. This report examines likely carrier channel innovations in the 1985 to 1995 time frame, and the strategies of current and prospective players like **Sony, CBS, RCA, Sears and Comsat**. It projects the differentiated roles for DBS vs. terrestrial broadcast vs. cable as high-definition carriers, and evaluates HD's impact on entertainment, advertising, marketing and information delivery.

Additional Research Reports Available to The Home of the Future Planning Service Subscribers...

THE WIRED HOME AND THE ELECTRONIC SUPERSTRUCTURE

TELESHOPPING: THE NEW ELECTRONIC MARKETPLACE

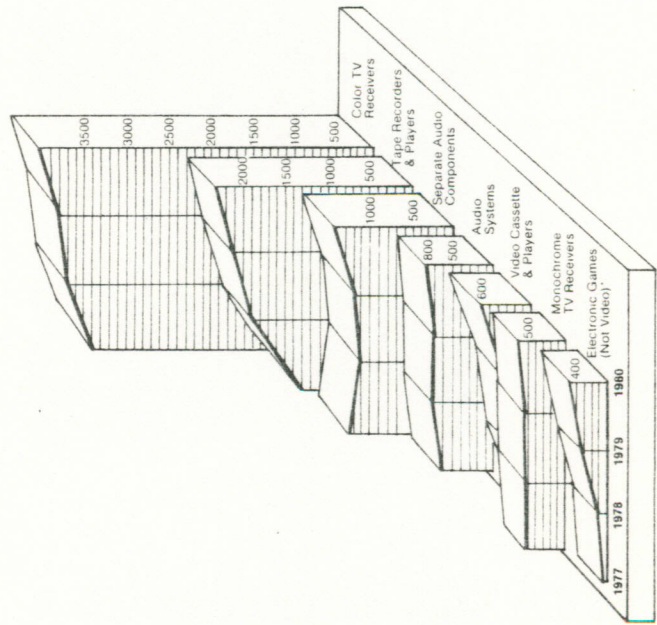
THE INFORMATION SUPERMARKET: INTERACTIVE INFORMATION & EDUCATION SERVICES

TELEBANKING: BEYOND INTERACTIVE FINANCIAL SERVICES

INTERACTIVE, ONE-WAY & STANDALONE ENTERTAINMENT

THE COMMAND & CONTROL SYSTEM: SECURITY, ENERGY MANAGEMENT, AND HOME COMPUTING

Cumulative Home Video Market Indicators



Segment	1981	1982	1983	1984	1985
Homes Passed by Cable	38.3 Mil.	45.3 Mil.	56.1 Mil.	66.0 Mil.	74.0 Mil.
Basic Cable Subscribers	19.6 Mil.	23.3 Mil.	28.2 Mil.	33.1 Mil.	39.0 Mil.
Pay Cable Subscribers	8.9 Mil.	15.1 Mil.	23.2 Mil.	27.8 Mil.	33.1 Mil.
VCR Unit Sales	1.9 Mil.	3.2 Mil.	6.2 Mil.	9.6 Mil.	13.0 Mil.
Personal Computers	800,000	1.2 Mil.	2.0 Mil.	4.0 Mil.	7.0 Mil.
STV Subscribers	787,000	1.2 Mil.	1.7 Mil.	2.2 Mil.	3.0 Mil.
MDS Subscribers	547,000	780,000	1.0 Mil.	1.5 Mil.	2.1 Mil.
Video Disc Units	50,000	110,000	190,000	260,000	330,000
Two-Way Cable Subscribers	30,000	95,000	225,000	450,000	750,000
Videotex	16,000	33,500	60,000	120,000	250,000

Source: The Yankee Group

**the
YankeeGroup**

NORTH AMERICA

89 Broad Street
Boston, Massachusetts 02110
Telephone: (617) 542-0100
Telex: Yankee BSN

WORLD TRADE

Regal House, Lower Road
Chorleywood
Rickmansworth
Herts, England
WD35LQ

Telephone: (09278) 4110
Telex: 923384 Yankee

FAR EAST

Room 705
Akasaka Omote-machi Building
4-8-19, Akasaka, Minato-Ku
Tokyo 107 Japan

Telex: MARCOMTYO

MEMORANDUM

TO: Josh Denham

DATE: June 14, 1982

FROM: Gary S. Moskovitz

SUBJECT: Yankee Group Review of Pictureware Business Proposal

The attached review was just received from the Yankee Group.

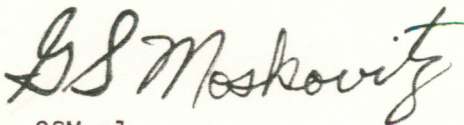
As can be seen, the Yankee Group is very skeptical about 1) The future of "standalone" videotext/teletext systems (vs. home computers) and 2) The technological advantages of VCR storage in general and Pictureware implementation in specific, compared to other technologies later in the decade.

The Yankee Group also highlights the cold, hard facts of competition within the industrial sector.

I think the Yankee Group's comments about enhanced home video and arcade game opportunities are more in line with our thinking.

This report certainly portrays the venture as a tough-going, high-risk one. We knew this already, but the Yankee Group certainly puts it into perspective.

One caution: I have learned very recently that the Yankee Group also invests in new technology companies. They currently have a small equity position in IXO. We should be cautious in considering their technology pronouncements to a certain extent.



GSM:e1

cc: P. Rioux
S. Prodromou
W. Gillis
P. Pirner
D. Chandler
R. Chang
H. Barnes
D. Hightower

RECEIVED
JUN 17 1982
D. CHANDLER

JUN 11 1982

the
Yankee Group

89 Broad Street, 14th Floor, Boston, Massachusetts 02110, (617) 542-0100

June 10, 1982

Mr. Gary S. Moscovitz
Marketing Director
Mattel Electronics
5150 Rosecrans Avenue
Hawthorne, California 90250

Dear Gary:

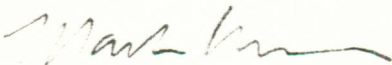
I'm enclosing our review of the Pictureware (EECO, Inc.) Business Proposal. We've assumed the role of hard-nosed sceptics here, so don't be put off if our analysis appears overly critical.

As agreed, we completed the review in lieu of the consultation day which is included in your new subscription to the Home of the Future Planning Service.

Feel free to call if you have any questions, and please keep in touch.

Best regards.

Sincerely,



Mark Kriss
Research Manager
Home of the Future Planning Service

cc: Howard Anderson
Jack Brown
Michele Corbeil
Alison McGrath

Yankee Ingenuity.

YANKEE GROUP REVIEW
OF
PICTUREWARE (EECO, INC.) BUSINESS PROPOSAL

Mark Kriss
Research Manager
Home of the Future Planning Service
June 1982

Part I: PROBLEM AREAS

Strategic Risks:

1. Proposed venture does not play to Mattel's strengths.

According to EECO, Pictureware's industrial market performance (real estate, automotive, travel, etc.) is expected to exceed consumer market performance (both in revenue and margin dollars) until 1989. But neither Mattel nor EECO has experience in non-consumer or information/data-base marketing.

There are tough, savvy companies serving such industrial markets (e.g. Sears, American Express, Tymshare, Foremost McKesson) who have both the desire and the resources to develop proprietary systems (with "photographic-quality pictures" if need be).

2. "Uniqueness" of Pictureware black box is questionable (p. 49).

The Yankee Group agrees with Mattel conclusion that EECO patent position may be weak. (Mattel estimates it will be "4-6 years before the patent process is culminated" [p. 101].)

Retailing companies (Sears, Comp-U-Card [partially owned by Federated Deptment Stores and Merrill Lynch], Foremost McKesson) and computer software firms such as Interactive Training Systems (Cambridge, MA) are working in related areas. Add to this list: movie companies such as Lucasfilm (see attached clipping), Fox Video, Warner Home Video, Paramount Home Video, MCA Videodiscs, Optical Programming Associates and publishers (Houghton Mifflin, Random House, John Wiley & Sons), all of whom are experimenting with video-based branching techniques.

3. New technologies may outmode VCRs (and the Pictureware concept) sooner than anticipated (p. 54).

This may be especially true in the target industrial environment. The Yankee Group estimates the following probabilities for market introduction of moderate-priced (\$2000-3000) read/write videodisc players:

1985 (early)	10% probability
1986	25%
1987	75%
1988	Will be available

Such players (to be manufactured by Pioneer, Sony, Phillips, and possibly Matsushita or Tandy) would offer several key advantages over Pictureware:

- o Faster access
- o More sophisticated interactive capabilities
- o Larger data storage capacity
- o Longer life -- images won't wear out
- o Better picture resolution

The Yankee Group also believes banks of videodisc (or possibly Pictureware-controlled VCRs) at cable system headends could obsolete the in-home VCR/Pictureware approach in the 1985-88 time frame (see attached excerpts from Teleshopping, Home of the Future Industry Report, Volume IV).

Questionable Assumptions:

4. "Two types of systems being welcomed as new market possibilities are videotex and teletext." (p. 22)

On the contrary, the Yankee Group sees growing retrenchment especially in the videotex area. See, for example, "obituaries" in the recent issue (May, 1982) of the leading trade newsletter, Videotex/Teletext News (see Appendix 1):

- "Antiope's U.S. Marketing Effort to Close"
- "BELO 'Temporarily' Suspends BISON Electronic Publishing in Dallas"
- "Minneapolis Star/Tribune Drops Out of Firsthand Trial"
- "Cox Starting Over to Redevelop 'INDAX' System"
- "Source Looking for a 'Partner' Amidst Retrenchment"

CABLE TV GROWTH: 1980 - 1990

	1980	1982	1984	1986	1988	1990
TV HH [000]	76,300	79,900	83,600	87,100	90,500	93,900
% U.S. HH	98%	98%	98%	99%	99%	99%
Homes Passed By Cable [000]	35,900	46,225	59,200	67,200	72,400	75,120
% TV HH	47%	58%	71%	79%	80%	80%
Total Cable HH [000]	18,699	25,424	31,607	36,863	41,029	45,072
% TV HH	24%	32%	38%	42%	45%	48%
Homes Passed By 2-way Cable [000]	105	1,020	5,710	9,710	14,505	19,300*
% TV HH	0%	2%	6%	11%	16%	21%
Pay-Per-View HH [000]	70	1,900	8,290	17,290	26,290	35,290
% TV HH	0%	2%	10%	20%	29%	38%

Sources:
A.C. Nielsen
Cable TV Technology
Donaldson Lufkin Jenrette
Cablevision
Yankee Group estimates

[revised 6/3/82]

* Includes 10.3 million households passed by upgraded systems in top fifty cities.

5. In the Yankee Group's opinion, the economics of "integrated" videotex system offerings (including those slated for 1982-3 market trials) are highly questionable. (p. 39)

Prestel, the first implementation of videotex, was a stunning failure of British social engineering; cost-based pricing put it well out of range of the mass audience (who can buy cheap newspapers, watch free TV, etc.)

There is no hard evidence to support the (Knight Ridder) contention that the "magic" monthly revenue figure is \$40 (p. 43). To date, Viewtron field trials have not charged their subjects to test "willingness to pay."

6. LINK personal computer forecasts underestimate personal computer growth by a factor of two or more (p. 44)

Yankee Group research shows that low-end (under \$500) personal computer sales will total one million units, reaching six million by 1985 and 18 million in 1990 [refer to upcoming Home of the Future Industry Report entitled Personal Computers in the Home].

7. The explosive growth of personal computers means that "videotex-type" service offerings will be mostly structured around existing (personal computer) terminals rather than "videotex dial-up" or "transaction" terminals (p. 44).

"Videotex" forecasts (AT&T and Strategic, Inc., p. 39) are optimistic at best, misleading at worst. We contend it is more meaningful to talk about market demand for specific offerings (e.g., off-track betting, education software, electronic classified advertising services, real estate directories).

8. Recent Yankee Group projections of cable TV growth (1980-90) also differ, significantly in some respects, from LINK forecasts [refer to Table 1]

9. Information providers and advertisers may be less enthusiastic than anticipated about developing software for Pictureware because of: (a) limited set population; and (b) software development costs (p. 83, 90).

Part II: CRITICAL UNANSWERED QUESTIONS

1. Inadequate analysis of industrial market characteristics and demand.

If Pictureware doesn't fly in the industrial arena, consumer market potential may be irrelevant. We suggest, therefore, that initial field trial(s) test demand for Pictureware in such locations as real estate offices, auto parts suppliers, travel agencies or hardware stores. Will potential industrial sector partners (Century 21, American Express, Household International, etc.) be inclined to form partnerships with a "toy company"?

2. How unique is Pictureware's ability to develop enhanced home videogames or arcade video games (p. 81)?

Are there more cost-effective means available of achieving comparable (or superior) effects? Can Pictureware be developed on cost-effective standalone basis as a game or computer peripheral?

3. Based on the experiences of previous market trials (Prestel, Dow Jones/Apple, Project Ida, etc.), there are several reasons why residence market consumers may not be receptive to the Pictureware approach. Consumer market trials should address the following concerns:

- (a) High cost of ownership (\$200-750) relative to perceived value?
- (b) High usage cost (\$10/mo.) relative to perceived value?
- (c) Problem of delayed gratification (off hour transmission)? For what types of service offerings?

Part III: CONCLUSIONS & POSSIBLE MATTEL PARTNERS

According to Mattel officials, the goal of a Mattel-EECO joint venture would be to position the company for the next area of electronics growth after video games. In the Yankee Group's opinion, this would include electronic software publishing, multi-sensory involvement technologies and new forms of retailing.

Pictureware may not be the next logical step for Mattel, primarily because the real potential of EECO's technology lies in areas unrelated to Mattel's diversification objectives:

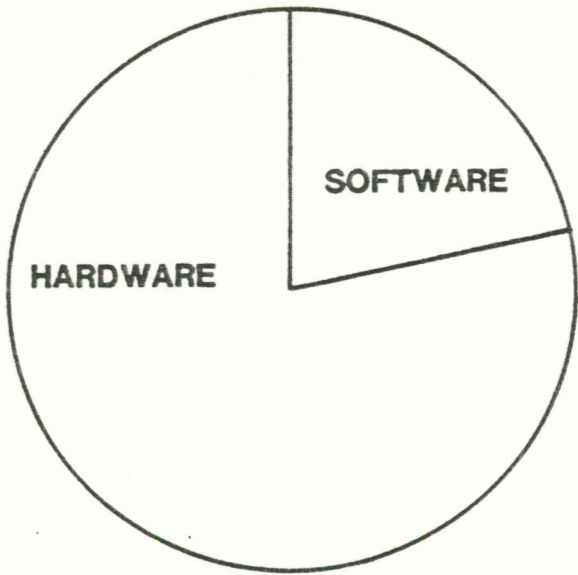
- o Real estate and other industrial-type point-of-sale applications
- o Direct consumer marketing systems (the electronic equivalent of "junk" mail), given a substantial installed base of Pictureware decoders.

Extensive research and development ventures of this nature also have a tendency to drain capital and human resources (e.g. Apple's Lisa project), especially for companies such as Mattel that are not vertically integrated.

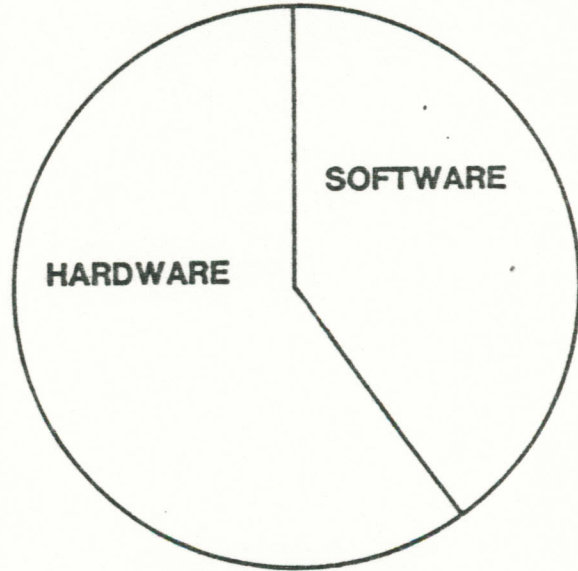
On the plus side, Pictureware might provide capabilities for enhanced home video and arcade videogames (see "Unanswered Questions," #2). But this application would not appear to be consistent with stated diversification objectives (i.e., going beyond video games).

In the Yankee Group's opinion, aggressive development of innovative personal computer software (e.g., entertaining education, do-it-yourself packages, audio enhancements, etc.) and new modes of software distribution such as PlayCable and software specialty stores may offer better starting points. (Yankee Group estimates of the increasing importance of software, relative to hardware, are shown in Figure 1.)

HARDWARE VS. SOFTWARE (\$200-\$500 PERSONAL COMPUTERS)



1980



1982

Possible partners for software ventures would include:

- o Computer and specialty software firms such as Interactive Training Systems (Cambridge, MA) and Optical Programming Associates
- o Publishers (Houghton Mifflin, Random House, John Wiley & Sons)
- o Movie companies such as Fox Video, Paramount Home Video, MCA Videodiscs
- o Terminal manufacturers such as Sinclair, Commodore, IXO.

LUCASFILM'S RESEARCH INCLUDES INTERACTIVE VIDEODISKS

P.O. BOX 2009, SAN RAFAEL, CA 94912. Phone: 415-499-0239

Lucasfilm, the movie production company which has brought to the American cinema such classics as *Star Wars*, *The Empire Strikes Back*, *American Graffiti*, and *Raiders of the Lost Ark*, would seem to be the last place to look for advanced research on videodisk software. Well, we found otherwise during a recent visit to their research center. It is located in a modest group of buildings at an address that is not even printed on the business cards of the employees. The research is managed by Ed Catmull who directs a group of 30 out of Lucasfilm's 200 employees that are actively working on research in areas of film production that require new techniques to meet the requirements of Lucasfilm's productions, plus interactive games.

Lucasfilm set up a research facility to build their own sound and mixing studio so as to be less dependent on outside sources. The new digital audio mixdown processor project, managed by Andy Moorer, has been completed and is in the final testing stage. It will allow them to mixdown as many tracks as is necessary and since it is all stored digitally, they will be able to keep changing the relationships between the various sound sources until they have exactly what they are looking for. They can also start mixing the sound track a good deal earlier in the production than they were able to before, and this should allow for more creative sound mixes than were heretofore possible.

Lucasfilm has extensive computer facilities, with two digital VAX 11-750 computers (nicknamed *Bespin* and *Chester*) and one VAX 11-780 (codenamed *Dagobah*) with the CDC disk drives. These computers keep track of information concerning special effects that require building of props or models which must be carefully scheduled so that all are ready before the day of shooting arrives.

The computer is also used in the computer graphics project, directed by Alvy Ray Smith. Their goal is to allow computer-generated backgrounds to be intermixed with live action thus creating scenes which could be done in no other way. The new *Star Trek* film includes one minute segment of computer animation generated by Lucasfilm's team. The goal in the next generation of the machine is to store all of the computer generated graphics digitally, including the high resolution backgrounds, landscapes etc., using a laser input and output scanner and a digital film printer. Ideally these images would be stored on optical DRAW disks, due

to the limits of the computer's magnetic disk drives. They have a need to generate frames faster than is currently possible, in order to create some of the scenes that have become a trademark of Lucasfilm's productions.

The film editing project, managed by Ralph Guggenheim, started about a year and a half ago. The purpose of the project is to enable quick electronic editing, eliminating many of the problems in film editing. Once the edits have been done on video, the final cutting is greatly simplified. The goals are to speed production and reduce costs. A prototype machine has been built using videotape. They are working to make the same transport functions that are presently available with videotape machines be available with videodisk players. The prototype consists of a two-machine console. They are developing it further to handle either videotape or videodisk machines.

The console will connect many video machines. A scene can be viewed in its entirety as the various machines play their segments in turn. They will first duplicate some work prints from an old movie, most probably *American Graffiti*, and practice on them, until the editors feel more comfortable with the machinery.

Lucasfilm's fourth research project is in interactive entertainment. It can be compared to a videogame, but it is more. Currently all video games, both in arcades and in homes, have certain capabilities that cannot be changed. Lucasfilm is looking to put an interactive game or games onto videodisk, which will allow them to change the games by merely changing the videodisk, and in arcades by changing the panels on the sides of the machine. This project seems to have great profit potential. Atari, with 100,000 *PacMan* games in arcades across America, contributed over half of Warner Communications profits last year. Lucasfilm's desire is to apply their software development creativity and expertise to provide games with far better cognitive value, and the level of intrinsic value common to their blockbuster movies. They would license the games and their other research projects to others to build and distribute.

Much of their research is centered around software creation for videodisks. If they succeed, not only will they be in line for further Academy Awards, but they will have advanced not only the film industry but the videodisk industry as well.

Conference Calendar

CONSUMER ELECTRONICS SHOW, McCormick Place, IL. Introduction of several laser digital players, (eventually computer peripherals). Consumer Electronics Shows, Two Illinois Village, IL 60601. Phone: 312-861-1040.

JULY: NATIONAL COMPUTER CONFERENCE, Astrohall, TX. Several optical disk products will be sponsor: National Computer Conference, 1815 N. Arlington, VA 22209. Phone: 703-558-3610.

AUGUST: NATIONAL EDUCATIONAL COMPUTING CONFERENCE, BIT, Radisson Muehlebach Hotel, Kansas City, includes interactive videodisk tutorial. Sponsor: University of Missouri-Columbia, 305 Jesse Hall, Columbia, MO 65211. Phone: 314-882-8205.

JULY 18-20: OUTLOOK FOR OPTICAL AND VIDEO DISC SYSTEMS AND APPLICATIONS, Highlands Inn, Carmel, CA. Topics include direct-read-after-write optical disks, and interactive read-only videodisks. Sponsor: Institute for Graphic Communication, 375 Commonwealth Ave., Boston, MA 02115. Phone: 617-267-9425

AUGUST 25-27: FOURTH ANNUAL CONFERENCE ON INTERACTIVE VIDEO LEARNING SYSTEMS, Naval Underwater Systems Center, New London, CT. Military training applications using interactive videodisk emphasized. Sponsor: Society for Applied Learning Technology, 50 Culpepper Street, Warrenton, VA 22186. Phone: 703-347-0055.

SEPTEMBER 28-OCTOBER 1: NATIONAL VIDEODISC CONFERENCE, University of Nebraska, Lincoln, NE. Sponsor: Nebraska Videodisc Design/Production Group, Box 83111, Lincoln, NE 68501. Phone: 402-472-3611.

a standard telecommunications control system, based on the timesharing principle, operators can segment their subscriber population by network. For example, network "A" might handle the northeast of town, with perhaps 10 channels for every 20,000 people. All subscribers stay within the cable environment (i.e., they do not access the public phone network), and there is no need to schedule them upfront for some future viewing time.

Small cable systems, on the other hand, lack the channel capacity to satisfy more than a handful of distinct requests (which is why Adams-Russell has gone the route of broadcasting -- rather than narrowcasting -- individually requested segments.) This stopgap approach will not be satisfactory to consumers who, by and large, demand instant gratification of their wants and needs.

II. Video on Demand

A. Mixed Data Type Technology

True "video on demand" would allow individual viewers to receive unscheduled still or motion pictures immediately upon request. Computer-controlled videodisc players and videotex could provide the synergy required to make this a reality.

Teleshopping: The New Electronic Marketplace
Home of the Future Industry Report, Vol. II
(June/July, 1981)

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*Teleshopping: The New Electronic Marketplace
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Optical videodisc systems can combine motion, slide stills, text stills (like a book), two-channel audio, and microprocessor control. The main drawback of videotex is its inability to integrate photographs or motion pictures. On private networks, such as two-way cable systems, it is feasible to combine the best features of videodisc visuals and videotex. A hypothetical mixed data type "on demand" retailing system is depicted in Figure 6-1.

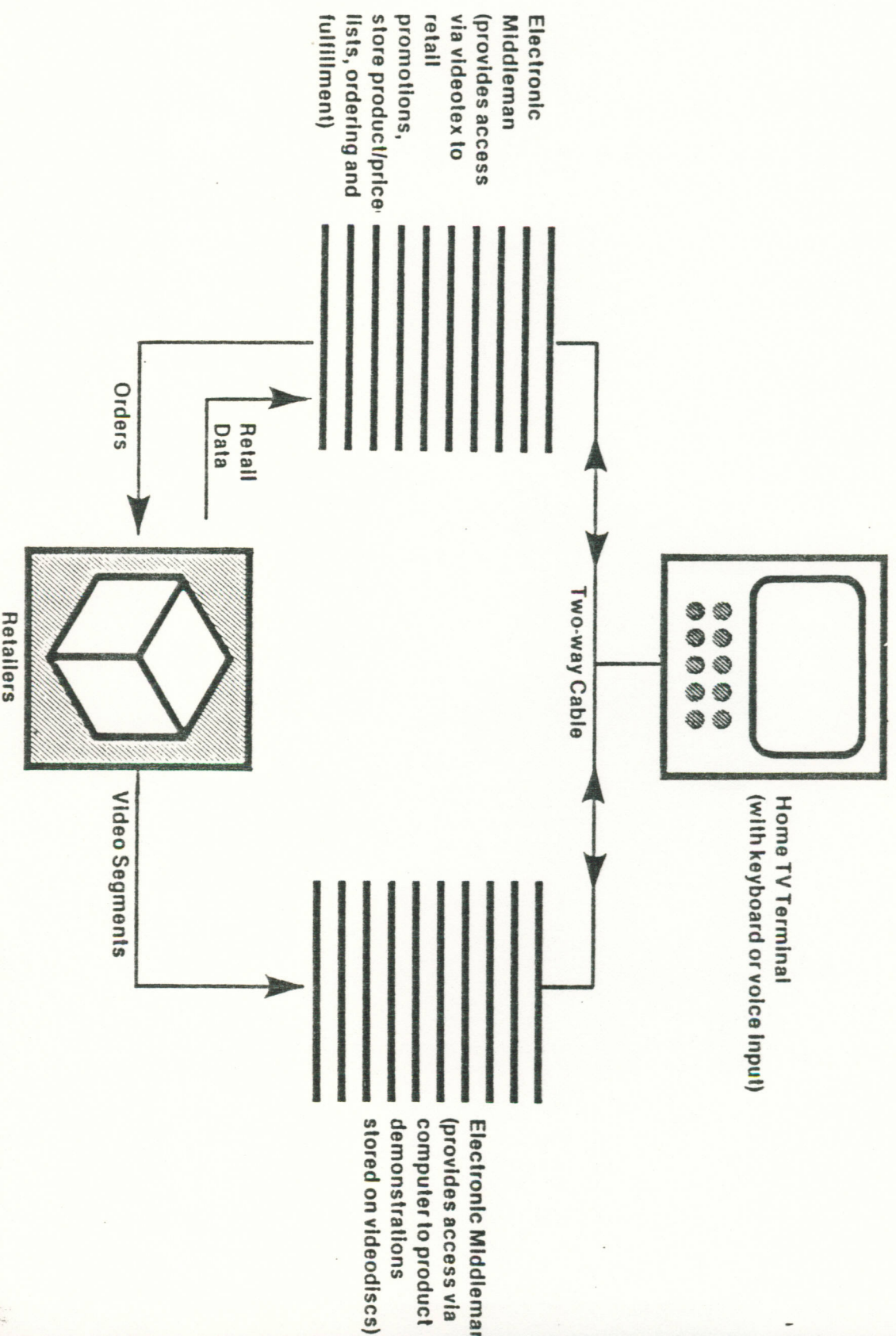
Zap Systems, a wholly-owned subsidiary of Caltrav Corp. (Toronto), has developed a prototype computer system based on mid-slice processors that retrieve signals from videodiscs. The complete system, which will not be on the market for at least another six months, consists of a videodisc player, word processor/general computer, and telex, Prestel, or Telidon interfaces. Costs to the system operator will range from approximately \$10,000-12,000 (for a black and white screen only) to \$30,000-40,000 with all interfaces.

Zap's system could be networked, multi-accessed, and then distributed to requesting households. The Yankee Group expects near-term application areas, however, to remain within such commercial realms as travel agencies where video pictures are needed.

Xerox's Shugart Division (Sunnyvale, CA) -- the largest manufacturer of floppy disk drives -- is collaborating with

FIGURE 6-1

FUTURE TWO-WAY CABLE RETAILING SYSTEM



• Cable TV operator, retailer, independent packager

Source: The Yankee Group/Home of the Future Study

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Thomson-CSF on the latter's videodisc system which involves a series of finely focused lasers that read the tops and bottoms of stacked discs. (A schematic of present Thomson-CSF optical videodisc players is shown in Figure 6-2.) Under the joint-venture agreement, Xerox is developing a suitable storage system for the new player.

Given the ability to access centralized videodisc players, cable TV operators could provide still or motion video to individually addressed homes. To implement such a system, cable operators face nothing more complicated than a standard data processing problem in managing the disk packets.

B. Prototype Systems

1. "Interact"

International Interact Corp. (NYC) was formed last year by a senior vice president of a major corporation to take advantage of a "technical window" in the teleshopping field.

Interact's business analysis indicated that a home access service network which (a) provides full-color, still video on demand to the consumer, (b) is paid for primarily by sources other than the consumer, (c) requires absolutely no knowledge or understanding of computers, and (d) offers a wide range of

VIDEOTEX TELETEXT NEWS

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Editor-Publisher: Gary H. Arlen

May 1982

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HIGHLIGHTS

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ANTIOPE'S U.S. MARKETING EFFORT TO CLOSE; LOOKING FOR A NEW FRENCH STANDARD-BEARER

Antiope and Telematics Corp., the U.S. marketing organization for French teletext technology, will fold its tent next month. The move reflects the current French plan to cease financing of teletext activity in the U.S. A&TC had been created last summer (IVTN #16).

A&TC's Washington office--previously occupied by the predecessor group, Antiope Videotex Systems--will shutter, although one or two technical and administrative officials may be retained to keep the Antiope presence afloat in the U.S. There are also plans to create a new organization solely to handle technical liaison and promotion of the Antiope format.

Broadcasters who have already allied with Antiope--notably CBS--will be serviced as needed directly from Teledifusion de France, the French TV corporation. Conveniently, the first stage of the Los Angeles teletext trial--which includes CBS, NBC and a public TV station--ends this summer. It is still unclear how other Antiope customers--including Group W, Dow Jones and the Louisville Courier-Journal--will be handled. In addition, other French teletext organizations in the U.S., such as Alphatel and Unitex, will continue to operate independently, offering turn-key systems and teletext equipment. The A&TC evaporation apparently doesn't affect videotex activities of France's Intelmatique marketing agency or independent companies such as Videodial.

French planners are trying to develop a "different role" for new organizations they hope to create. The primary objective is to develop a new "industrial cartel" by July--based around a major hardware vendor. We have learned that Thomson CSF is being recruited as the centerpiece of this effort, which could encompass some or all of the other Antiope organizations in the U.S. However, newly nationalized Thomson is not particularly eager to assume the lead in promoting U.S. Antiope efforts. Matra, another major French hardware maker, is also being mentioned as the major standard-bearer in this latest effort to shape a U.S. presence for Antiope.

TELIDON HELD "HOSTAGE" AS U.S. BROADCASTERS SEEK REVENGE FOR CANADIAN AD POLICY

Telidon technology and equipment are becoming the latest pawns in a battle between U.S. TV broadcasters and the Canadian government. A proposal now being considered by the U.S. Senate Finance Committee would prevent U.S. companies from claiming a business-expense tax deduction on Telidon equipment imported from Canada. Although the fate of that proposal in Congress is uncertain, the issue is already raising concerns on both sides of the border--and some executives are fretting that the matter jeopardizes the future of the "North American Broadcast Teletext Standard," the combination Canadian-French-PLP format (IVTN #13).

"STAR-TEXT" ELECTRONIC NEWSPAPER LAUNCHED BY TANDY AND FORT WORTH PUBLISHER

Radio Shack and the Fort Worth Star-Telegram newspaper have inaugurated "STAR-Text," an electronic home information service which subscribers can access via telephone lines and home terminals (IVTN #19). The package of information costs \$5 per month and is available in the Fort Worth area through Tandy Videotex Service. It is being marketed by the Star-Telegram; locally based Tandy is demonstrating it at its 37 Radio Shack stores in the region. Tandy has lined up Fort Worth National Bank to offer financing for TRS-80 Videotex terminals through the retail stores.

Initially, STAR-Text offers three types of information: hard news, entertainment information and shopping data. The news section includes local, state, national and international stories, sports, weather and business news. Data is gathered from the newspaper's local staff and from its bureaus in Washington, Austin and Dallas as well as from wire services including the New York Times, Associated Press and Knight-Ridder. This segment is updated continuously 16 hours per day.

The entertainment package includes movie and restaurant reviews, theatre time schedules and ticket information. Shopping information includes consumer tips, classified-type advertising and some sponsored information and product presentations.

Specialized databases will be added as the system develops. For example, American Airlines' flight information into and out of Dallas-Fort Worth Regional Airport was put online several weeks after the system debuted.

STAR-Text runs on a host TRS-80 Model II computer, maintained at Tandy's headquarters. The system is similar to ones which Tandy is promoting to newspapers throughout the U.S. as an inexpensive way to get into electronic publishing.

Tandy and the Star-Telegram recently conducted a market survey of area homes, and found that 8% said they "would desire a STAR-Text type of service." The target prospect for the online service is an 18-34 year old college educated male professional.

MINNEAPOLIS STAR/TRIBUNE DROPS OUT OF FIRSTHAND TRIAL

The Minneapolis Star & Tribune Co. has pulled out of the FirstHand videotex project, due to get underway in three North Dakota communities this month, operated by Minneapolis-based First Bank Systems. The Star/Tribune decided to withdraw as a provider of general news because previous experiments showed that specialized features (stock information, catalogues and similar detailed data) and local information seem to be far more appropriate for videotex systems. Star/Tribune Associate Publisher Christopher Burns said, "We just don't think there's a market" for daily general news, which the Minneapolis paper was supposed to provide.

The FirstHand project (IVTN #19) will still include local news from community newspapers in the three towns, grain and commodity prices, sports scores and other data. In addition, the 240 homes taking part in FirstHand will be able to conduct financial transactions, including commodities purchases and retail teleshopping.

The Des Moines Register and Tribune Co. will continue to deliver agricultural news and information for the project. In addition, some national and international news will be inserted into the databases of the participating newspapers. The local papers taking part in the project are the Fargo-Moorehead Forum, the Wahpeton-Brekinridge Daily News and the Valley City Times-Record.

ADP TO HANDLE FINANCIAL SERVICES FOR AT&T/CBS TEST; MORE IP'S SIGNED

ADP, one of the largest U.S. data processing firms, has been contracted to handle the financial transaction processing activities on Venture One, the AT&T/CBS videotex joint venture due to start this Fall in Ridgewood, NJ (IVTN #18). Formal

On the surface it seems that such a move would then actually be buying U.S.-made devices. However, the trade advisers for the border broadcasters are suggesting that the test of tax deductibility would be the "country of origin" of the technology--thus maintaining the leverage against Canada.

The issue--still awaiting formal Congressional action--is already shaping up as a serious trans-border conflict. The rhetoric is biting and intense. For example, a U.S. international trade expert--who is working with the border broadcasters--told us that Canada can create her own release from the entire situation merely by dropping C-58. "The longer Canada maintains C-58, the longer it could face retaliatory trade actions," he said.

BELO "TEMPORARILY" SUSPENDS BISON ELECTRONIC PUBLISHING IN DALLAS

Belo Information Systems Online Network (BISON) is "temporarily" closing down, until a larger universe of personal computer users is available to access the electronic publication. The sudden shut-down came in mid-May when parent A.H. Belo Co. (publisher of the Dallas Morning News) decided to suspend BISON operations. However, a stripped-down BISON staff will continue to develop software in anticipation of another launch in the future.

The 200 customers who were online when BISON closed down will continue to be able to use the system, mainly for electronic mail and a few other services. These users will not be billed for access to the BISON system. The news and information database of May 18--the last day BISON was in service--will remain available, primarily for demonstration purposes.

When we visited the \$2-million-dollar BISON installation in early April, about 28 people were on board. Now the staff has been cut to 10 people, mostly software developers. Equipment, including a Tandem computer which is BISON's host device, is remaining in place.

Gean Holden, BISON director, told us he is "encouraged" that the shut-down "won't be terribly long." His remaining staff is keeping tabs on the growth of personal computers in the Dallas area, and is trying to encourage local dealers to offer the microcomputers necessary to access BISON.

When BISON debuted last summer, its arrival was heralded in the Dallas Morning News as "the first commercial, regional videotex system in the U.S....an exciting advance in telecommunications." BISON is an outgrowth of the system Belo originally tested as its part in the Park Cities two-way cable information service in late 1980 (IVTN #1).

BISON, during its recent incarnation, sought to become an ad-supported system. Subscribers also paid a \$10 monthly fee. The system typically had up to 20,000 pages online in news, entertainment and feature information sections. A gateway feature is being developed, along with other specialized services. The system operates in ASCII format, but Holden told us he'd like to use the AT&T Presentation Level Protocol format, revised for a 24-line--rather than a 20-line--depth.

Significantly, BISON closed down at just about the same time that STAR-Text (see below) went online in nearby Fort Worth. The differences between the two regional systems, of course, are substantial--most notably the host equipment: In Fort Worth, Tandy operates the host mini-computer rather than the software partner, The Fort Worth Star-Telegram.

The Dallas situation also bears watching because of the media situation in that city. Times Mirror Corporation owns the arch-rival Dallas Times Herald newspaper and has extensive cable TV holdings in Texas. Given TM's videotex activity (see page 5), we expect the company to pay closer-than-ever attention to BISON's next step.

via the vertical blanking interval of Superstation WTBS, the most widely carried cable TV channel. Cable operators--especially the smaller cable operators with limited channel capacity--seemed puzzled about how they could offer the service without dedicating a separate channel to it.

Moreover, we heard many skeptical comments about the prices SSS/Keycom recommends for Keyfax, which will be limited to about 100 pages of data at a time. SSS suggests that Keyfax be offered at \$10 or more per month, possibly as part of an "information tier." In addition, SSS suggests that cable operators charge \$9.95 per month plus deposit and installation for reception equipment, making a total monthly bill of \$19.95. SSS's contract form suggests that 35% of the monthly service fee will be retained by the cable operator, and 65% will be paid to Keyfax--a pricing schedule guaranteed for two years. SSS says that systems delivering Keyfax will receive teletext decoders costing about \$300 and may rent them or sell them to customers at any time at that price. According to the SSS document, decoders are to be rented at a guaranteed rate of \$9.95 per month for three years.

NITE OWL COULD MOVE TO CHICAGO PUBLIC TV CHANNEL; AUDIO ADS MAY BE ADDED

Nite Owl, the all-night series of cycled teletext pages on WFLD-TV Chicago Channel 32, may have to find a new home--possibly on public TV station WTTW-TV Channel 11. Field Communications, which owns WFLD, has had a policy to keep its stations "dark" from midnight to dawn, which is why it was so easy to start Nite Owl during a period in which the station would otherwise have been off-the-air.

Now, Field is planning to carry Cable News Network's live telecast during the overnight hours on all its stations, part of CNN's new effort to find broadcast auxiliary outlets to its primary cable system affiliates. In the process Chicago's Nite Owl would be knocked off Channel 32. However, WTTW, the public TV station which currently doesn't carry overnight programming, is negotiating to pick up the service. The timing seems ideal: WTTW is one of the few U.S. public broadcasters authorized to experiment with commercials on public TV stations, a convenient factor in its plan to transmit ad-supported Nite Owl. Moreover, WTTW executives are well acquainted with Field's teletext activity; one of the station's key executives worked for Field last year when the teletext project began.

Meanwhile, Keycom Electronic Publishing--the Field-Centel-Honeywell joint venture which operates Nite Owl and other services--is examining ancillary services to add to Nite Owl. One possibility now being considered is audio commercials to supplement text and graphics. Keycom VP Ben Smylie mentioned such a possibility in remarks at the recent cable TV convention, suggesting that an audio component--perhaps akin to radio commercials--would make the text service more attractive to national advertisers. Currently Nite Owl runs background music while the text and graphics pages are cycled.

COX STARTING OVER TO REDEVELOP "INDAX" SYSTEM; NEW VENTURE WITH ABC

Cox Communications will start from scratch to re-invent its "INDAX" two-way cable service, the beleaguered project which has run months behind schedule. Cox is downplaying the scope of the INDAX overhaul, but concedes that extensive changes are being made. As we've reported earlier, staff changes have already been implemented (IVTN #25). Cox still intends to operate test INDAX on its San Diego system, but in a scaled-down, reconstituted version. Meanwhile, the first couple dozen INDAX homes are in operation in Omaha, where the interactive service was a requirement of the franchise awarded last year.

To be sure, Cox has had substantial problems with its suppliers in obtaining INDAX terminal equipment. However, there have been other software and system problems in INDAX development; the first tests in San Diego were originally scheduled to begin in Fall 1980.

Meanwhile Cox has plunged into a new joint venture with ABC Video Enterprises. Although the precise nature of the project is still hazy, among the stated objectives is the development of one-way and two-way addressable systems. Each company has formed an internal task force to identify and create projects--and to suggest research in areas which should be developed.

The first thrust of the Cox/ABC partnership is likely to be pay-per-view subscription TV programming; on its own ABC Video recently proposed an addressable, scrambled pay TV service which would be downloaded overnight into home videocassette recorders, using ABC-TV network affiliated stations for local distribution.

ABC and Cox officials told us that they discovered each other traveling along similar research routes during the past few months. The partnership was patched together in just a few weeks in late April. In their formal announcement, the companies suggest that they'll look into tele-shopping and other interactive home services. ABC has aggressively been seeking to develop such projects--and in Cox it has a partner with a vast roster of cable systems on which to experiment. Cox systems in Spokane, Saginaw, Santa Barbara and Fort Wayne have been mentioned as possible test sites.

The new Cox plans raise inevitable questions about the company's future relationships with HomeServ, ViewMart and The Source--companies which are packaging, respectively, the financial, marketing and information services for INDAX. Spokesmen for the various companies suggest that no changes are imminent.

JERROLD DEVELOPING "COMMUNICOM" VIDEOTEX SYSTEM FOR CABLE TV; BASED ON PLP

Jerrold Division of General Instruments, one of the leading U.S. cable TV equipment suppliers, is developing a home terminal and keyboard for cable-videotex applications. The system uses the Presentation Level Protocol, thus making it compatible with phone-based systems which AT&T is developing. Jerrold's objective is to refine the unit by 1985 so that the cable decoder/videotex terminal combination unit can sell for about \$250.

Jerrold is using the name "Communicom" for its new device. Actually that name has been in Jerrold's product line for nearly a decade, previously applied to other interactive terminals. The new Communicom system includes a new network architecture with nodes at various locations in the system to accommodate switched interactive services. Jerrold envisions that the network architecture will facilitate service and billings. For example, several information/service suppliers could take part in a single package; the Communicom architecture would permit billing support for all these service nodes so that the customer receives just one bill for videotex services, rather than individual billing from each vendor.

One of Jerrold's objectives is to encourage the development of "data highways" for use on cable systems as an overlay on the entertainment networks now in place. Jerrold is developing analog headend equipment and packet repeater facilities to ease the introduction of such services.

Jerrold quietly demonstrated the system during the recent National Cable TV Association convention and may install a fuller exhibit of the system at next month's Videotex '82 conference and exposition in New York. The company is eager to interest prospective service providers in the system.

The Jerrold system has been included in the dramatic package of services which Cablevision Systems proposes to build in Sacramento, California.

The new Jerrold package of services uses a technology which is completely different from the one used on PlayCable interactive games service; PlayCable Co. is a joint venture of General Instruments and Mattel Electronics and uses Jerrold headend

and customer equipment. PlayCable operates using subcarriers on cable channels, displaying Intellivision videogame graphics.

file: Source
cc: HA

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METAMORPHOSIS AT THE SOURCE: LOOKING FOR A "PARTNER" AMIDST RETRENCHMENT

Source Telecomputing Corp. is on the verge of yet another change in its young life. Parent Readers' Digest Association continues the hunt for a partner with technical expertise; the staff size is being dramatically cut amidst an official "retrenchment for fiscal 1983"; and rumors about the fate of the company and its top executives continue to bubble up.

STC has "talked casually" to several prospective partners, President Graeme Keeping told us. The ideal partner, he indicated, would be a systems operator, experienced in technology and computer operations.

"We'd like to have a partner for long-term future development so that we (Readers' Digest) can do what we do best: marketing. We've always discussed that we would need such a partner as The Source grows toward 100,000 subscribers," Keeping, a veteran Readers' Digest executive, said.

One impediment to developing a partnership deal, he admits, is determining the value of STC. RD paid just under \$3 million for STC in late 1980, and has spent several million to upgrade facilities and increase the staff. Nonetheless, the "perceived value" of the company (Keeping's term) is based on potential growth--not on current investment.

The recent personnel reduction at STC is a sudden reversal: STC's staff grew from 35 people a year ago to about 130 by early Spring; now it is 115 people and attrition is still taking its toll. The technology VP departed a few weeks ago for a "once-in-a-lifetime" opportunity, and other top officials are making plans to leave. Marshall Graham, who RD installed as President when it acquired STC, left The Source three months ago to form his own communications consulting firm.

10's

We hear mixed reports about RD's active involvement in STC. Many observers still insist that the conservative private company saw acquisition of The Source as a relatively inexpensive way to plunge into electronic publishing--but RD quickly has become disenchanted with the expense and esoteric nature of the business. RD never quotes financial statistics about its operations, but Keeping told us that "a few million dollars" have been spent to upgrade equipment and personnel during the past year, adding that RD's investment has been "very hefty." He admits that STC "hasn't attained the revenue projections we expected," but dismisses that by comparing it to others in the business who have faced similar start-up disappointments. He insists that STC was "spot on the money" about what it would cost to run the company this year.

STC is now trying to improve its marketing. "We want and need more usage during prime time," Keeping says. The company is promoting its relationship with microcomputer dealers--and Keeping cited a recent independent study which said STC enjoys extremely good vendor relations with those dealers. In addition, STC is pleased that its user demographics have shifted: originally most Source customers were engineers/scientists/computer hobbyists. Now about 45% of subscribers are executives, small business owners, doctors and lawyers. Significantly, about one-fourth of users access The Source via Apple computers--making an impressive audience of online Apple owners.

Rumors about a major shake-up at STC escalated this month after an interview with Keeping appeared in a popular computer hobbyist magazine. The interview included several blunt and critical comments--and within days we began to hear rumors that Keeping was leaving STC and that the company was up for sale. (Keeping says that the interview itself was tape-recorded against his wishes, and that the printed version was dotted with questions which were never asked.)

MEMORANDUM

TO: Josh Denham
FROM: Gary Moskowitz

DATE: August 16, 1982

SUBJECT: PICTUREWARE/MANPOWER SUPPORT

It is my strong opinion that the following EECO personnel are crucial to the success of our proposed Pictureware joint-venture:

Robert Pargee
Gary Ware
John Rowe
Mike Harvill
Stuart Krasney

It is extremely important that these five people, with the initiation of the joint-venture, immediately become full-time employees of the joint-venture, and not sub-contracted out by EECO.

I would be pleased to discuss this subject with you at your convenience.



GSM:e1

cc: P. Pirner
W. Catron
P. Rioux
S. Prodromou
D. Chandler
R. Chang
H. Barnes

M E M O R A N D U M

TO: Josh Denham/Bill Catron DATE: August 26, 1982
FROM: Gary Moskovitz
SUBJECT: LETTER OF INTENT BETWEEN MATTEL ELECTRONICS AND EECO, EFFECTIVE
AUGUST 16, 1982

Three critical, time-related conditions of the above Letter of Intent are addressed by this memo:

Paragraph 11, Page 5

Part a.

EECO to prepare an itemized list of employees (and any additional physical assets) to be dedicated and transferred by EECO to the Joint Venture.

Part b.

1. Mattel to notify EECO, in writing, within 10 working days (by Monday, August 30) whether or not as a result of its technical review, Mattel desires to continue pursuing the Joint Venture arrangement.
2. Mattel to notify EECO, in writing, within 15 working days (by Monday, September 6) whether or not as a result of its patent review, Mattel desires to continue pursuing the Joint Venture arrangement.

To support the above, meetings were held with EECO on August 17 (see Ron Goldman's August 18 memo and August 20 letter regarding Patents) and August 23.

The following is the joint assessment of Messrs. Barnes, Chandler, Ferguson and Moskovitz regarding Parts a and b.1., with comments relating to Part b.2.:

ASSESSMENT

Part a.

- o During our discussions, the following list of people surfaced as being the core technical group of individuals key to the Joint Venture's success:

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D. CHANDLER

Robert Pargee
— Gary Ware
John Rowe
— Michael Harvill
Robert Yablonski

- o In addition to these five technical people, it was felt that Stuart Krasney was a valuable core member from a management/marketing/strategic planning vantage.

A seventh member of the EECO team, the engineering manager, William Neely is not felt to be critical to the success of the effort.

- o It was the Mattel group's strong consensus that the six EECO personnel should become full-time employees of the Joint Venture. It was also the group's consensus that part-time, sub-contract arrangements between EECO and the Joint Venture for technical personnel were totally unacceptable. If any sub-contract arrangements were to be made, they should only be done so on a full-time 24 - 36 month term, with the employee's office locations being that of the Joint Venture and not EECO.

Part b.1.

- o It is the consensus of the Mattel group that the Pictureware approach, as reviewed, appears to be technically feasible. The group recommends advising EECO that Mattel desires to continue the Joint Venture discussions. However, any and all communications to EECO of Mattel's desires for continuance must be qualified relative to satisfactory arrangements being made regarding the transfer of the technical core of EECO personnel to the Joint Venture (Part a preceding).
- o There are a great many issues at risk in the Pictureware project. The more we probed, the more insights we gained. Of greatest concern is product cost and schedule.

The following lists areas of concern/required actions relative to our assessment:

o RESOURCE LIMITATIONS

- o It was very apparent that the technical staff severely lacks manpower in hardware, software and system support.
- o At least 2, and most probably 4, additional engineers are required immediately.

o SCHEDULE

- o Most items of the schedule have slipped in the past and will

most likely continue to slip in the near term.

- o EECO has greatly underestimated the time required to design and produce custom LSI circuit packages. They may have underestimated by 12-18 months. To bring this schedule back into line may require going to PLA and gate array compromises versus custom LSI chips. This will impact the product cost.
- o AUDIO FEASIBILITY
 - o While the audio compression/expansion concepts look doable on paper, no hardware demonstrations are as yet possible.
 - o EECO has no real program plans for audio past the production of 50 prototype systems.
 - o It is still very unclear whether audio is a necessity to make the basic Pictureware concept attractive in consumer applications. If this proves true, product cost will be severely impacted, perhaps to the point of restructuring the sales strategy for hardware.
- o PROTOTYPES
 - o Ten (10) prototype Pictureware systems are planned to be completed by the end of 1982. It is fairly clear that more prototypes will be required to accomplish the many technical and commercial tasks involved in bringing such a new concept to the market.
- o SPECIFICATIONS
 - o No formalized, written product or system hardware or software specifications or definitions are available.
 - o This is crucial to the technology transfer to the Joint Venture.
- o SECURITY/SCRAMBLING
 - o No work has begun as yet on code security (or protection). This is to avoid both tape duplication and "illegal" decoder boxes from being utilized.
- o APPLICATIONS/USER INTERACTION
 - o Besides the electronic magazine/publishing work, EECO has no strengths in developing innovative applications for Pictureware.
 - o It will be necessary for Mattel Electronics' manpower (R. Chang, D. Chandler) to be invested into creating unique applications and also into making user interaction with the system interesting (more than turning pages in a magazine).

o CONSUMER DESIGN

- o The current Pictureware design is costly and will need to be very significantly redesigned for consumer utilization. This will require new consumer-design experienced engineers for the Joint Venture and Mattel technical support personnel (J. Fairbanks).

o PUBLISHER ALLIANCES

- o A great deal of work will need to be done in formalizing Pictureware alliances with Information Providers.
- o It is as yet unclear what actual alliances currently exist versus what Stuart Krasney implies exist.

o MANAGEMENT

- o The Joint Venture requires a very strong, organized and aggressive management team to put a realistic operating plan together, monitor and manage progress and "wheel and deal" with Information Providers and suppliers. It is clearly evident that Stuart Krasney is not that type of individual.
- o Mattel executive and marketing management coordination will be critical (and in the early stages, quite extensive).

o MISCELLANEOUS

- o For over-the-air broadcast, the Pictureware delivery system needs FCC approval. No plan has been developed.
- o No plans have been developed for the operation of Pictureware in international markets.
- o Only lip-service has been given to the development of the remote keypads to control the Pictureware controllers. This, as well as the interface with the many VCR manufacturers, will require a great deal of follow-up.
- o The Pictureware concept, to be successful, may need to become integrated into already existing or "New/In The Future" home components or home information systems. It may not be viable for the Pictureware hardware to stand by itself.

o PATENTS (part 6.2.)

- o It was the consensus opinion of Barnes, Chandler, Ferguson and Moskovitz that Pictureware would be extremely fortunate to receive any patents. This would be a windfall.
- o A major concern of the group was whether any of the Pictureware circuit concepts infringe on existing patents. The audio

compression/expansion area is one of particular concern. Per Ron Goldman's direction, EECO is conducting/verifying patent searches.

o SUMMARY

- o While advising that the Pictureware approach is technically feasible, the analysis clearly underlined the many large risks and unanswered questions.
- o In addition, it is quite evident that making the Joint Venture a success will require a larger investment of Mattel manpower than at first believed.
- o It is also extremely critical to select a very strong and capable management staff for Pictureware. The next 3 years will be a significant challenge to the Joint Venture, EECO and Mattel.

GSM:e1

cc: D. Chandler
H. Barnes
L. Ferguson
S. Prodromou
P. Rioux
P. Pirner
R. Goldman
T. Reams
R. Ferris

Dictated but not read



Inter-Office Memorandum
ELECTRONIC ENGINEERING COMPANY OF CALIFORNIA

To: Mattel File

Date: September 15, 1982

From: Stuart Krasney

Copy to: SEE DISTRIBUTION

Subject: MEETING HELD SEPTEMBER 10, 1982

A meeting was held at Mattel Electronics on Friday, September 10, 1982.
Attendees were:

EECO

Stuart Krasney, Director, Marketing Development
Bob Pargee, Division Fellow
Bill Neely, Manager, Engineering

Mattel Electronics

David Chandler, Chief Scientist, Vice President-Strategic Development
Hugh Barnes, Vice President, Engineering
Lee Ferguson, Design Engineer
Richard Schaffer, Director, Program Management

Objective: Define engineering and technical requirements and related staffing needs for Pictureware joint venture. The assumption was made that all schedules were related to a 10/1/82 joint venture start date. The meeting started with a review of the EECO schedules with the objectives of:

1. Identifying major milestones
2. Coordinating the intensive 6-month plan with the long range objectives

Key milestones identified were:

1. Written specification for the decoder by January 15, 1983 accompanied by a final design review.
2. Consumer market test plan by April 15, 1983.

PICTUREWARE DECODER/AUDIO COMPRESSION UNIT-4Q82

Assignment of the work to be done was divided between Mattel, EECO and Joint Venture. Staffing requirements were discussed as they relate to the Joint Venture and EECO's support was identified.

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D. CHANDLER

<u>Function</u>	<u>Responsibility</u>	<u>Joint Venture Staffing Requirements</u>	
		-0-	
PCB Fabrication	EECO		
Engineering Manager	JV	Director	1
Board Layout	JV	PCB Designer	2
Mechanical Design	JV	Mechanical Designer	1
Documentation/Configuration Control	EECO/JV	Clerk Checker	1
		Mechanical Engineer	1
Circuit Design	JV	Engineers	4
Parametric Evaluation	JV	Technicians	3
Test and Repair (Prototype)	JV		
(Production Units)	EECO		
Writing of Specifications (Technical & User Manuals)	JV	Technical Writers	4
Handling of FCC/UL	Mattel/EECO		
Test Hardware	EECO		
Hot Mock Up	JV	Super Technician	1
Software/Firmware		Software Engineer	2
Operating System	JV		
Service Test Applications	JV		
Test	EECO		
Tooling	EECO		
Quality Plan	JV	Quality Engineer	1
		Technician	1
DECODER/AUDIO ENGINEERING TEAM-TOTAL			23

EDIT DEVELOPMENT SYSTEM-4Q82 (Formerly referred to as Production Formatting System)

All identified staffing to be part of the joint venture. The general categories of expertise necessary are identified under the staffing requirements. The staffing described above is for the turnkey editing system currently under development.

EDIT DEVELOPMENT SYSTEM (continued)

Manager	1
DEC System Engineer	
Device IO Expert	1
Data Base Programmer	1
User Software Programmer	1
Product Specialist	1

EDIT DEVELOPMENT TEAM-TOTAL 5

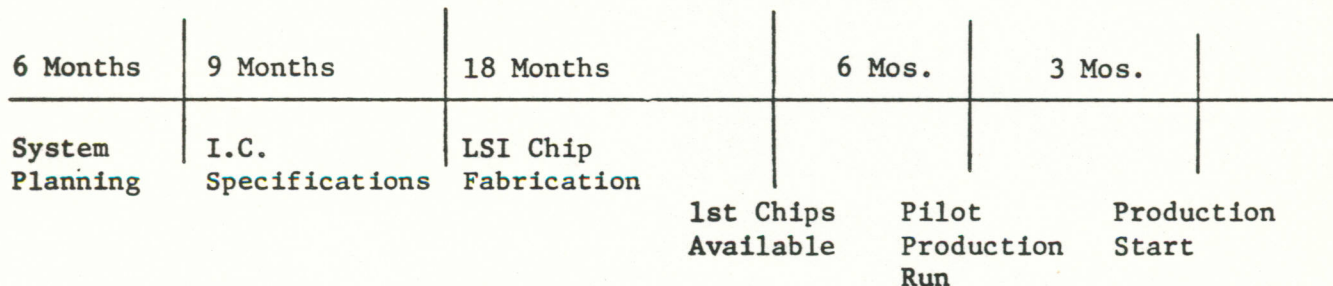
CONSUMER DECODER REQUIREMENTS DESIGN AND DEVELOPMENT-4Q82

This function will fall under the jurisdiction of both marketing and engineering. It is an active design requirements planning and design activity. Preliminary estimates of staffing include 4-6 people whose responsibilities would include:

1. Re-evaluation of system definition
2. Partitioning of function design
3. Circuit redesign
4. Integration pathing
5. Functional audit
6. Compatibility study (1985 environment)
7. Evaluation of outside developments

CONSUMER DECODER REQUIREMENTS DESIGN
 AND DEVELOPMENT TEAM-TOTAL 6

This will result in a final consumer product specification and could take as much as 15 months. On the low side, it could possibly be done in 6-12 months depending on availability of already developed LSI chips. The work of this system planning function would be completed prior to heavy investment in LSI circuit design. Below is a possible schedule leading to production and FCS of consumer units.



Of the 10 engineering prototypes expected to be available the 1st week of November, assignment was made on the following basis:

FCC	1
U/L	1
Hot Mock Up	1
Parametric Testing	1
Audio Design Team	1
Editing System	2
Manuals	1
Marketing	2

A tentative schedule of units of current design was agreed to based on needs for proposed consumer market test, closed user group applications, sales service requirements, and other various marketing and technical needs. This schedule calls for EECO to produce the following number of units:

50 Units	3/15/83
50 Units	4/15/83
75 Units	5/15/83
100 Units	6/15/83
100 Units	7/15/83

Above based on assumption of ordering of materials prior to 10/15/82.

EDIT OPERATIONS SYSTEM-2Q83

A "fully operational" system will be required to handle the needs of information providers. At that point in time, an operational crew will be necessary to run such a system. This crew will all be hired by the joint venture and will include:

Computer Operator	1
Video Technician	1
Keypunch Operator	1
Product Specialist(s)	1 or
(Assumption: 1 Product	More
Specialist will handle	
7 active IP accounts)	
Edit System Manager	<u>1</u>

BASIC EDIT OPERATIONS SYSTEMS
TEAM-TOTAL

5

A meeting is scheduled with Gary Moskovitz to review this preliminary technical evaluation and work on the other staffing requirements and schedules related to financial administrative and marketing needs.

SK:gh



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H. Barnes (Mattel)
D. Chandler (Mattel)
L. Ferguson (Mattel)
S. Krasney (EECO)
G. Moskovitz (Mattel)
B. Neely (EECO)
B. Pargee (EECO)
R. Schaffer (Mattel)

9/22/82

MATTEL ELECTRONICS
DICK SHAFFER

Dave -

Attached is a first cut of
the EECO Joint Venture schedule
for December. In addition
to this plot, I have an
activity listing showing early/late
start/finish dates. Please
let me know if I can be
of further help.

Dick

September 22, 1982

TO: Stav Prodromou
CC: Dave Chandler
Gary Moskovitz
FROM: Hugh Barnes
SUBJECT: EECO

I wanted to briefly relay my thoughts on the EECO evaluation.

First, a small addition to the notes published by Stu Krasney regarding the Sept. 10, 1982, review. In addition to the 10 engineering models, we identified the need for an additional 85 to 113 units in early 1983 in order to meet the milestones as outlined.

● QA (environmental, transportation, etc) (Life)	6 10	16
● MARKETING (customer) (show) (P.R.) (Demo) (Exec Samples) (Salesmen Units)	10-15 4- 8 3- 6 5 5-10 10	} 37+54
● REGULATOR (1UL & 3 FCC)	4	4
● ENGR TEST (Dev-H/W & S/W) (Applications S/W) (Parametric)	8 6 6-10	} 20-24
● EDITING SYSTEM	8-15	8-15
TOTAL		<u>85-113</u>

Second, subjective comments relative to the proposed joint venture.

- The time-to-market for a viable consumer product (video & audio, highly integrated for cost effectiveness) is very long; 1986 for first shipments. I think other forms of delivering electronic publishing to the home will have a better lead time than we originally anticipated.
- The proposed commercial/industrial version of the unit requires that the joint venture enter the "service" business. I am very uncomfortable concerning our combined talents in this unfamiliar business; I think we would be naive to assume we can step right in to this area without a few costly mistakes.

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- I estimate the cost of the project to exceed \$20 million before significant consumer sales occur. This is far in excess of the original cost figure of under \$5 million that I was privy to. I think a more enlightened cash flow and ROI analysis is indicated in view of these significant changes.
- The original people list is highly critical; it is my understanding that the commitment for one or two Key individuals is still in question. This is a serious concern to me.

In summary, I cannot recommend a commitment to a program of this apparent magnitude without a better understanding of the potential rewards.

Thank you

hugh
D

M E M O R A N D U M

TO: Distribution
FROM: Gary Moskovitz
DATE: October 18, 1982
SUBJECT: SUMMARY OF MATTEL PICTUREWARE MEETING OF OCT. 13

- . Ray Ferris, Paul Rioux, Bill Catron and I met to discuss:
 - a) Current action items from the October 5 meeting at EECO.
 - b) Resultant telephone conversations between EECO and Mattel.
- . According to several conversations, the next action item was for Mattel to call EECO with: A list of topics of conversations regarding bringing in additional partners, different equity arrangements, etc. A meeting was then to be scheduled to discuss this list of topics.
- . Discussion then commenced regarding categories of possible partners:
 1. Manufacturers that could contribute value:
 - . RCA
 - . Sony
 - . GI
 2. Media Transmission Groups
 - . Networks
 - . Large Cable Companies
 3. Selected Venture Capitalists
 - . Single investors - (e.g. Arthur Rock) who would invest \$5-20 million and require both control and representation on operational management and Board groups.
 - . Investor groups - who, for 250,000 - \$1 million per investor, would each want large percentages of the business.

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Summary of Mattel Pictureware Meeting, Oct 13
October 18. 1982

Page 2

- . It was agreed that for Mattel to attract other manufacturers into the venture, Mattel would need to be a financial participant ("at risk") and not just a provider of marketing expertise.
- . Discussion then centered around various alternatives in structuring a future venture:
 - . 1/3 each financial participation of three (3) partners (EECO, Mattel and "X") with decision point prior to consumers roll-out on continuing equity position after roll-out.
 - . The Mattel possibility of a cash payment now (e.g \$100,000) to EECO for six-month option to purchase rights to Pictureware in exchange for a future EECO percentage of eventual business. Mattel's efforts in seeking out and securing third partners would be equivalent to value of EECO's to date contributions (e.g. \$1.5 - 3.5 million)
- . The meeting ended with the following list of proposed subjects to be transmitted to EECO as a basis for the next EECO/Mattel meeting.
 - . Financial analysis of Pictureware business through 1988.
 - . Most advantageous categories of potential participants.
 - . Potential structure of presentations to potential participants.
 - . Discussions of dedication of EECO/Pictureware assets into potential venture.
- . The next step will be a strategy session with Josh Denham regarding the above discussion points.

GSM/lS

CC: R. Ferris
J. Denham
P. Pirner
P. Rioux
W. Catron
S. Prodromou
H. Barnes
D. Chandler