lookout

September 21, 1979

TO: RICHARD HOAG & JEFF ROCHLIS

FROM: ED KRAKAUER   *Ed*

SUBJECT: SEARS

I had a telephone conversation with Jerry Coll of Sears
this week regarding the testing of Intellivision. Jerry
had not yet received the complete results. However, he
indicated that Mattel performed reasonably well in the
tests.

I have arranged to make a complete Intellivision presentation
to Jerry and the others involved in the decision making
process (Bob Ingold, Ken Eldridge and Bob Jandeska) at
9:00 am on October 30th at Sears.

They are interested specifically, that the presentation
address the technical aspects of the system; the availability
of the master component, keyboard and other peripheral hard-
ware developments; the complete range of software planned
and the scheduled availability of each cartridge and cassette.
The entire morning has been set aside. It will be necessary
for whatever equipment is needed to be set up the previous
evening.

By copy of this memo I would ask that Richard Hoag contact
Jerry Coll on his return from Japan in three weeks to make
the necessary logistical arrangements.

If you have any questions, let me know.

EK:jj

cc: Dave Chandler
     Al Secor
     Ray Wagner

AGENDA FOR MEETING WITH BOB JANDESKA
October 24-25, 1979

Wednesday - October 24, 1979

10:30 a.m.	Review Agenda	
10:35 a.m.	Marketing Overview and General Discussions	Richard Hoag
11:00 a.m.	Update on Cartridges and Demonstration	Brian Dougerty
11:30 a.m.	Lunch	
2:00 p.m.	Production Status of Master Component	Ron Taylor
2:30 p.m.	Keyboard Component Functions and Architecture	Dave Chandler
3:00 p.m.	Keyboard Component Hardware Status and Demonstration	John Lishman
3:30 p.m.	Cassette Program Status	Brian Dougherty

Thursday - October 25, 1979

| 9:30 a.m. | Meet with Jeff Rochlis |
| 10:00 a.m. | Wrap-up Discussions |

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TECHNICAL DESCRIPTION OF THE INTELLIVISION SYSTEM

Intellivision is a modular system which can be purchased one component at a time. The central portion of the system is the Master Component which is a sophisticated video game that provides enduring individual or family entertainment. When combined with the Keyboard Component, the combination becomes a powerful, versatile, expandable home computer. Its low power requirement (approximately 20 watts for the Master Component, and 40 watts for the Keyboard Component) makes it an energy conserving form of entertainment and utility.

MASTER COMPONENT

The Master Component is a video game system which interfaces to the customer's television system. The modulator for this interface is built into the Master Component. The desired game is selected by plugging in the cartridge for that game, selected from the variety of software available.

Controls: The controls of the Master Component are quite simple. There is a power on/off switch and a reset button on the Master Console. All the rest of the controls are in the two handheld controllers. These are versatile controllers; each of which contains a 12 key keypad, a 16 direction control pad, and 4 action buttons. Each game is supplied with a set of plastic overlays which slide into the hand controllers, over the keypad, to relabel the keys appropriately for that particular game.

Graphics Capabilities:

16 colors

Background resolution: 96 lines (2 T.V. lines per data line), 160 pixels each

8 moving objects - each 8 x 16 pixels - programmable resolution as high as one T.V. line per data line and horizontal pixel size the same as the background. Moving objects have capability of high degree of animation.

Alpha-numerics: 12 rows of 20 characters each. Any color for any character.

Sound Generator: Intellivision Master Component contains a versatile sound generator capable of producing three different tones simultaneously along with a pseudo-white noise. With this capability sounds all the way from three part harmony to rather complex general sounds can be generated under program control.

Internal Memory: In addition to the several sections of memory utilized in displaying graphics on the T.V. screen, the following internal memory greatly enhances the program effectiveness of the game cartridges:

Scratch pad RAM: 112 words by 16 bits
256 words by 8 bits

Executive ROM: 4K by 10

Graphics ROM: 2K by 8

Graphics RAM: 512 by 8

CPU: The microprocessor being used as the CPU in Intellivision is General
            Instruments 1610. It is a powerful 16 bit microprocessor, utilizing
            10 bit instruction words. It operates with a 16 bit buss which trans-
            mits both address information and data. Three control lines are used
            to define the nature of transmissions over the data buss at any one
            time.

Cartridge Port: A cartridge port is provided, into which the game cartridges are
            plugged. This cartridge port connector contains the data buss and
            control lines from the CPU as well as a number of additional signals
            which are designed to enhance expansion into the home computer. This
            port then becomes the means of connecting to the Keyboard Component,
            as far as electrical signals are concerned.

KEYBOARD COMPONENT

The Keyboard Component is designed to be combined with the Master Component to
make a new single unit, which is the home computer. The Keyboard Component contains
a 60 key typewriter-like keyboard, a built-in computer controlled cassette tape
drive, a 16K x 10 dual port RAM, another 1610 CPU, a high-resolution alpha-numeric
character generator, a microphone, expansion and cartridge ports, and the necessary
circuitry to make all of this work. These sub-systems are described in more detail
below.

Controls: All of the Master Component controls are still effective, including the
            on/off switch, which turns the power on and off for the combined system.
            The Keyboard Component provides additional controls in the form of a
            60 key typewriter-like keyboard. This keyboard is configured both
            physically and appearance-wise to be like a typewriter keyboard with
            additional control keys. The key arrangement is designed to provide
            conventional touch typing capability as well as convenient computer
            controls.

Cassette Tape Drive:

            Completely computer controlled - no direct manual controls

            Uses four tracks in the same direction:
                Two pre-recorded tracks - one digital, one audio
                Two home recordable tracks - one digital, one audio

            Provides up to 30 minutes tape capacity

            High data density provides fast program load (typically only
                                a few seconds until program execution
                                is started)

Second CPU: A second General Instruments 1610 microprocessor is included in the
            Keyboard Component. Its primary function is to interface with the
            built-in perepherals as well as expansion perepherals. The architecture
            however, is one which can permit this CPU to be used quite generally
            with control being transferred between the two CPU's or shared by both,
            as elected by the programmer. The combination makes an extremely powerful,
            versatile, and expandable system.

Internal Memory:

        Dual Port Memory: 16K x 10 RAM - addressable by both CPU's, each transparent to the other

        Scratch pad RAM: 1K x 16 - of which half is reserved for high-resolution alpha-numeric character generator

        Resident program ROM: 4K x 10, half on each CPU buss

        Character pattern ROM: 2K x 8

High-resolution Alpha-Numeric Character Generator:

        Can superimpose white characters on whatever video the Master Component is generating. Limited colors which provide practical backgrounds for characters of this resolution, but the rest of the screen is not restricted.

        Resolution: 20 lines of 40 characters each

        Character display can be scrolled for a continuous flow of text. Can be coordinated with scrolling of graphics displayed by the Master Component.

Microphone: A microphone is provided with the Keyboard Component. It is used to record home generated audio on the home recordable audio track under program control.

Cartridge Port: Because the cartridge port in the Master Component is used to couple the Master Component and the Keyboard Component, a new cartridge port is provided in the Keyboard Component. This permits playing of all of the ROM game cartridges in the combined system the same as they could be played with the Master Component alone. Because this cartridge port has access to the buss and control lines from the first CPU (in the Master Component), it also provides a means of expanding the system further by access to CPU #1.

Expansion Ports: Two expansion ports are provided on the Master Component. These are intended for the addition of perepherals. These expansion ports contain the buss and control lines from the second CPU (in the Keyboard Component) and, therefore, provide virtually unlimited expansion capability in connection with CPU #2.

PEREPHERALS

As indicated above, a variety of perepherals are possible. Two are scheduled which are of particular interest.

Forty Column Printer:

        Continuous roll paper (adding machine paper)

        Can copy alpha-numeric display from T.V. screen, or print from memory

        Capable of limited graphics print out

Telephone Modem: The telephone modem will provide capability to communicate over normal telephone lines, at rates up to 1200 Baud. With this capability a whole new realm of uses of the Intellivision System is opened up.

MATTEL ELECTRONICS

CARTRIDGE STATUS - OCTOBER 24, 1979

In Masked Rom (Production) Form

2610 – NFL Football		Available 11-12-79
2615 – NBA Basketball		Available 11-12-79
2614 – Baseball		Available 11-12-79
2613 – CTW Math Fun		Available 11-12-79
2611 – Las Vegas I		Available 11-12-79
1121 – Armor Battle		Available 11-12-79
1119 – Backgammon		Available 11-12-79
1120 – Checkers		Available 11-12-79

Released For Masking:

In-Store Demo Cartridge
Production Start 11-1-79 Available In Stores 11-9-79

Soon To Be Released:

1123 – Horseracing – Rel. Fin. Code 11-1-79, Prod. Start 1-7-80, Available 1-14-80
1122 – Spelling – " " " 11-30-79 " " 1-30-80 " " 2- 6-80
1113 – Auto Race – " " " 11-30-79 " " 1-30-80 " " 2- 6-80

Scheduled For 1980 Introduction:

Golf   Tennis   Boxing
Puppet Theatre Skiing   Sea Battle

MATTEL

MATTEL ELECTRONICS

CASSETTE PROGRAM STATUS — OCTOBER 24, 1979

BEING DEBUGGED

IN STORE DEMO CASSETTE	AVAILABLE 12-10-79
1147 — BERLITZ CONV. FRENCH	AVAILABLE 12-27-79
1146 — JACK LALANE EXERCISE	AVAILABLE 1-14-80
1153 — FOOD & DIET	AVAILABLE 2- 6-80

PLANNED FOR NEXT YEAR:

CONVERSATIONAL SPANISH

EARLY READING

COOKING

YOGA

DISCO DANCING

MUSIC

ART

TAX

MATTEL ELECTRONICS

KEYBOARD COMPONENT HARDWARE STATUS

HOUSING TOOLING COMPLETE EXCEPT FOR TEXTURING

KEYBOARD AND CASSETTE MECHANISM IN PRODUCTION

POWER SUPPLY, PREAMP AND TAPE CONTROL ASSEMBLY PCB DESIGNS COMPLETE

LOGIC BOARDS DEBUGGED IN WIREWRAP FORM, P.C. BOARD DESIGNS NEARLY COMPLETE

SOFTWARE IS PROGRAMMED AND BEING DEBUGGED WITH WORKING HARDWARE

MATTEL ELECTRONICS

KEYBOARD COMPONENT HARDWARE

Presently Mechanized on 5 P.C. Boards

 COMPUTER ASSEMBLY
 HIGH RESOLUTION ALPHANUMERIC ASSEMBLY
 PREAMP ASSEMBLY
 TAPE CONTROL ASSEMBLY
 POWER SUPPLY ASSEMBLY

Planned Revisions

 HAVE CIRCUIT SIMPLIFICATIONS WHICH WILL PERMIT COMBINING COMPUTER ASSEMBLY AND H.R. ALPHANUMERIC ASSEMBLY - PROBABLY BEFORE YEAR END
 Plan interchangeable cost reduction redesign for next year