

January 28, 1980

TO: Ed Krakauer  
Jeff Rochlis  
Al Secor  
Chuck Rudd  
Tom Dineen

FROM: Dave Chandler

*DPC*

SUBJECT: VISIT TO EMI

I spent the day Thursday, January 24th, with EMI. Part of the day was spent in London at their Audio Visual Systems Division and part of the day was a trip to EMI TAPE at Hayes, which is outside London by about 25 miles.

EMI TAPE:

At EMI TAPE I got a tour of the plant, which makes magnetic tapes. Among other things, I saw the spools of our first production lot of tape which had just completed the coating process about an hour before I got there. I met the management of EMI TAPE, some of whom expect to be visiting us in March.

Audio Visual Systems:

Mike Cross had made arrangements for me to visit with the people at Audio Visual Systems. The primary contact was with Byron Turner, Manager of Computers Video Operations.

Audio Visual Systems has been primarily in the business of generating, and I guess editing, graphics for the T.V. industry. They have more recently been involved in creating computerized methods of generating this graphics - and this is the area that Byron Turner is in charge of. They have a very impressive capability in this area and are continuing to develop the system. It is capable of generating high resolution, high quality, animated color graphics for film and T.V. It enables fast generation and easy modification of pictures; perhaps

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more importantly, it provides high resolution animation between pictures, as well as the ability to generate animation sequences following a variety of instructions for rotation, mixing, fading, and so forth.

They have more recently begun a second field of activity, which is programming microcomputers. They are writing programs (games, as well as other types) for several microcomputers, including PET, Apple, and the Atari 800.

#### Involvement with Atari:

EMI AVS is doing work for Atari. They showed me a portion of a demo program done for Atari U.K. on the Atari 800. (This demo has been publicly released, so they felt free to show it to me - otherwise, they are equipped to and maintain good confidentiality control). The demo program was well done, but not particularly innovative or outstanding.

They apparently are doing other things for Atari, but I was not able to find out exactly what. I would say there is a good probability that they are developing a simplified version of their system for generating graphics suitable for generating Atari 800 graphics. It might be using the 800 in the process of doing this work. It is not clear whether their work is limited to supporting Atari U.K. or whether it may also apply to the U.S. applications for Atari.

#### Potential Mattel Involvement with EMI AVS:

AVS is interested in doing programming for our Intellivision system.- either work for us or being in a position to generate software of their own. I was not especially impressed with their game writing capability, although they would have the ability to add interesting graphics, I suspect. Of perhaps more potential interest might be having them generate a graphics development system, suitable for use with Intellivision. The primary thing they would add to this would be the ability to do computerized generation of graphics sequences. This would not be animation in the sense that we have used animation of running men and so forth, but would be generation of a sequence of pictures which evolve from one thing into another - much like is used in the generation of T.V. advertisements. I suspect the tools to aid in the generation of graphics of the type that we presently do would be better done by us.

CONFIDENTIAL

OPS 118

July 25, 1980

TO: Ed Krakauer  
FROM: Dave Chandler *DPC*  
SUBJECT: Background to the attached letter from EMI

At the recommendation from Lou Solomon of GI while I was in England in January, I visited Byron Turner and his operation at EMI. There were again brief discussions in Chicago at CES in June with Byron and seperately with David Rurka and Bob Denton from ACE relative to having EMI develop software for Intellivision. Right after CES Byron visited Mattel and met with Jeff Rochlis and myself to discuss the possibilities of establishing EMI to do software for Intellivision.

Because Thorr who now owns EMI owns a major portion of the rental television sets in England and is therefore a very important potential customer for ACE, ACE is very interested in having a good relationship with EMI/Thorn relative to Intellivision. In addition to the positive interest of EMI being a potential source of additional software, ACE is particularly concerned that we avoid creating any negative feelings relative to Intellivision on the part of EMI Thorn.

Byron heads up a portion of EMI whose primary activity is that of generating graphics type software for the television and movie industries. For this activity, they have developed a very elegant set of equipment for computer generation of complex color graphics sequences. In addition to that activity however they have started getting involved in generating software for home computers. While I was there, they were working on a program for the ATARI 800, for instance. It is this portion of the operation which would be involved in developing software for Intellivision. They are physically well equipped to maintain isolation of developments on one computer system from that for another, and their mode of operation appears to be rather good for maintaining control of proprietary information in spite of the fact that they are working on a number of home computers.

The discussions out here with Jeff led to the following proposed approach for consideration. EMI would develop software for Mattel for which they would receive a royalty the magnitude

of which would be discussed after appropriate titles had been agreed upon. ACE would serve as Mattel's marketing arm in this relationship for the purpose of selecting with EMI the software to be developed and for approving that software once it had been developed. Mattel would have to make available the necessary software development equipment and the training of EMI personnel for doing the programming. EMI would also be looking for some amount of upfront money for this project. EMI's interest is only in developing software which would have International interest as opposed to software which would be purely for the UK Market. They might, however, be willing to do software just for British distributors if we fully paid for the development (no royalties). Specific subject matter was not discussed in our meeting, but EMI feels that they have some areas of interest relative to software which would be complimentary to the things Mattel is doing and would, among other things, provide software of interest for the US Market. Neither Jeff nor I arrived at any conclusions as to the validity of their belief because subject matter for the software was left for later discussions with ACE. (No proprietary agreements have been signed as far as I know.) The meeting was concluded with an agreement that we would discuss the matter with ACE and recommend that EMI get together with ACE when they got back to England to discuss the subject matter which would be suitable for programming and see if ACE felt there was a valid basis for continuing the discussion. It is my understanding that these discussions have taken place and that both ACE and EMI are interested in pursuing the matter.

As an additional bit of background, you should be aware that while I was in England for the Prestel International forum, I also met another software group which impressed me as being more likely to generate the kind of software we are interested in for Intellivision. They would be interested in considering doing software for us for the British market if as the result of that activity they were in a position to apply the Intellivision system to small business applications in England. It is conceivable that we could have both companies developing software for us if we wanted to go that route.

An additional bit of information you should be aware of is that in order to support EMI or any other outside company with software development systems, it will be necessary for us to furnish both the development software and a Widget which are property of APH. Furthermore the 1610 Widget which would be used here is marginal in design. While we have been able to make it work with tender care at Mattel and at APH, it is not presently suitable for furnishing as a piece of equipment outside the companies. I do not believe there would be any problem in having the software and Widget available except for the necessity to do engineering on the Widget. But this would have to be negotiated with APH.

cc: D. Kissell  
A. Secor  
G. Schwandner

17th. July, 1980

Dr. David P. Chandler,  
Director, Product Engineering,  
Mattel Electronics,  
Mattel Inc.,  
5150, Rosecrans Avenue,  
Hawthorn, CA 90250.

Dear David,

Thank you for the very informative meeting in Los Angeles last month. We have now had a meeting with David Rurka and Bob Denton of ACE and they are in favour of us setting up a software capability for Intellivision in the United Kingdom. They would prefer that the primary agreement be reached between Mattel and THORN EMI with ACE playing a subsidiary role.

Apparently Mattel will be visiting ACE in the U.K. in September and we intend to set up a meeting between the three interested parties to establish the working relationships, funding, timescales and possibly the initial product selections. I hope that you will be available for this meeting.

THORN EMI, in addition to being one of the most significant retail and rental customers for Intellivision in the United Kingdom, also has Cable T.V. interests. I would, therefore, like some current technical details of your Playcable venture with Jerrold, since my information was obtained from a meeting at Hatboro with Fred Shuh, Colin O'Brien and Michael Jeffers in January last year.

I look forward to hearing from you and hope that we can establish an ongoing working relationship.

Yours sincerely,



Byron M. Turner

Manager, Computer Video Operations

*Dave Chandler*

RECEIVED

- 1. General tape specification as standard EMI Tape 152/161 product data.
- 2. Watermark Specification

D. CHANDLER

2.1. All watermark W/M code frequencies and durations relate to a tape speed of 1 7/8" per second. The codes are in the form of 100 cycle duration 'bursts' of a 135Hz W/M carrier. The codes are distinguishable by the duration of the gap between these repeating 'bursts'. These gaps are multiples of the 'bursts' i.e. equivalent to 100 cycles at 135Hz.

A code type will be present throughout the full length and width of a coded tape.

Code type 250 (Blank)

Repeating 'Bursts' of 100 cycles of 135Hz.

Gap length equivalent to 200 cycles of 135Hz

Burst period = 0.74 second  
 Gap length = 1.48 seconds  
 Code length = 2.22 seconds

All code timings to be within  $\pm 2\%$  maximum

Code type 251 (Pre Record)

Repeating 'Bursts' of 100 cycles of 135Hz

Gap length equivalent to 100 cycles of 135 Hz

Burst period = 0.74 second  
 Gap length = 0.74 seconds  
 Code length = 1.48 seconds

All code timings to be within  $\pm 2\%$  maximum

2.2. Carrier Level

Following suitable DC magnetisation (reference 1), the W/M carrier level will be within  $\pm 2$ dB of the EMI W/M replay reference tape.

NOTE: The figures quoted are mean values and are subject to manufacturers' tolerances.

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## 2. Watermark Specification cont'd

### 2.3. DC Noise

When the tape is recorded with DC + bias (reference 2). The ratio of DC noise (reference 3) to reference level (reference 4) replayed on a correctly equalised replay system (reference 5) shall be greater than 44dB.

### 3. Tape Opacity

Measured with infra red light at approximately 9000 Å limit - 42% maximum.

Reference 1 - The DC field will be such that it will fully saturate (erase) the tape under test, (i.e. fully erase a 315Hz signal recorded at peak level).

Reference 2 - DC magnetisation current to be equivalent to the RMS value of signal current that is required to produce reference level (reference 4) from the tape under test.

AC bias 2.5dB overbias at 6.3kHz on tape under test

Reference 3 - The RMS AC component arising from the DC magnetisation during code off period.

Reference 4 - 315 Hz 200 nwb/m.

Reference 5 - Equalised to the 120 us and 3180 us characteristic, (in accordance with IEC publication 94, edition 3).

NOTE: The figures quoted are mean values and are subject to manufacturers' tolerances.

Dave Chandler

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D. CHANJLI

**AUDIO PERFORMANCE SPECIFICATION**  
Tape Speed 4.76 cm/sec (1 7/8in/sec)

RECORD GAP LENGTH 2 $\mu$ mREPLAY GAP LENGTH 2 $\mu$ mREPLAY AMPLIFIER CHARACTERISTIC 120 $\mu$ sec. and 3180  $\mu$  sec.

(In accordance with IEC Publication 94  
Edition 3, BS 1568 Part 1 and DIN 45513).

BIAS AND SENSITIVITY REFERENCE TAPE – EMI Type 152 (S.13)

REFERENCE BIAS 2.5dB overbias at 6.3 kHz (this condition is that with increase of bias current the 6.3 kHz output level has fallen by 2.5dB from its maximum value) Ref. 5.

1.	Sensitivity	25 Hz	0dB	
		315 Hz	0dB	
	(Ref. 5)	1 kHz	0dB	
		6.3 kHz	0dB	
		10 kHz	0dB	
		14 kHz	0dB	
2.	Maximum Output Level for 5% THD at 315 Hz. (Ref. 1)		+5.25dB	
3.	Maximum Output Level for 3% THD at 315 Hz. (Ref. 1)		+4 dB	
4.	Maximum Output Level for Saturation at 10 kHz. (Ref. 1)		-11 dB	
5.	The Ratio of the Reference Level to Bias Noise (Ref. 2)		57dB (Mono track) 53.5dB (Stereo track)	
6.	The Ratio of the Reference Level to Bias Noise (Ref. 3)		49dB (Mono track) 45.5dB (Stereo track)	
7.	The ratio of the 400 Hz Maximum Output Level to Print (Ref. 4). First Pre-Echo after storage for 72 hours at +20°C.		55dB (Type 152)	54dB (Type 161)
8.	Output Uniformity Variations at 315 Hz. within a reel	Tracks 1 and 2 Monophonic	$\pm 0.25$ dB	
		Tracks 1 and 4 Stereophonic	$\pm 0.25$ dB	
		Tracks 2 and 3 Stereophonic	$\pm 0.25$ dB	
9.	Output Uniformity Variations at 3150 Hz. within a reel	Tracks 1 and 2 Monophonic	$\pm 0.5$ dB	
		Tracks 1 and 4 Stereophonic	$\pm 0.75$ dB	
		Tracks 2 and 3 Stereophonic	$\pm 0.5$ dB	

Note: The figures quoted are mean values and are subject to manufacturers' tolerances.





## EMITAPE 152/161

EMITAPE 152/161 are high output low noise C60/C90 magnetic recording tapes for both compact cassette and pre-recorded musicassette applications.

### PHYSICAL SPECIFICATIONS

	<b>152</b>	<b>161</b>
1. Colour	Brown	Brown
2. Base Film	Polyester	Polyester
3. Base Thickness	12 $\mu$ m	8 $\mu$ m
4. Coating Thickness	5 $\mu$ m	5 $\mu$ m
5. Width	3.81mm $\begin{matrix} +0.0 \\ -0.05 \end{matrix}$	0.15in. $\begin{matrix} +0.00 \\ -0.002 \end{matrix}$
	(IEC Publication 94A)	
6. Ultimate Tensile Strength (N/mm <sup>2</sup> )	294	290
7. Yield Strength (F <sub>3</sub> ) (N/mm <sup>2</sup> )	103	96

### MAGNETIC SPECIFICATIONS

1. Coercivity (Hc) (A/m)	25,902 (325 Oersteds)
2. Retentivity (Br) (Tesla)	0.14 (1400 Gauss)

*Note:* The figures quoted are mean values and are subject to manufacturers' tolerances.



- Ref. 1      Relative to an RMS flux of 200nWb/m tape width at a frequency of 315 Hz.
- Ref. 2      Using an indicating instrument of the square-law type and a weighting network ('A' curve) in accordance with the International Electrotechnical Commission recommendation, Publication 179.
- Ref. 3      Weighted using a filter and a quasi peak measuring instrument in accordance with DIN 45405.
- Ref. 4      The maximum Output Level to Print Ratio obtained when the tape has been stored with the leader out. The test frequency used for this parameter is a 400 Hz tone recorded to a level at which 5% THD is generated.
- Ref. 5      The reference bias current is the value of current used in the preparation of this data, and is not necessarily the best operational bias current for individual applications.

TYPICAL BIAS/DISTORTION AND BIAS/SENSITIVITY  
CHARACTERISTICS

