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March 14, 2005

To Whom It May Concern:

My name is Sellam Ismail. I am a computer historian, archivist and consultant. I own one of the world's largest privately held collections of historic computers, including several examples of IBM unit record equipment¹ as well as numerous manuals describing the operation of such equipment.

I am Software Curator for the Computer History Museum in Mountain View, California, which holds the world's largest collection of computing artifacts. The Museum's collection contains numerous examples of IBM computers and Unit Record Equipment, including an IBM 650, IBM 407 and other related machines. In my role as Software Curator I am responsible for maintaining the Museum's software collection as well as conducting research on a wide variety of historical computing topics in order to produce content for museum displays and to assist outside researchers.

I am also an independent historical computing consultant, providing research into historical computing systems among other services. A large portion of my consulting work involves researching patents in the computing field for legal teams that are working to either defend or overturn patents. My research in this area requires that I comprehensively search through old computer manuals and literature in order to attempt to find or not find features of interest in old computer systems and software. My work also involves reviving obsolete computer systems and software to serve evidentiary purposes as well as to retrieve data that has been stranded on outmoded data media. I also build replica computers for museum displays, which requires an attention to detail to achieve realism. All of these skills require an acute knowledge of computing and its history, as well as the ability to research and understand technology that is often older than I am.

My previous court room experience includes being called as a technical expert witness in a murder-for-hire trial, and I have been deposed for approximately ten hours in technology related civil litigation.

¹ IBM punched card machines are also known as "Unit Record Equipment".

I was asked by Dr. Michael Minovitch to research whether the IBM 650 "Magnetic Drum Data-Processing Machine" circa 1953 was able to generate an automated date and time stamp. The purpose of this research was to determine whether the IBM 650 could have automatically generated a date stamp on a computer printout featuring calculations ostensibly made by Dr. Richard H. Battin. I set about conducting this research by first reading through the IBM 650 Manual of Operation (Major Revision June 1955)². In the entire manual, there is not a single mention of any ability of the IBM 650 to keep time or automatically generate a date or time stamp. IBM manuals of this era were very explicit and would document every feature available on the machines for which they were written. A feature as prominent as a real-time clock/calendar, had it been available, would have been documented in the manual in order to instruct the engineer or operator responsible for the installation and programming of the system on how to set the date and time or access the date and time from within programs.

My research also included the examination of manuals of operation for various IBM accounting machines, including the IBM 402, 403, 409³, and models 412-418⁴, as well as references for various related IBM punched card accounting and tabulating machines⁵. I searched throughout each manual seeking even the most discrete references to time-keeping equipment but did not find any

The IBM 407 Accounting Machine was modified for use as an output device (i.e. printer) for the IBM 650. IBM developed a variant of the 407 designated as the IBM 716 Printer. The 716 could be fitted with a Program Accounting Clock that would keep time in increments of .01 minutes (1/100 of a minute) up to 9999.99 minutes. The clock could be set and read from the host computer to which it was attached. However, according to the documentation, this feature was only available for IBM 704, 709 and 7090 computers⁶. Even if used with the IBM 650, the time would still have to be set by the programmer at the beginning of a session, and such time would only make sense within the context of that session. For example, if the clock was reset to all zeroes at 8:00am, then after one hour had elapsed the clock would read 0060.00, indicating 60 minutes had elapsed since the clock was set. This time value would then have to be manually translated by the programmer into hours, minutes and seconds, offset by the time at which the clock was originally set, in this case 8:00am. In any event, this clock would not have kept any indication of the passing of entire days. Since the clock

² From the IBM 650 Manual of Operation: 'MAJOR REVISION (June 1955) This edition, Form 22-6060-1, obsoletes Form 22-6060-0 and Form 22-6149-0. Significant changes have been made throughout the manual, and this new edition should be reviewed in its entirety.'

³ IBM Accounting Machine 402, 403 and 419 Principles of Operation (January 1956)

⁴ IBM Card-Programmed Electronic Calculator Model A1 using machine types 412-418, 605, 527, and 941 Principles of Operation (Third Revision, October 1954)

⁵ Reference Manual, IBM Operator's Guide (July 1959) containing information regarding IBM punches, verifiers, sorters, collators, interpreters and accounting machines

⁶ IBM Special Systems Feature Bulletin, IBM 704, 709, 7090 Data Processing Systems, Program Accounting Clock - RPQ 78054, 1960.

could count up to 9999.99 minutes, this allows the clock to measure a span of time up to 166.66 hours, or 6 days, 22 hours and 40 minutes. Therefore, it is highly improbable if not impossible that the IBM 650 was capable of keeping track of the calendar date for an indefinite period of time automatically.

I have prior knowledge that IBM manufactured analog time clocks that were used in certain applications for automatically recording the time. However, I found no evidence to indicate that any of IBM's time clock products were ever interfaced with the IBM 650.

Simply stated, a somewhat exhaustive search of IBM publications did not produce any evidence that the IBM 650 manufactured from the time period of 1954 through 1961 featured a real-time clock capable of storing and maintaining the actual date and time.

In my opinion, the numbers "01-26-61" on the printed page claimed by Dr. Richard H. Battin to be evidence of a date stamp cannot be deemed an incontrovertible date automatically printed by the IBM 650 computer, for as my research shows, the IBM 650 was not capable of automatically maintaining and printing the date in real-time. Furthermore, without any additional context, the numbers can be interpreted in any way one might wish, and can be considered as cryptic as they might be obvious.

I hereby certify that the information presented in this report is true and factual based on the research that I conducted.



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3/14/2005
Date