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***637 THE STATUTE OF FRAUDS ONLINE: CAN A COMPUTER SIGN A CONTRACT FOR THE
SALE OF GOODS?**

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I. Introduction [\[FN1\]](#)

Section 1-102 of the Uniform Commercial Code (the "U.C.C.") provides that the "underlying purposes and policies" of the Code are to "modernize the law governing commercial transactions" and to "permit the continued expansion of commercial practices through custom, usage and agreement of the parties." [\[FN2\]](#) Today, commercial transactions routinely involve the use of devices and practices which, needless to say, did not exist when the U.C.C. first was promulgated in 1952 nor when the original Statute of Frauds was enacted by Parliament in 1677. [\[FN3\]](#)

Electronic Data Interchange (EDI) is an automated computer-to-computer system of business communication which recently has been gaining wide acceptance. [\[FN4\]](#) EDI represents an "expansion of commercial *638 practices" far beyond their previous borders; it seeks to completely eliminate paper from certain commercial transactions, including transactions for the sale of goods. While EDI greatly enhances the efficiency with which the sale of goods may take place, the practice represents a significant departure from established notions of what constitutes a writing and what constitutes a signature and therefore raises important questions of enforceability under the U.C.C. Statute of Frauds for sales of goods. [\[FN5\]](#)

Although a large volume of sales have been transacted under this new procedure during the last two decades, the number of EDI contract formation cases reported to date has been surprisingly low--zero, to be exact. [\[FN6\]](#) While this statistic may suggest that EDI trading partners are fully satisfied with the procedure, history would suggest that important legal issues relating to new commercial technologies ineluctably find their way into court. History also may suggest the manner in which courts will respond to some of these issues.

An examination of EDI in connection with the Statute of Frauds reveals a striking analogy to the advent of the electromagnetic telegraph, which also transmitted messages by electronic means (but which still made use of paper as a final repository of the data). While history does not repeat itself, it often speaks in rhyme. Therefore, an analysis of the law's historical response to the advent of the telegraph will help *639 to lay a foundation for predicting the legal future of EDI. In addition, some of the legal principles already established with regard to the telegraph may be directly applicable to EDI.

II. The Customs and Usages of Electronic Data Interchange [\[FN7\]](#)

A. What is EDI? [\[FN8\]](#)

Electronic Data Interchange (EDI) is "the standardized method of electronically transmitting and processing data." [\[FN9\]](#) A common application of EDI is to detect when inventory of a certain retail item drops below a previously established floor and to automatically order more of that item. Manufacturers make similar use of EDI to order parts for production. The goals of EDI are to reduce the overhead and labor costs associated with processing and storing paper, to eliminate human errors that can occur while re-keying data, and to shorten the time it takes to respond to an order. The shortening of "turn around" time increases sales (by increasing sensitivity to the market) while reducing inventory requirements, thus generating more revenue with less overhead and less capital.

The distinguishing characteristic of EDI is the standardized format used in transmitting data. Anyone can exchange data electronically with, for example, LEXIS or Westlaw. But to do so, one program is required to talk with Westlaw, and another with LEXIS. In the business environment, where each business needs to communicate with hundreds of other trading partners, electronic communications would necessitate multiple software packages. In the past, this obstacle has served to discourage attempts at electronic commerce. EDI was developed as a universal format in which to exchange business information. By gathering all trading partners into the same understanding of certain data patterns, EDI allows every business entity to have instant *640 communication with every other business entity within the EDI world. [\[FN10\]](#)

B. The Structure of EDI Transmissions

Since EDI replaces paper documents, an understanding of electronic "documents" is essential to a comparison of the reliability of these two media. One reason courts trust the evidentiary value of paper documents is because the data they contain can not be easily altered without evidence of the alteration appearing physically on the paper. Data stored on magnetic media, however, can be easily altered without leaving any physical evidence in the medium. EDI attempts to build data structures such that the data itself will show evidence of any tampering. It is therefore important to understand the data structures of EDI transmissions when analyzing their legal effect under the Statute of Frauds. With all appropriate apologies hereby assumed and incorporated by reference, the technical aspects of EDI must now be described.

Within the four corners of a paper form are lines designating the proper place in which to put particular kinds of information. Thus, on a purchase order, the number "300" will have one meaning when placed in the "quantity" column, and another when placed in the "stock number" column. On a paper form, then, the lines give meaning to the data. An electronic form--known in EDI jargon as a "transaction set" [\[FN11\]](#)--contains similar lines designating the proper place in which particular data must appear; those "lines" are nothing more than a set of rules, previously agreed upon and voluntarily adhered to by all trading partners. Since all trading partners agree upon and mutually understand the structure in which the data are to be placed, they all have the *641 same understanding of what the data mean once they are placed within that structure.

In order to assure that the sender and receiver of each transmission ascribe the proper meaning to each piece of data, and to assist in preserving the integrity of the data, EDI tightly controls the sequence in which the data appear. To keep track of each piece of data, EDI translation software inserts a constant series of codes into the data sequence. Just like eggs in a carton, each piece of data rests safely between these surrounding control codes. In roughly translated terms, an EDI transaction set would read something like this:

"This is a purchase order"
"This purchase order belongs to this particular transmission."
[EDI translation software generates and enters the number assigned to this transaction set.]
"This purchase order has X number of segments in it."
[EDI translation software calculates and enters the number of "segments" in this transaction set. (Each of the hypothetical statements in this simulated translation would be one segment.)]
"The number of items in this purchase order is ..."
[EDI translation software calculates how many items this purchase order contains.]
"This is Item 1 ..."
[Here is the first piece of the sender's data, the stock number of an item ordered. (This is the first "data segment;"

the earlier segments were "control segments."]
"The quantity of Item 1 ordered is ..."
[data]
Etc. etc.

EDI's strict control of the data sequence allows the system instantly to know if the data are intact or if they are defective. For example, EDI software can detect any difference between the number of segments sent and the number received; if anything is wrong with a single piece of data within a transaction set, the entire transaction set will be rejected.

EDI transmissions contain many "documents," usually of several different types. Each type of document will be sent in bundles, one bundle containing all purchase orders, another containing all invoices, etc. Each bundle of documents is called a "functional group." All of these *642 functional groups together comprise one "transmission group," which is something like an overnight package containing bundles of different types of documents all being sent to the same destination. Thus, at each level, user data is surrounded with a paired header and trailer. As the following diagram illustrates, each of these pairs act like two halves of a mold:

E.D.I. TRANSMISSION STRUCTURE

TABULAR OR GRAPHIC MATERIAL SET FORTH AT THIS POINT IS NOT DISPLAYABLE
TABULAR OR GRAPHIC MATERIAL SET FORTH AT THIS POINT IS NOT DISPLAYABLE

*643 Changes in the data contained between a paired header and footer will cause that data not to fit the "mold" any more. By recording this header and footer information at each stage of the process, an "audit trail" is built. Thus, not only could most data changes be detected, but the stage of the process at which those changes occurred would also appear.

It is important to remember that, for the most part, EDI does not interpret the user's data; it only asks whether the data is properly packaged. In that sense, EDI is like a (theoretical) crew of professional movers who come to your house and flawlessly box up your belongings, carry them to another place, and then unpack them--bathroom things in the bathroom, kitchen things in the kitchen, etc. They don't care what your things are; they only care that your things get correctly identified, safely packed, properly delivered, and correctly unpacked. At their destination, the movers tick off every item against the items originally packed; if everything arrived safely, they ask you to sign an acknowledgment. Similarly, in EDI, when a transmission arrives safely the sender gets back a "functional acknowledgment." A functional acknowledgment says that the data, whatever they were, arrived in the same condition in which they left, but that is all a functional acknowledgment says. It cannot be used to demonstrate particular facts about the sender's data (such as a quantity ordered) any more than a sheriff's return can be used to demonstrate whether the complaint which was served properly states a claim upon which relief can be granted. [\[FN12\]](#)

One final point must be mentioned about EDI technology: there are several routes a transmission may take from sender to receiver. Just as EDI itself resulted from the need to eliminate differences between data structures, there has been a similar need to overcome problems resulting from differences in methods of data transmission. Not unlike humans, some computers talk faster than others can listen. What is *644 more, even if everyone's computer were to talk at the same speed, there are hundreds of partners with whom to physically link. To overcome these obstacles, most EDI trading partners subscribe to the services of third party networks. [\[FN13\]](#) Thus, with a single data link, a business can send messages to and receive messages from any other party who subscribes to that particular network. Furthermore, networks generally have links to other networks. Thus, by subscribing to a network, any business with a single data link can talk to most EDI users.

The use of third party networks, however, brings two additional considerations to mind. First, should a dispute arise as to the contents of a transmission, the network may have its own copy of the transmission, as well as its own audit trail showing when the transmission was sent, when it was received, and whether the transmission was intact (functionally acknowledged). In some cases, network data might also provide information about the actual contents of the user's data. The second consideration arises from the current configuration of network relationships. As it

turns out, both a transmission between a user and a single network and a transmission directly between users will preserve the audit trail; transmissions between two different networks, however, entirely wipe out the audit trail. [\[FN14\]](#) Both of these considerations suggest that the route a transmission takes may affect the legal character of the data contained within that transmission.

From the foregoing description, it can be seen that EDI represents at least two legally significant technological developments. First, unlike previous applications of computers to commercial transactions, EDI seeks to entirely eliminate the use of paper. Second, EDI software provides a unique structure of data such that tampering or outright fabrication can usually be detected from an examination of the control data associated with every transmission. [\[FN15\]](#)

*645 III. The Statute of Frauds Online

A. The Law's Response to the Advent of the Telegraph

1. Acceptance of Telegraphic Contract Formation Generally

The first electromagnetic telegraph transmission occurred in 1844. [\[FN16\]](#) Just seven years afterward, the contractual enforceability of a telegram's terms had found its way into court. In *Durkee v. Vermont Central Railroad Company*, [\[FN17\]](#) the Vermont court assumed that telegrams can be "relied upon to establish contracts," but held that "they must be proved in the same manner as other writings." [\[FN18\]](#) The *Durkee* court did not require production of the original order form, but held that oral testimony could be admitted to establish the existence of the telegram. [\[FN19\]](#) *Durkee* could be taken to demonstrate the proposition that courts were very quick to accept the telegraph and to work it into the legal system; more probably, *Durkee* represents the slowness of courts to recognize the legal problems associated with this new technology.

By 1867 courts were openly confronting the problems raised by the telegraph in connection with the Statute of Frauds. The New York court in *Trevor & Colgate v. Wood* [\[FN20\]](#) held that telegrams did satisfy the requirements of the Statute of Frauds where the parties previously had agreed to transact business by telegraph. The context of this holding is significant because early telegraph cases dealing with the Statute of Frauds generally hinged upon the degree of exactness with which essential terms were described, not the acceptability of the medium by which those descriptions were communicated. [\[FN21\]](#) The *Trevor* holding quite plainly centered on the mode of acceptance, the telegraphic instrument itself, and found it sufficient.

*646 In an 1869 decision, *Howley v. Whipple*, [\[FN22\]](#) the New Hampshire court noted that telegraphic contracts "must be in writing by the Statute of Frauds," and opined:

[i]t makes no difference whether that operator writes the offer or the acceptance in the presence of his principal and by his express direction, with a steel pen an inch long attached to an ordinary penholder, or whether his pen be a copper wire a thousand miles long. In either case, the thought is communicated to the paper by use of the finger resting upon the pen; nor does it make any difference that in one case common record ink is used, while in the other case a more subtle fluid, known as electricity, performs the same office. [\[FN23\]](#)

The Whipple opinion was a bit eccentric in its metaphors, to be sure, but was not maverick in its results.

By 1873, one treatise on contracts contained the subject: "Contracts Between Sender and Receiver by Telegraph," which began by saying, "These are now common." [\[FN24\]](#) Furthermore, the commentator confidently asserted that "the principles already well established when applied to contracts made by telegraph, will lead to the conclusion that they satisfy" the requirements of the Statute of Frauds. [\[FN25\]](#) A 1913 commentary asserted, "It is universally conceded that people may contract by means of telegraphic messages." [\[FN26\]](#) Williston's 1920 treatise on contracts stated that "Telegrams and teletype messages, too, are sufficient" to satisfy the writing requirement of the Statute of Frauds. [\[FN27\]](#) Williston added: "The only difficulty ... relates to the agency of the telegraph operator," [\[FN28\]](#) thus apparently concluding that the telegraphic form of communication presented no serious difficulties under the Statute of Frauds.

The United States Supreme Court acknowledged the validity of telegraphic transmissions used in formation of contracts before the turn of the century. [\[FN29\]](#) The Court referred to telegrams as "papers" within *647 the meaning of the Statute of Frauds, relying upon the doctrine of incorporation:

We say "the papers," because the principle is well established that a complete contract, binding under the Statute of Frauds, may be gathered from letters, writings, and telegrams between the parties. [\[FN30\]](#)

The Supreme Court's approach to telegrams was a bit more guarded in that the Court did not announce that a telegram, by itself, is a writing signed by the party to be charged. What it did recognize was that telegrams, considered along with paper documents, were not so ephemeral under the Statute of Frauds as to make their incorporation fatal to the written character of the proof of a contract's existence. [\[FN31\]](#)

By all accounts, then, it would seem that the law did not so much as blink at the introduction of telegraphic technology and its rapid assimilation by the business community. But at the time the earlier telegraph cases were decided, the telephone had not yet become a part of the American business environment. The first public telephone was not introduced until 1877, a full third of a century after the introduction of the telegraph. [\[FN32\]](#) Without the telephone to facilitate oral communications with the telegraph operator, each telegraphic transmission was supported by a written order form. [\[FN33\]](#) It would therefore be a mistake to read pre-telephone era telegraph cases as representing the law's response to the absence of paper during any part of the communication process. The most helpful cases, therefore, are those cases which deal with the lack of paper originals of telegraphic messages.

*648 2. The Writing Requirement and the Phone Ordered Telegram

The post-telephone cases dealing with the telegraph in connection with the writing requirement of the Statute of Frauds reveal three basic concerns. Two concerns are evidentiary: tangibility and accuracy. Accuracy includes both accuracy of content (lack of tampering) and accuracy of meaning. [\[FN34\]](#) Another concern, which admittedly has been gleaned from between the lines, is the ritualistic function of making parties consider the seriousness of their commitments before being bound by them. While accuracy was an issue frequently raised with regard to the telegram, neither tangibility nor the ritual function have received much analysis. Some comments, however, can be made concerning them.

Tangibility of the evidence has always been recognized as one of the important functions of reducing agreements to writing. Thus, the Kentucky court in *Selma Savings Bank v. Webster County Bank* [\[FN35\]](#) noted that "[t]he existence of a tangible written memorial ... is the main reason for requiring a writing." [\[FN36\]](#) The U.C.C. defines "written" or "writing" to be any "reduction to tangible form." [\[FN37\]](#) Since a telegraph always results in a printout at the receiving end of the transmission, the tangibility of the telegram seems to have posed little problem, and no cases directly questioned it.

Neither have the courts addressed directly the telegraph's ability to accomplish the ritualistic function. Insight can be gleaned, however, from cases such as *Selma*, which apparently assumed that a telegram fulfills the ritualistic function of a writing. The *Selma* court, in holding that a telegram dictated over the phone to the telegraph operator was a signed writing, reasoned that there was no legal difference between dictating a telegram to a company secretary who delivers it to the telegraph operator, and dictating a telegram directly to the telegraph operator over the phone. [\[FN38\]](#)

*649 Since the court reasoned that the use of an intermediary does not change the legal character of a communication, why would it not also follow that an oral promise--whether made over the phone directly to the other party or indirectly through the telegraph operator--remains oral? The court apparently assumed that the call to the telegraph operator--like the hypothetical dictation to a secretary--was more than an oral transaction. Because the calling party knew that the telegraph operator would reduce the oral message into tangible form, the call apparently was seen by the court as serving the same ritualistic function as if the caller himself had reduced the message into tangible form.

The question of accuracy, as has been noted, did present a wrinkle for the telegram under the writing requirement of the Statute of Frauds. The concern for accuracy of content, or lack of tampering, can be seen in *Farmers' Produce*

Company v. McAlester Storage and Commission Company, [\[FN39\]](#) a case in which a produce company offered to sell a broker two carloads of potatoes. The broker sent a letter accepting the deal, but then received an "oops" telegram from the produce company saying it did not have enough potatoes and wished to rescind the offer. [\[FN40\]](#) The court decided the case using the mailbox rule. [\[FN41\]](#) Therefore, the case turned upon accuracy of the time data on the cancellation telegram: One minor alteration of the telegram's content, i.e., changing the "p" to an "a" before the "m," would have rendered the telegram a different instrument and reversed the outcome of the dispute. Based on carbon copies of the original order forms from which the telegrams had been generated, the court ruled that the letter was sent first, closing the jaws of the contract. [\[FN42\]](#)

Farmers' Produce is significant, not only for what it did--it acknowledged the formation of a telegraphic contract on the basis of carbons [\[FN43\]](#) as opposed to originals--but for what it did not do. It did not dispatch the best evidence dispute by holding that the telegraph was an ***650** accepted form of business technology; the court insisted on having before it carbon copies of the order from which the telegrams had been generated.

Eventually, however, the unpapering of the telegraph order process became acceptable under the writing requirement of the Statute of Frauds. Without analysis, most courts began to receive telegrams into evidence regardless of the presence or absence of paper originals--or carbons--underlying the transmissions. There developed a strong line of cases in which telegrams were examined only for sufficiency of the terms contained within them, not for sufficiency of the telegraphic medium itself. [\[FN44\]](#) In 1954, a court held flatly that a telegram was a "written receipt." [\[FN45\]](#) Today, when most telegrams are ordered by phone, courts proceed on the notion that contracts made by telegraph are written. [\[FN46\]](#)

3. How the Telegram Came to be "Signed"

In contrast to the writing requirement, the use of phone orders to generate telegraph messages raised considerable concern under the signing requirement of the Statute of Frauds. In a 1905 case, *Cobb v. Glenn Boom & Lumber Co.*, [\[FN47\]](#) the defendant pled the Statute of Frauds ***651** in a dispute over the sale of land. The plaintiff proffered a series of telegrams (and a letter) as writings signed by the party to be charged. Acknowledging that contracts may be formed by a collection of "various papers referring to one another, or directly related to one another, such as letters and telegrams," [\[FN48\]](#) the court nevertheless rejected the proffered telegrams as insufficiently signed.

The court's rationale was that the proffered telegrams lacked proof of the defendant company's intent to authenticate the telegraphic signatures. Specifically, the court held that "[t]here is nothing to show that [the telegrams] had in reality been written and signed by [agent] Sager." [\[FN49\]](#) This, in spite of the fact that the contents of the operative telegram had been duplicated in a letter signed and sent by Mr. Sager the same day! [\[FN50\]](#)

Obviously, the *Cobb* court was reluctant to trust a new technology which purported to allow a transmission received by the plaintiff in Elkins, West Virginia to be signed by the defendant in Sunbury, Pennsylvania. Only a hand signed original of the telegram order, delivered by Mr. Sager to the Sunbury telegraph agent, would satisfy the signing requirement of the Statute of Frauds, the court held. [\[FN51\]](#) The *Cobb* court was understandably concerned about the prospect of false telegrams being generated by mistake--or by design--and had the court's rationale won the day, contracts might never have been routinely formed by means of phone ordered telegrams.

The court in *Selma Savings Bank v. Webster County Bank*, [\[FN52\]](#) however, was of a different mind. In *Selma*, plaintiff bank had sent telegrams to each of two defendant banks asking whether those banks would honor large checks drawn on certain of their accounts. In each instance, defendant bank's cashier phoned the local telegraph office, dictated an affirmative response, and "dictated ... the signature" of that defendant bank. [\[FN53\]](#) The court held that "the telegrams in these cases were in writing and were signed by the appellee banks within the meaning of the requirement that an acceptance must be in writing and signed by the drawee." [\[FN54\]](#)

***652** Counsel for defendants made much of the fact that the telegrams had been ordered orally over the phone. [\[FN55\]](#) From this fact, defendants argued that the operator who received the call acted as the agent of the caller in filling out the forms from which the telegrams were processed. Defendants argued that since the state's negotiable instruments law forbade an agent from signing documents without a written power, the printed signatures on the telegrams could not be binding upon the alleged principals. [\[FN56\]](#)

The kind of agency problem [\[FN57\]](#) raised in Selma arose most often in connection with a telegraph company's liability for botched messages. The telegraph companies had adopted forms which contained releases on the back sides, and customers who filled out such a form were bound by the release. When orders came in over the phone, however, the form was filled out by the telegraph operator. One line of authority had held that where the operator informed the caller of the nature of the release on the back of the form, the operator acted as the caller's agent in filling out the form, thus binding the caller to the terms of the release. Another line of authority rejected this legal fiction. [\[FN58\]](#)

Finding the weight of authority to hold the telegraph operator was not an agent of the caller, the Selma court avoided the state's negotiable instruments law, but thereby also avoided resort to the fiction that the telegraph operator had signed the telegram as the caller's agent. Even so, the court noted that the practice of phoning in an order for a telegram should not be discouraged "in this busy and practical age," and ruled that "[the] message dictated to the operator over the telephone ... constitute[d] a [signed] writing sufficient to satisfy the statute." [\[FN59\]](#) Thus the Selma court accepted intent to authenticate, by itself, as a satisfaction of the signing requirement of the Statute of Frauds.

The Selma court's position prevailed in the law, [\[FN60\]](#) but that did not mean the matter was above discussion. A leading case for the proposition that a contract may be signed by telegraph is *Denuzio Fruit Co. v. Crane*. [\[FN61\]](#) The defendants in *Denuzio Fruit* had sent teletype [\[FN62\]](#) messages *653 to plaintiff, and the court acknowledged that "these teletype messages do not bear the signature in writing of the party to be charged in the sense that they were not literally signed with pen and ink in the ordinary signature of the sender." [\[FN63\]](#) Nevertheless, in light of the "extensive use to which the teletype machine is being used today among business firms, particularly brokers, in the expeditious transmission of typewritten messages," the court's "realistic view of modern business practices" dictated a finding that the identification codes entered by defendants on the teletype constituted signed writings satisfying the requirements of the Statute of Frauds. [\[FN64\]](#)

Denuzio Fruit is often cited by EDI cognoscenti for the proposition that the telegram is a signed writing within the meaning of the Statute of Frauds. [\[FN65\]](#) It will be recalled, however, that commentators had declared the matter fairly settled as early as 1913. [\[FN66\]](#) *Denuzio Fruit* therefore raises the question why the point remained to be decided in California as late as 1948. [\[FN67\]](#)

It is of course true that the law does consider telegrams capable of being signed writings. [\[FN68\]](#) Yet as late as 1983, the Nebraska Supreme Court took up the question whether a particular telegraphic writing had been signed by the party to be charged. In the case of *Hansen v. Hill*, [\[FN69\]](#) the court reversed a grant of summary judgment on the question of the legal effect of a telegram and remanded the case for further proceedings to determine if the printed name was affixed with intent to authenticate. In 1979, the Vermont court in *Pike Industries v. Middlebury Associates* found a telegram not to have been signed. [\[FN70\]](#) Against the backdrop of the court's *Durkee* holding 123 years earlier, the following language from *Pike Industries* is striking:

*654 The telegram contains no actual signature. The evidence does not disclose whether it was dispatched by telephone or by submission of a written text. If the latter, no signed version has been introduced, if one exists, nor any signed authority of the sending agent. Therefore, the Statute of Frauds bars use of the telegram as written evidence.... [\[FN71\]](#)

Pike Industries appears to be a modern anomaly, but it does show that the concerns underlying *Cobb* are not without voice.

As the law stands today, the issue of whether a telegram has been "signed" involves a fact-based inquiry into the subjective intent of the sender. A case on point is *Clark v. Coats & Suits Unlimited*, which held: "In our opinion, the issue [whether a typewritten memorandum was signed] is one of fact." [\[FN72\]](#) *Corbin* teaches that a typewritten name may satisfy the signature requirement of the Statute of Frauds only if the party typing his or her name intends by so doing to authenticate the document. [\[FN73\]](#) The Restatement position, well accepted in the courts, is that "[t]he signature to a memorandum may be any symbol made or adopted with an intention, actual or apparent, to authenticate the writing as that of the signer." [\[FN74\]](#) With regard to the sale of goods, "[t]he question always is whether the symbol was executed or adopted by the party with present intention to authenticate the writing." [\[FN75\]](#) The question of subjective intent is the type of question which tends to go before the trier of fact; this explains why

the signing requirement continues to present occasional difficulties for telegrams even today.

B. The Law's Probable Response to EDI

1. EDI and the Writing Requirement

As to tangibility, magnetic media are one step removed from paper. In magnetic form, the data are both fragile and invisible to the naked eye. Yet the touch of a button produces a printed, tangible copy of the data. Perhaps the reason magnetically stored data seem less tangible than do data stored on paper is that magnetically stored data can *655 be altered between the time of storage and the time of printing. The question of tangibility thus seems to blend with the question of accuracy; we seem to want data to be tangible because of our desire to be able to trust them. [FN76] The proper focus of inquiry under the writing requirement, then, is the reliability with which magnetically stored data can reflect the original message.

The first consideration is the accuracy of meaning. One way in which EDI is different from the telegram is that the telegram was written in English whereas EDI transmissions are written in an electronic code. Modern courts should have no problem with the use of codes. In the 1893 case of *Bibb v. Allen*, the Supreme Court upheld a contract based on encoded terms contained in a series of telegrams. [FN77] The parties had "agree[d] upon the terms in which the business should be transacted" by adopting a standardized code of cipher, one "Shepperson's" code; the terms "Albert," "Alfred," "Alexander," etc. in several telegrams were thus construed by the Court, which read them against Shepperson's code, to mean B.S. Bibb & Company, the defendant in the trial court action. The memoranda were thus held sufficient to satisfy the Statute of Frauds which, at that time, required thorough descriptions of all material terms. [FN78]

Another early case that bears a striking resemblance to the current legal treatment of EDI is *Brewer v. Horst-Lachmund Co.* [FN79] *Brewer* held that the following two telegrams, standing alone, created a contract enforceable under the Statute of Frauds:

Tel. 1: "Bought thirteen, at eleven five-eighths net you."

Tel. 2: "We confirm purchase W. eleven five-eight cent, like sample."

The *Brewer* court noted that it would be all but impossible from the language itself to determine what these messages meant. Nevertheless, it found that "when the court is put into possession of all the knowledge which the parties to the transaction had at the time," the meaning *656 of all terms could be determined with exactitude. [FN80] After taking evidence regarding the prearranged meanings of terms within such transmissions, the court ruled "it is not difficult to see" that the term "13" represented 296 bales of hops of the last pickings from the 1897 crop of a certain farm in Sacramento. [FN81]

As it turns out, it was the custom of hops traders to attach numbers to each sample supplied to the vendee's agent by hopeful vendors. After the home office examined the samples, it accepted or declined each offer using the attached number as a shorthand symbol to identify the lot from which it came. [FN82] The meaning of the term was thus previously agreed between the parties, and its use in a telegram incorporated all of that meaning. Any other outcome, the court reasoned, "would certainly impair the usefulness of modern appliances to modern business, tend to hamper trade, and increase the expense thereof." [FN83]

Modern EDI data structures far surpass the *Bibb* and *Brewer* scenarios for accuracy of meaning. The meaning of the codes are stringently adhered to according to the carefully crafted and universally accepted standards in the X-12 dictionary of transaction sets. [FN84] While it certainly would take expert testimony to establish the meaning of EDI coded data, there should be no dispute among those experts as to the meaning of those data.

The second consideration is accuracy of content, that is, the absence of tampering or data error. On a continuum between certainty and uncertainty about the security from tampering, the various media of data storage would fit approximately as follows:

ACCURACY OF CONTENT

SURE <--paper----telegram-----magnetic media--> NOT SURE

Paper almost always shows traces of any tampering, and telegrams, which have brief oral and electronic phases, quickly get reduced to paper. Data stored on magnetic media, on the other hand, can be "peeked" at and "poked" with no physical signs of alteration. Only by *657 comparing the data itself with prior copies of that same data can alteration be detected.

Herein lies the genius of EDI. By building a data structure which molds itself to each piece of data the moment the data is created, EDI builds audit trails into the data at every stage of transmission and storage. The fact that the data have not changed in the slightest from the moment of their creation until printout is reasonably assured by the number sequences, time stamps, and other reliability checks built into the headers and footers surrounding each level of every transmission. EDI effectively moves magnetically stored data along the reliability continuum to approximately the same place as the telegram: [\[FN85\]](#)

ACCURACY OF CONTENT

TABULAR OR GRAPHIC MATERIAL SET FORTH AT THIS POINT IS NOT DISPLAYABLE
TABULAR OR GRAPHIC MATERIAL SET FORTH AT THIS POINT IS NOT DISPLAYABLE

Even while stored on fragile magnetic media, EDI data is as tamper proof as a telegram because of the audit trail it builds on the way to that medium. [\[FN86\]](#) What is more, EDI might actually be more accurate than a telegram because there is virtually no human error factor, [\[FN87\]](#) and functional acknowledgments verify the accuracy of each transmission.

This is not to say that EDI data cannot be successfully tampered with; to alter EDI data, however, one would have to fabricate new data which would exactly fit the electronic "mold" [\[FN88\]](#) in which the original data were encased. Such an effort would seem to equal or exceed the *658 effort required to successfully alter markings on paper. As for the telegram, it usually contains an oral step, the phone order, for which there can be no audit trail whatsoever. While one cannot guarantee that courts will so hold, in theory it seems clear that EDI is a writing to the same extent that a telegraphic transmission is a writing. Since telegrams already satisfy the writing requirements of the Statute of Frauds, EDI should be taken to do so as well.

2. EDI and the Signing Requirement

As with the telegraph, EDI's greatest hurdle may be the signing requirement. [\[FN89\]](#) EDI presents several problems not faced by the telegraph: First, the best electronic "signature" is nothing more than an electronic code [\[FN90\]](#) which serves as a means of access to a system. [\[FN91\]](#) Furthermore, computers are manifestly incapable of satisfying an intent requirement; intent must be inferred from the use of the electronic code to access the system.

In EDI, parties to a transaction frequently access the system by means of a Personal Identification Code (PIC), similar to the Personal Identification Number (PIN) that banks assign to customers who desire access to automatic teller machines. PIC's are designed for individual user access, and only permit the performance of specified operations. Other, more sophisticated security measures, such as encryption, are available but their cost proscribes their routine use in EDI. [\[FN92\]](#)

Electronic signatures might be compared with the list of code names used by the trading partners in *Bibb v. Allen*. [\[FN93\]](#) Other cases *659 demonstrated an early acceptance of the use of codes to identify parties to a transaction. An encoded signature was held enforceable [\[FN94\]](#) in 1844, the same year which saw S.F.B. Morse's first telegraph transmission between Baltimore and Washington. [\[FN95\]](#) Holding that "a person may be bound by any mark or designation he thinks proper to adopt, provided it be used as a substitute for his name, and he intend to bind himself," the court in *Brown v. Butchers' and Drovers' Bank*, affirmed the use of parol evidence to prove that the mark "1. 2. 8." on the back of a bill of exchange was the signature of the party to be charged on a bill of exchange.

[\[FN96\]](#) The U.C.C. and Restatement have essentially adopted the Brown court's remarkably prescient position. [\[FN97\]](#)

It would be simplistic, however, to suggest that the primitive practices upheld in Bibb and Brown are directly analogous to the complex systems at work in EDI. Indeed, one commentator, G.P.V. Vandenberghe, has concluded that "the expression 'electronic signature' [is] a form of Orwellian Newspeak. The electronic signature is not an authenticator: neither the signer, nor a specific will is authenticated." [\[FN98\]](#) This is because it "serves only as a means of access to a system." [\[FN99\]](#) Vandenberghe further noted: "Historically, an electronic signature comes closer to the seal than to the signature. In order to provide proof that the seal was affixed by its owner, it was affixed in the presence of witnesses." [\[FN100\]](#)

Nevertheless, it seems inaccurate to suggest that an electronic signature "is not an authenticator." [\[FN101\]](#) Under the U.C.C., a document may be signed by "any symbol adopted by a party with present intention to authenticate" that document. [\[FN102\]](#) The process of assigning PIC's would seem to be the adoption of those symbols precisely for purposes of authentication, thus providing "apparent" intent [\[FN103\]](#) to authenticate *660 all documents generated using that PIC. [\[FN104\]](#) The Statute of Frauds for the sale of goods is satisfied by "any authentication" [\[FN105\]](#) adopted by the parties "sufficient to indicate" the existence of a valid transaction. [\[FN106\]](#) What Vandenberghe perhaps means to say is that the intent manifest in assigning the PIC does not necessarily transfer to each act of its use.

If this is Vandenberghe's meaning, the point is well taken; unauthorized use is a serious possibility. Unlike autographs, PICs can be passed around to other persons. [\[FN107\]](#) People tend to write down their secret numbers, or even give them out. In 72% of the cases of lost or stolen automatic teller cards in the U.S., the PIN numbers were written down and kept close to the card. [\[FN108\]](#) Illegal access to corporate computer systems had led to significant problems in fraudulent long distance calling. [\[FN109\]](#) Determined intruders can always find a way into any computer system, eventually.

Both the issue of identity and the issue of intent, then, collapse into one question of fact: was this message generated by the user to whom the PIC had been issued, or by someone else? So long as the party using the PIC was the party authorized to do so, intent to authenticate might be presumed from the process by which the PIC came to be assigned. If the user of the PIC was unauthorized, however, the "signature" might also be presumed to be unauthorized.

For these reasons, it is impossible in the abstract to plot EDI on the intent continuum:

*661 INTENT TO AUTHENTICATE

TABULAR OR GRAPHIC MATERIAL SET FORTH AT THIS POINT IS NOT DISPLAYABLE
TABULAR OR GRAPHIC MATERIAL SET FORTH AT THIS POINT IS NOT DISPLAYABLE

Yet intent to authenticate is precisely the question asked by the Restatement, the U.C.C., and those courts which have examined the signature requirement in connection with the telegram.

The wrinkle with EDI is that unlike telegraph operations, all of which use the same system, each EDI user has its own unique system of security. Thus, it becomes a question of fact whether the configuration of a given system makes it more likely than not [\[FN110\]](#) that a particular use of the system was authorized. [\[FN111\]](#) This works an inverse relationship: The more expensive and thorough the system of security, the less likely a message can successfully be repudiated in court. Thus construed, the Statute of Frauds discourages the use of those measures most likely to prevent EDI fraud.

EDI users will balance the costs of security with the costs of fraud. Because EDI shortens response time, it both reduces the dollar value of each order and increases the volume of orders. A larger number of smaller transactions means a higher cost-benefit ratio to provide electronic security for each transaction. Under these circumstances, why should a user go to the expense of increasing security, when it may only mean less ability to repudiate a fraudulent message? Both those users who analyze the problem of security costs and those who merely react to it [\[FN112\]](#) are

likely to keep security at a minimum. Since security is a key to establishing intent to authenticate, the triers of fact in those EDI disputes which do find their way to the courtroom might in some cases conclude that certain messages were not "signed" within the meaning of the Statute of Frauds.

*662 EDI trading partners might therefore do well to program into their systems a requirement for human authorization of any transaction exceeding a certain dollar limit. In the event of electronic fraud, the cost of these smaller transactions can simply be absorbed. While careful analysis will be required to strike an acceptable balance between risk and flexibility, the process may help to avoid the harsher burdens of commercial litigation.

IV. Conclusion

The more widely a business practice is used, the more likely it is to appear in court. The telegraph found way into the courtroom, and so, most likely, will EDI. The law's response to the telegraph suggests both an openness to new business practices and the slowness of the process by which well accepted principles tend to percolate through the many jurisdictions within our country. The wide acceptance of telegraphic contract formation portends well for the practice of EDI because EDI approximates the telegram in fulfilling the underlying purposes of both the writing and the signing requirements of the Statute of Frauds.

Even so, it may be the wrong question to ask whether a computer can sign a contract. Most probably it can. The question most likely to arise in an EDI contract formation case is whether this computer did "sign" this contract. Therefore, while the trend of the law probably will be to embrace the general concept of EDI, trading partners must prepare themselves to face in court issues relating to the security of individual systems and the existence of present intent to authenticate particular electronic messages.

[\[FN1\]](#) The author wishes to thank Professors Robert M. O'Neil of the University of Virginia School of Law and James E. Byrne of George Mason University School of Law for their advice. Mr. William R. Myers of the Electronic Data Interchange Association and Mr. Chris Cavanaugh of the Data Interchange Standards Association provided access to valuable materials and information.

[\[FN2\]](#) U.C.C. § § 1-102(2)(a) and 1-102(2)(b) (1990).

[\[FN3\]](#) The U.C.C. Statute of Frauds for sales of goods is contained in § 2-201, paragraph (1) of which reads as follows:

"Except as otherwise provided in this section a contract for the sale of goods for the price of \$500 or more is not enforceable by way of action or defense unless there is some writing sufficient to indicate that a contract for sale has been made between the parties and signed by the party against whom enforcement is sought or by his authorized agent or broker. A writing is not insufficient because it omits or incorrectly states a term agreed upon but the contract is not enforceable under this paragraph beyond the quantity of goods shown in such writing."

[\[FN4\]](#) The number of registered EDI users in the U.S.A. went from negligible amounts in the early 1970's to 1,046 in 1987. Then the number suddenly jumped almost 900% in just three years, reaching 9,400 in 1990. See 1991 EDI Yellow Pages International. Business Week went so far as to say: "Like the telephone, the personal computer and the fax, EDI is rapidly becoming a prerequisite for participating in today's global business environment." The Strategic Link Between Business Partners, Business Week, Nov. 12, 1990 (1990 Reprint at 2).

One user which recently went online is the federal government. In December, 1990, the General Services Administration [GSA] authorized the use of EDI for purchasing. [48 C.F.R. § 552.216-73 \(1990\)](#); See also [57 Fed.Reg. 7555-01 \(April, 1992\)](#). The Internal Revenue Service is proposing to go online as well ([56 Fed.Reg. 50971-03 \(1991\)](#)), as is the Department of Defense, Military Traffic Management Command ([56 Fed.Reg. 41665-03 \(1991\)](#)). The National Institute of Standards and Technology is proposing Digital Signature Standards which would be applicable to EDI. [56 Fed.Reg. 42980-02 \(1991\)](#). See also [56 Fed.Reg. 13123-01 \(1991\)](#).

In addition, the Department of State recently formed a Study Group on International Electronic Commerce under

the Secretary of State's Advisory Committee on Private International Law. The Study Group, which focuses on computer-assisted commercial technology, is looking at how legal principles relating to EDI contract formation in the United States might need to be restated in international terms. ([57 Fed.Reg. 35868-001 \(August, 1992\)](#)).

While the federal government's use of EDI for public contracting and its interest in EDI for private contracting speak well of the practice, private contracts under state commercial codes are the focus of this Comment. In particular, this Comment addresses the use of EDI absent the benefit of underlying Trading Partner Agreements; such agreements are a condition of contracting with the GSA under [48 C.F.R. § 552.216-73](#).

[\[FN5\]](#) A Model Agreement has been proposed for EDI trading partners which: (1) defines the electronic transmissions to take place thereunder as "writings" which are "signed" by the sender, and (2) provides for waiver of the defense of the Statute of Frauds, and (3) defines customary EDI practices in the course of trade. Electronic Messaging Services Task Force, Commercial Use of Electronic Data Interchange, 45 Bus.Law. 1680-93. Unfortunately, many trading partners do not take the time to enter into such agreements. (See note 112.) The current study does not attempt to analyze the potential effect of such an agreement, but rather asks what legal effect EDI transmissions have intrinsically. But See note 31, with accompanying text.

[\[FN6\]](#) The only reported cases which deal at all with EDI are [Yellow Freight System Inc. of Delaware v. United States, 24 Cl.Ct. 804 \(Dec. 30, 1991\)](#) (whether EDI program development qualified for tax credit as a research expense); and [Mississippi Public Service Com'n v. Merchants Truck Line Inc., 598 So.2d 778 \(Miss.1992\)](#) (considering EDI as one of many factors of "convenience" and "necessity" relative to granting of trucking permit).

[\[FN7\]](#) The current study focuses on EDI usage in the United States only.

[\[FN8\]](#) Much of the general and technical information to follow cannot be specifically cited because it was obtained orally at a seminar, "Fundamentals of Electronic Data Interchange," conducted by the Electronic Data Interchange Association, Washington D.C., April 16-17, 1991. Other information is of such a general nature as to make repeated citations overly cumbersome; background may be obtained from *The Strategic Link Between Business Partners*, Supra note 4, and Benjamin Wright, *EDI and American Law* (1989).

[\[FN9\]](#) *Electronic Data Interchange: A Quiet Revolution*, 3 Price Waterhouse Review (1988 Reprint at 3).

[\[FN10\]](#) Picture companies A and B, with two different systems of compiling their own electronic data--just as two companies may have different paper forms on which they write their purchase orders. Company A's computer system generates a purchase order in company A's format. EDI software then translates the data up into EDI format and sends it to company B (either directly or through a third party network). Company B's computer system receives the EDI data and translates it down into company B's format for use in company B's system.

[\[FN11\]](#) An official EDI committee writes the rules for each transaction set and establishes a complete dictionary of transactions sets. For example, a purchase order is transaction set 850. Thus, any trading partner who receives an 850 will know exactly how to read it. In the United States, the official EDI standards committee operates under the auspices of the Data Interchange Standards Association, 1800 Diagonal Road Suite 355, Alexandria, Virginia 22314 [(703) 548-7005]. It establishes the X-12 standard, an umbrella standard for all other American protocols.

[\[FN12\]](#) The functional acknowledgment may fulfill a statutory exception to the Statute of Frauds. See U.C.C. § 2-201(2) (1990), which states:

Between merchants if within a reasonable time a writing in confirmation of the contract and sufficient against the sender is received and the party receiving it has reason to know its contents, it satisfies the requirements of subsection (1) against such party unless written notice of objection to its contents is given within 10 days after it is

received.

While the functional acknowledgment may not prove what were the contents of a transmission, it does help to prove that the recipient had reason to know its contents. The use of the U.C.C. § 2-201(2) exception, however, itself requires a "writing."

A functional rejection, on the other hand, may implicate U.C.C. § 2-207. In the case of an invoice sent in response to a purchase order, functional rejection of the invoice might not alter the "expression of acceptance" indicated by the failed transmission.

[\[FN13\]](#) Third party networks are called "Value Added Networks," or VANs. Some businesses use a VAN or VANs while still maintaining direct links to some of their individual trading partners.

[\[FN14\]](#) The security of EDI data, a central consideration throughout the legal discussion which follows, is greatly affected by the loss of the audit trail.

[\[FN15\]](#) No claim is made that EDI data control structures are absolutely foolproof; the point of this paper is to evaluate comparative reliability between different media.

[\[FN16\]](#) Bernard Grun, *The Timetables of History 1844* (1963). This followed the death of James Madison by only 8 years.

[\[FN17\]](#) [29 Vt. 127 \(1856\)](#).

[\[FN18\]](#) [Id. at 140](#), (emphasis supplied)

[\[FN19\]](#) [Id.](#)

[\[FN20\]](#) [36 N.Y. 307 \(1867\)](#).

[\[FN21\]](#) Modern statutes have done away with the need for comprehensive descriptions of essential terms. The only term that must be stated under U.C.C. § 2-201 is the quantity term, and that term, if incorrectly stated, does not render the contract unenforceable en toto, but only unenforceable over and beyond the term as stated in the memorandum. See White and Summers, *Uniform Commercial Code* § 2-4. Also compare *Restatement of Contracts* § 207 with *Restatement of Contracts (Second)* § 131.

[\[FN22\]](#) [48 N.H. 487 \(1869\)](#).

[\[FN23\]](#) [Id. at 488](#).

[\[FN24\]](#) 2 *Theophilus Parsons, Law of Contracts*, § 257 (1873).

[\[FN25\]](#) [Id. at 287-88](#).

[FN26] 1 William Elliott, Commentaries on the Law of Contracts § 45 (1913).

[FN27] 1 Samuel Williston, A Treatise on the Law of Contracts § 568 (1st. ed. 1920 & Supp.1926).

[FN28] *Id.* at 1083 (emphasis supplied). Williston's third edition in 1961 made no changes in this assessment of the telegraph and its use in contract formation. S. Williston, A Treatise on the Law of Contracts § 568 (3d. ed. 1957 & Supp.1961).

[FN29] [Ryan v. United States, 136 U.S. 68 \(1889\).](#)

[FN30] [Id. at 83.](#)

[FN31] This application of the doctrine of incorporation might transfer directly to EDI transmissions received pursuant to an underlying Trading Partner Agreement. See *supra* note 5.

[FN32] *Grun*, *supra* note 16, at 1877. It is interesting to note the contrast between the Supreme Court's pre-telephone decision in [Utley v. Donaldson, 94 U.S. 29 \(1876\)](#), which assumed the written character of telegrams, and the Court's more guarded approach to telegrams evinced in the post-telephone Ryan case. Other pre-telephone cases include: [Calhoun v. Atchison, 4 Bush 261 \(Ky.1868\)](#); [Beach v. Raritan and Delaware Bay R.R. Co., 37 N.Y. 457 \(1868\)](#); [Duble v. Batts, 38 Tex. 312 \(1873\)](#); *Wells v. Milwaukee and St. Paul R.R. Co.*, [30 Wis. 605 \(1872\)](#).

[FN33] The Whipple court, for example, noted: "We know that by the admirable system regulating the government of the telegraphic companies, the original dispatch is preserved and may be at all times procured for the proper purposes." [48 N.H. at 489.](#)

[FN34] Since telegrams were usually sent in English rather than in code, accuracy of meaning was not a major issue. For discussion of those telegrams in which code was used, See *infra* notes 77-83 and accompanying text.

[FN35] [206 S.W. 870 \(Ky.1918\).](#)

[FN36] [Id. at 872.](#)

[FN37] U.C.C. § 1-201(46) (1990). One court found that a tape recording satisfied the writing requirement of the Statute of Frauds because it was a reduction of the agreement to "tangible form." [Ellis Canning Co. v. Bemstein, 348 F.Supp. 1212 \(D.Col.1972\).](#)

[FN38] [206 S.W. at 872.](#)

[FN39] [150 P. 483 \(Okla.1915\).](#)

[FN40] [Id. at 483-84.](#)

[FN41] [Id. at 485](#). The mailbox rule states that an acceptance is final when tendered to the postal service with proper postage and a correct address. See e.g., Howard O. Hunter, *Modern Law of Contracts* ¶ 16.03[1] (1987).

[FN42] [Id.](#)

[FN43] Defendant's lawyer had gone to the telegraph offices in both towns and obtained the original written forms from which the telegraph operators had generated the electronic transmissions. The opinion states only that the lower court had admitted into evidence "carbon copies of the telegrams involved" because "the originals were in the possession of counsel for the defendant (below), either in the courtroom or at the office of counsel, and that a request, if not a demand, was made for said telegrams and refused." [Id.](#)

[FN44] See [Niles v. Hancock](#), 73 P. 840, 841 (Cal.1903); [Franklin v. Hansen](#), 30 Cal.Rptr. 530 (Cal.1963); [Continental Grain Co. v. Followell](#), 475 N.E.2d 318 (Ind.Ct.App.1985); [Dohrman v. Sullivan](#), 220 S.W.2d 973 (Ky.1949); [Commercial Factors Corp. v. Zephyr Awning Corp.](#), 91 N.W.2d 511 (Mich.1958); [Wheeler v. Blanton](#), 253 S.W.2d 497 (Mo.Ct.App.1952); [McKeown v. John Nooter Boiler Works Co.](#), 237 S.W.2d 217 (Mo.Ct.App.1951); [Benjamin v. Arundel Corp.](#), 59 N.Y.S.2d 437 (N.Y.A.D.1946); [Horn Waterproofing Corp. V. Horn Const. Co., Inc.](#), 104 A.2d 851 (N.Y.A.D.1984); [North Jersey Sales & Const. Co. v. Emerman Erie Steel Co.](#), 82 A.2d 307 (Pa.Super.Ct.1951); [Republic Bankers Life Ins. Co. v. Wood](#), 792 S.W.2d 768 (Tex.Ct.App.1990); [Dunn v. Growers Seed Ass'n](#), 620 S.W.2d 233 (Tex.Ct.App.1981); [Leche v. Stautz](#), 386 S.W.2d 872 (Tex.Ct.App.1965); [Gilbert v. Texas Co.](#), 218 S.W.2d 906 (Tex.Ct.App.1949).

[FN45] [Cook v. Young](#), 269 S.W.2d 457, 459-60 (Tex.1954).

[FN46] See [Williams v. Singleton](#), 723 P.2d 421, 423 (Utah 1986). See also [Nationwide Resources Corp. v. Massabni](#), 658 P.2d 210 (Ariz.Ct.App.1982); [Franklin v. Hansen](#), 27 Cal.Rptr. 216 (Cal.Ct.App.1962); [Mark Keshishian & Son, Inc. v. Washington Square, Inc.](#), 414 A.2d 834 (D.C.1980); [Holland v. Riverside Park Estates](#), 104 S.E.2d 83 (Ga.1958); [Providence Granite Co., Inc. v. Joseph Rugo, Inc.](#), 291 N.E.2d 159 (Mass.1972); [Lake Company v. Molan](#), 131 N.W.2d 734 (Minn.1964); [Pickett v. Miller](#), 412 P.2d 400 (N.M.1966); [Grattan v. Societa Per Azzioni Cotonificio Cantoni](#), 151 N.Y.S.2d 875 (N.Y.Sup.Ct.1956); [Hollywood Plays v. Columbia Pictures Corporation](#), 77 N.Y.S.2d 568 (N.Y.Sup.Ct.1947); [Hoth v. Kahler](#), 74 N.W.2d 440 (N.D.1956); [Meek v. Flynn](#), 174 P.2d 363 (Okla.1946); [Trautwein v. Leavey](#), 472 P.2d 776 (Wyo.1970).

[FN47] [49 S.E. 1005 \(W.Va.1905\)](#).

[FN48] [49 S.E. at 1007](#) (a matter already made clear by the Supreme Court in [Ryan v. United States](#), 136 U.S. 68 (1889), see supra note 29).

[FN49] [Id. at 1008](#). Mr. Sager was the secretary of the company.

[FN50] [Id.](#)

[FN51] [Id.](#)

[FN52] [206 S.W. 870 \(Ky.1918\)](#), see supra note 35 and accompanying text.

[\[FN53\]](#) [Id. at 872.](#)

[\[FN54\]](#) [Id. at 873.](#)

[\[FN55\]](#) [Id.](#)

[\[FN56\]](#) [Id. at 873-874.](#)

[\[FN57\]](#) See Williston, *supra* note 28, and accompanying text.

[\[FN58\]](#) [206 S.W. at 872-875.](#)

[\[FN59\]](#) [Id. at 875.](#)

[\[FN60\]](#) See *infra* notes 73-75, and accompanying text.

[\[FN61\]](#) [79 F.Supp. 117 \(S.D.Cal.1948\).](#)

[\[FN62\]](#) The teletype machine was similar to the telegraph in that electronic pulses were used to link remote keyboards. Each party was identified by means of preassigned codes, and the only printout was the one produced at the recipient's end. See [id. at 128.](#)

[\[FN63\]](#) [Id. at 128.](#)

[\[FN64\]](#) See [Id. at 128-29.](#)

[\[FN65\]](#) See Electronic Messaging Services Task Force, *supra*, note 5, at 1687 (citing Denuzio for the proposition that "[t]he telegram and telex cases have consistently concluded an adequate signature existed").

[\[FN66\]](#) See *supra* note 26, and accompanying text.

[\[FN67\]](#) The court noted that the issue was one of first impression in California. [79 F.Supp. at 129.](#)

[\[FN68\]](#) See generally [Sacks v. Martin Equipment Corp., 130 N.E.2d 547 \(Mass.1955\)](#); [Mangini v. Wolfscmidt Ltd., 13 Cal.Rptr. 503 \(Cal.Ct.App.1961\)](#); [Holland v. Riverside Park Estates, 104 S.E.2d 83 \(Ga.1958\).](#)

[\[FN69\]](#) [340 N.W.2d 8 \(Neb.1983\)](#) (citing *Hillstrom v. Gosnay*, 614 P.2d 466 (Mont.1980) for the proposition that a telegram may constitute a signed writing, but only if intent to authenticate is shown).

[FN70] [398 A.2d 280 \(Vt.1979\)](#), aff'd on other grounds [436 A.2d 725 \(Vt.1980\)](#), cert. denied, [455 U.S. 947 \(1982\)](#).

[FN71] *Id.* at 282.

[FN72] [352 N.W.2d 349, 354 \(Mich.Ct.App.1984\)](#).

[FN73] 2 Arthur Corbin, *Corbin on Contracts*, § 522, 768-769 (1950).

[FN74] *Restatement (Second) of Contracts* § 134 (1979).

[FN75] *U.C.C.* § 1-201(39) Comment 39 (1962).

[FN76] See e.g., [Rudolph J. Peritz, Computer Data and Reliability: A Call for Authentication of Business Records Under the Federal Rules of Evidence, 80 Nw.U.L.Rev 956, 960 \(1986\)](#). As to the ritualistic functions of the writing requirement it would seem that the act of programming the system, knowing that it will result in a tangible data trail, should occasion adequate consideration of the seriousness of the commitments those programs will generate.

[FN77] [149 U.S. 481, 494 \(1893\)](#).

[FN78] *Id.* at 496. Bibb did not raise the question of the adequacy of a telegram to satisfy the signature requirements of the Statute of Frauds because the telegrams were read together with signed letters and with executed bought and sold notes. *Id.*

[FN79] [60 P. 418 \(Cal.1900\)](#).

[FN80] *Id.*

[FN81] *Id.*

[FN82] *Id.*

[FN83] *Id.* at 420.

[FN84] See *supra* note 11. (The X-12 protocol is the established standard for transactions conducted in the United States).

[FN85] EDI is different from paper documents because the evidence of tampering with paper inheres in the paper itself, while part of the basis for protecting electronic data is the security gained from passwords and other devices. Security, then, speaks both to the signing and the writing requirements of the Statute of Frauds.

[FN86] In addition to providing detection of tampering, EDI also provides deterrence. Only those with technical background in EDI could successfully get to the data in the first place; what is more, the tamperer would have to access every system where the data is stored, including a third party network; finally, the creation of phony messages is difficult because of the time stamping and number assigning that takes place every time a message is created.

[FN87] Although in one sense, computers can actually create human error in that they behave as programmed until told otherwise. Thus, under the old paper system, no order was made until some person acted. With EDI, however, even after a human decision to stop ordering an item, the computer will continue to order it until someone keys in the changes. Furthermore, a single programming error can be multiplied quite rapidly into hundreds of erroneous transmissions. Even so, it is a Statute of Frauds we are dealing with, not a statute of mistakes.

[FN88] See supra part II.B for a discussion of headers, footers, and the audit trail.

[FN89] Some writers have suggested just the opposite. Professor Lowry notes that the signature requirement of the U.C.C. Statute of Frauds has been interpreted with greater latitude than has the writing requirement. Houston P. Lowry, *Is Computer Data a Writing?*, 9 Rutgers Computer & Tech.L.J. 93, 100 (1982). See also Robert L. Misner, *Tape Recordings, Business Transactions via Telephone, and the Statute of Frauds*, 61 Iowa L.Rev. 941, 951 (1976). Nevertheless, the same language in U.C.C. § 1-201(39) that opens the door to new methods of signing ("any symbol" adopted with "intention to authenticate"), also imposes an intent requirement not found within the writing requirement.

[FN90] Electronic Messaging Services Task Force supra note 5, at 1691 n. 187.

[FN91] H.W.K. Kaspersen et al., *Telebanking, Teleshopping and the Law* 63, (Yves Pouillet & G.P.V. Vandenberghe eds. 1988) [hereinafter *Telebanking*] ("The electronic signature being a procedure it is very difficult to produce/submit it in court." *Id.* (emphasis omitted)).

[FN92] *Id.* at 62-63.

[FN93] [149 U.S. 481 \(1893\)](#), see supra notes 77, 78 and accompanying text. One writer, noting that U.C.C. § 1-201 Comment 39 says "[n]o catalog of possible authentication can be complete and the court must use common sense and commercial experience in passing upon these matters," suggests that "a non-physical 'symbol' clearly connected with the writing is a sufficient 'signing.'" Thomas Roland, *Note, Sufficiency of the Writing and Necessity for a Signature in the Statute of Frauds of the Uniform Commercial Code*, 4 U.S.F.L.Rev. 177, 184 (1969).

[FN94] See, e.g., [Brown v. Butchers and Drovers' Bank, 6 Hill 443 \(N.Y.1844\)](#).

[FN95] Grun, supra note 16, at 1844.

[FN96] 6 Hill at 433.

[FN97] See supra notes 74, 75 and accompanying text.

[\[FN98\]](#) Telebanking, *supra* note 91, at 66 (emphasis in original).

[\[FN99\]](#) *Id.* at 65 (emphasis in original).

[\[FN100\]](#) *Id.* at 66.

[\[FN101\]](#) This is especially clear in the context of negotiable instruments. See U.C.C. Art. 3, § 3-110(b) (1990), Comment 1 ("A check-writing machine is likely to be operated by means of a computer").

[\[FN102\]](#) U.C.C. § 1-201(39) (1990) (emphasis supplied).

[\[FN103\]](#) See *supra* note 74 and accompanying text.

[\[FN104\]](#) See *supra* note 75, and accompanying text.

[\[FN105\]](#) U.C.C. § 2-201 (1990), Comment 1. The Comment also says: "All that is required is that the writing afford a basis for believing that the offered oral evidence rests on a real transaction." (emphasis supplied).

[\[FN106\]](#) U.C.C. § 2-201(1) (1990).

[\[FN107\]](#) Even so, electronic signatures in some ways are superior to the autograph. Autograph signatures, while containing unique characteristics that are almost impossible to fake, require the individual attention of a human eye, perhaps a trained one, to verify their authenticity. For this reason, "autographs often go unchecked." Benjamin Wright, *Authenticating Electronic Contracts: The Case for Internal Recordkeeping*, Conference Proceedings, EDI and the Law '91, Feb. 26-27, Washington, D.C., Data Interchange Standards Association. But see *Computer Teaches Itself To Read Handwriting*, N.Y. Times, Feb. 3, 1990 at 38. Computers, on the other hand, can rapidly and flawlessly examine millions of electronic signatures at low cost, so that even the smallest of transactions routinely gets checked. Wright, [supra](#) at 38.

[\[FN108\]](#) Telebanking, *supra* note 91, at 64.

[\[FN109\]](#) Computer "hackers" have found ways to access the long-distance lines of internal corporate switchboards, called a private branch exchange [PBX]. Mitsubishi International Corporation currently is suing AT & T to recover \$10 million which it paid on fraudulent calls, alleging AT & T failed to adequately warn of the vulnerabilities of the PBX security system. Cindy Skrzyck, *Thieves Tap Phone Access Codes to Ring up Illegal Calls*, Washington Post, Sept. 2, 1991, at A1.

[\[FN110\]](#) White and Summers conclude that the standard of proof under the "sufficient to indicate" language of the U.C.C. Statute of Frauds is the preponderance of the evidence. White and Summers, *supra* note 21, at 78-79.

[\[FN111\]](#) The question of data paths also enters the inquiry. The reader will recall that the audit trail may be either

built up or wiped out by the path the transmission has taken. See supra note 15 and accompanying text.

[\[FN112\]](#) Unfortunately, as one industry observer noted, "it seems most companies feel they got into EDI because they were forced to by a major customer." Cebular, EDI's Role in CIM, Production and Inventory Management, May 1990, at 46. As a result, many new EDI users have little interest in the further bother associated with sorting through the legal issues associated with their new, unwelcome practice. Costs, at all costs, will be kept to a minimum.

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