

1972

Identifying the Typewriter Ribbon Used to Write a Letter a Case Study Employing New Techniques

Ordway Hilton

Follow this and additional works at: <https://scholarlycommons.law.northwestern.edu/jclc>

 Part of the [Criminal Law Commons](#), [Criminology Commons](#), and the [Criminology and Criminal Justice Commons](#)

Recommended Citation

Ordway Hilton, Identifying the Typewriter Ribbon Used to Write a Letter a Case Study Employing New Techniques, 63 J. Crim. L. Criminology & Police Sci. 137 (1972)

This Criminology is brought to you for free and open access by Northwestern University School of Law Scholarly Commons. It has been accepted for inclusion in Journal of Criminal Law and Criminology by an authorized editor of Northwestern University School of Law Scholarly Commons.

IDENTIFYING THE TYPEWRITER RIBBON USED TO WRITE A LETTER A CASE STUDY EMPLOYING NEW TECHNIQUES

ORDWAY HILTON

The author has been an Examiner of Questioned Documents in New York City since 1946. He is the author of *Scientific Examination of Questioned Documents* and of a number of technical articles which have appeared in this Journal and other publications in this country and abroad.

The usual means of proving that a letter was written on a particular typewriter is to compare the identifying defects found in specimens from the machine and in the document in question. The same combination of type design and typing defects in the two sets without any fundamental differences establishes that the questioned document was in fact written on the known machine. The further step of identifying the specific ribbon with which the document was written is much less common, and apparently there is no reported use of linking an actual carbon ribbon to the questioned letter to assist in dating the latter.¹ While document examiners may have recognized this potential, most of them have not encountered a situation in which they could use it.

By design carbon ribbons, which today are a carbon-wax coating on polyethylene tapes, are used only once and then discarded.² After each character is typed there is a clear sharp outline left in the ribbon. With a properly operating machine no two letter or characters strike the same surface area of the ribbon. The problem is, therefore, to simply read and compare the material impressed in the ribbon with what is found in the document in question. In many respects it is simi-

¹The significant distinction here is the actual ribbon. Ribbon wear of inking has long been recognized as a basis for dating specimens, but it involves study of dated specimens from the machine and matching of ribbon characteristics which appear in this written work. Here we are considering a comparative study of the ribbon itself and the disputed document which might have been typed with the ribbon.

²This statement does not apply to the special carbon-plastic ribbon cartridge of the new IBM Selectric II (introduced in the fall of 1971). Its ribbon is designed to reink itself for five typings in the same area within a series of 15 consecutive strokes. Because of the overtypings the characters in any one area cannot be deciphered. This ribbon actually feeds through the machine only once from end to end and does not rewind as a fabric ribbon does. In this paper we are dealing with the more common single use, single impression carbon ribbons.

lar to reading typewriting or writing impressions left in a used sheet of carbon paper. To establish that what is read in the ribbon at hand represents the actual typing of the document at hand requires full analysis of ribbon and document. How to accomplish this and to present the findings in court is the subject of this paper.

CASE BACKGROUND

In some respects the uniqueness of the case helped to bring about the need for and the opportunity to make this kind of examination and demonstration in court. Two letters were actually in dispute, and the technique described established comparable data for both. One was dated July 12, 1957 and the second September 3, 1957. Only the September letter will be considered in detail.

Litigation arose out of a controversy among the three executors. One, the decedant's widow, had brought forward the two questioned letters. During a hearing the month before two document examiners had testified that her principal exhibit, a prenuptial letter from the decedant, was a forgery. The September letter made reference to the prenuptial letter and had a photocopy of it attached. In effect if the September letter was genuine, a serious doubt would be cast upon the accuracy of the forgery determination.

The disputed September letter was typewritten on an IBM Executive machine similar to one used by the decedant. It was, however, a different machine. In the course of field investigation another IBM was located which might have been used to write the September letter. A very short and barely adequate sample of typewriting was obtained which showed that the questioned letter had been written on the machine. One of the attorneys made arrangements for his secretary to prepare more adequate standards from the suspected typewriter for court use.

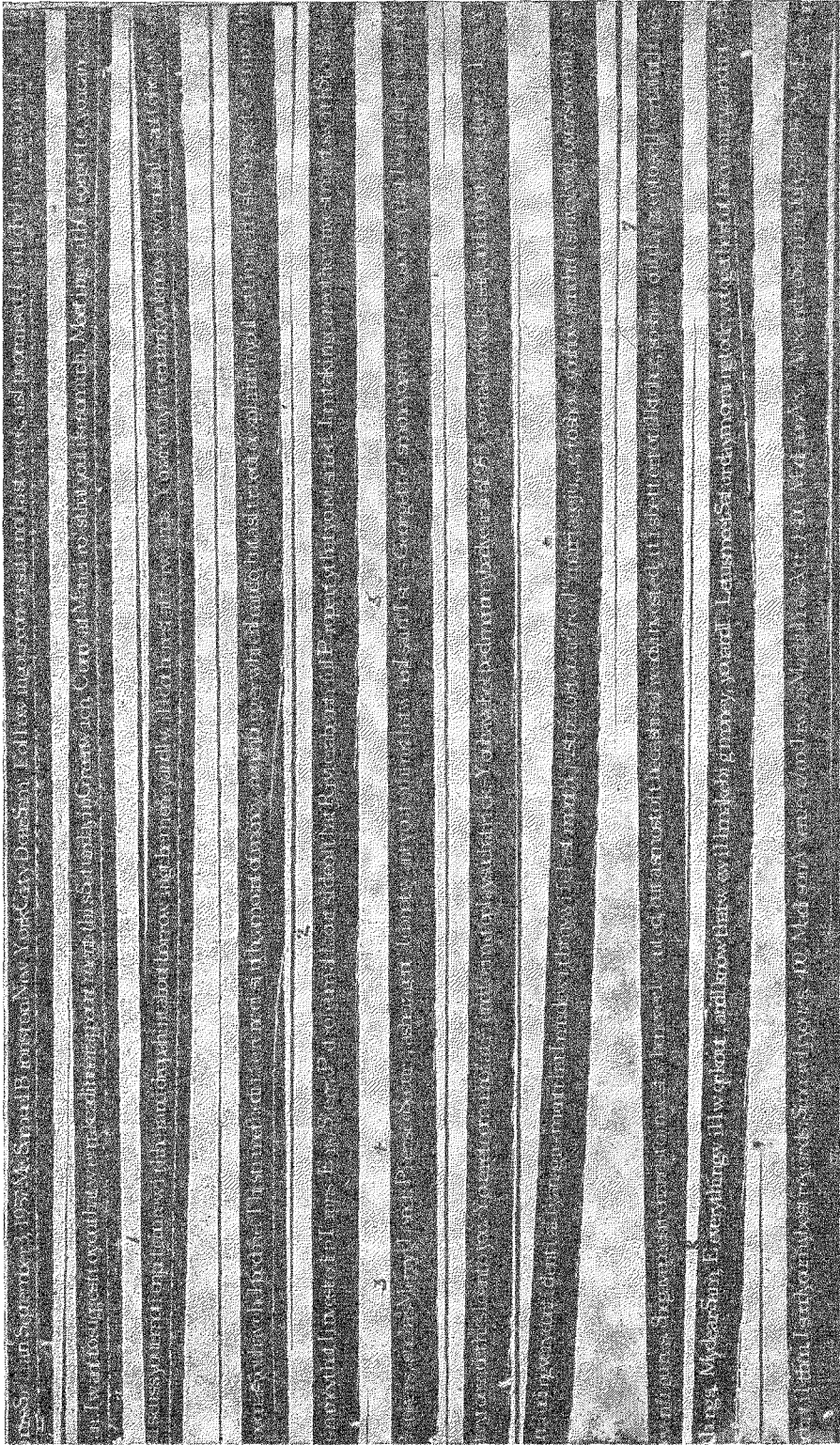


FIGURE 1.

Reproduction of the typewriter ribbon used to type the letter shown in Figure 2. A series of typing errors and misspellings have been indicated in this illustration and also in the actual letter by the same identifying numbers. Careful study of the tape reveals that the street address of the addressee and the notation in parenthesis at the top of the sheet (Figure 2) were not typewritten until the letter had been completed.

(c/o of Irwin Margulies Att.)
400, Madison Av.

ALEXANDRE SAFFIAN
400 MADISON AVENUE
NEW YORK 17, N.Y.
CABLE ADDRESS: ALEXSAFFIAN

EXHIBIT 19
JAN 27 1968

Samuel E. Skinner
Official Register

September 3, 1957

Mr. Samuel Bronston
400, Madison Avenue
New York City

Dear Sam:

Following our conversation of last week, as I promised, I would help you as soon as I can. I want to suggest to you that we make a dinner appointment this Saturday in Greenwich, Conn. at Manciro's that you like so much. Meeting with Georgette, you can discuss your motion picture with her and drop a hint about borrowing the money and I will do the rest afterwards.

You are my friend and you know how much I want to help you as you have helped me. This time the difference is in the amount of money, much bigger which I can do, but as I tried to explain to you last time, it is Georgette's money that I invested in Trans-Era / Sieras Petroleum all outside of that Riviera Beautiful Property that you visited.

I am taking care of her investments with StockBrokers, such as Merry Lynch Pierce Secur., as her agent. I do not want you to think that when I said "It is Georgette's money or my wife's money" that I would try to evade this loan to you. You are too much of a friend for me to play such a trick. You have helped me in my bad years in 1953, even as far back as 48, and I do not forget ever.

I am including very confidentially an agreement that I made with my wife last month, just prior to our "real" marriage, to show you how much it is involved, over seven figures. She gave me free hands to invest whenever I wanted, but as most of the cash is already invested, it is better to talk to her, so she would agree to sell certain things.

My dear Sam, everything will work out, and I know that we will make big money, you and I.

Let us meet Saturday morning to discuss together to the country, and until then, I send you my best regards.

Sincerely yours,
A. Saffian

FIGURE 2.
The September 3, 1957 letter as offered in evidence.

When the secretary attempted to type, the ribbon did not function properly. In order to adjust it she opened the discard chamber which was filled with an unwound, tangled mass of used ribbon. All of this was removed, the ribbon properly threaded, and the new specimens were typewritten. After a brief discussion between parties it was decided to take the tangled mass of ribbon along with the new standards. Initially, it was thought that if the ribbon could be read, some useful information might be derived from it. Its present owner had only recently purchased the typewriter from the widow but had not used it except to prepare one brief specimen which had already been examined.

EXAMINATION OF THE RIBBON

Preliminary examination of the ribbon revealed material which read like the September letter. The typewriting could be read with side lighting or somewhat more easily with transmitted light. Simply holding the ribbon above a white surface with the light reflected through it proved to be an easy way for rapid scanning. Careful reading of the ribbon disclosed three typings of the contents of the September letter. Did any one of these represent the actual letter in evidence or were all three simply copies of it?

Unwound ribbon of this nature is difficult to handle and study. In all it consisted of between twenty or thirty yards. Its condition was in part good and in part wrinkled, torn, and badly mutilated. It was broken into a number of sections of various lengths. Fortunately there were several long sections which were in moderately good condition. The fragments had not been kept in order so that the broken ends had to be fitted together in an attempt to reestablish sequence. It was possible that some smaller sections might have been lost. After preliminary scanning and assembling, a section which appeared to duplicate the contents of the September letter most closely was wound on a small tape recorder reel which both facilitated handling and protected it. By off-reeling onto another spool handling became easier and smaller sections could be examined in detail.

The letter itself and the ribbon were studied and compared for identical wording and factors which would establish simultaneous preparation. In the course of this study, it was found that extra characters appeared in the ribbon impressions at several points. When the corresponding words in

the letter were examined, each was found to contain an erasure. The erased letters had been overtyped. In each instance the eradicated material could be deciphered from the letter. Here was the basis for more positive proof that the letter in evidence had been typewritten with this particular segment of the ribbon.

The contents of the letter could be read directly from the ribbon (figure 1). Further, within the letter there were five erasings and overtypings. In addition there were three uncorrected spelling errors (figure 2). The spelling errors were located in the ribbon.

The ribbon was studied in connection with the erasures. In each instance the deciphered erased letter was found impressed first followed by the correction which now appeared in the document in evidence. The typist evidently recognized each mistake immediately even before finishing the word. The examples are as follows:

1. "Pierce" had been misspelled "Pierse" and the ribbon reads "Piersce."
2. "It" had been originally typed "Is" and the ribbon reads "Ist."
3. Following the word marriage the letters "ju" were typed and erased together with two commas, one of these can be seen faintly intersecting the final "e" of "marriage." (figure 3) The typist had had trouble at this point back-spacing the paper to make corrections as the ribbon reads "marriage ju,e,." The final "e" of "marriage" must have been retyped for at least a portion of it would need to be erased in order to remove a comma which touched it.
4. "Agree" near the end of the paragraph had been typed "Af" and the "f" erased so that the ribbon reads "Afgree."
5. The word "everything" had originally been written with a capital "E" and erased so that the ribbon shows "Eeverything."

This unique combination of typing errors coupled with identical spelling and the exact wording of the letter in evidence establishes strong proof that this was the portion of the ribbon which typed the letter.

Inspecting the ribbon reveals these factors. There is no ribbon spacing when the space bar had had been struck. Thus words run together. On this particular machine the ribbon had not been moving forward properly. When certain letters were typed the ribbon would move farther than neces-

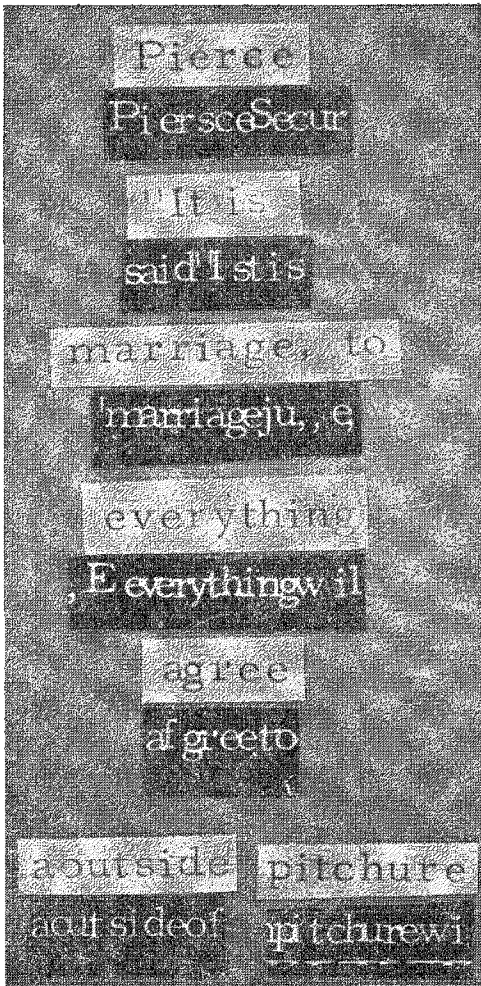


FIGURE 3.

Comparison of typing errors and corrections as they appear in the letter (Figure 2) and on the typewriter ribbon (Figure 1). Note that the spacing of the letters on the ribbon itself is irregular and that certain letter impressions actually overlap. This was undoubtedly due to the fact that the ribbon was not feeding into the discard chamber properly. Where portions of the second letter overlap the first as appears in the word "marriage" on the tape, the typing of the "a" in the September 3rd document shows a weakened stroke. Note particularly its lower left edge.

sary to accommodate the width of the letter. At other points the letters are crowded and overlap slightly no doubt due to the fact that there was not the proper tension and roll up of the ribbon in the discard chamber. Figure 3 shows for example the overlapping of the "m" and "a" in the ribbon and the imperfect impression of the "a" in the letter. Furthermore, on the ribbon the letters are

not uniformly aligned along the base line, a condition no doubt due to the action of the ribbon vibrator and possibly the improper feed and takeup action.

These observations meant that it is not possible to study the vertical or horizontal alignment of the letters from the ribbon impressions. In those instances in which two letters did not hit the ribbon so closely together that portions overlapped, typeface damage could be determined from the ribbon impressions. On this machine the lower left serif of both the "n" and "l" was worn away and the defect was apparent in the ribbon. Thus had the ribbon been separated from the machine it could, in fact, have been partially identified by these defects and the undamaged type faces as having been used on this particular typewriter.

PREPARATION OF DEMONSTRATION CHARTS

To demonstrate in court that the ribbon and letter represented a single typing presented a challenge. The whole September letter used up between eight and nine feet of typewriter ribbon. While some parts of it had been damaged and torn into short sections the portion which contained the September letter was a continuous unit. It would not be easy to take a ribbon of this length rolled on a spool and to unroll it while testifying in order to point out both the identity of wording, spelling, and capitalization and the common typing errors. Nor did this length of unbroken ribbon lend itself to easy photographing with a camera. A special photographic technique had to be devised.

It was accomplished in the following manner. A sheet of film was cut into strips approximately $\frac{3}{4}$ inch wide. By utilizing a contact printer equipped with a rheostat to control the light intensity, the ribbon was printed by contact on film in 10 inch units. After each exposure the ribbon was moved forward about $9\frac{1}{2}$ inches to give a slight overlap of words. Thus with eleven strips the entire letter was reproduced. In this way the typewriter ribbon itself formed the negative to expose the film. The intensity of light was adjusted for an exposure of approximately one second with Eastman Contrast Panchromatic Process Film.

The strips of film were processed in the usual manner, dried, and reassembled into a sheet with transparent Scotch tape, and the entire contents of the ribbon printed compactly on paper (figure 1). With this print and a corresponding print of

the letter in evidence it was possible to designate the various points at which typing errors and corrections were made, and thus to make a convincing presentation of the similarities between the ribbon and the letter in evidence. This testimony, of course, required careful explanation on how the ribbon moved through the machine and why there were points at which there was no spacing between words and irregular alignment of letters along the base line of the ribbon even though they were properly aligned in the finished letter. But the photographs allowed the court to follow the testimony and to see the significant similarities.

INVESTIGATION OF THE TYPEWRITER'S HISTORY

In this case there was excellent field investigation completely coordinated with the laboratory work. Thus the evidence derived from this examination was fully utilized. For one thing, the typewriter was subpoenaed so that it would be available in court at the time of trial. Thus before testifying the examiner was able to inspect the machine and the type face conditions and when necessary to point out the key mechanical parts of the typewriter itself.

Subpoena of the typewriter proved to be even more helpful. The serial number according to IBM records established that the typewriter had been built in France in 1958, *i.e.*, after the date of the letters. A few days before trial as one of the attorneys was checking over the machine he noticed a small sticker with the name of a local typewriter agency.

When the agency was contacted, the owner im-

mediately identified the machine from the serial number as one which he had rented. It was a startling discovery since the machine had been sold to its present owner by the widow. The agency owner, upon checking his records further, reported back that it had been first leased to the widow in January 1966 but subsequently purchased. (The date of purchase actually was a week or so after she had sold it.) The original date of rental was about two weeks before the September letter had been offered in evidence in the Surrogate's court. Thus it was possible to establish clearly that the letter was fraudulent, and further that it had been prepared very shortly before it was offered in evidence. Technical examination also showed that the signature was fraudulent if this added proof was necessary.

CONCLUSIONS

This technique employed for examining the used typewriter ribbon and relating the impressions to a specific document enabled the examiner to show conclusively that the document had been typewritten on the machine at hand with the ribbon before him. The conclusions were demonstrated photographically. Further, with coordinated field investigation it was possible to establish when the document had been prepared. This combination of evidence brought about the rejection of the disputed document and with other evidence in the case lead to a decision against the entire fraudulent claim.³

³ Estate of Saffian, N. Y. L. J., Jan. 9, 1967.