

# Typewriting Examinations

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# Typewriting Examinations

## 1 INTRODUCTION

This procedure is intended to be utilized by trained personnel to ensure consistency and transparency of methods employed during the examination of typewriting evidence received in the Questioned Documents Unit (QDU).

## 2 SCOPE

These procedures will be used by a forensic document examiner to conduct examinations, classifications, and comparisons of typewriters, typing components (e.g., elements, ribbons, carbon paper), and/or items containing typewritten impressions.

Trained document analysts may conduct classifications of typewriting with guidance from an examiner.

## 3 EQUIPMENT

- 150-watt tungsten halogen light, or comparable equipment
- 30-watt transmitted light box, or comparable equipment
- Hand magnifier (minimum magnification, 4X)
- Stereomicroscope (minimum magnification, 6.3X), or comparable equipment
- Leica DMC Comparison Microscope (minimum magnification, 32X), or comparable equipment
- Keyence VHX-2000E Digital Microscope, or comparable equipment
- Foster and Freeman Video Spectral Comparator (VSC), or comparable equipment
- ChemImage Hyperspectral Imager (HSI) Examiner 200 QD, or comparable equipment
- Typewriting measurement grids or standard ruler

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## 4 PROCEDURE

- The steps in this section will all be performed using lighting and magnification sufficient to allow fine detail to be distinguished, as applicable.

## 4.1 Classification of Typewriting

### 4.1.1 Technology Used to Prepare the Typewriting

- A. Visually examine the item(s) to determine the technology used to prepare the typewriting (e.g., typebar or single element).
- A typebar typewriter uses typefaces attached to individual typebars that move individually to print the desired character when each key is struck.  
**Redacted**
  
  - A single element typewriter uses a printing element (e.g., ball, printwheel, or thimble) containing a full set of characters that moves to print the desired character when each key is struck. **Redacted**
- B. Record the technology used to prepare the typewriting and any observations in the case notes.
- The [QD-003](#) may be used to record this information.

### 4.1.2 Horizontal and Vertical Spacing of The Typewriting

- A. Measure the horizontal and vertical spacing using grids and record this information in the case notes and/or on the [QD-003](#). A ruler may also be used to make a general determination of the number of characters per inch.
1. Overlay the transparent grids on the typewriting until all the characters evenly fill the boxed fields.
  2. The horizontal measurement is obtained from fitting the appropriate grid on the longest line of continuous typewriting.
  3. The vertical measurement is obtained by fitting the appropriate grid over lines of type that repeat in a regular pattern.
- B. Determine whether the size of type is consistent with the measured spacings, both horizontal and vertical.

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## 4.2 Ribbons

### 4.2.1 Determining the Type of Ribbon Used

- A. Visually examine the item(s) to determine the type(s) of ribbon(s) used.
- A fabric ribbon(s) is usually nylon cloth that contains ink. Characteristics of impressions made with a fabric ribbon(s) are included in Table 1; however, the edges of the characters are not crisp, but appear somewhat fuzzy or blurry in appearance.
  - A carbon ribbon(s) is usually a carbon wax coating on a polyethylene base. Carbon ribbons include single-strike paper or film, permanent or lift-off correctable film, and multi-strike film. Characteristics of impressions made with a carbon ribbon(s) are included in Table 1.
  - A thermal ribbon is usually a carbon ribbon that is coated with wax. When heated, the wax adheres to the surface of the paper and can be removed using a scalpel or other such instrument.
    - The edges of the printed characters may be stepped.
  - Sometimes carbon paper may be utilized instead of a ribbon. Characteristics of impressions made with carbon paper are included in Table 1.

**Table 1: Characteristics of Various Types of Ribbons**

Type of Ribbon	Characteristics of Ribbon
Fabric	<ul style="list-style-type: none"><li>● Warp and weft weave pattern of fabric</li><li>● Ink soaks into paper</li><li>● Uneven inking of letter</li><li>● No flaking</li></ul>
Carbon yellow or orange (Single-strike)	<ul style="list-style-type: none"><li>● Plastic film ribbon</li><li>● Carbon-wax coating on ribbon</li><li>● No ink absorbing into paper</li><li>● Clean outline of letter</li><li>● May be flaking of carbon</li></ul>

	<ul style="list-style-type: none"> <li>• May be lift off or cover up corrections</li> </ul>
Carbon Pink (Permanent)	<ul style="list-style-type: none"> <li>• Plastic film ribbon</li> <li>• Carbon, wax, dye coating on ribbon</li> <li>• Permanent</li> <li>• No correction</li> </ul>
Carbon Blue (Multi-strike)	<ul style="list-style-type: none"> <li>• Plastic film ribbon</li> <li>• Liquid ink</li> <li>• Multi-strike or security</li> <li>• Looks like a combination of fabric ribbon and carbon</li> </ul>
Carbon Green (Composer)	<ul style="list-style-type: none"> <li>• Used by type-setters</li> <li>• Wider and bigger ribbon</li> </ul>
Thermal	<ul style="list-style-type: none"> <li>• Heated wax carbon ribbon</li> <li>• Adheres to surface of paper</li> </ul>
Carbon Paper	<ul style="list-style-type: none"> <li>• Fuzzy appearance of the characters</li> <li>• May have carbon build-up between the paper fibers</li> <li>• May have pieces of carbon paper observed in areas of heavy impressions</li> </ul>

#### 4.2.2 Transcription of Ribbons

A. Visually examine the ribbon to determine if the item is suitable for transcription

Redacted

B. If a ribbon is not suitable for transcription, discontinue examinations and report accordingly.

C. If a ribbon is suitable for transcriptio

Redacted

The item(s)

may be transferred to the Operational Projects Unit for imaging of the text visible on the ribbon. To manually transcribe a ribbon:

1. Take the ribbon out of the cartridge and note in the case records any damage to the ribbon observed.
2. Make sure the carbon side is facing downwards and tape the end tightly to a plastic reel.
3. Place the reel onto the manual ribbon reader and wind to the beginning.
4. Once at the beginning of the ribbon, transcribe the ribbon, character by character, as visible on the ribbon.
5. Maintain the transcription as part of the case note.

D. If a request is made to determine if a particular text is contained on a submitted ribbon, the examiner has the option of transcribing the entire ribbon or manually searching the ribbon for the desired text.

- If the requested text is searched for and located on the submitted ribbon, a copy of that portion of the transcription or a description of its location will be noted in the case records.
- If a paper fiber impression transfer examination is to be conducted between the text located on the submitted ribbon and typewritten text on a document, refer to section [4.2.3](#).

**4.2.3 Paper Fiber Comparison of Item(s) and Ribbons**

- A. Visually examine the questioned typewritten text to determine the type of ribbon used (see section [4.2.1](#)).
  - If a fabric or multi-strike carbon ribbon(s) was used, discontinue paper fiber examinations and report accordingly.
- B. Examine the ribbon to be compared using back lighting, if necessary, to determine if it is consistent with the type of ribbon (section [4.2.1](#)) and style of type (section [4.1](#)) used to prepare the questioned text.
  - If the ribbon is not consistent with the questioned typewritin **Redacted** iscontinue the examinations and report accordingly.
- C. Determine whether the questioned text is present on the ribbon (see section [4.2.2](#)).
  - If the questioned text is not present, discontinue the examination and report accordingly.
- D. Compare macroscopically the area(s) on the ribbon containing the questioned text and the questioned text for consistency in wording, typestyle, size, **Redacted**
  - If the text is not consistent, discontinue examinations, make appropriate notations in the examination records, and report accordingly.
- E. Using a comparison microscope, digital microscope, VSC, or similar equipment, compare similar portions of the typewritten text and ribbon text.
  - If the same wording appears multiple times on the same ribbon, evaluate each repetition independently, as necessary.
  - Examine like characters from several areas of the text and ribbon (e.g., the beginning, middle, and end) for correspondence between the typewritten text and the corresponding portions of the ribbon. **Redacted**
- F. If consistent, the examiner will draw, photograph, or by any other means document the correspondence **Redacted**
- G. If not consistent, the examiner will make the appropriate notations in the examination records.

### 4.3 Typewriting Examinations

- A. Visually examine the typewriting submitted and make notations regarding the following characteristics, as necessary:
1. The technology used to prepare the typewriting (see section [4.1.1](#))
  2. The type of ribbon used (see section [4.2.1](#))
  3. The horizontal and vertical spacing of the typewritten text (see section [4.1.2](#))
  4. The presence of any typewritten corrections and the method or technology of the correction.

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- B. Evaluate the consistency of the typewriting throughout the document for possible interlineations by attempting to align the typewriter grids so that multiple lines of type fall into the grid spaces.
- o When multiple pages are present, each line of each page should be examined to determine consistency with other pages.
- C. Classify the style of type, which may include the manufacturer of the style of type, and the possible make and model of the typewriter (see section [4.1](#)).
- D. Record and evaluate any identifying characteristics which may associate the questioned typewriting to a particular machine, exemplars from a known machine, or other questioned typewriting.

Redacted

- E. If a known typewriting element or typewriter is received, note at a minimum the following class characteristics:
- Typewriting mechanism (typebar, single element using a ball element, printwheel element or thimble element, and manual, electric, or electronic)
  - Style of type
  - Horizontal character spacing
  - Vertical line spacing
  - Character pitch (i.e., fixed, or proportional)
  - Printed manufacturing information on element or typewriter and serial number, if available

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- F. Compare the class characteristics of the known typewriting element(s) or typewriter(s) to the questioned text.
  - o If the known element(s) or typewriter(s) is not consistent in class characteristics with the typewritten impression(s), this indicates exclusion. Discontinue the procedure and report accordingly.
- G. If the known element(s) or typewriter(s) is consistent in class characteristics with the typed impression(s), examine the element or typewriter and note at a minimum its condition (e.g., clean, dirty, worn, damaged).

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- I. Take exemplars from the typewriter(s), on the stencil setting if possible, using a ribbon appropriate for the machine.
  - o The ribbon that was submitted with the machine should NOT be used to take exemplars whenever possible.
  - o A sheet of carbon paper may be substituted when the appropriate ribbon cannot be used.
- J. To make known impressions of an element when a typewriter has not been submitted, mount the element on another appropriate typewriter if one is available.
  - o If such a typewriter is not available, conduct comparisons using the element itself.
- K. Conduct a side-by-side comparison of the questioned and/or known typed impressions or element(s).
  - o The digital microscope or VSC may be useful.
  - o Compare and evaluate identifying characteristics accordingly. Redacted

- L. Evaluate the similarities, differences, and limitations. Determine their significance individually and in combination.

#### 4.4 Conclusions

- Once examinations have been completed, reports may include one or more of the following types of conclusion(s), opinion(s), or other findings, if applicable:

##### 4.4.1 Classification

- The following conclusion(s), opinion(s), or other findings apply to classification of typewriting and/or other non-comparison assessments of typewriting:
  - The Laboratory standard(s) for a particular typestyle most closely corresponding to the typewriting
  - The classification of the style of typewriting
  - The manufacturer of the style of typewriting
  - The make and model of machine used to produce the typewriting
  - Other information about the machine used to prepare the document
  - No Conclusion/No Determination
    - No determination could be reached as to the classification of the style of typewriting, the manufacturer of the style of typewriting, or the make and model of machine used to produce the typewriting, usually due to limiting factors **Redacted**
    - This conclusion requires an explanation of the limiting factor(s).

##### 4.4.2 Ribbons

- The following conclusion(s), opinion(s), or other findings apply to the examination of ribbons:
  - Information regarding the type of ribbon used to prepare the item(s)
  - Statement(s) related to transcription of the ribbon(s) and copies of the transcription
  - Information regarding the presence or absence of text
  - Statement(s) that the ribbon(s) was not transcribed due to limiting **Redacted**
    - This conclusion requires an explanation of the limiting factor(s).
  - Identification

- The examiner’s opinion that the questioned typewritten text was prepared by the known typewriter ribbon due to agreement in all identifying characteristics. No differences that would preclude an identification were observed.
  - No Conclusion/No Determination
    - No determination can be reached whether the typewritten text originated/did not originate from a known ribbon. Although there may be correspondence in class characteristics between the items, factors are present that significantly limit meaningful examinations. This opinion requires explanation of limiting factors.
  - Elimination
    - The examiner’s opinion that the questioned typewritten text was not prepared by the known typewriter ribbon due to sufficient disagreement in class and/or identifying characteristics.

#### 4.4.3 Typewriting Examinations

- The following conclusion(s), opinion(s), or other findings apply to examinations to determine whether a particular typewriter or typing element prepared a questioned document(s):
  - Identification
    - A determination that the questioned typewritten text was prepared by the known typewriter or typing element due to agreement in identifying characteristics. No differences which would preclude an identification were observed.
  - May Have Been Used
    - A less than definite determination that a particular typewriter or typing element was used in the preparation of the questioned document(s). There is a correspondence in characteristics between the typewriter/typing element and the questioned document(s); however, there is limited agreement in identifying characteristics and limitations are present. This opinion requires explanation of the limiting factors.
  - No Conclusion
    - No determination can be reached as to whether a particular typewriter or typing element was or was not used in the preparation of the questioned document(s) due to significant limitations. This opinion requires explanation of the limiting factors.
  - May Not Have Been Used
    - A less than definite determination that a particular typewriter or typing element was not used in the preparation of the questioned document(s). There is a lack of correspondence in characteristics between the typewriter/typing element and the questioned document(s) and some inconsistencies are noted; however, limitations are present. This opinion requires explanation of the limiting factors.

- Elimination
  - A determination that a particular typewriter or typing element was not used in the preparation of the questioned document(s) due to sufficient disagreement in class and/or identifying characteristics. Significant differences are observed.
- The following conclusion(s), opinion(s), or other findings apply to examinations to determine whether two or more typewritten documents share a common source:
  - Originated from a Common Source
    - A determination that the items originated from a common source (e.g., typewriter, typing element) due to agreement in identifying characteristics. No differences which would preclude a definitive conclusion were observed.
  - May Have Originated from a Common Source
    - A less than definite determination that the typewritten items originated from a common source. There is significant agreement in observed characteristics of the typewritten impressions and no significant, reproducible, or inexplicable differences are noted; however, limitations are present. This opinion requires explanation of the limiting factors.
  - No Conclusion/No Determination
    - No determination can be reached whether the items originated/did not originate from a common source. Although there may be correspondence in class characteristics between the items, factors are present that significantly limit meaningful examinations. This opinion requires explanation of the limiting factors.
  - May Not Have Originated from a Common Source
    - A less than definite determination that the items did not originate from a common source. Reproducible and inexplicable variations are found at some level in the analysis. Inconsistencies are observed; however, limitations are present. This opinion requires explanation of the limiting factors.
  - Did Not Originate from a Common Source
    - A determination that the typewritten items did not originate from a common source (e.g., typewriter, typing element) due to sufficient disagreement in class and/or identifying characteristics. Significant differences are observed.

#### 4.5 Records

- Ensure all notes, data, and observations used to support the conclusions derived from the examination(s) conducted are recorded in the examination records.
  - These records may include any of the following items:
    - Reference information
    - QD-007 Form
    - Redacted
    - Image files

- Printouts or photographs
- Transcriptions
- Descriptions of observations
- Drawings of class, identifying, and/or eliminating characteristics
- **Redacted**
- Typewritten impressions made during the examination process

**5 LIMITATIONS**

- The following factors could affect the examination process and/or the results rendered:
  - **Redacted**
  - Lack of sufficient comparability between the text being compared
  - **Redacted**
  - Prior destructive forensic examinations such as latent print processing
  - Lack of/limited identifying characteristics
  - Search capabilities are limited to items and/or information contained in the reference materials
  - Accuracy and quantity of information provided to the Laboratory

**6 SAFETY**

Standard precautions should be followed for the handling of chemical and biological materials. Chemical and biological materials that are hazardous or potentially hazardous will be maintained and examined in specifically designated areas within QDU space. QDU personnel may refer to the [FBI Laboratory Safety Manual](#) for additional guidance.

**7 REFERENCES**

Haas Atlas, CD-ROM or DVD, American Society of Questioned Document Examiners, Long Beach, CA, 2004.

**8 REVISION HISTORY**

Revision	Issued	Changes
06	01/14/2022	Completely reformatted to organize the technical procedures and meet new template requirements. Combined typewriting sections from DOC-212, DOC-213, DOC-214, and DOC-223. Computer-Generated Text portion of this document has been removed and added to DOC-207.