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Standard for Examination of Mechanical Checkwriter Impressions and Machines

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410 North 21st Street
Colorado Springs, CO 80904

Foreword

Mechanical checkwriters are used on checks or drafts to impress or imprint currency value symbols and provide protective impressions or inking in areas of amount designations and payee name entries for purposes of protection against alteration. The impression can be liquid ink or inked ribbon product bearing impression forms that emboss, print, perforate, or shred the substrate. The impression may be a composite of multiple parts within a checkwriter and may contain information unique to a particular manufacturer, model or machine.

The procedures outlined here are grounded in the generally accepted body of knowledge and experience in the field of forensic document examination. By following these procedures, a forensic document examiner can reliably reach an opinion concerning whether two or more impressions were created by the same checkwriter, whether a particular checkwriter created a specific impression, or the make and model(s) from which an impression was created.

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This document was revised, prepared, and finalized as a standard by the Forensic Document Examination Consensus Body of the AAFS Standards Board.

Questions, comments, and suggestions for the improvement of this document can be sent to AAFS-ASB Secretariat, asb@aafs.org or 401 N 21st Street, Colorado Springs, CO 80904.

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Standard for Examination of Mechanical Checkwriter Impressions and Machines

1 Scope

This standard provides procedures for determining classification information and machine identification of mechanical checkwriters. These procedures include evaluation of the material. These procedures are applicable whether the examination and comparison is of questioned and known items or of exclusively questioned items.

2 Normative References

There are no normative reference documents. Annex A, Bibliography, contains informative references.

3 Terms and Definitions

For purposes of this document, the following terms and definitions apply.

3.1 3.1
blemish
Small extraneous spot found near inked regions of checkwriter impressions that is characteristic of machines that use ribbons as their ink source.

3.2
checkwriter (check protector)
Device manually or electrically-powered or computer-generated, designed to ink, emboss, print, perforate, or shred a monetary value, along with other peripheral information, onto a document.

3.3
dialing checkwriter
Class of checkwriter, not having a payee perforator or prefix, in which each symbol, numeral, or otherwise is individually and sequentially impressed.

3.4
impression
Image formed by pressure.

3.5
impression format
Manner in which the paper is embossed or shredded.

3.6
individual prefix
Specially designed portion of a checkwriter impression immediately preceding that of the collective segments or the machine part from which the designed impression is created.

3.7
payee perforator
Optional portion of an impression intended to emboss, shred or puncture the document at the location of the payee name on a check or similar document, or the part from which the designated impression is created.

3.8
perforation
Small hole or a group of small holes punched in a substrate.

3.9
platen (checkwriter)
Plate or plates used to press the substrate against the prefix, elements, payee perforator, or segments.

3.10
prefix
Specially designed or model-standard portion of a checkwriter impression immediately preceding that of the collective segments, or the machine part from which the designed impression is created.

3.11
printing element
Portions of impression designating certain non-numeric designations located to the right of the first numeric segment.

3.12
ribbon shift
Movement of a multicolored inking ribbon allowing for a change in color to manifest itself in an impressed character.

3.13
segment
Singular part on which is forged or attached a set of numerals or symbols that can be adjusted by the operator in establishing an impression value.

NOTE Multi-currency machines commonly have a dedicated segment for currency designation.

3.14
variation
Imprecise duplication in multiple impressions from the same machine.

4 Requirements

4.1 Competence

4.1.1 General

Competency in the examination of checkwriter impressions on documents is based upon a combination of knowledge, skills, and abilities acquired through education, training, and experience specific to forensic document examination.

4.1.2 Requisite Knowledge, Skills, and Abilities

It is critical that the forensic document examiner has a knowledge base that includes the individual parts that comprise the composite checkwriter impression and the mechanics involved in its creation.

4.2 Equipment

4.2.1 The necessary time and facilities shall be made available to complete all applicable procedures and to maintain the condition of the items under examination.

4.2.2 Appropriate light source(s) to distinguish fine detail shall be available. Natural, incandescent, fluorescent, light emitting diode (LED), or fiber optic lighting sources are generally used. These may include transmitted, side, and vertical incident lighting. Gooseneck lighting may prove beneficial.

4.2.3 Optical or digital magnification necessary to resolve fine detail shall be available. The magnification level and the equipment used to observe the feature(s) should be recorded. Gooseneck microscope or stand may be useful for examination of machine parts.

4.2.4 Image capture device(s) capable of sufficient resolution to record accurate detail shall be available. The equipment used and the resolution needed to observe the feature(s) should be recorded.

4.2.5 Measuring devices shall be available; these include paper micrometer, typewriter grids, rulers, or magnifiers with reticle patterns.

4.2.6 Checkwriter classification reference materials sufficient to aid in the determination of manufacturer, dating information, and model differentiation should be available.

4.2.7 Other equipment or devices generally used in the forensic document examination discipline that should be available for the examination of mechanical checkwriters, as deemed appropriate by the FDE (e.g., hand tools).

4.3 Considerations and Limitations

4.3.1 Items submitted for examination may have inherent limitations that can interfere with the procedures in this standard. Limitations can be due to factors such as submission of non-original documents; the condition, quantity or comparability of the material submitted; or from limited discriminating characteristics. The FDE shall ensure that limitations are noted and recorded.

4.3.2 Document examinations should be conducted prior to any destructive processing (e.g., latent prints, DNA, ink chemistry). The FDE shall handle the items as required to avoid compromising subsequent examinations. The results of prior storage conditions, handling, testing, or destructive processing can interfere with the examination.

4.3.3 Consideration shall be given to the possibility that multiple mechanical checkwriters may produce indistinguishable impressions.

4.4 Procedure

4.4.1 The FDE shall conduct an initial assessment to determine the appropriate examinations, the sequence of examinations, and the potential limiting factors. Based on the submission(s) and communication(s) with the submitter, the FDE may seek to clarify the issue(s) to be addressed and the examination(s) to be undertaken.

4.4.2 Subsequent to the completion of the initial assessment, the FDE shall proceed to the applicable examinations. The FDE may discontinue the procedure at any point during the examination. The FDE shall record the reason(s) for a discontinuation.

NOTE The remaining procedures in 4.4 need not be performed in the order listed. Not all procedures may be applicable to the item(s) being examined.

4.4.3 The FDE shall perform applicable procedures and contemporaneously record examinations performed and relevant observations in the notes. The results and accompanying notes should have sufficient detail to allow for an independent review and assessment of the conclusions by another FDE. The FDE shall include any relevant information, observations, equipment used, methods, evaluations, and conclusions, opinions, or interpretations.

4.4.4 The FDE shall examine the submitted questioned impression(s) to determine if they were produced by a mechanical checkwriter. If not, discontinue the examination.

4.4.5 The FDE shall examine the submitted evidence to determine if it is original or non-original.

NOTE Examination of the original impression is preferable.

4.4.6 The FDE shall determine whether the submitted evidence is suitable for comparison. If it is not suitable, discontinue the procedure and report accordingly. Factors that affect suitability can include, but are not limited to, clarity, detail, degree of inking or embossing, or condition

4.4.7 The FDE shall note whether the examination is a comparison of questioned impression(s) to known impression(s) or questioned impression(s) to questioned impression(s).

4.4.8 The FDE shall form two or more mutually exclusive hypotheses, propositions, or explanations (herein "hypotheses") for each set of comparisons. There are typically two competing hypotheses, associated sub-hypotheses for each set of comparisons may also exist.

Examples of hypotheses that, when mutually exclusive, may be combined as competing hypotheses for evaluation include:

a) the questioned mechanical checkwriter impression was produced by the known mechanical checkwriter.

b) the questioned mechanical checkwriter impression was produced by another mechanical checkwriter.

NOTE It is appropriate to evaluate additional hypotheses and sub-hypotheses such as duplication of the impression.

4.5 Examination of Questioned Checkwriter Impression(s)

4.5.1 The FDE shall perform an analysis of the questioned checkwriter impression(s).

4.5.2 If non-original checkwriter impressions are submitted, the FDE shall determine whether the details or class characteristics of the make and model have been reproduced with sufficient clarity for comparison purposes. Proceed to the extent possible noting that there are inherent limitations associated with examining non-original checkwriter impressions.

4.5.3 The FDE shall assess and note the different mechanical components comprising the impression(s).

4.5.4 The FDE shall examine and note class characteristics of the make and model of the source machine.

NOTE 1 Inclusive of this analysis is the inking, method of shredding, embossing or perforation, pattern of payee perforator, font designs, and form of elements. Prefixes containing registration numbers or other individualizing content provides sourcing information. Other factors such as oscillating or non-oscillating prefixes and dialing machines are further aspects of class examinations. A prefix may have a set location within the impression thereby leaving a gap in the impression or it may oscillate to a location adjacent to subsequent portions of the impression leaving no gap.

NOTE 2 Individual prefixes may be unique to a company or to a specific machine based on either the design or a unique number that is part of the prefix. Consider the possibility of replacement of the prefix, payee perforator, any individual segment, and each element in addition to the platen.

4.5.5 The FDE shall examine and record any randomly acquired characteristics.

NOTE Each segment is individual and separate from other segments. These segments, and their impression(s) may have independent randomly acquired characteristics. An exception to this is with dialing machines.

4.6 Examination of the Checkwriter Machine and Production of Known Specimens

4.6.1 If a machine(s) is submitted, the FDE shall record the condition (i.e., clean, dirty, missing parts, damage, etc.), manufacturer, serial number, and settings as submitted. The FDE shall obtain and record authorization from the responsible party to remove covers or parts.

NOTE 1 The submission of the checkwriter machine is preferable.

NOTE 2 Covers can be removed without affecting the operation/characteristics of the machine, however, the removal of parts may affect the operation. Impression changes could result from dismantling efforts beyond that of covers.

4.6.2 The FDE shall record details of any removals.

NOTE If authorization for the removal of part(s) has not been given, some examinations described in Section 4.6 may not be possible or may be limited to varying degrees.

4.6.3 The FDE shall ensure that impressions are taken before any dismantling occurs.

4.6.4 The FDE shall prepare a known specimen with the settings on the machine as received.

4.6.5 The FDE may contact the manufacturer, or other resources, for purposes of dating the checkwriter.

4.6.6 The FDE shall conduct a detailed magnified examination of the platen, prefix, printing elements and segments that can be seen without dismantling and record any observations.

NOTE Assessment of the condition of the various parts of a machine may be difficult due to limitations in obtaining a clear line of sight.

4.6.7 The FDE shall examine and record any physical details of the checkwriter parts that correspond to those characteristics observed in the questioned impression(s)

4.7 The Examination of Known Checkwriter Impression Specimens

4.7.1 If a checkwriter has been submitted, the FDE shall prepare comparable specimens from the submitted machine(s) on paper of equivalent weight to that of the questioned impression(s). The first specimen shall be prepared with the settings on the machine as received. A comparable set of specimens includes multiple impressions verbatim to the questioned impression value(s), as well as a complete strike-up of all numerals from each segment. If a machine is hand-powered, samples of varied degrees of force should be exhibited in the specimens.

NOTE Checkwriter impressions may exhibit some variation between individual impressions.

4.7.2 If a checkwriter has not been submitted or cannot be submitted, the responsible party shall be informed as to the requirements set forth in 4.7.1 If checkwriter specimens are received, the FDE shall determine suitability for comparison.

NOTE The submission of the checkwriter machine is preferable.

4.7.3 The FDE shall examine the known specimen(s) and record characteristics of make and model, to the extent possible.

NOTE Inclusive of this analysis is the inking, method of shredding, embossing or perforation, pattern of payee perforator, font designs, and form of elements. Prefixes containing registration numbers or other individualizing content provides sourcing information. Other factors such as oscillating or non-oscillating prefixes and dialing machines are further aspects of class examinations.

4.7.4 The FDE shall examine and record any randomly acquired characteristics present in the specimen impressions.

4.8 The Comparison of Checkwriter Impressions

4.8.1 The FDE shall compare class characteristics between specimens. If the class characteristics of the questioned impression(s) differ from those of the submitted or prepared specimens, record differences and report accordingly.

NOTE Certain “differences” may be based on replacement parts, to include the liquid ink color and ribbon colors and custom designed parts (particularly prefixes and, to a much lesser extent, payee perforators and font designs). Payee perforators can be deactivated and prefixes can be changed or manually restrained from appearing on any given impression on certain makes and models.

4.8.2 The FDE shall record the dates of execution of each impression, if known.

4.8.3 The FDE shall compare randomly acquired characteristics between impressions and evaluate similarities, differences, missing features, and limitations of each impression.

4.8.4 The FDE shall evaluate the significance individually and in combination of any recorded similarities, differences, missing features, and limitations relative to the mechanical part(s) involved.

4.8.5 The FDE shall consider the results of the above procedures in relation to the competing hypotheses based on the characteristics, features, or information under observation as interpreted with the knowledge, skills, and abilities acquired through education, training, and experience.

4.8.6 The FDE shall form a conclusion for each set of comparisons with respect to the extent that the results of the above procedures support one hypothesis over the alternative(s) and report in accordance with the criteria in Section 4.6.

4.9 Report

4.9.1 The conclusion(s), or opinion(s), or observation(s) may be reached after following the appropriate procedures outlined in this standard. The number and nature of the examinations required are dependent on the items submitted for examination and the examination request(s).

4.9.2 The bases and reasons for the conclusion(s), and opinion(s) shall be included in the examiner's documentation and summarized in the report.

4.9.2.1 If an examination reveals a make or model class difference, a conclusion of different sources is appropriate.

4.9.2.2 When the examination reveals no significant, inexplicable differences between two or more items, there is agreement in all class characteristics, and there is agreement in substantive randomly acquired characteristics, a conclusion of common source to the highest confidence level possible is appropriate.

4.9.2.3 When the examination reveals significant, inexplicable differences between two or more items are found at any level of the analysis, a conclusion of elimination of common source is appropriate. Similarities between the two or more items may exist. Consideration shall be given to part replacements.

4.9.2.4 If there are limiting factors and the examination reveals similarities or differences of limited significance between two or more items, the use of qualified opinions may be appropriate. The report shall include an explanation of the limiting factors.

4.9.2.5 If there are significant limiting factors, and the examination reveals no significant differences, a report of an indeterminate conclusion is appropriate. The report shall include an explanation of the limiting factors.

4.9.2.6 If the examination reveals no significant randomly acquired characteristics, a report of an indeterminate conclusion is appropriate. The report shall include an explanation of the limiting factors.

Annex A
(informative)

Bibliography

The following bibliography is not intended to be an all-inclusive list, review, or endorsement of literature on this topic. The goal of the bibliography is to provide examples of publications addressed in the standard.

1] Vastrick, Thomas, *Classification and Identification of Checkwriters*, American Board of Forensic Document Examiners, Inc. 1991

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