

An Update of the Typestyle Classification Program (TYPE) into a Windows® Based Format (WinType)

Karen J. Nobles

Senior Crime Laboratory Analyst, Florida Department of Law Enforcement, Pensacola Regional Operations Center, Pensacola, Florida 32501

In the late 1980s, Dr. Philip D. Bouffard began development of the 1st computer-based typewriter typestyle classification program, which he called "TYPE." This program, based on the manual typewriter classification systems of the time, required a DOS-based operating system and used a searchable database to limit the number of known type specimens that had to be compared with a questioned typewritten text. Dr. Bouffard gave his time and this program to the forensic document examination discipline in order to further the science. Over the years, this author has used Dr. Bouffard's program to solve many typewriter questions and, in appreciation, endeavors to update the program to run in the current Windows® environment so that the forensic document community can continue to benefit from Dr. Bouffard's foresight and generosity.

Introduction

As long as there have been typewriters, there have been document experts who have been tasked with identifying which typewriter, or which make of typewriter, was used in the creation of a particular document. One of the earliest references to typewriter identification was written in 1894 by William E. Hagan in his book, *A Treatise on Disputed Handwriting and the Determination of Genuine from Forged Signatures*. Mr. Hagan wrote, "All typewriter machines, even when using the same kind of type, become more or less peculiar by use as to the work done by them. One of these characteristics which each machine manifests is that produced by varying alignment, in which some of the type make peculiar imprints which very positively connects the work done with the machine by which it was produced, and this occurs more particularly to such of them as have been used for some time, and so distinctly marked does this peculiarity become connected with the printing done by each machine that little skill is required when comparing the work done by a dozen of them to pick out that produced by each of them. A knowledge of this fact sometimes becomes important in tracing up the source of an anonymous letter printed by a typewriter machine."

Then in 1901, Daniel T. Ames devoted a section in his book, *Ames on Forgery*, to the identification

of typewriting and wrote, "Since typewriting has come so generally into use, the question often arises as to the identity of writing by different operators as well as that done on different machines. This may usually be done with considerable degree of certainty....The distinctive character of the writing done on different machines is usually determined with absolute certainty. With most machines there are accidental variations in alignment. Certain letters from use become more or less imperfect, or become filled or fouled with ink. It is highly improbable that any one even of these accidents should occur in precisely the same way upon two machines, and that any two or more should do so is well-nigh impossible.... A careful comparison of different typewritings in these respects cannot fail to determine whether they are written by the same operator or upon the same machine."

Albert S. Osborn, author of *Questioned Documents*, first published in 1910, devoted an entire chapter of his book to "Questioned Typewriting" which began, "There is an increasing use of the typewriting machine for the production of spurious papers; this is due to the great increase in use of the typewriter generally and the erroneous idea that fraudulent typewriting cannot be detected." Osborn outlines the problems of the time by stating, "Sometimes the question is simply whether a document was written on a certain

kind of machine, and then again whether it was written on a certain particular typewriter which may be one of a number of suspected machines." He further explains that "...the most important special points for consideration are the design, size and proportions of the type faces."

Hagan, Ames, and Osborn recognized early on that typewriters developed individual defects; and if a sufficient kind and number of those defects existed, a particular machine could be identified as being the source of a questioned typewritten document. Fortunately for them, the limited number of typewriters that were manufactured and available in their particular geographic location provided them with a relatively small number of machines and samples for comparison. However, as travel became easier and more common, the geographic location that could contain a suspect typewriter grew. During the same time period, the number of makes and models of typewriters increased, as did the sheer number of typewriters in use. In the beginning, the heavy and cumbersome typewriting machines were primarily used in businesses; but with the introduction of the relatively inexpensive portable typewriters in the 1940s and '50s, home use was growing by leaps and bounds. This growth presented a much greater challenge to document examiners. Now when examining a questioned typewritten document, the examiner would need to classify the make and model of the typewriter in order to narrow down the possible number of suspect machines.

By 1951, Ordway Hilton had already recognized the need for a classification system. He published a study in the *American Journal of Police Science* to "set up a systematic scheme for checking an unknown specimen so as to enter a reference collection knowing definitely the make and having only to determine within a narrow range the age-model." Then in the late 1960s, Dr. David Crown developed a system to help document examiners classify pica monotone typewriters, and he continued to update this system for many years. In 1972, Gerry de la Durantaye also presented a paper on a system of typestyle classification. Finally, in Germany in the mid 1980s, a comprehensive collection of typefaces was assembled by Josef and Bernard Haas and published as the Haas Pica and Non-Pica Atlases.

Building mainly on the work of Josef Haas and Dr. Crown, Dr. Philip Bouffard began the laborious process of compiling the information for use with a personal computer. Using a relational database format, a search could be conducted to

significantly narrow down the possible matches of make and model of typewriter used to produce a questioned typewritten text. The **TYPE** program was born! Dr. Bouffard continued to update and enhance the TYPE program for many years, adding designations for Courier, Prestige, Elite Sans Serif, Cubic, Script, and other typeface designs. The examiner could enter the criteria into the program and retrieve a list of typewriters with similar design characteristics. The "Memo Pad" function was then activated; and specific information about each typewriter was displayed, along with a corresponding page in the Haas Atlas which contained a strike-up of the typeface. Then a physical examination could be made to determine if the typefaces corresponded. Over 20 years later, Dr. Bouffard's TYPE program is still being used. The data has not changed, but the DOS-based format is difficult to run in the Windows environment. This project began as a way to try to bring the data into a Windows-compatible format.

Methods and Materials

The data in the original TYPE program was stored using dBase, 1 of the best database programs of the time, but unfortunately not designed for a Windows-based environment. Microsoft Access®, is a relational database management system that combines the relational Microsoft Jet Database Engine with a graphical user interface and software development tools. Access stores data in its own format but can also import or link directly to data stored in other Access databases, Excel, SharePoint lists, text, XML, Outlook, HTML, dBase, Paradox, Lotus 1-2-3, or any ODBC-compliant data container. For these reasons, it was the logical choice for the updated TYPE program. **WinType** was born!

Discussion

Microsoft Access was able to successfully import the tables of data from the original TYPE program, but all the codes for the search functions had to be rewritten by Joe Stephens, document analyst with the United States Secret Service, so that the correct results would be generated. The technology for digital imaging has come so far since the original TYPE program was written that a decision was made to add images to assist the examiner in choosing the correct search criteria. Let's take a look at where the program is now.

The main screen displays a list of the searchable typestyles (Figure 1). Clicking on the "+"

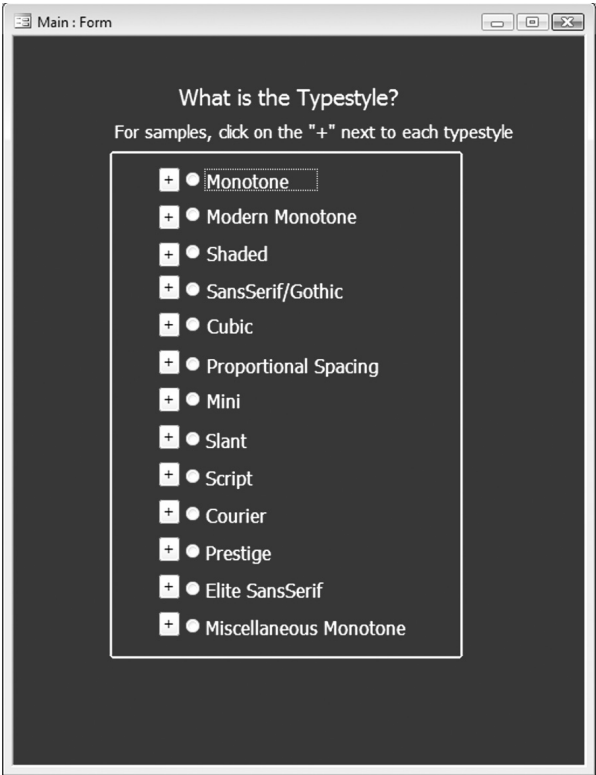


Figure 1 WinType's Main Search Screen

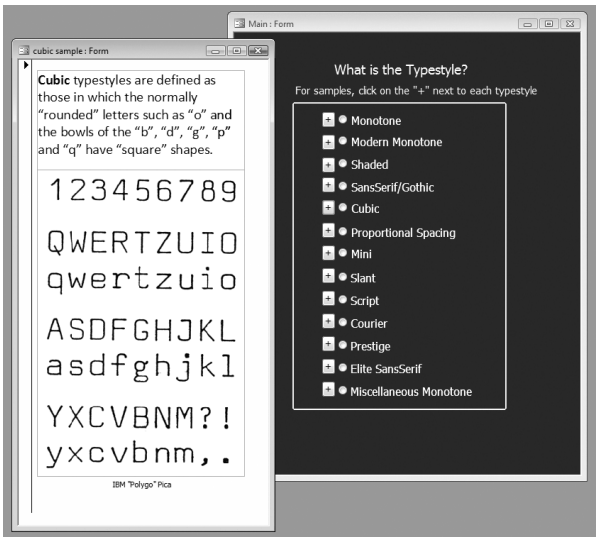


Figure 3 Cubic definition and sample

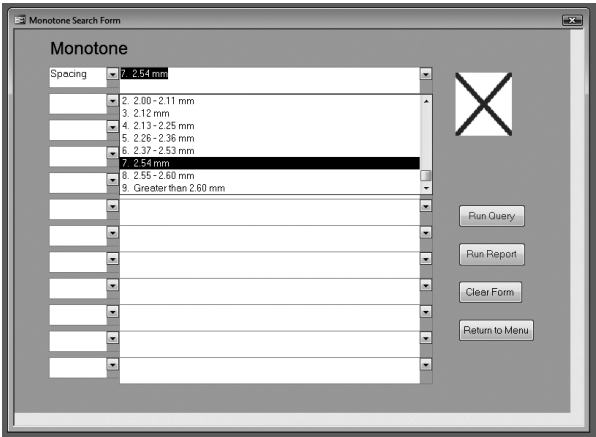


Figure 4 Monotone search form

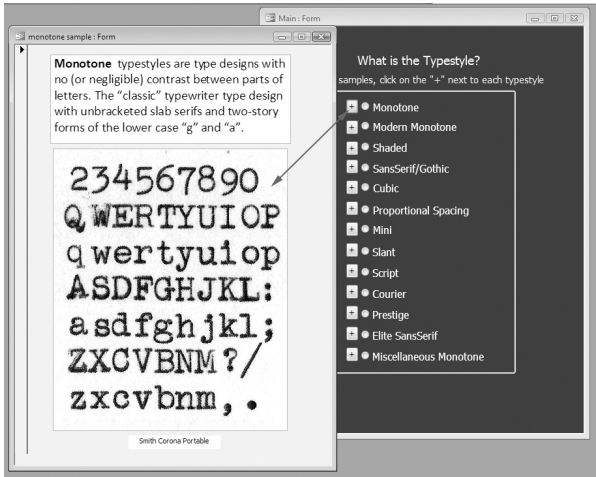


Figure 2 Monotone definition and sample

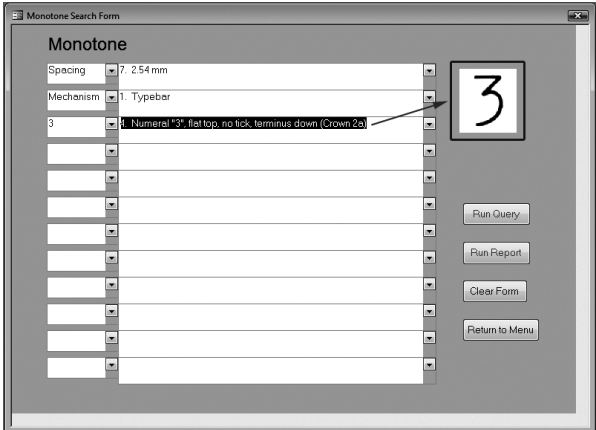


Figure 5 Typeface design feature

Figure 6 Criteria being entered into the Monotone search form

symbol next to a specific typestyle name will open another window that provides a description of the typestyle, as well as a sample of type (Figures 2 and 3).

Once a typestyle is chosen, the circular radio button is clicked, and a type style-specific search window is opened.

Within this search form, there are drop-down boxes on the left where the criteria for the search are chosen and a corresponding drop-down box for selecting the specific parameter of that criteria (Figure 4).

For those criteria that involve typeface design features, a sample of that feature will be available in the image box in the top right-hand corner of the search form (Figure 5). If no image is available, the red "X" shown above will be visible.

The examiner then continues using the drop down boxes to select the criteria to search on the left and the specific design feature of that criteria on the right. The characteristic showing in the image box will always be the most recent criteria

chosen (Figure 6). Note that the criteria listed are consistent with Dr. Bouffard's original list which he formulated by putting the most discriminatory criteria at the top of the list.

When several criteria have been entered, the "Run Query" button should be selected for the primary search. A window will pop up showing the number of records that match. It will also show each parameter chosen for each criteria for a specific typewriter (Figure 7). In this case, there were 5 possible typewriters found.

In Figure 8, we see that the lowercase "d" and lowercase "r" each have 2 different characteristics listed, which means that if either of those letters appears in the questioned text, the search can be further refined. Going back to the search form, a "2" will be entered for the lowercase "d" and a "1" for the lowercase "r." Then the search will be repeated (Figure 8). Two possible matches were returned; and looking at the criteria, they are essentially the same typeface. Below is the Memo Pad information for each match, and a report can be generated listing them (Figure 9).

*Smith Corona 1P, Pica Monotone,
from about the mid-1960s
Used on Smith-Corona P/El and on Tower P.
Haas Pica Atlas #44-A1
Crown # Smith-Corona P1.*

*Smith Corona 1P, Pica Monotone,
from early 1960s
Used on Smith-Corona P/El and Tower P.
This version has different " from 44A1 version
Haas Pica Atlas #44-A2.
Crown # Smith-Corona P1.*

Results

As of this writing, Dr. Bouffard's TYPE database appears to have been successfully converted from a DOS-based format into a Windows-based

qryMasterSearch: Select Query

Typewriter	Memo Pad	Typ	Spa	Sut	Mec	3	4	7	8	M	W	lower w	a	f	t	lower g	E	lower d	lower r	lower l	lower m	j	c	b	y	k	h	lowe	
PM CSA 1P E150-254	Manufactured by Caracteres S. A. - Le Lo	1	7	5	1	4	4	4	2	6	4	4	2	3	6	2	1	2	1	2	1	1	3	3	1	4	2	1	1
PM CSA 1P E250-254	Manufactured by Caracteres S. A. - Le Lo	1	7	5	1	4	4	4	2	6	4	4	2	3	6	2	1	2	1	2	1	1	3	3	1	4	2	1	1
PM CSA 1P E350-254	Manufactured by Caracteres S.A. - Le Loc	1	7	5	1	4	4	4	2	6	4	4	2	3	6	2	1	2	1	2	1	1	3	3	1	4	2	1	1
PM SC 1P C161-254	Smith Corona 1P, Pica Monotone, from at	1	7	5	1	4	4	4	2	6	4	4	3	3	1	1	1	2	2	1	1	1	3	3	2	3	1	2	1
PM SC 1P C261-254	Smith Corona 1P, Pica Monotone, from ea	1	7	5	1	4	4	4	2	6	4	4	3	3	1	1	1	2	2	1	1	1	3	3	2	3	1	2	1
*																													

Record: 1 of 5

Figure 7 Preliminary search results

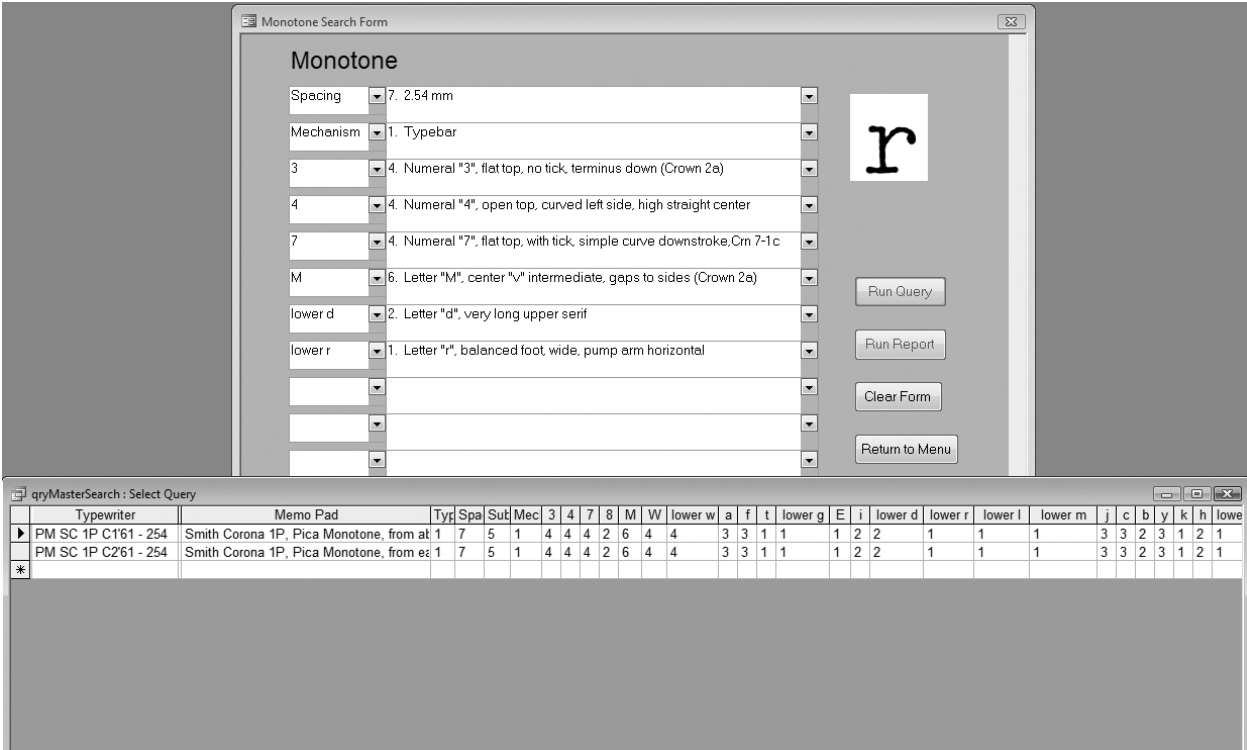


Figure 8 Final search results

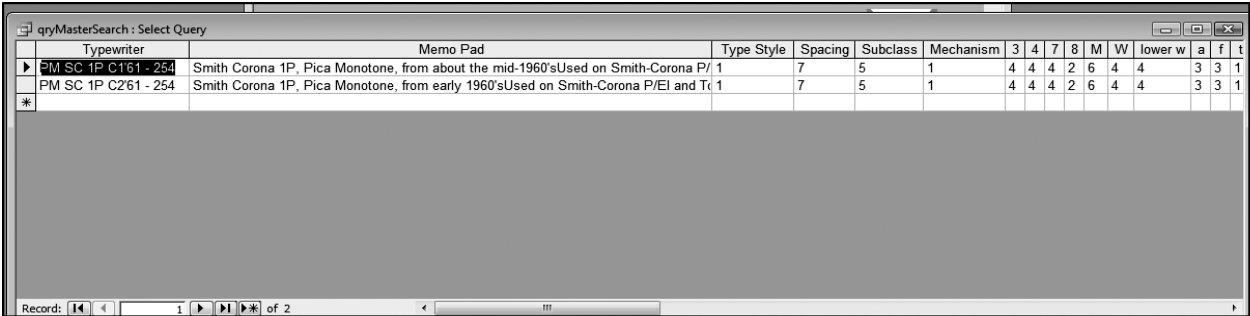


Figure 9 The final 2 typefaces

format which can be searched and reported on using the Microsoft Access program. The design of the database, its search functions, and reporting format are currently being refined through testing and use. Images of each of the Monotone characteristics are being scanned into the database, and other type styles will follow. However, additional testing and validation will need to be done before the database is ready for general use by forensic document examiners in case work.

Conclusion

The results of this research and project bring into focus the need to preserve the knowledge and work of those who have come before us and to insure that this information is accessible to the community of forensic document examiners now and in the future. This project has also highlighted the need to digitize other valuable typewriter references such as the Interpol database and to

link it and the digital version of the Haas Atlas to the WinType program if legal permissions can be obtained.

Acknowledgements

First and foremost, this author would like to thank Dr. Philip Bouffard for the thousands of hours he invested in the original TYPE database, which has proved invaluable to forensic document examiners for many years. Also, this project would never have progressed to this point if it were not for Joe Stephens, document analyst with the United States Secret Service, who so willingly shared his time and expertise in Microsoft Access; and this author thanks him for his patience with the many, many large and small changes that had to be made throughout the process. And lastly, this author would also like to thank Lamar Miller for his wonderful advice and continued encouragement during the past 24 years.

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