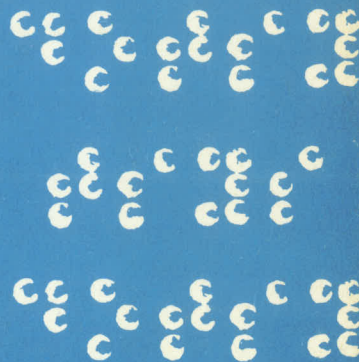


Computerized Braille

quite
knowledge
people
rather
which

PCVE X TO CODED-SIGN (CUTPTR).
PCVE COTS-1-4 (X) TC BRAILLE-(1)
MOVE DOTS-2-5 (X) TC BRAILLE-(2)
PCVE COTS-3-6 (X) TC BRAILLE-(3)



Proceedings of a Workshop on the Compliance of
Computer Programs with English Braille, American Edition

Edited by R. A. J. Gildea and M. Berkowitz



Association for Computing Machinery

American Foundation for the Blind

COMPUTERIZED BRAILLE

Proceedings of a Workshop on
**COMPLIANCE OF COMPUTER PROGRAMS WITH
ENGLISH BRAILLE, AMERICAN EDITION**

New York City, June 7–8, 1976

Sponsored by
Association for Computing Machinery
American Foundation for the Blind

Edited by
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Transcribed in English Braille by

ARTS Service Bureau
Protestant Guild for the Blind
Watertown, Massachusetts

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Foreword

In the past decade a vast amount of experience has been accumulated in the computerized translation and production of English braille. Some of the braille rules reflect the fact that the code is based, in part, on natural language considerations such as pronunciation, stress, pause, syllabification, and variations in type, font, and format. Experience has shown that it is not economically feasible, and in some instances impossible, to program a computer to translate English braille so that the translation will be in perfect accord with the braille rules without human intervention. It is imperative to reduce the amount of human intervention which is required so that automation will be able to achieve:

- a. much greater variety of braille reading matter;
- b. more timely brailled material;
- c. inexpensive braille despite sharply rising costs;
- d. error-free braille.

The entire braille community, including producers, consumers, and supporting organizations, is interested in these goals so long as readability of braille is not significantly impaired. Changes in the present rules could come close to attaining the above goals without significantly tampering with readability. Upon the basis of experience with computerization of braille, we are now in a better position to define the problem areas which prevent automatic translation of braille by computer. It is advisable, therefore, to determine which provisions of the official rules should be modified. It is important to stimulate communication between computer programmers (who may not be experts in the rules of braille and in the problems of braille readers) and experts in braille (who may not be cognizant of computer limitations). Such interchange of ideas can form the basis of informed recommendations for modification of the official braille rules to facilitate computer production of braille while maintaining high standards of readability. With this goal in mind this first national conference was convened to serve as a forum for the exchange of ideas among experts in braille and in computer technology.

Preface

The American Foundation for the Blind (AFB) and the Special Interest Group on Computers and the Physically Handicapped (SIGCAPH) of the Association for Computing Machinery (ACM) jointly sponsored a workshop held in New York City, June 7-8, 1976, at AFB.

Participation in the workshop was for those expert in the rules of English braille and in computer translation of braille. The goal of the workshop was to produce two types of recommendations concerned with automated production of computer braille:

TYPE A: Changes to the rules for English braille; and

TYPE B: Changes to the policy and procedures for Library of Congress certification.

This workshop was concerned only with literary braille, not textbook formats, music braille, the Nemeth code, or multiplicity of automation implementation issues. The final recommendations of the workshop will be submitted to the National Braille Authority who will act on matters concerning rule changes. There was insufficient time to consider Type B recommendations.

Invitations to participate in the workshop were extended to those who submitted position papers, recommendations, or background material. A small number of observers were also invited. Copies of these documents, in print or braille, were distributed in advance to all invited participants and observers. A roster of attendees is included at the end of these Proceedings.

The workshop began with a plenary session Monday morning and broke into six working subgroups Monday afternoon. Tuesday began with a short plenary session followed by subgroup meetings. The subgroups completed their deliberations by mid-morning. The workshop ended with a plenary session during which subgroup reports were read and discussed.

Each subgroup was assigned a section of the 1972 revision of the braille rules* for consideration as follows:

* English Braille American Edition 1959, revised 1962, 1966, 1968, 1970, 1972, compiled under the authority of the American Association of Workers for the Blind, the Association for Education of the Visually Handicapped, and the National Braille Association. Louisville: American Printing House for the Blind, 1972.

- Subgroup 1. Rule VI: Abbreviations, particularly quantity and acronyms.
- Subgroup 2. Rules and sections concerning and, for, of, the, with, and a and to, into, and by.
- Subgroup 3. Punctuation, composition, letter sign, and number sign.
- Subgroup 4. Rule XIII: Lower Signs.
- Subgroup 5. Initial-letter and final-letter contractions.
- Subgroup 6. Short-form words.

Subgroups consisted of a discussion leader and a secretary. At least one braille and one computer expert were in each subgroup.

At the conclusion of the workshop, expressions of appreciation were voiced to AFB and ACM for their creativity and imagination in initiating and supporting a workshop to discuss such pression issues. Special appreciation is extended to Mr. Robert Gildea of ACM and to Dr. Marvin Berkowitz of AFB for organizing and hosting the workshop. A special note of appreciation is made to Mr. Peter Duran and the ARTS Service Bureau, Protestant Guild for the Blind, Watertown, Massachusetts for preparing braille copies of the position papers and a braille version of these Proceedings on the ARTS computer system.

Sponsors' Statements

ACM Statement

With great pleasure this statement is being written, because the workshop documented herein was so successful. I think it was successful in the following three ways.

The first way in which it was successful is that there was a beneficial exchange of understandings and experiences amongst the participants. Most participants said to me or Dr. Berkowitz that they were pleased to have been present and that they learned a lot.

The second way is that the workshop was the first step in bringing together those who are knowledgeable in the design of the braille rules and those who are knowledgeable in the design of computer programs for braille translation. At the end of this document there is a list of attendees which reflects a very broad representation of the braille community. The workshop initiated the dialogue between the brailleists and information processing technologists at a time when the three sponsoring organizations of the Joint Braille Authority were considering revamping the structure and operation of the Joint Braille Authority. Hopefully, the results of the workshop will serve in some way as a contribution to the three organizations in reaching the goal of serving the readers of braille.

The third way is that the material in these Proceedings, especially in the position papers, forms a significant data base for researchers who will continue the work started at this workshop.

The Special Interest Group on Computers and the Physically Handicapped (SIGCAPH) of the Association for Computing Machinery (ACM) is very interested in the subject of introducing more automation into the production of braille. In 1973, it co-sponsored the First International Workshop on Computerized Braille with the University of Muenster, American Foundation for the Blind, and IBM Germany. That workshop, held in Muenster, Germany, and the Second International Workshop, held near Copenhagen, Denmark, were restricted to those who were information processing technologists. This workshop on English braille, held in New York City, had the added dimension of participation by braille rules experts and was better for it. The first two international workshops have possibly served their purpose in having the technologists learn about what is going on in the rest of the world.

Perhaps the next international workshop on computerized braille will start with the New York meeting as a model and extend it to invite not only the technology and braille rule experts, but also the representatives from the ministries and braille presses.

The purpose of the workshop was to study the American version of standard English braille and since this is of interest to other English-speaking countries, observers were invited from Canada and England. I made a serious mistake in forgetting about our friends in Australia and New Zealand, for which I sincerely apologize. I hope that this error can be rectified by communicating with them in the future.

This document is divided into two main sections, with the first being the minutes of the workshop and the second the set of correspondence, articles, and position papers which were for the most part generated before the workshop. The material in the first part is the product of much distillation of the discussions of the workshop because there were enough participants who did not want to be quoted or have their remarks taken out of context. The detail that is left in the minutes of the workshop and in the submitted position papers is there for the use of future researchers.

Several of the participants assisted in the preparation of these Proceedings starting at the close of the workshop on Tuesday, and working through Wednesday and Thursday. A special note of appreciation is expressed for the contribution of Dr. Phyllis Biese-meier, who worked through that nearly three-day period on the Proceedings. Also assisting in the editing were Peter Duran, Bernard Krebs, Lois Leffler, Susan Maure, and Dr. Abe Nemeth.

As Vice Chairman of SIGCAPH I was pleased to work with and receive the cooperation of the staff of the co-sponsoring American Foundation for the Blind and wish here to express my appreciation.

Robert A. J. Gildea
SIGCAPH Vice Chairman for the Blind

November, 1976

AFB Statement

In co-sponsoring the workshop on Compliance of Computer Programs with English Braille, American Edition with the Special Interest Group on Computers and the Physically Handicapped of the Association for Computing Machinery, the American Foundation for the Blind carried forward its involvement with braille, an involvement stemming from the early 1920's. (Frances A. Koestler has documented this history in her recent book The Unseen Minority--A Social History of Blindness in America, David McKay Co., Inc., New York: 1976.) We are mindful of the considerable emotional and intellectual investment that leaders in braille transcription made in resolving the "War of the Dots," during the period when several competing braille punctiform codes vied for supremacy among the braille reading public. And we tend, therefore, to weigh with care any proposal to alter the code used for the past fifty years in braille printing.

Advances in both software and hardware in the computing industry during the last ten years have made possible the automatic transcription of ink print into contracted braille. In the main, the systems developed to date involve skilled braille transcribers in feeding data into the computer, checking the output of the computer, or both. The most recent developments presage wholly automatic transcription of ink print into braille without human intervention.

Elsewhere in the world where such developments have taken place, there exists already a two-, three-, even four-tier set of "standards" often de facto but not de jure, that is, only the code authorized for human transcription and not using the computer is an official standard; the alternative standards represent variations in the published braille standard introduced because of the limitations of the computer in coping with the intricacies and difficulties of the rules for braille transcription. Even so, it ought to be pointed out, the quality of braille transcription possible by wholly automatic translation is strikingly high, as several observers at this Workshop pointed out.

It is interesting to note that of the 775 new titles of books announced as available in the U.S. in the Braille Book Review during 1970, nearly 600 were made without assistance from the computer. It is obvious to us that there is considerable room yet for the introduction of automatic transcribing capabilities in wide-scale deployment if we are to reach the goal of enhancing the availability of braille, holding down the cost of its production, and increasing significantly the present readership of braille publications.

It was AFB's hope that by bringing together skilled brailleists, those responsible for establishing the rules for braille, and computer specialists who had developed the capability for computer transcription of ink print material, we could create the conditions under which braille could be more widely deployed while still satisfying the demands of readers for continuity in the braille code. As an ideal, we shared with the participants the hope that a single standard for braille transcription would eventually obtain; failing that, that some accommodation could be made with the official standard for the contraction of braille and the application of its rules, to the end that the variability among computer-generated facilities could be reduced as far as feasible.

We believe that:

- the dialog among experts initiated at this meeting was an important first step in that direction;
- greater understanding and appreciation will be generated of both the inherent logic of the present braille standard and the capabilities of the computer to undertake automatic transcription; and
- out of the efforts of this group will come a mandate for structured research and application of changes in the rules of braille toward the goals of preservation of readability and the lowering of cost of the braille product.

Marvin Berkowitz
Leslie L. Clark

Research and Technological
Development Department

November, 1976

Proceedings

I. Plenary Session, Monday, June 7, 1976

The opening session of the workshop was convened at 9:00 a.m. on Monday, June 7, 1976.

After introductions and a brief discussion of arrangements, the group considered principles on which the rules of braille should be based using as a basis of discussion Peter Duran's position paper (Annex 3).

We present here the major points of view discussed in each case without attributing authorship and without making a judgment on their merits. We shall be as brief as possible and no importance should be attached to the amount of space required for the presentation.

A. CONFORMITY BETWEEN BRAILLE AND INK PRINT

1. Complete conformity is necessary because blind people must have a common ground of communication with sighted peers.
2. Conformity should be sacrificed where necessary in favor of improved readability.
3. The amount of conformity depends on the philosophy of education and on the roles of the blind persons in society.
4. Adherence to strict conformity would facilitate computer translation of braille.
5. Complete conformity is impractical because of space considerations and the huge ratio of available print symbols compared with braille symbols.
6. Publishers' preferences for symbols and type fonts should not be permitted to impair readability where alternative standard practices are available.

B. ONE-TO-ONE CORRESPONDENCE BETWEEN PRINT AND BRAILLE SYMBOLS

This principle means that there should be one and only one unique symbol in braille for each distinct print symbol and vice versa.