BRAILLE
(Expert Comments: Mr. Harshad U. Joshi)

"The significance of Braille's contribution is critical: without a system of effective communication through reading and writing, the education of blind children would undoubtedly have remained as it had been through the Middle Ages" - Lowenfeld, 1975

1. Introduction

1.1 Inventor : The name 'Braille' of the embossed script for the blind has been derived from the inventor of this six dot system - Mr. Louis Braille of Couprey near Paris in France:

Louis Braille : Born : 4 January, 1809
Death: 6 January, 1852

Louis Braille devised the embossed six dot system based on a twelve dot secret code-system prepared by a Frenchman Charles Barbier for the use of the French Intelligence.

1.2 System : Braille is a tactile approach to reading and writing. The basic Braille symbol is called the Braille cell. It consists of six dots arranged in the formation of a rectangle, three dots high and two dots wide or arranged in two columns and three rows. Each dot has a assigned number between one and six.

Braille is a system of embossed "signs" which are formed by using combinations of six dots arranged and numbered thus:

$$1\ O \quad O\ 4$$
$$2\ O \quad O\ 5$$
$$3\ O \quad O\ 6$$

These cells can be arranged in 63 combinations each representing a different character as illustrated in the Standard English Braille Chart.

ENGLISH BRAILLE

```
        A    B    C    D    E    F    G    H    I    J
1st    ●○   ●○   ●●   ●●   ●○   ●●   ●●   ●○   ○●   ○●
Line   ○○   ●○   ○○   ○●   ○●   ●○   ●●   ●●   ●○   ●●
       ○○   ○○   ○○   ○○   ○○   ○○   ○○   ○○   ○○   ○○

        K    L    M    N    O    P    Q    R    S    T
2nd    ●○   ●○   ●●   ●●   ●○   ●●   ●●   ●○   ○●   ○●
Line   ○○   ●○   ○○   ○●   ○●   ●○   ●●   ●●   ●○   ●●
       ●○   ●○   ●○   ●○   ●○   ●○   ●○   ●○   ●○   ●○

        U    V    X    Y    Z   and  for  of   the  with
3rd    ●○   ●○   ●●   ●●   ●○   ●●   ●●   ●○   ○●   ○●
Line   ○○   ●○   ○○   ○●   ○●   ●○   ●●   ●●   ●○   ●●
       ●●   ●●   ●●   ●●   ●●   ●●   ●●   ●●   ●●   ●●
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```
        ch   gh   sh   th   wh   ed   er   ou   ow   w
4th    ●○   ●○   ●●   ●●   ●○   ●●   ●●   ●○   ○●   ○●
Line   ○○   ●○   ○○   ○●   ○●   ●○   ●●   ●●   ●○   ●●
       ○●   ○●   ○●   ○●   ○●   ○●   ○●   ○●   ○●   ○●
```

```
             ;    :    .
        ,    be  con  dis         !   ( )   "         "
        ea   bb   cc   dd   en   ff   gg   ?    in   J
5th    ○○   ○○   ○○   ○○   ○○   ○○   ○○   ○○   ○○   ○○
Line   ○○   ●○   ●○   ●●   ○●   ●●   ●●   ○●   ○●   ○●
       ○○   ●○   ○●   ○●   ●○   ●○   ●●   ●●   ●○   ●●
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```
                    Numeral  Poetry    Apostrophe  hyphen
                    Sign     sign
        st   ing    ble      ar                    com
6th    ○●   ○●     ○●       ○●          ○○         ○○
Line   ○●   ○●     ○●       ○●          ○○         ○○
       ●○   ●●     ●●       ●○          ●○         ●●
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```
        Accent    Italic    Letter    Capital
        sign      sign      sign      sign
7th    ○●        ○●        ○○        ○○
Line   ○○        ○○        ○●        ○○
       ○○        ○●        ○○        ○●
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Used in forming   ○○   ○●   ○●   ○●   ○○   ○○
Contractions :    ○●   ○●   ○●   ○○   ○●   ○○
                  ○○   ○○   ○●   ○●   ○●   ○●
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```
                       Square Brackets  Inner   quotes
              *    Dash    [        ]       '         '
Compound  ○○○○ ○○○○ ○○○○ ○○○○ ○○○○ ○○○○
Signs     ●○○● ○○○● ○○●● ●●○○ ○○●● ●●○●
          ●○●○ ●●●● ●●●● ○●●● ●●●○ ●●●○
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The beauty of Braille is that it is based on phonetics. Thus be it any language, Hindi, Japanese, German or Chinese, the same sounding letters will have the same Braillle sign. For example, "ba" in Hindi has the same dot as "b" in English.

1.3 Capital Letters : There are no different symbols for capital letters in Braille. Capitalization is accomplished by placing a dot 6 in the cell just before the letter that is capitalized.

Illustration: For example, dot 6 in one cell before dot 1 in the next cell would make the combination "A".

```
○ ○   ● ○        ○ ○   ● ●
○ ○   ○ ○        ○ ○   ○ ○
○ ●   ○ ○        ○ ●   ○ ○
+-------+        +------+
     A                C
```

1.4 Numbers: The first ten letters of the alphabet are used to make numbers. These are expressed by the letters 'a' to 'j' preceded by the numeric indicator which is dots 3-4-5-6.

Illustration: The numeric indicator, dots 3-4-5-6 in one cell, before dots 1 in the next cell, which is letter 'a' would make the combination as numeral '1'. Similarly the letter 'b' preceded by numeric indicator would represent numeral '2'. In the same sequence the letter 'j' preceded by numeric indicator would represent numeral '0'

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○ ●   ● ○        ○ ●   ○ ●
○ ●   ○ ○        ○ ●   ● ●
● ●   ○ ○        ● ●   ○ ○
+-------+        +------+
     2                0
```

1.5 GradeLevels : The Braille system is classified into three grade levels:

1.5.1 Grade I: Each letter of the Braille word is fully spelled out. It is generally sufficient to learn Grade I for those who do not read and write Braille extensively.

Illustration: The word "STAND" can be represented by dots 2-3-4 in one cell, dots 2-3-4-5 in the second cell, dot 1 in the third cell, dots 1-3-4-5 in the fourth cell and dots 1-4-5 in the fifth cell:

```
○ ●   ○ ●   ● ○   ● ●   ● ●
● ○   ● ●   ○ ○   ○ ●   ○ ●
● ○   ● ○   ○ ○   ● ○   ○ ○
  S     T     A     N     D
```

1.5.2 Grade I and 1/2: It represents normal (open) Braille with group symbols which are moderately contracted.

Illustration: The group symbol for 'THE' is dots 2-3-4-6. Thus if dots 2-3-4-6 in one cell are followed by dots 1-3-4 in the second cell, the combination is read as 'THEM'.

```
○ ●   ● ○   ● ○   ● ●
● ●   ● ●   ○ ●   ○ ○
● ○   ○ ○   ○ ○   ● ○
  T     H     E     M
        _____
        ○ ●   ● ●
        ● ○   ○ ○
        ● ●   ● ○
```

Similarly, the group symbols for the following common words are indicated below:

```
● ○   ● ●        ● ○   ● ●
● ●   ● ○        ● ○   ● ○
○ ○   ● ●        ● ○   ● ●
   HAND             LAND
```

1.5.3 Grade II: It represents contracted form of Grade I Braille. Generally the Braille books for children contain Grade II Braille.

Illustrations

(i)   Contractions With One Cell Only

B	in Braille stands for	BUT
C	in Braille stands for	CAN
D	in Braille stands for	DO
E	in Braille stands for	EVERY
K	in Braille stands for	KNOWLEDGE
P	in Braille stands for	PEOPLE, etc.

(ii)   Contractions With Two Cells

Dot 5 N
Stands for NAME

Dot 5 F
Stands for FATHER

Dot 5 M
Stands for MOTHER

(iii) Group Symbols with Three Cells

C   H   A   N   C   E

CH   ANC   E

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Thus dots 4 and 6 in one cell which is a second cell in a group symbol stands for ANCE. Similarly, dots 5 and 6 in one cell in this position stands for ENC e.g. in PENCE.

(iv)   Abbreviation

A   B   A   C   R

Stands for
ABOUT

Stands for
ACROSS

B   R   L

Stands for
BRAILLE

The practice of reading and writing of Braille from grade 1 to Grade 1 and 1/2 to Grade 2 has now generally been given up, and Braille Grade 2 is used from the beginning of reading and writing instructions.

1.5.4 Grade III: It is a complicated form of Braille, mostly used as short-hand.

Illustrations

(i)   Contractions

Stands for
FOLLOWING

Dots   F
4, 5, 6

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2. Braille Reading and Writing : It should include

a. Pre- Braille Training
b. Reading Readiness Test
c. Reading Braille
d. Writing Braille

2.1 Pre-Braille Training

Before teaching Braille reading and writing skills, it is important that the child develops good tactual discrimination and finger dexterity. A child should be encouraged to perform various activities to develop hand coordination, finger movement, tactual discrimination and fine muscle coordination. It is advisable to develop a variety of Pre-Braille worksheets using different combinations of six dots. These worksheets train the child to move fingers from left to right, identify location of dots and identify differences among Braille dots.

Kirk Horton has suggested Pre-Braille Worksheets in his UNESCO publication *"Guides for Special Education No.6"*. These Worksheets can be easily developed using a Braille frame or a brailler, stylus and Braille paper:

worksheet a: Follow the Braille lines

- Develop a worksheet with Braille lines using dots 3 and 6.
- Make four lines of different lengths.
- Identify shortest and longest lines.

worksheet b: Follow the Braille line and identify breaks

- Make a worksheet like worksheet A, but leave a single four cell break in each line.
- Have the child identify breaks.

worksheet c: Follow the Braille line and identify the misplaced dots

- Make a worksheet using a single dot.
- in one place on each line, use a different dot.
- Have the child find misplaced dot.

In this way a number of worksheets can be developed.

2.2 Reading Readiness Test

As a sensory training, Reading Readiness Test, as recommended by Wolfgang Stein, should be administered. The test can be developed using cardboard, scissor, glue and paper. Three shapes viz. round, triangle and square should be cut into larger and smaller sizes. The shapes should be pasted on paper in the following sequence:

Worksheet No.	Items	Illustration
1.	Large circle	◯
2.	Large square	☐
3.	Large triangle	△
4.	One large circle and one small circle	◯ ∘
5.	One large square and one small square	☐ ▫
6.	One large triangle and one small triangle	△ △
7.	One large circle and two small circle	◯ ∘∘
8.	One large squares and two small squares	☐ ▫▫
9.	One large triangle and two small triangles	△ △△

Increase the small circle, square and triangle one each in the subsequent worksheets till their number reaches six. The last three worksheets should have six small circles, six small squares and six small triangles each.

Administer the test to the blind child who has been exposed to pre-Braille activities. Once the child is able to identify these worksheets clearly, he is ready for training in reading of Braille.

2.3 Reading of Braille

The Pre-Braille Training and Reading Readiness Test should culminate into reading of Braille. Wolfgang Stein advocates scientific approach to teaching of Braille and recommends the following sequence:

- Reading of Braille should be the first step
- Beginning should be made with recognition of dots
- Writing of Braille should be the last stage

2.3.1 System
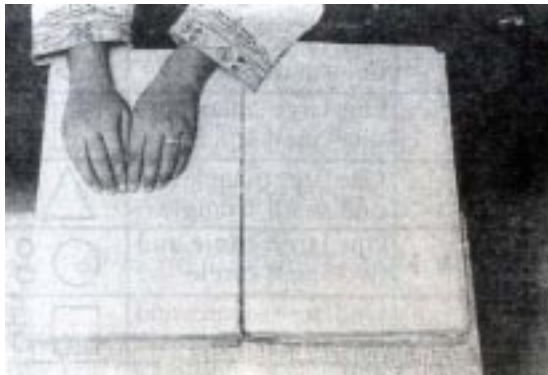
- Use both forefingers for reading Braille
- Read Braille with the tips of the fingers
- Fingers should be slightly bent and wrist should be slightly elevated
- Fingers should be slightly curved and resting lightly on the reading material
- Dots should be touched lightly and not pressed hard
- Read from left to right
- Most people read Braille with the right index finger, using the left index finger to read part of the Braille line or as a marker at the left margin to help find the next line.

2.3.2 Technique

- To develop the Braille mechanism, certain tactual discrimination activities should be undertaken.
- Start with Grade I Braille only.
- First Braille word introduced to the child should be a familiar word.
- Sentence-Word-Letter method of teaching Braille reading is recommended, sentence should be introduced to the child at the outset.
- Once a child is able to analyze the sentence, words of the sentences should be given in pieces.
- When the child is able to understand sentence and words completely, he should be encouraged to break words into characters.
- The analysis would help him to understand configuration of each character which is very essential for a blind child to understand.

2.4 Braille Writing

2.4.1 Method: Generally, Braille is written with a Braille slate, Inter Point Braille Frame, or a four line pocket frame and a stylus; or with a Brailler.

a. To write Braille with a slate or Interpoint Braille Frame:

- Paper is inserted between the top and bottom layers of the guide of the slate or the pocket frame.
- Paper is held firmly using locking mechanism in case of the slate or corner pins in case of a pocket frame.
- Braille dots are punched using the stylus downward into the paper through the cells of the slate or frame.

- Braille is written from right to left so that when the paper is turned over for reading, characters can be read from left to right.

b. To write Braille with a Brailler:

- Paper is inserted through a slot.
- Paper is rolled on a drum by rotating the knobs.
- Braille can be written on the top of the paper by pressing the necessary keys.
- On Brailler, the operator will write from left to right as dots are appearing on the upper part of paper.

2.4.2 Necessary Skills

a. Child must understand the meaning of each cell

b. Child should possess the following:

- Finger manipulation skills
- Fine motor coordination and control of muscles
- Competency to read familiar Braille words

2.4.3 Technique

- Ask the child to punch all the dots.
- Teach easiest formations, to begin with.
- Left hand should identify the Braille cells while the right hand punches the dots in the previous cells.
- Stylus should be held vertically.
- Left hand and the stylus which is held in the right hand should be held consequently
- It helps in identifying the correct dots.

2.4.4 Writing Table

It is essential that while reading and writing Braille, a person is sitting straight and that the Braille reading material is at a comfortable height.

In rural areas, writing desks are not available. It is advisable to provide a writing table with the following specifications to enable the child to maintain right posture while reading and writing Braille.

a. Recommended size

Length of the Top : 18" (45.4 Cms.)
Breadth of the Top: 12" (25.4 Cms.)
Height in the Front : 12" (25.4 Cms.)
Height in the Rear : 14" (35.3 Cms.)

b. Material

Structure	: Iron bars of 1 cm thickness
Top	: Sunmica or formica of 12 mm thickness
Fabrication structure	: Arc welding for metal : Top fixed using screws
Edging	: In the front portion of top to avoid slipping downward of the writing frame or book.

3. Development of Braille in India

The later half of 19th Century saw the advent of Braille as a staple medium of reading and writing for the blind in Europe as well as the United States of America. Braille was introduced by the Missioneries who established various schools for the blind at Amritsar (1987), Palayamkottai (1890), Calcutta (1897), Ranchi (1898), Mumbai (1900).

1902: Mr. J. Knowles and Mr. L. Garthwaite, representatives of the Foreign Bible Society invented the Oriental Braille and published it.

1922 (January): Mr. P. M. Advani, Principal, School for the Blind, Karachi expressed the need for evolving a common Braille code at a meeting of the Central Advisory Board of Education.

1923: Discussion in the Conference of the Workers of the Blind and the Deaf held in Mumbai on the possibility of having a common Braille code.

1938: Appointment of a Committee for the development of a uniform Indian Braille Code.

1941 (November): The Committee met for the first time and debated the issue.

1943: The Committee prepared a common Braille Code and circulated the same among various provincial Governments and institutions for the blind.

1944: Sir Clutha Mackenzie, Officer on Special Duty (Blindness) submitted the historical *"Report of Blindness in India"*.

1945: Sir Clutha Mackenzie appointed a committee composed primarily of Capt. A. X. Mortimer and Mr. Lal Advani for evolving a Standard Indian Braille Code.

1947 (April): Following the recommendations of the *"Report of Blindness in India,"* the Ministry of Education established a Unit to deal with education of the visually impaired for developing a Uniform Braille Code and setting up Braille Printing Presses in the Country.

1947: When India gained independence, 11 Braille codes were in use in various parts of the country:

a. Shirreff (Urdu & Hindi) Braille
b. Indian Braille of Dr. Nilkanthrai Chhatrpati
c. Tamil Braille of Ms. Askwith
d. Mysore and Kannada Code
e. Chatterjee (Bengali) Code
f. Oriental (Knowles & Garthwaite) Braille
g. Shah Braille
h. Advani (Sindhi) Braille
h. Uniform Indian Braille by Expert Braille Committee
i. Standard Indian Braille framed by an informal committee under the chairmanship of Lt. Col. Sir Clutha Mackenzie.

1949 (23rd April): Prof. Humayun Kabir, Joint Secretary, Ministry of Education approached the Director General, UNESCO urging upon development of a uniform World Braille Code.

1949 (December): UNESCO convened the preliminary meeting of the Advisory Committee on World Braille.

1950 (March): UNESCO convened an International Braille Conference in Paris for developing World Braille Code.

1951: UNESCO established the World Braille Council with Mr. Lal Advani as representative from India.

1951 (January): The Govt. of India accepted the recommendations of the International Braille Conference and proceeded to frame a Braille Code, named as *"Bharti Braille"* for Indian languages. It was submitted to the Central Advisory Board of Education for approval. The Board approved the code in principle and recommended that necessary modifications might be made in the light of the Regional Braille Conference.

1951 (February): Asian Regional Conference on Braille uniformity held in Beirut.

1951 (April): The *"Bharti Braille"* was finalized and recommended for its nation-wide use. It has become an international system as Nepal and Bangladesh are also using this code.

1988: Workshop convened at NIVH, Dehradun to adopt Nemeth Braille Code as *"Braille Mathematics Code for India"* (1972 publication).

4. Braille Presses in India

The Report on Blindness (1944) had recommended the establishment of a Braille Press at Dehradun. Around 1950, the Government of India had sent Mr. Kalidas Bhattacharya to be trained at American Printing House for the Blind, U.S.A. The Braille Press at Dehradun began functioning during April, 1951. Over the years number of Braille Presses have been established in different parts of the country.

1. AICB Computerized Braille Press
   All India Confederation of the Blind
   Braille Bhawan, Institutional Area
   (Near D.T.C. Bus Depot No. 1)
   Sector V, Rohini, Delhi 110 085
   Phone : 011-7054082
   Fax   : 7050915
   E-mail : aicb@mailcity.com

2. Braille Printing Press

   Red Cross School for the Blind
   Ganjam District Branch
   Behrampur (Orissa)

3. Central Braille Press
   National Institute for the Visually Handicapped
   116, Rajpur Road, Dehradun - 248 001
   Phone   : 0135 744491
   Fax   : 748147
   E-mail : nivhddn@nde.vsnl.net.in

4. CFB Braille Press
   Christian Foundation for the Blind
   Pallavaram, Chennai 600 043

5. Computerized Braille Press
   K.K. School for the Blind
   Vidyanagar, Bhavnagar
   Phone   : 0278 429326
   E-mail : pnr@bhavnagar.com

6. Computerized Braille Production Unit
   Shri Ramakrishna Mission Vidayalaya
   Coimbatore 641 020
   Phone   : 0422 892441
   Fax   : 895066
   E-mail : srkvcoe@md3.vsnl.net.in

7. Computerized Braille Production Unit
   L.K.C. Shri Jagdamba Andh Vidayalaya
   Hanumangarh Road, Sri Ganganagar, Rajasthan
   Phone   : (0154) 21358/25358/26358
   Fax   : 20505/23328

8. Kerala Federation of the Blind Braille Press
   Kerala Federation of the Blind
   Trivandrum (Kerala)

9. Government Braille Press
   Government Blind School
   Tilak Nagar, Sayaji Rao Road
   Mysore (Karnataka)

10. Government Braille Press
    Panchayat and Social Welfare Department
    Directorate, Marwari Lane,
    Sadar Bazar, Bilaspur (Madhya Pradesh)

11. NAB Braille Press
    National Association for the Blind
    11, Khan Abdul Gaffar Khan Road
    Worli Seaface, Mumbai 400 025
    Phone   : 022 4935370 Fax: 4932539
    E-mail : nab@giasbm01.vsnl.net.in

12. NAB Braille Press
    National Association for the Blind
    M. P. Branch, Indore (Madhya Pradesh)

13. NAB Braille Press
    National Association for the Blind
    Gujarat State Branch
    Vastrapur, Ahmedabad 380 015
    Phone   : (079) 6305082, 6305070
    Fax   : 6300106
    E-mail : bpa@vsnl.com

14. NFB Braille Press
    National Federation of the Blind
    Bahadur Garh (Haryana)

15. Regional Braille Press
    Government School for the Blind
    Poonamallee, Chennai 600 056

16. Regional Braille Press
    Malak Pet, Hyderabad (Andhra Pradesh)

17. Regional Braille Press
    Ramakrishna Mission Ashram
    P. O. Narendrapur
    24 Parganas (West Bengal)

18. R. K. Computerized Braille Press
    Andhjan Kalyan Mandal
    P.D. Malaviya College
    Gondal Road, Rajkot 360 004
    Phone: 0281 223985

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