



## A study of Roman & Devanagari Fonts for a Dot Matrix Printer on the Indian Railway Tickets

Kavya Tejas Tolia, Rachana Sansad College of Applied Art & Craft, Mumbai, India,  
kavyatolia@hotmail.com

**Abstract:** Little is known and observed about the printing techniques and typography on something like Railway tickets. It's a medium passing our eyes daily but yet passes by unnoticed.

One Color printing with distinguishing features in the background printing on the front is the key factor of the ticket. The tickets are bilingual in nature, having the information in Roman as well as the Devanagari Script. A number of different fonts are used according to the importance of every detail and following a visual hierarchy.

Legibility is a measure of how easy it is to distinguish one letter from another in a particular typeface. Majority of the text is printed using the Dot Matrix Printers and it is not very legible, as there has been no specific typeface designed for this purpose. So due to the print technique and the lack of specific fonts, alignment, legibility and overlapping text issues have been noticed quite often. These have been overlooked for a while now, but need to be worked on now.

**Key words:** *Dot Matrix Printer, Devanagari Typography, Roman Typography, Bilingual, Font, Indian Railway Ticket, Legibility.*

### 1. Introduction

Typography is a study of the design of typefaces, the way in which the type is laid out on a page to best achieve the desired visual effect and to best convey the meaning of the reading matter.

Typography isn't just text, it is an art as it not only plays a great role in shaping a message but is also equally important when it comes to design (which could include ads for a newspaper, magazine, logo designs or branding of any product).

On some daily observation analysis, it has been concluded that typography is all around us everyday. There is typography on billboards, bus panels, railway station and yes any kind of travel tickets. This research paper is about the typography and printing technique used by the Indian Railway to print their local tickets. A niche media of typography, but we use these tickets daily and are yet so ignorant about its design and typography.

## **2. Study of the Indian Railway Tickets**

### **2.1 Ticket Size and Paper Specifications**

The Unreserved Ticketing System (UTS) produces computerized tickets of a commercial advertisement size, 10cm x 6.4cm. A security bond white paper, 115 to 300 GSM with the Railway Mark of the Indian Railway logo is used. The logo size is not more than 1" in roll of 500 tickets.

### **2.2 Printing specifications**

One color printing with distinguishing features in the background printing on the front is the key factor of the ticket. This standard artwork is printed by the 4 color offset printers and packed in rolls of 500. These rolls are then used for issuing local tickets by undergoing a second printing process by the Dot Matrix Printers.

The ticket is bilingual in nature with variations in Roman and Devanagari scripts. The copper brown color band on top has "SHUBH YATRA" in Devanagari and "HAPPY JOURNEY" in Roman, printed in a light grey color. The logo of "BHARTIYA RAIL" in Devanagari and "INDIAN RAILWAY" in Roman is printed next to it. The adjoining grey color strip on the right has an eight-digit serial number pre-printed by a special indelible penetrating ink such that the number is visible on the back of the ticket and cannot be erased. The last four digits of the serial number shall be in a bold type and the foolproof system machine shall do the numbering, by tallying it with the post printed Dot Matrix Printer serial number as well. And the hatching of the zonal Railway is printed diagonally all over the ticket except for the light grey strip.

After this offset printing, while selling the tickets it undergoes an on the spot Dot Matrix Print which adds the travel details on the ticket. The ticket number, the travel journey

destinations, date and time, class, validity and the price of the ticket is printed in a Roman Dot Matrix form. The class and the journey destinations of the ticket is translated and mentioned in Devanagari Dot Matrix form as well.



Figure.1 Local Railway Ticket

### 3. Study of the Dot Matrix Printer and the Fonts used on the Ticket

#### 3.1 Working of the Dot Matrix Printer

Dot Matrix Printers were the most common inexpensive printing option during the 1970s and 1980s, but were largely replaced by laser and inkjet models by the mid 1990s. However, as of the date of publication, Dot Matrix printers are still in use for some applications like the Indian Railway Tickets, due to their ability to print very quickly even on multi-part documents.

A Dot Matrix Printer is a type of computerized printer which uses a print head with a back and forth motion or and up and down motion, on the page and prints by impact. Dot Matrix printers create characters by sticking an inked ribbon with a hard surface. It does not have inks or ink jet based mechanism.



Figure.2 Ticket Printing through a Dot Matrix Printer

### 3.2 Font Study

Dot Matrix printers do not have any fixed character, shapes or inbuilt list of fonts. In fact, each individual character is formed by the arrangement of a series of pins based on how it appears on the connected computer. This allows Dot Matrix printers to be used for graphical or text printing. Hence, any font or graphic can be converted into a dotted form using the Dot Matrix Printer conveniently.

Considering all these factors, and based on a few comparative analysis of different local railway tickets, it was noticed that there is no fixed or uniform font used for printing through the Dot Matrix printer. The fonts used are totally dependent on the existing font in the respective computer system. And this applies to both the Roman as well as the Devanagari fonts seen on the tickets. The printer works in such a way that, it converts the existing font into a dot matrix font, i.e. the font is treated like a graphic and obtained the results.

For example, if the text to be printed on the ticket is set to be in Font Helvetica, the result print will be in Font Helvetica but in a dotted form.



Figure.3 Font Helvetica in a dotted form

### 4. Study on the Printing Errors

It has been noticed very often that there is an overlapping of the text or disturbance in the alignment of the text leading to legibility issues.

The most possible cause of this problem is the wearing out of the gears in the machine. These machines are used for a very long term by the Indian Railways and not regularly serviced or checked causing the gears to wear out after a period of time. This results in the lagging and jamming of the machine causing the overlapping or alignment issue. This further leads to legibility issues.

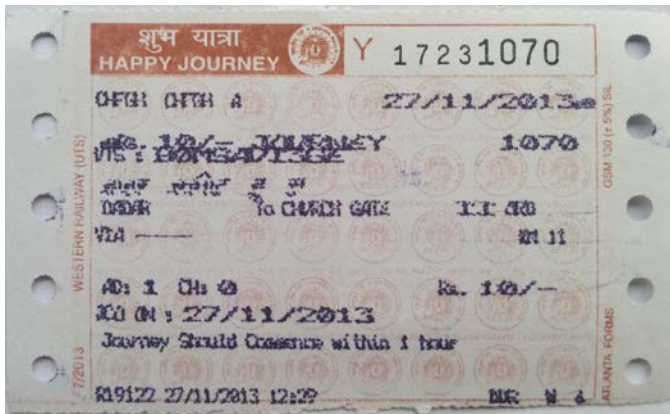


Figure.4 Local Railway Ticket with Overlapping Text

Another viable possibility of the misalignment of the text is the prior settings of the Dot Matrix Printer. Before you start printing, there a few adjustments to be made in the printer for aligning the text just well enough on the printing area of the ticket. If its not done accurately resulting prints could be shaken or misplaced.

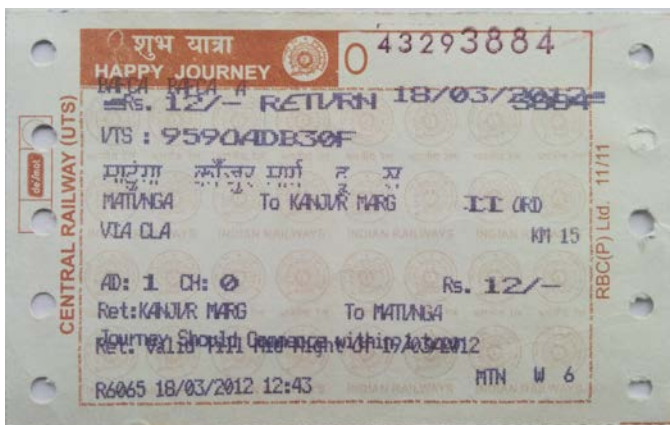


Figure.5 Local Railway Ticket with Misalignment and Overlapping Text

## 5. Usable Font Study

Since Dot Matrix Printers do not recognize any fonts and treats every character like a graphical sign, a graphical font gives much better and clearer results. Fonts like Verdana, Calibri, Tahoma and Courier New can be used. Courier New when tried and tested gave results very much like required, with exact character spacing, alignment and clear legibility. Whereas, Tahoma also gave a legible output but the alignment was shaken.

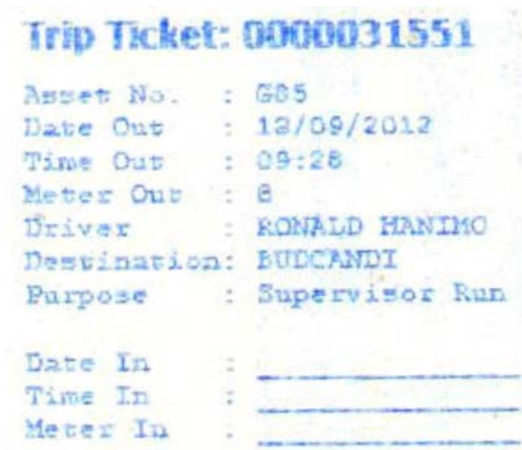


Figure.6 Courier New Test Print



Figure.6 Tahoma Test Print

## 6. Conclusion

Having studied the problems faced in using Dot Matrix Printers and the resultant printing errors, the best suggestive solution is to design a Roman and a Devanagari font exclusively for the use of the Dot Matrix Printers. This solves the purpose of even replacing normal fonts with graphical fonts. And the entire Indian Railway System should have this uniformity for the Design Unity. It will definitely add the design value to the ticket and there wont be any major legibility issue faced by people. Also the layout of all the information should be redesigned according to the order of importance. This visual hierarchy will make the ticket crisp and clear, and it will also make it easy for the reader to check the information.

Below is a proposed layout for a Local Railway Ticket. The layout is based on the visual hierarchy of the text. The fonts used, already exist for general use, but the purpose of the redesign is primarily for the layout.



Figure.7 Proposed Layout Design for the Local Ticket

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