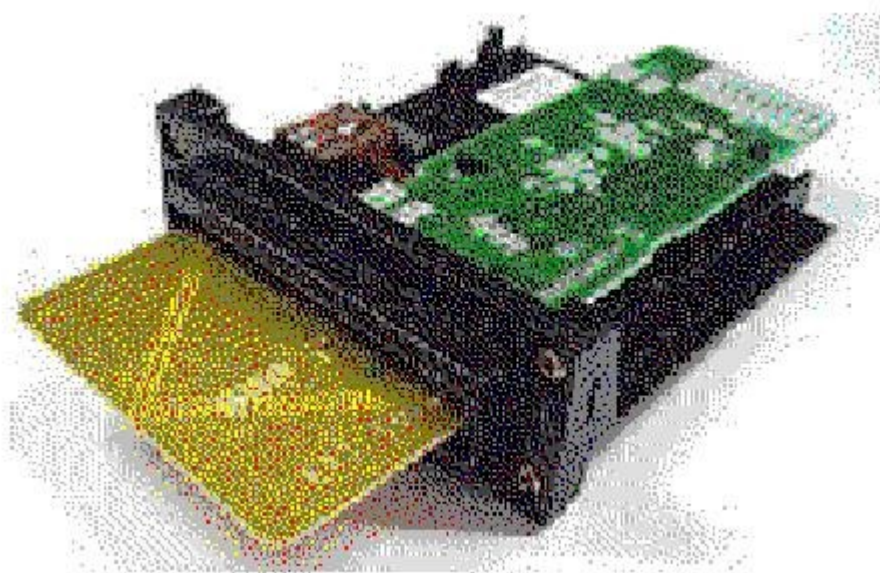


Magnetic Card Analyzer

Author: F. Thomas Hogans



This project aims to read a specific set of data from the magnetic stripe of a standard magnetic card. Utilizing a microcontroller and card reader, the project accepts the card into the reader and outputs the data via a serial connection to any terminal platform. The data output is the content of the card's second track, which according to ISO 7811 standards, must contain the personal/account number for which the card was issued.

Due to the varied nature of the data, dependent upon the type of card being analyzed, there is no uniform way to output the data. Therefore the track data will be dumped in its "raw" form; i.e. in ASCII form, but including control characters and separators. This will provide the discerning analyst with more information about the actual content of the magnetic stripe and avoid issues with a predefined output pattern not being compatible with the data. An example of how this could be a problem is the difference on track two between driver's licenses and credit cards. The credit card uses the "expiration date" field for simply a month and a year; whereas the license fills this area with birth date and expiration, with no control character separating the two. In order to make the program compatible with all types of these situations, an unpractical amount of ISO standard handling would have to be included. As this aims to serve as a general analyzer of the magnetic stripe data, and not specifically geared towards any particular type of card, the raw output method makes the most sense.

Understanding Output

In order to properly understand the output of this program's analysis of a magnetic card, it is necessary to be able to recognize the various control characters and data fields present on the track two standard. The table below shows the possible characters that could be present in the output:

Parity	D3	D2	D1	D0	Character	Function
1	0	0	0	0	0 (0H)	Data
0	0	0	0	1	1 (1H)	Data
0	0	0	1	0	2 (2H)	Data
1	0	0	1	1	3 (3H)	Data
0	0	1	0	0	4 (4H)	Data
1	0	1	0	1	5 (5H)	Data
1	0	1	1	0	6 (6H)	Data
0	0	1	1	1	7 (7H)	Data
0	1	0	0	0	8 (8H)	Data
1	1	0	0	1	9 (9H)	Data
1	1	0	1	0	:(AH)	Control
0	1	0	1	1	;(BH)	Start Sentinel
1	1	1	0	0	<(CH)	Control
0	1	1	0	1	=(DH)	Field Separator
0	1	1	1	0	>(EH)	Control
1	1	1	1	1	?(FH)	End Sentinel

The following is the format of the data, in order:

| SS | PAN | FS | Additional Data | ES | LRC |

SS = Start Sentinel ":"

PAN = Primary Acct. # (19 digits max)

FS = Field Separator "="

Additional Data = Expiration Date, Birth Date, offset, encrypted PIN, etc.

ES = End Sentinel "?"

LRC = Longitudinal Redundancy Check (for data integrity)