

Certainly! Let's explore **Track 1, Track 2, and Track 3** — what they are, their formats, differences, usage, and examples. These are magnetic stripe data formats defined by **ISO/IEC 7813** and used in card transactions (also found in EMV contact/contactless cards).

◆ **Overview of Tracks**

Track Data Type		Max Length	Format	Use Case
1	Alphanumeric	79 chars	ASCII	Airline + general credit cards
2	Numeric only	40 digits	BCD (compressed)	Financial & ATM use
3	Numeric only	107 digits	BCD	Rarely used (loyalty, debit cards)

◆ **Track 1 – Alphanumeric (Format B)**

- Defined by ISO/IEC 7813.
- Contains more detailed info than Track 2.
- Alphanumeric (A–Z, 0–9, and some symbols).

**Format:**

pgsql

CopyEdit

Start Sentinel (1 char) : %

Format Code (1 char) : B

Primary Account Number : Up to 19 digits

Field Separator (1 char) : ^

Name : Up to 26 chars (LAST/FIRST)

Field Separator (1 char) : ^

Expiration Date : YYMM (4 digits)

Service Code : 3 digits

Discretionary Data : Variable length

End Sentinel (1 char) : ?

LRC (1 char) : Longitudinal Redundancy Check (not always shown)

✅ **Example:**

perl

CopyEdit

%B1234567890123456^DOE/JOHN ^2512101000000000000000?

**Breakdown:**

- %B: Start and format code.
- 1234567890123456: PAN (card number).
- DOE/JOHN: Cardholder name.
- 2512: Expiry date (Dec 2025).
- 101: Service code.
- 000000000000: Discretionary data.

---

◆ **Track 2 – Numeric Only (ISO Format 2)**

- Most commonly used for financial transactions.
- Same info as Track 1 but in compact format.

**Format:**

yaml

CopyEdit

Start Sentinel: ;

PAN : Up to 19 digits

Separator : =

Expiration : 4 digits (YYMM)

Service Code : 3 digits

Discretionary : Variable

End Sentinel : ?

✅ **Example:**

ini

CopyEdit

;1234567890123456=25121010000000000000?

**Breakdown:**

- ;: Start.
  - 1234567890123456: PAN.
  - =: Separator.
  - 2512: Expiry (Dec 2025).
  - 101: Service code.
  - Rest: Discretionary data.
- ♦ Most EMV cards include **Track 2 Equivalent Data (Tag 57)** inside chip.
- 

♦ **Track 3 – Rarely Used (Custom Format)**

- Up to 107 digits.
- May include PIN offset, currency units, loyalty points, etc.
- Originally used on older debit or stored value cards.

✓ **Example (format varies by issuer):**

diff

CopyEdit

+1234567890123456=251210112345678901234567890123456?

Many cards today don't store Track 3 data.

---

♦ **Service Code (used in Track 1 & 2)**

**Digits**

**Meaning**

1st digit – Interchange    1 = International; 2 = National only

2nd digit – Authorization    0 = Normal; 2 = Chip required

3rd digit – Restrictions    0 = No restrictions; 1 = No ATM

### Example:

101 → International, normal auth, no restrictions

---

#### ◆ Summary: Key Differences

Feature	Track 1	Track 2	Track 3
Type	Alphanumeric	Numeric only	Numeric only
Used by	Airlines + banking	Banking	Legacy loyalty/debit
Length	79 characters	40 digits	107 digits
Availability	Often present	Always present	Rarely used

---

If you want me to **decode a real Track 1 or Track 2 data** from your logs or card simulator dumps, feel free to paste it (mask sensitive PAN values if needed).

### You said:

explain service code

### ChatGPT said:

Let's dive into the **Service Code** — a 3-digit numeric code found in Track 1 and Track 2 of magnetic stripe or EMV cards.

---

#### ◆ What is the Service Code?

The **Service Code** is a 3-digit number that provides instructions on:

1. **Interchange rules** (where and how the card can be used),
2. **Authorization requirements**,
3. **Cardholder verification methods (CVMs)**,
4. **Technology limitations** (e.g., magnetic stripe only or chip required).

It's encoded within the **Track 1** and **Track 2** data structures.

---

#### ◆ Location in Tracks

##### ■ Track 1 Format (ISO/IEC 7813):

php-template

CopyEdit

%B<PrimaryAccountNumber>^<Name>^YYMM<ServiceCode><DiscretionaryData>?

Example:

css

CopyEdit

%B1234567890123456^DOE/JOHN^25121010000000000000?

↑↑↑

Service Code

#### ■ Track 2 Format:

markdown

CopyEdit

;1234567890123456=25121010000000000000?

↑↑↑

Service Code

---

#### ◆ Structure of Service Code

Each of the **three digits** represents a different instruction:

Digit Position	Meaning
1st	Interchange & Technology Type of card usage (magstripe, chip, etc.)
2nd	Authorization Processing Whether PIN is required, online/offline capability
3rd	CVM / Restrictions Whether card can be used internationally, restrictions

---

#### ◆ Detailed Breakdown of Service Code Digits

**First Digit: Interchange / Technology**

### **Digit Meaning**

- 1 International interchange OK, magnetic stripe
- 2 International interchange OK, chip
- 5 National interchange only, magnetic stripe
- 6 National interchange only, chip
- 7 Private network only
- 9 Test card only

### **Second Digit: Authorization Processing**

#### **Digit Meaning**

- 0 Normal, no restrictions
- 1 Must use online authorization
- 2 Reserved
- 5 Must use PIN verification
- 6 Offline transactions OK (no online required)

### **Third Digit: CVM / Usage Restrictions**

#### **Digit Meaning**

- 0 No restrictions
  - 1 PIN required
  - 2 Goods and services only (no cash access)
  - 3 ATM only
  - 4 Cash only
  - 5 Reserved
  - 6–7 Reserved
  - 9 Test transactions only
-

### ◆ Examples of Full Service Codes

Service Code	Meaning
101	Magnetic stripe, international, online authorization required, PIN required
201	Chip, international, online only, PIN required
221	Chip, international, online only, PIN required
520	Magnetic stripe, national only, online authorization optional, no CVM required

---

### ◆ EMV Cards and Service Code

In EMV chip cards, service code is still included for **backward compatibility**, especially when fallback to magstripe is needed.

---

### ✓ Summary

- **Service code** governs how and where a card can be used.
- **Track 1 & Track 2** both hold this information.
- Each digit provides information about technology, authorization, and usage restriction.