



**USA Supplementary  
EMV™ Test Card Set**

**Version 6.10**

**June, 2018**

**Powered by B2»**

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## Revision History

| Version | Date              | Updated By | Revisions   |
|---------|-------------------|------------|---|
| 5.50    | August 30, 2016   | B2PS       | Initial document release  |
| 5.60    | Sept. 21, 2017    | B2PS       | <ul style="list-style-type: none"><li>• TC04, TC05: Cards v6.0 have 2-byte Kernel ID</li></ul>  |
| 6.00    | December 27, 2017 | B2PS       | <ul style="list-style-type: none"><li>• TC04, TC05 - Cards updated with increased contactless facility, 'Approval Amount' updated</li></ul> |
| 6.10    | June 26, 2018     | B2PS       | <ul style="list-style-type: none"><li>• TC04 - CL CVM (Tag '8E') corrected</li><li>• TC05 - CL CVM list corrected.</li></ul>                |

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**CAUTION**

Multiple consecutive incorrect PIN entry attempts may result in the card being blocked. This is known as being 'PIN Blocked'.

If this occurs, it will no longer be possible to enter an Offline PIN which will cause all future transactions to be declined.

**\*\*\* It is not possible to unblock a 'PIN Blocked' card \*\*\***

## Chapter 1 - B2 USA Supplementary EMV Test Card Set Profiles

This USA-Supplementary EMV Test Card Set contains six cards with three cards from each of the following card brands.



|                                  | Test Card 01                        | Test Card 02                        | Test Card 03                        |
|----------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|
| <b>Brand</b>                     | American Express                    | American Express                    | American Express                    |
| <b>Type</b>                      | Credit                              | Credit                              | Credit                              |
| <b>Description</b>               | Dual Interface,<br>Online Only      | Dual Interface,<br>Online Only      | Fallback                            |
| <b>IIN</b>                       | -                                   | -                                   | -                                   |
| <b>AID</b>                       | A000000025010402                    | A000000025010402                    | -                                   |
| <b>PAN</b>                       | 3742 450017 51006                   | 3742 450027 71003                   | 3742 450037 31006                   |
| <b>Expiry Date</b>               | 12/2020                             | 01/2020                             | 12/2022                             |
| <b>Service Code</b>              | 201                                 | 201                                 | 201                                 |
| <b>Interface</b>                 | Contact, Contactless,<br>MSR        | Contact, Contactless,<br>MSR        | MSR                                 |
| <b>CVM</b>                       | <a href="#">See card definition</a> | <a href="#">See card definition</a> | <a href="#">See card definition</a> |
| <b>Approval Amount</b>           | \$68.00                             | \$1.03                              | \$36.00                             |
| <b>Issuer Country Code</b>       | 840 - USA                           | 840 - USA                           | -                                   |
| <b>Application Currency Code</b> | 840 - USD                           | 840 - USD                           | -                                   |
| <b>Language</b>                  | 'en' – English                      | 'en' – English                      | -                                   |
| <b>Card Version</b>              | v5.0                                | v5.0                                | v5.0                                |



|                                  | Test Card 04                        | Test Card 05                        | Test Card 06                        |
|----------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|
| <b>Brand</b>                     | Discover                            | Discover                            | Discover                            |
| <b>Type</b>                      | Credit                              | Credit                              | Credit                              |
| <b>Description.</b>              | Dual Interface,<br>Online Only      | Dual Interface,<br>Online Only      | Fallback                            |
| <b>IIN</b>                       | -                                   | -                                   | -                                   |
| <b>AID</b>                       | A0000001523010                      | A0000001523010                      | -                                   |
| <b>PAN</b>                       | 6510 0000 0000 0133                 | 6510 0000 0000 0216                 | 6510 0000 0000 0331                 |
| <b>Expiry Date</b>               | 12/2019                             | 12/2019                             | 01/2022                             |
| <b>Service Code</b>              | 201                                 | 201                                 | 201                                 |
| <b>Interface</b>                 | Contact, Contactless,<br>MSR        | Contact, Contactless,<br>MSR        | MSR                                 |
| <b>CVM</b>                       | <a href="#">See card definition</a> | <a href="#">See card definition</a> | <a href="#">See card definition</a> |
| <b>Approval Amount</b>           | \$79.00                             | \$79.00                             | \$26.00                             |
| <b>Issuer Country Code</b>       | 840 - USA                           | 840 - USA                           | -                                   |
| <b>Application Currency Code</b> | 840 - USD                           | 840 - USD                           | -                                   |
| <b>Language</b>                  | 'en' – English                      | 'en' – English                      | -                                   |
| <b>Card Version</b>              | v7.0                                | v7.0                                | v5.0                                |

## 1.1 Test Card 01 – American Express, DI, Credit, English, USA, USD

A Dual Interface (Contact / Contactless) American Express credit card with Issuer Country Code of 'USA' and Currency Code of 'USD'.

The recommended transaction amount to generate a host approval is \$68.00.

### 1.1.1 Cardholder Verification Method List

| Cardholder Verification Method List ('4201 4203 5E03 5F03') |                     |                            |                 |
|---|---------------------|----------------------------|-----------------|
| CVM   | Verification Method | Conditions                 | If unsuccessful |
| 1   | Online PIN          | Unattended Cash            | Next CVM        |
| 2   | Online PIN          | Terminal supports CVM type | Next CVM        |
| 3   | Signature (paper)   | Terminal supports CVM type | Next CVM        |
| 4   | No CVM required     | Terminal supports CVM type | Next CVM        |

### 1.1.2 Application Tag data (Contact Interface, online)

\* Tag value changes with card usage

| Tag   | Element name                                    | Data   | v5.0 |
|-------|---|--|------|
| 50    | Application Label                               | 41 4D 45 52 49 43 41 4E 20 45<br>58 50 52 45 53 53 - 'AMERICAN<br>EXPRESS'                                       |      |
| 57    | Track 2 Equivalent Data                         | 37 42 45 00 17 51 00 6D 20 01<br>20 11 50 21 23 45 00 00 0F  |      |
| 5A    | Application Primary Account Number (PAN)        | 37 42 45 00 17 51 00 6F  |      |
| 5F 20 | Cardholder Name                                 | 55 53 41 20 53 55 50 50 2F 54<br>65 73 74 20 43 61 72 64 20 30<br>31 20 20 20 20 20 - 'USA<br>SUPP/Test Card 01' |      |
| 5F 24 | Application Expiration Date                     | 20 01 31   |      |
| 5F 25 | Application Effective Date                      | xx xx xx   |      |
| 5F 28 | Issuer Country Code                             | 08 40 - USA  |      |
| 5F 2D | Language Preference                             | 65 6E - 'en' (English)   |      |
| 5F 30 | Service Code                                    | 02 01  |      |
| 5F 34 | Application PAN Sequence Number                 | 00   |      |
| 82    | Application Interchange Profile                 | 1C 00  |      |
| 84    | Dedicated File (DF) Name                        | A0 00 00 00 25 01 04 02  |      |
| 87    | Application Priority Indicator                  | 01   |      |
| 8C    | Card Risk Management Data Object List 1 (CDOL1) | 9F 02 06 9F 03 06 9F 1A 02 95<br>05 5F 2A 02 9A 03 9C 01 9F 37<br>04   |      |
| 8D    | Card Risk Management Data Object List 2 (CDOL2) | 8A 02 9F 02 06 9F 03 06 9F 1A<br>02 95 05 5F 2A 02 9A 03 9C 01<br>9F 37 04                                       |      |
| 8E    | Cardholder Verification Method (CVM) List       | 00 00 00 00 00 00 00 00 42 01<br>42 03 5E 03 5F 03   |      |
| 94    | Application File Locator (AFL)                  | 08 01 01 00 08 02 03 01  |      |
| 9F 07 | Application Usage Control                       | FF 00  |      |
| 9F 08 | Application Version Number                      | 00 01  |      |
| 9F 0D | Issuer Action Code - Default                    | BC 50 EC A8 00   |      |
| 9F 0E | Issuer Action Code - Denial                     | 00 00 00 00 00   |      |
| 9F 0F | Issuer Action Code - Online                     | BC 78 FC F8 00   |      |
| 9F 10 | Issuer Application Data [American Express]      | xx xx 01 xx xx xx xx *   |      |
| 9F 11 | Issuer Code Table Index                         | 01   |      |
| 9F 12 | Application Preferred Name                      | 41 6D 65 72 69 63 61 6E 20 45<br>78 70 72 65 73 73 - 'American<br>Express'                                       |      |

| Tag   | Element name   | Data                      | v5.0 |
|-------|--|---------------------------|------|
| 9F 13 | Last Online Application Transaction Counter (ATC) Register | xx xx *                   |      |
| 9F 17 | Personal Identification Number (PIN) Try Counter           | 09                        |      |
| 9F 26 | Application Cryptogram (AC)                                | xx xx xx xx xx xx xx xx * |      |
| 9F 27 | Cryptogram Information Data (CID)                          | 80                        |      |
| 9F 36 | Application Transaction Counter (ATC)                      | xx xx *                   |      |
| 9F 38 | Processing Options Data Object List (PDOL)                 | 9F 35 01                  |      |
| 9F 42 | Application Currency Code                                  | 08 40 - USD               |      |

### 1.1.3 Cardholder Verification Method List (CL)

| Cardholder Verification Method List ('0000') |                     |            |                 |
|--|---------------------|------------|-----------------|
| CVM  | Verification Method | Conditions | If unsuccessful |
| 1  | Fail CVM Processing | Always     | Fail            |

### 1.1.4 Application Tag data (Contactless Interface, online)

\* Tag value changes with card usage

| Tag   | Element name                                    | Data   | v5.0 |
|-------|---|--|------|
| 50    | Application Label                               | 41 4D 45 52 49 43 41 4E 20 45<br>58 50 52 45 53 53 - 'AMERICAN<br>EXPRESS'                                       |      |
| 57    | Track 2 Equivalent Data                         | 37 42 45 00 17 51 00 6D 20 01<br>70 21 50 21 23 45 00 00 0F  |      |
| 5A    | Application Primary Account Number (PAN)        | 37 42 45 00 17 51 00 6F  |      |
| 5F 20 | Cardholder Name                                 | 55 53 41 20 53 55 50 50 2F 54<br>65 73 74 20 43 61 72 64 20 30<br>31 20 20 20 20 20 - 'USA<br>SUPP/Test Card 01' |      |
| 5F 24 | Application Expiration Date                     | 20 01 31   |      |
| 5F 25 | Application Effective Date                      | xx xx xx   |      |
| 5F 28 | Issuer Country Code                             | 08 40 - USA  |      |
| 5F 2D | Language Preference                             | 65 6E - 'en' (English)   |      |
| 5F 30 | Service Code                                    | 02 01  |      |
| 5F 34 | Application PAN Sequence Number                 | 00   |      |
| 82    | Application Interchange Profile [Expresspay]    | 44 80  |      |
| 84    | Dedicated File (DF) Name                        | A0 00 00 00 25 01 04 02  |      |
| 87    | Application Priority Indicator                  | 01   |      |
| 8C    | Card Risk Management Data Object List 1 (CDOL1) | 9F 02 06 9F 03 06 9F 1A 02 95<br>05 5F 2A 02 9A 03 9C 01 9F 37<br>04   |      |
| 8D    | Card Risk Management Data Object List 2 (CDOL2) | 8A 02 9F 02 06 9F 03 06 9F 1A<br>02 95 05 5F 2A 02 9A 03 9C 01<br>9F 37 04                                       |      |
| 8E    | Cardholder Verification Method (CVM) List       | 00 00 00 00 00 00 00 00 00 00<br>00 00   |      |
| 94    | Application File Locator (AFL)                  | 08 01 02 00 08 03 04 02  |      |
| 9F 07 | Application Usage Control                       | FF 00  |      |
| 9F 08 | Application Version Number                      | 00 01  |      |
| 9F 0D | Issuer Action Code - Default                    | 00 00 00 00 00   |      |
| 9F 0E | Issuer Action Code - Denial                     | 00 00 00 00 00   |      |
| 9F 0F | Issuer Action Code - Online                     | 00 00 00 00 00   |      |
| 9F 10 | Issuer Application Data [American Express]      | xx xx 01 xx xx xx xx *   |      |
| 9F 12 | Application Preferred Name                      | 41 6D 65 72 69 63 61 6E 20 45<br>78 70 72 65 73 73 - 'American<br>Express'                                       |      |
| 9F 26 | Application Cryptogram (AC)                     | xx xx xx xx xx xx xx xx *  |      |



| Tag   | Element name                               | Data        | v5.0 |
|-------|--|-------------|------|
| 9F 27 | Cryptogram Information Data (CID)          | 80          |      |
| 9F 36 | Application Transaction Counter (ATC)      | xx xx *     |      |
| 9F 38 | Processing Options Data Object List (PDOL) | 9F 35 01    |      |
| 9F 42 | Application Currency Code                  | 08 40 - USD |      |

## 1.2 Test Card 02 – American Express, DI, Credit, English, USA, USD

A Dual Interface (Contact / Contactless) American Express credit card with Issuer Country Code of 'USA' and Currency Code of 'USD'.

The recommended transaction amount to generate a host approval is \$1.03.

### 1.2.1 Cardholder Verification Method List

| Cardholder Verification Method List ('4201 5E03 4103 5F03') |                       |                            |                 |
|---|-----------------------|----------------------------|-----------------|
| CVM   | Verification Method   | Conditions                 | If unsuccessful |
| 1   | Online PIN            | Unattended Cash            | Next CVM        |
| 2   | Signature (paper)     | Terminal supports CVM type | Next CVM        |
| 3   | Offline Plaintext PIN | Terminal supports CVM type | Next CVM        |
| 4   | No CVM required       | Terminal supports CVM type | Next CVM        |

### 1.2.2 Application Tag data (Contact Interface, online)

\* Tag value changes with card usage

| Tag   | Element name                                    | Data   | v5.0 |
|-------|---|--|------|
| 50    | Application Label                               | 41 4D 45 52 49 43 41 4E 20 45<br>58 50 52 45 53 53 - 'AMERICAN<br>EXPRESS'                                       |      |
| 57    | Track 2 Equivalent Data                         | 37 42 45 00 27 71 00 3D 20 01<br>20 11 50 21 23 45 00 00 0F  |      |
| 5A    | Application Primary Account Number (PAN)        | 37 42 45 00 27 71 00 3F  |      |
| 5F 20 | Cardholder Name                                 | 55 53 41 20 53 55 50 50 2F 54<br>65 73 74 20 43 61 72 64 20 30<br>32 20 20 20 20 20 - 'USA<br>SUPP/Test Card 02' |      |
| 5F 24 | Application Expiration Date                     | 20 01 31   |      |
| 5F 25 | Application Effective Date                      | xx xx xx   |      |
| 5F 28 | Issuer Country Code                             | 08 40 - USA  |      |
| 5F 2D | Language Preference                             | 65 6E - 'en' (English)   |      |
| 5F 30 | Service Code                                    | 02 01  |      |
| 5F 34 | Application PAN Sequence Number                 | 00   |      |
| 82    | Application Interchange Profile                 | 1C 00  |      |
| 84    | Dedicated File (DF) Name                        | A0 00 00 00 25 01 04 02  |      |
| 87    | Application Priority Indicator                  | 01   |      |
| 8C    | Card Risk Management Data Object List 1 (CDOL1) | 9F 02 06 9F 03 06 9F 1A 02 95<br>05 5F 2A 02 9A 03 9C 01 9F 37<br>04   |      |
| 8D    | Card Risk Management Data Object List 2 (CDOL2) | 8A 02 9F 02 06 9F 03 06 9F 1A<br>02 95 05 5F 2A 02 9A 03 9C 01<br>9F 37 04                                       |      |
| 8E    | Cardholder Verification Method (CVM) List       | 00 00 00 00 00 00 00 00 42 01<br>5E 03 41 03 5F 03   |      |
| 94    | Application File Locator (AFL)                  | 08 01 01 00 08 02 03 01  |      |
| 9F 07 | Application Usage Control                       | FF 00  |      |

| Tag   | Element name   | Data   | v5.0 |
|-------|--|--|------|
| 9F 08 | Application Version Number                                 | 00 01  |      |
| 9F 0D | Issuer Action Code - Default                               | BC 50 EC A8 00   |      |
| 9F 0E | Issuer Action Code - Denial                                | 00 00 00 00 00   |      |
| 9F 0F | Issuer Action Code - Online                                | BC 78 FC F8 00   |      |
| 9F 10 | Issuer Application Data [American Express]                 | xx xx 01 xx xx xx xx *   |      |
| 9F 11 | Issuer Code Table Index                                    | 01   |      |
| 9F 12 | Application Preferred Name                                 | 41 6D 65 72 69 63 61 6E 20 45<br>78 70 72 65 73 73 - 'American<br>Express' |      |
| 9F 13 | Last Online Application Transaction Counter (ATC) Register | xx xx *  |      |
| 9F 17 | Personal Identification Number (PIN) Try Counter           | 09   |      |
| 9F 26 | Application Cryptogram (AC)                                | xx xx xx xx xx xx xx xx *  |      |
| 9F 27 | Cryptogram Information Data (CID)                          | 80   |      |
| 9F 36 | Application Transaction Counter (ATC)                      | xx xx *  |      |
| 9F 38 | Processing Options Data Object List (PDOL)                 | 9F 35 01   |      |
| 9F 42 | Application Currency Code                                  | 08 40 - USD  |      |

### 1.2.3 Cardholder Verification Method List (CL)

| Cardholder Verification Method List ('4203 5E03 1F02') |                     |   |                 |
|--|---------------------|---|-----------------|
| CVM  | Verification Method | Conditions                                      | If unsuccessful |
| 1  | Online PIN          | Terminal supports CVM type                      | Next CVM        |
| 2  | Signature (paper)   | Terminal supports CVM type                      | Next CVM        |
| 3  | No CVM required     | Not Unattended Cash,<br>Manual Cash or Cashback | Fail            |

### 1.2.4 Application Tag data (Contactless Interface, online)

\* Tag value changes with card usage

| Tag   | Element name                                    | Data  | v5.0 |
|-------|---|---|------|
| 50    | Application Label                               | 41 4D 45 52 49 43 41 4E 20 45 58<br>50 52 45 53 53 - 'AMERICAN EXPRESS'                                       |      |
| 57    | Track 2 Equivalent Data                         | 37 42 45 00 27 71 00 3D 20 01 70<br>21 50 21 23 45 00 00 0F   |      |
| 5A    | Application Primary Account Number (PAN)        | 37 42 45 00 27 71 00 3F   |      |
| 5F 20 | Cardholder Name                                 | 55 53 41 20 53 55 50 50 2F 54 65<br>73 74 20 43 61 72 64 20 30 32 20<br>20 20 20 20 - 'USA SUPP/Test Card 02' |      |
| 5F 24 | Application Expiration Date                     | 20 01 31  |      |
| 5F 25 | Application Effective Date                      | xx xx xx  |      |
| 5F 28 | Issuer Country Code                             | 08 40 - USA   |      |
| 5F 2D | Language Preference                             | 65 6E - 'en' (English)  |      |
| 5F 30 | Service Code                                    | 02 01   |      |
| 5F 34 | Application PAN Sequence Number                 | 00  |      |
| 82    | Application Interchange Profile [Expresspay]    | 44 80   |      |
| 84    | Dedicated File (DF) Name                        | A0 00 00 00 25 01 04 02   |      |
| 87    | Application Priority Indicator                  | 01  |      |
| 8C    | Card Risk Management Data Object List 1 (CDOL1) | 9F 02 06 9F 03 06 9F 1A 02 95 05<br>5F 2A 02 9A 03 9C 01 9F 37 04   |      |
| 8D    | Card Risk Management Data Object List 2 (CDOL2) | 8A 02 9F 02 06 9F 03 06 9F 1A 02<br>95 05 5F 2A 02 9A 03 9C 01 9F 37<br>04                                    |      |
| 8E    | Cardholder Verification Method (CVM) List       | 00 00 00 00 00 00 00 00 00 42 01 5E<br>03 1F 02   |      |
| 94    | Application File Locator (AFL)                  | 08 01 02 00 08 03 04 02   |      |

| Tag   | Element name                               | Data  | v5.0 |
|-------|--|---|------|
| 9F 07 | Application Usage Control                  | 3D 00   |      |
| 9F 08 | Application Version Number                 | 00 01   |      |
| 9F 0D | Issuer Action Code - Default               | F4 70 C4 98 00  |      |
| 9F 0E | Issuer Action Code - Denial                | 00 00 00 00 00  |      |
| 9F 0F | Issuer Action Code - Online                | F4 70 C4 98 00  |      |
| 9F 10 | Issuer Application Data [American Express] | xx xx 01 xx xx xx xx *  |      |
| 9F 12 | Application Preferred Name                 | 41 6D 65 72 69 63 61 6E 20 45 78<br>70 72 65 73 73 - 'American Express' |      |
| 9F 26 | Application Cryptogram (AC)                | xx xx xx xx xx xx xx xx *   |      |
| 9F 27 | Cryptogram Information Data (CID)          | 80  |      |
| 9F 36 | Application Transaction Counter (ATC)      | xx xx *   |      |
| 9F 38 | Processing Options Data Object List (PDOL) | 9F 35 01  |      |
| 9F 42 | Application Currency Code                  | 08 40 - USD   |      |

### 1.3 Test Card 03 – American Express, Technical Fallback Card

This card has a chip image printed on the card but it does not contain an actual chip.

When inserted, a chip error will be detected.

This should trigger Technical Fallback processing and the transaction should continue as a magstripe Technical Fallback transaction.

The recommended transaction amount to generate a host approval is \$36.00.

### 1.4 Test Card 04 – Discover, DI, Credit, English, USA, USD

A Dual Interface (Contact / Contactless) Discover credit card with Issuer Country Code of 'USA' and Currency Code of 'USD'.

The recommended transaction amount to generate a host approval is \$79.00.

#### 1.4.1 Cardholder Verification Method List

| Cardholder Verification Method List ('4203 5E03 1F03') |                     |                            |                 |
|--|---------------------|----------------------------|-----------------|
| CVM  | Verification Method | Conditions                 | If unsuccessful |
| 1  | Online PIN          | Terminal supports CVM type | Next CVM        |
| 2  | Signature (paper)   | Terminal supports CVM type | Next CVM        |
| 3  | No CVM required     | Terminal supports CVM type | Fail            |

#### 1.4.2 Application Tag data (Contact Interface, online)

\* Tag value changes with card usage

| Tag | Element name                             | Data  | v7.0 |
|-----|--|---|------|
| 50  | Application Label                        | 44 49 53 43 4F 56 45 52 -<br>'DISCOVER'                     |      |
| 57  | Track 2 Data [Discover]                  | 65 10 00 00 00 00 01 33 D1 91<br>22 01 10 00 07 49 00 00 0F |      |
| 5A  | Application Primary Account Number (PAN) | 65 10 00 00 00 00 01 33                                     |      |

| Tag   | Element name                                      | Data  | v7.0 |
|-------|---|---|------|
| 5F 20 | Cardholder Name                                   | 55 53 41 20 53 55 50 50 2F 54<br>65 73 74 20 43 61 72 64 20 30<br>34 20 20 20 20 20 - 'USA<br>SUPP/Test Card 04'  |      |
| 5F 24 | Application Expiration Date                       | 19 12 31  |      |
| 5F 25 | Application Effective Date                        | xx xx xx  |      |
| 5F 28 | Issuer Country Code                               | 08 40 - USA   |      |
| 5F 2D | Language Preference                               | 65 6E - 'en' (English)  |      |
| 5F 30 | Service Code                                      | 02 01   |      |
| 5F 34 | Application PAN Sequence Number                   | 01  |      |
| 82    | Application Interchange Profile                   | 18 00   |      |
| 84    | Dedicated File (DF) Name                          | A0 00 00 01 52 30 10  |      |
| 87    | Application Priority Indicator                    | 01  |      |
| 8C    | Card Risk Management Data Object List 1 (CDOL1)   | 9F 02 06 9F 03 06 9F 1A 02 95<br>05 5F 2A 02 9A 03 9C 01 9F 37<br>04 9F 35 01 9F 34 03  |      |
| 8D    | Card Risk Management Data Object List 2 (CDOL2)   | 91 0A 8A 02 95 05 9F 37 04  |      |
| 8E    | Cardholder Verification Method (CVM) List         | 00 00 00 00 00 00 00 00 42 03<br>5E 03 1F 03  |      |
| 94    | Application File Locator (AFL)                    | 08 01 01 00 18 01 02 01   |      |
| 9F 07 | Application Usage Control                         | FF 00   |      |
| 9F 08 | Application Version Number                        | 00 01   |      |
| 9F 0D | Issuer Action Code - Default                      | 30 40 E4 28 00  |      |
| 9F 0E | Issuer Action Code - Denial                       | 00 10 00 00 40  |      |
| 9F 0F | Issuer Action Code - Online                       | 30 68 C4 F8 00  |      |
| 9F 10 | Issuer Application Data [DPAS]                    | xx 06 xx xx xx xx xx xx   |      |
| 9F 11 | Issuer Code Table Index                           | 01  |      |
| 9F 12 | Application Preferred Name                        | 43 72 65 64 69 74   |      |
| 9F 17 | Personal Identification Number (PIN) Try Counter  | 03  |      |
| 9F 26 | Application Cryptogram (AC)                       | xx xx xx xx xx xx xx xx *   |      |
| 9F 27 | Cryptogram Information Data (CID)                 | 80  |      |
| 9F 36 | Application Transaction Counter (ATC)             | xx xx   |      |
| 9F 4D | Transaction Log Entry                             | 0B 0A   |      |
| 9F 4F | Transaction Log Format                            | 9F 02 06 5F 2A 02 9A 03 9F 36<br>02 9F 34 03 9F 52 06 9F 1A 02<br>95 05 9C 01 8A 02 9F 37 04 9F<br>03 06 9F 53 08 9F 66 04 9F 71<br>02 9F 6C 02             |      |
| 9F 78 | Application State [D-PAS]                         | 01  |      |
| C1    | Application Configuration Options [DPAS]          | 15 60   |      |
| C2    | Issuer Life Cycle Data (ILCD) [DPAS]              | 00 00 00 00 00 00 00 00 00 00<br>00 00 00 00 00 00 00 00 00 00<br>00 00 00 00 00 00 00 00 00 00<br>00 00 00 00 00 00 00 00 00 00<br>00 00 00 00 00 00 00 00 |      |
| C3    | Currency Conversion Codes 1 [DPAS]                | 08 40 00 00 02  |      |
| C4    | Currency Conversion Codes 2 [DPAS]                | 08 40 00 00 02  |      |
| C5    | Card Action Code - Denial [DPAS]                  | 01 00   |      |
| C6    | Card Action Code - Default [DPAS]                 | 22 4B   |      |
| C7    | Card Action Code - Online [DPAS]                  | F6 7F   |      |
| D0    | Issuer Application Data ObjectList (IADOL) [DPAS] |   |      |
| D2    | CRM Country Code [DPAS]                           | 08 40 - USA   |      |
| D3    | CRM Currency Code [DPAS]                          | 08 40 - USD   |      |

| Tag   | Element name                             | Data  | v7.0 |
|-------|--|---|------|
| DF 20 | Transaction Profile Objects(TPO0) [DPAS] | 00 18 00 08 01 01 00 18 01 02<br>01 00 00 00 00 00 00 00 00 00<br>00 00 00 00 00 00 00 00 00 00<br>00 00 00 00 00 01 00 F6 7F 22<br>4B 00 00 00 00 00 00 00 00 00<br>00 00 00 00 00 00 00 00 00 00<br>00 00 |      |

### 1.4.3 Cardholder Verification Method List (CL)

| Cardholder Verification Method List ('4203 5E03 1F03') |                       |                            |                 |
|--|-----------------------|----------------------------|-----------------|
| CVM  | Verification Method   | Conditions                 | If unsuccessful |
| 1  | Online PIN            | Unattended Cash            | Next CVM        |
| 2  | Offline Plaintext PIN | Terminal supports CVM type | Next CVM        |
| 3  | No CVM required       | Terminal supports CVM type | Fail            |

### 1.4.4 Application Tag data (Contactless Interface, online)

\* Tag value changes with card usage

| Tag   | Element name                               | Data   | v7.0 |
|-------|--|--|------|
| 50    | Application Label                          | 44 49 53 43 4F 56 45 52 20 43<br>4C - 'DISCOVER CL'  |      |
| 57    | Track 2 Data [Discover]                    | 65 10 00 00 00 00 02 16 D1 91<br>22 01 10 00 07 49 00 00 0F  |      |
| 5A    | Application Primary Account Number (PAN)   | 65 10 00 00 00 00 02 16  |      |
| 5F 20 | Cardholder Name                            | 55 53 41 20 53 55 50 50 2F 54<br>65 73 74 20 43 61 72 64 20 30<br>35 20 20 20 20 20 - 'USA<br>SUPP/Test Card 04' |      |
| 5F 24 | Application Expiration Date                | 19 12 31   |      |
| 5F 25 | Application Effective Date                 | xx xx xx   |      |
| 5F 28 | Issuer Country Code                        | 08 40 - USA  |      |
| 5F 2D | Language Preference                        | 65 6E - 'en' (English)   |      |
| 5F 30 | Service Code                               | 02 01  |      |
| 5F 34 | Application PAN Sequence Number            | 01   |      |
| 82    | Application Interchange Profile [DPAS CL]  | 18 00  |      |
| 84    | Dedicated File (DF) Name                   | A0 00 00 01 52 30 10   |      |
| 87    | Application Priority Indicator             | 01   |      |
| 8E    | Cardholder Verification Method (CVM) List  | 00 00 00 00 00 00 00 00 42 03<br>5E 03 1F 03   |      |
| 94    | Application File Locator (AFL)             | 08 02 02 00 18 03 04 01  |      |
| 9F 07 | Application Usage Control                  | FF 00  |      |
| 9F 08 | Application Version Number                 | 00 01  |      |
| 9F 0D | Issuer Action Code - Default               | 00 00 00 00 00   |      |
| 9F 0E | Issuer Action Code - Denial                | 00 00 00 00 00   |      |
| 9F 0F | Issuer Action Code - Online                | 00 00 00 00 00   |      |
| 9F 10 | Issuer Application Data [DPAS CL]          | xx 15 xx xx xx xx xx xx xx xx  |      |
| 9F 11 | Issuer Code Table Index                    | 01   |      |
| 9F 12 | Application Preferred Name                 | 44 69 73 63 6F 76 65 72 20 43<br>4C  |      |
| 9F 26 | Application Cryptogram (AC)                | xx xx xx xx xx xx xx xx *  |      |
| 9F 27 | Cryptogram Information Data (CID)          | 80   |      |
| 9F 36 | Application Transaction Counter (ATC)      | xx xx *  |      |
| 9F 38 | Processing Options Data Object List (PDOL) | 9F 66 04 9F 02 06 9F 03 06 9F<br>1A 02 5F 2A 02 9A 03 9C 01 9F<br>37 04  |      |
| 9F 4F | Transaction Log Format                     | 9F 02 06 5F 2A 02 9A 03 9F 36<br>02 9F 34 03 9F 52 06 9F 1A 02   |      |

| Tag   | Element name  | Data  | v7.0 |  |
|-------|---|---|------|--|
|       |   | 95 05 9C 01 8A 02 9F 37 04 9F<br>03 06 9F 53 08 9F 66 04 9F 71<br>02 9F 6C 02   |      |  |
| 9F 6C | Card Transaction Qualifiers [DPAS]                        | 00 00   |      |  |
| 9F 71 | Card Processing Requirements [DPAS]                       | 00 0F   |      |  |
| 9F 71 | Card Processing Requirements [DPAS]                       | 00 0F   |      |  |
| 9F 78 | Application State [D-PAS]                                 | 01  |      |  |
| BF 51 | Contactless D-PAS MS and ZIP Default Profile              | 82 02 00 00 94 04 08 01 01 00   |      |  |
| C0    | Contactless Application Configuration Options (CL-ACO)    | 00 80   |      |  |
| C2    | Issuer Life Cycle Data (ILCD) [DPAS]                      | 00 00 00 00 00 00 00 00 00 00<br>00 00 00 00 00 00 00 00 00 00<br>00 00 00 00 00 00 00 00 00 00<br>00 00 00 00 00 00 00 00 00 00<br>00 00 00 00 00 00 00 00 |      |  |
| C3    | Currency Conversion Codes 1 [DPAS]                        | 08 40 00 00 02  |      |  |
| C4    | Currency Conversion Codes 2 [DPAS]                        | 08 40 00 00 02  |      |  |
| C8    | Lower Consecutive Offline Amount (LCOA) Limit [DPAS]      | 00 00 00 00 00 00   |      |  |
| C9    | Upper Consecutive Offline Amount Limit (UCOA) [DPAS]      | 00 00 00 00 00 00   |      |  |
| CA    | Single Transaction Amount (STA) Limit [DPAS]              | 00 00 00 00 00 00   |      |  |
| CB    | Lower Consecutive Offline Limit (LCOL) [DPAS]             | 00  |      |  |
| CC    | Upper Consecutive Offline Transaction Limit (UCOL) [DPAS] | 00  |      |  |
| CD    | Number of Consecutive Offline Transactions (NCOT) [DPAS]  | 00  |      |  |
| CE    | Cumulative Offline Amount [DPAS]                          | 00 00 00 00 00 00   |      |  |
| D0    | Issuer Application Data ObjectList (IADOL) [DPAS]         |   |      |  |
| D1    | Offline Balance [DPAS]                                    | 00 00 00 00 00 00   |      |  |
| D2    | CRM Country Code [DPAS]                                   | 08 40 - USA   |      |  |
| D3    | CRM Currency Code [DPAS]                                  | 08 40 - USD   |      |  |
| D4    | CVM-Accumulator [DPAS]                                    | 00 00 00 00 00 00   |      |  |
| D5    | CVM-Cum limit 1   | 00 00 00 00 00 00   |      |  |
| D6    | CVM-Cum limit 2   | 00 00 00 00 00 00   |      |  |
| D7    | CVM-STA limit 1   | 00 00 00 00 00 00   |      |  |
| D8    | CVM-STA limit 2   | 00 00 00 00 00 00   |      |  |
| D9    | CVM-Counter   | 00  |      |  |
| DA    | CVM-Cons limit 1  | 00  |      |  |
| DB    | CVM-Cons limit 2  | 00  |      |  |
| DE    | Counter and Accumulator Control Options (CACO) [D-PAS]    | C1 01 21 01 01 00   |      |  |
| DF 30 | CRM-CAC Switch Interface [D-PAS]                          | 00 00 00  |      |  |
| DF 31 | CRM-CAC Denial [D-PAS]                                    | 00 00 00  |      |  |
| DF 32 | CRM-CAC Online [D-PAS]                                    | C8 FE FF  |      |  |
| DF 33 | CRM-CAC Default [D-PAS]                                   | 98 FE EB  |      |  |
| DF 34 | CVM Card Action Codes - Online                            | 40 80   |      |  |
| DF 35 | CVM Card Action Codes - Signature                         | 00 80   |      |  |
| DF 40 | CL-Accumulator  | 00 00 00 00 00 00   |      |  |
| DF 41 | CL-Cum Limit  | 00 00 00 00 00 00   |      |  |
| DF 42 | CL-STA  | 00 00 00 00 00 00   |      |  |
| DF 43 | CL-Counter  | 00  |      |  |
| DF 44 | CL-Cons Limit   | 00  |      |  |

## 1.5 Test Card 05 – Discover, DI, Credit, English, USA, USD

A Dual Interface (Contact / Contactless) Discover credit card with Issuer Country Code of 'USA' and Currency Code of 'USD'.

The recommended transaction amount to generate a host approval is \$79.00.

### 1.5.1 Cardholder Verification Method List

| Cardholder Verification Method List ('4201 4103 1F03') |                       |                            |                 |
|--|-----------------------|----------------------------|-----------------|
| CVM  | Verification Method   | Conditions                 | If unsuccessful |
| 1  | Online PIN            | Unattended Cash            | Next CVM        |
| 2  | Offline Plaintext PIN | Terminal supports CVM type | Next CVM        |
| 3  | No CVM required       | Terminal supports CVM type | Fail            |

### 1.5.2 Application Tag data (Contact Interface, online)

\* Tag value changes with card usage

| Tag   | Element name                                     | Data   | v7.0 |
|-------|--|--|------|
| 50    | Application Label                                | 44 49 53 43 4F 56 45 52 -<br>'DISCOVER'  |      |
| 57    | Track 2 Data [Discover]                          | 65 10 00 00 00 00 02 16 D1 91<br>22 01 10 00 07 49 00 00 0F  |      |
| 5A    | Application Primary Account Number (PAN)         | 65 10 00 00 00 00 02 16  |      |
| 5F 20 | Cardholder Name                                  | 55 53 41 20 53 55 50 50 2F 54<br>65 73 74 20 43 61 72 64 20 30<br>35 20 20 20 20 20 - 'USA<br>SUPP/Test Card 05' |      |
| 5F 24 | Application Expiration Date                      | 19 12 31   |      |
| 5F 25 | Application Effective Date                       | xx xx xx   |      |
| 5F 28 | Issuer Country Code                              | 08 40 - USA  |      |
| 5F 2D | Language Preference                              | 65 6E - 'en' (English)   |      |
| 5F 30 | Service Code                                     | 02 01  |      |
| 5F 34 | Application PAN Sequence Number                  | 01   |      |
| 82    | Application Interchange Profile                  | 18 00  |      |
| 84    | Dedicated File (DF) Name                         | A0 00 00 01 52 30 10   |      |
| 87    | Application Priority Indicator                   | 01   |      |
| 8C    | Card Risk Management Data Object List 1 (CDOL1)  | 9F 02 06 9F 03 06 9F 1A 02 95<br>05 5F 2A 02 9A 03 9C 01 9F 37<br>04 9F 35 01 9F 34 03                           |      |
| 8D    | Card Risk Management Data Object List 2 (CDOL2)  | 91 0A 8A 02 95 05 9F 37 04   |      |
| 8E    | Cardholder Verification Method (CVM) List        | 00 00 00 00 00 00 00 00 42 01<br>41 03 1F 03   |      |
| 94    | Application File Locator (AFL)                   | 08 01 01 00 18 01 02 01  |      |
| 9F 07 | Application Usage Control                        | FF 00  |      |
| 9F 08 | Application Version Number                       | 00 01  |      |
| 9F 0D | Issuer Action Code - Default                     | 30 40 E4 28 00   |      |
| 9F 0E | Issuer Action Code - Denial                      | 00 10 00 00 40   |      |
| 9F 0F | Issuer Action Code - Online                      | 30 68 C4 F8 00   |      |
| 9F 10 | Issuer Application Data [DPAS]                   | xx 06 xx xx xx xx xx xx  |      |
| 9F 11 | Issuer Code Table Index                          | 01   |      |
| 9F 12 | Application Preferred Name                       | 43 72 65 64 69 74  |      |
| 9F 17 | Personal Identification Number (PIN) Try Counter | 09   |      |
| 9F 26 | Application Cryptogram (AC)                      | xx xx xx xx xx xx xx xx *  |      |
| 9F 27 | Cryptogram Information Data (CID)                | 80   |      |
| 9F 36 | Application Transaction Counter (ATC)            | xx xx *  |      |

| Tag   | Element name                                      | Data  | v7.0 |
|-------|---|---|------|
| 9F 4D | Transaction Log Entry                             | 0B 0A   |      |
| 9F 4F | Transaction Log Format                            | 9F 02 06 5F 2A 02 9A 03 9F 36<br>02 9F 34 03 9F 52 06 9F 1A 02<br>95 05 9C 01 8A 02 9F 37 04 9F<br>03 06 9F 53 08 9F 66 04 9F 71<br>02 9F 6C 02   |      |
| 9F 78 | Application State [D-PAS]                         | 01  |      |
| C1    | Application Configuration Options [DPAS]          | 15 E0   |      |
| C2    | Issuer Life Cycle Data (ILCD) [DPAS]              | 00 00 00 00 00 00 00 00 00 00<br>00 00 00 00 00 00 00 00 00 00<br>00 00 00 00 00 00 00 00 00 00<br>00 00 00 00 00 00 00 00 00 00<br>00 00 00 00 00 00 00 00   |      |
| C3    | Currency Conversion Codes 1 [DPAS]                | 08 40 00 00 02  |      |
| C4    | Currency Conversion Codes 2 [DPAS]                | 08 40 00 00 02  |      |
| C5    | Card Action Code - Denial [DPAS]                  | 01 00   |      |
| C6    | Card Action Code - Default [DPAS]                 | 22 4B   |      |
| C7    | Card Action Code - Online [DPAS]                  | F6 7F   |      |
| D0    | Issuer Application Data ObjectList (IADOL) [DPAS] |   |      |
| D2    | CRM Country Code [DPAS]                           | 08 40 - USA   |      |
| D3    | CRM Currency Code [DPAS]                          | 08 40 - USD   |      |
| DF 20 | Transaction Profile Objects(TPO0) [DPAS]          | 00 18 00 08 01 01 00 18 01 02<br>01 00 00 00 00 00 00 00 00 00<br>00 00 00 00 00 00 00 00 00 00<br>00 00 00 00 00 01 00 F6 7F 22<br>4B 00 00 00 00 00 00 00 00 00<br>00 00 00 00 00 00 00 00 00 00<br>00 00 |      |

### 1.5.3 Cardholder Verification Method List (CL)

| Cardholder Verification Method List ('4201 4103 1F03') |                       |                            |                 |
|--|-----------------------|----------------------------|-----------------|
| CVM  | Verification Method   | Conditions                 | If unsuccessful |
| 1  | Online PIN            | Unattended Cash            | Next CVM        |
| 2  | Offline Plaintext PIN | Terminal supports CVM type | Next CVM        |
| 3  | No CVM required       | Terminal supports CVM type | Fail            |

### 1.5.4 Application Tag data (Contactless Interface, online)

\* Tag value changes with card usage

| Tag   | Element name                              | Data   | v7.0 |
|-------|---|--|------|
| 50    | Application Label                         | 44 49 53 43 4F 56 45 52 20 43<br>4C - 'DISCOVER CL'  |      |
| 57    | Track 2 Data [Discover]                   | 65 10 00 00 00 00 02 16 D1 91<br>22 01 10 00 07 49 00 00 0F  |      |
| 5A    | Application Primary Account Number (PAN)  | 65 10 00 00 00 00 02 16  |      |
| 5F 20 | Cardholder Name                           | 55 53 41 20 53 55 50 50 2F 54<br>65 73 74 20 43 61 72 64 20 30<br>35 20 20 20 20 20 - 'USA<br>SUPP/Test Card 05' |      |
| 5F 24 | Application Expiration Date               | 19 12 31   |      |
| 5F 25 | Application Effective Date                | xx xx xx   |      |
| 5F 28 | Issuer Country Code                       | 08 40 - USA  |      |
| 5F 2D | Language Preference                       | 65 6E - 'en' (English)   |      |
| 5F 30 | Service Code                              | 02 01  |      |
| 5F 34 | Application PAN Sequence Number           | 01   |      |
| 82    | Application Interchange Profile [DPAS CL] | 18 00  |      |



| Tag   | Element name  | Data  | v7.0 |
|-------|---|---|------|
| 84    | Dedicated File (DF) Name                                  | A0 00 00 01 52 30 10  |      |
| 87    | Application Priority Indicator                            | 01  |      |
| 8E    | Cardholder Verification Method (CVM) List                 | 00 00 00 00 00 00 00 00 42 01<br>41 03 1F 03  |      |
| 94    | Application File Locator (AFL)                            | 08 02 02 00 18 03 04 01   |      |
| 9F 07 | Application Usage Control                                 | FF 00   |      |
| 9F 08 | Application Version Number                                | 00 01   |      |
| 9F 0D | Issuer Action Code - Default                              | 00 00 00 00 00  |      |
| 9F 0E | Issuer Action Code - Denial                               | 00 00 00 00 00  |      |
| 9F 0F | Issuer Action Code - Online                               | 00 00 00 00 00  |      |
| 9F 10 | Issuer Application Data [DPAS CL]                         | xx 15 xx xx xx xx xx xx xx xx   |      |
| 9F 11 | Issuer Code Table Index                                   | 01  |      |
| 9F 12 | Application Preferred Name                                | 44 69 73 63 6F 76 65 72 20 43<br>4C   |      |
| 9F 26 | Application Cryptogram (AC)                               | xx xx xx xx xx xx xx xx *   |      |
| 9F 27 | Cryptogram Information Data (CID)                         | 80  |      |
| 9F 36 | Application Transaction Counter (ATC)                     | xx xx *   |      |
| 9F 38 | Processing Options Data Object List (PDOL)                | 9F 66 04 9F 02 06 9F 03 06 9F<br>1A 02 5F 2A 02 9A 03 9C 01 9F<br>37 04   |      |
| 9F 4F | Transaction Log Format                                    | 9F 02 06 5F 2A 02 9A 03 9F 36<br>02 9F 34 03 9F 52 06 9F 1A 02<br>95 05 9C 01 8A 02 9F 37 04 9F<br>03 06 9F 53 08 9F 66 04 9F 71<br>02 9F 6C 02             |      |
| 9F 6C | Card Transaction Qualifiers [DPAS]                        | 00 00   |      |
| 9F 71 | Card Processing Requirements [DPAS]                       | 00 0F   |      |
| 9F 71 | Card Processing Requirements [DPAS]                       | 00 0F   |      |
| 9F 78 | Application State [D-PAS]                                 | 01  |      |
| BF 51 | Contactless D-PAS MS and ZIP Default Profile              | 82 02 00 00 94 04 08 01 01 00   |      |
| C0    | Contactless Application Configuration Options (CL-ACO)    | 00 80   |      |
| C2    | Issuer Life Cycle Data (ILCD) [DPAS]                      | 00 00 00 00 00 00 00 00 00 00<br>00 00 00 00 00 00 00 00 00 00<br>00 00 00 00 00 00 00 00 00 00<br>00 00 00 00 00 00 00 00 00 00<br>00 00 00 00 00 00 00 00 |      |
| C3    | Currency Conversion Codes 1 [DPAS]                        | 08 40 00 00 02  |      |
| C4    | Currency Conversion Codes 2 [DPAS]                        | 08 40 00 00 02  |      |
| C8    | Lower Consecutive Offline Amount (LCOA) Limit [DPAS]      | 00 00 00 00 00 00   |      |
| C9    | Upper Consecutive Offline Amount Limit (UCOA) [DPAS]      | 00 00 00 00 00 00   |      |
| CA    | Single Transaction Amount (STA) Limit [DPAS]              | 00 00 00 00 00 00   |      |
| CB    | Lower Consecutive Offline Limit (LCOL) [DPAS]             | 00  |      |
| CC    | Upper Consecutive Offline Transaction Limit (UCOL) [DPAS] | 00  |      |
| CD    | Number of Consecutive Offline Transactions (NCOT) [DPAS]  | 00  |      |
| CE    | Cumulative Offline Amount [DPAS]                          | 00 00 00 00 00 00   |      |
| D0    | Issuer Application Data ObjectList (IADOL) [DPAS]         |   |      |
| D1    | Offline Balance [DPAS]                                    | 00 00 00 00 00 00   |      |
| D2    | CRM Country Code [DPAS]                                   | 08 40 - USA   |      |
| D3    | CRM Currency Code [DPAS]                                  | 08 40 - USD   |      |

| Tag   | Element name   | Data              | v7.0 |
|-------|--|-------------------|------|
| D4    | CVM-Accumulator [DPAS]                                 | 00 00 00 00 00 00 |      |
| D5    | CVM-Cum limit 1  | 00 00 00 00 00 00 |      |
| D6    | CVM-Cum limit 2  | 00 00 00 00 00 00 |      |
| D7    | CVM-STA limit 1  | 00 00 00 00 00 00 |      |
| D8    | CVM-STA limit 2  | 00 00 00 00 00 00 |      |
| D9    | CVM-Counter  | 00                |      |
| DA    | CVM-Cons limit 1                                       | 00                |      |
| DB    | CVM-Cons limit 2                                       | 00                |      |
| DE    | Counter and Accumulator Control Options (CACO) [D-PAS] | C1 01 21 01 01 00 |      |
| DF 30 | CRM-CAC Switch Interface [D-PAS]                       | 00 00 00          |      |
| DF 31 | CRM-CAC Denial [D-PAS]                                 | 00 00 00          |      |
| DF 32 | CRM-CAC Online [D-PAS]                                 | C8 FE FF          |      |
| DF 33 | CRM-CAC Default [D-PAS]                                | 98 FE EB          |      |
| DF 34 | CVM Card Action Codes - Online                         | 40 80             |      |
| DF 35 | CVM Card Action Codes - Signature                      | 00 80             |      |
| DF 40 | CL-Accumulator   | 00 00 00 00 00 00 |      |
| DF 41 | CL-Cum Limit   | 00 00 00 00 00 00 |      |
| DF 42 | CL-STA   | 00 00 00 00 00 00 |      |
| DF 43 | CL-Counter   | 00                |      |
| DF 44 | CL-Cons Limit  | 00                |      |

### 1.6 Test Card 06 – Discover, Technical Fallback Card

This card has a chip image printed on the card but it does not contain an actual chip.

When inserted, a chip error will be detected.

This should trigger Technical Fallback processing and the transaction should continue as a magstripe Technical transaction.

The recommended transaction amount to generate a host approval is \$26.00.

## Chapter 2 - ASCII Character Conversion Chart

| Dec | Bin      | Hex | Char         | Dec | Bin      | Hex | Char     | Dec | Bin      | Hex | Char       |
|-----|----------|-----|--------------|-----|----------|-----|----------|-----|----------|-----|------------|
| 00  | 00000000 | 00  | <b>NUL</b>   | 44  | 00101100 | 2C  | ,        | 88  | 01011000 | 58  | <b>X</b>   |
| 01  | 00000001 | 01  | <b>SOH</b>   | 45  | 00101101 | 2D  | -        | 89  | 01011001 | 59  | <b>Y</b>   |
| 02  | 00000010 | 02  | <b>STX</b>   | 46  | 00101110 | 2E  | .        | 90  | 01011010 | 5A  | <b>Z</b>   |
| 03  | 00000011 | 03  | <b>ETX</b>   | 47  | 00101111 | 2F  | /        | 91  | 01011011 | 5B  | [          |
| 04  | 00000100 | 04  | <b>EOT</b>   | 48  | 00110000 | 30  | <b>0</b> | 92  | 01011100 | 5C  | \          |
| 05  | 00000101 | 05  | <b>ENQ</b>   | 49  | 00110001 | 31  | <b>1</b> | 93  | 01011101 | 5D  | ]          |
| 06  | 00000110 | 06  | <b>ACK</b>   | 50  | 00110010 | 32  | <b>2</b> | 94  | 01011110 | 5E  | ^          |
| 07  | 00000111 | 07  | <b>BEL</b>   | 51  | 00110011 | 33  | <b>3</b> | 95  | 01011111 | 5F  | _          |
| 08  | 00001000 | 08  | <b>BS</b>    | 52  | 00110100 | 34  | <b>4</b> | 96  | 01100000 | 60  | `          |
| 09  | 00001001 | 09  | <b>HT</b>    | 53  | 00110101 | 35  | <b>5</b> | 97  | 01100001 | 61  | <b>a</b>   |
| 10  | 00001010 | 0A  | <b>LF</b>    | 54  | 00110110 | 36  | <b>6</b> | 98  | 01100010 | 62  | <b>b</b>   |
| 11  | 00001011 | 0B  | <b>VT</b>    | 55  | 00110111 | 37  | <b>7</b> | 99  | 01100011 | 63  | <b>c</b>   |
| 12  | 00001100 | 0C  | <b>FF</b>    | 56  | 00111000 | 38  | <b>8</b> | 100 | 01100100 | 64  | <b>d</b>   |
| 13  | 00001101 | 0D  | <b>CR</b>    | 57  | 00111001 | 39  | <b>9</b> | 101 | 01100101 | 65  | <b>e</b>   |
| 14  | 00001110 | 0E  | <b>SO</b>    | 58  | 00111010 | 3A  | :        | 102 | 01100110 | 66  | <b>f</b>   |
| 15  | 00001111 | 0F  | <b>SI</b>    | 59  | 00111011 | 3B  | ;        | 103 | 01100111 | 67  | <b>g</b>   |
| 16  | 00010000 | 10  | <b>DLE</b>   | 60  | 00111100 | 3C  | <        | 104 | 01101000 | 68  | <b>h</b>   |
| 17  | 00010001 | 11  | <b>DC1</b>   | 61  | 00111101 | 3D  | =        | 105 | 01101001 | 69  | <b>i</b>   |
| 18  | 00010010 | 12  | <b>DC2</b>   | 62  | 00111110 | 3E  | >        | 106 | 01101010 | 6A  | <b>j</b>   |
| 19  | 00010011 | 13  | <b>DC3</b>   | 63  | 00111111 | 3F  | ?        | 107 | 01101011 | 6B  | <b>k</b>   |
| 20  | 00010100 | 14  | <b>DC4</b>   | 64  | 01000000 | 40  | @        | 108 | 01101100 | 6C  | <b>l</b>   |
| 21  | 00010101 | 15  | <b>NAK</b>   | 65  | 01000001 | 41  | <b>A</b> | 109 | 01101101 | 6D  | <b>m</b>   |
| 22  | 00010110 | 16  | <b>SYM</b>   | 66  | 01000010 | 42  | <b>B</b> | 110 | 01101110 | 6E  | <b>n</b>   |
| 23  | 00010111 | 17  | <b>ETB</b>   | 67  | 01000011 | 43  | <b>C</b> | 111 | 01101111 | 6F  | <b>o</b>   |
| 24  | 00011000 | 18  | <b>CAN</b>   | 68  | 01000100 | 44  | <b>D</b> | 112 | 01110000 | 70  | <b>p</b>   |
| 25  | 00011001 | 19  | <b>EM</b>    | 69  | 01000101 | 45  | <b>E</b> | 113 | 01110001 | 71  | <b>q</b>   |
| 26  | 00011010 | 1A  | <b>SUB</b>   | 70  | 01000110 | 46  | <b>F</b> | 114 | 01110010 | 72  | <b>r</b>   |
| 27  | 00011011 | 1B  | <b>ESC</b>   | 71  | 01000111 | 47  | <b>G</b> | 115 | 01110011 | 73  | <b>s</b>   |
| 28  | 00011100 | 1C  | <b>FS</b>    | 72  | 01001000 | 48  | <b>H</b> | 116 | 01110100 | 74  | <b>t</b>   |
| 29  | 00011101 | 1D  | <b>GS</b>    | 73  | 01001001 | 49  | <b>I</b> | 117 | 01110101 | 75  | <b>u</b>   |
| 30  | 00011110 | 1E  | <b>RS</b>    | 74  | 01001010 | 4A  | <b>J</b> | 118 | 01110110 | 76  | <b>v</b>   |
| 31  | 00011111 | 1F  | <b>US</b>    | 75  | 01001011 | 4B  | <b>K</b> | 119 | 01110111 | 77  | <b>w</b>   |
| 32  | 00100000 | 20  | <b>SP</b>    | 76  | 01001100 | 4C  | <b>L</b> | 120 | 01111000 | 78  | <b>x</b>   |
| 33  | 00100001 | 21  | <b>!</b>     | 77  | 01001101 | 4D  | <b>M</b> | 121 | 01111001 | 79  | <b>y</b>   |
| 34  | 00100010 | 22  | <b>"</b>     | 78  | 01001110 | 4E  | <b>N</b> | 122 | 01111010 | 7A  | <b>z</b>   |
| 35  | 00100011 | 23  | <b>#</b>     | 79  | 01001111 | 4F  | <b>O</b> | 123 | 01111011 | 7B  | {          |
| 36  | 00100100 | 24  | <b>\$</b>    | 80  | 01010000 | 50  | <b>P</b> | 124 | 01111100 | 7C  |            |
| 37  | 00100101 | 25  | <b>%</b>     | 81  | 01010001 | 51  | <b>Q</b> | 125 | 01111101 | 7D  | }          |
| 38  | 00100110 | 26  | <b>&amp;</b> | 82  | 01010010 | 52  | <b>R</b> | 126 | 01111110 | 7E  | ~          |
| 39  | 00100111 | 27  | <b>'</b>     | 83  | 01010011 | 53  | <b>S</b> | 127 | 01111111 | 7F  | <b>DEL</b> |
| 40  | 00101000 | 28  | <b>(</b>     | 84  | 01010100 | 54  | <b>T</b> |     |          |     |            |
| 41  | 00101001 | 29  | <b>)</b>     | 85  | 01010101 | 55  | <b>U</b> |     |          |     |            |
| 42  | 00101010 | 2A  | <b>*</b>     | 86  | 01010110 | 56  | <b>V</b> |     |          |     |            |
| 43  | 00101011 | 2B  | <b>+</b>     | 87  | 01010111 | 57  | <b>W</b> |     |          |     |            |