



**Debit AID Processing
Global vs Common
Process as Credit vs. Process as Debit
EMV Level 2 Kernels in ID TECH products**

Version .11

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10721 Walker Street, Cypress, CA 90630, USA Voice: (714) 761-6368 Fax: (714) 761-8880

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Revision History

Revision	Date	Description	By
Initial Draft	12/13/2018	Initial Draft	Randy P
.02	1/17/2019	Updated Tag Value to DFED48	Randy P
.03	2/6/2019	Added Common Debit Preferring	Randy P
.04	2/7/2019	Updated Common Debit Preferring Added flowchart	Randy P
.05	2/11/2019	Redefined specification	Randy P
.06	2/12/2019	Updated Country Code to be 5F55	Randy P
.07	2/12/2019	Fixed Typos	Randy P
.08	2/12/2019	Added Flowchart	Randy P
.09	2/13/2019	Updated information for Debit vs Credit	Randy P
.10	2/14/2019	Updated flowcharts	Randy P
.11	2/14/2019	Added Cashback restrictions	Randy P

Background

In the past, issuers were allowed to route all debit transactions through their own networks. After the passage of the Dodd-Frank Wall Street Reform and Consumer Protection Act, the issuers were required to offer merchants at least two unaffiliated networks that transactions could be routed through. As a result, issuers now include on their cards a "US Common Debit" AID in addition to their Global AID. The US Common Debit AID uses all available networks, while the Global AID uses the issuer's own network.

While the issuers were forced to comply with the act by adding this second AID, they are not forced into which AID is assigned the default choice. Since the issuers would prefer their network be used over the alternate networks, in almost all cases they make their AID with the higher priority, so it is automatically chosen in all contactless transactions, and also all "cardholder confirmation off" transactions for contact. And in cases where cardholder confirmation is ON, their AID is listed at the top providing an advantage when presented to the uninformed cardholder forced to make a selection.

Since the US Common Debit contains all the networks in the Global AID plus additional networks, there is no reason a merchant would desire the more restrictive Global AID to be selected when US Common Debit is available.

Networks

The US Common Debit will support multiple networks the merchant has access to. Each network has characteristics as follows:

- They will/will not process Online PIN (debit transaction)
- They will/will not process Signature (credit transactions)
- They will/will not process No CVM (credit transactions or debit transactions with pin bypass),
 - They can only process if the amount is less than the defined NO_CVM limit for that network

If the matched CVM is Online PIN, they must process it through a network with Online PIN

If the matched CVM is Online PIN, and cardholder cancel PIN entry (bypass PIN)

- They can process through a NO_CVM network if the amount is under what is allowed as NO_CVM
- They can process through a Signature (process as credit) network if the amount is over the NO_CVM amount

If the matched CVM is Signature

- They can process through a NO_CVM network if the amount is under what is allowed as NO_CVM
- They can process through a Signature (process as credit) network

If the matched CVM is NO_CVM

- They can process through a NO_CVM network if the amount is under what is allowed as NO_CVM
- They can process through a Signature (process as credit) network if the amount is over the NO_CVM amount

If the networks approve the decision, they will approve with one of three different outcomes:

- Approved with PIN (online PIN validated)
- Approve with Signature (Signature CVM, PIN CVM with pin bypass, or No CVM over limit)
 - In this case, a signature must still be captured
- Approve with No CVM.

Forcing No CVM

If the merchant knows that a network will accept debit (PIN transactions) without PIN entry if it is under a certain amount, the merchant has no need to prompt for PIN entry. We can define a “No CVM Limit” tag that can be evaluated during runtime that would effectively bypass PIN entry if the amount is under that limit. This would be accomplished by loading a kernel configuration before CVM is attempted that only has the NO_CVM CVM.

Processing as Debit vs. Processing as Credit when using Debit AID

A Transaction with a Debit AID can be processed as “Credit” or “Debit”. In context of a Debit AID, the term “Credit” does not refer to funding from a line of credit from the issuer. For both “Credit” and “Debit” transaction with a Debit AID, both are funded from existing funds from the same bank account. The difference is the customer’s experience, and what network the merchant will use to authorize the payment. When a customer chooses “Credit”, they expect to only have to sign for the purchase, and if they chose “Debit”, they expect to use PIN entry.

“Credit” transaction on a Debit AID use a Signature CVM and are processed over a network that can process Signature

“Debit” transactions on a Debit AID use an Online PIN CVM, and are processed over a network that can process PIN

The logic for presenting Debit/Credit choice to the customer is as follows (flowchart at end of doc):

- The AID selected is a US Debit AID (has IIN Tag 42 – Country Tag 5F55 = “US”)
- The transaction does not have any cashback value (9F03)
- If the amount is under the NO_CVM Limit, load Kernel Configuration NO_CVM and process without prompting for credit/debit first
- If the amount is over the NO_CVM Limit, prompt customer for Debit/Credit
- If customer chooses “Credit”, load Kernel Configuration with SIGNATURE

Since Contactless doesn’t support Menu selection by the customer, having a customer choose between “Credit” and “Debit” is limited to Contact transactions.

US Common Debit AIDs

There currently are 5 US Common Debit AIDs

Visa: A0000000980840

M/C: A0000000042203

Discover: A0000001524010

China Union Pay: A000000333010108

Debit Network Alliance (DNA): A0000006200620

Global Debit AIDs

To determine if an AID is a Debit Aid, the PPSE/PSE and/or FCI (File Control Information, under Issuer Discretionary Data Tag BF0C – see examples at end of document) will contain tag 42, which is the IIN (Issuer Identification Number). The IIN is the first 6 digits of the BIN, represented by 3 bytes. If there is no tag 42, then that AID is not a debit AID.

To determine if the Global Debit AID can be replaced by US Common Debit AID, the Global AID must have tag 5F55 (country) to be “US”, and tag 42 (IIN) must match tag 42 of the US Common Debit AID.

Contactless vs Contact AID Selection Behavior

For a Contactless transaction, if the card has multiple AIDs, the one with the highest priority will always be used.

For a Contact Transaction:

If Cardholder confirmation of OFF, it will use the one with the highest priority

If Cardholder confirmation is ON, and there is more than one AID in the Candidate List,

they will be listed in ascending order, lowest priority number first, for the cardholder to select.

Proposed Solution

- We know the names of all the US Common AIDs
- We know how to recognize if other US Global Debit AIDs are on the candidate lists (US country tag 5F55 is “US” and Tag 42 exists)
- We want to allow the merchant to bypass PIN entry prompt if amount under a defined value
- We want the option to allow customer Debit/Credit selection, when applicable

We define five new tags (Kas will have to formally give final tag values):

DFED48 : Common Debit Preferring, 1 byte

DFEF49 : No_CVM Limit, 6 bytes

DFEF50: No_CVM Kernel Configuration, 1 byte

DFEF51: Signature Kernel Configuration, 1 byte

DFEF52: Prompt for Debit/Credit, 1 byte

Common Debit Preferring: DFED48 – 1 byte

Flag	Description
Bit 5-7	RFU
Bit 4	Prefer US Common Debit DNA
Bit 3	Prefer US Common Debit China Union Pay
Bit 2	Prefer US Common Debit Discover
Bit 1	Prefer US Common Debit MasterCard
Bit 0	Prefer US Common Debit VISA

This tag will tell us which US Common AID we would like to replace a US Global Debit AID, if they both exist on the candidate list.

No CVM Limit: DFED49 - 6 bytes

This tag can either be in the terminal settings, to apply to all transactions, or it can just be in the US Common AID of the issuer to apply just to that transaction.

This tag defines the amount ceiling for changing the kernel configuration to a NO_CVM configuration, if the transaction amount is under it. The format matches tag 9F02 (amount), which is 6 bytes.

Example **DFED49 06 00000005000**

After the US Common Debit has been selected, if the amount is under 50.00, before the CVM matching stage happens within the kernel, a NO_CVM only kernel configuration will replace the current kernel configuration. This will make the only valid CVM that can be matched a NO_CVM

No CVM Kernel Configuration: DFED50 - 1 byte

This tag will contain the No-CVM kernel configuration to temporarily use when the amount is under the No-CVM limit tag DFED49.

Example: DFED50 01 05

This will temporarily change kernel configuration to 5C before CVM matching happens if the transaction amount is under the amount specified in DFED49.

Signature Kernel Configuration: DFED51 - 1 byte

This tag will contain the Signature kernel configuration to temporarily use when the customer chooses to process the transactions as "Credit".

Prompt for Debit/Credit: DFED52 - 1 byte

If this tag has value "01", we will prompt for Debit/Credit for contact transactions that are above the NO_CVM limit and a Debit AID is selected.

Example Transaction Flow:

- Start Transaction
- Candidate List Populated
 - Check Tag DFED48 to see if US Common Aid checking is needed
 - If US Common Aid checking and US Common Aid Found, look for any US Global AIDs with US country 5F55 = "US" and Tag 42 (IIN) that matches US Common Aid. If found, remove it from candidate list
 - Return Candidate List to Kernel
- Kernel processes Candidate List
 - US Common AID selected
 - Check to see if transaction amount is under amount in tag DFED49
 - If under NO_CVM amount & no cashback, load kernel configuration listed in tag DFED50
 - If Contact Transaction and Debit/Credit option ON and over NO_CVM amount and no cashback
 - Present Debit/Credit choice to customer
 - If customer selects Credit, load kernel configuration listed in tag DFED51
 - If customer selects Debit, keep default config
- Kernel process CVM
- Kernel produces 1st Gen AC results
- At end of transaction, restore kernel configuration to original value if changed by DFED50/DFED51

Example FCI from US Visa Global:

▼ application #A0000000031010	
▼ answer to select	
▼ File Control Information (FCI) Template 6F	63
• Dedicated File (DF) Name 84	61
▼ FCI Proprietary Template A5	7
• Application Label 50	10
• Application Priority Indicator 87	1
• Language Preference SF2D	2
• Application Preferred Name 9F12	10
• Issuer Code Table Index 9F11	1
▼ FCI Issuer Discretionary Data BFOC	10
• Issuer Country Code (alpha2 format) SF55	2
• Issuer authority 42	3
▼ processing_options	8

```

6F3D8407A0000000031010A532500A564953412044454249548701015F2D0265
6E9F120A564953412044454249549F110101BF0C0A5F550255534203430665h
> \240\000\000\000\003\020\020 (A0000000031010)
> VISA DEBIT
01h
> en
56495341204445424954h
01h
5553h
430665h
8006180008020400h

```

Example FCI from US Common Debit

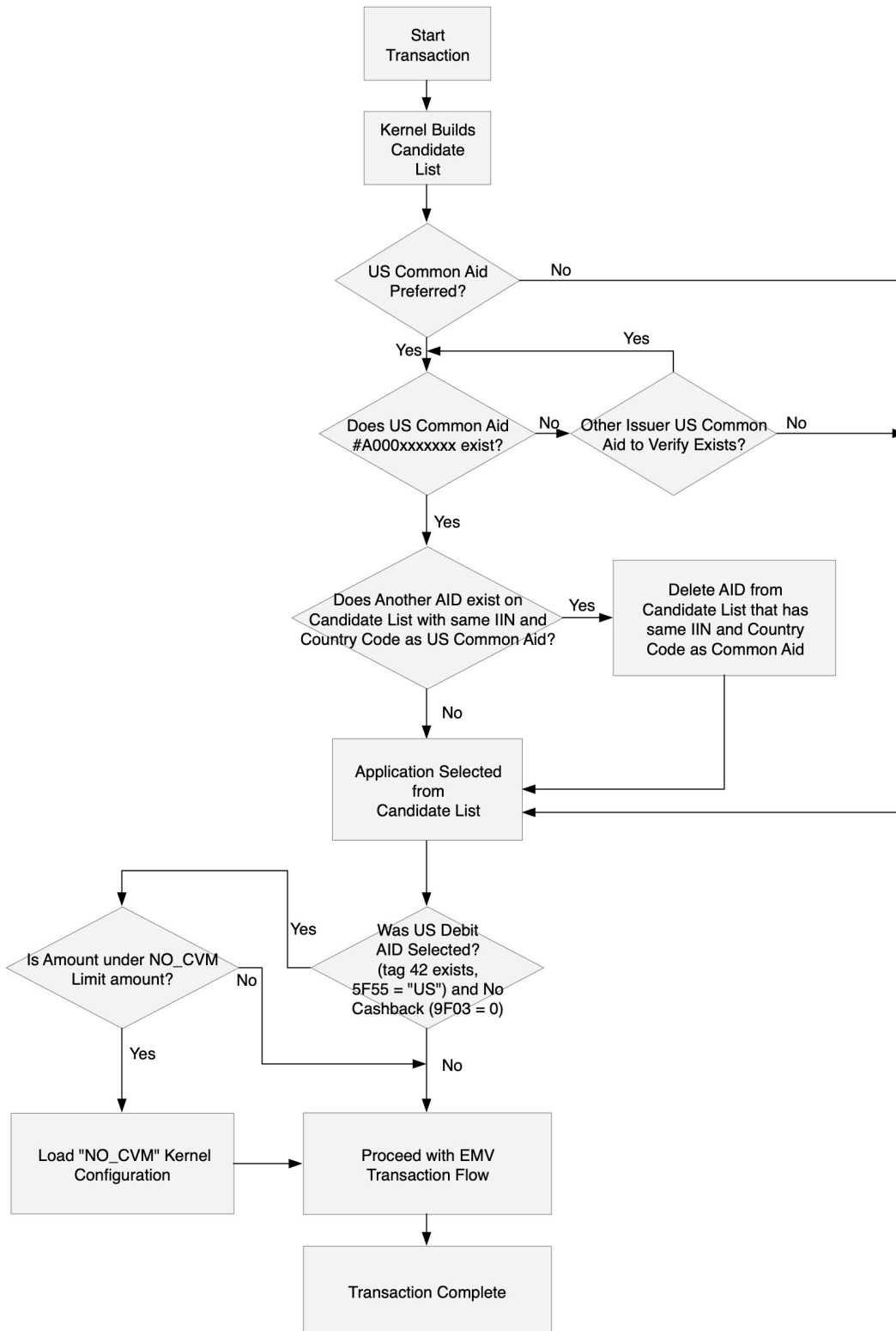
▼ application #A0000000980840	
▼ answer to select	
▼ File Control Information (FCI) Template 6F	59
• Dedicated File (DF) Name 84	57
▼ FCI Proprietary Template A5	7
• Application Label 50	46
• Application Priority Indicator 87	8
• Language Preference SF2D	1
• Application Preferred Name 9F12	2
• Issuer Code Table Index 9F11	8
▼ FCI Issuer Discretionary Data BFOC	1
• Issuer Country Code (alpha2 format) SF55	10
• Issuer authority 42	2
▼ processing_options	3

```

6F398407A0000000980840A52E500855532044454249548701025F2D02656E9F
120855532044454249549F110101BF0C0A5F550255534203430665h
> \240\000\000\000\230\0108 (A0000000980840)
> US DEBIT
02h
> en
5553204445424954h
01h
5553h
430665h

```


Contact/Contactless Transaction Flow, No Credit/Debit Option



Contact Transaction Flow, Credit/Debit Option Enabled

