

### 3.0 Appendix B – Project Aspire Enhancement Functional Design

<b>ADML ID</b>	<b>072</b>
<b>ADML Description</b>	<b>CUSIP Check Digit Validation</b>
<b>ADML Tech #</b>	<b>070</b>

#### 3.1 Background

##### 3.1.1 Functional Requirement

Validate CUSIP numbers based on check digit algorithm. The Committee on Uniform Security Identification Procedures (CUSIP) numbers designates a unique identification code to each security traded. CUSIP numbers are validated based on a check digit algorithm.

##### 3.1.2 Delivered Functionality

The CUSIP number is a delivered field in Deal Management; however, the validation functionality is not delivered.

##### 3.1.3 Gap Description

N/A.

#### 3.2 Description of New Functionality

Validate CUSIP numbers based on check digit algorithm at the Securities page under Deal Management.

The CUSIP Check Digit: In data transmission, when accuracy of the number may represent the only means of identification, the use of a check digit becomes mandatory as it provides the means of mathematically determining the accuracy of the whole number transmitted. For this reason it is necessary to use the full nine digits of the CUSIP code.

A check digit based on the Modulus 10 Double Add Double technique will be assigned to each CUSIP number. Modulus 10 was selected over the other systems because it provides the greatest degree of reliability without the loss of any available numbers. The

illustrations below will clarify the manner of calculation of a Modulus 10 Double Add Double check digit.

**Illustration 1**

<b>Issuer Number 837649</b>	<b>Issue Number 12</b>
$\begin{array}{r} 8 \quad 3 \quad 7 \quad 6 \quad 4 \quad 9 \\ \times 1 \quad \times 2 \quad \times 1 \quad \times 2 \quad \times 1 \quad \times 2 \\ \hline 8 \quad 6 \quad 7 \quad 12 \quad 4 \quad 18 \end{array}$	$\begin{array}{r} 1 \quad 2 \\ \times 1 \quad \times 2 \\ \hline 1 \quad 4 \end{array}$
<p><b>Thus, 8 + 6 + 7 + 1 + 2 + 4 + 1 + 8 + 1 + 4 = 42,</b></p> <p><b>The complement of 2 is 8; therefore, the CUSIP number with optional check digit would appear as 837649 12 8</b></p>	

In the calculation of the check digit, alphabetic characters will be assigned a numeric value. The letter A will be 10; and the value of each subsequent letter will be the preceding letter's value incremented by 1. Normally, validation of the number would be made internally within a computer, using a relatively simple program.

**Illustration 2**

<b>Issuer Number 392690</b>	<b>Issue Number QT</b>
$\begin{array}{r} 3 \quad 9 \quad 2 \quad 6 \quad 9 \quad 0 \\ \times 1 \quad \times 2 \quad \times 1 \quad \times 2 \quad \times 1 \quad \times 2 \\ \hline 3 \quad 18 \quad 2 \quad 12 \quad 9 \quad 0 \end{array}$	$\begin{array}{r} 26(Q) \quad 29(T) \\ \times 1 \quad \times 2 \\ \hline 26 \quad 58 \end{array}$
<p><b>Thus, 3 + 1 + 8 + 2 + 1 + 2 + 9 + 0 + 2 + 6 + 5 + 8 = 47,</b></p> <p><b>the complement of 7 is 3,</b></p> <p><b>and the CUSIP number with check digit would appear 392690 QT 3</b></p>	

To avoid confusion, the fixed income issue number assignments have omitted the alphabetic "I" and numeric "1" as well as the alphabetic "O" and numeric zero. However, in the check digit computation described above, the value of "Z" is 35. A check digit has also been computed for Issuers assigned a six character issuer number. Alpha characters and their equivalent numerical values Alphabetic characters are assigned a numeric value. The letter A will be 10; and the value of each subsequent letter will be the preceding letters value incremented by 1:

A = 10	K = 20	U = 30
B = 11	L = 21	V = 31
C = 12	M = 22	W = 32
D = 13	N = 23	X = 33
E = 14	O = 24	Y = 34
F = 15	P = 25	Z = 35
G = 16	Q = 26	
H = 17	R = 27	* = 36 (PPN System)
I = 18	S = 28	@ = 37 (PPN System)
J = 19	T = 29	# = 38 (PPN System)

### 3.3 Navigation path

Securities page:

Deal Management > Capture Deals > Securities

TRX\_SECURITY\_HDR page: current use of CUSIP field

The screenshot displays the 'Security Header' and 'Security Market Value' tabs. The 'Security Header' section includes the following fields:

- Unit: US001
- Security ID: 0000000001
- Instrument Type: CORPBOND
- \*Status: Active
- CUSIP: IP00000001
- \*Asset or Liability: Asset
- \*Issuer: USBNK
- \*Issue Date: 09/16/2003
- Issue Amount: [Empty]
- Currency: [Empty]
- Maturity Date: [Empty]
- Est. Maturity: [Empty]
- Coupon at Issue: [Empty]
- Description: [Empty]

The 'Audit Information' section shows:

- Created By: SAMPLE
- Last Changed By: SAMPLE
- 01/06/2003 12:51:25PM

### 3.4 Set Up/Control Data

There is no set up/control data associated with this enhancement.

### 3.5 Application Changes (e.g., Pages, Components, Menus, Records, App Engines, SQRs, etc.)

Add new Record PeopleCode to TRX\_SEC\_HDR.CUSIP-ID.FieldEdit.

### 3.6 Unit Test Considerations

The Unit testing plan for the CUSIP number will include the following:

- **Action:** Addition of a valid new CUSIP number.  
**Result:** New CUSIP value added to table.
- **Action:** Attempt to add an incomplete CUSIP number.  
**Result:** Display of an error message: **Invalid CUSIP number**
- **Action:** Attempt to add non numeric CUSIP number.  
**Result:** Display of an error message: **Invalid CUSIP number**
- **Action:** Attempt to add a CUSIP number greater than nine digits.  
**Result:** Display of error message: **Invalid CUSIP number**
- **Action:** Attempt to add a CUSIP number with an invalid Check digit.  
**Result:** Display of an error message: **CUSIP number does not conform to standards.**

### 3.7 Miscellaneous

N/A.

### 3.8 Assumptions

User will use Securities page to enter a CUSIP value when required. CUSIP is not a required field.