# Check Characteristic Guidelines
User Guide

# Contents

# 1. Overview of Check Characteristics Guidelines

UMB provides Payee Positive Pay as a comprehensive automated check fraud mitigation solution. The Payee Positive Pay platform solutions use sophisticated data and image analysis to confirm that the check presented for payment has not been altered since issuance. The FraudGuard solutions use a common set of base administrative modules along with optional solutions that focus on various fraud-causal issues, including:

- **Payee Positive Pay (PPP) with issue file**
  Payee Positive Pay is a patent pending solution which enhances traditional positive pay by using digital interrogation technology to analyze payee line information and optionally to extend the analysis to the check number and dollar amount, and compare the extracted data with the "checks issued" file provided by the bank's corporate customer to validate consistency or to identify an alteration to the field data. At a minimum, the bank's client will need to meet the requirement to send the conforming payee name information on an X9 compliant check format of acceptable quality.

- **Counterfeit Detection**
  Counterfeit Detection automates the analysis of the key static elements on the face of a check. Key check fields such as bank name and logo; check, account and routing numbers; name and address; marks, lines, font type and size are automatically interrogated for placement, size, and/or content by FraudGuard based on customer defined rules sets.

There are increasing opportunities for check fraud with the advent of Image Exchange, merchant or corporate capture, along with expanded availability of digital copying. FraudGuard's sophisticated technology provides proven reduction of fraud in combination with best practices such as applying reasonable check printing and processing guidelines.

## 2. Background

This document outlines the check design, processing, and printing characteristics that are required to optimize the Digital Interrogation (DI) of the items.  Throughout the document there will be many references to consistency of the information.  In order for the Digital Interrogation process to optimally extract the targeted image based information, consistency of the check per account number is expected.  Less than optimal conditions will result in less than optimal results.

Since this is a solution exposed to various controlled and uncontrolled production environments, there are other factors, listed in the final section of the document, which can be expected to impact data extraction rates of the Digital Interrogation that are not within the control of the software and are external influences.

## 3. Paper Stock and Check Design Requirements

An integral part of the total solution is the paper stock and check design.  Consistency of the check will be important as it is verified in the check paying process.  High quality paper stock always adds appeal to clients and forms the background for information printed on the item.  As a result, the quality of the check stock can dictate the quality of the resulting image in the check paying process.  The below guidelines require conformity with ANS standards X9.7 – X9.100 inclusive should be followed when selecting & designing paper stock and check design:

### 3.1 Paper Stock:

- The check dimensions are consistent for each Bank Account number
- The paper weight is 24-lb. MICR Bond

### 3.2 Check Design:

- Conforms to published ANSI X9.7 –X9.100 layout standards
    - The check stock and design are image friendly. Background washes out for black and white images when scanned using standard 200/240dp monochrome cameras (see ANSI guideline X9-TG-2 section 3.2.2).
- Any printing, shading or other use of the back of all checks must conform to Federal Reserve Bank Regulation CC Standards
- Any overlays that are part of the check design or printing should always be consistent

# 4. Payee Information Verification Requirements

The differentiating basis for the Payee Positive Pay application is including the verification of the payee name information to traditional positive pay field validation. In order to optimize this verification process, payee criteria should be consistent, therefore when printing checks the below characteristics should be followed:

- The location of all the payee information (e.g. name, date, courtesy amount and legal amount) must be consistently printed in the same location by Account number.

- All payee information (payee name, dollar amount and date) must be in black ink.

## 4.1 Fonts on Checks

- Serif and. San Serif: The recognition engines perform best with certain popular Serif and San Serif fonts (without the small lines at the end of characters, like Arial). The most effective fonts include:

  - Arial (not Arial Black or bold)
  - Arial Narrow (not bold)
  - Century Gothic
  - Dotum (not DotumChe)
  - Gulim
  - Latha (not bold)
  - MS Gothic
  - MV Boli
  - Trebuchet MS
  - Univers
  - Courier
  - Courier New

- Regular vs. Non-regular: Only fixed-width (fixed spacing) fonts like Courier New project the best results (vs. fonts that have characters of different widths (proportional spacing), like Times New Roman).

- The application provides optimum results when a minimum font size of 12 points or higher (larger fonts are preferred, smaller fonts will lower the yield).

- Payee Positive Pay IRDs must be a minimum 12 point font size due to the "reduction" process employed in the IRD creation (font sizes below 12 point do not restore effectively for automated analysis and font sizes larger than 14 point have no material benefit).

- Payee information printing is optimized when all UPPER CASE characters are used (lower or mixed case will lower the yield).

- Payee information printing should not be Boldfaced, Italicized, Cursive, Underlined, or "Narrow". Each of these printing enhancements leads to poor results.

*Note: Although previously allowed, Times Roman has proved to produce very poor results, especially when the image has been converted to an IRD, it is therefore not recommended.*

## 4.2 Location and Spacing on Checks

- The payee and address block must be left aligned.

- The payee name(s) must start on the first line of the payee address block.

- If there is an address line present, it must always follow the payee line. There must be no blank

spaces or lines between the payee and the address. Blank lines in the body of the field can provide fraudsters with a location to add a payee and must be specifically avoided.

- For the payee address block, the paragraph should use 1.0 line spacing between all lines. This includes payee lines and address lines.

## 4.3 Backgrounds on Checks

- Any background patterns, images or watermarks on the check stock that is within the area of the data to be recognized can interfere with the recognition results.

- The data to be interrogated (e.g. payee, amount) must be surrounded by an area of white space which to minimize the interference of any irrelevant printed information on the item, and allow for some shifting/offset of the data's location during the scanning process.

- Amount area and all background and design graphics should have high reflectivity. It is recommended that half-tone printing be used for the non-critical portions of the check. Pastel colored backgrounds are optimal.

## 4.4 Target Marker Guidelines

The target markers for location of the Payee, specifically, "PAY TO THE ORDER OF":

- Must not be italicized, bold or underlined

- Must be in all UPPER CASE font

- Must be printed horizontally on the check

- First line of target marker must be at the same level on the check and to the left of the payee or if above the payee, the payee must be immediately below it (with no space for an additional payee to be added)

The target marker for location of the Amount known as the "CAR amount" must be preceded by a "$ sign" (e.g. $100.00).

# 5. Payee Location & Fraud Identification

To optimize payee location and fraud identification, the "Unrestricted" setting is recommended. The "Unrestricted" option is used to automatically locate and detect the number of lines of payee and compare this with the payee in the issue file. All lines of the actual payee must be provided and specified in the issue data that is submitted for comparison and validation in order to catch fraudulent information. After the payee in the issue file has been matched, any subsequent lines are analyzed to decide whether they are address lines or additional (fraudulent) payee lines.

The application scans several possible locations on the face of the check to automatically locate the payee/address block. This is based on the standard X9 check layout and location of keywords, like "to the order of", to identify a left-justified paragraph as the payee/address block. Once the payee/address block is identified, the engine will process each line of text, starting from the top line and going down. Each line is evaluated as a payee name candidate, and the DI process will stop processing text lines when it encounters something other than payee, like address line 1. Information that is sufficiently outside of the payee/address block will not be considered for automated verification.

The area around the payee/address block is uniquely determined by the DI engine on a per image basis, but as a general rule 2 lines above & below the payee information defines the payee zone. For example, if there is sufficient white space between a payee value that is either above or to the right of the payee/address block, the value may not undergo the recognition or comparison process. If it is not possible to provide all the lines of payee in the issue file, the "Issue file payee only" option should be used; this will stop analyzing the payee lines once the issue file payee lines have been matched. This means that although frauds above and to the right of the payee will still be caught; additional payees added below the genuine payee will be missed.

The possible fraud scenarios that may be captured with the "Unrestricted" or "Issue file payee only" options are as follows:

1.  Complete replacement of the name:
    Ex.:  John Brown          ->   **Peter Star**
          13, NW road              13, NW road
          75045 Anywhere, OK  75045 Anywhere, OK

2.  Replacement of certain words:
    Ex.:  John Brown          ->   John Brown
          & Peter Star             & Peter **White**
          13, NW road              13, NW road
          75045 Anywhere, OK   75045 Anywhere, OK

3.  Adding characters at the end of a line:
    Ex.:  John Brown          ->   John Brown**sweig**
          & Peter Star             & Peter Star
          13, NW road              13, NW road
          75045 Anywhere, OK  75045 Anywhere, OK

4.  Adding another name at the end of a line
    Ex.:  John Brown          ->   John Brown **& John White**
          & Peter Star             & Peter Star
          13, NW road              13, NW road
          75045 Anywhere, OK  75045 Anywhere, OK

*Note: The following fraud scenario will only be caught using the "Unrestricted" option:*

5.  Adding another name above the address block in case of available free space
    Ex.:  John Brown      ->    **George White** & John Brown
            & Peter Star         & Peter Star
            13, NW road        13, NW road
            75045 Anywhere, OK   75045 Anywhere, OK

## 5.1 Samples of Conforming Checks*

### 5.1.1 Sample 1



*UMB can accept other check formats for Positive Pay services. The above sample is the most successful format and results in the fewest amount of false exceptions due to reader errors. Other, non-standard formats, can be utilized for Positive Pay accounts, but approval from the bank will be required. Non-standard check stock can lead to higher exception rates and increased fees.

## 5.2 Samples of Non-Conforming Checks

### 5.2.1 Sample 1

- There must not be any symbols, characters or numbers above the payee line because the DI engine will treat it as part of the payee. A barcode is acceptable.

- The "Pay to the Order of" must be above or parallel to the level of the payee.

- Over-spray interferes with the area of the check that is being interrogated.

### 5.2.2 Sample 2

- The ID number above the payee line interferes with the DI on a check, similar to sample 1.

- The area to be recognized (i.e. payee) must not have any background patterns (i.e. "VOID" background), watermarks, or seals as this can interfere with the DI process.



## 6. Check Stock Verification Requirements

Check Stock Validation automates the analysis of all static and dynamic elements on the face of a check. All check fields such as bank name and logo; check, account and routing numbers; name and address; marks, lines, font type and size are automatically interrogated for placement, size, and/or content by the system based on customer defined rules sets.

- The colored background should 'wash out' when the check is imaged in black and white at standard sorter resolutions (200/240 dpi). For this reason lighter colors are preferred (see ANSI guideline X9-TG-2 section 3.2.2).

- Optimal results will be obtained from printing on a plain white or lightly colored background, than from a colored highly patterned stock.

- Static text such as 'Pay To', 'Date', 'Amount' etc. should be separated from other printed or handwritten text, and should not be overwritten by any writing.

- Text must be printed using at least a 12 point font with a clear (preferably Sans Serif) typeface to avoid blurring and merging when converted to an IRD. (Also see font guidelines under Payee Information Verification Requirements section in this document).

- The check layout must not vary for a defined template within a specific account, unless a unique template is defined for every new check format or layout.

- The reference templates cannot be created using IRD images.

- Using different logos or pictures for the same template / layout within an account will impact the read rate.

- The layout should not have heavy border patterns.

- Check endorsement must not be applied over the static printed text on the check.

# 7. Check Printing Requirements

**The printing of the checks is an important step of the process.  High quality printing will enhance the quality of the image that will be used in the check paying process.**

The printing would be Laser or Ink Jet print, although Laser is preferred.

- Minimum of 600 DPI

Checks that experience poor quality printing of check information and/or Seal will subsequently produce poor quality check images.  This will negatively impact the recognition of values by Digital Interrogation and the decoding of Seal values.

# 8. IRD Processing

**IRD (Image Replacement Document) checks include a reproduction of the original check as a substitute of the original. In order to fit in the allocated print area, the original check image is scaled-down to standard conforming percentages, so there will be some loss of detail and size of the image data that will impact Digital Interrogation and Seal decoding.**

As a general rule, payee decode from conforming IRD items remains a technology challenge that results in lowered digital interrogation results.

This scaling-down of the image reduces the ability of Digital Interrogation to read values from the face of IRD's. In order to have any reasonable measure of success at recognizing values from IRD items, the items must first follow the ANSI X9.90 standard for creating IRD's so that the front image area can be pre-processed correctly by

Digital Interrogation. Secondly, the items must follow the Requirements listed above. Finally, these items must be identifiable as IRD's from position 44 of the MICR; this indicator is required so that Digital Interrogation will process the item accordingly.

Although processing institutions have no control over the quality of the image used on the IRD it is worth noting that IRDs produced with monochrome 200/240 dpi images give far better read rates than those using grayscale images.
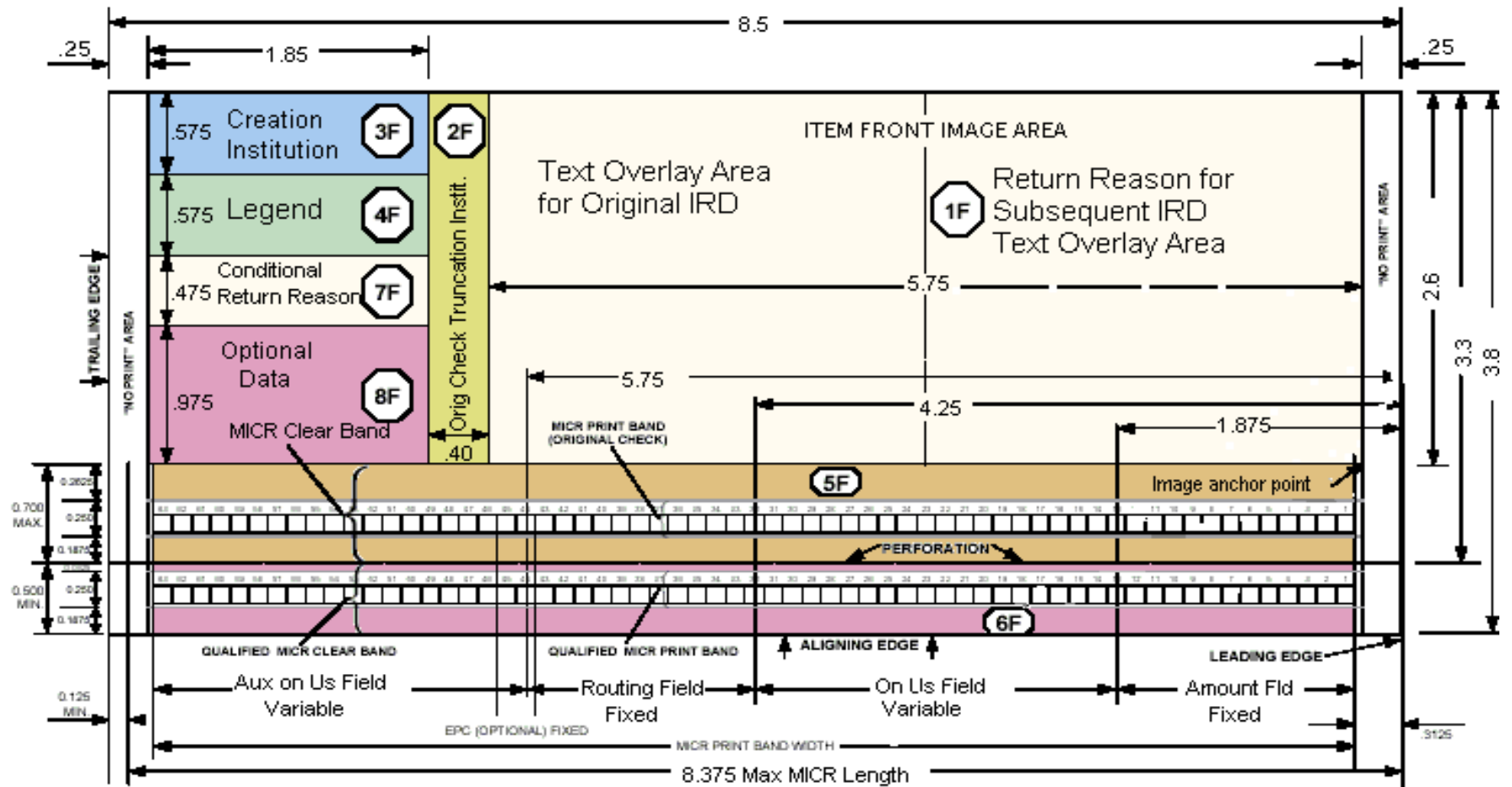
## 8.1 Sample of Conforming IRD



*Note: This is a sample IRD of a personal check, but for PPP scenario, the items would be business checks using business size check stock and layout.*

# 9. Check Layout Guidelines

## 9.1 Return Front Image Layout

# 10. Other Factors

There are other factors that will affect the read rate that this section will address.  These factors preclude Digital Interrogation of the targeted data (e.g. payee, signature, check stock) or Secure Seal and include:

- Images with poor check print quality

- Check images with poor scanned image quality

- Non-standard items such as items in carriers, items that contain Lundy strips and/or items with front endorsements or occlusions that interfere with targeted data read zones

- Processing stamps or endorsements that the POS, teller or other first presentment point entity may add to obscure information

- Audit trail sprays that obscure targeted information or confuse check layout

- Additional characters directly above the payee line would interfere with the Digital Interrogation ability to identify first payee line

- The "Pay to the Order of" below the level of the payee name, making it difficult to recognize the payee

- IRDs created with poor quality original images, or original images scanned as grayscale instead of black and white.

When the check is presented for payment, the party (POS, teller, or other entity) that first receives the item may inspect the item and add annotations.  If this is completed around the payee name, it may result in lower read rates with the Digital Interrogation process. Occlusions on the face of the check over targeted data are outside the control of software and will eliminate the potential to read data below the occlusion.
As the check is processed through the Financial Institutions and other entities, an audit trail is sprayed on the check.  Some Financial Institutions and entities put their audit trail on the front of the check, and depending on the check, such a spray could overlap with the payee information.   Through testing it has been detected that, these audit trails negatively affect the read rate of the Digital Interrogation as well as manual inspectors.

Many corporate clients will outsource some or all of their check printing.  Some outsourced check printing companies may add an audit trail to the printing of the check.  Depending on where and how this is accomplished, it could affect the read rates of the Digital Interrogation.

Any additional numbers, symbols, or characters that are added to the payee/address block, above the first payee line is not acceptable for Digital Interrogation.  This will impact the recognition engine's ability to locate and identify the first payee line in the payee/address block, and will often cause it to raise an exception for a fraudulent payee above the genuine one.

If the key phrase "Pay to the Order of" is below the horizontal level of the first line of the payee/address block, the recognition engine will have difficulties locating the first line of the payee value.  It is recommended that the key phrase be to the left and at the same level as the first line, or above the payee/address block.

Check images that are scanned or digitally captured at poor quality may negatively impact Digital Interrogation and the decoding of Seal values.  Problems such as excessive skew, image too dark, image too light, streaks or marks from the scanning process could cause these difficulties.