



**Data Security & Cryptography Division**

**White Paper**

**Using the Barcode Inspector to Detect  
Shortpaid Electronic Postage**

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## Introduction

Electronic postage technology has changed the way individuals and businesses use the postal service. Gone are the days of going to a post office and waiting in a long line to buy stamps. Now, anyone with a personal computer, a printer, and an internet connection can easily purchase and print a shipping label containing electronic postage, technically known as Information-Based Indicia (IBI). This implementation of electronic postage is also referred to as PC Postage.

However, allowing customers to print shipping labels with electronic postage at the convenience of their home or business and deposit the letters and packages directly into mail collection boxes creates potential risks of revenue loss for the postal service.

## Postal Revenue Loss from Electronic Postage

The Universal Postal Union (UPU) has classified four main categories of risks which cause postal services worldwide to lose an estimated five to ten percent of their annual postage revenues:<sup>1,2</sup>

1. Fraud and counterfeiting
2. Shortpaid or unpaid postage
3. Mail accepted and processed without verification
4. Improper accounting procedures

Electronic postage technology is the most susceptible to these risks.

The United States Postal Service (USPS), the world's largest postal authority, has estimated that shortpaid postage alone, stemming from the use of shipping labels with electronic postage on packages, was nearly \$70 million in fiscal year 2012. That staggering amount represented the largest share of total shortpaid revenue for that year.<sup>3</sup>

A cost-effective and modern technology solution can help the USPS and other postal services easily detect mailpieces which cause postage revenue loss during all phases of mail handling, starting with acceptance, continuing through processing, and ending with final delivery.

Micronite's Barcode Inspector is an innovative software solution which can scan, decode, audit, and verify the electronic postage on a shipping label. It recognizes the IBI barcodes used by the USPS and other international postal authorities. The Barcode Inspector can verify that the IBI barcode is authentic, ensure that the data encoded within the IBI barcode matches what is printed on the shipping label, and confirm that the correct postage was paid by the mailer.

The best way to illustrate how the Barcode Inspector can quickly detect shortpaid electronic postage is to use a real-life example of a USPS shipping label.

## A Suspicious Electronic Postage Label

Click-N-Ship is an online shipping service offered by the USPS. It allows anyone to print domestic and international shipping labels with electronic postage. Users have an option to save the generated shipping label as a PDF file which can be subsequently sent to a printer.

We will use a Click-N-Ship label found during a random search of the internet. The PDF file contains an international shipping label for a Priority Mail Express International (PMEI) package weighing 22 pounds going from California to South Africa.

Exhibit 1 shows the first page of the international shipping label which contains the electronic postage, or the PC Postage IBI, marked as A.

<b>PRIORITY MAIL EXPRESS</b> <small>UNITED STATES POSTAL SERVICE</small>		<b>Customs Declaration Dispatch Note - CP 72</b>  <b>EC 988 697 787 US</b>		<b>Click-N-Ship</b> <small>usps.com</small> <b>US POSTAGE PAID</b> <b>\$148.31</b> 22 lb 0 oz 08/25/13 Mailed from 95336 <b>062S000000311</b>		EC988697787US004983010000824  <b>Commercial Base Pricing</b>				
<b>From</b> [Redacted] MANTECA CA 95336-3148 USA	License Number(s)		Certificate Number(s)		Invoice Number		Scheduled Delivery Date:			
	Insured Amount (US \$)		SDR Value		\$200.00		\$0.00			
	<b>To</b> [Redacted] 0824 PRETORIA, GAUTENG SOUTH AFRICA		Importer's Telephone/Fax/Email Phone: [Redacted]		Nondelivery Instructions Return to Sender					
Comments (e.g., goods subject to quarantine, sanitary/ phytosanitary inspection, or other restrictions)										
Detailed description of contents						Qty.	Weight lb. oz.	Value (US \$)	HS Tariff Number	Country of Origin
laptop						1	22 0	200.00		US
<b>Contents</b> <input checked="" type="checkbox"/> Gift <input type="checkbox"/> Documents <input type="checkbox"/> Commercial Sample <input type="checkbox"/> Returned Goods <input type="checkbox"/> Merchandise <input type="checkbox"/> Humanitarian Donation <input type="checkbox"/> Dangerous Goods <input type="checkbox"/> Other Explanation: laptop				Total Wt.	Total Value	Total Postage/Fees	Mailing Office Date Stamp			
				22 0	\$200.00	\$148.32 <b>B</b>				
Sender's Customs Reference (if known)		Importer's Customs Reference - (Fiscal or VAT-number of the addressee, if known)		AES/ITN/Exemption NOEEI 30.37(a)						
I certify the particulars given in this customs declaration are correct. This item does not contain any undeclared dangerous articles, or articles prohibited by legislation or by postal or customs regulations. I have met all applicable export filing requirements under federal law and regulations.				<b>POSTAL USE ONLY</b>						
Sender's signature [Redacted]		Date 08/25/2013		Date In:	Time In:	Employee Initials:				
					<input type="checkbox"/> AM <input type="checkbox"/> PM					

Exhibit 1: Click-N-Ship label, Page 1, Customs Declaration

At first glance, there seems to be something suspicious about the shipping label. Total postage and fees shown within the human-readable portion of the IBI is \$148.31. But it does not match the amount of \$148.32 shown in the Total Postage/Fees box, marked as B.

Rounding error? Maybe. Software glitch? Possible.

## Barcode Inspector in Action

The only way to know for certain is to use the Barcode Inspector to scan and decode the IBI barcode to see what is going on.

The Barcode Inspector results are shown in Exhibit 2. The three components of the Click-N-Ship account number, specifically 06, 2S, and 0000000311, appear in the human-readable portion of the IBI. The Mailing Date of 08/25/2013 is correct.

But the Postage amount within the IBI barcode tells a different story. That amount is \$49.83 which does not match any of the visible postage amounts on the shipping label!

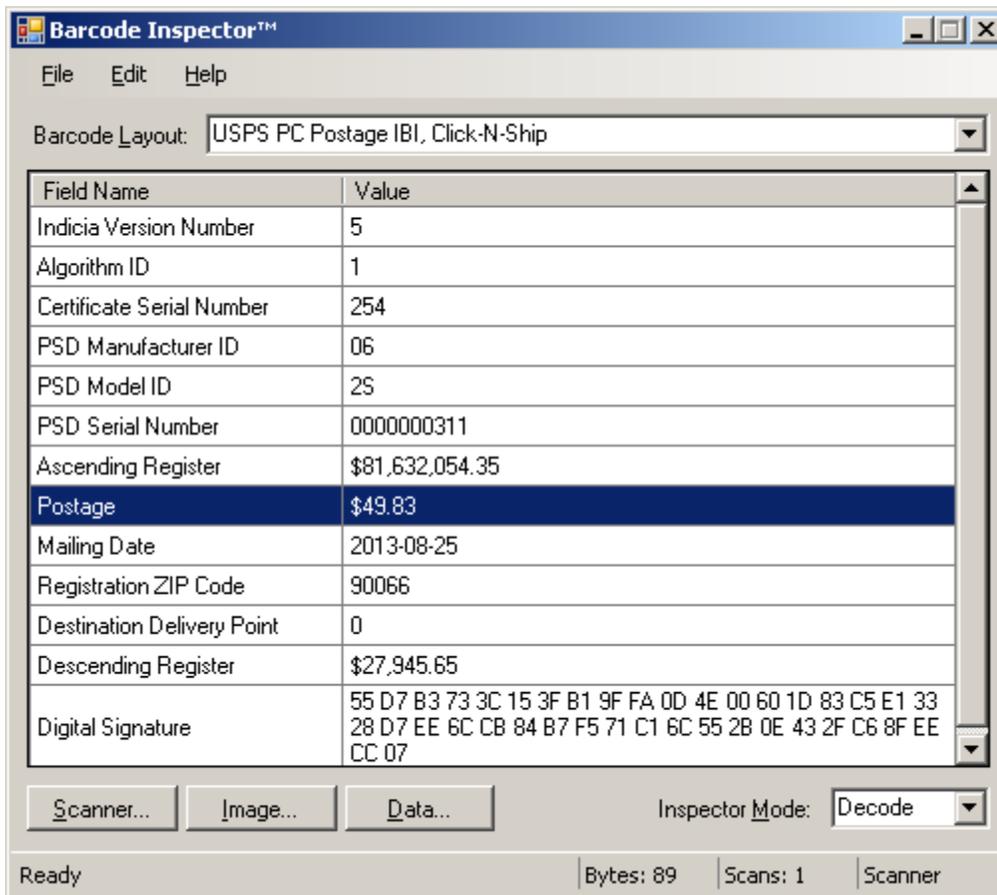


Exhibit 2: Barcode Inspector results for the IBI barcode in the Click-N-Ship label

Furthermore, Click-N-Ship labels display a special alpha-numeric text above the IBI barcode which includes a few details about the shipment such as the tracking number, postage amount, weight, and the destination postal code. Exhibit 3 shows the different elements of the special alpha-numeric text.

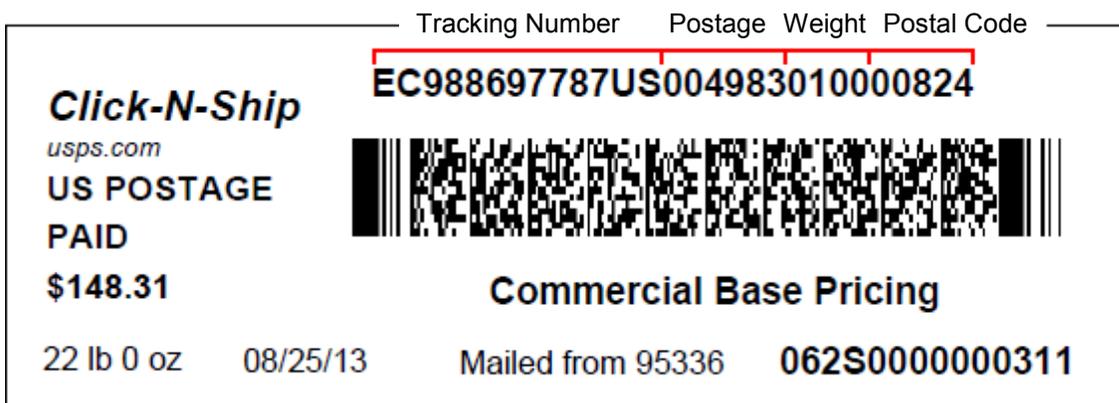


Exhibit 3: Elements of the Click-N-Ship alpha-numeric text

Notice that the Postage area contains 004983 which equates to \$49.83, the same amount as the postage value within the IBI barcode. The Weight area contains 0100 which equates to 1 pound, 0 ounces. Neither the Postage nor the Weight match the values shown in the human-readable portion of the IBI and other parts of the shipping label.

## Conclusion

These discrepancies lead us to conclude that the Click-N-Ship customer may have tampered with the PDF file containing the shipping label and changed the discrete postage and weight values before printing the label. Anyone can easily modify a PDF document and manipulate the text to fit their needs by using any of the PDF file editors available in the market today, some can even be downloaded for free from the internet.

Of course, another possibility exists: A major defect in the Click-N-Ship application software at the time the label was generated caused these glaring discrepancies. However, given the magnitude of the error, this situation is highly unlikely.

Regardless of the cause, whether it is intentional tampering or a software issue, if the postal service personnel was using the Barcode Inspector, the USPS would have recovered \$98.49 of shortpaid postage on just one package alone!

To learn more about the Barcode Inspector, call us at 916-781-6700 or visit the Web page below:

<http://www.micronite.com/en-us/products/barcodeinspector>

## References

<sup>1</sup> Universal Postal Union, *White Paper on Postal Revenue Protection*, CC 2010.1–Doc 3b

<sup>2</sup> Universal Postal Union, *Clipping the wings of revenue loss*, *Union Postale*, March 2011

<sup>3</sup> Office of the Inspector General, USPS, *Shortpaid Postage – Information-Based Indicia Packages, Southern Area*, Report Number MS-AR-13-011