

Currency Note Examination “Bank of Jamaica Five Thousand Dollar Currency Note”

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Abstract:

In many different areas of society, counterfeit products circulation is on the rise. Currency note is no exception. Over the last decade, the Questioned Document Section of the Jamaica Constabulary Force has seen a significant increase in cases related to counterfeit currency notes. This study aims to investigate the methodology of detecting counterfeit notes in Jamaica. This paper highlights various security features of the Bank of Jamaica currency note specifically the \$5000 denomination. This paper analyse methodology used to investigate counterfeit currency notes. The video spectral comparator (VSC40 & 80), Bausch and Lomb Microscope and a Hand Held Magnifier were used in this analysis which took place in the Questioned Documents Laboratory of the Jamaica Constabulary Force. Bank of Jamaica currency notes are issued in Five (5) denominations namely \$50, \$100, \$500, \$1000, and \$5000. The front of these notes carries either a National Hero of Jamaica or a former Prime Minister whilst the back of the notes carries a local scenery or popular landmarks. These currency notes are the same size measuring (143 X 68 mm) and has a watermark portrait that is unique to each of these notes. They also carry unique security features that are visible only under ultraviolet light source. They contain serial numbers that can be seen at the front of each note running both vertically and horizontally to the left and right, respectively. No two note carries the same serial number. The printing date as well as the signature of the Governor of the Bank of Jamaica can also be seen at the front of each note. The \$5000 note bears the portrait of The Rt. Honourable Hugh Lawson Shearer. If after an examination is conducted and one of the features from any of the above-mentioned currency note is found to be missing, then such note is deemed to be a counterfeit of the genuine Bank of Jamaica currency note.

Keywords: Bank of Jamaica, Denominations, Security Features, Video Spectral Comparator (VSC40 & 80), Bausch and Lomb Microscope, Hand Held Magnifier, Counterfeit.

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Introduction

In this point in time where society has become more dependent on technology, the world the more connected in ways that are once thought to be a very distant future. With these advances in technology, the need for resources has become more demanding. For this reason, unscrupulous individuals and organizations find ways and means of creating counterfeit or fake items. In recent years this form of criminal activity has been steadily growing. Thus damaging countries' economies and the society at large. Counterfeit notes can be authenticated using various methods including; the feel of the Paper, tilt of the note, performing a check with light and also, checking not with UV light.

Counterfeit currency varies from the low quality color scanner/printer-based notes to high quality counterfeits whose production is sponsored by hostile states. Due to their harmful effect on the economy, detecting counterfeit currency notes is a task of national importance. However, automated approaches for counterfeit currency detection are effective only for low quality counterfeits; a manual examination is required to detect high quality counterfeits. Furthermore, no automatic method exists for the more complex – and important – problem of identifying the source of counterfeit notes (Sarkar *et al*, 2013).

Jamaica originally adopted their monetary system from the United Kingdom where the currency was known as the “Sterling Exchange Standard”. At this time Jamaica was a dependent territory to the British. (Analyst, 1953) After independence in 1952, the Sterling was exchanged for the Jamaican Dollar (sign: \$, code: JMD).

To mitigate counterfeit currency notes, various distinguishing security features have been put in place. The Bank of Jamaica currency notes are issued in Five (5) denominations namely Fifty Dollar (\$50) Currency Note, One Hundred Dollar (\$100) Currency Note, Five Hundred Dollar (\$500) Currency Note, One Thousand Dollar (\$1000) Currency Note and Five Thousand Dollar (\$5000) Currency Note.

This paper will focus on the examination of the Bank of Jamaica Five Thousand Dollar (\$5000) Currency Note, which was introduced in the year 2009. It is the highest value currency used in Jamaica and bears the portrait of The Rt. Honourable Hugh Shearer at the front of the note. The Rt. Honourable Hugh Lawson Shearer who was Jamaica's third Prime Minister was born on May 18, 1923, in the parish of Trelawny,

Jamaica. Shearer served as Prime Minister from April 11, 1967, to March 2, 1972.

He was appointed Assistant General Secretary of the Bustamante Industrial Trade Union in 1947, then in 1953, he was appointed Island Supervisor, Vice President in 1969 and President in 1977. In 1992, Shearer was elected as the Chairman of the Joint Trade Unions Research Centre. He received The Order of Jamaica twice in 1990 and 2002 respectively. (jis.gov.jm).

Review of Literature

Fung and Shao (2011), discusses the importance of policies that should be put in place in the fight against counterfeit. The writers mentioned that policies should be aimed towards enhancing bank note security which will, in turn, improve currency note verification. Additionally, anti-counterfeit measures in the fight against reducing the production of counterfeit notes. The review mentioned that a comprehensive anti-counterfeit strategy that involves the routine issuance of new series of bank notes, is more effective in preventing counterfeiting than any one measure.

Kumar *et al*. (2020), discusses the examination of a counterfeit bank note using a flowchart. This flowchart depicts the stages of counterfeit detection which includes image acquisition, grayscale conversion, edge detection, dividing the image in different parts, extracting the various characteristic of the note, and then compare these notes to one that is genuine.

Security Features

Security Features are authentication features that are placed on documents to help prevent such documents from being duplicated into counterfeit documents. Most security features on any document cannot be seen with the naked eye. The paper focuses on The Jamaica Five Thousand Dollar (\$5000) Currency Note. According to the Bank of Jamaica, the list below shows the security features of the said bank note. (boj.org.jm).

On the front of the bank note, the security features are:

1. The fine engraved lines of the portrait of the Most Hon. Hugh Lawson Shearer
2. The black vertical serial number which increase in size. This should not match the red horizontal number on the right hand.
3. The wide Optiks™ silver thread featuring images of the Jamaican Coat of Arms (reversed

on the front). This thread is contained within the paper and is not stuck on top of it.

4. When the note is held up to the light, the complete thread with 'BOJ 5000' REPEATED vertically on both sides.
5. When viewed under UV light two parallel bars of fluorescent green are visible along the edge of the Optiks thread.
6. The yellow background of the Jamaican coat of arms (right reading) displays a red map of Jamaica on a green background under UV light.
7. Feel the tactility of the denomination numerals in the corners and the text containing the words 'BANK OF JAMAICA' and 'FIVE THOUSAND DOLLARS'.
8. The watermark of the Most Honorable Hugh Lawson Shearer and an adjacent bright '5000' electrotype.
9. The checked image becomes perfectly complete as a leaf when the note is held up to the light.



Figure No. 1: The picture below shows the security features found in the front of the Bank of Jamaica Five Thousand Dollar (\$5000) Currency Note

On the back of the bank note, the security features are:

1. The leaf pattern is completed when the note is held up to the light.
2. The honeycomb pattern should look smooth and be of one colour
3. The image of Highway 2000
4. The silver metallic oval create by the Optiks window, within the oval, there is at least one complete image of the Jamaican Coat of Arms (right reading).
5. When held up to the light 18mm wide Optiks thread is visible with images of the Jamaican Coat of Arms and the 'BOJ 5000' text repeated at the edges.
6. Under UV light the text 'BOJ 5000' is visible along the edges of the thread
7. The fine engraved lines of the Frangipani Flower (*Plumeria Rubra*).



Figure No. 2: The picture below shows the security features found in the back of the Bank of Jamaica Five Thousand Dollar (\$5000) Currency Note

Materials and Method of Examination

The examination was conducted using the various methods and materials listed below:

- **Feel of Paper** is a simple method that can be used to identify counterfeit bank note.
- **Check with light**, when held up to the light some security features can be visible with the naked eye.
- **Video Spectral Comparator (VSC 40 & VSC 80)** is a machine that was manufactured by Foster and Freeman. This machine has several different functions and light sources that are used during document examination. It is used by document examiners to check the validity or authenticity of documents. (Foster and Freeman, 2018)
- **Bausch and Lomb Microscope** has a three dimensional view feature giving the Examiner the option to manipulate its function.
- **Hand Held Magnifier** is a tool with a handle that is attached to a lens which is used to view text and images. (associatedoptical.com)



Figure No. 3: The picture below shows the Examiner using the Bausch and Lomb Microscope. The Hand Held Magnifier can also be seen in the picture.



Figure No. 4: The picture below shows the Video Spectral Comparator 80.

Genuine Bank of Jamaica Five Thousand Dollar (\$5000) Currency Note

The pictures below show the Genuine Bank of Jamaica Five Thousand Dollar (\$5000) Currency Note when viewed under the Ultra Violet Light source.



Figure No. 5: Front of Genuine Bank of Jamaica Five Thousand Dollar (\$5000) Currency Note



Figure No. 6: Back of Genuine Bank of Jamaica Five Thousand Dollar (\$5000) Currency Note

The pictures below show a Bank of Jamaica Five Thousand Dollar (\$5000) Currency Note that was examined under the Ultra Violet Light source.



Figure No. 7: Front of Currency Note Examined



Figure No. 8: Back of Currency Note Examined

On July 23, 2012, in preparation for Jamaica’s 50th Anniversary of Independence which is celebrated on August 1st, the Bank of Jamaica made minor changes to the Banknotes and coins. The National Logo for the 50th Anniversary of Independence was superimposed over the watermark area on the front of each denomination. The unique designs at the back of each denomination were replaced with a photograph of a group of children from the Central Branch Primary School. This photograph depicts Jamaica’s National Motto “Out of Many, One People”.

Results and Discussion

- **Watermark Portrait-** This image was drawn at the back of the note with a writing instrument.
- **Optiks Thread-** The oval shaped area was carved out with a sharp instrument resulting in it being uneven and the thread was replaced with a cellophane tape which was stuck onto the paper.
- **Fluorescent Green-** This was not visible when the currency note was examined.
- **Red Map of Jamaica-** This was not visible when the currency note was examined.
- **Watermark Highlights-** This was drawn at the back of the currency note with a writing instrument.
- **Paper Quality-** The paper used in the currency note examined resembles regular commercial paper which lacks strength and elasticity.

Conclusion

Counterfeiting of goods and instruments has been happening for centuries. In his Journal “Arming you with knowledge and tools to combat counterfeit images: Develop Your Sixth Sense for Fakes”, (Frohne, 2019) mentioned that Civil War images needed to be preserved to protect their originality. It is, however, no doubt that that counterfeiting is on the rise compared to many years ago. Whether these counterfeits be documents, bank notes, clothes or even medical instruments, a country economy suffer from loss of genuine revenue (Clement and Risi, 1983). These crimes need to be eradicated and as a Certified Questioned Document Examiner, it is one's duty to

help bring to justice the perpetrators of these crimes. In this research, the procedure of the study of counterfeit currency was analysed and the various methods and materials used in this analysis were. Based on the examination conducted on the currency note shown in figures 7 and 8, it is my professional opinion that it is a counterfeit of the genuine Bank of Jamaica Currency. If one security feature is missing from any currency note, it is therefore deemed to be counterfeit.



References:

Analyst. "Currency and Banking in Jamaica." *Social and Economic Studies*, vol. 1, no. 4, 1953, pp. 41–53. JSTOR, www.jstor.org/stable/27850938.

"Bank of Jamaica \$5000 Banknote Security Features" Currency Department, Bank of Jamaica. Accessed on 22 February 2021. https://boj.org.jm/wp-content/uploads/2019/08/5000_security_feature.pdf

Clement, J L, and Risi, B. "Laboratory Examination of Counterfeit and Fraudulently Altered Documents." *International Criminal Police Review*, 1983, pp. 138-165. Print.

Foster and Freeman Forensic Science Innovation. *Video Spectral Comparator 80 for Document Examination*. Worcestershire, United Kingdom. 2018.

Frohne, P., "Arming you with knowledge and tools to combat counterfeit images: Develop Your Sixth Sense for Fakes". vol. 37, no. 4 (210), 2019, pp. 20-21.

Fung, Ben & Enchuan Shao. "Modelling the Counterfeiting of Bank Notes: A Literature Review," *Bank of Canada Review, Bank of Canada*, vol. 2011(Autumn), pp 29-35.

Kumar, Kailash *et al.* "Counterfeit Currency Recognition Using Image Processing Techniques". *International Journal of Advanced Science and Technology*, vol. 29, no. 05, May 2020, pp. 7769-76, <http://sersc.org/journals/index.php/IJAST/article/view/18427>.

Sarkar, Ankit, et al. "Detecting Counterfeit Currency and Identifying Its Source." *Advances in Digital Forensics IX*, 2013, pp. 367–84. *Crossref*, doi:10.1007/978-3-642-41148-9_24.

"Hugh Lawson Shearer – Jamaica Information Service." *Jamaica Information Service - The Voice of Jamaica*, Accessed on 22 February 2021, jis.gov.jm/profiles/the-most-hon-hugh-lawson-shearer-onoj.

"Types of Magnifier." *Associated Optical*, 2015. Accessed on 22 February 2021. www.associatedoptical.com/types-of-magnifier.html