Lies, damned lies and scans

DAVID KRIESEL, dkrieseI.com
HEAD OF RELEASE ENGINEERING
IVU TRAFFIC TECHNOLOGIES AG, BERLIN AND AACHEN (IVU.COM)

FrOSCon, 10, August 22th, 2015

ALL UNLABELED IMAGES ARE OWN WORK, PUBLIC DOMAIN OR BROWSER SCREENSHOTS.
2008: Tinfoil hat theories on Barack Obama’s nationality
2008: Tinfoil hat theories on Barack Obama’s nationality

![Birth certificate of Barack Obama](https://upload.wikimedia.org/wikipedia/commons/1/13/Barack_Obama_Birth_Certificate_2008.jpg)


Image: brownpau, Wiki Commons
2011: Publication of „Long Form Birth Certificate“
2011: Indications of LFBC forgery
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2011: Indications of LFBC forgery
2011: Indications of LFBC forgery
July 24th, 2013: Construction plan scan
July 24th, 2013: Construction plan scan
July 24th, 2013: Construction plan scan

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### July 24th, 2013: Construction plan scan

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# July 24th, 2013: Construction plan scan

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July 24th, 2013: Cost register

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July 24th, 2013: Some self-generated test numbers

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Trusting support is making sure you’ll die alone
Trusting support is making sure you’ll die alone.

Local Xerox distributor (archive pic)
Twining support is making sure you’ll die alone

Xerox (archive pic)
August 1st: Blog post online
August 2nd and 3rd: First mentions in tech blogs

Xerox scanners/photocopiers randomly alter numbers in scanned documents

Please see the "condensed time line" section (the next one) for a time line of how the Xerox saga unfolded. It for example depicts that I did not push the thing to the public right away, but gave Xerox a lot of time before I did so. Personally, I think this is important. I will post updates and links to the relevant blog posts in there in order not to make total crap out of this article's outline. In this way, I keep this article up-to-date for future visitors and also write new blog posts on the topic for RSS users.
From August 4th: Mentions on tech sites world wide

5,000 readers/hr

dkriesel.com
August 5th: Mass Media kicking in

> 100.000 rdrs
Confused Xerox copiers rewrite scanned documents, expert finds

Scans made by some Xerox copiers are changing numbers on documents, a German computer scientist has discovered.

David Kriesei found that scans he made of construction plans had altered room dimensions.

Other users have replicated the problem, which has been blamed on faults with compression software used in a setting offered by the machines similar to this model were swapping around numbers, David Kriesei discovered.

Turkish corruption probe row deepens
Spanish princess summoned over 'four killed' in helicopter crash
Iraq in 'deadly strike' on militants

France 1914
A nation in mourning
Copier conundrum: Xerox machines swap numbers during scans

Published: Wednesday, 7 Aug 2013 | 10:44 AM ET
By: Devon Caldwell, NBC News

Minimum wage debate is on, says 'Mr. Wonderful'
Sudden gold plunge has traders looking for answers
Why analysts target could lead to a 'panic taper'
Starbucks makes its iced coffee—and more with
New York is running out of luxury condos
Top 3 cheap stocks for 2014: Pro
Cramer's key stock to gauge market

FEATURED

Other users have been blamed on Facebook's
software used in a setting other than

Some Xerox Scanners Can Alter Documents by Accident

By Peter C. | August 08, 2013

On the scale of things too horrible to contemplate, “document-altering scanners” is right up there with “flash-eating bacteria.” This week, Xerox (XRX) acknowledged that some of its scanners can, with certain settings, change the numbers in scanned documents. On Wednesday it announced a fix for the problem, which a spokesman called “really an anomaly.”
On the scale of things too horrible to contemplate, “document-altering scanner” is right up there with “flesh-eating bacteria”.

- Peter Coy, Economics Editor, Businessweek
On the scale of things too horrible to contemplate, “document-altering scanner” is right up there with “flesh-eating bacteria”.

- Peter Coy, Economics Editor, Businessweek
Compression test image
Compression test image segments

CDEFGH
INOPQR
UVWXYZ
Compression: GIF
Compression: Low quality JPEG
Compression: JBig2
Compression: JBig2

Dieser Satz
kein Verb

ABCDEFGHIJKLMNOPQRSTUVWXYZ

1234567890
1234567890
Compression: JBig2
Compression: JBig2

Dieser Satz
kein Verb

ABCDEFGHJKLMNOPQRSTUVWXYZ

1 2 3 4 5 6 7 8 9 0
1 2 3 4 5 8 7 8 9 0
Compression: JBig2

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Compression: JBig2

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UVWXYZ

1 2 3 4 5 6 7 8 9 0
1 2 3 4 5 8 7 8 9 0
Compression: JBig2
August 5th

• 3 days after world-wide currency: Life sign of Xerox
  – PR department of Xerox Germany calling
August 6th, morning

Quality / File Size
Normal Quality Small file size High Quality Large File Size

Quality: Normal / File Size: Small

The normal quality option produces small file sizes by using advanced compression techniques. Image quality is generally acceptable, however, text quality degradation and character substitution errors may occur with some originals.

Small files are better for sharing and transmitting over the network.
August 6th, morning

Quality / File Size

Quality: Normal / File Size: Small

The normal quality option produces small file sizes by using advanced compression techniques. High quality is generally acceptable, however, text quality degradation and character substitution may occur with some originals. Small files are better for sharing and transmitting over the network.
August 6th, morning

D. Kriesel

Possible workaround for character substitutions in xerox machines

It might be, that a reader of this blog found the magic bullet, or at least a workaround to the issue. It seems to be a scan parameter within the machines, whose tendency to create character substitutions was even known to Xerox. This raises the question why several xerox support guys weren't able to help at all, even though they visited the machines several times since the end of july. But, first things first, here is the work around. Yesterday, I was made aware of a scanning parameter in the Xerox ColorCube 9203, which seems to at least diminish the issue. Have a look at the following screen shot:
August 6th, afternoon

• TelCo with Xerox
  – Rick Dastin, Corp. Vice President
  – Francis Tse, Principal Engineer
August 6th, afternoon

- TelCo with Xerox
  - Rick Dastin, Corp. Vice President
  - Francis Tse, Principal Engineer

> 100,000 rdrs
August 6th, afternoon

For data integrity purposes, we recommend the use of the factory defaults with a quality level set to “higher.”

[…] we provide the following message to our customers next to the quality settings within the device web user interface […]

> 100,000 rdrs
August 6th, afternoon

Conference call with Xerox

This evening, I had like half an hour conference call with

- Rick Dastin, Corporate Vice President Office and Solutions, and
- Francis Tse, Imaging System Architect at Xerox Corporation.

First, I’d like to point out that the atmosphere of the call was very relaxed and easy-going. Above all, both sides were listening to each other, at least this is what I feel (Mr. Dastin, Mr. Tse, feel free to object 😊). I highly appreciate the way, Xerox deals with the issue, as not all enterprises would do it in this friendly way. We all know the stories of enterprises shooting at the messenger for such a blog post.

Facts first:

1. The suggestions of this blog concerning JBIG2 are right

2. The suggested workaround is indeed a workaround, as it switches off JBIG2

> 100,000 rdrs
THE END?
NOPE.
As a workaround, Kriesel suggested switching compression mode to „high“ or „higher“ even before Xerox did.
Fehler in Multifunktionsgeräten: Xerox war Zahlendreherproblem seit Jahren bekannt

Xerox wundert sich über die Aufregung, die ein Fehler in seinen Multifunktionsgeräten ausgelöst hat: Dass die Maschinen beim Scannen Zahlen vertauschen könnten, sei lange bekannt und dokumentiert. Ein Software-Update soll das Problem beseitigen.
August 7th: Internet fun

a shipload of old papers to see if any glitches occurred with people working of a bad copy.
Permalink Übergeordnet

Im going to have to check this tomorrow.
If I can indeed reproduce this..... fecal matter will indeed hit the rotary air impeller.
We digitize EVERYTHING

OrangutanClyde Sysadmin 1 Punkt 5 Monate zuvor
I hope to fuck you scan in TIF. We digitize everything too.
Permalink Übergeordnet

Yeah, the added last section provides a plausible explanation. I
### August: Humoriges

**Reddit**

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**XEROX.**

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**8 JOB.**

> > 300.000 redd

**Featured**

2014: Wh
Well, according to Xerox vice president Rick Dastin who spoke to the BBC, nobody really important... just oil rigs... the military... companies in developing countries...

Xerox says that 14 of its models dating back to 2005 offer Jbig2 compression, representing hundreds of thousands of individual units.

Mr Dastin said that oil rigs, the military and clients in developing markets were among the owners most likely to have switched their copiers to the setting.

They would have done so to make it quicker to send files over the internet when only slow data speeds were available.

... hang on a minute! Oil rigs and the military!? Isn’t it rather important that they get their numbers right?
Well, according to the BBC, nobody really gets their numbers right...

... hang on a minute, do you have the numbers right?
Cat images reportedly unaffected
August 5, 2013 7:06 AM  ■ Subscribe

Xerox scanners/photocopiers randomly alter numbers in scanned documents
posted by JpFed (112 comments total) 37 users marked this as a favorite

While this sounds like some kind of ominous copyright protection or counterfeit prevention feature, it's almost

> 300,000 rdrs Reddit
August 7th: Xerox announces software patch
(The laugh is for free...)

Company publishes a workaround in the meantime
August 7th: Xerox announces software patch

„You will not see a character substitution issue when scanning with the factory default settings.“ (Compression “higher”, min. 200 DPI)
August 9th: Switched numbers on factory settings

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> 300,000 rdrs

THX, ck :)
August 9th: Switched numbers on factory settings

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> 300,000 rdrs

Reddit
August 9th: Switched numbers on factory settings
August 9th: Switched numbers on factory settings

> 300,000 rdrs

Reddit
August 9th: Switched numbers on factory settings
August 9th: Switched numbers on factory settings

All three compression modes mangling numbers on Xerox WorkCentre 7545, reader reports also on 7655 »

Xerox investigating latest mangling test findings

In the second Xerox press statement, Rick Dastin, Vice President at Xerox Corporation, stated: “You will not see a character substitution issue when scanning with the factory default settings.” In a Question and Answers Sheet on the Topic, Xerox defined the factory default settings to be the “higher” compression mode, with a resolution of at least 200 dpi. For the “higher” (and for the “high”) compression mode, there is also no “character substitution” warning, neither in the manuals, nor in the admin panel, at least not in those I know.

Earlier today, I was able to replicate mangled numbers on a Xerox WorkCentre 7545, using the “higher”
August 9th: Switched numbers on factory settings

We continue to test [...] to ensure we fully understand the breadth of this issue.
August 9th: Switched numbers on factory settings
August 9th: Switched numbers on factory settings
Aug 11th: Switched numbers even on „high“ mode
Aug 12th: Bug confirmation

[... due to a software bug character substitution is not completely eliminated.]

Update On Scanning Issue: Work Continues on Software Patch To Solve Character Substitution

By Rick Dastin, corporate vice president and president, Office and Solutions Business Group.

After further testing of the scanning function we've now determined the unit's "Quality/file save modes don't completely alleviate the problem of substituting characters on stress documents," ongoing communication with David Kriesel who alerted us to still seeing character substitution issues. This is consistent with what David has been reporting, and we thank him for his findings. The default and highest substantially reduce the likelihood of character substitution but due to a software bug character substitution is not eliminated. We apologize for any confusion that came from our prior communications.

We continue to work tirelessly and diligently to develop a software patch to address the problem. We'll pass along about the timing of the patch as soon as we have it.

We want to reiterate, we believe the issue deals with "stress documents," which include documents with small for scanned multiple times and hard to read. Regardless of the document condition we are committed to address any
Aug 22th: Patch release
Aug 22th: Patch release
Another one ...
Bonus “Lesson learned”

• Want the problem solved? Don’t aim for money.
Bonus “Lesson learned”

• Want the problem solved? Don’t aim for money.
All other „lessons learned“

• **First, contact people in a non-public way.**
  – The more personal, the better.
  – Beware of twitter.
• **Involve your readers directly.** (Here: Place test documents online)
• **Publish in several languages.** Native language of your recipients home market must be covered
• **From the start on, be a professional.**
  – Don’t yell, don’t hate, don’t exaggerate
• Have someone watch the opponent when communicating with them longer
• Distinct between insider’s and outsider’s view. It’s perfectly normal to be nervous
• Crisis management is no micro management. Carefully decide where to dig into the details
• The bug is probably larger than you expect it to be
• Negotiate in the right moment
Epilogue – March 2015: BSI „bans“ JBig2
Epilogue – Barack Obama’s nationality

Reality Check: https://rcradioblog.wordpress.com/2013/08/11/xerox-for-dummies/
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THANK YOU FOR LISTENING

MORE INFO:
HTTP://WWW.DKRIESEL.COM/EN/XEROX

SLIDES (LATER):
HTTP://WWW.DKRIESEL.COM/EN

... AND CONGRATULATIONS,
FR8SCON!