

# Stamps That Glow

## Luminescent Tagging on United States Stamps

### Part II

## Evolution of the Technology

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# In Review

This presentation is a follow-on to:

## **Stamps That Glow**

**Luminescent Tagging on United States Stamps**

**Part I**

**The Experimental Years**

Part I addressed:

- Postmaster General Summerfield's Post Office automation initiative
- The early experiments using long-wave UV to locate stamps on the envelope
- The first experiment with luminescent tagging in Dayton, Ohio
- The Phase II experiment and the subsequent implementation of tagging nation-wide

This presentation will discuss how the stamps were tagged

# Part I Follow-up

Real Cover



From my collection

(Wrong picture pasted into Part I presentation.)



Fake Cover



Photo from ebay

# Luminescence - Fluorescence - Phosphorescence

**Luminescence** – general term for the process in which a material absorbs energy from an external source and re-emits that energy in the form of visible light.

**Fluorescence** – subcategory of Luminescence

- Emission of visible light by a substance during exposure to incident external radiation of a shorter wavelength, such as ultraviolet light
- First observed in the mineral Fluorite by George Stokes in 1852.
- Emission stops when the ultraviolet light source is removed

**Phosphorescence** – subcategory of Luminescence

- Emission of visible light by a substance that during and after the exposure to incident external radiation of a shorter wavelength, such as ultraviolet light
- Emission continues when the ultraviolet light source is removed

# WARNING

## **Never look directly into the light emitted by a UV lamp!**

Direct exposure to UV light, particularly short wave UV light (UV-B), will do permanent damage to your eyes.

When working with UV light source, you should always wear glasses containing a UV blocker.

- The light emitted by the stamps when illuminated with UV light is eye-safe.
- It is the UV light source used to illuminate the stamps that is not eye-safe.
- Do not look into the UV light source, or allow it to be reflected into your eyes by stamp mounts or other mirror surfaces.
- With eye protection, working with tagged stamps is perfectly safe.

If you work extensively with the UV light for long periods of time, you should consider wearing gloves and long sleeve shirts to limit skin exposure and prevent sunburn and related ill effects.

# Tagging Variants Were Driven By Printing Press Technology

## Overall Tagging

Initially applied as an overprint

Application Types

**Type I Tag** – applied with rubber mats

**Type II Tag** – applied with a rubber roller

**Type III Tag** – applied with a steel transfer plate

Later applied as an additional color on a multi-color press (Giori, Huck, Andreotti or Combination)



## Block Tagging

Printed as part of the vignette

First done on a multi-color Huck press – later on the Andreotti and Combination presses



# Type I Tagging (1963-64)

Applied by overprinting the stamp on a flat plate press using four rubber mats as the printing plates.



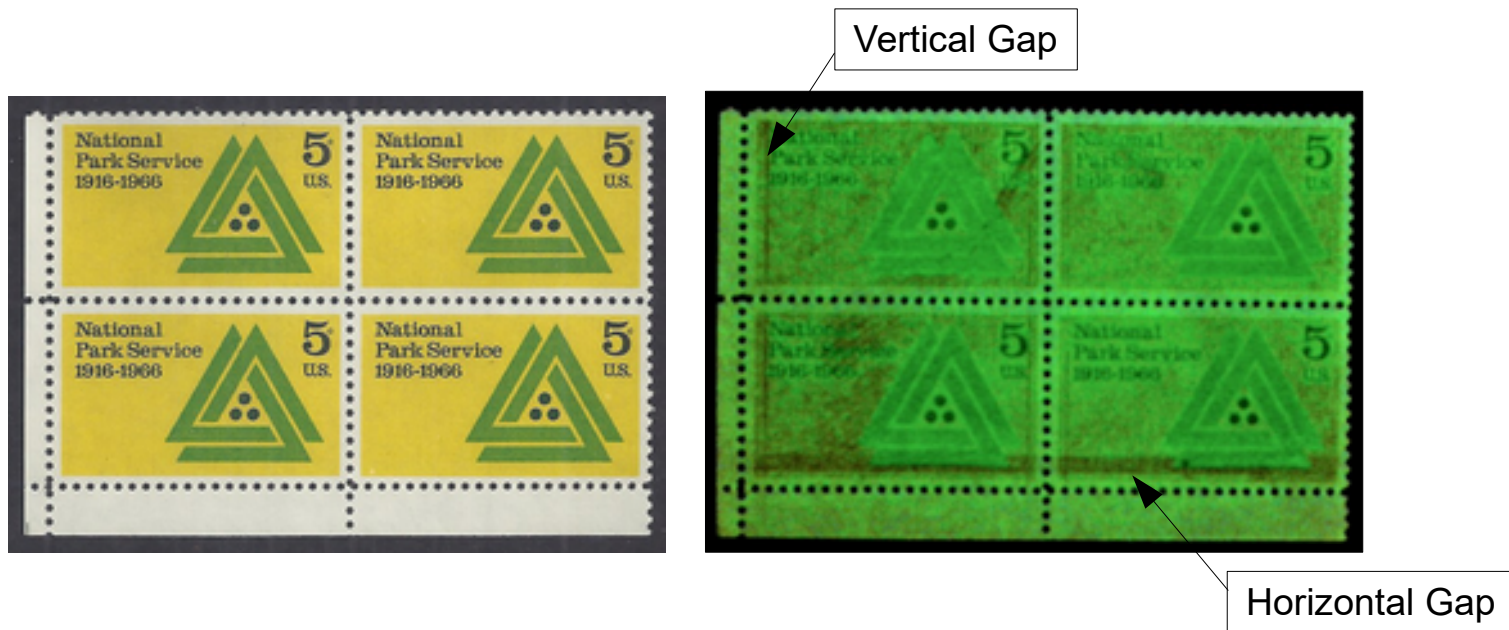
The wide plate number margin is partially untagged; the short margin is completely untagged.

# Type I Tagging



- Type I tagging on a commemorative issue.
- Note both selvages are untagged.
- Because the clear varnish used to apply the taggant has yellowed over time, the tagging application is usually visible on the stamps under ambient light.

# Type I Tagging



Type I tagging on the National Park Service (Scott 1314a) showing horizontal and vertical gap lines at the rubber mat joints. Both of the selvages are tagged because this block came from the center gutter of a 200 stamp sheet. The block also exhibits the mottled effect in the taggant created by the wear on the mat surface resulting from abrasion caused by the phosphor in the taggant.

# Type I Tagging on Coils



- A dark blue [untagged] “joint line” splits the right hand stamp of this tagged coil pair.
- The Type I “joint lines” are caused by the joints between the rubber mats.
- The “joint lines” do not align with the vignette, and can be found running the length of the coil and or across the coil as in this example.

# Boerger Documented Efforts to Reduce Type I Gaps

- Type I Gaps caused by the joints between the four rubber mats
- In coils, gaps occurred every 24<sup>th</sup> stamp
- POD Philatelic Division saw impact on collectors and ordered Bureau of Engraving and Printing to eliminate gaps.
- Top “thick gap” from early printing
- Bottom “minimal gap” from later printing
- Small arrows highlight blemish from mat attachment screws
- Introduction of silicone rollers eliminated the gaps between the rubber mats.



# Type II Tagging

- Applied using a silicon roller placed at the letterpress station on a rotary press
- The roller only covered the vignettes of the stamps being printed



Type II - The wide plate number selvage is partially tagged; the short selvage is completely tagged.

# Type IIA Tagging

- Applied using a silicon roller placed at the letterpress station on a rotary press
- The roller nearly covered the full warp of the paper



Type IIA – All selvages of the pane are completely tagged except for small edge on side of the plate number selvage which was just outside the width of the application roller.

# Type III Tagging

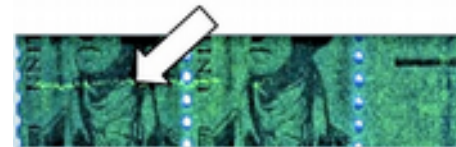
- Applied as an additional color on a multi-color rotary press
- The steel plate impression covers the full warp of the paper



Type III – All margins of the pane are completely tagged.



Example of parallel tagging gap lines on the on the short (horizontal) axis caused by a lack of taggant at the joint of the steel plates applying the taggant.



Example of a bright line across the short axis of the stamp resulting from a deposit of taggant buildup between the two steel plates applying the taggant. (Can also be caused by a crack in the plate.)

# Tagged 3¢ Statue of Liberty Coil



Scott 1057c



Image of Scott 1057c  
Under short-wave UV illumination

3¢ "Look" Statue of Liberty Coil



Scott 1057d



Image of Scott 1057d  
Under short-wave UV illumination

3¢ "Look" Statue of Liberty Coil Reprint

# Tagged 2¢ Jefferson Coil



Scott 1055a



Image of Scott1055a  
Under short-wave UV illumination

1968 DAV printing in rolls of 3,000



Scott 1055a



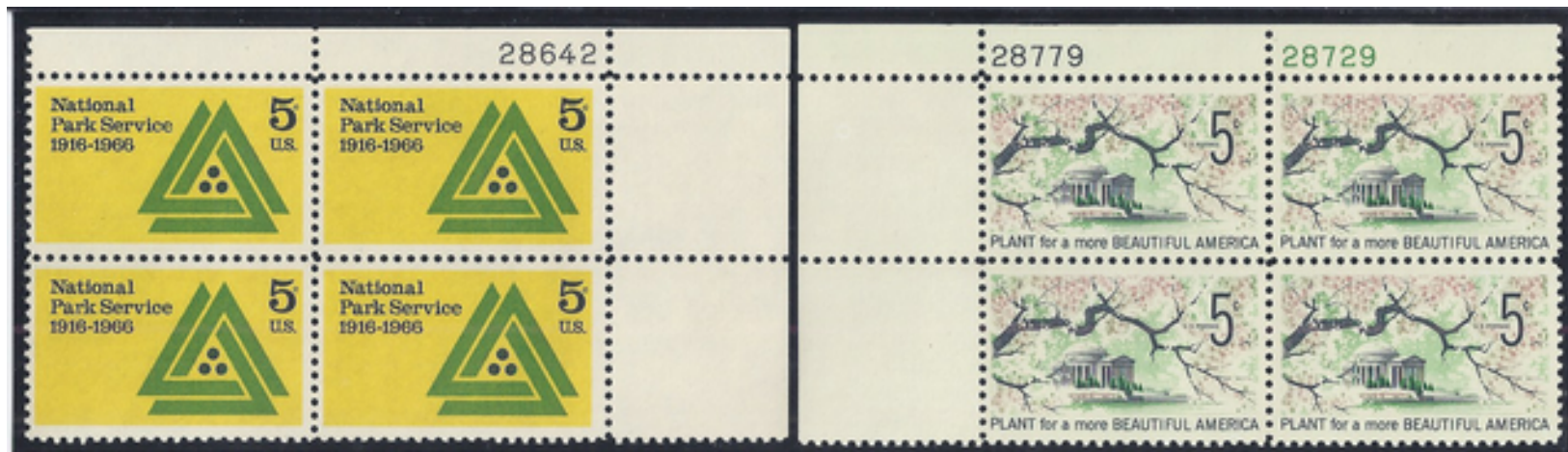
Image of Scott 1055a  
Under short-wave UV illumination

1971 printing in rolls of 500

▼ Taggant Joint Line

# Tagged After Perforation (TAP)

1966 tagged National Park Service (Scott 1314a)  
and Beautification of America (Scott 1318a) issues.



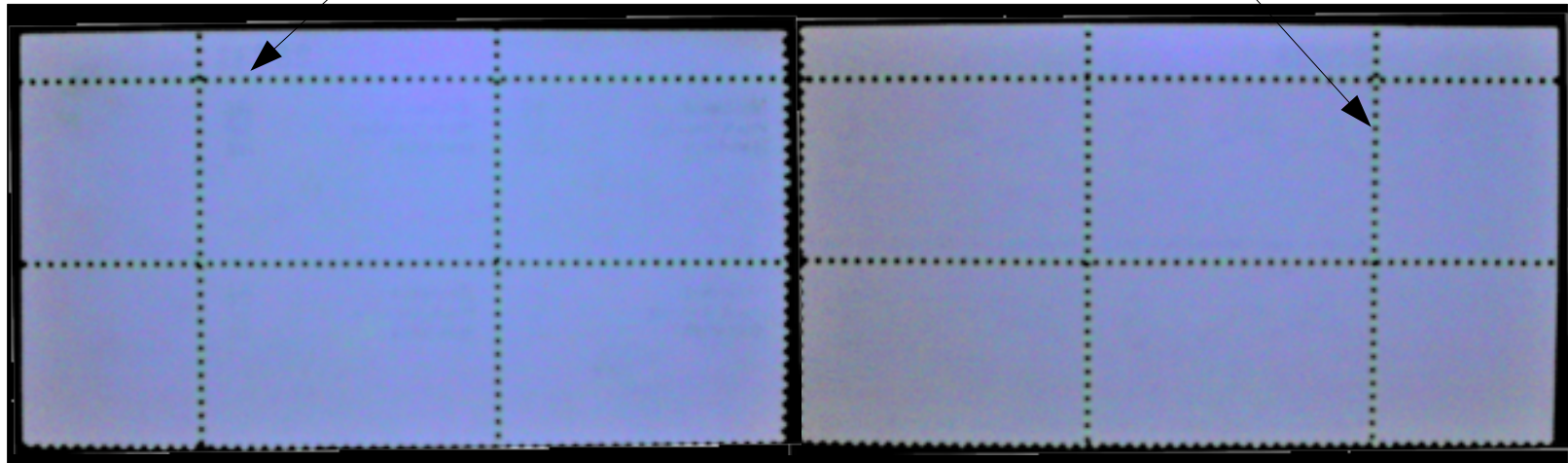
Scott 1314a

Scott 13184a

# Tagged After Perforation (TAP)

Reverse Under Short-Wave UV Illumination

blue-green taggant along perforations

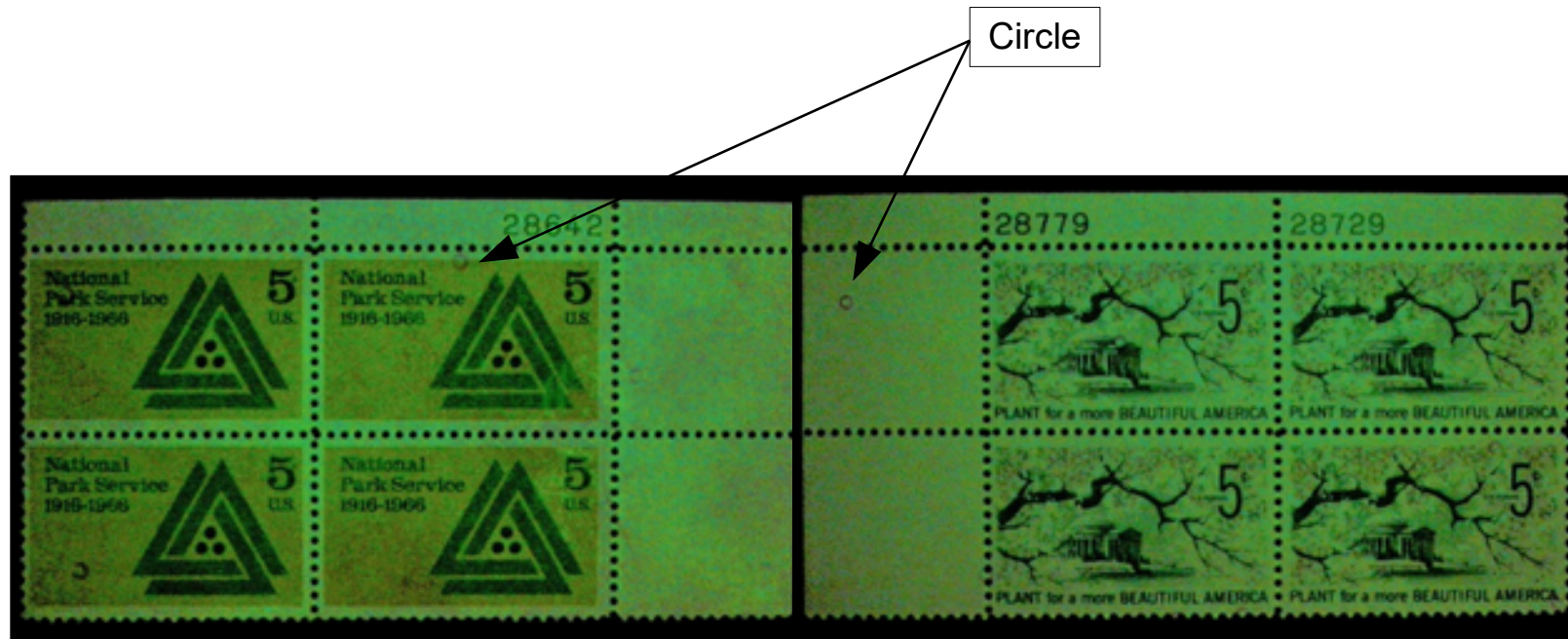


Scott 1314a

Scott 13184a

# Tagged After Perforation (TAP)

Obverse Under Short-Wave UV Illumination



Scott 1314a

Scott 13184a

# Same Stamp – Multiple Versions

Five versions of the same stamp with the same plate number (3 shown)

- No Tag
- Type I Tag (on previous slide)
- Type II Tag TAP
- Type IIA Tag (not pictured)
- Type IIA Tag TAP

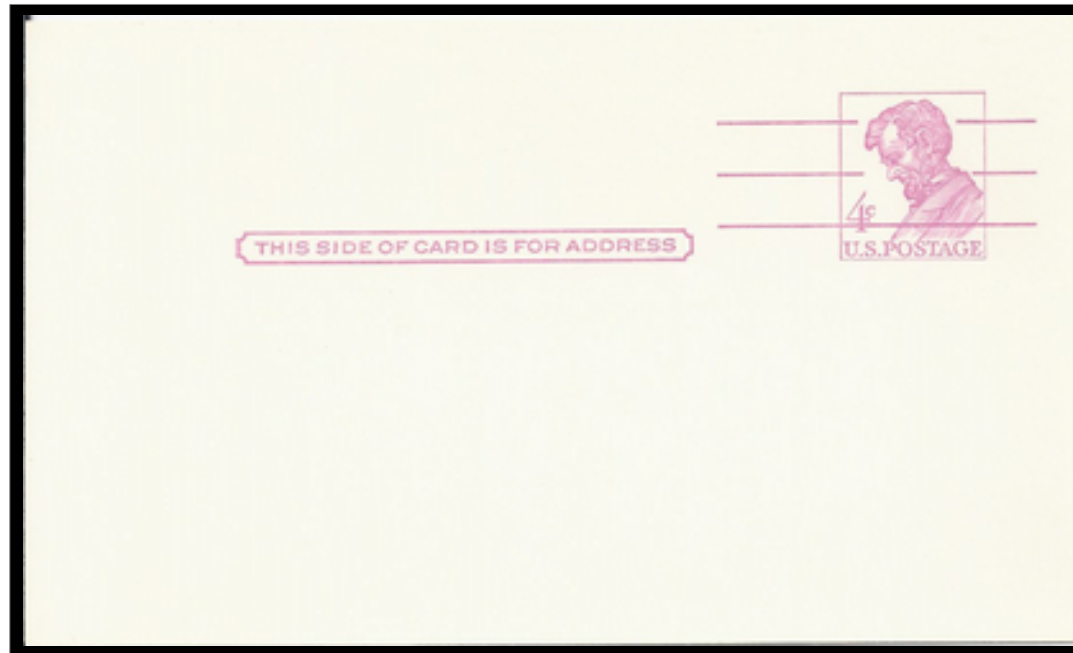


Type II Tag TAP



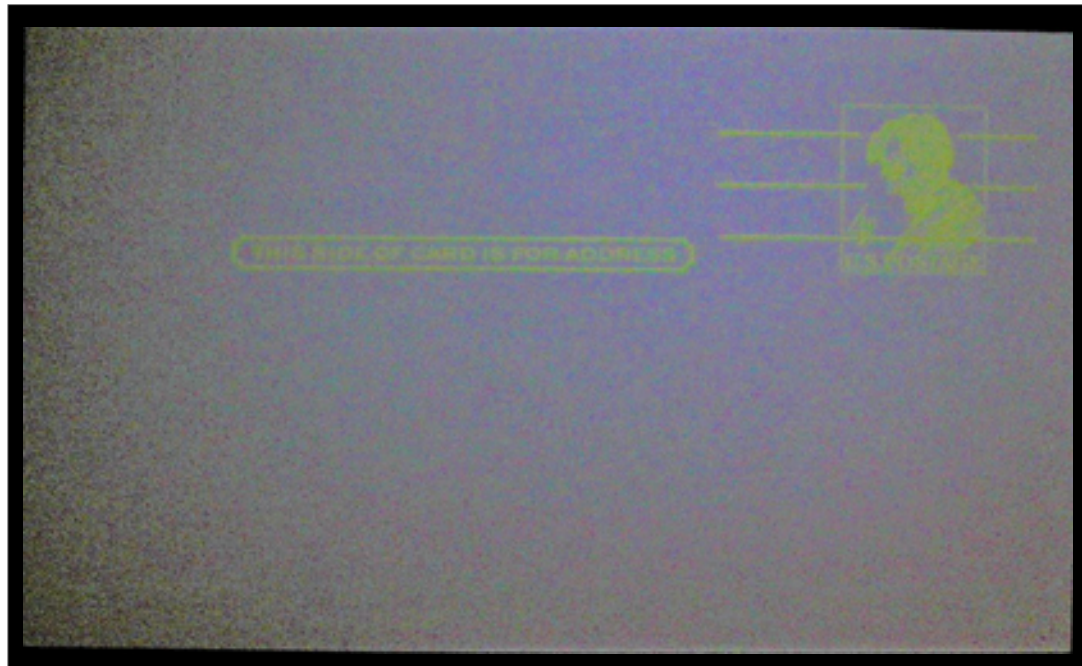
Type IIA Tag TAP

# Phosphor in the Ink



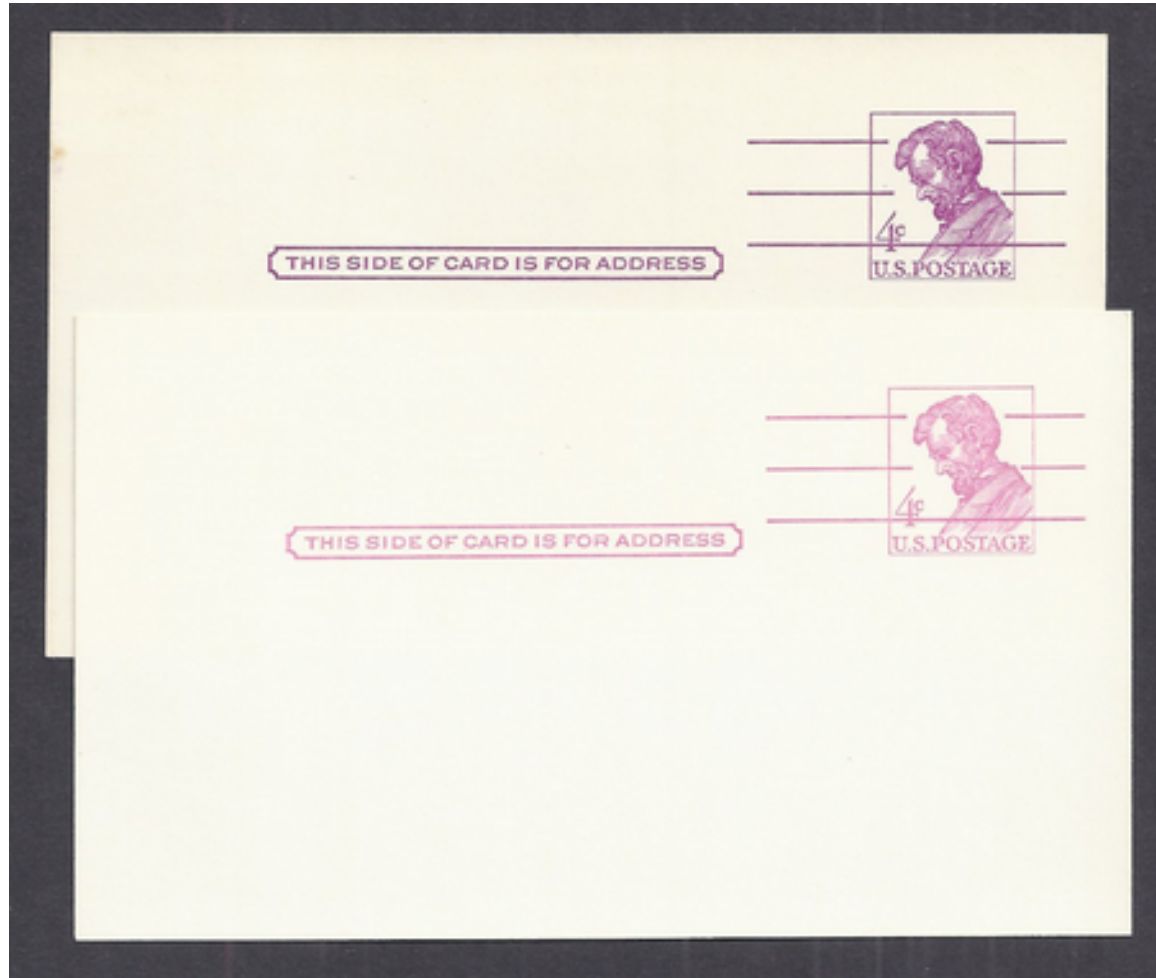
Scott UX48a

# Phosphor in the Ink



Scott UX48a

# The Inks Are Different Colors



Scott UX48 (top) and UX48a (bottom)

# Phosphor in the Ink

Lithographed  
and engraved



Scott 1359



Image of Scott 1359  
Under short-wave UV illumination

# Phosphor in the Ink

Reintroduced in 1988

Lithographed issue of  
Classic Automobiles



Scott 2380-84



Image of Scott 2380-84  
Under short-wave UV illumination

# Phosphor in the Ink

Tried again in 1999

Lithographed beach umbrella issue



Scott 2443



Image of Scott 2443  
Under short-wave UV illumination

# Block Tagging

First issue block tagged was the 1968 Christmas stamp (Scott 1363)  
Printed in one pass on a Multi-color Huck press



Scott 1363

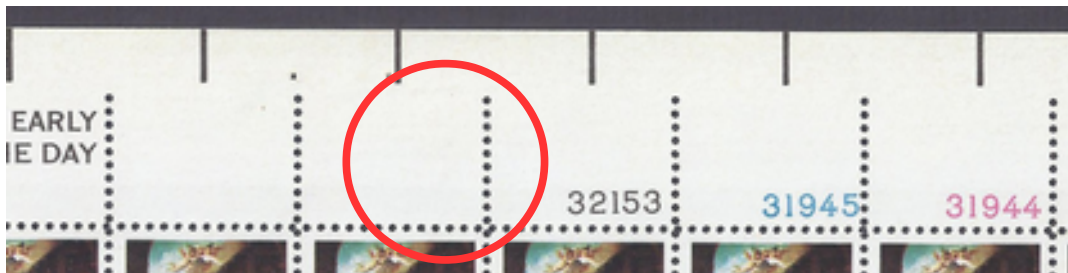


Image of Scott 1363  
Under short-wave UV illumination

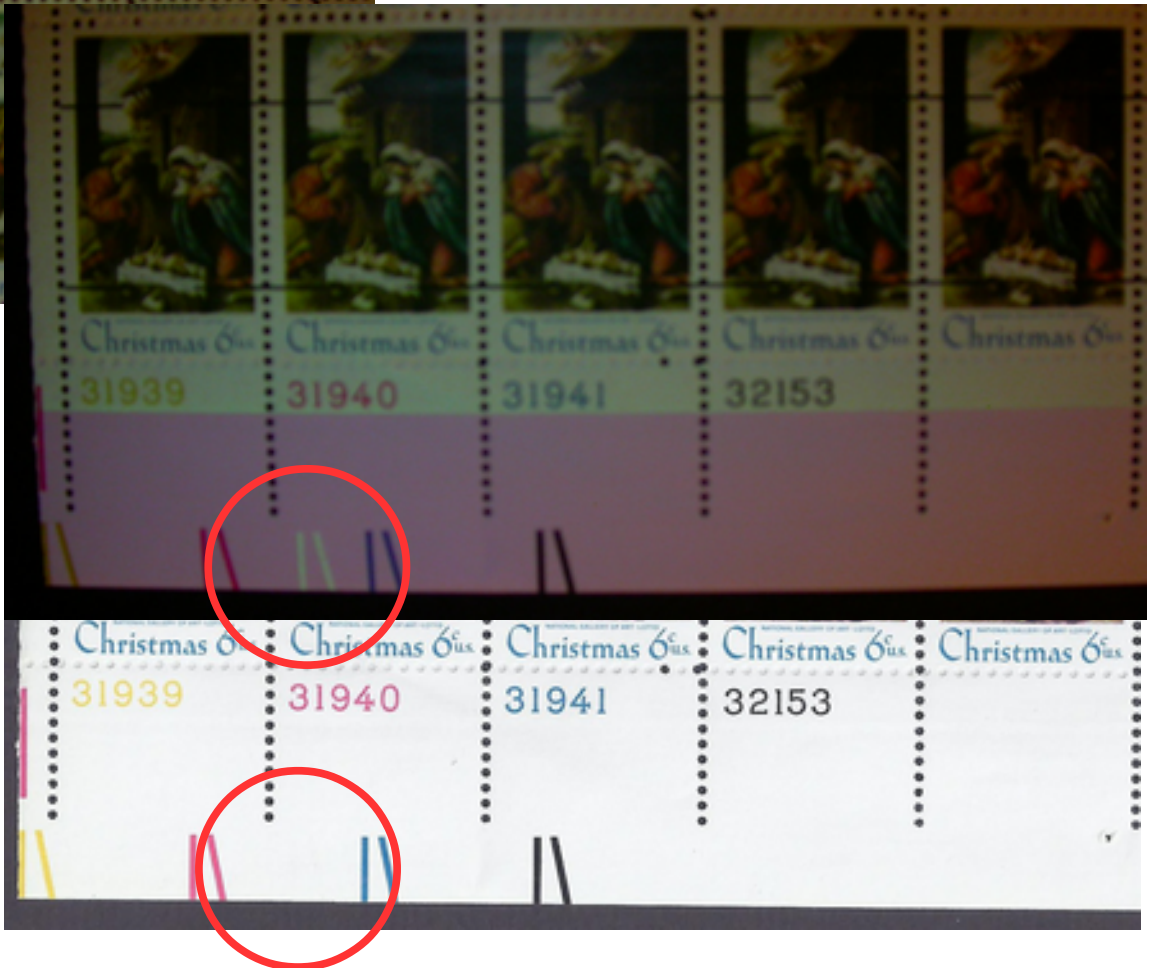
# The Andreotti Press

- First use by the Bureau of Printing and Engraving was by contracted printing of the 1970 Anti-Pollution (Scott 1410-13) and Christmas (Scott 1414 and 1415-18) issues
- The Andreotti Press required registration marks for each ink color
- The taggant was printed as a sixth ink color
- Taggant registration marks are visible under short-wave UV
- After this printing it was realized that registration marks invisible to the naked eye are of no use
- The practice of printing taggant registration marks was discontinued on subsequent issues





Scott 1414e  
Under short-wave UV illumination  
showing the registration marks



The same registration marks appear on all four variants (Scott 1414, 1414a, 1414d, and 1414e)

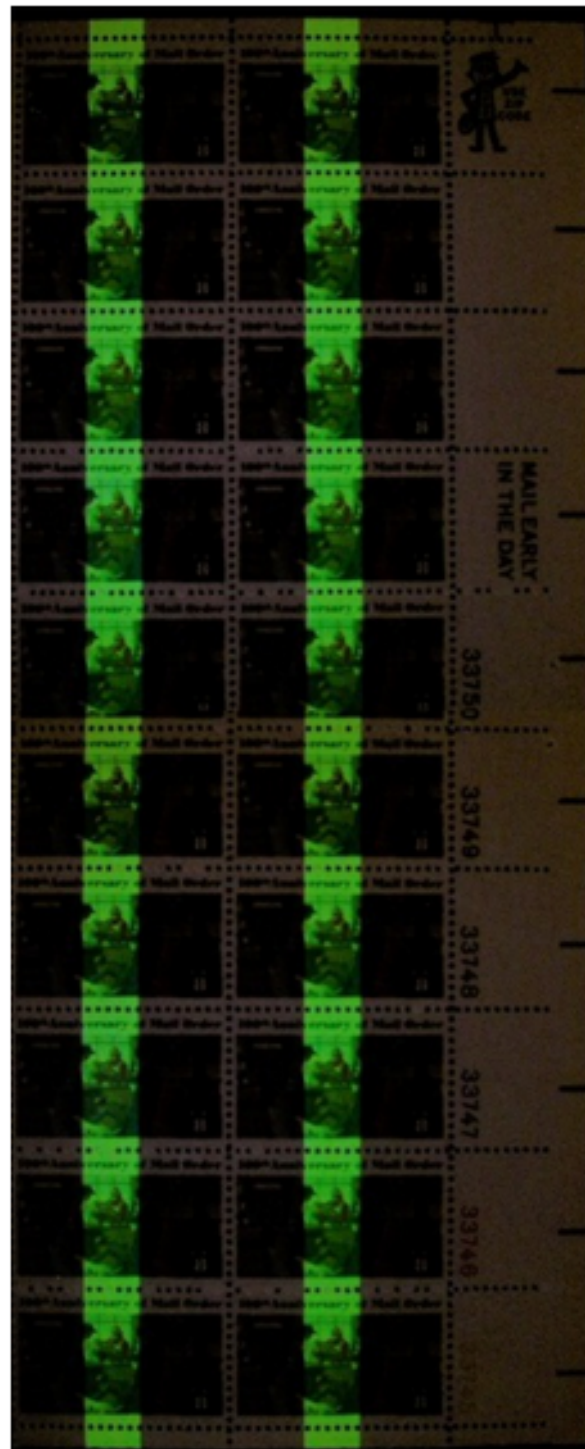
The registration marks on the Christmas Toys (Scott 1415-18) are identical to those shown

# 100<sup>th</sup> Anniversary of Mail Order

- First attempt at less than overall or full vignette block tagging
- Taggant applied in a 10mm strip as an additional color
- Strip runs across perforations and selvage



Scott 1768



Scott 1768  
Under short-wave UV illumination

# Small Block Tagging



Scott 1507



Scott 1508



Images of Scott 1507 and 1508  
Under short-wave UV illumination

- The 1970 Christmas (Scott 1507 & 1508) issues introduced small block tagging
- Use of the taggant as a “color” in the design later inspired interesting usages of small “block tagging”



Scott 3332



Image of Scott 3332  
Under short-wave UV illumination

# Phosphor Migration on Mint Stamps

Identifiable because the reverse glows green under UV light



1978 Carl Sandburg  
(Scott 1731)



Obverse



Reverse

Under short-wave UV illumination



1982 Library of Congress  
(Scott 2004)



Obverse

Under short-wave UV illumination



Reverse

Under short-wave UV illumination



1982 Peace Garden  
(Scott 2014)



Obverse



Reverse

Apparently from taggant bleed because stamps not issued on prephosphored paper.  
Phenomena does not appear on used stamps soaked off of envelopes.

# Prephosphored Paper

The 1987 test of prephosphored coated paper



Scott 2115c



Image of Scot 2115c  
Under short-wave UV illumination

1989 reprint on prephosphored uncoated paper



Scott 2280a



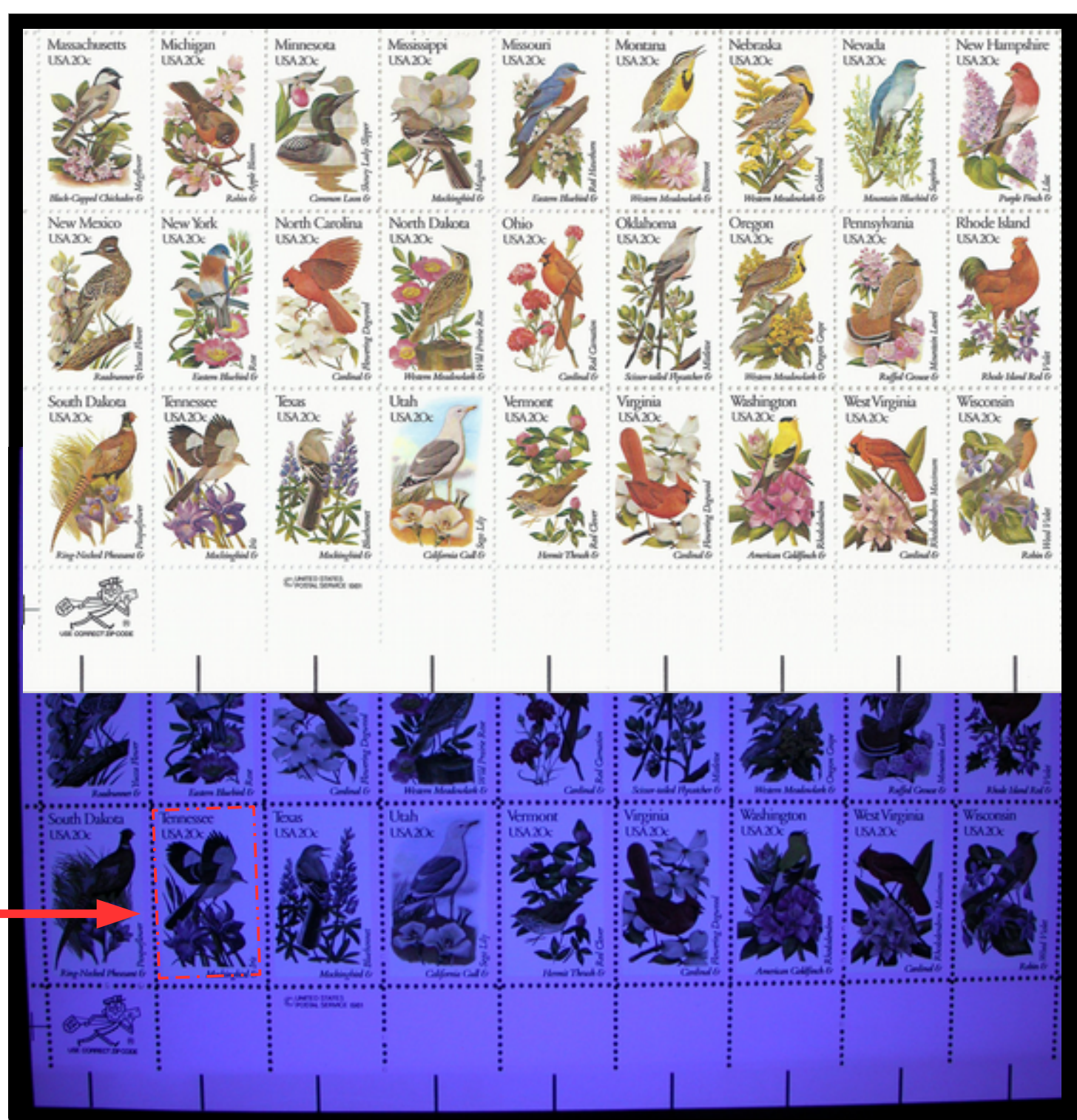
Image of Scot 2280a  
Under short-wave UV illumination

# Blue/White Phosphor

1982  
State Birds & Flowers  
(Scott 1950-2002)

Blue Tag on  
Phosphorescent  
Paper when viewed  
under short wave UV

Red box outlines  
block tag, almost the  
same color as the  
prephosphored paper



# More Blue/White Phosphor



1983 Treaty of Amity and Commerce 200th Anniversary (Scott 2036)  
Joint Issue with Sweden

1998 \$1 Red Fox (Scott 3036 and 3036a)



First Printing  
Tagged Green

Second Printing  
Tagged Blue/White

# Block and Overall Tagging on the Same Issue

1976 *Winter Pastime* by Nathaniel Currier



Scott 1702



Scott 1703



Images of Scott 1702 and 1703  
Under short-wave UV illumination

# 1999 33¢ Aquarium Fish Stamps

(Scott 3317-20 & 3317a-20a)

Had the taggant been visible, the block tagged and overall tagged aquarium stamps would have been clearly identified as separate and unique stamps, a “type I” and a “type II”.



Scott 3317 & 3317a

# Errors, Freaks & Oddities (EFOs)

## **Multiple Pass and Multi-Color Presses**

- Double feed – Untagged stamp
- Misregistration – Taggant in wrong places

## **Letter Press Station Rollers**

- Worn rollers – Streaks or blotches in the taggant
- Too much ink – Hot spots in the taggant
- Too little ink – Gaps or voids in the taggant
- No ink – Untagged stamp

## **Huck, Andriotti and Combination Presses**

- Too much ink – streaked taggant
- Too little ink – gapped or blotched taggant
- No ink – Untagged stamp



**And most of you  
thought all this stuff  
was just postage!**

**Questions ?**