

Hidden Images, Scrambled Indicia and the USPS Stamp Decoder



An APS Stamp Chat Presentation

by

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Preface

In the late 1990s the USPS began incorporating experimental images into postage stamp production.

- Embedded Text using Micro-print



- Luminescent Tagging as part of the design



- Hidden Images encoded using Scrambled Indicia



Remember the USPS Stamp Decoder?

- Were you collecting current US issues around the turn of the 21st century?
- Remember that plastic viewer the USPS was selling?
- They called it a Stamp Decoder
- It is the device used to view images encoded using Scrambled Indicia



Scrambled Indicia – What Is It?

- Patented Security Technology
- Invented by Graphic Security Systems Corporation (GSSC)
- Encodes printed material with covert elements that are only visible using a Decoder
- Protects against all forms of document fraud:
 - Counterfeiting
 - Alteration
 - Photo Substitution
 - Cannibalization
- Can be etched, stamped or embossed in metal, plastic and paper

How Does It Work?

Lenticular lens technology.

Commonly found in the moving images found on some refrigerator magnets



At first angle, chest appears closed



Tipped slightly, chest appears open

Looking From The Right End



Ribbed plastic lens

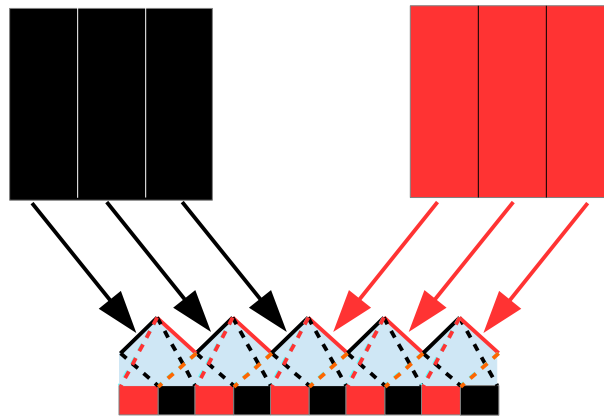
Paper with printed image

Magnet backing

Image of Refrigerator Magnet from the St. Augustine Pirate & Treasure Museum depicting Thomas Tew's Treasure Chest, the only authentic pirate treasure chest in the world, circa 1695.

How Does It Work?

For the refrigerator magnet example, the two images are printed in alternating strips that align with the ribbed lens as illustrated below.



- Scrambled Indicia modifies this one dimensional process into a two dimensional array of picture segments and corresponding lens elements
- The picture segments that map into the hidden image are miniaturized to individual pixels in the printed image
- Each lens element or lenticule in the decoding lens can be oriented in a variety of different directions and focused on individual pixels at varying distances from the lenticules
- The specific positioning of the hidden image pixels and the lenticule orientation is defined by a patented algorithm

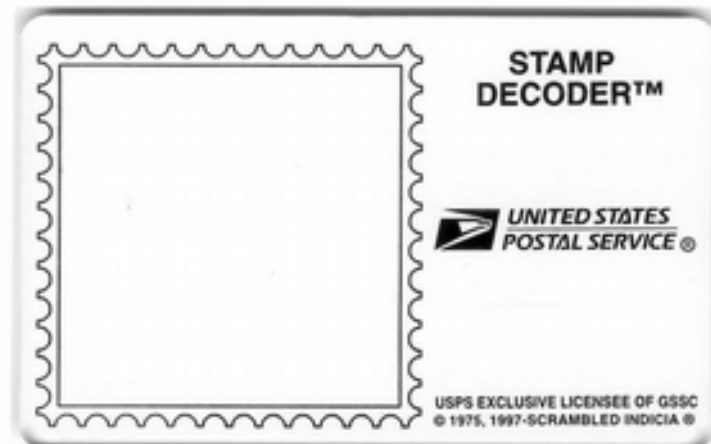
The USPS Stamp Decoder

Hidden images encoded using scrambled indicia were incorporated experimentally in 42 US stamps issued between 1997 and 2004

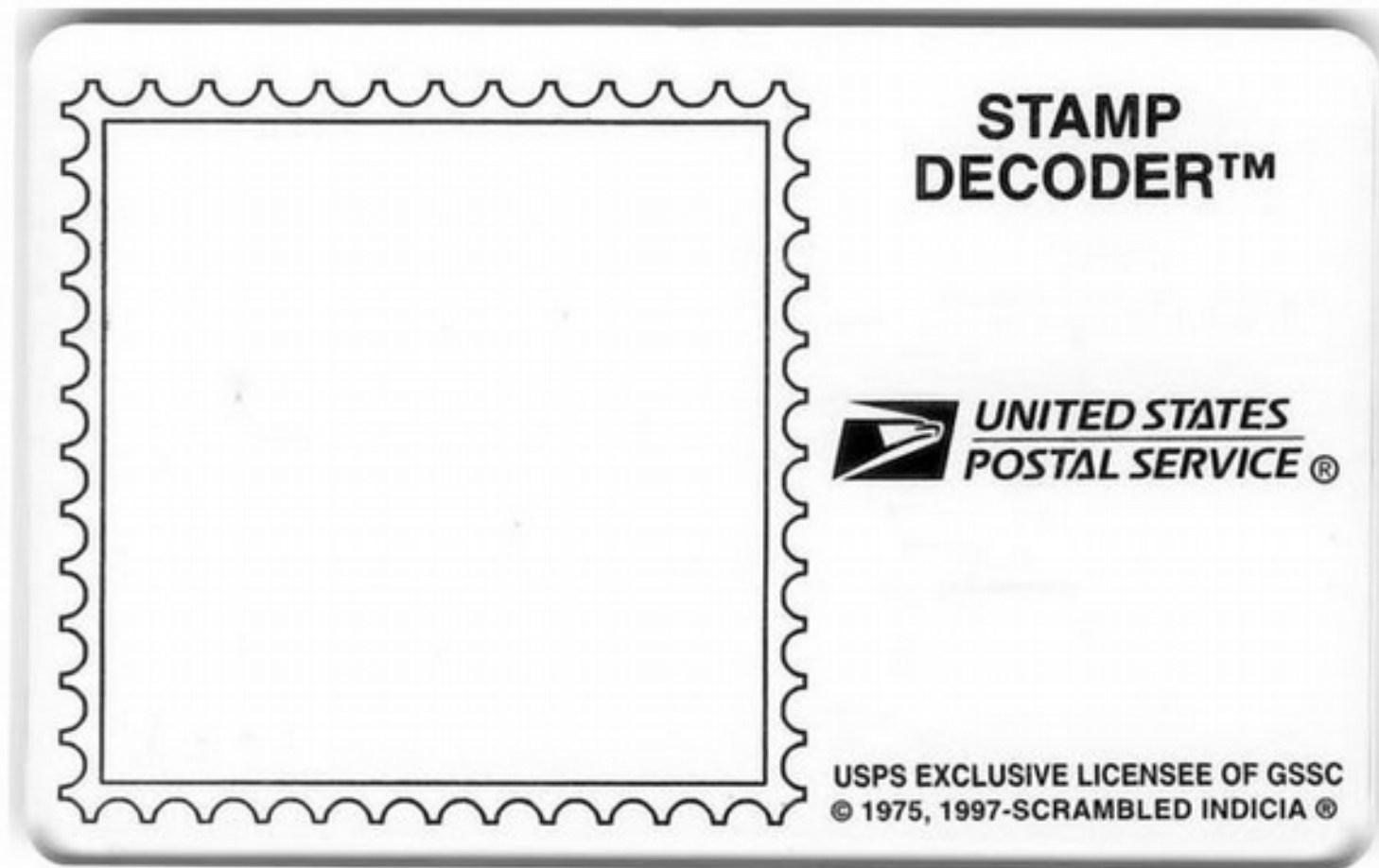
The stamps were printed using pixelated printing processes:

- Lithography
- Photogravure

Viewing required a USPS Stamp Decoder sold at post offices.



The USPS Stamp Decoder



The Postal Service's STAMP DECODER is a decoder lens manufactured especially for reading hidden images and symbols on selected stamp issues. The decoder lens is a precision optical device manufactured with the same acrylics used for prescription eyeglass lenses. Each decoder is comprised of nearly a thousand tiny elongated lenses called lenticules.

The entire Decoder is covered with lenticules. They are not just in the stamp outline.

Scott Number: 3167

Issue Date: 1997

Face Value: 32¢

Stamp Name: Air Force Thunderbirds

Hidden Image: "USAF" and Star in circle
(View at 15 Degrees)



First U. S. Issue Incorporating Scrambled Indicia



Notes on Viewing

- Decoder must be right on the stamp
- Hidden image is visible if stamp is in a plastic mount, but:
 - Decoder must be right against the mount
 - Image is not as clear when stamp is viewed in the mount
 - If stamp is mounted in an album, the page must be flat
- On some stamps the decoder must be rotated to see the image

Classic Movie Monsters

Scott Number: 3170

Issue Date: 1997

Face Value: 32¢

Stamp Name: Boris Karloff in Frankenstein

Hidden Images: 3 Lightning bolts



Classic Movie Monsters

Scott Number: 3171

Issue Date: 1997

Face Value: 32¢

Stamp Name: Boris Karloff as The Mummy

Hidden Images: 2 Egyptian deities



Classic Movie Monsters

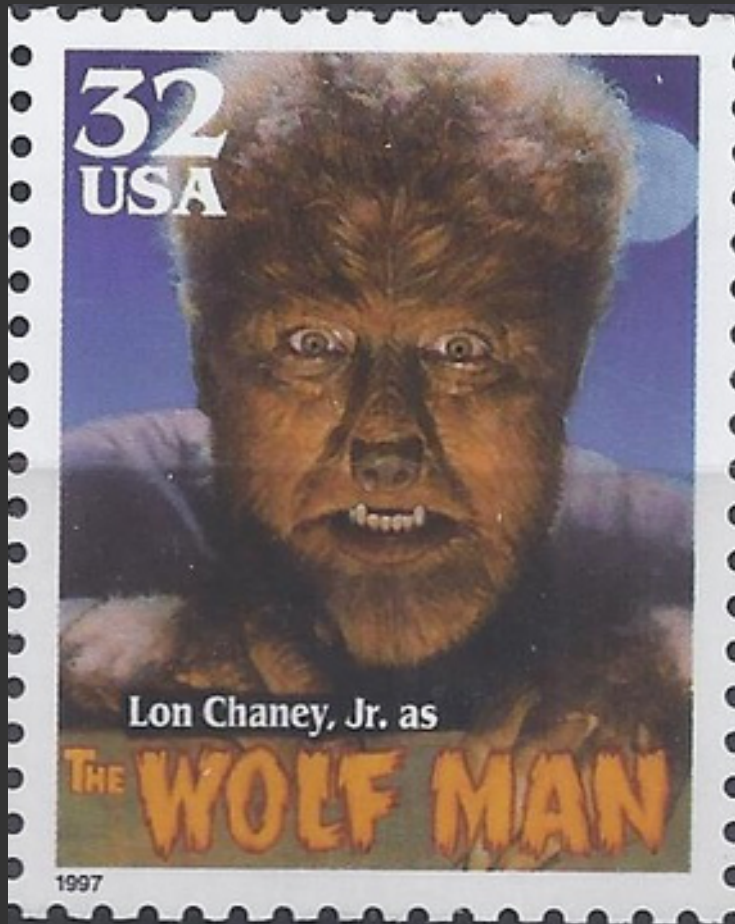
Scott Number: 3172

Issue Date: 1997

Face Value: 32¢

Stamp Name: Lon Chaney, Jr. as The Wolf Man

Hidden Images: 2 Howling wolves



Classic Movie Monsters

Scott Number: 3168

Issue Date: 1997

Face Value: 32¢

Stamp Name: Lon Chaney as The Phantom of The Opera

Hidden Images: 2 Opera masks



Classic Movie Monsters

Scott Number: 3169

Issue Date: 1997

Face Value: 32¢

Stamp Name: Bela Lugosi as Dracula

Hidden Images: 3 Bats



Scott Number: 3178

Issue Date: 1997

Face Value: \$3.00

Stamp Name: Mars Pathfinder

Hidden Image: "•MARS PATHFINDER•JULY 4,1997", •USPS (repeating)



Issue Date: 1998

Face Value: 32¢

Stamp Name: Wisconsin

Hidden Image: Badger



Scott Number: 3036

Issue Date: 1998

Face Value: \$1.00

Stamp Name: Red Fox

Hidden Image: Fox



Bright Eyes

Scott Number: 3232

Issue Date: 1998

Face Value: 32¢

Stamp Name: Bright Eyes Cat

Hidden Images: Paw print and mouse



Bright Eyes

Scott Number: 3233

Issue Date: 1998

Face Value: 32¢

Stamp Name: Bright Eyes Parakeet

Hidden Image: Bird cage



Bright Eyes

Scott Number: 3234

Issue Date: 1998

Face Value: 32¢

Stamp Name: Bright Eyes Hamster

Hidden Image: Exercise wheel



Bright Eyes

Scott Number: 3230

Issue Date: 1998

Face Value: 32¢

Stamp Name: Bright Eyes Dog

Hidden Images: Dog bone and dog house



Bright Eyes

Scott Number: 3231

Issue Date: 1998

Face Value: 32¢

Stamp Name: Bright Eyes Fish

Hidden Images: 8 Bubbles



Space Discovery

Scott Number: 3238

Issue Date: 1998

Face Value: 32¢

Stamp Name: Space City

Hidden Images: Large & small spacecraft



Space Discovery

Scott Number: 3239

Issue Date: 1998

Face Value: 32¢

Stamp Name: Spaceship landing

Hidden Image: Small spacecraft



Space Discovery

Scott Number: 3240

Issue Date: 1998

Face Value: 32¢

Stamp Name: Person in space suit

Hidden Image: Small spacecraft



Space Discovery

Scott Number: 3241

Issue Date: 1998

Face Value: 32¢

Stamp Name: Space ship taking off

Hidden Image: Small spacecraft



Space Discovery

Scott Number: 3242

Issue Date: 1998

Face Value: 32¢

Stamp Name: Large domed structure

Hidden Images: Large & small spacecraft



Scott Number: 3261

Issue Date: 1998

Face Value: \$3.20

Stamp Name: Shuttle Landing

Hidden Image:

ENTERPRISE/COLUMBIA/CHALLENGER/ATLANTIS/ENDEAVOR/DISCOVERY



Scott Number: 3262

Issue Date: 1998

Face Value: \$11.75

Stamp Name: Shuttle Piggyback

Hidden Image:

ENTERPRISE/COLUMBIA/CHALLENGER/ATLANTIS/ENDEAVOR/DISCOVERY



Extreme Sports

Scott Number: 3321

Issue Date: 1999

Face Value: 33¢

Stamp Name: Skateboarding

Hidden Image: "GNARLY "



Extreme Sports

Scott Number: 3322

Issue Date: 1999

Face Value: 33¢

Stamp Name: BMX biking

Hidden Image: "RAD"



Extreme Sports

Scott Number: 3323

Issue Date: 1999

Face Value: 33¢

Stamp Name: Snowboarding

Hidden Image: "SWEET"



Extreme Sports

Scott Number: 3324

Issue Date: 1999

Face Value: 33¢

Stamp Name: Inline Skating

Hidden Image: "PHAT"



Scott Number: 3472

Issue Date: 2001

Face Value: \$3.50

Stamp Name: US Capitol

Hidden Image: "PRIORITY MAIL"



Scott Number: 3473

Issue Date: 2001

Face Value: \$12.25

Stamp Name: Washington Monument

Hidden Image: "EXPRESS MAIL"



Scott Number: 3647

Issue Date: 2002

Face Value: \$3.85

Stamp Name: Jefferson Memorial

Hidden Image: Jefferson's Signature



Scott Number: 3648

Issue Date: 2002

Face Value: \$13.65

Stamp Name: U.S. Capitol Dome

Hidden Image: U.S. Flag



Scott Number: 3651

Issue Date: 2002

Face Value: 37¢

Stamp Name: Harry Houdini

Hidden Image: 4 Chains around Houdini's body



Scott Number: 3771

Issue Date: 2003

Face Value: 80¢

Stamp Name: Special Olympics

Hidden Image: Special Olympics logo, View at 90 degrees



Southeastern Lighthouses

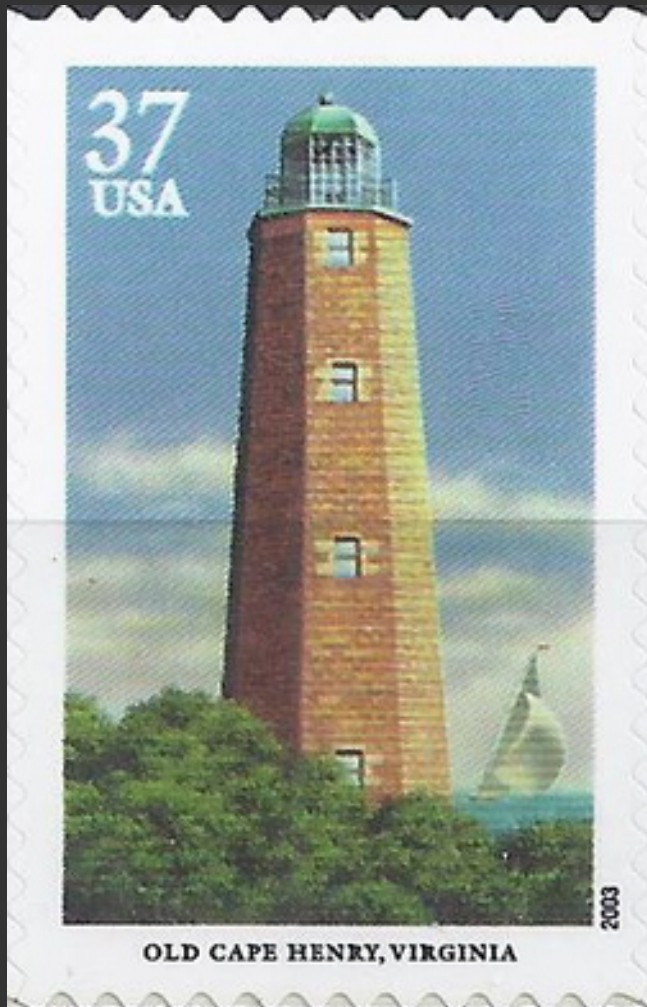
Scott Number: 3787

Issue Date: 2003

Face Value: 37¢

Stamp Name: Old Cape Henry, VA

Hidden Image: Date: 1792



Southeastern Lighthouses

Scott Number: 3788

Issue Date: 2003

Face Value: 37¢

Stamp Name: Cape Lookout, NC

Hidden Image: Date: 1859



Southeastern Lighthouses

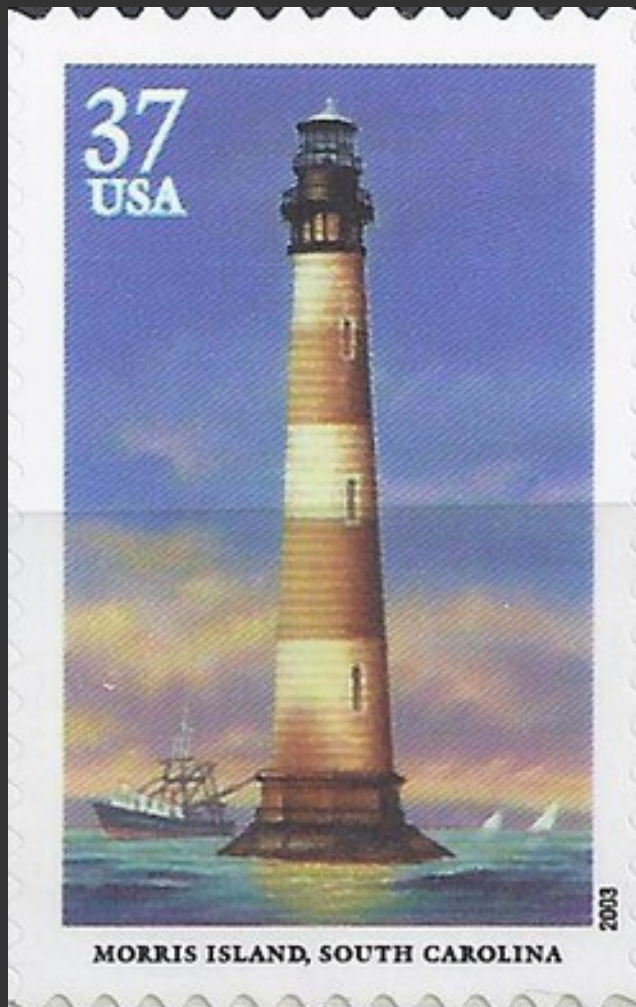
Scott Number: 3789

Issue Date: 2003

Face Value: 37¢

Stamp Name: Morris Island, SC

Hidden Image: Date: 1876



Southeastern Lighthouses

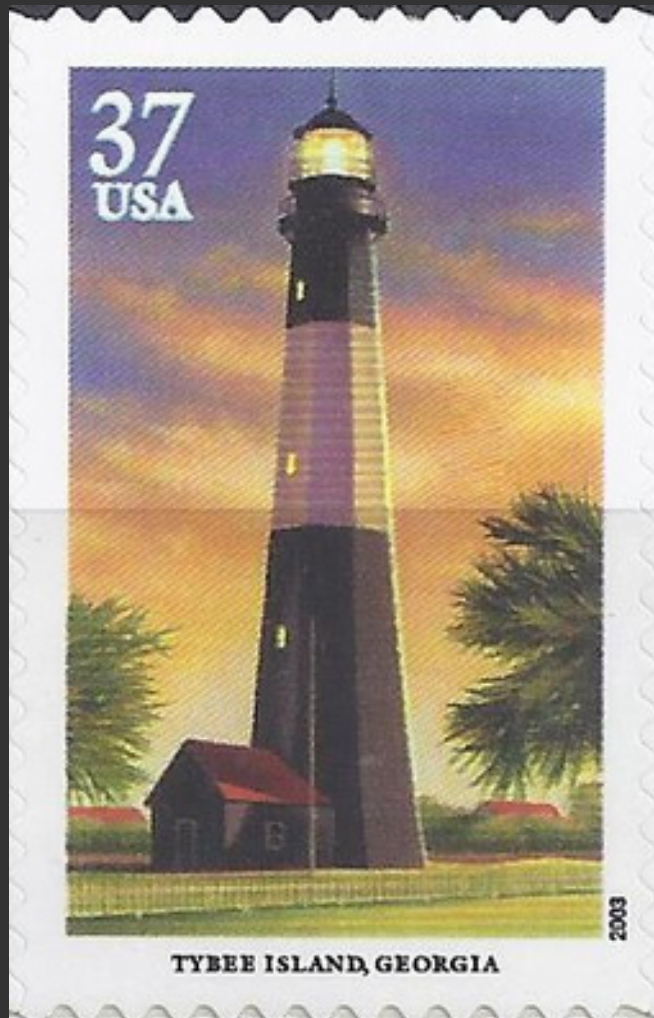
Scott Number: 3790

Issue Date: 2003

Face Value: 37¢

Stamp Name: Tybee Island, GA

Hidden Image: Date: 1867



Southeastern Lighthouses

Scott Number: 3791

Issue Date: 2003

Face Value: 37¢

Stamp Name: Hillsboro Inlet, FL

Hidden Image: Date: 1907



Southeastern Lighthouses

Scott Number: UX395-399

Issue: Southeastern Lighthouses
Postal Cards

Issue Date: 2003

Face Value: 23¢

Hidden Images: None



OLD CAPE HENRY LIGHT, Virginia, 1792, tower height 90 feet © 2003 USPS



- Postcard images have a lower resolution and less detail than the stamps
- Postcard images are wider than the stamp images
- Postcard colors are not as vibrant and differ some from the stamp colors

The post cards do not contain the hidden images found on the stamps.

Early Football Heroes

Scott Number: 3809

Issue Date: 2003

Face Value: 37¢

Stamp Name: EARLY FOOTBALL HEROES - Ernie Nevers

Hidden Image: Football Player

Note Ghost Image



Early Football Heroes

Scott Number: 3808

Issue Date: 2003

Face Value: 37¢

Stamp Name: EARLY FOOTBALL HEROES - Bronko Nagurski

Hidden Image: Football Player

Note Ghost Image



Early Football Heroes

Scott Number: 3811

Issue Date: 2003

Face Value: 37¢

Stamp Name: EARLY FOOTBALL HEROES - Harold Red Grange

Hidden Image: Football Player

Note Ghost Image



Early Football Heroes

Scott Number: 3810

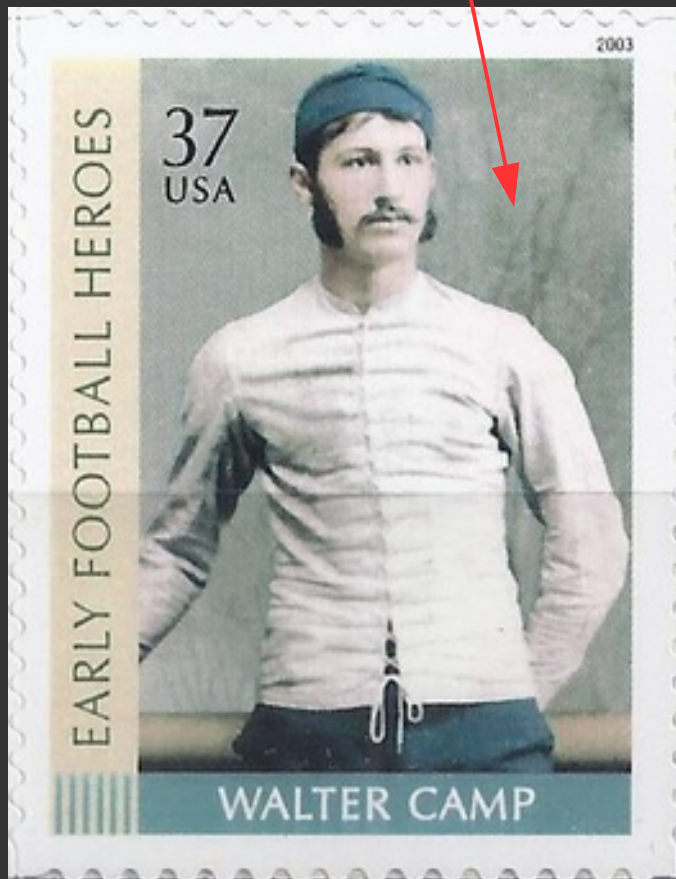
Issue Date: 2003

Face Value: 37¢

Stamp Name: EARLY FOOTBALL HEROES - Walter Camp

Hidden Image: Football Player

Note Ghost Image



Scott Number: 3838

Issue Date: 2004

Face Value: 37¢

Stamp Name: U.S. Air Force Academy

Hidden Image: Peregrine falcon, View at 90 degrees



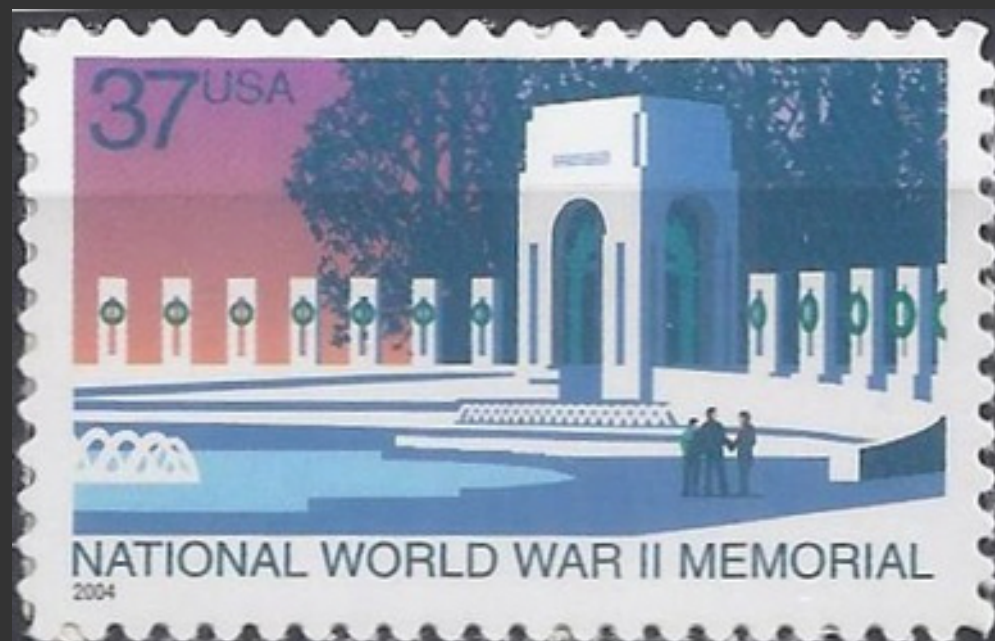
Scott Number: 3862

Issue Date: 2004

Face Value: 37¢

Stamp Name: National WWII Memorial

Hidden Image: U.S. Flag



And Then, The Post Office Stopped Putting Hidden Images on US Postage Stamps Using Scrambled Indicia

Why did they start the program?

It had to be to encourage young people to collect stamps.

Why did they end the program?

It had to be cost. According to Terry McCaffrey, Manager of Stamp Development at the USPS, “the hidden image technology was very expensive.”

A Few More Thoughts

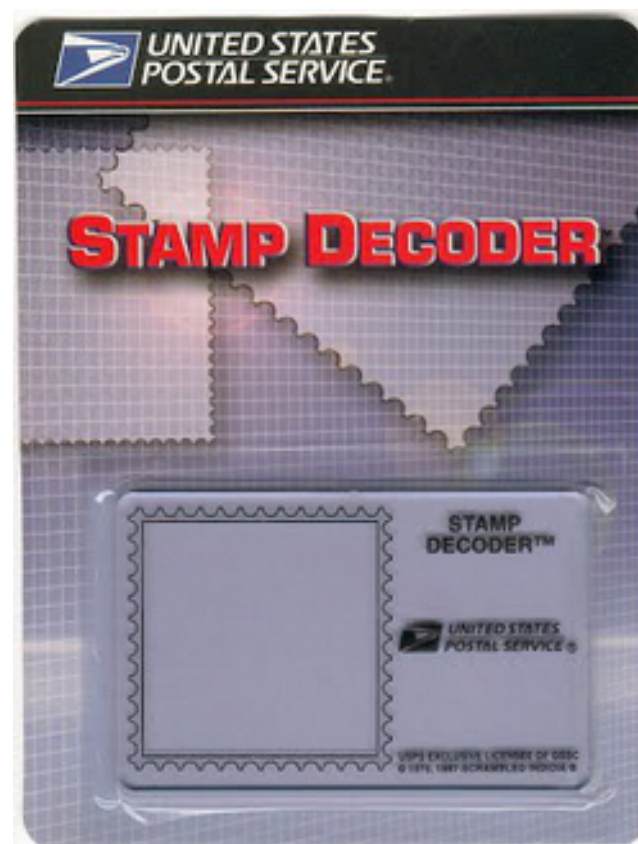
- The hidden scrambled indicia images are embedded in the printed vignette of the stamp
- The hidden images are not degraded when the stamp is canceled or when used stamps are removed from the envelope.
- Although the quality of the hidden image varies from issue to issue, the hidden images are uniform across a given issue.
- All of the stamps containing scrambled indicia hidden images were commercially printed.
- The quality of the hidden image seems to be dependent on which commercial firm did the printing.

The Big Take Away

- Saving the decoder is as important as saving the stamps
- When the last decoder is lost, these hidden images will be forever lost to history



Original Packaging



Later/Newer Packaging

Questions ?



STAMPS WITH HIDDEN IMAGES MADE VISIBLE BY USING THE USPS STAMP DECODER

Scott No.	Year	Face Value	Stamp Description	Hidden Image(s)
3036	1998	\$1.00	Red Fox	Fox
3036 a	2002	\$1.00	Red Fox	Fox
3167	1997	32¢	Air Force Thunderbirds	"USAF", Star in circle, View at 15 degrees
3168	1997	32¢	Lon Chaney as the Phantom	2 Opera masks
3169	1997	32¢	Bella Lugosi as Dracula	3 Bats
3170	1997	32¢	Boris Karloff as Frankenstein	3 Lightning bolts
3171	1997	32¢	Boris Karloff as the Mummy	2 Egyptian deities
3172	1997	32¢	Lon Chaney, Jr. as the Wolf Man	2 Howling wolves
3178	1997	\$3.00	Mars Pathfinder	"• MARS PATHFINDER • JULY 4, 1997 • USPS" (repeating)
3206	1998	32¢	Wisconsin	Badger
3230	1998	32¢	Bright Eyes Dog	Dog bone and dog house
3231	1998	32¢	Bright Eyes Fish	8 Bubbles
3232	1998	32¢	Bright Eyes Cat	Paw print and mouse
3233	1998	32¢	Bright Eyes Parakeet	Bird cage
3234	1998	32¢	Bright Eyes Hamster	Exercise wheel
3238	1998	32¢	Space City	Large & small spacecraft, figure
3239	1998	32¢	Spaceship landing	Small spacecraft
3240	1998	32¢	Person in space suit	Small spacecraft
3241	1998	32¢	Space ship taking off	Small spacecraft
3242	1998	32¢	Large domed structure	Large & small spacecraft
3261	1998	\$3.20	Shuttle Landing	"ENTERPRISE/COLUMBIA/CHALLENGER/ATLANTIS/ENDEAVOR/DISCOVERY"
3262	1998	\$11.75	Shuttle Piggyback	"ENTERPRISE/COLUMBIA/CHALLENGER/ATLANTIS/ENDEAVOR/DISCOVERY"
3321	1999	33¢	Skateboarding	"GNARLY "
3322	1999	33¢	BMX biking	"RAD"
3323	1999	33¢	Snowboarding	"SWEET"
3324	1999	33¢	Inline Skating	"PHAT"
3472	2001	\$3.50	US Capitol	"PRIORITY MAIL"
3473	2001	\$12.25	Washington Monument	"EXPRESS MAIL"
3647	2002	\$3.85	Jefferson Memorial	Jefferson's Signature
3648	2002	\$13.65	U.S. Capitol Dome	U.S. Flag
3651	2002	37¢	Harry Houdini	4 Chains around Houdini's body
3771	2003	80¢	Special Olympics	Special Olympics logo, View at 90 degrees
3787	2003	37¢	Old Cape Henry, VA	Date: "1792"
3788	2003	37¢	Cape Lookout, NC	Date: "1859"
3789	2003	37¢	Morris Island, SC	Date: "1876"
3790	2003	37¢	Tybee Island, GA	Date: "1867"
3791	2003	37¢	Hillsboro Inlet, FL	Date: "1907"
3808	2003	37¢	Bronko Nagurski	Football Player
3809	2003	37¢	Ernie Nevers	Football Player
3810	2003	37¢	Walter Camp	Football Player
3811	2003	37¢	Harold "Red" Grange	Football Player
3838	2004	37¢	U.S. Air Force Academy	Peregrine falcon, View at 90 degrees
3862	2004	37¢	National WWII Memorial	U.S. Flag