ANATOMY OF A SERIES:

PLATE NUMBERS ON SERIES 2009 $10 FEDERAL RESERVE NOTES

By Joe Farrenkopf

Plate development of Series 2009 $10 Federal Reserve Notes bearing the signatures of Secretary of the Treasury Timothy F. Geithner and Treasurer of the United States Rosa Gumataotao Rios began in March 2010, and printing of the first sheets from those new series plates began five months later at the Western Currency Facility (WCF) in Fort Worth, Texas. Except for two hiatuses of several months each, production of Series 2009 $10 FRNs continued at the WCF through October 2013 when the last run of notes from the JG-B block was serialed. In all, 1,465,600,000 regular notes were serialed for all twelve Federal Reserve districts, and 7,936,000 star notes were serialed for four[1] Federal Reserve districts. The quantity of both regular and star notes combined was about 4% less than the preceding Series 2006.

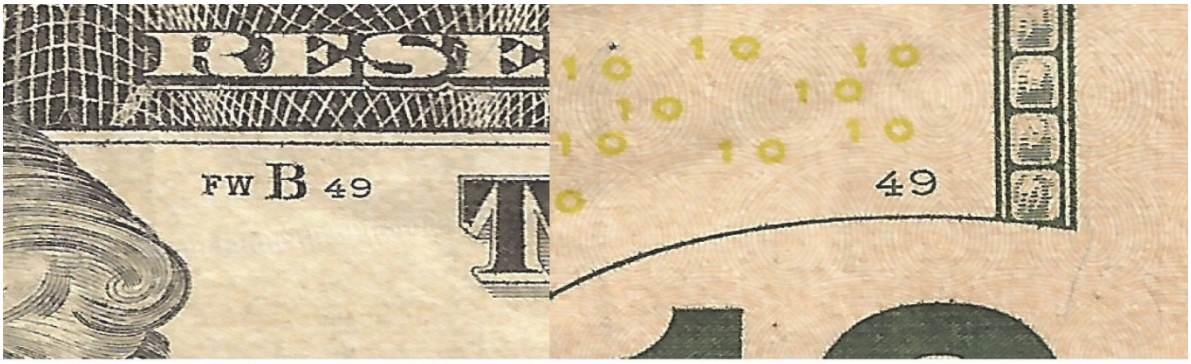
The WCF has twelve presses for printing faces and backs of currency sheets. Four of those presses are the newer Super Orlof Intaglio (SOI) presses, which use three plates in rotation, while the remaining eight presses are the older I-10 presses, which use four plates in rotation. That means that four sheets are printed, one from each plate, before the first plate makes its second impression. All Series 2009 $10 FRNs were printed using the I-10 presses.

The lifespan of a currency printing plate can vary widely from one plate to another. For instance, a plate could sustain damage that warrants removal from the press after little use; nowadays, such plates are not usually repaired and reintroduced into production. But barring any mishaps, it is common for a plate to make hundreds of thousands of impressions before wearing out. Some plates that are particularly durable and happen to remain damage-free can exceed easily one million impressions. If a set of four plates remains usable for 500,000 impressions, those plates collectively will print 2,000,000 sheets. A standard press run of regular $1, $2, $5, $10 and $20 notes comprises 200,000 sheets, so those four plates would produce enough sheets to serial as many as 10 press runs (not taking into account spoilage for any defective/damaged sheets).

[1] The BEP's monthly production report from September 2010 listed a full (3.2 million) note-replacement star run for the New York Federal Reserve District. However, that run is presumed to have been destroyed before issuance as no notes from that run have been observed or documented.

PLATE SERIAL NUMBERS

Each note image on a plate is engraved with a serial number that identifies the plate from which the note's image was produced.



Face Plate Serial Back Plate Serial

Since about the mid-1990s, the BEP's practice has been to start each new series face and back plate serial numbers at 1 and progress (more or less) sequentially through the life of the series. Plate serial numbers of many recent series have reached into the low hundreds before the next new series began, even reaching the mid-hundreds in a few instances. Prior to the mid-1990s, the resetting of plate numbers did not occur with the same regularity, resulting at times in some plate serial numbers reaching into the thousands.

For various reasons, it is typical for plates to be used out of sequence or to go unused altogether. As with other contemporary new series, both face plate and back plate serial numbers of Series 2009 $10 FRNs started at 1. By the time the series ended, the face plate and back plate serial numbers had reached 80 and 68, respectively, although only 69 face plates and 65 back plates had been used. Table 1 lists all of the face and back plate serial numbers used for Series 2009 $10 FRNs and identifies each plate's percentage of the entire series. Figure 1 is a pictorial representation of the same information.

Table 1. Series 2009 $10 FRN Face and Back Plate Frequency.

Plate Serial	FP Frequency	BP Frequency	Plate Serial	FP Frequency	BP Frequency	Plate Serial	FP Frequency	BP Frequency	Plate Serial	FP Frequency	BP Frequency
1	2.4%	2.4%	21	1.2%	3.1%	41	2.3%	1.5%	61	1.1%	1.7%
2	2.4%	2.4%	22	1.0%	3.1%	42	2.0%	1.5%	62	1.0%	1.7%
3	2.4%	2.4%	23	1.0%	3.1%	43	2.0%	1.5%	63	1.0%	1.7%
4	2.4%	2.4%	24	1.0%	1.4%	44	2.3%	1.5%	64	1.1%	1.7%
5	1.9%	2.5%	25	1.0%	0.5%	45	2.0%	0.5%	65	1.0%	0.6%
6	1.9%	2.5%	26	0.2%	2.1%	46	2.0%	1.9%	66	1.0%	0.6%
7	1.9%	2.5%	27	1.3%	0.5%	47	2.3%	1.8%	67	unused	0.6%
8	1.9%	2.5%	28	unused	1.7%	48	1.3%	1.8%	68	1.7%	0.6%
9	unused	1.4%	29	1.3%	1.7%	49	1.3%	1.8%	69	unused	-
10	unused	unused	30	2.4%	1.7%	50	1.8%	1.8%	70	1.2%	-
11	unused	1.4%	31	2.4%	2.1%	51	1.8%	0.5%	71	1.4%	-
12	unused	1.4%	32	2.4%	1.7%	52	1.8%	0.5%	72	0.9%	-
13	2.2%	unused	33	2.4%	1.7%	53	1.1%	0.5%	73	unused	-
14	unused	1.4%	34	1.2%	1.5%	54	0.7%	1.1%	74	0.9%	-
15	2.2%	0.8%	35	1.2%	1.5%	55	0.05%	1.9%	75	unused	-
16	2.2%	0.8%	36	unused	unused	56	0.05%	1.9%	76	0.9%	-
17	2.2%	0.8%	37	1.2%	1.5%	57	2.9%	1.9%	77	0.6%	-
18	1.2%	0.8%	38	0.7%	1.5%	58	1.7%	1.1%	78	0.6%	-
19	1.1%	0.5%	39	0.5%	2.1%	59	0.6%	1.1%	79	0.6%	-
20	1.2%	0.5%	40	2.3%	2.1%	60	0.6%	1.1%	80	0.6%	-

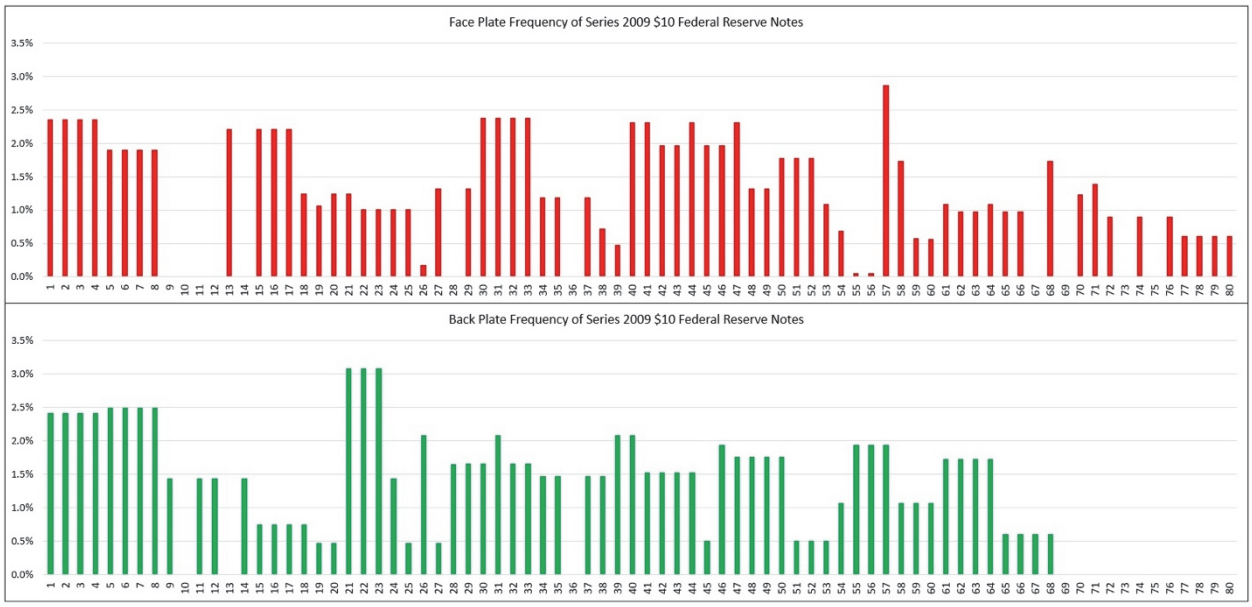


Figure 1. Series 2009 $10 FRN Face and Back Plate Frequency

PLATE SEQUENCES

At times when Series 2009 $10 FRNs were in production, just one pair of face and back presses were printing $10s while the remaining presses at the WCF were printing other denominations. There were times, though, when two and even three pairs of face and back presses were printing $10s simultaneously. Table 2 shows $10 FRN plate sequences by press. For example, face plates 1, 2, 3 and 4 were loaded to Press 22 at the beginning of the series, producing consecutive notes with face plate serials 1, 2, 3, 4, 1, 2, 3, 4, 1, 2, and so on. A cell that contains more than one four-plate sequence indicates that one, two or three plates in the sequence were replaced at some point. For example, Press 22 shows both 34-35-37-38 and 34-35-37-39 in the same cell. This means that face plates 34, 35, 37 and 38 were loaded to the press initially and that face plate 38 was replaced some time later by face plate 39 while plates 34, 35 and 37 were kept on the press.

Table 2. Series 2009 $10 FRN Face and Back Plate Sequences by Press.

Face Plates				Back Plates			
Press 20	Press 22	Press 23	Press 24	Press 10	Press 12	Press 13	Press 14
62-63-65-66	1-2-3-4	5-6-7-8	13-15-16-17	54-58-59-60	1-2-3-4	5-6-7-8	9-11-12-14
77-78-79-80	18-19-20-21 18-26-20-21	22-23-24-25	42-43-45-46	65-66-67-68	21-22-23-24 21-22-23-28	19-20-25-27	15-16-17-18
	30-31-32-33	55-56-57-59 55-61-57-59 64-61-57-59 64-61-57-60 58-68-57-71 58-68-57-70 72-74-76-70	40-41-44-47		29-30-32-33	46-55-56-57	34-35-37-38
	34-35-37-38 34-35-37-39		27-29-48-49		47-48-49-50	61-62-63-64	26-31-39-40
	50-51-52-53 50-51-52-54						41-42-43-44
							45-51-52-53

The longest-lived face plate sequence was 30-31-32-33, which shows up in about 9.5% of the entire series. Those face plates appear in greater than 14 press runs spanning the end of the JB-A block and continuing through most of the JB-B block as well as in 7 runs of the JC-A block, plus a little more than 1 run of the JH-A block and small portion of the JG-★ block. The shortest-lived face plate sequence was 55-61-57-59; only about 5,400 sheets were printed in that sequence. If any new sequential notes with that sequence exist, they are most likely in run 2 of the JB-C block. The longest-lived back plate sequence was 5-6-7-8, which shows up in about 10% of the entire series. Those back plates appear in most of the early runs of the series across almost all Federal Reserve districts, although they show up only in very small quantities in the JB-A and JH-A blocks; they appear to be entirely absent from the JA-A block. The shortest-lived back plate sequence was 19-20-25-27, which shows up in about 1.9% of the series and is limited to near the tail end of the JB-A block and the first two-thirds or so of the JL-A block.

There is no correlation between face and back plates; the plate serial numbers are independent of one another. A sheet printed from back plate 1, for example, could be matched with any face plate that happened to be on the press at the same time. Plates are replaced on an as needed basis, so a face plate that is used for a very short time might ultimately be paired with only four back plates. By contrast, a face plate that is used for a very long period could end up being paired with lots of different back plates. Face plate 56 for Series 2009 $10 FRNs, for example, was on the press for a mere six days and is found paired with just four back plates. Face plate 57, on the other hand, was on the press for nearly two and one-half months and can be found paired with 12 different back plates.

SCARCE PLATES

In terms of scarcity of any individual plate for Series 2009 $10 FRNs, face plates 56 and 55 are tough to find, with 26 only slightly less so (see fig. 2). FP 56 is found in run 2 of the JB-C block as is FP 55 (although an instance of FP 55 has also turned up in run 1 of the JB-C block); FP 26 is found in run 9 of the JL-A block and in runs 13 through 15 of the JB-A block. None of the back plates are overly difficult to find, although 19, 20, 25 and 27 show up least often.

FP 56

FP 55

FP 26

Figure 2. FPs 56 and 55 are the keys to Series 2009 $10 FRNS; FP 26 is a semi-key.

SCARCE PLATE PAIRINGS

When considering scarce plate pairings, FP 1-2-3-4 with BP 5-6-7-8 exists but in extremely small quantities; in fact, it might be limited to a single half-load (a range of 10,000 sheets) in run 11 of the JB-A block. Some other tough pairings to locate are FP 1-2-3-4 with BP 21-22-23-24; FP 5-6-7-8 with BP 9-11-12-14; FP 13-15-16-17 with BP 1-2-3-4; FP 13-15-16-17 with BP 5-6-7-8; FP 50-51-52-53 with BP 41-42-43-44; and FP 72-74-76-70 with BP 54-58-59-60.

Figures 3 and 4. Most Series 2009 $10 FRNs from FP sequence 1-2-3-4 are paired with BP sequence 1-2-3-4, but a small quantity of notes from FP sequence 1-2-3-4 are paired with BP sequences 5-6-7-8 and 21-22-23-24.

There are a couple of ways that scarce FP/BP pairings can be produced. It should be explained here that the backs of sheets are printed first and are then stored for 72 hours to dry and cure before the faces are printed. Presses at the WCF and at the Eastern Currency Facility (ECF) in Washington DC can be configured to print either faces or backs of sheets, but most of the time, a given press is dedicated to just one or the other. Further, presses are paired such that sheets printed on a particular back press are usually finished on the same face press. For example, back press A and face press Y may constitute a press pair, meaning that sheets that are back-printed on press A are usually face-printed on press Y. Meanwhile back press B and face press Z may constitute a different press pair, meaning that sheets that are back-printed on press B are usually face-printed on press Z. (Diagram 1.)

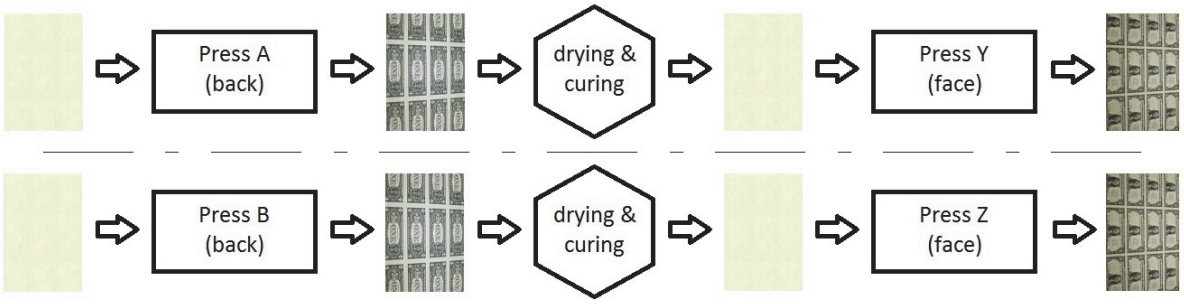


Diagram 1. Two fictional press pairs showing the usual printing path of currency sheets. Sheets that are started on Press A (backs) are usually finished on Press Y (faces) while sheets that are started on Press B (backs) are usually finished on Press Z (faces).

The reason for this is likely attributable to the physical layouts of the production facilities rather than to any internal BEP policy; face and back presses are probably in close proximity to one another with drying and curing areas located nearby. But whenever two or more pairs of presses are simultaneously printing the same denomination, "cross-press pairing" can occur, resulting in notes that have FP/BP pairings from unpaired face and back presses. That is, sheets that are back-printed on Press A may occasionally be face-printed on Press Z instead of Press Y, and sheets that are back-printed on Press B may occasionally be face-printed on Press Y instead of Press Z. (See Diagram 2.) (It's worth noting that the BEP manages to keep sheets printed on the SOI presses separate from sheets printed on the I-10 presses, so a mechanism of some kind exists to prevent that sort of cross-press pairing.)

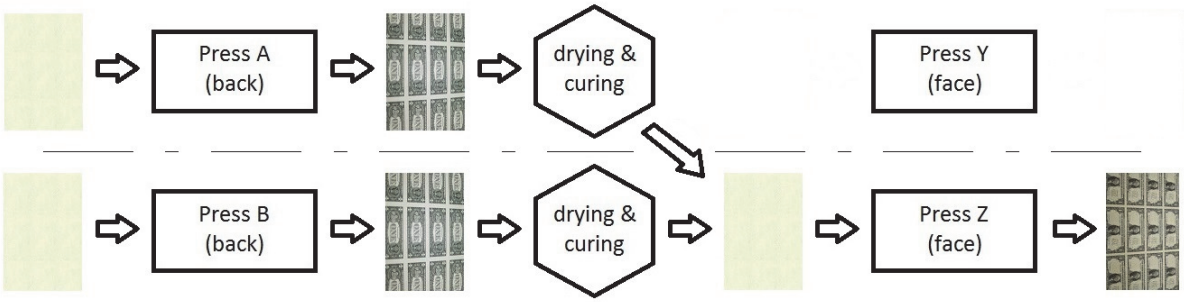


Diagram 2. Two fictional press pairs showing cross-press pairing of currency sheets. Sheets that are started on Press A (backs) are occasionally finished on Press Z (faces). Likewise, sheets that are started on Press B (backs) may occasionally be finished on Press Y (faces).

With this information in mind, the first of two ways that scarce FP/BP pairings can be produced involves slightly out-of-sync timing when back plates and face plates are replaced. If a set of four plates on a back press is replaced with a set of four new back plates, and then a few days later, a set of four plates on the corresponding face press is replaced with a set of four new face plates, that few days of overlap can result in a small quantity of sheets in which the new back plates are paired with the old face plates. In the scarce pairings noted in the preceding paragraph, FP 1-2-3-4 with BP 21-22-23-24 exists as a result of this scenario. Both sets of plates were on the same pair of presses, i.e., back Press 12 and face Press 22. BPs 21-22-23-24 were loaded to the press on October 25, 2010, and four days later, FPs 1-2-3-4 were removed from the press, resulting in a short timeframe when those FP/BP pairings could be created. The second way that scarce FP/BP pairings can be produced involves cross-press pairing. Since backs printed on Press 12, for example, usually have faces printed on Press 22, most of the time the FP/BP pairings will be limited to the same pairs of presses. But if some sheets

printed on back Press 12 are subsequently fed into a face press other than Press 22, the result would be cross-press pairings. Cross-press pairing can occur only if more than one pair of presses is simultaneously printing the same denomination or if the face press normally paired with a back press is out of service for some reason. Two, and sometimes three, pairs of presses were printing Series 2009 $10 FRNs simultaneously for a little more than one-third of the time that the series was in production. But data from observed notes shows that cross-press pairing occurs infrequently; less than 1.5% of Series 2009 $10 FRNs have cross-paired plate numbers. In the scarce pairings noted in the preceding paragraph, FP 1-2-3-4 with BP 5-6-7-8 exists as a result of this scenario; BPs 5-6-7-8 were on Press 13 (paired with face Press 23) while FPs 1-2-3-4 were on Press 22 (paired with back Press 12).

UNSERIALED REPLACEMENT SHEETS

For most denominations, blank currency paper is delivered to the BEP in loads of 20,000 sheets (two pallets of 10,000 sheets). During each step of the manufacturing process, sheets that cannot be processed due to significant flaws or damage are removed. When the batch of remaining sheets reaches the offline inspection stage, sheets that do not meet quality standards (e.g., those with ink spots or smears, ink deficiencies, etc.) are removed, and the remaining good sheets are collated into new batches of 20,000 half-sheets for serial overprinting. Because a varying number of sheets is removed at each step of the manufacturing process, including offline inspection, the resulting new batch may be made up of sheets from two or more consecutive input loads.

During the serialing process, half-sheets that have been damaged prior to receiving serial numbers, either during loading or due to feeder issues, may be replaced by unserialed sheets that have been held in reserve for replacement purposes, in the same way that star sheets are used to replace damaged half-sheets that have already been serialed. At the start of a new series, a small supply of unserialed sheets is typically set aside in reserve for this purpose and is replenished periodically as the reserve is used up. Like sheet-replacement star sheets, these unserialed replacement sheets can be inserted at any point during the serialing stage. It is also common for them to be added in small batches at the end of the press run in order to bring up the sheet count of the press run to its standard run size. Unlike sheet-replacement star sheets, which are identified by the star suffix in the serial number, these unserialed replacement sheets are indistinguishable from all other unserialed sheets because they are merely regular production sheets with no special markings of any kind. It is sometimes possible to identify them, though, by their plate serial numbers because those numbers may be atypical of most of the other sheets in a press run.

An example of unserialed replacement sheets in Series 2009 $10 notes involves FP sequence 1-2-3-4. That sequence appears at the beginning of the series, starting with the JB-A block serialed in October 2010. By January 2011, sheets with that sequence had been used up, the last batches appearing in run 9 of the JL-A block. Production of $10 notes then ceased for several months. A new production run began in late August/early September 2011, with serialing starting in October 2011. The first few press runs serialed that month have FP and BP sequences left over from the end of the previous cycle's production, indicating that the resumed production started by using up old leftover stock. Then a brand-new FP sequence 30-31-32-33 made its appearance late in run 15 of the JB-A block. FP sequence 30-31-32-33 is present almost exclusively from that point on for more than 21 press runs, or 134+ million notes (through run 14 of the JB-B block, in runs 7 through 13 of the JC-A block, and into run 4 of the JH-A block) before another different FP sequence began to appear. I say "almost exclusively" because dotted here and there in those 21+ press runs, seemingly randomly, are notes with FP sequence 1-2-3-4 (see fig. 5). Those notes came from unserialed replacement sheets that were needed during various points in the serialing process. Table 3 identifies FP and BP sequences of unserialed replacement sheets in Series 2009 $10 FRN production.

FP 31

FP 31

FP 3

FP 33

Figure 5. Notes from about the lowest 25,000 sheets from the last run of the JB-A block plus the first fourteen runs of the JB-B block (serials JB89600001A through JB96000000A and JB00000001B through JB89600000B) – more than 90 million notes – exhibit almost exclusively face plate sequence 30-31-32-33 and back plate sequences 21-22-23-24 and 21-22-23-28. But the note with serial JB61245577B pictured at left comes from a randomly intermixed unserialed replacement sheet that had been held in reserve from the days when face plates 1-2-3-4 and back plates 1-2-3-4 were on the presses.

BEP Building. Engraved 1880 by Lorenzo Hatch and Francis H. Noyes

Table 3. Series 2009 $10 FRN Face and Back Plate Sequence Pairings of Unserialed Replacement Sheets.

FP / BP Sequence	Production Months and Press Runs Where Primarily Found	Production Months and Press Runs Where Found Later as an Unserialed Replacement Sheet
1-2-3-4 / 1-2-3-4	Oct 2010 JBA runs 1-12 Nov 2010 JEA run 1 JGA run 1, run 6 Dec 2010 JFA run 1, run 2, runs 7-9 JKA run 4 Jan 2011 JLA run 8, run 9	Oct 2011 JBB run 2, run 10 Nov 2011 JCA run 7 Jan 2012 JAA run 7 Feb 2012 JFA run 15
42-43-45-46 / 26-31-39-40	Dec 2011 JDA run 14 Jan 2012 JAA runs 5-10 JEA runs 8-13 Feb 2012 JEA runs 14-15 JFA runs 14-15 JFB runs 1-2	Apr 2012 JJA run 4 Jun 2012 JLB run 4 Feb 2013 JBB run 15 JBC run 1 Mar 2013 JBC run 5, run 7
64-61-57-60 / 46-55-56-57	Mar 2013 JBC runs 6-8 JHA runs 8-9 JJA runs 7-8	Apr 2013 JFC runs 2-3 May 2013 JEB runs 1-4 Jun 2013 JDA run 15 JGB runs 5-6, run 8 Sep 2013 JG* run 1

FACE AND BACK PLATE SEQUENCE PAIRINGS

Table 4 lists face and back plate sequence pairings of Series 2009 $10 FRNs and how often those sequences are found paired. For example, a note from FP sequence 1-2-3-4 will be found paired with BP sequence 1-2-3-4 about 99% of the time, with BP 5-6-7-8 less than 1% of the time, and with BP 21-22-23-24 also less than 1% of the time. By comparison, a note from FP sequence 22-23-24-25 will be found paired with BP 5-6-7-8 about 64% of the time and with BP 19-20-25-27 about 36% of the time. The lowest and highest FP/BP pairings in the series are 1/1 and 80/68, respectively. Twenty-five pairings in which the FP and BP match can be found: 1/1, 2/2, 3/3, 4/4, 5/5, 6/6, 7/7, 8/8, 15/15, 16/16, 17/17, 20/20, 21/21, 25/25, 30/30, 32/32, 33/33, 40/40, 41/41, 44/44, 50/50, 55/55, 56/56, 57/57 and 58/58.

Table 4. Series 2009 $10 FRN Face and Back Plate Sequence Pairings.

FP Sequence	Paired w/ BP Sequence	How Often Paired	BP Sequence	Paired w/ FP Sequence	How Often Paired
1-2-3-4	1-2-3-4	99%	1-2-3-4	1-2-3-4	96%
	5-6-7-8	<1%		5-6-7-8	3%
	21-22-23-24	<1%		13-15-16-17	<1%
5-6-7-8	1-2-3-4	4%	5-6-7-8	1-2-3-4	<1%
	5-6-7-8	95%		5-6-7-8	73%
	9-11-12-14	<1%		13-15-16-17	<1%
13-15-16-17	1-2-3-4	<1%		22-23-24-25	26%
	5-6-7-8	<1%	9-11-12-14	5-6-7-8	<1%
	9-11-12-14	64%		13-15-16-17	99%
	15-16-17-18	34%	15-16-17-18	13-15-16-17	100%
18-19-20-21	19-20-25-27	1%	19-20-25-27	18-19-20-21	3%
	21-22-23-24	99%		18-26-20-21	21%
18-26-20-21	19-20-25-27	55%		22-23-24-25	76%
	21-22-23-24	45%	21-22-23-24	1-2-3-4	1%
22-23-24-25	5-6-7-8	64%		18-19-20-21	73%
	19-20-25-27	36%		18-26-20-21	6%
27-29-48-49	41-42-43-44	62%		30-31-32-33	20%
	45-51-52-53	38%	21-22-23-28	30-31-32-33	100%
30-31-32-33	21-22-23-24	12%	26-31-39-40	40-41-44-47	78%
	21-22-23-28	69%		42-43-45-46	22%
	29-30-32-33	19%	29-30-32-33	30-31-32-33	27%
34-35-37-38	29-30-32-33	100%		34-35-37-38	43%
34-35-37-39	29-30-32-33	100%		34-35-37-39	28%
40-41-44-47	26-31-39-40	70%		42-43-45-46	2%
	41-42-43-44	30%	34-35-37-38	42-43-45-46	100%
42-43-45-46	26-31-39-40	24%	41-42-43-44	27-29-48-49	53%
	29-30-32-33	1%		40-41-44-47	46%
	34-35-37-38	75%		50-51-52-53	<1%
50-51-52-53	41-42-43-44	1%	45-51-52-53	27-29-48-49	100%
	47-48-49-50	99%	46-55-56-57	55-56-57-59	2%
50-51-52-54	47-48-49-50	100%		55-61-57-59	<1%
55-56-57-59	46-55-56-57	100%		64-61-57-59	27%
55-61-57-59	46-55-56-57	100%		64-61-57-60	29%
64-61-57-59	46-55-56-57	100%		58-68-57-71	41%
64-61-57-60	46-55-56-57	100%	47-48-49-50	50-51-52-53	61%
58-68-57-71	46-55-56-57	58%		50-51-52-54	39%
	61-62-63-64	42%	54-58-59-60	58-68-57-70	8%
58-68-57-70	54-58-59-60	25%		62-63-65-66	91%
	61-62-63-64	75%		72-74-76-70	<1%
72-74-76-70	54-58-59-60	1%	61-62-63-64	58-68-57-71	34%
	61-62-63-64	99%		58-68-57-70	15%
62-63-65-66	54-58-59-60	100%		72-74-76-70	51%
77-78-79-80	65-66-67-68	100%	65-66-67-68	77-78-79-80	100%

FACE AND BACK PLATE SEQUENCES BY BLOCK AND RUN

Finally, Tables 5a and 5b list the blocks and press runs where the face and back plate sequences of Series 2009 $10 FRNs are found. For example, FP sequence 40-41-44-47 is found in runs 2 through 15 of the JF-B block, runs 8 through 15 of the JG-A block, runs 2 and 3 of the JI-A block, run 5 of the JJ-A block, and in the JF-★ block. Meanwhile, BP sequence 45-51-52-53 is found only in runs 8 through 13 of the JK-A block and runs 10, 11 and 13 of the JL-A block. Where more than one sequence is listed in a given block and run, sequences are shown in order of predominance within the run. For example, run 1 of the JC-B block shows FP sequences 62-63-65-66 and 72-74-76-70, with the former sequence listed first. That means notes with FPs 62, 63, 65 and 66 are more common in that run than are notes with FPs 70, 72, 74 and 76. A sequence followed by the letter 'e' indicates that the sequence is found in roughly equal proportions with another sequence in that same run. A sequence followed by a single asterisk indicates the sequence is found in 10% or less of the run; a sequence followed by a double asterisk indicates that the sequence is found in 1% or less of the run. (It should be noted that unserialed replacement sheet notes can show up anywhere and typically account for the inclusion of a sequence with a double asterisk. Since it isn't really possible to account for every unserialed replacement sheet occurrence, sequences not listed in a run in this table could exist. Such sequences, however, will account for just a minute fraction of the run.)

It is interesting to observe from the table how frequently a press run comprises a single plate sequence. Of the 229 regular block runs, nearly two-thirds (147) are made up of just one FP sequence‡, and another 20 are made up almost entirely (more than 90%) of just one FP sequence (excluding single instances of unserialed replacement sheet notes). Conversely, only 17 runs are made up of 3 or more FP sequences.

Table 5a. Series 2009 $10 FRN Face Plates by Block and Run. Federal Reserve Districts A through F

Regular A Blocks	JA-A	JB-A	JC-A	JD-A	JE-A	JF-A
Run 1 00000001 to 06400000	13-15-16-17 1-2-3-4 *	1-2-3-4	5-6-7-8	13-15-16-17	1-2-3-4	1-2-3-4
Run 2 06400001 to 12800000	13-15-16-17 18-19-20-21 *	1-2-3-4	5-6-7-8	13-15-16-17 5-6-7-8 **	5-6-7-8	1-2-3-4
Run 3 12800001 to 19200000	13-15-16-17	1-2-3-4	13-15-16-17 1-2-3-4	5-6-7-8	13-15-16-17	13-15-16-17 5-6-7-8
Run 4 19200001 to 25600000	18-19-20-21 1-2-3-4 **	1-2-3-4	5-6-7-8	13-15-16-17	5-6-7-8	5-6-7-8 1-2-3-4 **
Run 5 25600001 to 32000000	42-43-45-46	1-2-3-4	13-15-16-17 1-2-3-4 * 5-6-7-8 *	13-15-16-17	5-6-7-8	13-15-16-17
Run 6 32000001 to 38400000	42-43-45-46	1-2-3-4	5-6-7-8	13-15-16-17	5-6-7-8 13-15-16-17 *	13-15-16-17
Run 7 38400001 to 44800000	42-43-45-46 1-2-3-4 **	1-2-3-4	30-31-32-33 1-2-3-4 **	34-35-37-38	5-6-7-8	1-2-3-4 13-15-16-17 *
Run 8 44800001 to 51200000	42-43-45-46	1-2-3-4	30-31-32-33	34-35-37-38	42-43-45-46	1-2-3-4 13-15-16-17 5-6-7-8 *
Run 9 51200001 to 57600000	42-43-45-46	1-2-3-4	30-31-32-33	34-35-37-38	42-43-45-46	1-2-3-4
Run 10 57600001 to 64000000	42-43-45-46	1-2-3-4	30-31-32-33	34-35-37-39	42-43-45-46	22-23-24-25 18-19-20-21
Run 11 64000001 to 70400000	72-74-76-70 58-68-57-70	1-2-3-4 5-6-7-8	30-31-32-33	34-35-37-39 34-35-37-38	42-43-45-46	22-23-24-25 13-15-16-17
Run 12 70400001 to 76800000	72-74-76-70 58-68-57-71	1-2-3-4	30-31-32-33	34-35-37-39	42-43-45-46	13-15-16-17
Run 13 76800001 to 83200000		18-19-20-21 18-26-20-21 22-23-24-25 *	30-31-32-33	34-35-37-39 34-35-37-38 *	42-43-45-46 34-35-37-39 *	22-23-24-25 13-15-16-17 *
Run 14 83200001 to 89600000		22-23-24-25 18-26-20-21	72-74-76-70	42-43-45-46 34-35-37-39	42-43-45-46	42-43-45-46
Run 15 89600001 to 96000000		18-26-20-21 30-31-32-33 22-23-24-25	72-74-76-70	72-74-76-70 77-78-79-80 62-63-65-66 64-61-57-60 **	42-43-45-46	42-43-45-46 1-2-3-4 **

Regular B Blocks		**JB-B**	**JC-B**	**JD-B**	**JE-B**	**JF-B**
Run 1 00000001 to 06400000		30-31-32-33	62-63-65-66 e 72-74-76-70 e	77-78-79-80 62-63-65-66 72-74-76-70 *	58-68-57-70 72-74-76-70 64-61-57-60 **	42-43-45-46
Run 2 06400001 to 12800000		30-31-32-33 1-2-3-4 **		77-78-79-80 62-63-65-66 *	58-68-57-70 58-68-57-71 64-61-57-60 **	42-43-45-46 40-41-44-47
Run 3 12800001 to 19200000		30-31-32-33		77-78-79-80	58-68-57-71 58-68-57-70 62-63-65-66 72-74-76-70 * 64-61-57-60 **	40-41-44-47
Run 4 19200001 to 25600000		30-31-32-33			72-74-76-70 64-61-57-60 **	40-41-44-47
Run 5 25600001 to 32000000		30-31-32-33				40-41-44-47
Run 6 32000001 to 38400000		30-31-32-33				40-41-44-47
Run 7 38400001 to 44800000		30-31-32-33				40-41-44-47 34-35-37-38 *
Run 8 44800001 to 51200000		30-31-32-33				40-41-44-47
Run 9 51200001 to 57600000		30-31-32-33				40-41-44-47
Run 10 57600001 to 64000000		30-31-32-33 1-2-3-4 **				40-41-44-47
Run 11 64000001 to 70400000		30-31-32-33				40-41-44-47
Run 12 70400001 to 76800000		30-31-32-33				40-41-44-47
Run 13 76800001 to 83200000		30-31-32-33				40-41-44-47
Run 14 83200001 to 89600000		30-31-32-33				40-41-44-47
Run 15 89600001 to 96000000		50-51-52-54 42-43-45-46 **				40-41-44-47
Regular C Blocks		**JB-C**				**JF-C**
Run 1 00000001 to 06400000		64-61-57-59 42-43-45-46 ** 55-56-57-59 **				62-63-65-66 58-68-57-71
Run 2 06400001 to 12800000		55-56-57-59 64-61-57-59 50-51-52-53 50-51-52-54 * 55-61-57-59 **				62-63-65-66 58-68-57-71 64-61-57-60 **
Run 3 12800001 to 19200000		64-61-57-59				62-63-65-66 58-68-57-71 64-61-57-60 **
Run 4 19200001 to 25600000		64-61-57-59				58-68-57-71 62-63-65-66 *
Run 5 25600001 to 32000000		64-61-57-59 42-43-45-46 **				58-68-57-71 62-63-65-66
Run 6 32000001 to 38400000		64-61-57-59 e 64-61-57-60 e				58-68-57-71 62-63-65-66 58-68-57-70 *
Run 7 38400001 to 44800000		64-61-57-60 42-43-45-46 **				58-68-57-71 62-63-65-66 58-68-57-70
Run 8 44800001 to 51200000		64-61-57-60				58-68-57-70 58-68-57-71 62-63-65-66 *
Run 9 51200001 to 57600000						58-68-57-70 58-68-57-71
Star Blocks		**JB-★**		**JD-★**		**JF-★**
Run 1 00000001 to 03200000		No examples known		5-6-7-8		40-41-44-47
Uncut Sheet Blocks			**JC-A**			
Serials begin 99...			30-31-32-33			

Table 5a (continued). Series 2009 $10 FRN Face Plates by Block and Run. Federal Reserve Districts G through L

Regular A Blocks	JG-A	JH-A	JI-A	JJ-A	JK-A	JL-A
Run 1 00000001 to 06400000	1-2-3-4 5-6-7-8 *	18-19-20-21	22-23-24-25	18-19-20-21 13-15-16-17	13-15-16-17 5-6-7-8 *	22-23-24-25 13-15-16-17
Run 2 06400001 to 12800000	5-6-7-8 13-15-16-17 **	18-19-20-21	40-41-44-47 27-29-48-49	18-19-20-21	5-6-7-8	13-15-16-17 22-23-24-25
Run 3 12800001 to 19200000	5-6-7-8	18-19-20-21 22-23-24-25 * 13-15-16-17 *	27-29-48-49 50-51-52-53 40-41-44-47 *	22-23-24-25	5-6-7-8 1-2-3-4	18-19-20-21
Run 4 19200001 to 25600000	5-6-7-8	30-31-32-33 34-35-37-38	58-68-57-71 62-63-65-66	50-51-52-53 27-29-48-49 42-43-45-46 **	1-2-3-4	18-19-20-21
Run 5 25600001 to 32000000	13-15-16-17 5-6-7-8 **	34-35-37-38		27-29-48-49 50-51-52-53 40-41-44-47	13-15-16-17 1-2-3-4 *	22-23-24-25
Run 6 32000001 to 38400000	1-2-3-4	34-35-37-38 30-31-32-33 *		50-51-52-53 27-29-48-49	22-23-24-25 1-2-3-4 e 13-15-16-17 e 18-19-20-21 *	18-19-20-21
Run 7 38400001 to 44800000	13-15-16-17	34-35-37-38		64-61-57-60	27-29-48-49 50-51-52-53	22-23-24-25
Run 8 44800001 to 51200000	40-41-44-47	64-61-57-60 62-63-65-66		64-61-57-60 62-63-65-66	27-29-48-49	1-2-3-4 e 5-6-7-8 e
Run 9 51200001 to 57600000	40-41-44-47	58-68-57-71 62-63-65-66 64-61-57-60			27-29-48-49 50-51-52-53 *	18-26-20-21 1-2-3-4 e 5-6-7-8 e 18-19-20-21 22-23-24-25 * 13-15-16-17 **
Run 10 57600001 to 64000000	40-41-44-47				27-29-48-49	27-29-48-49 e 50-51-52-53 e
Run 11 64000001 to 70400000	40-41-44-47				27-29-48-49 50-51-52-53 *	50-51-52-53 27-29-48-49
Run 12 70400001 to 76800000	40-41-44-47				27-29-48-49 e 50-51-52-53 e	50-51-52-53
Run 13 76800001 to 83200000	40-41-44-47				50-51-52-53 27-29-48-49	50-51-52-53 27-29-48-49 *
Run 14 83200001 to 89600000	40-41-44-47				58-68-57-71	50-51-52-53
Run 15 89600001 to 96000000	27-29-48-49 50-51-52-53 40-41-44-47 *				58-68-57-71 62-63-65-66 *	50-51-52-53 27-29-48-49 **
Regular B Blocks	**JG-B**				**JK-B**	**JL-B**
Run 1 00000001 to 06400000	27-29-48-49				58-68-57-71 62-63-65-66	50-51-52-53 50-51-52-54
Run 2 06400001 to 12800000	27-29-48-49 50-51-52-53					50-51-52-54
Run 3 12800001 to 19200000	27-29-48-49 50-51-52-53					50-51-52-54
Run 4 19200001 to 25600000	62-63-65-66 72-74-76-70					50-51-52-54 42-43-45-46 **
Run 5 25600001 to 32000000	72-74-76-70 62-63-65-66 64-61-57-60 **					50-51-52-54
Run 6 32000001 to 38400000	72-74-76-70 62-63-65-66 64-61-57-60 **					50-51-52-54
Run 7 38400001 to 44800000	62-63-65-66 77-78-79-80 72-74-76-70					62-63-65-66
Run 8 44800001 to 51200000	77-78-79-80 64-61-57-60 **					58-68-57-71 62-63-65-66
Run 9 51200001 to 57600000	77-78-79-80					58-68-57-71
Run 10 57600001 to 64000000						58-68-57-71
Run 11 64000001 to 70400000						58-68-57-71

Star Blocks	JG-★					
Run 1 00000001 to 03200000	77-78-79-80 64-61-57-60 30-31-32-33 *					
Uncut Sheet Blocks	**JG-A**					**JL-A**
Serials begin 99...	5-6-7-8					22-23-24-25

The plate sequences listed in this table have been observed on notes in the run. In cases when more than one sequence is listed within a run, the order is the most predominant to least predominant. The notation 'e' indicates sequences that are of roughly equal proportions within the run. Asterisks (* or **) indicate a sequence that has been observed only in small quantities (10% or less and 1% or less, respectively) within the run. It is possible that other plate sequences not listed here could be found in the run; they would comprise a very small percentage of the run.

Figure 6. Table 5a shows that the face plate sequence 64-61-57-59 is found in run 4 of the JB-C block. The note with serial JB23757746C is from that run and has FP 64.

Table 5b. Series 2009 $10 FRN Back Plates by Block and Run. Federal Reserve Districts A through F

Regular A Blocks	JA-A	JB-A	JC-A	JD-A	JE-A	JF-A
Run 1 00000001 to 06400000	15-16-17-18 1-2-3-4 *	1-2-3-4	5-6-7-8 1-2-3-4 **	9-11-12-14	1-2-3-4	1-2-3-4
Run 2 06400001 to 12800000	15-16-17-18 21-22-23-24 *	1-2-3-4	1-2-3-4 5-6-7-8	9-11-12-14 5-6-7-8 **	5-6-7-8	1-2-3-4
Run 3 12800001 to 19200000	15-16-17-18	1-2-3-4	9-11-12-14 1-2-3-4	5-6-7-8	9-11-12-14	9-11-12-14 5-6-7-8
Run 4 19200001 to 25600000	21-22-23-24 1-2-3-4 **	1-2-3-4	5-6-7-8	9-11-12-14	5-6-7-8	5-6-7-8 9-11-12-14 1-2-3-4 **
Run 5 25600001 to 32000000	34-35-37-38	1-2-3-4	9-11-12-14 1-2-3-4 * 5-6-7-8 *	9-11-12-14	5-6-7-8	9-11-12-14
Run 6 32000001 to 38400000	34-35-37-38	1-2-3-4	5-6-7-8	9-11-12-14	5-6-7-8 9-11-12-14 *	9-11-12-14 15-16-17-18 5-6-7-8
Run 7 38400001 to 44800000	34-35-37-38 1-2-3-4 **	1-2-3-4	21-22-23-28 1-2-3-4 **	29-30-32-33	5-6-7-8	1-2-3-4 15-16-17-18 *
Run 8 44800001 to 51200000	34-35-37-38	1-2-3-4	21-22-23-28	29-30-32-33	34-35-37-38	1-2-3-4 15-16-17-18 5-6-7-8 *
Run 9 51200001 to 57600000	34-35-37-38	1-2-3-4	21-22-23-28	29-30-32-33	34-35-37-38 29-30-32-33 *	1-2-3-4 21-22-23-24 *
Run 10 57600001 to 64000000	34-35-37-38	1-2-3-4	21-22-23-28 29-30-32-33	29-30-32-33	34-35-37-38	5-6-7-8 21-22-23-24
Run 11 64000001 to 70400000	61-62-63-64	1-2-3-4 5-6-7-8	29-30-32-33	29-30-32-33	34-35-37-38	5-6-7-8 15-16-17-18
Run 12 70400001 to 76800000	61-62-63-64	1-2-3-4	29-30-32-33	29-30-32-33	34-35-37-38	15-16-17-18
Run 13 76800001 to 83200000		21-22-23-24 19-20-25-27	29-30-32-33	29-30-32-33	34-35-37-38 29-30-32-33 *	5-6-7-8 9-11-12-14 *
Run 14 83200001 to 89600000		19-20-25-27 21-22-23-24 **	61-62-63-64	29-30-32-33 34-35-37-38	34-35-37-38 26-31-39-40	26-31-39-40

Run 15 89600001 to 96000000		21-22-23-24 19-20-25-27	61-62-63-64	61-62-63-64 65-66-67-68 54-58-59-60 46-55-56-57 **	26-31-39-40 34-35-37-38	26-31-39-40 1-2-3-4 **
Regular B Blocks		**JB-B**	**JC-B**	**JD-B**	**JE-B**	**JF-B**
Run 1 00000001 to 06400000		21-22-23-24	54-58-59-60 e 61-62-63-64 e	65-66-67-68 54-58-59-60 61-62-63-64 *	61-62-63-64 54-58-59-60 46-55-56-57 **	26-31-39-40
Run 2 06400001 to 12800000		21-22-23-24 1-2-3-4 **		65-66-67-68 54-58-59-60 *	61-62-63-64 54-58-59-60 46-55-56-57 **	26-31-39-40
Run 3 12800001 to 19200000		21-22-23-28 21-22-23-24		65-66-67-68	61-62-63-64 54-58-59-60 46-55-56-57 **	26-31-39-40
Run 4 19200001 to 25600000		21-22-23-28			61-62-63-64 46-55-56-57 **	26-31-39-40
Run 5 25600001 to 32000000		21-22-23-28				26-31-39-40
Run 6 32000001 to 38400000		21-22-23-28				26-31-39-40
Run 7 38400001 to 44800000		21-22-23-28				26-31-39-40 29-30-32-33 *
Run 8 44800001 to 51200000		21-22-23-28				26-31-39-40
Run 9 51200001 to 57600000		21-22-23-28				26-31-39-40
Run 10 57600001 to 64000000		21-22-23-28 1-2-3-4 **				26-31-39-40
Run 11 64000001 to 70400000		21-22-23-28				26-31-39-40
Run 12 70400001 to 76800000		21-22-23-28				26-31-39-40
Run 13 76800001 to 83200000		21-22-23-28				26-31-39-40
Run 14 83200001 to 89600000		21-22-23-28				26-31-39-40
Run 15 89600001 to 96000000		47-48-49-50 26-31-39-40 *				26-31-39-40
Regular C Blocks		**JB-C**				**JF-C**
Run 1 00000001 to 06400000		46-55-56-57 26-31-39-40 **				54-58-59-60 61-62-63-64
Run 2 06400001 to 12800000		46-55-56-57 47-48-49-50				54-58-59-60 61-62-63-64 46-55-56-57 **
Run 3 12800001 to 19200000		46-55-56-57				54-58-59-60 61-62-63-64 46-55-56-57 **
Run 4 19200001 to 25600000		46-55-56-57				61-62-63-64 54-58-59-60 *
Run 5 25600001 to 32000000		46-55-56-57 26-31-39-40 **				61-62-63-64 54-58-59-60
Run 6 32000001 to 38400000		46-55-56-57				61-62-63-64 54-58-59-60
Run 7 38400001 to 44800000		46-55-56-57 26-31-39-40 **				61-62-63-64 54-58-59-60
Run 8 44800001 to 51200000		46-55-56-57				61-62-63-64 54-58-59-60
Run 9 51200001 to 57600000						61-62-63-64 54-58-59-60
Star Blocks		**JB-★**		**JD-★**		**JF-★**
Run 1 00000001 to 03200000		No examples known		5-6-7-8		26-31-39-40
Uncut Sheet Blocks			**JC-A**			
Serials begin 99...			29-30-32-33			

Table 5b (continued). Series 2009 $10 FRN Back Plates by Block and Run. Federal Reserve Districts G through L

Regular A Blocks	**JG-A**	**JH-A**	**JI-A**	**JJ-A**	**JK-A**	**JL-A**
Run 1 00000001 to 06400000	1-2-3-4 5-6-7-8 *	21-22-23-24	5-6-7-8	21-22-23-24 15-16-17-18 5-6-7-8	9-11-12-14 5-6-7-8 **	5-6-7-8 15-16-17-18 19-20-25-27 **
Run 2 06400001 to 12800000	5-6-7-8 9-11-12-14 **	21-22-23-24	41-42-43-44	21-22-23-24	5-6-7-8	15-16-17-18 19-20-25-27
Run 3 12800001 to 19200000	5-6-7-8	21-22-23-24 5-6-7-8 * 15-16-17-18 *	41-42-43-44 47-48-49-50	5-6-7-8	5-6-7-8 1-2-3-4	21-22-23-24
Run 4 19200001 to 25600000	5-6-7-8	29-30-32-33	46-55-56-57 54-58-59-60	47-48-49-50 41-42-43-44 26-31-39-40 **	1-2-3-4	21-22-23-24
Run 5 25600001 to 32000000	9-11-12-14 1-2-3-4 * 5-6-7-8 **	29-30-32-33		41-42-43-44 47-48-49-50	15-16-17-18 1-2-3-4 *	19-20-25-27
Run 6 32000001 to 38400000	1-2-3-4	29-30-32-33		47-48-49-50 41-42-43-44	5-6-7-8 15-16-17-18 e 21-22-23-24 e 1-2-3-4 *	21-22-23-24
Run 7 38400001 to 44800000	9-11-12-14	29-30-32-33		46-55-56-57	41-42-43-44 47-48-49-50	19-20-25-27
Run 8 44800001 to 51200000	41-42-43-44 26-31-39-40	46-55-56-57 54-58-59-60		46-55-56-57 54-58-59-60	41-42-43-44 45-51-52-53 **	1-2-3-4 e 5-6-7-8 e
Run 9 51200001 to 57600000	26-31-39-40	46-55-56-57 54-58-59-60			45-51-52-53 41-42-43-44 47-48-49-50 *	19-20-25-27 1-2-3-4 e 5-6-7-8 e 9-11-12-14 ** 21-22-23-24 **
Run 10 57600001 to 64000000	41-42-43-44				45-51-52-53	45-51-52-53 e 47-48-49-50 e
Run 11 64000001 to 70400000	41-42-43-44				45-51-52-53 47-48-49-50 *	47-48-49-50 45-51-52-53
Run 12 70400001 to 76800000	41-42-43-44				45-51-52-53 e 47-48-49-50 e	47-48-49-50
Run 13 76800001 to 83200000	41-42-43-44				47-48-49-50 45-51-52-53	47-48-49-50 45-51-52-53 *
Run 14 83200001 to 89600000	41-42-43-44				46-55-56-57	47-48-49-50
Run 15 89600001 to 96000000	41-42-43-44 47-48-49-50				46-55-56-57 54-58-59-60 *	47-48-49-50 41-42-43-44 **
Regular B Blocks	**JG-B**				**JK-B**	**JL-B**
Run 1 00000001 to 06400000	41-42-43-44				46-55-56-57 61-62-63-64 54-58-59-60	47-48-49-50
Run 2 06400001 to 12800000	41-42-43-44 47-48-49-50					47-48-49-50
Run 3 12800001 to 19200000	41-42-43-44 47-48-49-50					47-48-49-50
Run 4 19200001 to 25600000	54-58-59-60 61-62-63-64					47-48-49-50 26-31-39-40 **
Run 5 25600001 to 32000000	61-62-63-64 54-58-59-60 46-55-56-57 **					47-48-49-50
Run 6 32000001 to 38400000	61-62-63-64 54-58-59-60 46-55-56-57 **					47-48-49-50
Run 7 38400001 to 44800000	54-58-59-60 65-66-67-68 61-62-63-64					54-58-59-60
Run 8 44800001 to 51200000	65-66-67-68 46-55-56-57 **					46-55-56-57 54-58-59-60
Run 9 51200001 to 57600000	65-66-67-68					46-55-56-57
Run 10 57600001 to 64000000						46-55-56-57
Run 11 64000001 to 70400000						46-55-56-57

Star Blocks	**JG-★**					
Run 1 00000001 to 03200000	65-66-67-68 46-55-56-57 29-30-32-33 *					
Uncut Sheet Blocks	**JG-A**					**JL-A**
Serials begin 99...	5-6-7-8					19-20-25-27

The plate sequences listed in this table have been observed on notes in the run. In cases when more than one sequence is listed within a run, the order is the most predominant to least predominant. The notation 'e' indicates sequences that are of roughly equal proportions within the run. Asterisks (* or **) indicate a sequence that has been observed only in small quantities (10% or less and 1% or less, respectively) within the run. It is possible that other plate sequences not listed here could be found in the run; they would comprise a very small percentage of the run.

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SOURCES AND NOTES

Farrenkopf, Joe. 2018. “Unserialed Replacement Sheet Notes.” Paper Money LVII, no. 4 (Jul/Aug): pp-pp. 252-257.

Press and plate sequence information comes from internal BEP production records obtained through Freedom of Information Act requests. Plate frequency calculations and plate sequence pairings were determined from serial and plate data recorded from a random sampling of 20,378 regular and 312-star notes found in circulation.

The term “load” is used by the BEP to refer to a standard quantity of sheets used in a press run. A load comprises 20,000 sheets, and 10 loads make up one standard press run of 200,000 sheets. The random sampling for this analysis includes at least one note from more than 98% of all loads used in the series and at least one note from close to 93% of all half-loads used in the series.