

# Pagination Catalog

Using the JDF Fold Catalog to paginate single-sheet bindery signatures

Bernard Bastien

Software Architect, R&D  
Dynagram

with help from "Origination & Prepress" working group  
of the CIP4 organization

**Version 1.5**

December 4, 2012



## About this document

**Use of this document is subject to the following conditions which are deemed accepted by any person or entity making use hereof.**

## Copyright Notice

Copyright © 2012, International Cooperation for the Integration of Processes in Prepress, Press and Postpress (CIP4) with registered office in Zurich, Switzerland. All Rights Reserved. CIP4 hereby grants to any person or entity obtaining a copy of the Specification and associated documentation files (the "Specification") a perpetual, worldwide, non-exclusive, fully paid-up, royalty-free copyright license to use, copy, publish, distribute, publicly display, publicly perform, and/or sublicense the Specification in whole or in part verbatim and without modification, unless otherwise expressly permitted by CIP4, subject to the following conditions. This legal notice must be included in all copies containing the whole or substantial portions of the Specification. Copies of excerpts of the Specification which do not exceed five (5) pages must include the following short form Copyright Notice: Copyright © 2012, International Cooperation for the Integration of Processes in Prepress, Press and Postpress (CIP4) with registered office in Zurich, Switzerland.

## Trademarks and Tradenames

International Cooperation for the Integration of Processes in Prepress, Press and Postpress, CIP4, Job Definition Format, JDF, Job Messaging Format, JMF, and the CIP4 logo are trademarks of CIP4. Rather than put a trademark symbol in every occurrence of other trademarked names, we state that we are using the names only in an editorial fashion, and to the benefit of the trademark owner, with no intention of infringement of the trademark.

Except as contained in this legal notice or as allowed by membership in CIP4, the name of CIP4 must not be used in advertising or otherwise to promote the use or other dealings in this Specification without prior written authorization from CIP4.

## Waiver of Liability

**The JDF Specification is provided as is, without warranty of any kind, express, implied, or otherwise, including but not limited to the warranties of merchantability, fitness for a particular purpose and noninfringement. In no event will CIP4 be liable for any claim, damages or other liability, whether in an action of contract, tort or otherwise, arising from, out of, or in connection with the JDF Specification or the use or other dealings in the JDF Specification.**

## Abstract

This document provides a set of diagrams that explains how pages are arranged in groups when preparing the surfaces to be printed on large sheets, given a choice of a folding pattern to be used before binding.

The purpose of this document is to be used as a reference for all agents involved in the use of imposition techniques in the printing industry.

## Intended readers

- Developers and software analysts that need to implement pagination features in software applications used for stripping, pre-stripping, and print production planning;
- QA and technical support specialists that need a reference for pagination issues;

## Status of this document

- Final public release
- To be published as an Application Note by the "Origination & Prepress" working group of the CIP4 organization

## Revision History

| Version | Date       | Author          | Dept. | Details and comments   |
|---------|------------|-----------------|-------|--|
| 1.0     | 2007-05-02 | Bernard Bastien | R&D   | First release.   |
| 1.1     | 2007-05-08 | Bernard Bastien | R&D   | Corrections made after validation.   |
| 1.2     | 2007-07-06 | Bernard Bastien | R&D   | First chapter completely rewritten after rounds of discussions with O&P working group members.   |
| 1.3     | 2007-07-24 | Bernard Bastien | R&D   | After additional discussions with O&P working group members, sections 1.2 to 1.4 rewritten to correct misunderstanding about effect of BindingOrientation, new examples added. |
| 1.3.1   | 2007-07-27 | Bernard Bastien | R&D   | Some readability improvements.   |
| 1.3.2   | 2007-09-14 | Bernard Bastien | R&D   | Some additions needed before distribution as an Application Note.  |
| 1.3.3   | 2007-10-29 | Bernard Bastien | R&D   | Corrections applied on table 1.4.1, on examples in section 1.5.2, removed incorrect instruction above table 1.4.2.   |
| 1.3.4   | 2007-10-31 | Bernard Bastien | R&D   | Correction applied on table 1.5.1.   |
| 1.3.5   | 2008-04-01 | Bernard Bastien | R&D   | Correction of a typo in schema F6-2.   |
| 1.4     | 2008-12-15 | Bernard Bastien | R&D   | Added new entries: F4-2, F6-7, F6-8, F16-14. Also updated section 1.2.   |
| 1.4.1   | 2009-08-20 | Bernard Bastien | R&D   | Added fold sequences.  |
| 1.4.2   | 2009-08-25 | Bernard Bastien | R&D   | Added front page symbols. Corrected spine location on F6-8 and F12-14.   |
| 1.4.3   | 2009-09-30 | Bernard Bastien | R&D   | Removed schemas for F6-6 and F6-7.   |
| 1.5     | 2012-12-04 | Bernard Bastien | R&D   | Decision from CIP4 workgroup to define a pagination for F6-3, F6-6 and F6-7. Corrected fold sequences for F6-6 and F6-7 that were mixed.                                       |



# 1 How to interpret the diagrams

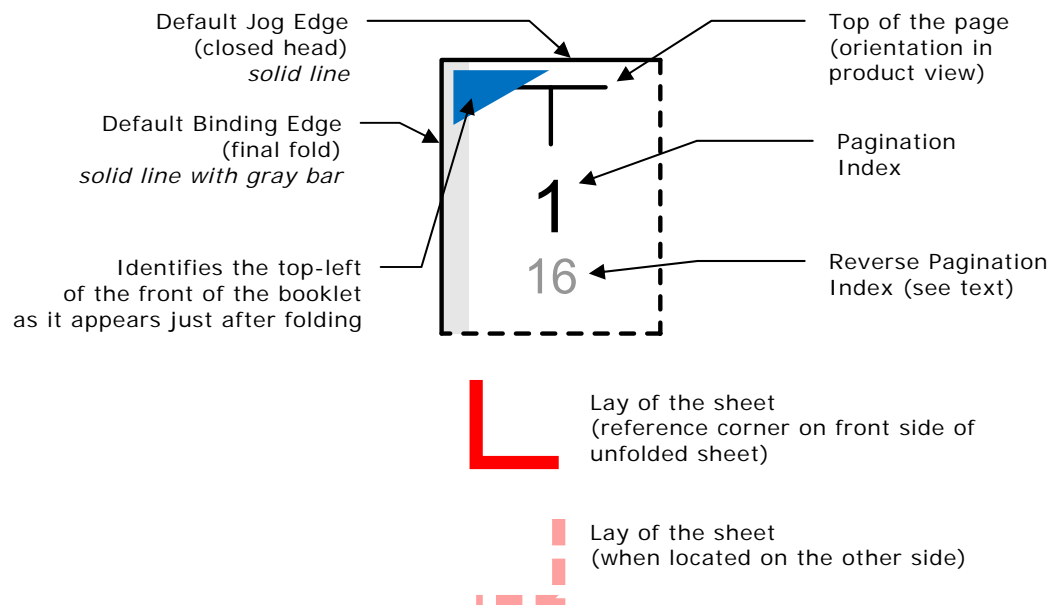
## 1.1 Legend

This document describes the structure and arrangement of bindery signatures into pagination schemes, which divide sheet surfaces into grids of rectangular areas to be filled by document pages during imposition process. These arrangements are the consequence of manipulations made on the sheets, by folding, trimming and binding them, to get booklets ready to be assembled.

This document uses diagrams to describe the pagination schemes. Each diagram shows a side of an unfolded sheet, illustrating how it is divided into "signature cells". All cells are usually of the same size, making the entire sheet to be divided into equal portions, each portion covering the whole area between folds that surround it. A signature cell is the space that "receives" a single document page and surrounding margins that are part of the gutters.

Each cell shown in the diagram displays how to orient the document page to be imposed there, and refers to the index of the page to be imposed, so the resulting booklet has properly ordered/oriented pages in product reader view, according to the default values defined in the JDF specification. Pagination indexes start at number 1.

The diagrams also show the pagination to be used when pages are flowed in reverse order because of different binding options (see sections 1.3 and 1.4).



Folding sequences are described using the same notation found in the JDF Specification:

- $\uparrow$  means "left-hand part goes over right-hand part" or "bottom part goes over top part";
- $\downarrow$  means "left-hand part goes under right-hand part" or "bottom part goes under top part";
- The size of part being folded is expressed as a fraction of unfolded sheet's size;
- First fold is always left-to-right, a "+" sign is used to toggle between left-to-right and bottom-to-top folding directions.

## 1.2 Meaning of a pagination scheme

The diagrams in the chapter 2 show the configuration of the page cells that occurs when the bindery signature is defined, in the JDF file, using the `BinderySignature/@FoldCatalog` attribute. Each arrangement corresponds to the "fold catalog identifier" shown at the left of the diagrams, used as a value of the `BinderySignature/@FoldCatalog` attribute, and referring to the recipe used to fold the sheet.

The pagination indexes shown in the diagram correspond to the imposition order, starting with 1, up to the number of pages in a booklet. This does not correspond to the actual page numbers that will be imposed on the sheets, unless a finished product is made of a single booklet. These numbers tell in which order pages are imposed into signature cells, given an array of pages that is associated to a booklet.

**These numbers have meaning only if the folded sheet is used as a booklet** intended for binding or assembling (i.e. trimmed after folding). In many cases (i.e. accordion folds) the result is mostly theoretical, as those folds are not intended for such use in real life.

When multiple booklets are assembled together, the imposition indexes have to be translated into numbers referring to the list of source document pages. This is calculated using the parameters found in the `Assembly` resource and the `StrippingParams/@SectionList` parameter.

The numbers and page orientation shown in the diagram correspond to the finished product view, in reader's perspective. The "top of the page", which is a product attribute, does not always correspond to the "head" of the booklet, which is a production attribute. **Please DO NOT consider the finished view as the reference for locating the production measurements** (head/foot/face trim and bleed sizes, spine size, overfolds, etc.) as their position is set by the `BindingOrientation` attribute, independently of the final page flow.

## 1.3 Settings that modify the pagination schemes

### 1.3.1 BindingOrientation

When a sheet has been folded, the last fold is recognized as being the "binding edge", and a perpendicular edge is known as the "jog edge". Both edges join together around a corner known as the "reference corner", which appears at the bottom left of the folded sheet (the last fold always appear either at the bottom or at the left when using the fold catalog).

The attribute `BinderySignature/@BindingOrientation` may be set to indicate that the reference corner is displaced for production purposes. This manipulation is not made on the folded sheet: only the "virtual" corner is changed, after edges had been identified. This means that the edges that are recognized as "binding" and "jog" are found at new places on the folded sheet, changing the location of the spine, head, face and foot on the booklet before pagination can be applied.

This attribute is very special because it has two default values, depending on the type of signature being defined: `Flip0` for single-row grids (no closed head), `Rotate0` for all other grids. This particularity reflects common practice of recognizing the jog edge to be at the top of signatures without closed heads (and supports JDF 1.2 compatibility).

The diagrams in the next chapter are based on these default values. If that parameter is set to another value, you must "convert" the pagination scheme to reflect this change, by using the tables in section 1.4 below.

### 1.3.2 Binding and jog sides

To make the bindery signatures to be assembled together into a finished product, the pages must have been imposed in the order and orientation needed to get the right reader's perspective after assembling. Before setting the page numbers and orientation in cells to obtain the expected result, the "assembly" is virtually rotated and flipped to make the binding and jog edges to be placed as requested, when looking at the very first page in the reader view.

The diagrams in this document show the pagination scheme where the front page of the booklet is oriented so that the binding side appears at the left, and the jog side appears at the top, according

to the default parameters defined by the JDF specification. For other values, transformations must be applied on the diagrams to get the right scheme.

These settings are found in the **Assembly** resource that is used to describe how the booklet is assembled:

- `Assembly/@BindingSide`
- `Assembly/@JogSide`

If any of these attribute is set, you must "convert" the pagination scheme to reflect this change, by using the tables in section 1.4 below.

The settings `BindingSignature/@BindingEdge` and `BindingSignature/@JogEdge` are ignored because they affect production view only. However, if `Assembly/@Order="None"`, then `BindingSignature/@BindingEdge` and `BindingSignature/@JogEdge` must be used as replacement settings, because assembly parameters must be ignored in that case, and production view becomes the product view.

## 1.4 Getting a specific pagination scheme

### 1.4.1 Using the settings to find the needed scheme transformation

Please use the table below to locate the name of the scheme transformation to be applied on the diagram, according to the `BindingSide`, `JogSide` and `BindingOrientation` settings. Default values for these settings are underlined in the table.

The obtained transformation is identified by a "scheme name", which refers to the table in section 1.4.2 where all pagination schemes are explained, based on the diagrams of the chapter 2.

| Binding Side | Jog Side   | Scheme name (for BindingOrientation setting shown in header)<br>(for single-row signatures: use column footers) |                                     |                                    |                                     |
|--------------|------------|---|-------------------------------------|------------------------------------|-------------------------------------|
|              |            | <u>Rotate0</u><br><i>Flip0</i>  | <u>Rotate90</u><br><i>Flip90</i>    | <u>Rotate180</u><br><i>Flip180</i> | <u>Rotate270</u><br><i>Flip270</i>  |
| left         | <u>top</u> | Rotate0<br><i>Flip0</i>   | Rotate270/90*<br><i>Flip90/270*</i> | Rotate180<br><i>Flip180</i>        | Rotate90/270*<br><i>Flip270/90*</i> |
|              | bottom     | Flip0<br><i>Rotate0</i>   | Flip270/90*<br><i>Rotate90/270*</i> | Flip180<br><i>Rotate180</i>        | Flip90/270*<br><i>Rotate270/90*</i> |
| right        | <u>top</u> | Flip180<br><i>Rotate180</i>   | Flip90/270*<br><i>Rotate270/90*</i> | Flip0<br><i>Rotate0</i>            | Flip270/90*<br><i>Rotate90/270*</i> |
|              | bottom     | Rotate180<br><i>Flip180</i>   | Rotate90/270*<br><i>Flip270/90*</i> | Rotate0<br><i>Flip0</i>            | Rotate270/90*<br><i>Flip90/270*</i> |
| top          | left       | Flip90<br><i>Rotate90</i>   | Flip180/0<br><i>Rotate180/0</i>     | Flip270<br><i>Rotate270</i>        | Flip0/180<br><i>Rotate0/180</i>     |
|              | right      | Rotate90<br><i>Flip90</i>   | Rotate0/180<br><i>Flip0/180</i>     | Rotate270<br><i>Flip270</i>        | Rotate180/0<br><i>Flip180/0</i>     |
| bottom       | left       | Rotate270<br><i>Flip270</i>   | Rotate180/0<br><i>Flip180/0</i>     | Rotate90<br><i>Flip90</i>          | Rotate0/180<br><i>Flip0/180</i>     |
|              | right      | Flip270<br><i>Rotate270</i>   | Flip0/180<br><i>Rotate0/180</i>     | Flip90<br><i>Rotate90</i>          | Flip180/0<br><i>Rotate180/0</i>     |
|              |            | <u>Flip0</u><br><i>Rotate0</i>  | Flip270<br><i>Rotate270</i>         | Flip180<br><i>Rotate180</i>        | Flip90<br><i>Rotate90</i>           |

\* **Important:** please take note that *if binding edges appear horizontally* on the diagram, the numbers must be **swapped** in the scheme names **indicated by an asterisk** (Rotate90/270 would become Rotate270/90). This happens because the direction of rotation is reversed in those cases (for example, F8-7, F12-7, F16-10, etc.)

### 1.4.2 Scheme transformations

| Scheme Name  | Getting the pagination scheme (using the diagram) |                             |                             |
|--------------|---|-----------------------------|-----------------------------|
|              | Page numbers                                      | Left-Bound Page             | Right-Bound Page            |
| Rotate0      | Normal  | as shown                    | as shown                    |
| Rotate0/180  | Normal  | as shown                    | Rotate 180°                 |
| Rotate90     | Normal  | Rotate 90° counterclockwise | Rotate 90° counterclockwise |
| Rotate90/270 | Normal  | Rotate 90° counterclockwise | Rotate 90° clockwise        |
| Rotate180    | Normal  | Rotate 180°                 | Rotate 180°                 |
| Rotate180/0  | Normal  | Rotate 180°                 | as shown                    |
| Rotate270    | Normal  | Rotate 90° clockwise        | Rotate 90° clockwise        |
| Rotate270/90 | Normal  | Rotate 90° clockwise        | Rotate 90° counterclockwise |
| Flip0        | Reverse   | Rotate 180°                 | Rotate 180°                 |
| Flip0/180    | Reverse   | Rotate 180°                 | as shown                    |
| Flip90       | Reverse   | Rotate 90° clockwise        | Rotate 90° clockwise        |
| Flip90/270   | Reverse   | Rotate 90° clockwise        | Rotate 90° counterclockwise |
| Flip180      | Reverse   | as shown                    | as shown                    |
| Flip180/0    | Reverse   | as shown                    | Rotate 180°                 |
| Flip270      | Reverse   | Rotate 90° counterclockwise | Rotate 90° counterclockwise |
| Flip270/90   | Reverse   | Rotate 90° counterclockwise | Rotate 90° clockwise        |

"Left-Bound" pages refer to odd pages in the diagrams, when looking at the main numbers.

For page numbers, "Normal" refer to the main numbers in the diagram, while "Reverse" refer to the smaller numbers in gray.

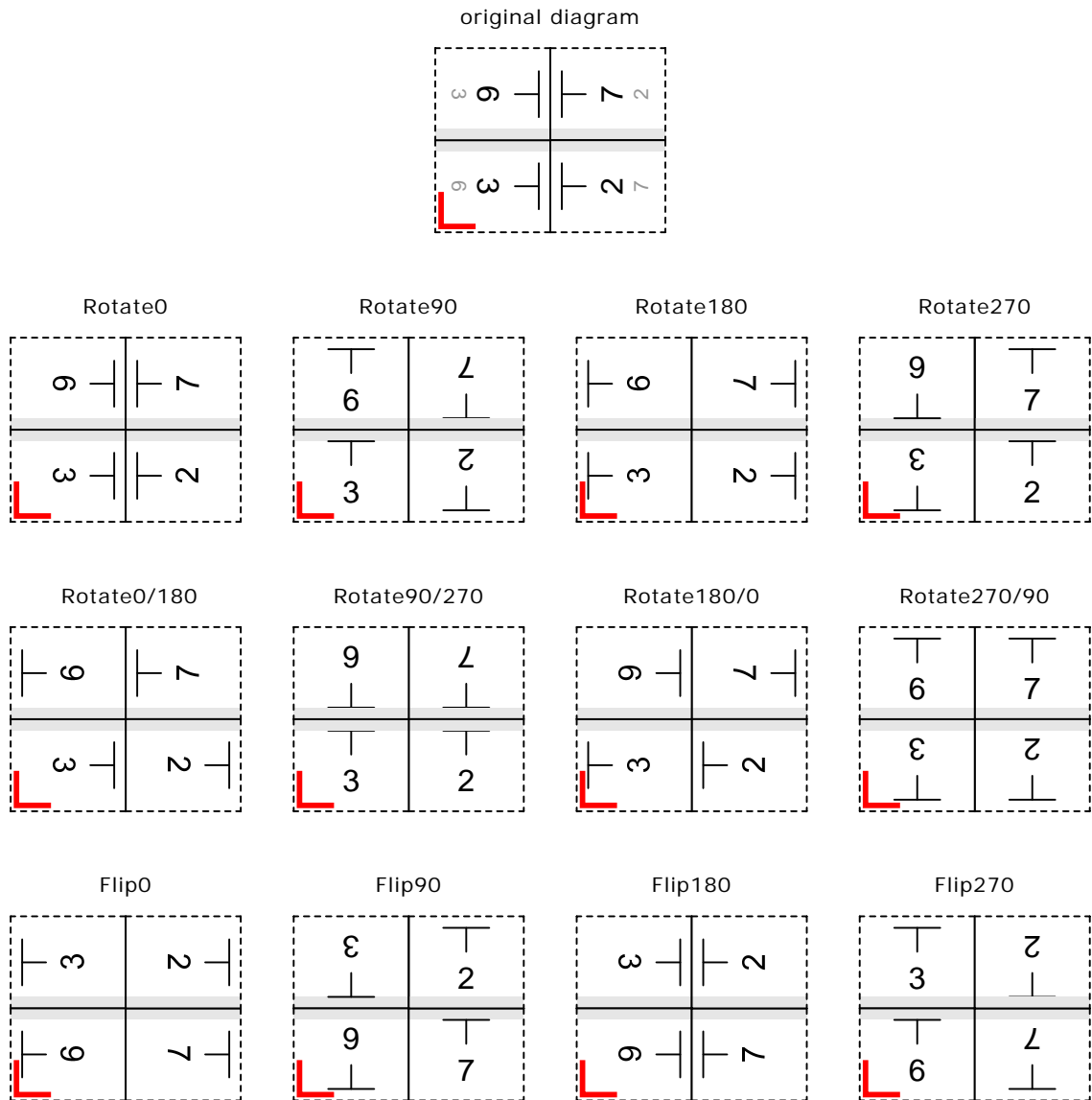
**Important note:** when a page is rotated 90° (clockwise or counterclockwise), remember that this rotation is made inside the signature cell: the cell itself is not rotated, since the folding operation remains the same. This means that the aspect ratio of the page must have been designed accordingly. You can observe this situation in the examples in the next section.

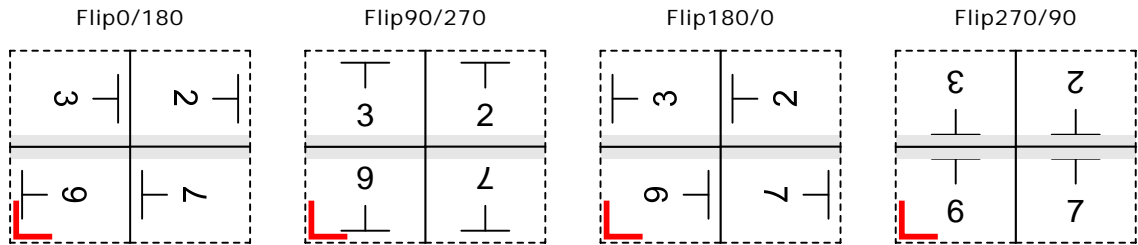


## 1.5 Examples

### 1.5.1 Signature with horizontal binding edges

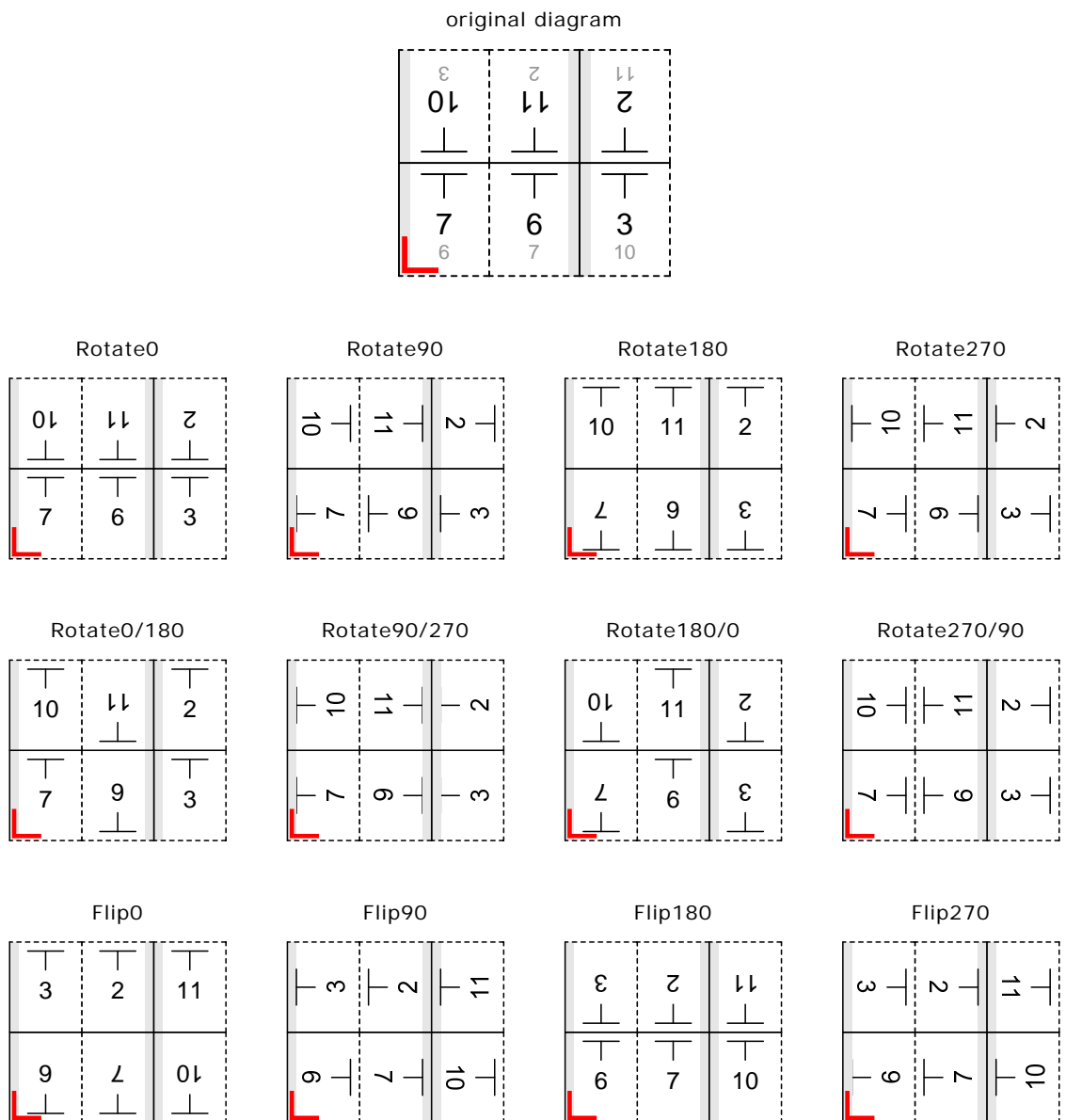
The examples below show how to read the diagrams after applying the transformations explained previously. Each diagram is an interpretation of the lay-side diagram defined for fold catalog F8-7, indicating the scheme name above it.

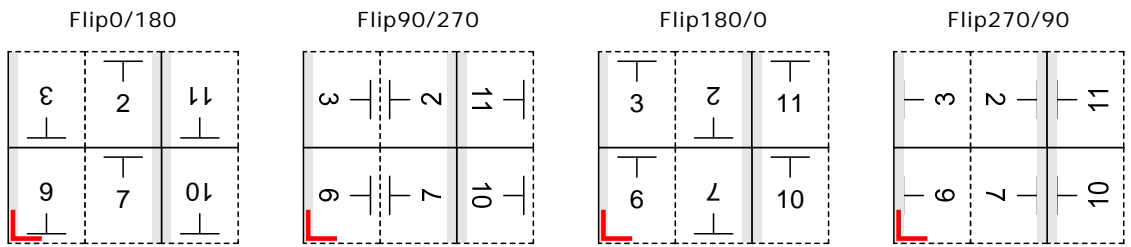




**1.5.2 Signature with vertical binding edges**

The examples below show how to read the diagrams after applying the transformations explained previously. Each diagram is an interpretation of the lay-side diagram defined for fold catalog F12-11, indicating the scheme name above it.





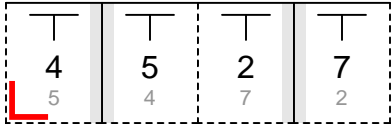
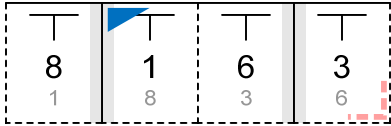
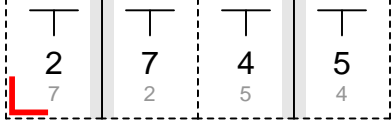
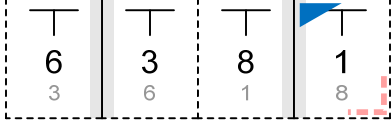
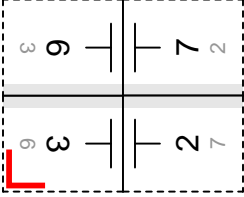
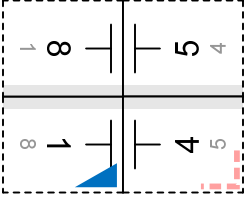
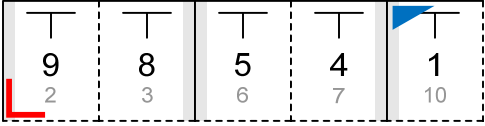
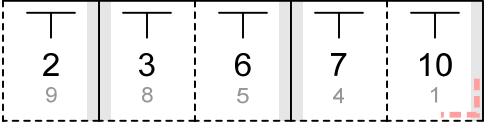


## 2 Pagination diagrams

| JDF Fold Catalog | Grid Size                                       | Front Side (Lay Side)<br>Back Side (Non-lay Side) |
|------------------|---|---|
| Folding Sequence |   |   |
| <b>F2-1</b>      | <b>1x1</b><br>(no fold)                         |   |
| <b>F4-1</b>      | <b>2x1</b><br>$\uparrow^{1/2}$                  |   |
| <b>F4-2</b>      | <b>2x1</b><br>$\downarrow^{1/2}$                |   |
| <b>F6-1</b>      | <b>3x1</b><br>$\uparrow^{1/3} \downarrow^{1/3}$ |   |
| <b>F6-2</b>      | <b>3x1</b><br>$\downarrow^{1/3} \uparrow^{1/3}$ |   |

| JDF Fold Catalog | Grid Size                                       | Front Side (Lay Side)<br>Back Side (Non-lay Side) |  |
|------------------|---|---|--|
| Folding Sequence |   |   |  |
| <b>F6-3</b>      | <b>3x1</b><br>$\uparrow^{1/4} \uparrow^{1/2}$   |   |  |
| <b>F6-4</b>      | <b>3x1</b><br>$\uparrow^{1/3} \uparrow^{1/3}$   |   |  |
| <b>F6-5</b>      | <b>3x1</b><br>$\uparrow^{2/3} \downarrow^{1/3}$ |   |  |
| <b>F6-6</b>      | <b>3x1</b><br>$\uparrow^{3/4} \downarrow^{1/4}$ |   |  |
| <b>F6-7</b>      | <b>3x1</b><br>$\uparrow^{1/4} \downarrow^{1/4}$ |   |  |

| JDF Fold Catalog | Grid Size  | Front Side (Lay Side)<br>Back Side (Non-lay Side) |  |
|------------------|--|---|--|
| Folding Sequence |  |   |  |
| <b>F6-8</b>      | <b>3x1</b><br>$\uparrow^{2/3} \uparrow^{1/3}$                  |   |  |
| <b>F8-1</b>      | <b>4x1</b><br>$\uparrow^{1/2} \uparrow^{1/4}$                  |   |  |
| <b>F8-2</b>      | <b>4x1</b><br>$\uparrow^{1/2} \downarrow^{1/4}$                |   |  |
| <b>F8-3</b>      | <b>4x1</b><br>$\uparrow^{1/4} \downarrow^{1/4} \uparrow^{1/4}$ |   |  |
| <b>F8-4</b>      | <b>4x1</b><br>$\uparrow^{1/4} \uparrow^{1/2} \downarrow^{1/4}$ |   |  |

| JDF Fold Catalog  | Grid Size | Front Side (Lay Side)<br>Back Side (Non-lay Side)   |  |
|---|-----------|---|--|
| Folding Sequence  |           |   |  |
| <p><b>F8-5</b>      <b>4x1</b></p> <p><math>\uparrow^{1/4} \uparrow^{1/4} \uparrow^{1/4}</math></p>                     |           |   |    |
| <p><b>F8-6</b>      <b>4x1</b></p> <p><math>\uparrow^{3/4} \downarrow^{1/4} \downarrow^{1/4}</math></p>                 |           |   |    |
| <p><b>F8-7</b>      <b>2x2</b></p> <p><math>\uparrow^{1/2} + \uparrow^{1/2}</math></p>                                  |           | <br> |  |
| <p><b>F10-1</b>      <b>5x1</b></p> <p><math>\uparrow^{1/5} \downarrow^{1/5} \uparrow^{1/5} \downarrow^{1/5}</math></p> |           |   |  |



| JDF Fold Catalog | Grid Size   | Front Side (Lay Side)<br>Back Side (Non-lay Side) |  |
|------------------|---|---|--|
| Folding Sequence |   |   |  |
| <b>F10-2</b>     | <b>5x1</b><br>$\uparrow^{4/5} \downarrow^{1/5} \downarrow^{1/5} \downarrow^{1/5}$ |   |  |
| <b>F10-3</b>     | <b>5x1</b><br>$\uparrow^{2/5} \downarrow^{2/5} \uparrow^{1/5}$                    |   |  |
| <b>F12-1</b>     | <b>6x1</b><br>$\uparrow^{1/3} \downarrow^{1/3} \uparrow^{1/6}$                    |   |  |
| <b>F12-2</b>     | <b>6x1</b><br>$\uparrow^{1/3} \uparrow^{1/3} \downarrow^{1/6}$                    |   |  |
| <b>F12-3</b>     | <b>6x1</b><br>$\uparrow^{1/2} \downarrow^{1/6} \uparrow^{1/6}$                    |   |  |

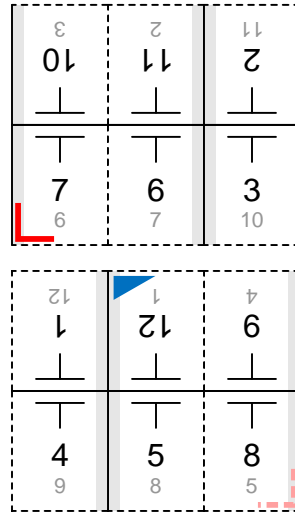
| JDF Fold Catalog   | Grid Size | Front Side (Lay Side)<br>Back Side (Non-lay Side) |  |
|--|-----------|---|--|
| Folding Sequence   |           |   |  |
| <p><b>F12-4</b>      <b>6x1</b></p> <p><math>\uparrow^{1/2} \downarrow^{1/6} \downarrow^{1/6}</math></p>                               |           |   |  |
| <p><b>F12-5</b>      <b>6x1</b></p> <p><math>\uparrow^{1/2} \downarrow^{1/3} \uparrow^{1/6}</math></p>                                 |           |   |  |
| <p><b>F12-6</b>      <b>6x1</b></p> <p><math>\uparrow^{1/6} \downarrow^{1/6} \uparrow^{1/6} \downarrow^{1/6} \uparrow^{1/6}</math></p> |           |   |  |
| <p><b>F12-7</b>      <b>3x2</b></p> <p><math>\uparrow^{1/3} \downarrow^{1/3} + \uparrow^{1/2}</math></p>                               |           |   |  |

| JDF Fold Catalog  | Grid Size | Front Side (Lay Side)<br>Back Side (Non-lay Side) |  |
|---|-----------|---|--|
| Folding Sequence  |           |   |  |
| <p><b>F12-8</b>      <b>3x2</b></p> <p><math>\uparrow^{2/3} \uparrow^{1/3} + \uparrow^{1/2}</math></p>    |           |   |  |
| <p><b>F12-9</b>      <b>3x2</b></p> <p><math>\uparrow^{1/3} \uparrow^{1/3} + \uparrow^{1/2}</math></p>    |           |   |  |
| <p><b>F12-10</b>      <b>3x2</b></p> <p><math>\uparrow^{2/3} \downarrow^{1/3} + \uparrow^{1/2}</math></p> |           |   |  |

| JDF Fold Catalog | Grid Size | Front Side (Lay Side)<br>Back Side (Non-lay Side) |
|------------------|-----------|---|
| Folding Sequence |           |   |

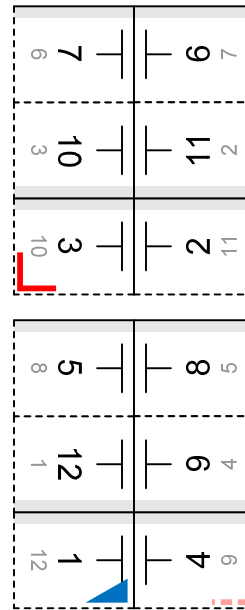
**F12-11 3x2**

$\uparrow^{1/3} + \uparrow^{1/2} + \uparrow^{1/3}$



**F12-12 2x3**

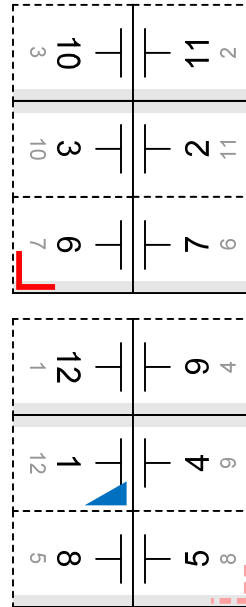
$\uparrow^{1/2} + \uparrow^{2/3} \downarrow^{1/3}$



| JDF Fold Catalog | Grid Size | Front Side (Lay Side)<br>Back Side (Non-lay Side) |
|------------------|-----------|---|
| Folding Sequence |           |   |

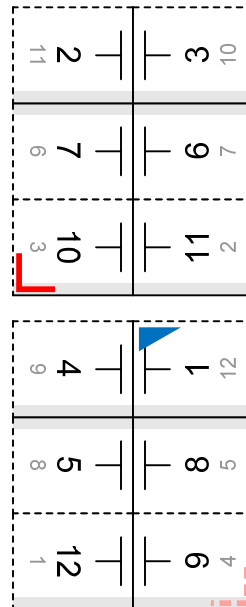
**F12-13 2x3**

$\uparrow^{1/2} + \uparrow^{1/3} \uparrow^{1/3}$



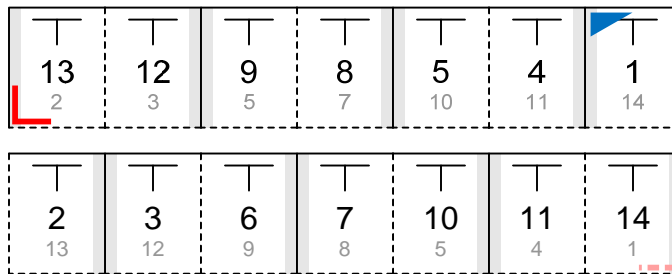
**F12-14 2x3**

$\uparrow^{1/2} + \uparrow^{1/3} \downarrow^{1/3}$



**F14-1 7x1**

$\uparrow^{1/7} \downarrow^{1/7} \uparrow^{1/7}$   
 $\downarrow^{1/7} \uparrow^{1/7} \downarrow^{1/7}$

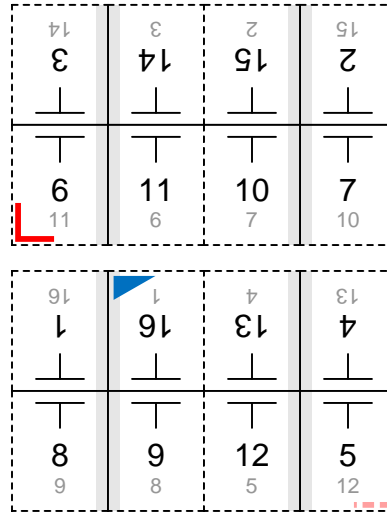


| JDF Fold Catalog | Grid Size   | Front Side (Lay Side)<br>Back Side (Non-lay Side)   |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |
|------------------|---|---|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| Folding Sequence |   |   |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |
| <b>F16-1</b>     | <b>8x1</b><br>$\uparrow^{1/2} \downarrow^{1/4} \uparrow^{1/8}$  | <table border="1"> <tr> <td>10<br/>7</td> <td>7<br/>10</td> <td>2<br/>15</td> <td>15<br/>2</td> <td>14<br/>3</td> <td>3<br/>14</td> <td>6<br/>11</td> <td>11<br/>6</td> </tr> <tr> <td>12<br/>5</td> <td>5<br/>12</td> <td>4<br/>13</td> <td>13<br/>4</td> <td>16<br/>1</td> <td>1<br/>16</td> <td>8<br/>9</td> <td>9<br/>8</td> </tr> </table> | 10<br>7 | 7<br>10 | 2<br>15 | 15<br>2 | 14<br>3 | 3<br>14 | 6<br>11 | 11<br>6 | 12<br>5 | 5<br>12 | 4<br>13 | 13<br>4 | 16<br>1 | 1<br>16 | 8<br>9  | 9<br>8  |
|                  |   | 10<br>7   | 7<br>10 | 2<br>15 | 15<br>2 | 14<br>3 | 3<br>14 | 6<br>11 | 11<br>6 |         |         |         |         |         |         |         |         |         |
| 12<br>5          | 5<br>12   | 4<br>13   | 13<br>4 | 16<br>1 | 1<br>16 | 8<br>9  | 9<br>8  |         |         |         |         |         |         |         |         |         |         |         |
| <b>F16-2</b>     | <b>8x1</b><br>$\uparrow^{1/2} \downarrow^{1/4} \downarrow^{1/8}$  | <table border="1"> <tr> <td>2<br/>15</td> <td>15<br/>2</td> <td>10<br/>7</td> <td>7<br/>10</td> <td>6<br/>11</td> <td>11<br/>6</td> <td>14<br/>3</td> <td>3<br/>14</td> </tr> <tr> <td>4<br/>13</td> <td>13<br/>4</td> <td>12<br/>5</td> <td>5<br/>12</td> <td>8<br/>9</td> <td>9<br/>8</td> <td>16<br/>1</td> <td>1<br/>16</td> </tr> </table> | 2<br>15 | 15<br>2 | 10<br>7 | 7<br>10 | 6<br>11 | 11<br>6 | 14<br>3 | 3<br>14 | 4<br>13 | 13<br>4 | 12<br>5 | 5<br>12 | 8<br>9  | 9<br>8  | 16<br>1 | 1<br>16 |
|                  |   | 2<br>15   | 15<br>2 | 10<br>7 | 7<br>10 | 6<br>11 | 11<br>6 | 14<br>3 | 3<br>14 |         |         |         |         |         |         |         |         |         |
| 4<br>13          | 13<br>4   | 12<br>5   | 5<br>12 | 8<br>9  | 9<br>8  | 16<br>1 | 1<br>16 |         |         |         |         |         |         |         |         |         |         |         |
| <b>F16-3</b>     | <b>8x1</b><br>$\uparrow^{1/2} \uparrow^{1/4} \downarrow^{1/8}$  | <table border="1"> <tr> <td>6<br/>11</td> <td>11<br/>6</td> <td>14<br/>3</td> <td>3<br/>14</td> <td>2<br/>15</td> <td>15<br/>2</td> <td>10<br/>7</td> <td>7<br/>10</td> </tr> <tr> <td>8<br/>9</td> <td>9<br/>8</td> <td>16<br/>1</td> <td>1<br/>16</td> <td>4<br/>13</td> <td>13<br/>4</td> <td>12<br/>5</td> <td>5<br/>12</td> </tr> </table> | 6<br>11 | 11<br>6 | 14<br>3 | 3<br>14 | 2<br>15 | 15<br>2 | 10<br>7 | 7<br>10 | 8<br>9  | 9<br>8  | 16<br>1 | 1<br>16 | 4<br>13 | 13<br>4 | 12<br>5 | 5<br>12 |
|                  |   | 6<br>11   | 11<br>6 | 14<br>3 | 3<br>14 | 2<br>15 | 15<br>2 | 10<br>7 | 7<br>10 |         |         |         |         |         |         |         |         |         |
| 8<br>9           | 9<br>8  | 16<br>1   | 1<br>16 | 4<br>13 | 13<br>4 | 12<br>5 | 5<br>12 |         |         |         |         |         |         |         |         |         |         |         |
| <b>F16-4</b>     | <b>8x1</b><br>$\uparrow^{1/2} \uparrow^{1/4} \uparrow^{1/8}$  | <table border="1"> <tr> <td>14<br/>3</td> <td>3<br/>14</td> <td>6<br/>11</td> <td>11<br/>6</td> <td>10<br/>7</td> <td>7<br/>10</td> <td>2<br/>15</td> <td>15<br/>2</td> </tr> <tr> <td>16<br/>1</td> <td>1<br/>16</td> <td>8<br/>9</td> <td>9<br/>8</td> <td>12<br/>5</td> <td>5<br/>12</td> <td>4<br/>13</td> <td>13<br/>4</td> </tr> </table> | 14<br>3 | 3<br>14 | 6<br>11 | 11<br>6 | 10<br>7 | 7<br>10 | 2<br>15 | 15<br>2 | 16<br>1 | 1<br>16 | 8<br>9  | 9<br>8  | 12<br>5 | 5<br>12 | 4<br>13 | 13<br>4 |
|                  |   | 14<br>3   | 3<br>14 | 6<br>11 | 11<br>6 | 10<br>7 | 7<br>10 | 2<br>15 | 15<br>2 |         |         |         |         |         |         |         |         |         |
| 16<br>1          | 1<br>16   | 8<br>9  | 9<br>8  | 12<br>5 | 5<br>12 | 4<br>13 | 13<br>4 |         |         |         |         |         |         |         |         |         |         |         |
| <b>F16-5</b>     | <b>8x1</b><br>$\downarrow^{1/8} \uparrow^{1/8} \downarrow^{1/8} \uparrow^{1/8}$<br>$\downarrow^{1/8} \uparrow^{1/8} \downarrow^{1/8}$ | <table border="1"> <tr> <td>16<br/>1</td> <td>13<br/>4</td> <td>12<br/>5</td> <td>9<br/>8</td> <td>8<br/>9</td> <td>5<br/>12</td> <td>4<br/>13</td> <td>1<br/>16</td> </tr> <tr> <td>2<br/>15</td> <td>3<br/>14</td> <td>6<br/>11</td> <td>7<br/>10</td> <td>10<br/>7</td> <td>11<br/>6</td> <td>14<br/>3</td> <td>15<br/>2</td> </tr> </table> | 16<br>1 | 13<br>4 | 12<br>5 | 9<br>8  | 8<br>9  | 5<br>12 | 4<br>13 | 1<br>16 | 2<br>15 | 3<br>14 | 6<br>11 | 7<br>10 | 10<br>7 | 11<br>6 | 14<br>3 | 15<br>2 |
|                  |   | 16<br>1   | 13<br>4 | 12<br>5 | 9<br>8  | 8<br>9  | 5<br>12 | 4<br>13 | 1<br>16 |         |         |         |         |         |         |         |         |         |
| 2<br>15          | 3<br>14   | 6<br>11   | 7<br>10 | 10<br>7 | 11<br>6 | 14<br>3 | 15<br>2 |         |         |         |         |         |         |         |         |         |         |         |

| JDF Fold Catalog | Grid Size | Front Side (Lay Side)<br>Back Side (Non-lay Side) |
|------------------|-----------|---|
| Folding Sequence |           |   |

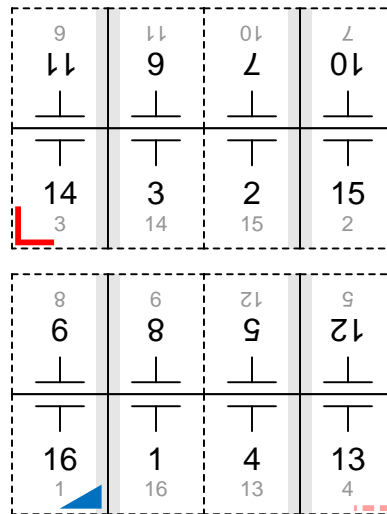
**F16-6      4x2**

$\uparrow^{1/2} + \uparrow^{1/2} + \uparrow^{1/4}$



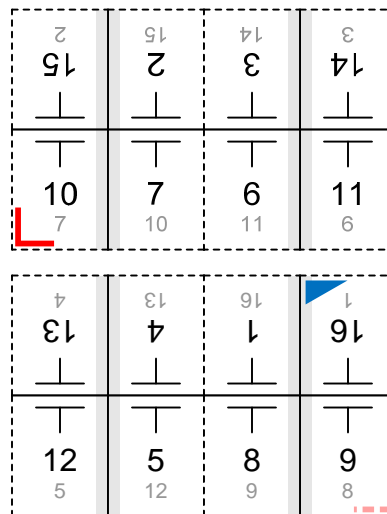
**F16-7      4x2**

$\uparrow^{1/2} + \uparrow^{1/2} + \downarrow^{1/4}$



**F16-8      4x2**

$\uparrow^{1/2} + \downarrow^{1/2} + \downarrow^{1/4}$



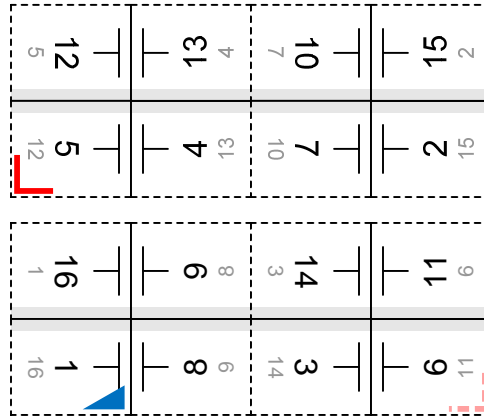
| JDF Fold Catalog   | Grid Size | Front Side (Lay Side)<br>Back Side (Non-lay Side) |  |  |  |
|--|-----------|---|--|--|--|
| Folding Sequence   |           |   |  |  |  |
| <p><b>F16-9</b>      <b>4x2</b></p> <p><math>\uparrow^{1/2} \downarrow^{1/4} + \uparrow^{1/2}</math></p>                 |           |   |  |  |  |
| <p><b>F16-10</b>      <b>4x2</b></p> <p><math>\uparrow^{1/2} \uparrow^{1/4} + \uparrow^{1/2}</math></p>                  |           |   |  |  |  |
| <p><b>F16-11</b>      <b>4x2</b></p> <p><math>\uparrow^{1/4} \downarrow^{1/4} \uparrow^{1/4} + \uparrow^{1/2}</math></p> |           |   |  |  |  |



|                     |              |   |
|---------------------|--------------|---|
| JDF Fold<br>Catalog | Grid<br>Size | Front Side (Lay Side)<br>Back Side (Non-lay Side) |
| Folding Sequence    |              |   |

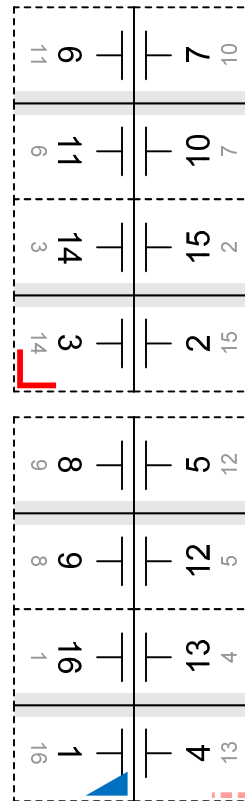
**F16-12 4x2**

$\uparrow^{1/4} \uparrow^{1/4} \uparrow^{1/4} + \uparrow^{1/2}$



**F16-13 2x4**

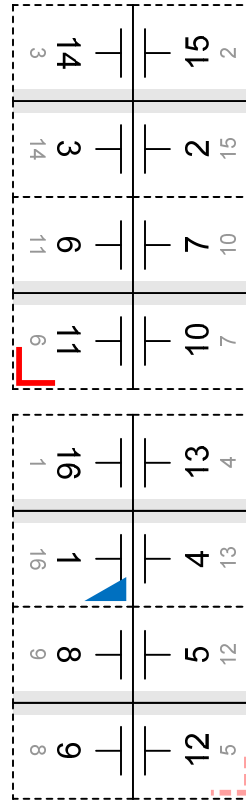
$\uparrow^{1/2} + \uparrow^{1/2} \downarrow^{1/4}$



|                  |           |   |
|------------------|-----------|---|
| JDF Fold Catalog | Grid Size | Front Side (Lay Side)<br>Back Side (Non-lay Side) |
| Folding Sequence |           |   |

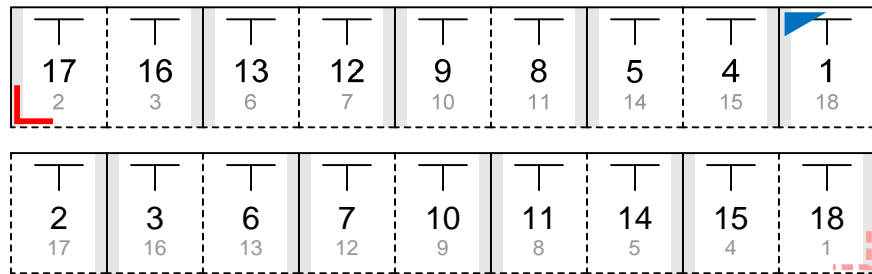
**F16-14 2x4**

$\uparrow^{1/2} + \uparrow^{1/2} \uparrow^{1/4}$



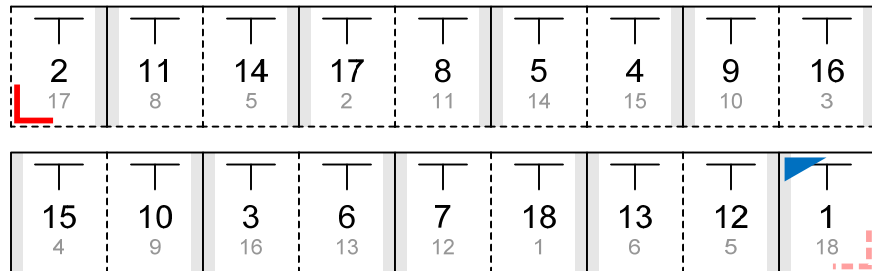
**F18-1 9x1**

$\uparrow^{1/9} \downarrow^{1/9} \uparrow^{1/9} \downarrow^{1/9}$   
 $\uparrow^{1/9} \downarrow^{1/9} \uparrow^{1/9} \downarrow^{1/9}$



**F18-2 9x1**

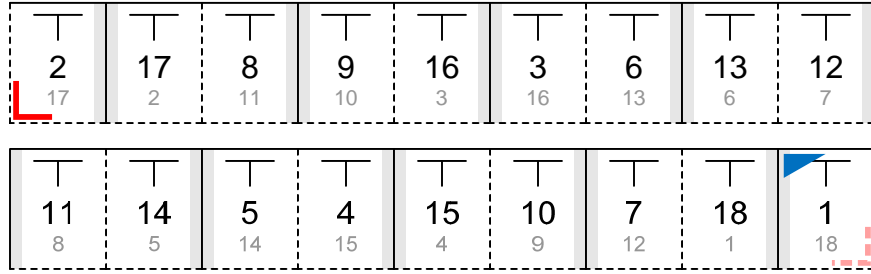
$\uparrow^{2/3} \downarrow^{1/3} \uparrow^{1/9} \downarrow^{1/9}$



| JDF Fold Catalog | Grid Size | Front Side (Lay Side)<br>Back Side (Non-lay Side) |
|------------------|-----------|---|
| Folding Sequence |           |   |

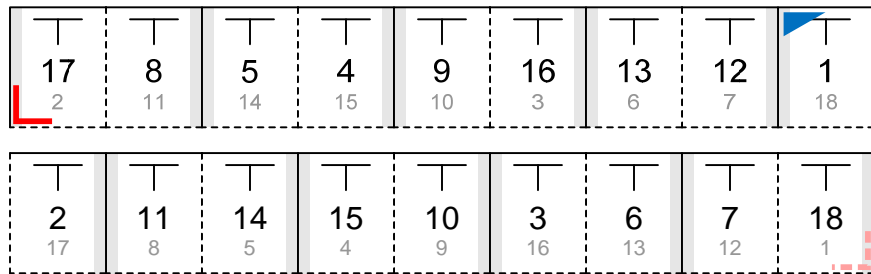
**F18-3 9x1**

$\uparrow^{1/3} \downarrow^{1/3} \uparrow^{2/9} \downarrow^{1/9}$



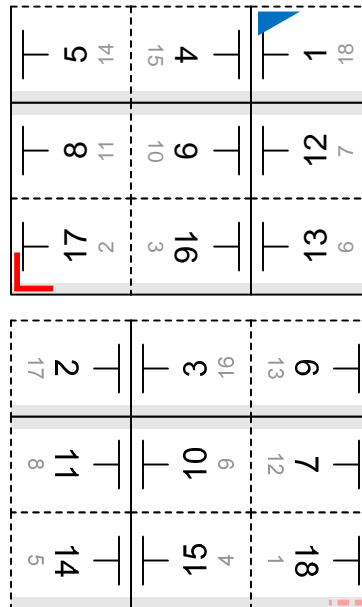
**F18-4 9x1**

$\uparrow^{1/3} \downarrow^{1/3} \uparrow^{1/9} \downarrow^{1/9}$



**F18-5 3x3**

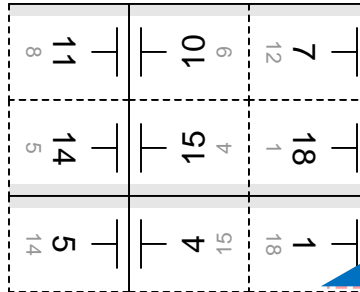
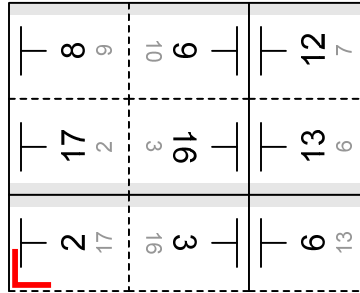
$\uparrow^{1/3} \downarrow^{1/3} + \uparrow^{1/3} \downarrow^{1/3}$



|                  |           |   |
|------------------|-----------|---|
| JDF Fold Catalog | Grid Size | Front Side (Lay Side)<br>Back Side (Non-lay Side) |
| Folding Sequence |           |   |

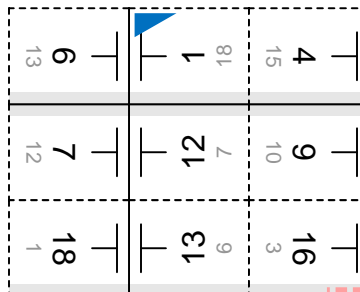
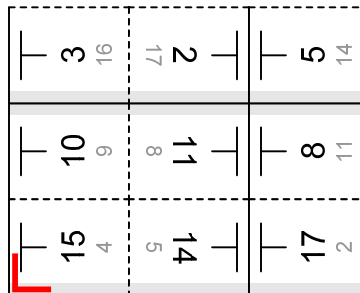
**F18-6 3x3**

$\uparrow^{1/3} \downarrow^{1/3} + \uparrow^{2/3} \downarrow^{1/3}$



**F18-7 3x3**

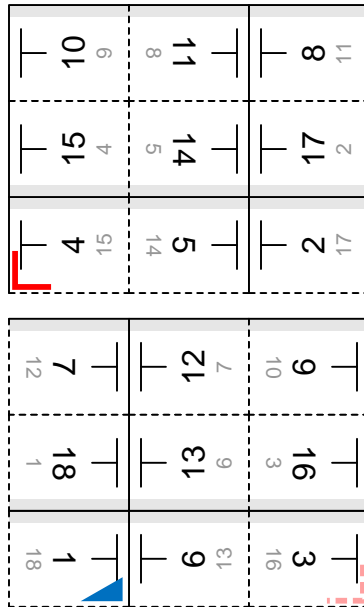
$\uparrow^{1/3} \uparrow^{1/3} + \uparrow^{1/3} \downarrow^{1/3}$



| JDF Fold Catalog | Grid Size | Front Side (Lay Side)<br>Back Side (Non-lay Side) |
|------------------|-----------|---|
| Folding Sequence |           |   |

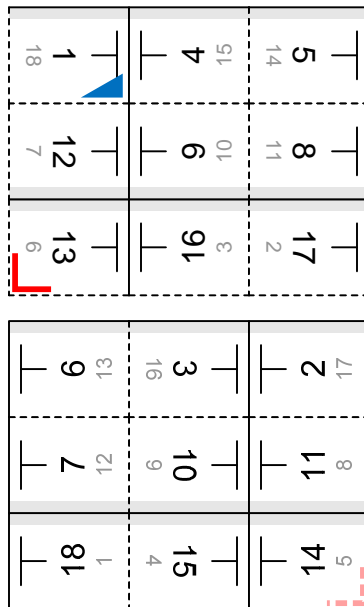
**F18-8 3x3**

$\uparrow^{1/3} \uparrow^{1/3} + \uparrow^{2/3} \downarrow^{1/3}$



**F18-9 3x3**

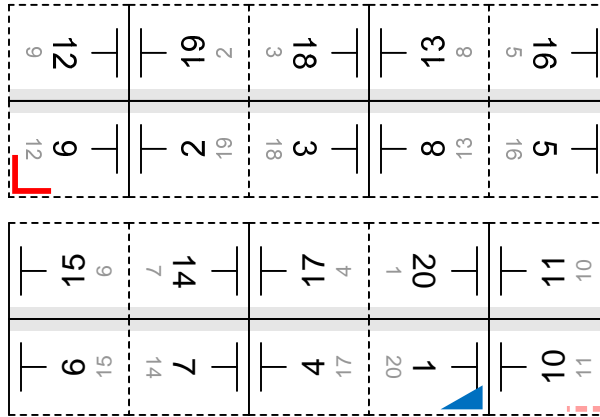
$\uparrow^{2/3} \uparrow^{1/3} + \uparrow^{2/3} \uparrow^{1/3}$



| JDF Fold Catalog | Grid Size | Front Side (Lay Side)<br>Back Side (Non-lay Side) |
|------------------|-----------|---|
| Folding Sequence |           |   |

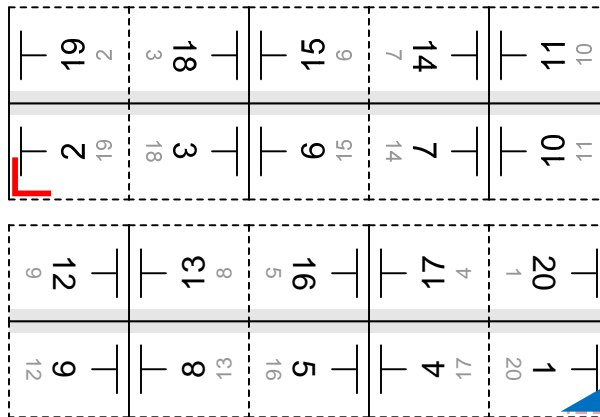
**F20-1 5x2**

$\uparrow^{2/5} \downarrow^{2/5} \uparrow^{1/5} + \uparrow^{1/2}$



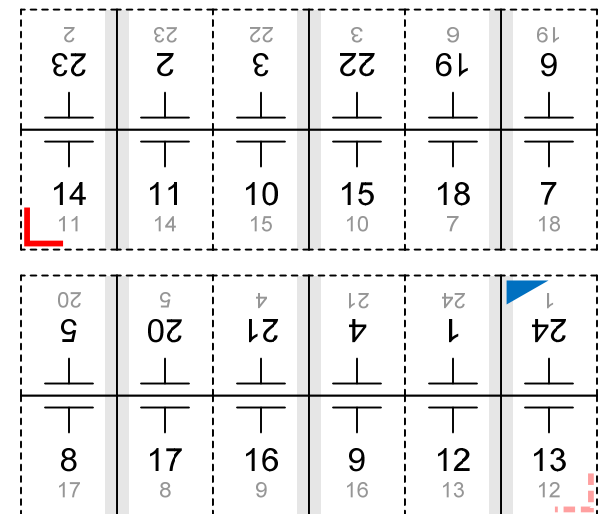
**F20-2 5x2**

$\uparrow^{1/5} \downarrow^{1/5} \uparrow^{1/5} \downarrow^{1/5} + \uparrow^{1/2}$



**F24-1 6x2**

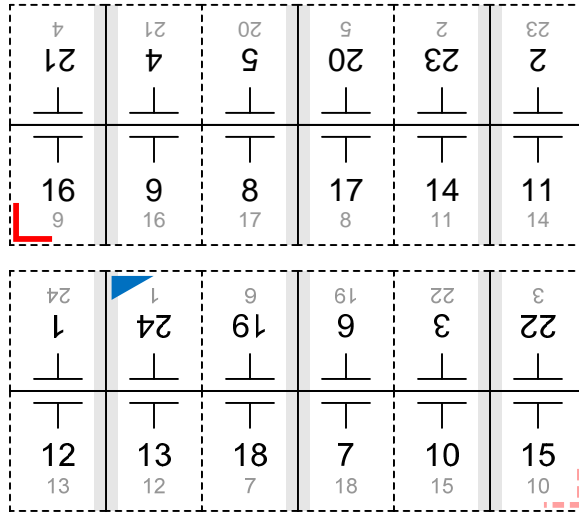
$\uparrow^{1/3} \downarrow^{1/3} + \uparrow^{1/2} + \uparrow^{1/6}$



|                  |           |   |
|------------------|-----------|---|
| JDF Fold Catalog | Grid Size | Front Side (Lay Side)<br>Back Side (Non-lay Side) |
| Folding Sequence |           |   |

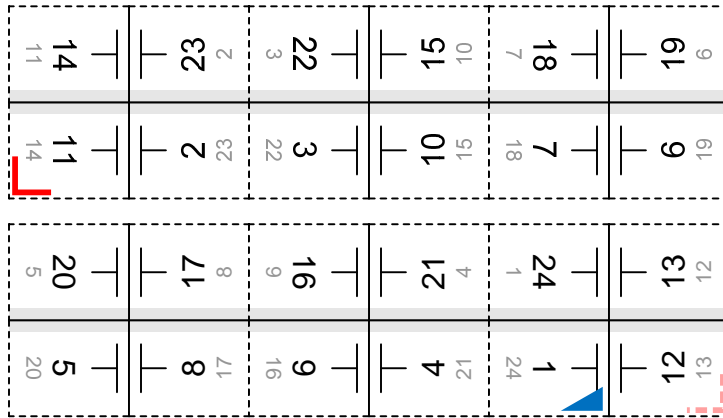
**F24-2 6x2**

$\uparrow^{1/3}\uparrow^{1/3} + \uparrow^{1/2} + \uparrow^{1/6}$



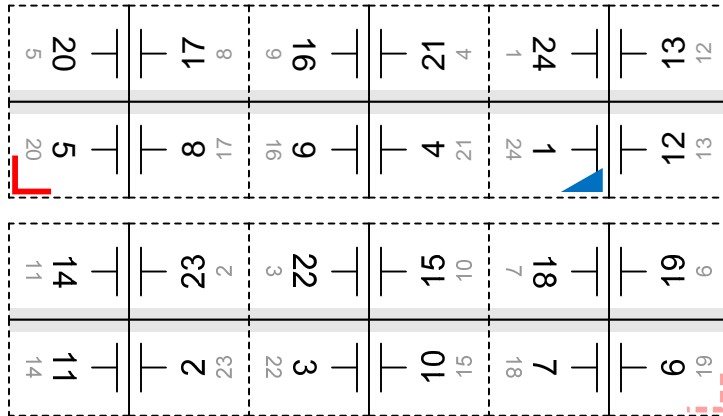
**F24-3 6x2**

$\uparrow^{1/3}\downarrow^{1/3}\uparrow^{1/6} + \uparrow^{1/2}$



**F24-4 6x2**

$\uparrow^{1/3}\downarrow^{1/3}\downarrow^{1/6} + \uparrow^{1/2}$



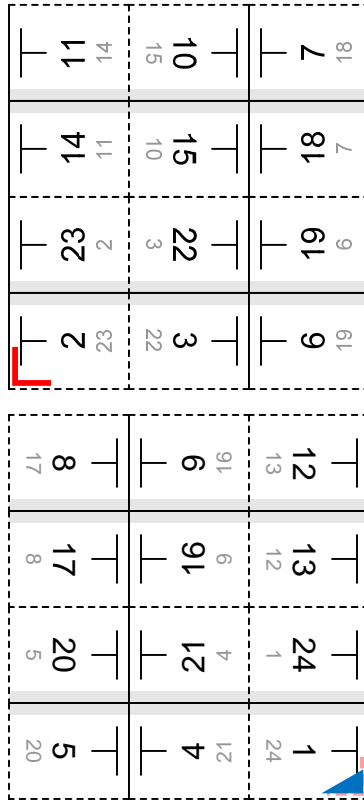
| JDF Fold Catalog | Grid Size  | Front Side (Lay Side)<br>Back Side (Non-lay Side) |
|------------------|--|---|
| Folding Sequence |  |   |
| <b>F24-5</b>     | <b>6x2</b><br>$\uparrow^{1/3} \uparrow^{1/3} \downarrow^{1/6} + \uparrow^{1/2}$                                      |   |
|                  |  |   |
| <b>F24-6</b>     | <b>6x2</b><br>$\uparrow^{1/6} \downarrow^{1/6} \uparrow^{1/6}$<br>$\downarrow^{1/6} \uparrow^{1/6} + \uparrow^{1/2}$ |   |
|                  |  |   |
| <b>F24-7</b>     | <b>6x2</b><br>$\uparrow^{1/3} + \uparrow^{1/2} + \uparrow^{1/3} \downarrow^{1/6}$                                    |   |
|                  |  |   |



| JDF Fold Catalog | Grid Size | Front Side (Lay Side)<br>Back Side (Non-lay Side) |
|------------------|-----------|---|
| Folding Sequence |           |   |

**F24-8      3x4**

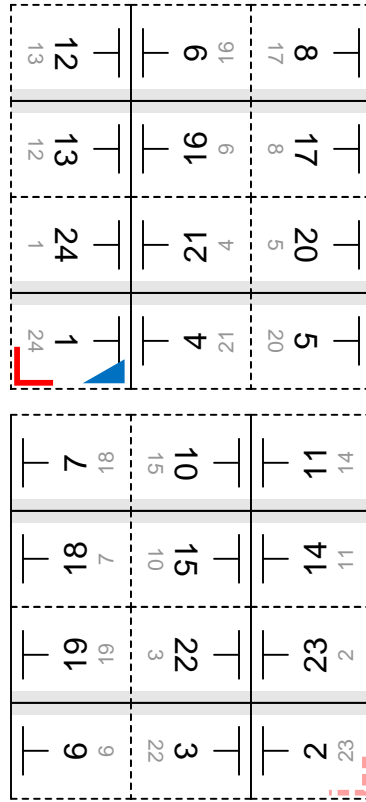
$\uparrow^{1/3} \downarrow^{1/3} + \uparrow^{1/2} \downarrow^{1/4}$



|                  |           |   |
|------------------|-----------|---|
| JDF Fold Catalog | Grid Size | Front Side (Lay Side)<br>Back Side (Non-lay Side) |
| Folding Sequence |           |   |

**F24-9      3x4**

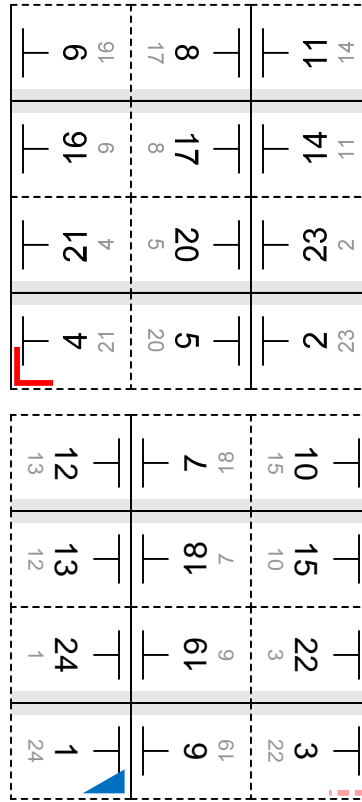
$\uparrow^{2/3} \uparrow^{1/3} + \uparrow^{1/2} \downarrow^{1/4}$



|                  |           |   |
|------------------|-----------|---|
| JDF Fold Catalog | Grid Size | Front Side (Lay Side)<br>Back Side (Non-lay Side) |
| Folding Sequence |           |   |

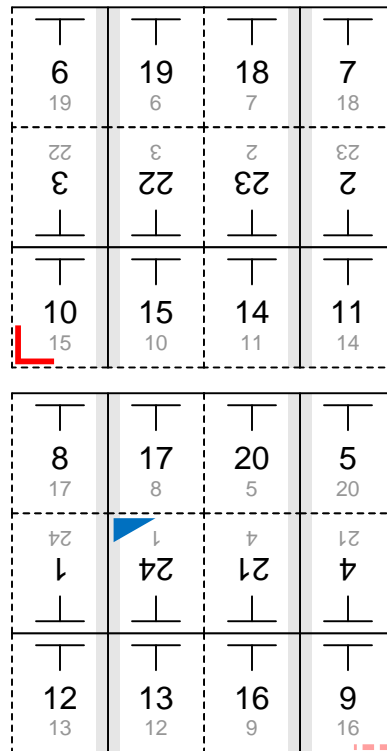
**F24-10 3x4**

$\uparrow^{1/3} \uparrow^{1/3} + \uparrow^{1/2} \downarrow^{1/4}$



**F24-11 4x3**

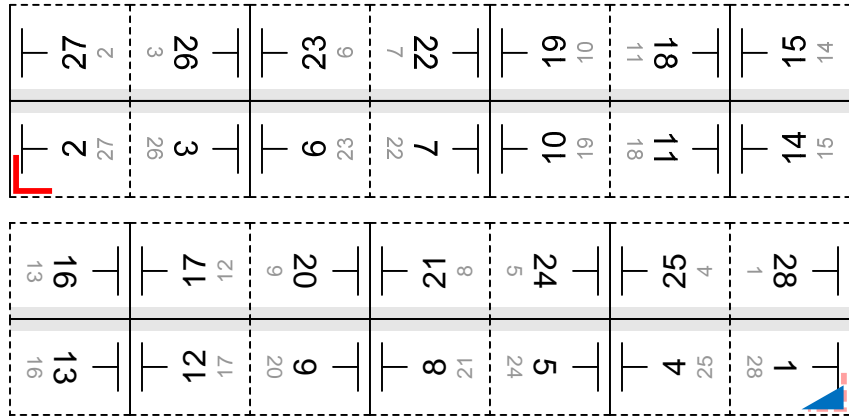
$\uparrow^{1/2} + \uparrow^{2/3} \downarrow^{1/3} + \uparrow^{1/4}$



| JDF Fold Catalog | Grid Size | Front Side (Lay Side)<br>Back Side (Non-lay Side) |
|------------------|-----------|---|
| Folding Sequence |           |   |

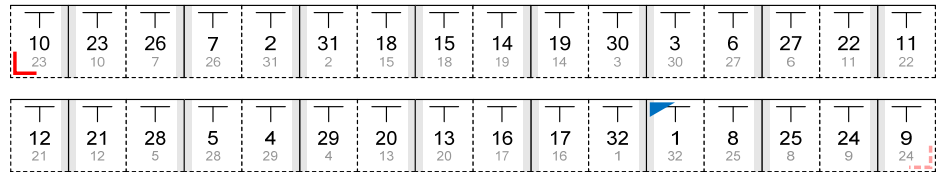
**F28-1 7x2**

$\uparrow^{1/7} \downarrow^{1/7} \uparrow^{1/7} \downarrow^{1/7}$   
 $\uparrow^{1/7} \downarrow^{1/7} + \uparrow^{1/2}$



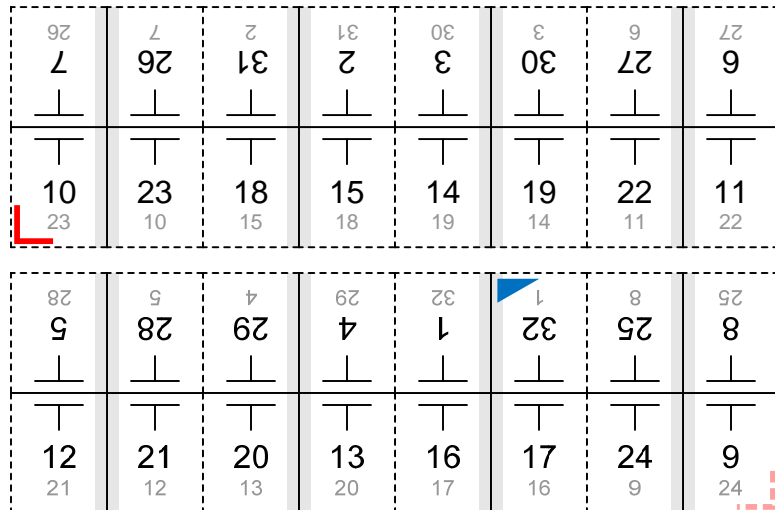
**F32-1 16x1**

$\uparrow^{1/2} \downarrow^{1/4} \uparrow^{1/8} \downarrow^{1/16}$



**F32-2 8x2**

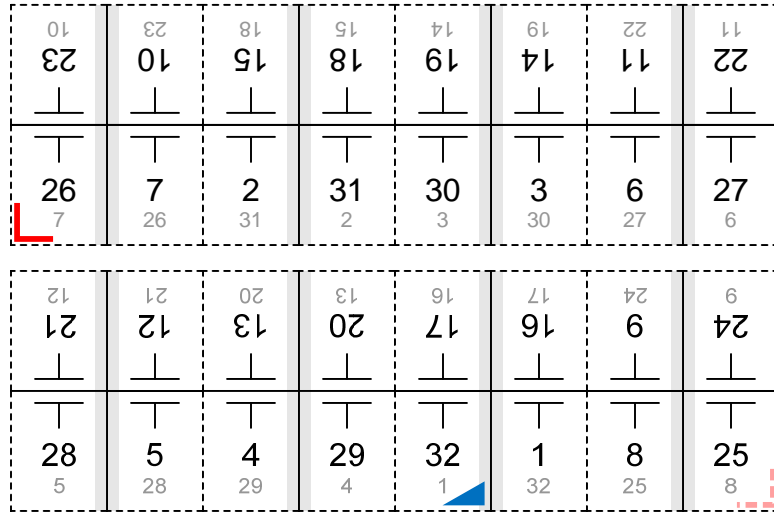
$\uparrow^{1/2} \downarrow^{1/4} + \uparrow^{1/2} + \uparrow^{1/8}$



| JDF Fold Catalog | Grid Size | Front Side (Lay Side)<br>Back Side (Non-lay Side) |
|------------------|-----------|---|
| Folding Sequence |           |   |

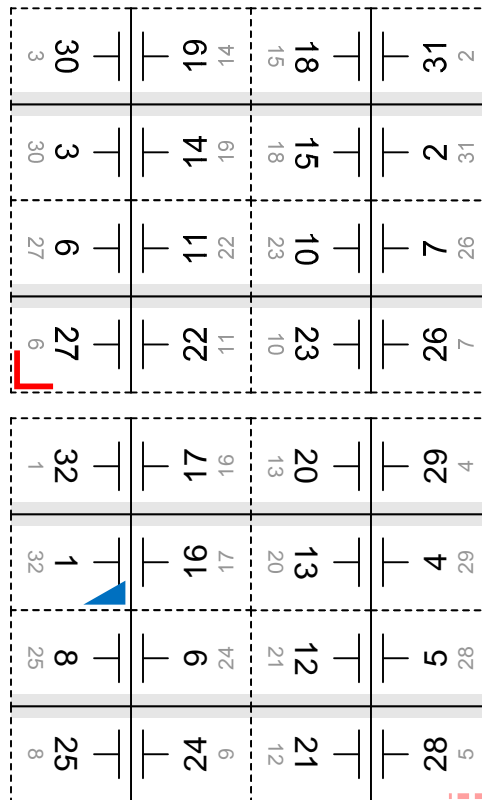
**F32-3 8x2**

$\uparrow^{1/2} \downarrow^{1/4} + \uparrow^{1/2} + \downarrow^{1/8}$



**F32-4 4x4**

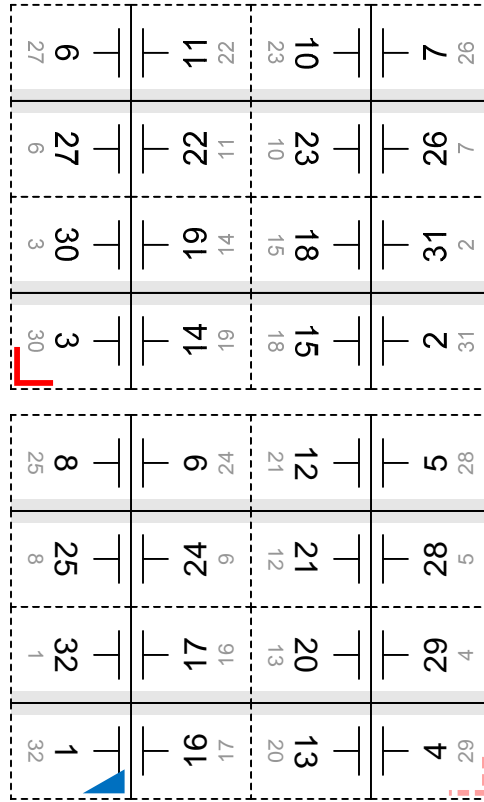
$\uparrow^{1/2} + \uparrow^{1/2} + \uparrow^{1/4} + \uparrow^{1/4}$



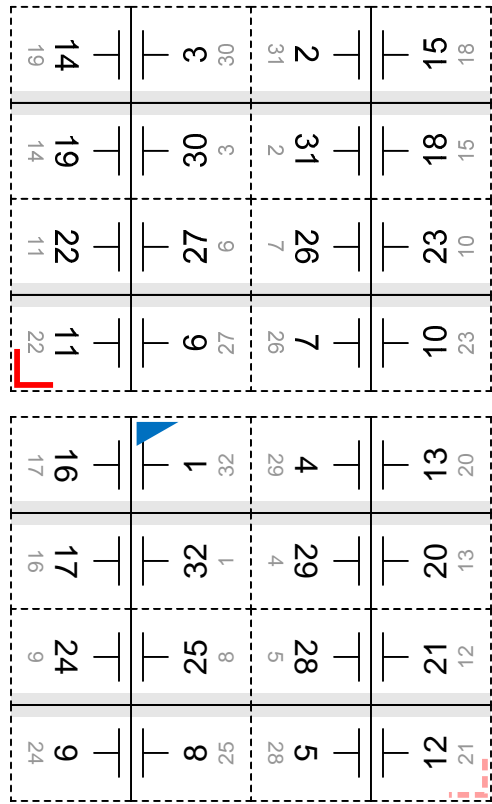
|                  |           |   |
|------------------|-----------|---|
| JDF Fold Catalog | Grid Size | Front Side (Lay Side)<br>Back Side (Non-lay Side) |
| Folding Sequence |           |   |

**F32-5      4x4**

↑<sup>1/2</sup> + ↑<sup>1/2</sup> + ↓<sup>1/4</sup> + ↓<sup>1/4</sup>



|                  |           |   |
|------------------|-----------|---|
| JDF Fold Catalog | Grid Size | Front Side (Lay Side)<br>Back Side (Non-lay Side) |
| Folding Sequence |           |   |



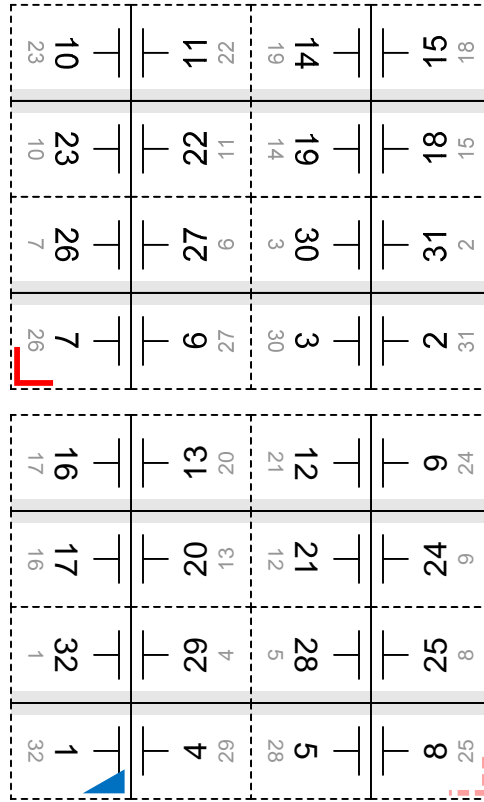
**F32-6      4x4**

$\uparrow^{1/2} + \uparrow^{1/2} + \uparrow^{1/4} + \downarrow^{1/4}$

|                  |           |   |
|------------------|-----------|---|
| JDF Fold Catalog | Grid Size | Front Side (Lay Side)<br>Back Side (Non-lay Side) |
| Folding Sequence |           |   |

**F32-7      4x4**

$\uparrow^{1/4} \downarrow^{1/4} \uparrow^{1/4} + \uparrow^{1/2} \downarrow^{1/4}$

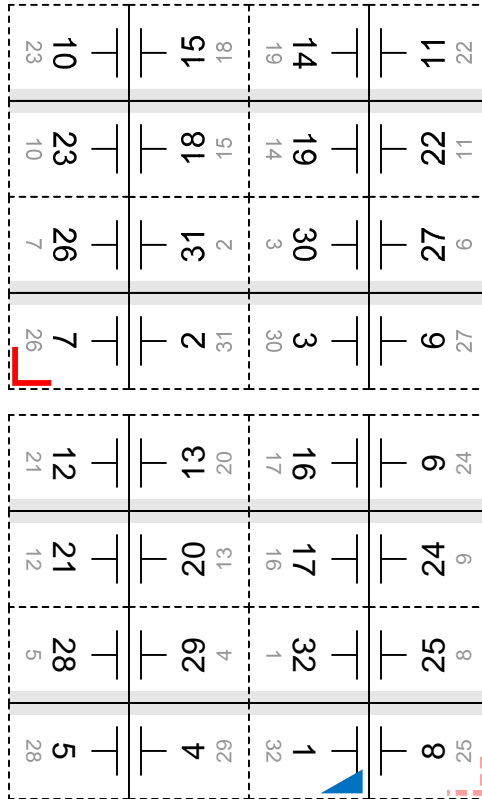




|                  |           |   |
|------------------|-----------|---|
| JDF Fold Catalog | Grid Size | Front Side (Lay Side)<br>Back Side (Non-lay Side) |
| Folding Sequence |           |   |

**F32-8      4x4**

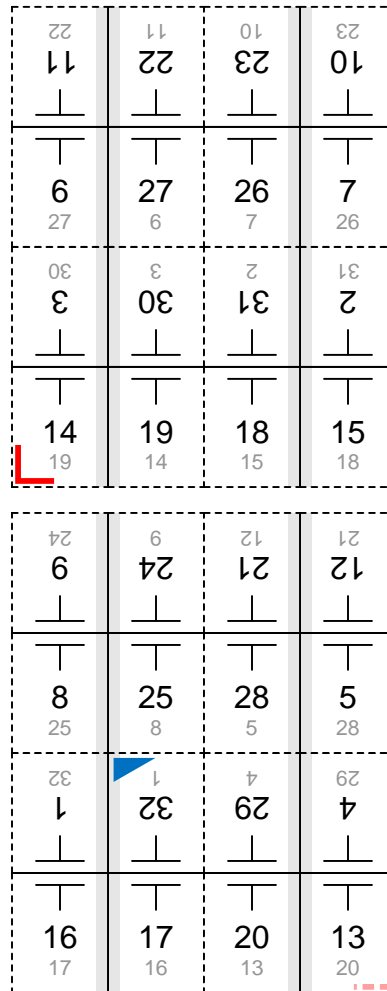
$\uparrow^{1/2} \downarrow^{1/4} + \uparrow^{1/2} \downarrow^{1/4}$



|                  |           |   |
|------------------|-----------|---|
| JDF Fold Catalog | Grid Size | Front Side (Lay Side)<br>Back Side (Non-lay Side) |
| Folding Sequence |           |   |

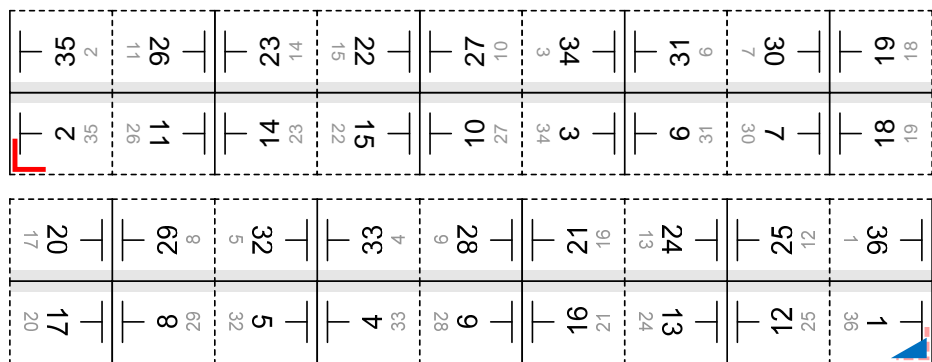
**F32-9 4x4**

$\uparrow^{1/2} + \uparrow^{1/2} \downarrow^{1/4} + \uparrow^{1/4}$



**F36-1 9x2**

$\uparrow^{1/3} \downarrow^{1/3} \uparrow^{1/9} \downarrow^{1/9} + \uparrow^{1/2}$



|                  |           |   |
|------------------|-----------|---|
| JDF Fold Catalog | Grid Size | Front Side (Lay Side)<br>Back Side (Non-lay Side) |
| Folding Sequence |           |   |

**F36-2 6x3**

$\uparrow^{1/3} \downarrow^{1/3} + \uparrow^{1/3} \downarrow^{1/3}$   
 $+ \uparrow^{1/6}$

|          |          |          |          |          |          |
|----------|----------|----------|----------|----------|----------|
| 14<br>23 | 23<br>14 | 22<br>15 | 15<br>22 | 18<br>19 | 19<br>18 |
| 11<br>26 | 92<br>11 | 27<br>10 | 10<br>27 | 7<br>30  | 30<br>7  |
| 2<br>35  | 35<br>2  | 34<br>3  | 3<br>34  | 6<br>31  | 31<br>6  |
| 20<br>17 | 17<br>20 | 16<br>21 | 21<br>16 | 24<br>13 | 13<br>24 |
| 62<br>8  | 8<br>62  | 6<br>82  | 82<br>6  | 52<br>12 | 12<br>52 |
| 32<br>5  | 5<br>32  | 4<br>33  | 33<br>4  | 36<br>1  | 1<br>36  |

**F40-1 5x4**

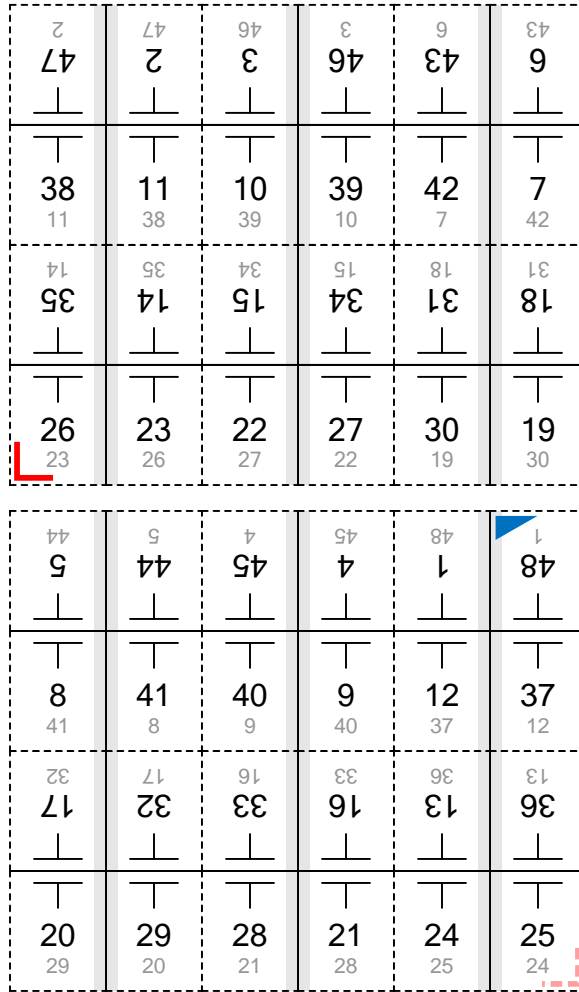
$\uparrow^{1/5} \downarrow^{1/5} \uparrow^{1/5}$   
 $\downarrow^{1/5} + \uparrow^{1/2} \downarrow^{1/4}$

|          |          |          |          |          |          |
|----------|----------|----------|----------|----------|----------|
| 22<br>61 | 61<br>22 | 2<br>36  | 36<br>2  | 11<br>30 | 30<br>11 |
| 23<br>18 | 18<br>23 | 3<br>38  | 38<br>3  | 14<br>27 | 27<br>14 |
| 38<br>3  | 3<br>38  | 9<br>50  | 50<br>9  | 7<br>34  | 34<br>7  |
| 34<br>7  | 7<br>34  | 92<br>51 | 51<br>92 | 27<br>14 | 14<br>27 |
| 32<br>9  | 9<br>32  | 82<br>16 | 16<br>82 | 21<br>20 | 20<br>21 |
| 32<br>9  | 9<br>32  | 8<br>33  | 33<br>8  | 4<br>36  | 36<br>4  |
| 29<br>12 | 12<br>29 | 33<br>8  | 8<br>33  | 40<br>1  | 1<br>40  |

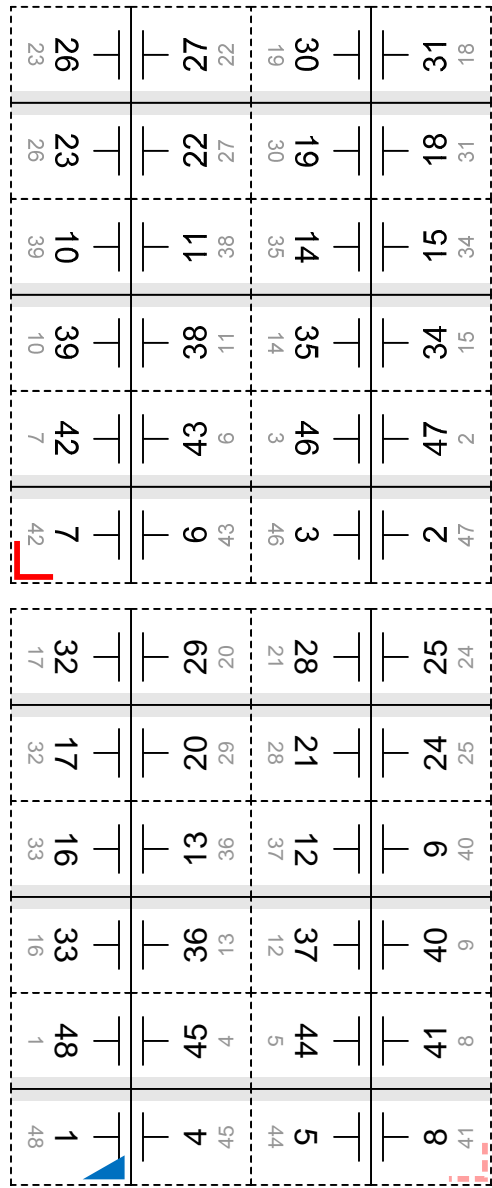
|                  |           |   |
|------------------|-----------|---|
| JDF Fold Catalog | Grid Size | Front Side (Lay Side)<br>Back Side (Non-lay Side) |
| Folding Sequence |           |   |

**F48-1      6x4**

$\uparrow^{1/3} \downarrow^{1/3}$   
 $+ \uparrow^{1/4} \downarrow^{1/4} \uparrow^{1/4} + \uparrow^{1/6}$



|                  |           |   |
|------------------|-----------|---|
| JDF Fold Catalog | Grid Size | Front Side (Lay Side)<br>Back Side (Non-lay Side) |
| Folding Sequence |           |   |



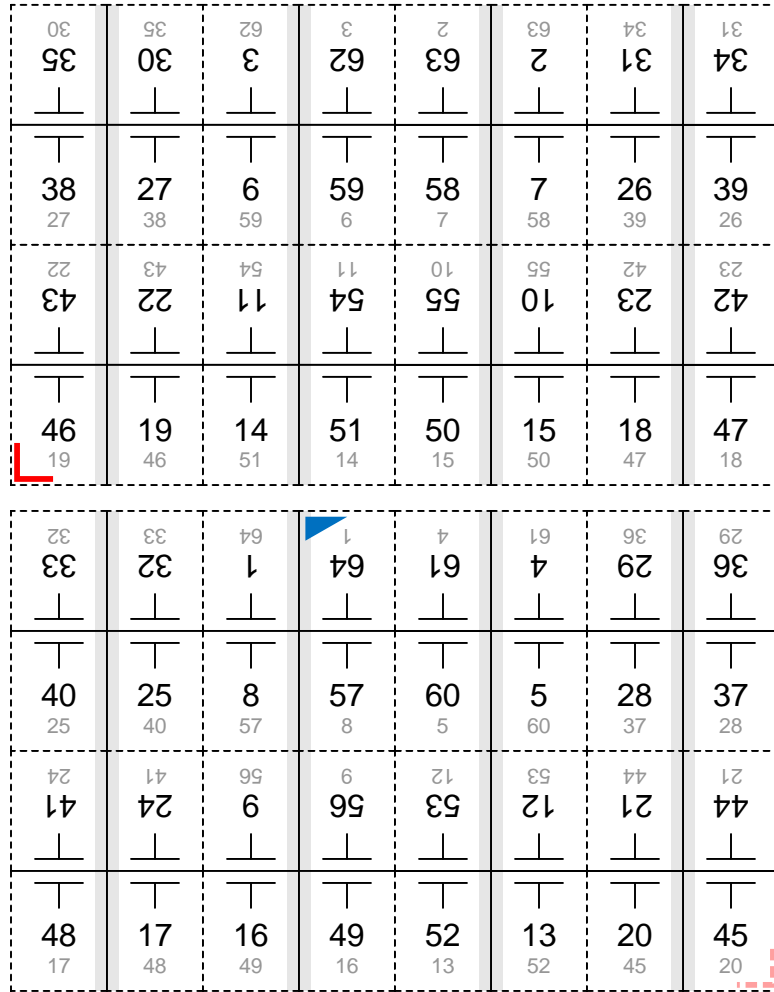
**F48-2 4x6**

$\uparrow^{1/4} \downarrow^{1/4} \uparrow^{1/4}$   
 $+ \uparrow^{1/3} \downarrow^{1/3} \uparrow^{1/6}$

|                  |           |   |
|------------------|-----------|---|
| JDF Fold Catalog | Grid Size | Front Side (Lay Side)<br>Back Side (Non-lay Side) |
| Folding Sequence |           |   |

**F64-1 8x4**

$\uparrow^{1/2} + \uparrow^{1/4} \downarrow^{1/4} \uparrow^{1/4}$   
 $+ \uparrow^{1/4} \downarrow^{1/8}$



|                  |           |   |
|------------------|-----------|---|
| JDF Fold Catalog | Grid Size | Front Side (Lay Side)<br>Back Side (Non-lay Side) |
| Folding Sequence |           |   |

**F64-2 8x4**

$\uparrow^{1/4} \downarrow^{1/4} \uparrow^{1/4} \uparrow^{1/4}$   
 $+\uparrow^{1/4} \downarrow^{1/4} \uparrow^{1/4} \uparrow^{1/4} + \uparrow^{1/8}$

