When first learning how to setup a paper folding machine, it can be difficult to understand how the machine works and knowing all the correct steps needed to setup and run the folder. The following information is a “technique” you might use to figure out the correct information needed to complete a quick and thorough setup. Remember the key word here is “TECHNIQUE” and this is not intended to teach the theory or mechanics of an actual paper folding machine. The intention here is to teach someone how to easily decide on a proper setup. Remember, paper folders are very versatile and there will often be more then one way to setup and run a folding job.

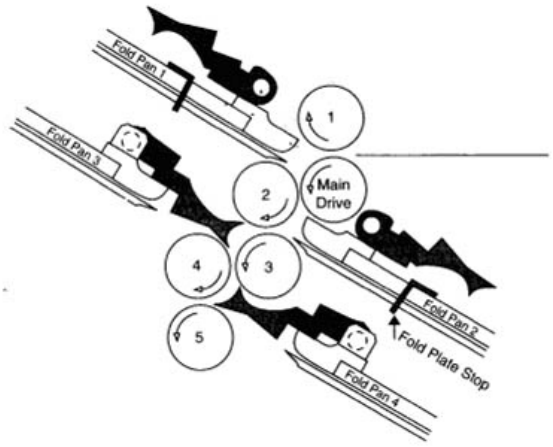
The goal here is to answer the following questions when setting up a folding machine:

1. How is the job folded?
2. How many times do you fold the piece?
3. How many fold plates do I need to fold the job?
4. How will I load the feeder?
5. Which fold plates should I use?
6. In the fold plates used, where should I set the fold stop at?
7. How should I set each roller?

When you can continuously answer these questions correctly, you have mastered the most difficult part of setting up a paper folding machine.

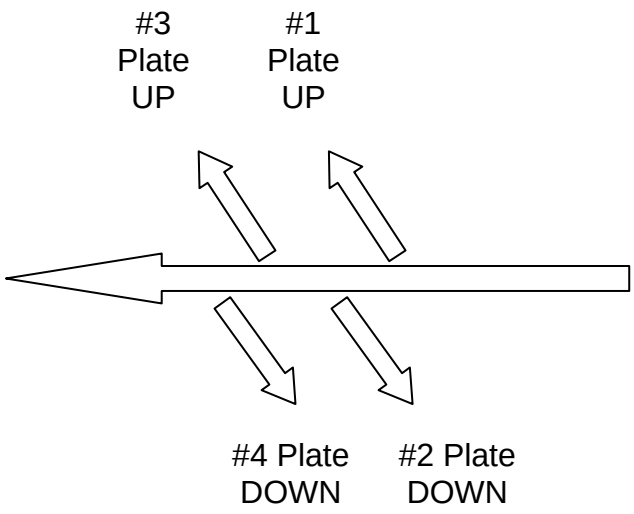
THE FOLDING MACHINE

Before we dive into answering all the questions, we need to know a little bit about the folding machine. It would be hard to answer some of our questions without first knowing something about the equipment. You must know the sheet size you can run and how many fold plates are available. For this training, it is assumed we are working with a common 26” wide folder with 4 fold plates.



The standard four (4) plate folder will have two (2) UP plates and two (2) DOWN plates. Each plate is number, 1, 2, 3, & 4, the ODD plates are UP and the EVEN plates are DOWN.

The folder will send the paper to each plate in order starting with the #1 plate and ending with the # 4 plate. A good way to visualize the folding process is by observing the following diagram:

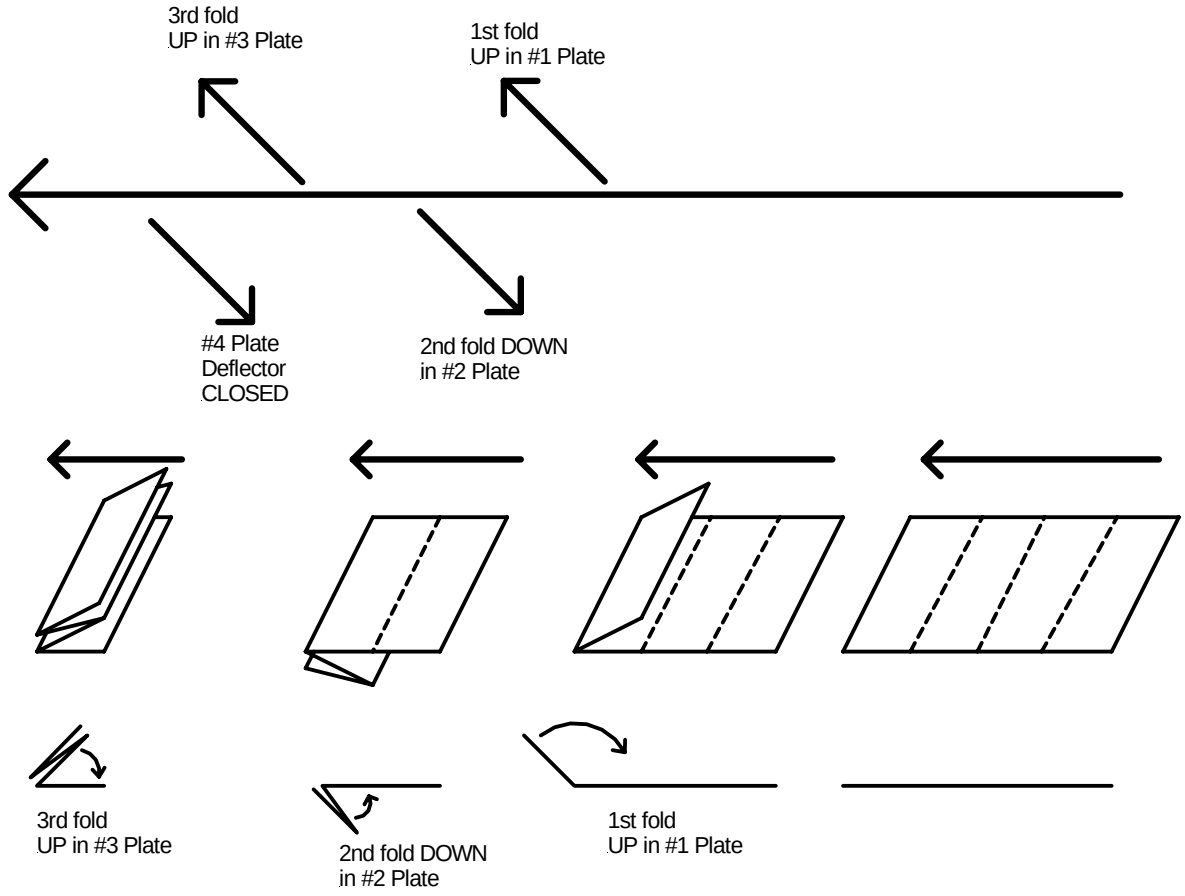


Notice the direction of the arrows, the sheet travels through the folder in the direction the big arrow is pointing, to the left. As the paper passes through the folder it will come to each fold plate in order. First it comes to the #1 plate and it will fold or deflect, then the #2 plate, then #3 and last #4. Also notice we have two UP folds and two DOWN folds. Look at the previous folder diagram and this diagram. Can you see the similarities?

To “deflect” is when you close a plate and do not fold in it; you open the deflector to use a fold plate to make a fold. The paper will “fold or deflect” in each plate, try to remember that even when you close the deflector and you are not using the plate for a fold, the paper will continue to be driven past it. Which brings us to the rollers, this standard folder with four (4) fold plates has six (6) fold rollers and two (2) slitter shafts “M” and these will be set accordingly to the job. The rollers and slitter shafts adjustments are numbered or marked; 1, 2, 3, 4, 5, and “M”. The adjustment on the Stahl folder marked with the “M” is to set the slitter shaft tension. This should not be confused with the “main” fold roller, that you will see references to elsewhere. The “main” roller is also referred to as the “stationary” roller and this roller is NOT adjustable and doesn’t need to be set, thus leaving five (5) adjustable fold rollers out of the six (6). Each roller is numbered for the corresponding plate that the roller drives into, for instance: the #1 roller drives the sheet into (or past when deflecting) the #1 plate, the # 2 roller drives the sheet into or past the #2 plate, and so on…

#1 roller drives to the #1 plate
#2 roller drives to the #2 plate
#3 roller drives to the #3 plate
#4 roller drives to the #4 plate
#5 roller drives out to slitter shafts “M”
“M” slitter shafts drives out onto the delivery.

When setting these rollers and shafts you will adjust or set for the MINIMUM thickness that will be driven through. YOU MUST ALWAYS SET ALL THE ROLLERS. It’s a common misconception that there is no need to set all the rollers if you are not using all the plates and this is WRONG! The paper travels through every roller no matter how many plates you are folding in, so remember to set ALL the rollers every time.



You see in this example we only need three (3) fold plates to fold this piece, by going UP in the #1 plate, DOWN in the #2 plate and UP in the #3 plate, the #4 is closed because we don't need it. You might hear a person say "That's folding UP-DOWN-UP & OUT" when referring to the setup for this job.

Notice: we are working from right to left as paper would travel through the folder being viewed from the operator side of the machine. After each fold is made, that new fold becomes the LEADING edge. The paper continues to travel in the same right to left direction. As you read on, you will notice that the folds are shown in this format, starting on right side. Study the above diagram until you understand this. Having a good understanding of this concept will make the rest of this training that much easier.

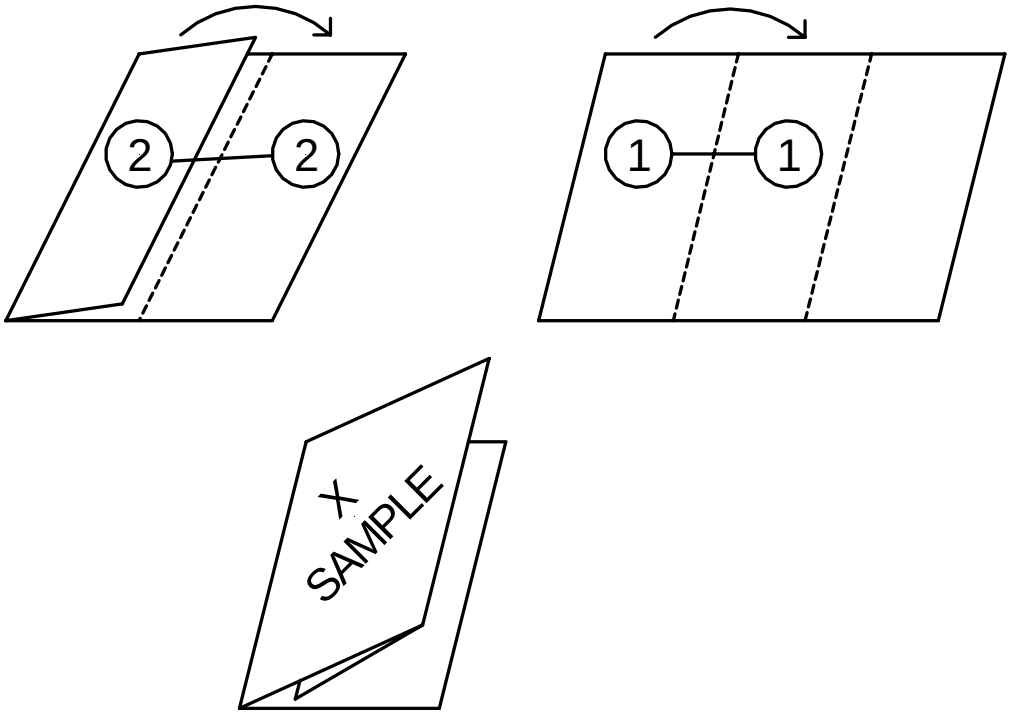
THE SETUP

Now let's get into answering these questions:

1. How is the job folded?
2. How many times do you fold the piece?
3. How many fold plates do I need to fold the job?
4. How will I load the feeder?
5. Which fold plates should I use?
6. In the fold plates used, where should I set the fold stop at?
7. How should I set each roller?

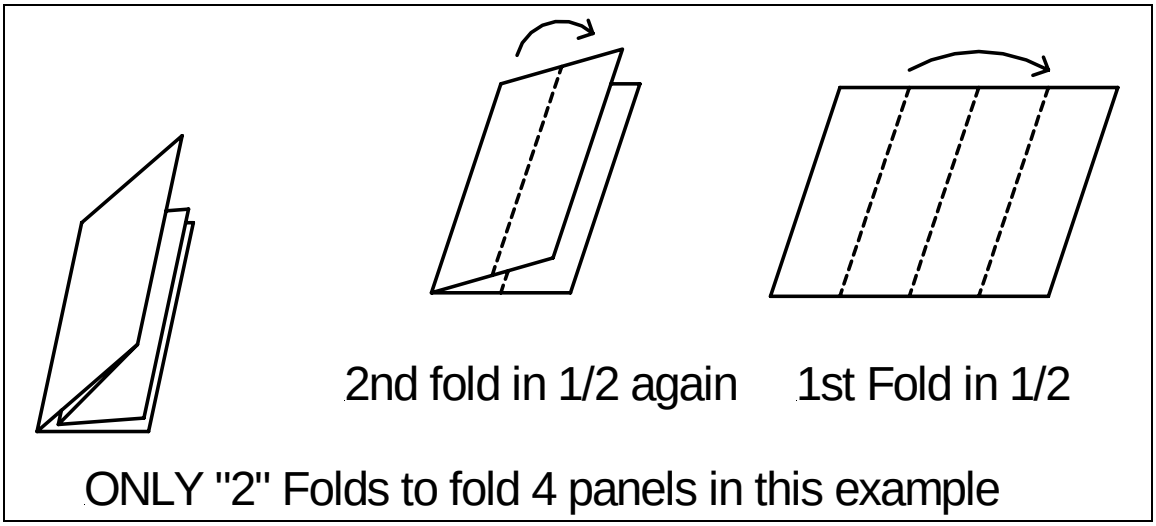
1. HOW IS THE JOB FOLDED?

Here we need the SAMPLE or DUMMY. If one is not available then its time to make one. Fold the piece like it should be done when finished. Mark or write on this sample with some indication of how it folds so it can't be confused if it was handled and then accidentally fold incorrectly.

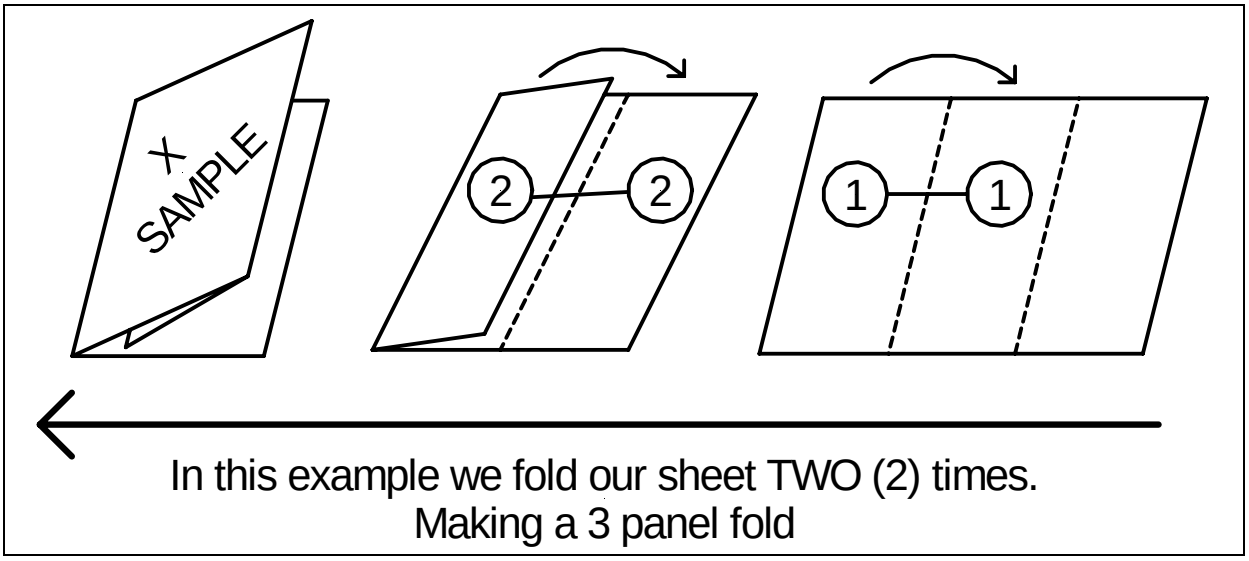


2. HOW MANY TIMES DO YOU FOLD THE PIECE?

This can be a tricky question. The correct answer to this question will lead to the answer for our next question about how many fold plates needed. Think of this…if you fold it by hand, how many times did you fold the sheet, not how many folds are in the sheet. I'll try to explain with the following example. If you fold a sheet in ½, then in ½ again, you only had to fold it two (2) times. But you'll also observe it has four (4) panels and three (3) folds. The answer we're looking for here; is you can fold this job by making two (2) folds.



We'll use the following example for the rest of this explanation and questions:



3. HOW MANY FOLD PLATES DO I NEED TO FOLD THE JOB?

This answer is easy, if you answer the previous question correctly. In this case the answer to the previous question is two (2). Therefore, the answer to this question is 2.

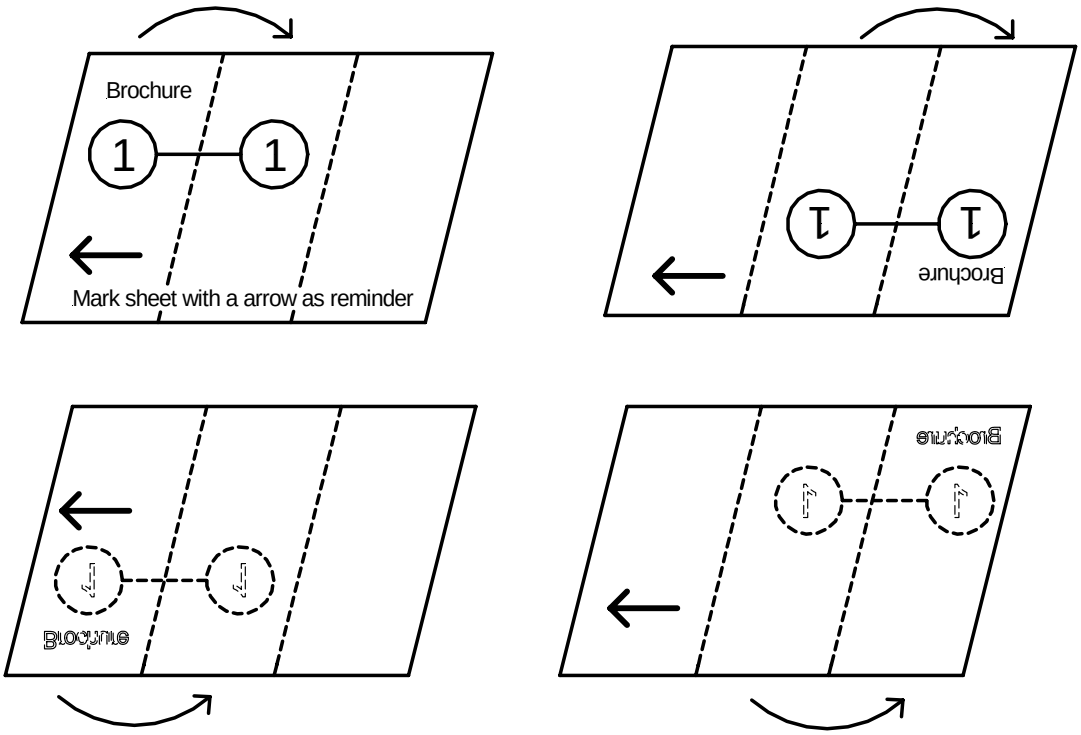
Now that you know how many fold plates are needed, you can proceed to work out the answers for the next questions.

NOTE: Be patient; carefully consider all the options when looking for the following answers. Remember there may be more then one correct answer. With practice and experience, the answers will become easier. For now, take the time to work through all your choices.

4. HOW WILL I LOAD THE FEEDER?

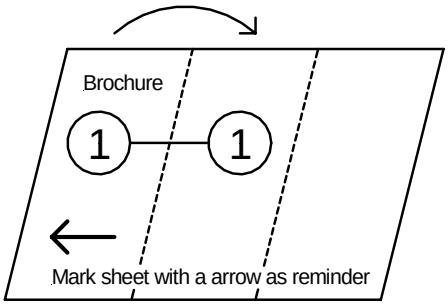
There are four (4) choices here. You can load the feeder four different ways and the choice made will influence the fold plates you will be using. Each choice may have advantages or disadvantages. Some choices just will not work, so you can eliminate those choices right away.

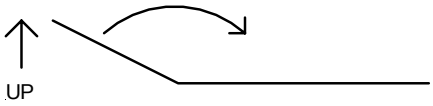
To start, make a choice, at this point it really doesn't matter which one, just remember how you started so you don't repeat it when making the next choice. I usually mark the paper with an ARROW to remind me how I started. After you choose work through the next question, then return to this question and make your next choice. Please try all 4 choices.



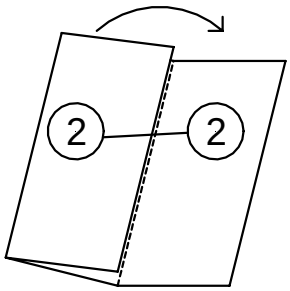
5. WHICH FOLD PLATES SHOULD I USE?

This really depends on how you loaded the feeder. In our example, we already know we only need two (2) fold plates. So let's start by looking at how the FIRST fold is going into the machine using the first choice shown in the previous question.
Does the FIRST fold go UP or DOWN when it enters the machine? It goes UP.



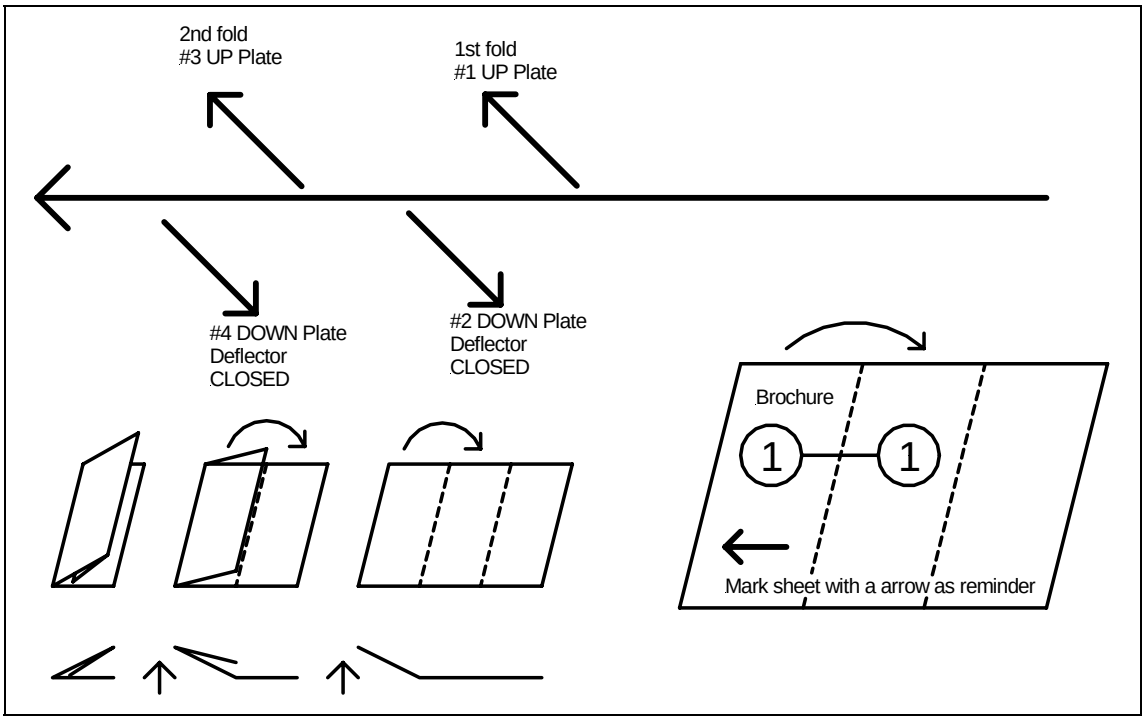


From this illustration, we can see that the FIRST fold made in the sheet will go UP and we can do that in an UP fold plate. Since the first plate the sheet could enter is the #1 UP plate, we can use this plate to make the first fold in our sheet. Now let's figure out the next fold plate needed. Again, ask yourself, does the next fold go UP or DOWN? It goes UP.

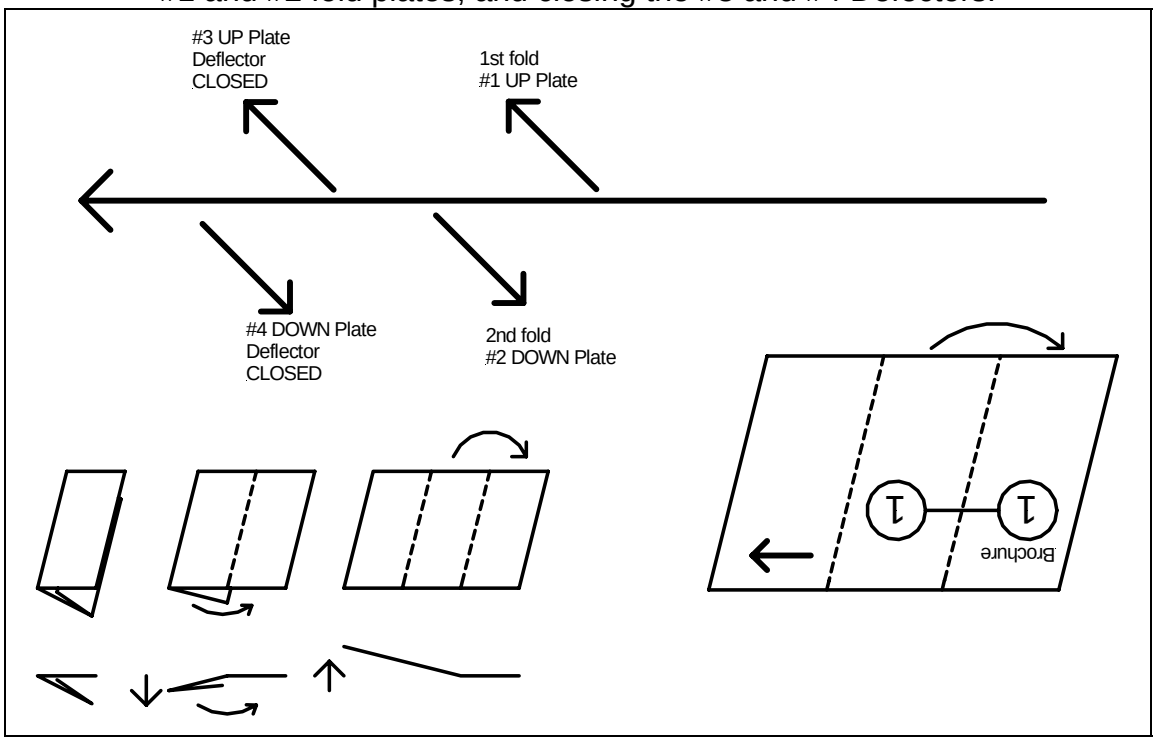


So, we need another UP plate. The next plate the sheet hits is the #2 plate which is a DOWN plate. (Remember the paper will go to every plate in order) We don't need this DOWN plate so we would close it and continue on to the next fold plate, #3 which is an UP plate. The #3 plate will make our 2nd fold and that would complete the job. Therefore, by loading the feeder this

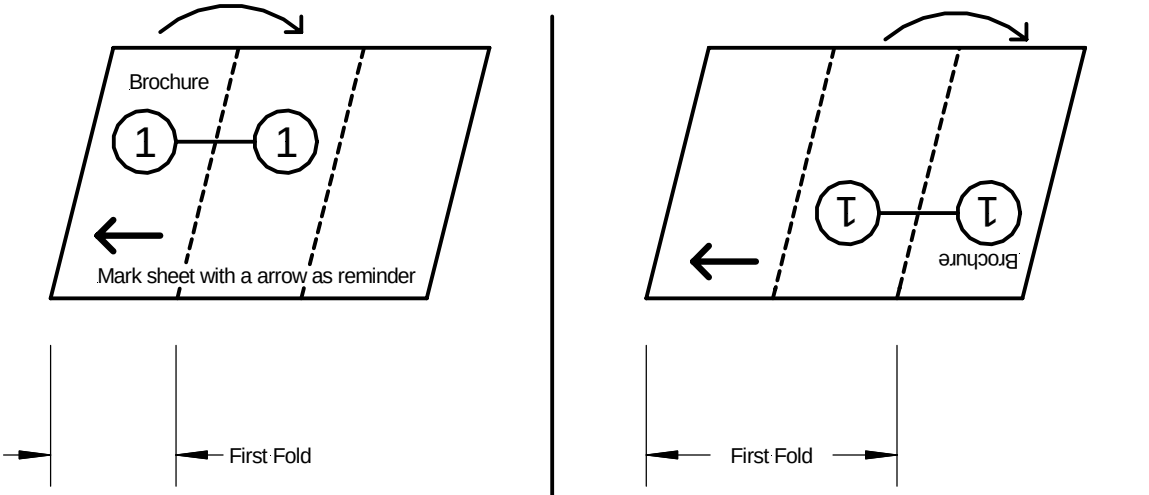
way, we determine that we can use the #1 and #3 fold plates. We would close the #2 and #4 plates. You might hear this setup referred to as “UP & UP & OUT”.



Here we load another way (our 2nd choice) and find we can run “UP & DOWN & OUT” using the #1 and #2 fold plates, and closing the #3 and #4 Defectors.



The advantage of the 1st choice when compared to our 2nd choice is we could run the sheets closer. When ever the first fold is longer then ½ the sheet size we must provide more space between the sheets, thus slowing down machine and losing some production speed.



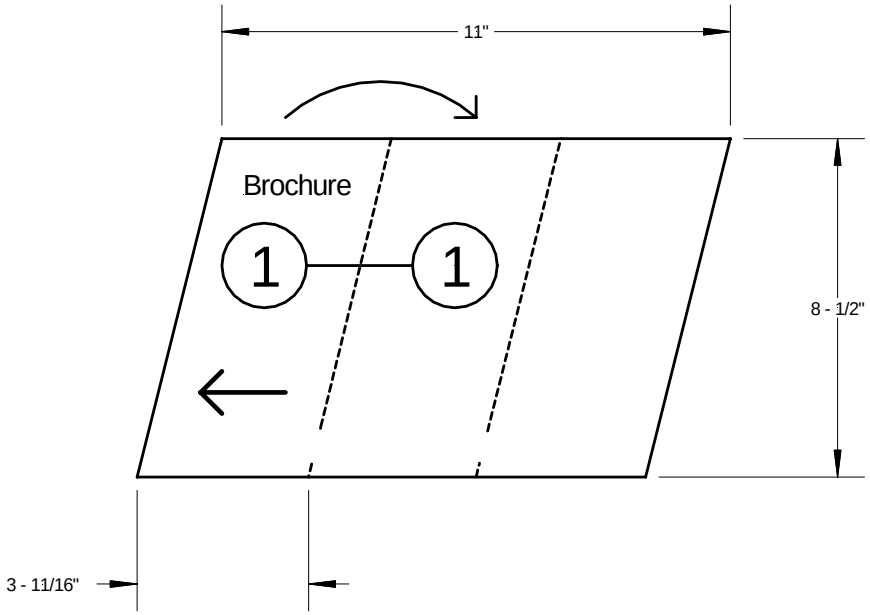
LESS THEN 1/2 THE SHEET FASTER

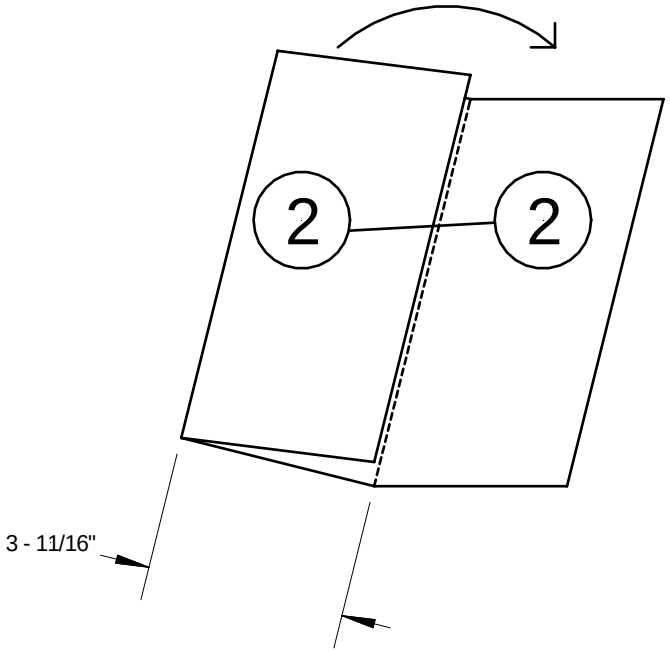
MORE THEN 1/2 THE SHEET SLOWER

Now you have the answers for two of the four choices when loading the feeder. Practice figuring this out and see if you can determine the last two choices.

6. IN THE FOLD PLATES USED, WHERE SHOULD I SET THE FOLD STOP AT?

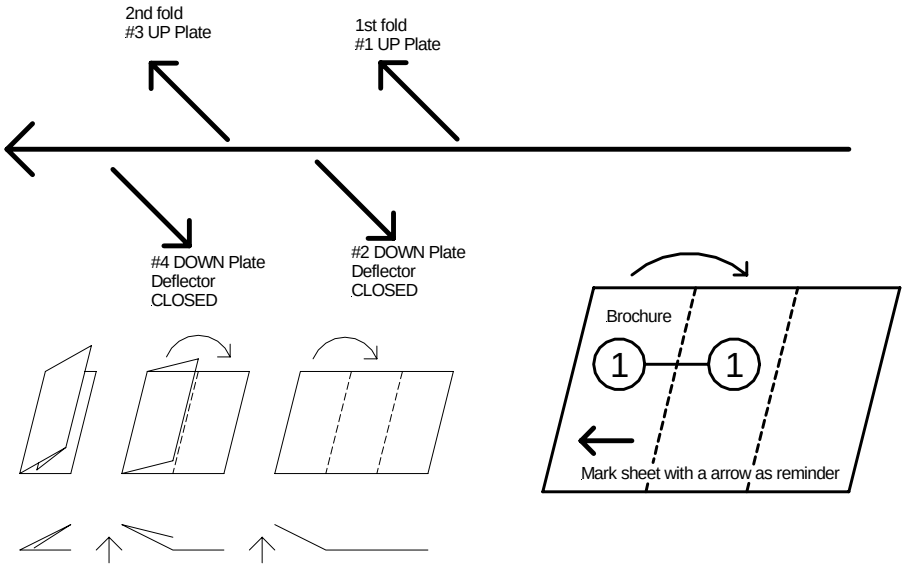
In this example we are going to use the 1st choice “UP & UP & OUT”. So we measure from the leading edge of the piece back to the fold for each fold and set the fold plate stops to this measurement. In our example we are letter folding an 8-1/2” x 11” sheet of paper. Our first fold measures about 3-11/16” so we would set the #1 plate for 3-11/16” and our second fold also measures 3-11/16” so we set the #3 plate for this measurement.



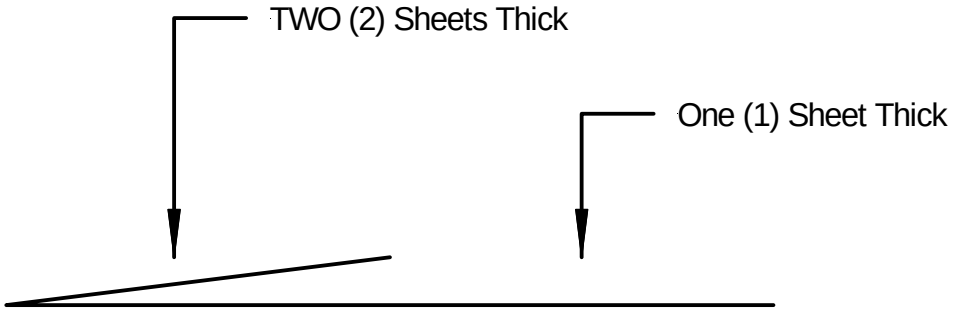


7. HOW SHOULD I SET EACH ROLLER?

Using the information from our previous steps we can now determine how to properly set each fold roller. You must set all the rollers even if you don't fold in all the plates. The paper passes through every roller. Set the roller to the MINIMUM thickness.

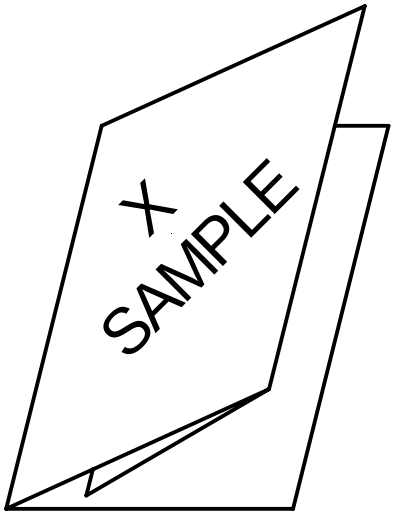


IN THIS EXAMPLE:
#1 roller drives a minimum one (1) sheet thickness to #1 plate = set #1 roller for 1 sheet
#2 roller drives a minimum one (1) sheet thickness to #2 plate = set #2 roller for 1 sheet
#3 roller drives a minimum one (1) sheet thickness to #3 plate = set #3 roller for 1 sheet
#4 roller drives a minimum three (3) sheet thickness to #4 plate = set #4 roller for 3 sheets
#5 roller drives a minimum three (3) sheet thickness to slitter shafts = set #5 for 3 sheets



Set roller for MINIMUM Thickness

Our example job notes:



Job Name: SAMPLE
Flat Size: 8-1/2” x 11” one up
Folded Size: 3-11/16” x 8-1/2” letter fold (or 6 page fold)

Number	Fold Plate Setting	Roller Setting
1	3 – 11/16”	1 sheet
2	Closed (Deflect)	1 sheet
3	3 – 11/16”	1 sheet
4	Closed (Deflect)	3 sheets
5	n/a	3 sheets
M	n/a	3 sheets