

**Mental Image Calling**  
**Bill Ackerman and Robert French**  
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# Chapter 1

## Preface

This book describes a *mental image* system of square dance calling. Such systems do something that might at first glance seem to be nearly impossible: enable you to call correctly resolved sequences, that are not in any way memorized, without looking at a square. Of course, if you could keep track of eight (or even four) dancers in your head you could do this directly. But most people can't keep track of this many dancers mentally. The mental image system requires you to keep track of only *one* dancer, plus an additional amount of information that is so small that you can keep track of it by inconspicuously counting on the fingers of one hand.

That it is possible to encode the state of an entire square for resolution purposes in the position of one dancer plus a tiny amount of additional information is rather remarkable. That it is possible for a caller to manipulate this information effectively, while calling, is even more so. With the mental image system, you can resolve while blindfolded!

This book is intended for any caller who is interested in learning about the mental image system, whether or not you intend to use it at actual dances. Both beginning and experienced callers should find plenty of material to interest them.

### 1.1 Acknowledgments

This book could not have been completed without the help of many people. First of all we would like to thank Don Beck for writing *Out of Sight*, the book from which so many of us originally learned mental image calling. Chris Stacy was an active participant with Bill Ackerman in reformulating the original mental image system. The book existed as little more than a “mental image” and some handwritten notes until 1994, when Robert French read the notes and began the push to come out with a real book. In 1997 both authors stopped working on it, while they went on to other pursuits. Another push to come out with a real book was made in 2014, leading to the present book.

Larry Denenberg and Stephen Gildea provided the original TeX macros used for laying out dancer formations. Atsushi Takeuchi provided an updated macro package. Andrew Greene provided the original dancer font.

We would also like to thank Kip Garvey, Stewart Kramer, Rich Reel, Nasser Shukayr, and CJ Smith for invaluable comments on early drafts of the book.

## 1.2 Introduction

The mental image system is a method for keeping track of the relative position of the dancers in a square while calling. It allows you to call without paying attention to where specific dancers are, or who the key couples are, and yet resolve the square quickly and correctly.

With the mental image system, you can make up zeros and equivalents on the fly. If you want to feature SPIN THE TOP, RIGHT AND LEFT GRAND getouts in some tip, you can do so in an extremely general way, rather than by memorizing equivalents or modules. If you want to add the module PLAN AHEAD, DOUBLE PASS THRU, STACK THE LINE, RIGHT AND LEFT GRAND to your repertoire, you can do so by just learning the mental image formulation of the individual calls involved.

When sight calling, you can read out the mental image state by looking at the key couples, and proceed from there. This gives you the full power of the mental image system for your getouts while allowing you full flexibility while calling. If you like to change the figures in your singing calls, you can use the mental image system to make up new figures on the fly.

Perhaps the most extraordinary aspect of the mental image system is that you can practice it at home. Of course, the generation of correctly resolved sequences is only one part of what a caller needs to do well, and many of the other aspects of calling can't be practiced without live dancers, so we have to keep this in perspective. Practicing on live dancers is best, and is absolutely necessary for improving one's timing, presentation, and showmanship. However, we believe that the ability to practice one's choreography at home will lead to more effective use of one's practice time with live dancers. The number of blunders that your dancers see will be reduced.

That said, we would like to emphasize that mental image is only one of the many tools available to you as a caller, and is unlikely to become your primary resolving tool. However, even if you only use mental image in a limited scope (for example, to make up singing call figures, or to create the opening sequence for a tip when you haven't memorized enough squares), we feel that this will still be useful to you. To a certain extent, learning mental image is like learning Latin—you may not use it on a daily basis, but it will help you understand languages (calling) better.

A good example of the peripheral benefits of the mental image system is in formation and arrangement management. This is the knowledge of where each sex is going to be at the end of the current call, so that you can issue the next call seamlessly, effortlessly, and confidently, fully aware of how common or uncommon the setup will be. As you practice mental image calling, you will develop a deep awareness of this. Even when you are not using the mental image system, but are just sight calling, this almost unconscious awareness will be present. Without even thinking about it, you will know whether the setup will be "standard" for a SCOOT BACK or SWING THRU, and you will know just what will happen when you call BOYS RUN. You will not need to wait for the dancers to complete a call in order to look and see what formation will emerge. These skills are extremely useful for smooth sight calling.

## 1.3 Background

Mental image calling has existed in various forms for many years. The current system can trace its roots back to the book *The Fundamentals of Hash Calling* by Dr. Julius King. This book was used and improved upon by Don Beck to produce the book *Out of Sight*, which has been the classic text on mental image calling for decades.

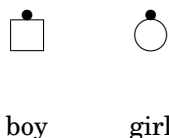
The book you're now reading modifies and builds upon Beck's work in a number of ways. First of all, it significantly reduces the amount of information you have to manipulate in real time. For example, Beck requires the memorization of the "allemande spot" location and the "X" state separately, while we combine them, thus allowing them to be represented by the fingers on one hand (freeing your brain for more important tasks). We also simplify the way one moves the allemande spot, use only

four spots instead of eight (though at a cost of more complex moves), use a more nearly uniform representation for all calls, and expand the system to handle many more calls and a few additional formations (like diamonds). Finally, we have attempted to present the information in a technically precise manner. You should always know exactly what is legal to call and why. Taking this to extremes, we have even provided a correctness proof of the mental image system. Most people will happily ignore this section, but it's there for the die-hard mathematicians.

## 1.4 About this Book

Square dance calls will be indicated as follows: RIGHT AND LEFT THRU. While the mental image system is most suited for Mainstream and Plus calls (where it meshes nicely with the “standard applications” idea), we have provided information on a variety of calls from the Advanced and Challenge lists. People not familiar with these levels can simply ignore references to calls they don't know. But if you do dance or call these levels, we hope they will provide additional insight.

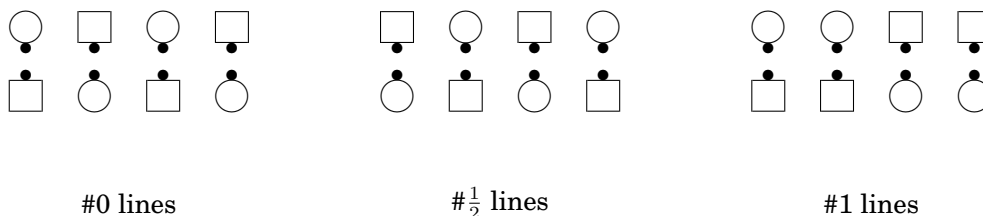
In this book, we use the following symbols to indicate dancers:

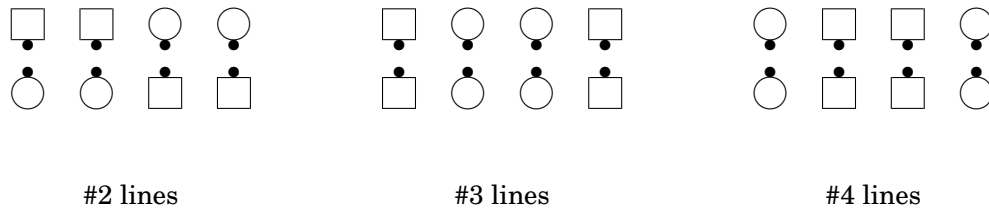


The dot indicates the dancer's nose and hence his/her facing direction. It is assumed that the caller is standing at the bottom of the page.

The following terms will be useful to know:

- *Formation* is the footprints the dancers are standing on and the directions they are facing, independent of sex. Possible formations are facing lines, right-handed waves, right-handed diamonds, a starting double pass thru, and right-handed 1/4-tags.
- *Arrangement* is the location of boys and girls within a given formation. For any symmetric eight-person formation, there are exactly six possible arrangements, that are given six standard names by Callerlab, as shown below. For example, from facing lines we can have these:





All other formations also have 6 arrangements and, one way or another, use the same numbering scheme. This book will, in each case, only deal with the “#0” and “# $\frac{1}{2}$ ” arrangements. The “#0” arrangement is the “natural” one—waves with boys on the end, 8-chain or lines made of normal couples, etc. The “# $\frac{1}{2}$ ” arrangement in all cases exchanges the boys and the girls from that. But you don’t need to worry about which arrangement is which. You just need to keep your square in one of the two admissible arrangements. Once you track *one* person, and you know that the arrangement is admissible, you implicitly know where all the boys are and where all the girls are. For example, if you are tracking just one boy, and you know that the setup is right-handed waves and he is in the center, you know that all the boys are in the center and the girls are on the end.

This restriction is firmly built into the system—we can’t handle boy-boy-girl-girl waves, for example. But, if you like, you can make up modules that involves such things, and work out their mental image formulation.

Formation and arrangement are the “F” and “A” of the Callerlab “FASR” (formation, arrangement, sequence, relationship) nomenclature. We will not use the sequence (“S”) or relationship (“R”) parts, because the mental image system takes care of them for us. That’s the point of the system—callers routinely and continuously track formation and arrangement while calling, but need some method to reconstruct sequence and relationship in order to get people to their corner.

We will implicitly discuss the combination of Formation and Arrangement throughout the book, often using the term *setup*.

We are able to relax the restriction on waves somewhat, by looking at them in two different ways. The arrangements with one sex in the center and one on the outside (e.g. HEADS PASS THE OCEAN, EXTEND), we will call “waves”, and allow calls like SWING THRU and RECYCLE. The arrangements with one sex looking in and one looking out (e.g. HEADS SQUARE THRU, TOUCH 1/4), we will call “boxes”, and allow calls like SPLIT CIRCULATE and WALK AND DODGE. Calls like BOYS RUN can be called in either setup. You must be aware of which setup you are dealing with at all times. But you need to be aware of that in any case to call effectively.

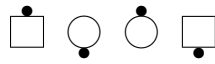
## 1.5 Scope

The mental image system restricts the setups and calls that can be used. This section describes the restrictions on setups. Individual calls will be treated throughout the rest of the book.

The mental image system deals principally with four-person sex-symmetric setups: four-person setups with two boys and two girls where each person’s diagonal opposite is of the same sex and is facing in the opposite direction.

Here are some acceptable four-person setups:

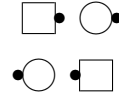




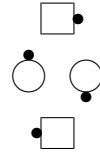
Wave



Facing couples

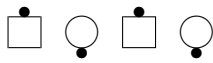


Box

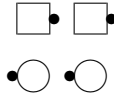


Diamond

Here are some setups that are not acceptable:



Opposite is wrong sex



Opposite is wrong sex



Opposite is facing same direction

Many eight-person formations can be looked at multiple ways. For example, normal facing lines can be looked at as lines of four or two boxes of four with facing couples. In the mental image system, it is only legal to call calls that look at the formation in a sex-symmetric way. For example, a single line of four people facing the same way is not symmetric. However, facing couples are. So from facing lines, only calls that treat the formation as facing couples may be called.

However, it is possible to use other calls from these formations under certain circumstances. These will be dealt with individually later. Also, it is a mistake to think that the mental image system can *only* handle four-person calls. There are many common eight-person calls that it can handle as well. However, in general four-person calls are easy to handle, while eight-person calls must be treated as special cases. In many of those cases (e.g. ALL 8 CIRCULATE and TRADE BY) the special treatment is extremely easy, and these calls are “staples” of the system.

## 1.6 Organization of This Book

Now that we have discussed the scope of the mental image system, the rest of the book will be devoted to explaining how to use it. The result will be a powerful method that can be used with few restrictions to call just about anything on the programs up through Plus, and some of the calls on A-1, A-2, and higher. The plan is as follows:

In Chapter 2 we will discuss how to call to the heads or the sides in the centers of the square.

In Chapter 3 we will allow calling four-person sex-symmetric material on each side of the set, so that all eight people can dance.

In later chapters we will introduce a number of “staple” eight-person calls and the techniques necessary to use them. At this point it will be possible to call high-quality sequences at actual dances.

In Chapter 23 and Chapter 24 we will show how to “read out” the active and allemande spot from a live square. This will make it possible to sight call with complete freedom, and use the mental image system only for resolving.

In Appendix A we give the mathematical proof that the system works, in case you are interested.

In Appendix [B](#) we discuss some of the traditional “standard” notation for various FASR’s, and how they relate to the mental image formulation.

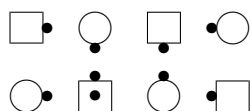
In Appendix [C](#) we give a list of many of the calls thru Plus, and some calls from A-1, A-2, and higher, as a quick reference.

## Chapter 2

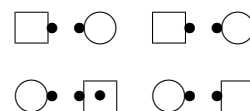
# First Steps – Heads Into the Middle And ...

### 2.1 The Allemande Spot

Before we delve deeply into the theory of mental image calling, let's see how the system works in the simplest case. Have the heads go into the center and SQUARE THRU 4. Mentally (or visually, if you have a live square) follow the number one man as he does the SQUARE THRU 4. He is the “active”. The miraculous thing about the mental image system is that *he is the only person you must follow*. In our diagrams, we will show the active with a dot inside him.

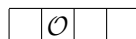


heads into the middle

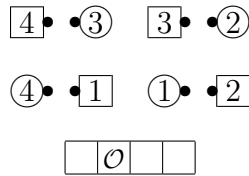


and SQUARE THRU 4

As discussed previously, you will have to keep track of the active, and, implicitly, the gender of everyone, that is, the “formation” and “arrangement”. But callers have to keep track of that information anyway in order to call smoothly. Once you keep track of that, and know, for example, that you are in a normal-couples 8-chain, you need to know whether ALLEMANDE LEFT is correct. The mental image system will figure that out for you, as long as you know just one additional piece of information, called the “allemande spot”. The allemande spot is one of four locations that you can imagine lined up in a row in front of the square, like this:



The symbol will be an  $\mathcal{X}$  or an  $\mathcal{O}$ . Later we will explain how to move the allemande spot around, while keeping track of it on the fingers of the non-microphone hand. For now, the allemande spot, being second from the left, corresponds to the location of the #1 man, that is, the active:



As we know, we can call an ALLEMANDE LEFT from here. We say that he is “standing on his allemande spot.”

The essence of the mental image system is that, when the active is in the front row, standing on the spot corresponding to the allemande spot, and the allemande spot is an  $O$ , you can call ALLEMANDE LEFT.

Since this is true after a HEADS SQUARE THRU 4, we can call an ALLEMANDE LEFT. If we dance the heads around until the active is on that spot, we might be able to call an ALLEMANDE LEFT.

Let’s try a few other sequences and see how well we do. Try to mentally track the #1 man through the following sequences. We assume, for now that we are just calling to the heads in the center.

HEADS SQUARE THRU 2  
 PARTNER TRADE  
 PASS THRU  
 ALLEMANDE LEFT

HEADS STAR THRU  
 PARTNER TRADE  
 ALLEMANDE LEFT

HEADS STAR THRU  
 RIGHT AND LEFT THRU  
 PASS THRU  
 ALLEMANDE LEFT

HEADS FAN THE TOP  
 RECYCLE  
 PASS THRU  
 ALLEMANDE LEFT

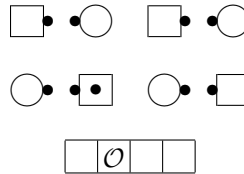
So far so good. Here is one that can’t possibly work:

HEADS RIGHT AND LEFT THRU  
 HALF SASHAY  
 TOUCH 1/4

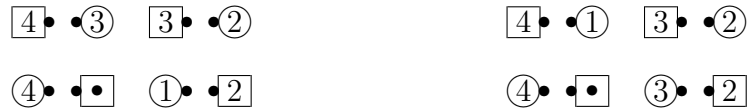
What is the problem? The head women aren’t facing the sides, that is, the setup is not an 8-chain. What this points out is that *you are responsible for formation management*. You may only call an ALLEMANDE LEFT from a suitable setup (in this case an 8-chain) with the active on his spot.

The active is the only person that you must specifically follow, but you also have to be aware of the entire 8-person formation and arrangement. Of course, you must do this to call successfully in any case.

So, given that the sides are normal couples facing in, we know that we must manipulate the heads until they are in a setup like this, a normal 8-chain:



Is it always true that, if we dance the heads around until the active is on his spot, we can call ALLEMANDE LEFT? Not quite. It is true that the number 1 man is in the correct position. By symmetry, the number 3 man is also correct. But the women are not known to be correct. We have one of these:



These are the only two possibilities. The first of them is correct for an ALLEMANDE LEFT, the second is not. Here is where the mental image system comes to the rescue. It keeps track of the two possibilities and tells you when the correct one has occurred. The way the mental image system keeps track of whether the head women got switched is through the characterization of four-person calls as  $\mathcal{X}$  calls or  $\mathcal{O}$  calls. Some  $\mathcal{O}$  and  $\mathcal{X}$  calls are listed in Section 2.2. This is only a partial list, showing the most common calls. Every call that can be done in an admissible four-person setup can be characterized as an  $\mathcal{X}$  or  $\mathcal{O}$ . The fact that a large number of common “staple” calls are  $\mathcal{O}$  calls is no coincidence - the mental image system was designed that way. We will give more complete call lists in Appendix C.

When we call two calls in succession, the combination is effectively an  $\mathcal{O}$  if both calls were  $\mathcal{O}$ s or both were  $\mathcal{X}$ s. The combination is effectively an  $\mathcal{X}$  if one call was an  $\mathcal{X}$  and one was an  $\mathcal{O}$ . Thus the only important thing about a sequence of calls is whether the number of  $\mathcal{X}$  calls is even or odd. If you like, you can think of  $\mathcal{X}$  calls as things that need to cancel each other in pairs.

Now the rule for calling to a correct ALLEMANDE LEFT is simple: dance the heads around, with an even number of  $\mathcal{X}$  calls, until the active is on his allemande spot. Any number of  $\mathcal{O}$  calls may be used; the only requirement is that the number of  $\mathcal{X}$  calls be even. You can think of an  $\mathcal{X}$  call as exchanging the head women. You must exchange them back in order to get them to the right place. What constitutes “exchanging” is somewhat esoteric. Don’t worry about it. Just keep track of  $\mathcal{X}$  calls and let the mental image system do the rest.

Most of the sequences given above, such as:

HEADS STAR THRU  
RIGHT AND LEFT THRU

PASS THRU  
 ALLEMANDE LEFT

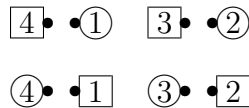
were made entirely from  $\mathcal{O}$  calls. This one:

HEADS FAN THE TOP ( $\mathcal{X}$ )  
 RECYCLE ( $\mathcal{X}$ )  
 PASS THRU  
 ALLEMANDE LEFT

had two  $\mathcal{X}$  calls which cancelled out. This one:

HEADS PASS THE OCEAN  
 RECYCLE ( $\mathcal{X}$ )  
 PASS THRU  
 ALLEMANDE LEFT?

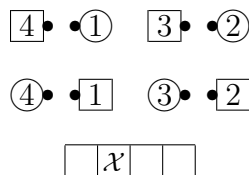
does *not* work. It has a single  $\mathcal{X}$  call. Although the active is on his spot, it leaves the head women switched from where they need to be:



There's a trick to keep track of this. Just as there are two kinds of calls, there are two states for the allemande spot:  $\mathcal{X}$  and  $\mathcal{O}$ .

Whenever you call an  $\mathcal{X}$ -type call, the nature of the allemande spot changes:  $\mathcal{O}$  to  $\mathcal{X}$  or  $\mathcal{X}$  to  $\mathcal{O}$ .  
 For now, the spot does not move. When we get to Chapter 4 we will start moving the allemande spot around.

The allemande spot will be an  $\mathcal{O}$  whenever the number of  $\mathcal{X}$ -type calls was even, so the resolve rule is simple—the active must be in the front row, standing on his spot, and the spot must be an  $\mathcal{O}$ . The previous sequence, with its single  $\mathcal{X}$ -call, left the setup like this:



So an ALLEMANDE LEFT is incorrect here. The earlier sequence with the FAN THE TOP and RECYCLE changed the allemande spot to an  $\mathcal{X}$  and back again, so it is correct.

So far, the allemande spot, while it may change between  $\mathcal{X}$  and  $\mathcal{O}$ , has always stayed in the second position from the left. This is because we have been calling only to the heads in the center. Once

we start calling to everyone, the spot might move. When it does, the location to which you have to move the active to get a correct ALLEMANDE LEFT will also move.

## 2.2 Characterization of some common calls as $\mathcal{X}$ or $\mathcal{O}$ .

$\mathcal{O}$  calls:

EXPLODE (THE WAVE)  
 HALF SASHAY  
 PARTNER HINGE (from a couple)  
 PASS THE OCEAN  
 PASS THRU  
 QUARTER IN/OUT  
 RIGHT AND LEFT THRU  
 SCOOT BACK  
 SQUARE THRU (any number)  
 STAR THRU  
 STEP THRU  
 STEP TO A WAVE  
 REAR BACK FROM A WAVE  
 TRADE  
 TURN THRU  
 U-TURN BACK  
 VEER LEFT/RIGHT  
 WALK AND DODGE  
 WHEEL AND DEAL (from 2-faced line)

$\mathcal{X}$  calls:

BEND THE LINE (from a 2-faced line)  
 SPLIT/BOX CIRCULATE  
 BOYS/GIRLS TRADE (wave or 2-faced line)  
 BOYS/GIRLS RUN (wave or 2-faced line)  
 BOYS/GIRLS RUN (box, whether couples or miniwave)  
 FAN THE TOP (from a wave)  
 (REVERSE) FLUTTER WHEEL  
 QUARTER RIGHT/LEFT  
 RECYCLE  
 SINGLE HINGE (from a miniwave)  
 SPIN THE TOP  
 SWEEP 1/4  
 SWING THRU  
 TOUCH 1/4

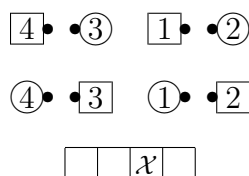
## 2.3 Use of a Female Active

The mental image method will work equally well with a male or female active. The female active is the number 1 woman, and her allemande spot starts out here:  $\square \square \mathcal{O} \square$

When we dance the heads around until the setup is an 8-chain and she is on her spot, and the spot is an  $\mathcal{O}$ , so an even number of  $\mathcal{X}$  calls are used, the sequence will be resolved. In this case, the count of  $\mathcal{X}$  calls keeps track of the head men, while you keep track of the head women. To see this, try the sequence:

HEADS TOUCH 1/4 ( $\mathcal{X}$ )  
 WALK AND DODGE  
 ALLEMANDE LEFT?

The active is where she belongs, but there was a single  $\mathcal{X}$  call. The setup is:



The mental image system tells us that the resolve is not correct: The active (#1 woman) is correctly placed on the allemande spot, but the spot is an  $\mathcal{X}$ . One can see that the head men are incorrectly placed.

It is probably best to use a active of the same sex as yourself, so that you will be completely familiar with the calls that you make the active execute. This will improve your ability to move the active mentally without mistakes.

## 2.4 Exercises

1. Study the following sequences called to the heads in the middle of the square, and determine for each: 1) if the active (either head man or head woman depending on which you prefer) ends up on his/her allemande spot, and 2) if the number of  $\mathcal{X}$  calls is even or odd. Refer to Section 2.2 as necessary, but try to memorize these staple calls as soon as possible. In addition, try to follow the active in your head rather than using checkers or live dancers.

HEADS RIGHT AND LEFT THRU  
STAR THRU  
PASS THRU  
ALLEMANDE LEFT?

HEADS TOUCH 1/4  
WALK AND DODGE  
PARTNER TRADE  
PASS THRU  
ALLEMANDE LEFT?

HEADS PASS THE OCEAN  
EXPLODE THE WAVE  
PARTNER TRADE  
TOUCH 1/4  
BOX CIRCULATE  
BOYS RUN  
PASS THRU  
ALLEMANDE LEFT?

HEADS FAN THE TOP  
HINGE  
BOX CIRCULATE  
BOYS RUN  
REVERSE FLUTTER WHEEL  
SWEEP 1/4  
PASS THRU  
ALLEMANDE LEFT?

HEADS PASS THRU  
PARTNER HINGE  
SWING THRU  
BOYS RUN  
BEND THE LINE  
SLIDE THRU  
PASS THRU  
ALLEMANDE LEFT?



- Write some of your own opening sequences using the heads in the middle of the square that correctly resolve to an ALLEMANDE LEFT. After writing them in your head, verify that they work using checkers or live dancers.

## 2.5 Counting on Your Fingers

We keep track of how many  $\mathcal{X}$  calls we have used by letting the allemande spot have two kinds ( $\mathcal{X}$  and  $\mathcal{O}$ ) as well as 4 positions. We will sometimes number the positions 1 through 4:

Position 1:	$\mathcal{O}$ <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	$\mathcal{X}$ <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
Position 2:	<input type="checkbox"/> $\mathcal{O}$ <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> $\mathcal{X}$ <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
Position 3:	<input type="checkbox"/> <input type="checkbox"/> $\mathcal{O}$ <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> $\mathcal{X}$ <input type="checkbox"/> <input type="checkbox"/>
Position 4:	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> $\mathcal{O}$ <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> $\mathcal{X}$ <input type="checkbox"/>

Whenever we call an  $\mathcal{X}$  call while we are dancing the heads around in the middle, we change the allemande spot's kind without changing its position. We change  $\mathcal{O}$  to  $\mathcal{X}$  and  $\mathcal{X}$  to  $\mathcal{O}$ . We start out with  $\mathcal{O}$  at the location from which the active started—position 2 for a man, 3 for a woman. The resolution rule is that the active must be standing on his or her spot *and the spot must be an  $\mathcal{O}$* .

So far, we have never moved the spot from the position that it started on. In the next two chapters we will start calling to all 8 people, and the spot will move. We need a way to keep track of 2 kinds and 4 positions easily. Ideally we want to keep track of them in a way that does not require a lot of thought, since calling takes up quite enough brain power as it is. Fortunately, the thumb and fingers of the non-microphone hand serve this purpose nicely. Hold the hand with the palm down in front of you. The four fingertips, from left to right, represent the four  $\mathcal{O}$  spots. When in an  $\mathcal{O}$ , hold the thumb in contact with the corresponding fingertip. For an  $\mathcal{X}$  spot, curl the finger and hold the thumb against the fingernail of the corresponding finger.

For example, if you hold the microphone in your left hand and use a male active, start each sequence with the right thumb against the third finger.

Whenever you call an  $\mathcal{X}$  call to the heads in the middle, the spot must change between an  $\mathcal{O}$  and an  $\mathcal{X}$ . Just rock the finger between having the fingertip in contact with the thumb and having the fingernail in contact with the thumb. You can only call an ALLEMANDE LEFT when the active is on the spot corresponding to the selected finger, and the thumb is in contact with that fingertip.

Of course, you don't need to hold the hand out in front of you. You can let it hang unobtrusively by your side.

## 2.6 Exercises

- Go through the following sequences and keep track of the active mentally while tracking the allemande spot on your non-microphone hand.

HEADS SPIN THE TOP  
 BOYS RUN  
 BEND THE LINE  
 RIGHT AND LEFT THRU  
 PASS THE OCEAN  
 RECYCLE  
 PASS THRU  
 ALLEMANDE LEFT

HEADS PASS THRU  
U-TURN BACK  
TOUCH 1/4  
BOYS RUN  
STEP TO A WAVE  
RECYCLE  
VEER LEFT  
GIRLS TRADE  
WHEEL AND DEAL  
SQUARE THRU 3  
ALLEMANDE LEFT

HEADS PASS THE OCEAN  
SINGLE HINGE  
SCOOT BACK  
BOYS RUN  
STAR THRU  
SWING THRU  
BOYS TRADE  
TURN THRU  
ALLEMANDE LEFT

2. Make up your own sequences, in real time, until you can bring the active to his or her  $\mathcal{O}$  allemande spot effortlessly.

## 2.7 Following the Active Mentally

We said earlier that you could follow the active mentally or, if you have a live square, visually. Since the active is a real person, you might think that you could just watch him until he lands on the allemande spot that you are keeping track of. It would not be a good idea to call this way for three reasons.

First of all, the mental image system requires a good deal of practice, which can be done in private with no live dancers or other equipment. In fact, mental image practice is a good way to make productive use of time that would otherwise be wasted by business meetings and similar things. (Don Beck suggests that the system can be practiced while driving your car. We do not recommend this, nor do we recommend practicing it during important one-on-one meetings such as performance reviews or job interviews. Departmental meetings are another matter.)

Second, there are a number of “fictitious moves” that we will discuss in later chapters, in which the mental active does something other than the corresponding person. Hence, you can’t depend on the real active to do your work for you. You must track the active mentally at all times.

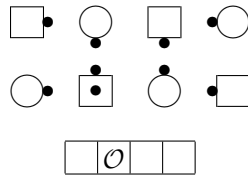
Third, and most important, all sight calling, whether with the mental image system or not, requires that you be ahead of the dancers. When you deliver a call, you must figure out what the ending setup will be before the dancers get there, so that you can give the next call in time to keep the dancers moving smoothly. There are two mental tasks when calling by mental image: figuring out the ending setup, which you need to do anyway, and figuring out where the active will go. You can easily combine the two tasks in your thinking, thereby reducing the total amount of effort. In fact, the “formation awareness” part of your thinking will fall out naturally as a consequence of the act of mentally tracking the active.

## 2.8 Starting with the Sides

As you can probably guess, the system works equally well if you call to the sides. You just have to do all of your analysis while pretending to be standing at one side of the hall instead of on the stage. When we start with the sides, our mental notion of how the setup is divided into two four-person setups is different. Instead of one setup on our left and one on our right, there is a near four-person setup and a far one.

Also, when starting with the sides the mental array of allemande spots runs front-to-back instead of left-to-right. Since we keep track of allemande spots on our fingers, it is useful to turn the hand 90° to match the orientation of the array of spots. If you hold the microphone in your right hand and count with your left hand, rotate your left wrist so that the palm is toward you and the thumb is toward the dancers (while being held at your side). If you hold the microphone in your left hand, rotate your right wrist the other way. In either case, when in the "sides" orientation, the palm of that hand is toward you and the thumb is toward the dancers.

The row of allemande spots is on the opposite side of the square from the hand you are using to count the spots. If you are counting on your left hand, you start with the #2 man or woman as your active. If you are counting on your right hand, you start with the #4 man or woman as your active.



Heads into the middle



Sides into the middle,  
counting on the right hand.

Sides into the middle,  
counting on the left hand.

Whichever hand you use, there will be just two orientations of that wrist that you ever use, and just two places where your mental row of allemande spots exists. Get accustomed to those two positions, and get accustomed to calling and resolving with side orientation. Practice.

In the rest of the book, we will use both side orientations interchangeably. If the orientation we illustrate isn't the one you use, just rotate the whole picture 180°.

## 2.9 Exercises

1. Redo all of the exercises earlier in this chapter starting with the sides instead of the heads.

## Chapter 3

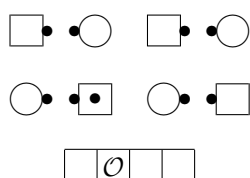
# Calling Four-Person Calls on Each Side

It's time to let all eight people dance.

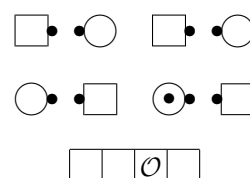
The first thing we notice is that, whenever we dance a group of four people around using an even number of  $\mathcal{X}$  calls and return to the same setup with the active standing on the original spot, we have produced a zero. If you get nothing else out of this book, this is an excellent result. It means that you can make up zeroes on the fly.

These zeroes are equally valid if you're only calling to a center group of four, or if you're calling four-person calls to each side of the square. This gives us an easy way to start calling to all eight dancers: Call a sequence such that the heads are facing the sides in an 8-chain formation, and then call a zero to the groups of four people on each side. At this point you can continue calling to the heads in the center to finish the resolution.

Let's look at an easy example. After the SQUARE THRU 4, the active is here in an 8-chain:



Male active



Female active

On each side, we have facing couples. We can dance him around in the group on our left (or our right if using a female active) until we get back to facing couples on each side, that is, another 8-chain. If the active is back where he started (on his allemande spot), and an even number of  $\mathcal{X}$  calls were used, all four dancers on that side are correct. The dancers on the other side are of course also correct by symmetry.

Let's try it:

HEADS SQUARE THRU 4  
 SWING THRU ( $\mathcal{X}$ )  
 BOYS RUN ( $\mathcal{X}$ )  
 BEND THE LINE ( $\mathcal{X}$ )

RIGHT AND LEFT THRU  
PASS THE OCEAN  
RECYCLE ( $\mathcal{X}$ )  
ALLEMANDE LEFT

Now let's look at a slightly more complicated example. We'll start our sequence with:

HEADS PASS THE OCEAN  
RECYCLE ( $\mathcal{X}$ )  
PASS THRU

At this point we know we can't call ALLEMANDE LEFT because we haven't used an even number of  $\mathcal{X}$  calls. To resolve this sequence we could call:

CENTERS TRADE  
SWING THRU ( $\mathcal{X}$ )  
TURN THRU  
ALLEMANDE LEFT

However, between these two sections we notice that we have a sex-symmetric box of four on each side of the square. We could interrupt our sequence at this point and call a zero, and then continue with our resolve. Let's add a zero, called to each (sex-symmetric) box:

STAR THRU  
SPIN THE TOP ( $\mathcal{X}$ )  
BOYS RUN ( $\mathcal{X}$ )  
WHEEL AND DEAL  
PASS THE OCEAN  
EXPLODE AND RIGHT AND LEFT THRU

If we add this "interruption" into the middle of our sequence calling only to the heads in the center, we can produce a full, resolved sequence which allows the sides to dance some of the time:

HEADS PASS THE OCEAN  
RECYCLE ( $\mathcal{X}$ )  
PASS THRU  
(start interruption)  
STAR THRU  
SPIN THE TOP ( $\mathcal{X}$ )  
BOYS RUN ( $\mathcal{X}$ )  
WHEEL AND DEAL  
PASS THE OCEAN  
EXPLODE AND RIGHT AND LEFT THRU  
(finish interruption)  
CENTERS TRADE (or CENTERS WHEEL AROUND for better flow)  
CENTERS SWING THRU ( $\mathcal{X}$ )  
CENTERS TURN THRU  
ALLEMANDE LEFT

This is a kind of contrived example, but it does show that with what you've already learned you can call danceable material that allows all eight dancers to become involved. Used in this manner, it's very similar to isolated sight calling, except of course that you don't actually have to memorize two (or four) dancers.

### 3.1 Going from Calling to the Centers to Calling to Everyone

We can actually switch between calling to the centers and calling to each side (this is sometimes called “gluing”) much more fluidly than that. All that is required is that, when we are calling to each side, the setups are sex-symmetric.

HEADS SQUARE THRU 2  
STEP TO A WAVE (calling to each side)  
LADIES TRADE ( $\mathcal{X}$  on each side)  
RECYCLE ( $\mathcal{X}$  on each side)  
PASS THRU (each side)  
EVERYONE TRADE (each side)  
CENTERS TRADE (calling to the centers)  
CENTERS PASS THRU (calling to the centers)  
ALLEMANDE LEFT

This was a bit contrived because of the perceived need to be precisely symmetric on each side while gluing, But a little common sense will show that we can take some liberties with this.

The snippet ALL TRADE, CENTERS TRADE, CENTERS PASS THRU can be seen to be just a TRADE BY. It was made entirely of  $\mathcal{O}$  calls. We just had to follow the active through the TRADE BY, that is, move him across the center.

Whenever you are in a sex-symmetric Trade By setup (that is, all normal or all sashayed), and the active is in the center, you can call a TRADE BY. Just walk the active through the call.

It is crucial that the active be in the center.

Whenever calling just to the centers, the active must be in the center.

We will introduce a trick in Chapter 5 that will fix the problem of a TRADE BY when the active is on the outside.

So the sequence is now:

HEADS SQUARE THRU 2  
STEP TO A WAVE (calling to each side)  
LADIES TRADE ( $\mathcal{X}$  on each side)  
RECYCLE ( $\mathcal{X}$  on each side)  
PASS THRU (each side)  
TRADE BY  
ALLEMANDE LEFT

There is another shortcut we can take. SQUARE THRU 2 is equivalent to PASS THE OCEAN and STEP THRU. Also, CENTERS STEP THRU followed by ALL STEP TO A WAVE is just EXTEND. So we can have the centers go out to the ends just by calling EXTEND.

If you have a 1/4-tag with the active in the center, you can just call EXTEND if the resulting waves will be sex-symmetric.

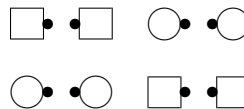
So if the wave is right-handed with girls in the center, or left-handed with boys in the center, the outsides must be normal. For the other wave arrangements, the outsides must be sashayed. The

important point is that the result must not be B-B-G-G waves. Note that starting a sequence with HEADS PASS THE OCEAN, or FAN THE TOP, PASS THE SEA, DIXIE STYLE TO A WAVE, or SWAP THE TOP, followed by EXTEND, will work.

The sequence is now:

```
HEADS PASS THE OCEAN
EXTEND
LADIES TRADE
RECYCLE
PASS THRU
TRADE BY
ALLEMANDE LEFT
```

What would happen if we tried to start with HEADS SPIN THE TOP, EXTEND? Between the implicit centers step thru and the implicit step to a wave, we would have this:



This is not sex-symmetric on each side! It won't work. However, we could fix that problem by calling:

```
HEADS SPIN THE TOP WHILE THE SIDES HALF SASHAY
EXTEND
```

You are responsible for arrangement management. If you want to EXTEND from a wave in the center, and you see that the centers will be sashayed when they step out of their wave while the outsides are normal, or vice versa, fix it. A quick OUTSIDES HALF SASHAY can often save the day.

Practice calling sequences like that until they feel natural.

Notice that waves and facing couples differ only by STEP TO A WAVE or REAR BACK, both of which are *O*s. Get used to the fluidity that this provides for calls that use the “facing couples rule” or the “ocean wave rule”.

### 3.2 PASS TO THE CENTER **and** DIVE THRU

The call PASS TO THE CENTER, or (DIVE THRU) allows us to take another short cut.

```
HEADS SQUARE THRU 2
RIGHT AND LEFT THRU
PASS TO THE CENTER
PASS THRU
ALLEMANDE LEFT
```

At the instant of the PASS TO THE CENTER, the active was on the outside facing in. The PASS TO THE CENTER was equivalent to all PASS THRU, all TRADE on each side, followed by a CENTERS TRADE. The centers can then PASS THRU and the square will be resolved.



Whenever you are in a sex-symmetric 8-chain setup and the active is on the outside, you can call PASS TO THE CENTER. Just walk the active through the call.

The result will be a starting DPT, which is not sex-symmetric, so you will have to call to the centers.

We will see a trick in Chapter 8 that will allow us to fix the problem of the active being in the center facing the outsides.

You now know enough to call “chicken plucker” types of sequences, but with a much wider repertoire of calls than are generally used.

### 3.3 Exercises

1. Make up “chicken plucker”-like sequences involving lots of calls. Remember to cancel  $\mathcal{X}$ s properly in each group of calls delivered to each side.

Better still, read the next chapter and then start making up more sophisticated sequences.

## Chapter 4

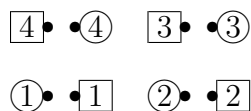
# Calling $\mathcal{X}$ s Anywhere, Anytime

Suppose we do this:

HEADS RIGHT AND LEFT THRU  
HEADS FAN THE TOP ( $\mathcal{X}$  in the center)  
EXTEND  
RECYCLE ( $\mathcal{X}$  on each side)  
PASS TO THE CENTER  
CENTERS SQUARE THRU 3

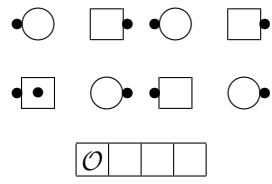
Just from following the active, he is where he started, the setup is an 8-chain, and we called an even number of  $\mathcal{X}$ s. Can we call ALLEMANDE LEFT? No.

The setup is



We can't call ALLEMANDE LEFT from there. But we can call PASS THRU, ALLEMANDE LEFT. *The allemande spot moved.* It moved from position 2 to position 1. (Or position 3 to position 4 if the active is a woman.) If we call PASS THRU the active will be on his spot and the sequence will be correct.

HEADS RIGHT AND LEFT THRU  
HEADS FAN THE TOP  
EXTEND  
RECYCLE  
PASS TO THE CENTER  
CENTERS SQUARE THRU 3  
PASS THRU  
ALLEMANDE LEFT



(This allemande left is “around the corner” for the outsides. If you find that unesthetic, don’t call it. The mental image system will give you a great deal of control over the formation at the instant of an ALLEMANDE LEFT or RIGHT AND LEFT GRAND.)

So the rule we gave earlier for changing the allemande spot when we call an  $\mathcal{X}$ , that the spot changes nature but does not move, only applies when calling to the 4 in the center. When calling to each side, the rule is as follows. *This is the most fundamental, most important principle in the mental image system.*

When you call an  $\mathcal{X}$  to the center 4, the allemande spot changes its nature ( $\mathcal{O}$  to  $\mathcal{X}$  or  $\mathcal{X}$  to  $\mathcal{O}$ ) but does not move.

When you call an  $\mathcal{X}$  to each side, the allemande spot changes its nature and moves. When changing from  $\mathcal{O}$  to  $\mathcal{X}$ , it moves one spot away from the active’s side. When changing from  $\mathcal{X}$  to  $\mathcal{O}$ , it moves one spot closer to the active.

You can imagine that the active hates  $\mathcal{X}$ s, and pushes them away when he creates them. But he loves  $\mathcal{O}$ s, and draws them close to himself. The rule for female actives is the same.

Let’s try it out:

HEADS SQUARE THRU 4 ( $\mathcal{O}$ ),  $\square \mathcal{O} \square \square$   
 STEP THE A WAVE  
 RECYCLE ( $\mathcal{X}$ , active is on left),  $\square \square \mathcal{X} \square$   
 PASS TO THE CENTER  
 CENTERS PASS THRU  
 SWING THRU ( $\mathcal{X}$ , active is on right),  $\square \square \square \mathcal{O}$   
 BOYS RUN ( $\mathcal{X}$ , active is on right),  $\square \square \mathcal{X} \square$   
 BEND THE LINE ( $\mathcal{X}$ , active is on right),  $\square \square \square \mathcal{O}$   
 PASS THE OCEAN  
 GIRLS TRADE ( $\mathcal{X}$ , active is on right),  $\square \square \mathcal{X} \square$   
 RECYCLE ( $\mathcal{X}$ , active is on right),  $\square \square \square \mathcal{O}$   
 ALLEMANDE LEFT

Spot positions “wrap around”. If the spot is pushed or pulled off the end of its row of 4 positions, it reappears at the other end.

HEADS PASS THE OCEAN  
 EXTEND  
 RECYCLE ( $\mathcal{X}$ , active is on right, pushes spot away),  $\mathcal{X} \square \square \square$   
 PASS THRU  
 TRADE BY  
 SWING THRU ( $\mathcal{X}$ , active is on left, spot falls off the end and wraps around),  $\square \square \square \mathcal{O}$   
 LINEAR CYCLE (setup is sashayed facing lines)  
 SLIDE THRU (active is now facing to the right, toward the side we want him on.)  
 TRADE BY (active is on the right side, but he’s in the back row.)  
 SLIDE THRU  
 SLIDE THRU (in front row, on his spot.)  
 ALLEMANDE LEFT

# Chapter 5

## Fictitious Moves

In much of the rest of this book, we will occasionally use “fictitious moves”, in which the mental action you move the active through is not the same as the motion that the corresponding physical dancer goes through. These fictitious moves will greatly increase the flexibility and power of the system. We will only discuss a few of the simple and most important cases here, but it brings up an important point:

Your “active” will not always be the same physical person. Don’t get too attached to him or her.

If you resolve to an ALLEMANDE LEFT at the usual “at home” spot, and the active’s identity hasn’t changed, that active will be the usual #1 man or woman, and the dancers will be at home (that is, a “bullseye”). But if fictitious moves have occurred, the people in the #1 couple’s spot may not be the #1 couple. The resolve will be correct, with everyone doing the ALLEMANDE LEFT with their corner, but the square may be rotated from what you expect.

The mental image system does not guarantee actual absolute position of the dancers, only relative position. In general, it can’t be used for “bullseye” endings.

This means that you move the active around in your head. You look at the actual dancers to dictate timing and flow, but not to literally follow the active.

### 5.1 Trade By Revisited

We will now get around the annoying problem that we can only call TRADE BY when the active is in the center.

Theorem: The call TRADE BY is exactly equivalent to the sequence

EVERYONE TRADE  
PASS THRU  
TRADE BY  
PASS THRU  
EVERYONE TRADE

followed by a rotation of the entire square by 180°.

Proof: Move your checkers (plastic, mental, human, or electronic) through it.

This means that, if you are in a trade-by setup with the active on the outside, you could say TRADE BY over the microphone while you mentally perform the above sequence. Let's see what happens. The active is on the outside facing out. The TRADE puts him on the outside facing in. The PASS THRU puts him in the middle. The TRADE BY is now legal in the mental image system; he just walks across. The final PASS THRU and TRADE put him on the outside facing in. He is in fact 3 positions behind where he started. (He is in fact in the diagonally opposite spot from where the real dancer went, but that's not important.)

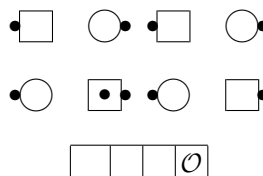
So what do we do when we want to call a TRADE BY while the active is on the outside? We say TRADE BY, while moving the active back 3 positions. All of the calls in the sequence shown above are completely simple  $\mathcal{O}$  calls, so the allemande spot does not change or move. Just pull the active all the way back.



There's a convenient trick we can use that might make this simpler. Just as allemande spots "wrap around", you could think of active spots as "wrapping around". Then the rule for a TRADE BY is: simply move the active forward one spot in all cases, wrapping around as necessary. This means that PASS THRU / TRADE BY combinations (or EIGHT CHAIN <N>) can be performed simply by pushing the active forward, wrapping him around. This is very useful for resolves: if the allemande spot is an  $\mathcal{O}$  and the active is in front, just issue PASS THRU / TRADE BY combinations until he is on his spot, and then call ALLEMANDE LEFT.

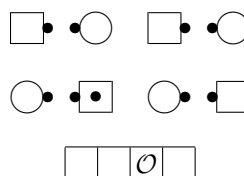
All of this works exactly the same if the active is a woman.

Example: What do we do from here?



Answer: We are two spots away. TRADE BY, PASS THRU, RIGHT AND LEFT GRAND.

Another one: What do we do from here?



Answer: We are three spots away. EIGHT CHAIN 3, ALLEMANDE LEFT.

## 5.2 All 8 Circulate

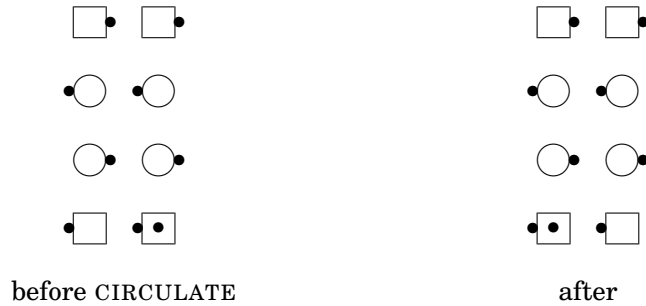
What we worked out for TRADE BY will also show us how to do various kinds of ALL 8 CIRCULATE.

Theorem: The call CIRCULATE is exactly equivalent to the sequence

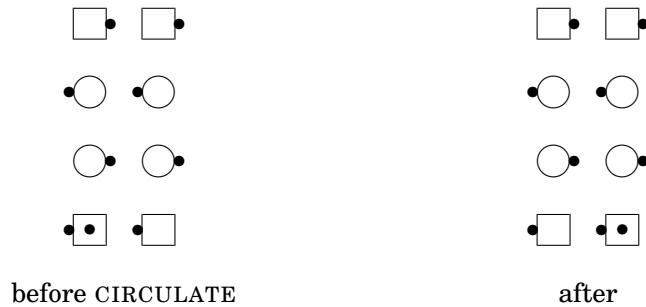
REAR BACK FROM THE WAVE  
 PASS THRU  
 TRADE BY  
 STEP TO A WAVE

Proof: Move your checkers through it.

This means that if the active is a trailer, just move him forward to the next wave. (Before the REAR BACK, his setup was 2 people deep. After the REAR BACK, it is 4 people deep. Move him forward by two, and, when he steps to a wave, he will be a leader in a setup that is 2 people deep.) This move is not fictitious.

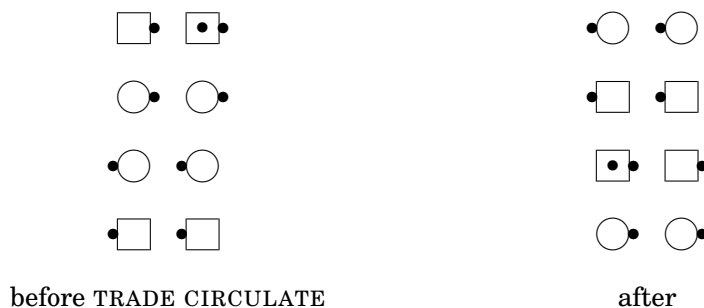


If the active is a leader, the move will be fictitious. When you move the active forward 2 spots, wrap around, and step to a wave, he will be a trailer, in the spot right behind where he started.



This works for left-handed wave also, by rearing back from or stepping to left hands. Also, if we use the appropriate VEER LEFT or VEER RIGHT (these are all simple  $\mathcal{O}$  calls), we can see that it works for COUPLES CIRCULATE in 2-faced lines.

Also, for those who call the Advanced program, note that SPREAD (or SLIDE), and HALF SASHAY are simple  $\mathcal{O}$  calls, so we can do CROSS OVER CIRCULATE or TRADE CIRCULATE by moving the active forward or back, sliding him over as necessary. It even works for TRADE CIRCULATE from 2-faced lines, remembering to slide the active way over whether going forward or back.



To do an ALL 8 CIRCULATE, including CROSS OVER CIRCULATE and TRADE CIRCULATE, move the active forward or backward to the other wave or line. Move the active as though doing the call if going forward, or undoing it if going backward. The allemande spot does not change or move.

One can also do BOYS CIRCULATE or GIRLS CIRCULATE, but they are not as simple. See Chapter 16.

### 5.3 When Not to Use Fictitious Moves

When doing singing calls, proper position is important in order to get correct promenade timing. This means you will need to avoid fictitious moves. It isn't hard to call without using fictitious moves—just don't do calls that would require walking the active backwards.

### 5.4 RIGHT AND LEFT GRAND Getouts

Try this:

HEADS LEAD LEFT ( $\mathcal{X}$ ),  $\square \mathcal{X} \square \square$

SWING THRU ( $\mathcal{X}$ ),  $\mathcal{O} \square \square \square$

BOYS TRADE ( $\mathcal{X}$ ),  $\square \mathcal{X} \square \square$

RECYCLE ( $\mathcal{X}$ ),  $\mathcal{O} \square \square \square$

We are in a sashayed 8-chain. We can call RIGHT AND LEFT GRAND.

The ALLEMANDE spot is also the RIGHT AND LEFT GRAND spot. It's just a matter of which way people are facing.

You can also do “around the corner” RIGHT AND LEFT GRAND getouts from sashayed trade-by setups:



HEADS PASS THE OCEAN ( $\mathcal{O}$ ),  $\square \mathcal{O} \square \square$   
 EXTEND  
 ALL 8 CIRCULATE (active is now on left),  $\square \mathcal{O} \square \square$   
 SWING THRU ( $\mathcal{X}$ ),  $\square \square \mathcal{X} \square$   
 TRADE THE WAVE  
 RECYCLE ( $\mathcal{X}$ ),  $\square \mathcal{O} \square \square$   
 PASS THRU (active is on his spot)  
 RIGHT AND LEFT GRAND

As before, if you find that unesthetic, don't call it. You can control where the allemande spot is.

As you develop the skill of formation management and spot management while doing mental image calling, you will be able to control the kind of getout you want. You control the setup; the mental image system provides the goal. By calling  $\mathcal{X}$  calls in appropriate places, you can move the goal where you want, and then drive the active toward that goal.

## 5.5 Exercises

1. Practice!

## 5.6 Getouts from Lines Facing or Lines Back-to-Back

Consider the sequence:

HEADS SQUARE THRU 4  
 RIGHT AND LEFT THRU  
 STAR THRU  
 PASS THRU

Everyone is in correct sequence. If you consider ALLEMANDE LEFT getouts acceptable from lines back-to-back, you could use it here. You can also call ALLEMANDE LEFT from facing lines when the active is on his spot, if you consider that to be an acceptable getout.

Another thing that can be done from facing lines with the active on his spot is CIRCLE LEFT. However, the mental image system does not always provide control over absolute orientation of the setup—it is only guaranteed to make the resolve work. Hence, you must look at the square to see whether “circle right” or perhaps “you're home” might be a more suitable thing to say.

HEADS LEAD RIGHT ( $\mathcal{X}$ )  
 SWING THRU ( $\mathcal{X}$ )  
 BOYS RUN ( $\mathcal{X}$ )  
 CHAIN DOWN THE LINE  
 RIGHT AND LEFT THRU  
 FLUTTERWHEEL ( $\mathcal{X}$ )  
 CIRCLE LEFT

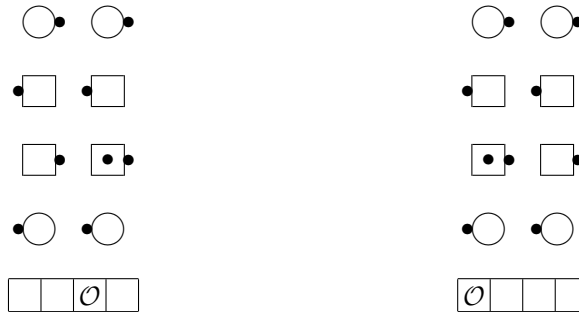
No fictitious moves were used, and the active is only slightly to the right of home, so the circling distance is extremely small in this case.

## 5.7 Getouts from Waves

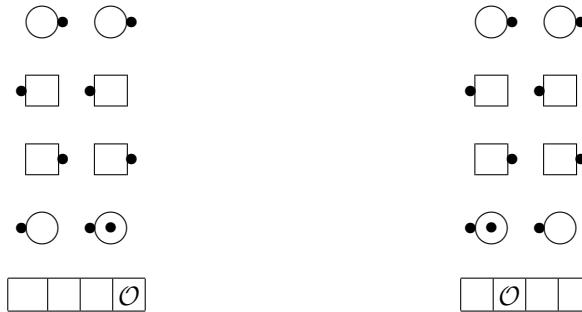
Whenever we have a right-hand wave with boys in the middle, we have a potential RIGHT AND LEFT GRAND possibility. If having everyone rear back from the handhold would create a valid 8-chain RIGHT AND LEFT GRAND, you could call a RIGHT AND LEFT GRAND in the wave. That is, you could do so if you and your dancers consider this acceptable. (Or you could call TURN THRU, ALLEMANDE LEFT instead, if you wish.)

These are the RIGHT AND LEFT GRAND positions:

With a male active:



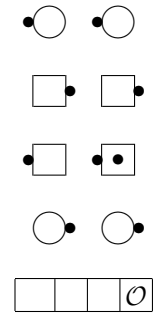
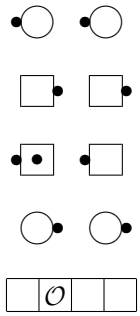
Or with a female active:



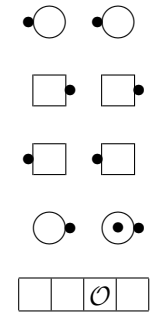
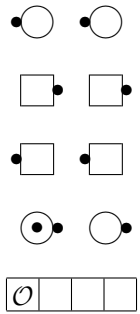
With practice, you can prepare such a getout by setting the spot correctly and then driving the active toward the correct place.

Whenever we have a left-hand wave with boys in the middle, we have a potential ALLEMANDE LEFT possibility. These are the ALLEMANDE LEFT positions:

With a male active:



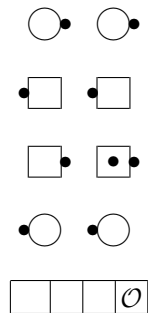
Or with a female active:



Example:

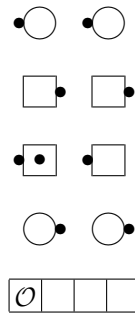
HEADS SQUARE THRU 4  
 SWING THRU, TWICE  
 TRADE THE WAVE  
 ALLEMANDE LEFT

If you and your dancers are not averse to EXTEND, RIGHT AND LEFT GRAND or EXTEND, ALLEMANDE LEFT, you can use them when the allemande spot is one position beyond the active. For example:



If the spot were here:  $\square\square\mathcal{O}\square$  we could call RIGHT AND LEFT GRAND. As it is, we can call EXTEND, RIGHT AND LEFT GRAND. To see that this is so, observe that the call STEP THRU would give us a trade by setup from which a RIGHT AND LEFT GRAND could be called. EXTEND is just STEP THRU and the CENTERS TOUCH.

In the same way, we can call EXTEND, ALLEMANDE LEFT (or SLIP THE CLUTCH, ALLEMANDE LEFT if you prefer) from a setup like this:



In fact, whenever we have right or left handed waves with the boys in the middle, and the spot is an  $\mathcal{O}$  and the active is on the side of his or her wave closest to us, we are very close to a RIGHT AND LEFT GRAND or an ALLEMANDE LEFT. We can call it either directly, after an EXTEND, after an ALL 8 CIRCULATE, or after a CIRCULATE and EXTEND. It just depends on how far away the allemande spot is from the active.

If you find that you are using EXTEND too much, you can use BOYS CIRCULATE or GIRLS CIRCULATE (either one) instead.

At this point, the system that we have developed is quite powerful. Congratulations! You can call a lot of really presentable material now (if you do enough practice, that is). Don't do too much of this at real dances, though, or the dancers will notice that you never use columns, or BEND THE LINE or WHEEL AND DEAL from lines back-to-back.

Make up more sequences like this that involve calling  $\mathcal{X}$  calls in various places. Practice, practice, practice.

## Chapter 6

# Categorization of Calls as $\mathcal{X}$ and $\mathcal{O}$

Here is how we determine whether four-person calls are categorized as  $\mathcal{X}$  or  $\mathcal{O}$ .

You may skip this section if you wish. All you really need to know when calling is whether a call is an  $\mathcal{X}$  or an  $\mathcal{O}$ ; you do not need to know why.

First, we need to emphasize that the  $\mathcal{X}$  or  $\mathcal{O}$  categorization really only applies to sex-symmetric four-person calls. Eight-person calls can be more difficult, though we have seen cases (TRADE BY and CIRCULATE) that are quite reasonable. Only the four-person sex-symmetric calls enjoy the simple property that, once you know whether a call is an  $\mathcal{X}$  or an  $\mathcal{O}$ , there is a single rule that says how to do it.

Second, we require for now that both the starting and ending setups be free of any people facing  $90^\circ$  from each other. At the start of the call, everyone must be facing head walls or everyone must be facing side walls. The same situation applies at the end of the call. This excludes diamonds and T-bone boxes of the sort that are used at C-1 and higher. We will fix diamonds presently, but will not handle T-bone boxes. (But you can always make up a module that goes into T-bones and comes out, figure out whether it is an  $\mathcal{X}$  or an  $\mathcal{O}$ , and use it.)

The classification of a call as an  $\mathcal{X}$  or  $\mathcal{O}$  depends only on the relative starting and ending facing directions of the dancers. It does not depend on any other aspect of how the call is done, nor does it depend on what turning motion was actually executed to reach the final facing direction.

In any four-person sex-symmetric call, the two men are facing opposite directions from each other at the start, they are also facing opposite directions at the end, and they both go through the same turning motions. They each finish in the same orientation as they started, or  $90^\circ$  clockwise, or the opposite way, or  $90^\circ$  counterclockwise. We can measure that in terms of quadrants clockwise: 0, 1, 2, or 3. For example, STAR THRU turns each man one quadrant clockwise. QUARTER LEFT effectively turns three quadrants clockwise.

The same considerations apply to the women. They can both be considered to turn 0, 1, 2, or 3 quadrants clockwise. For example, they turn 3 quadrants clockwise (actually one quadrant counterclockwise) on a STAR THRU.

call	men mod 4	women mod 4	men+women mod 4	call type
PASS THRU	0	0	0	$\mathcal{O}$
STAR THRU	1	3	0	$\mathcal{O}$
TRADE (couple)	2	2	0	$\mathcal{O}$
TRADE (miniwave)	2	2	0	$\mathcal{O}$
RIGHT AND LEFT THRU	2	2	0	$\mathcal{O}$
U-TURN BACK	2	2	0	$\mathcal{O}$
BOYS TRADE (wave or 2-faced line)	2	0	2	$\mathcal{X}$
GIRLS TRADE (wave or 2-faced line)	0	2	2	$\mathcal{X}$
SINGLE HINGE (miniwave)	1	1	2	$\mathcal{X}$
PARTNER HINGE (couple)	1	3	0	$\mathcal{O}$
SPLIT/BOX CIRCULATE (women in front)	0	2	2	$\mathcal{X}$
SPLIT/BOX CIRCULATE (men in front)	2	0	2	$\mathcal{X}$
VEER LEFT/RIGHT	0	0	0	$\mathcal{O}$
TOUCH 1/4	1	1	2	$\mathcal{X}$
LEFT TOUCH 1/4	3	3	2	$\mathcal{X}$
RECYCLE (women in center)	2	0	2	$\mathcal{X}$
RECYCLE (men in center)	0	2	2	$\mathcal{X}$
SWING THRU (women in center)	0	2	2	$\mathcal{X}$
SPIN THE TOP (women in center)	3	3	2	$\mathcal{X}$
SQUARE THRU 1 (normal)	0	0	0	$\mathcal{O}$
SQUARE THRU 2	1	3	0	$\mathcal{O}$
SQUARE THRU 3	2	2	0	$\mathcal{O}$
SQUARE THRU 4	3	1	0	$\mathcal{O}$
BEND THE LINE (2-faced line)	1	1	2	$\mathcal{X}$

We made some simplifying assumptions in the above table regarding gender arrangements and handedness, for example considering only normal couples for SQUARE THRU, only right-hand 2-faced lines for BEND THE LINE, and so on. But, when only the final  $\mathcal{X}$ -or- $\mathcal{O}$  result is needed, one can see that *none of this matters*. BEND THE LINE is an  $\mathcal{X}$ . SQUARE THRU is an  $\mathcal{O}$  no matter how many hands are involved or whether the couples are sashayed. SWING THRU is an  $\mathcal{X}$  no matter what the handedness or gender arrangement is. The same is true for CENTERS TRADE, ENDS TRADE, and SPLIT CIRCULATE.

Since we disallow diamonds or T-bone boxes, either both numbers are even (all dancers start and finish facing head walls, or start and finish facing side walls) or both numbers are odd (all dancers start facing head walls and finish facing side walls, or vice versa). The sum of the two numbers is therefore always even. If the sum mod 4 is zero, the call is an  $\mathcal{O}$ . If it is 2, the call is an  $\mathcal{X}$ .

It should be emphasized that the formal definition just given is for explanation only. *You do not need to think about it when calling*. You only need to be aware of whether the call that you are using is an  $\mathcal{X}$  or an  $\mathcal{O}$ , which you can memorize from the table.

An important thing is that the  $\mathcal{X}$  or  $\mathcal{O}$  property of a call is:

1. Independent of the handedness of the setup.
2. Independent of whether men and women exchange roles.
3. Independent of whether you need to step to a wave (e.g. SWING THRU from facing couples) or rear back (e.g. SQUARE THRU from a wave). This is because no one changes facing direction.

So you are almost completely safe in just associating the  $\mathcal{X}$  or  $\mathcal{O}$  property with the call name. There are exceptions for unusual setups. The call FAN THE TOP is legal from 2-faced lines, but is an  $\mathcal{O}$  in that setup. Similarly, BOX CIRCULATE is an  $\mathcal{O}$  if it happens to be a partner trade or a pass thru. The above list assumes the “usual” types of setups. It is best simply not to use calls in unusual

setups while doing mental image calling. The only exception is HINGE, which is worth learning in both the miniwave form ( $\mathcal{X}$ ) and, if you call Advanced, the couple form ( $\mathcal{O}$ ).

BEND THE LINE from 1-faced lines (lines facing or lines back-to-back) is not a four-person symmetrical call under the mental image system, and cannot use the simple  $\mathcal{X}$  or  $\mathcal{O}$  characterization. It will be discussed later, in Chapter 7.

With this definition of  $\mathcal{X}$  and  $\mathcal{O}$  calls, we can see how the system worked when we called to the heads. Assuming a male active, when we got to an 8-chain setup with the active on his allemande spot, the head men had turned 3 quadrants clockwise. Since the sequence was an  $\mathcal{O}$ , the head women must have turned 1 quadrant clockwise in order for the sum to be a multiple of 4. The number 1 woman started facing away from us, so she is now facing to our right. The only way she can do that while being in the center of a normal-sex 8-chain is if she is on the correct spot.

## 6.1 Exercises

1. Decide whether the following calls are  $\mathcal{X}$  or  $\mathcal{O}$  based on the above description. You can check your answers with Appendix C.

BOX THE GNAT  
CAST OFF 3/4 (miniwave? 2-faced line?)  
CHAIN DOWN THE LINE  
CHASE RIGHT  
CENTERS/ENDS RUN  
CENTERS/ENDS CROSS RUN  
CROSSFIRE  
DIXIE STYLE TO A WAVE  
EXPLODE AND . . .  
FOLLOW YOUR NEIGHBOR  
HALF TAG (from a 2-faced line)  
LADIES CHAIN  
LEAD RIGHT/LEFT  
LINEAR CYCLE  
PEEL THE TOP (from a box)  
SINGLE CIRCLE TO A WAVE  
SPREAD (from a wave)  
TRADE THE WAVE  
WHEEL AROUND

2. Write some short sequences using these new calls that resolve to a correct allemande left.

## Chapter 7

# Reorienting Calls and Conditional Spot Moves

Now we are going to raise the level of difficulty somewhat. If you are having trouble using the system at this point, you might want to practice more before going further.

### 7.1 Conditional Spot Moves

We will use the terms “ $\mathcal{O}$ -conditional” and “ $\mathcal{X}$ -conditional” several times in the rest of this book. If an operation is “ $\mathcal{O}$ -conditional”, it means that, if the allemande spot is an  $\mathcal{O}$ , do not move it. If the spot is an  $\mathcal{X}$ , move it (whichever way works) by 2. “ $\mathcal{X}$ -conditional” means that, if the allemande spot is an  $\mathcal{X}$ , do not move it. If the spot is an  $\mathcal{O}$ , move it by 2.

These are purely mental actions that you do while calling, above and beyond the normal spot changes and moves that you do. They are done for some special purpose, relating to special calls like BEND THE LINE, for which the spot actions that we have discussed so far aren’t sufficient.

You already know about the “wrap-around” property of spot moves. Obviously, if you move the spot by 2, it doesn’t matter which way you move it—it just goes to an obvious “other” position:

$$\begin{array}{cc} \boxed{\mathcal{O}} \boxed{\phantom{\mathcal{O}}} \boxed{\phantom{\mathcal{O}}} \boxed{\phantom{\mathcal{O}}} \Leftrightarrow \boxed{\phantom{\mathcal{O}}} \boxed{\phantom{\mathcal{O}}} \boxed{\mathcal{O}} \boxed{\phantom{\mathcal{O}}} & \boxed{\phantom{\mathcal{O}}} \boxed{\mathcal{O}} \boxed{\phantom{\mathcal{O}}} \boxed{\phantom{\mathcal{O}}} \Leftrightarrow \boxed{\phantom{\mathcal{O}}} \boxed{\phantom{\mathcal{O}}} \boxed{\phantom{\mathcal{O}}} \boxed{\mathcal{O}} \\ \boxed{\mathcal{X}} \boxed{\phantom{\mathcal{X}}} \boxed{\phantom{\mathcal{X}}} \boxed{\phantom{\mathcal{X}}} \Leftrightarrow \boxed{\phantom{\mathcal{X}}} \boxed{\phantom{\mathcal{X}}} \boxed{\mathcal{X}} \boxed{\phantom{\mathcal{X}}} & \boxed{\phantom{\mathcal{X}}} \boxed{\mathcal{X}} \boxed{\phantom{\mathcal{X}}} \boxed{\phantom{\mathcal{X}}} \Leftrightarrow \boxed{\phantom{\mathcal{X}}} \boxed{\phantom{\mathcal{X}}} \boxed{\phantom{\mathcal{X}}} \boxed{\mathcal{X}} \end{array}$$

### 7.2 BEND THE LINE

Now that you have practiced calling with both orientations, we can do several more calls. The most important of these is BEND THE LINE from lines back-to-back.<sup>1</sup> This is more difficult than the calls we have been working with so far—it does not have a simple  $\mathcal{X}$  or  $\mathcal{O}$  description.

The rule is that it is a “re-orienting  $\mathcal{O}$ -conditional equivalent” to TRADE. That means that we do a TRADE for the active, and, if the allemande spot is an  $\mathcal{O}$ , do not change it. If the spot is an  $\mathcal{X}$ , move it by 2. Finally, we have to re-orient the setup. That means we change our mental image of the setup so that, if we were previously oriented left-to-right, as though we had started the sequence with the heads, it is now front-to-back, as though we had started the sequence with the sides.

<sup>1</sup>BEND THE LINE from a 2-faced line is a simple four-person  $\mathcal{X}$ .



You only do the TRADE, along with the spot movement and reorientation, in your head. You say the words “BEND THE LINE”, of course.

To see how this works, move your checkers through the actual sequences below, and also track the calls with the mental image system, substituting TRADE for BEND THE LINE:

HEADS SQUARE THRU 4  
SLIDE THRU  
PASS THRU  
BEND THE LINE (spot was an  $\mathcal{O}$ , so don't change it; just do this mentally as a trade)  
SLIDE THRU  
ALLEMANDE LEFT

Similarly,

HEADS LEAD RIGHT  
SQUARE THRU 2  
BEND THE LINE (spot was an  $\mathcal{X}$ , so you must move it by 2; while mentally doing a trade)  
PASS THE OCEAN  
RECYCLE  
EIGHT CHAIN 3  
ALLEMANDE LEFT

To do a BEND THE LINE from lines facing or back-to-back:

- If lines are facing out, mentally do a TRADE. If facing in, do nothing.
- If spot is an  $\mathcal{X}$  move it by 2.
- Reorient.

There is a proof of this in Appendix A, if you are interested.

There is one additional problem: BEND THE LINE changes the setup from lines facing head walls to lines facing side walls and vice versa. TRADE does not. This means that, from our mental image standpoint, if we started the sequence with the heads, our image is now oriented as though we had started with the sides.

If you want your mental image to match the real formation, just rotate your hand and your mental image, including the location of the active, by  $90^\circ$ . Which way should you rotate them? Whichever way feels comfortable for your wrist. There are only two orientations that you ever use: the “heads” orientation (back of the hand toward the dancers) and one or the other of the “sides” orientations (thumb toward the dancers), depending on which hand you use. When you call BEND THE LINE, just rotate naturally from the orientation you are in to the other orientation that is natural for you. Be sure to rotate your mental image of where the active is in the same direction as you rotated your hand.

You may find that, as you gain more experience, you don't rely on the accurate correlation between your mental image's orientation and that of the actual square. If so, the act of re-orienting will hardly bother you at all. You will use your mental square for getting the right corner, not bothering to re-orient it, while being aware that there are live people down on the dance floor. But you won't be too concerned with the exact connection between the two.

We have described BEND THE LINE only from lines facing out. If you want to call it from lines facing in, it is a “re-orienting  $\mathcal{O}$ -conditional zero”. So you don't do the mental TRADE at all. Just move an  $\mathcal{X}$  spot by 2 and re-orient the setup. The reason this works is that BEND THE LINE from lines facing in is equivalent to TRADE followed by BEND THE LINE from the resulting lines facing out.

## Chapter 8

# The Change of Active Operation

To do even more sophisticated calls, like WHEEL AND DEAL from lines back-to-back<sup>1</sup>, CLOVERLEAF, FIRST COUPLE GO LEFT, NEXT COUPLE GO RIGHT, and CIRCLE TO A LINE, we need to do something called “change of active”.

Change of active is an operation we can perform when we need the active to be someone other than who he currently is. Specifically, we want him in the other group of 4. We saw earlier that we can perform the call TRADE BY by just doing it, as long as the active is in the center. If the active is on the end, we needed to do something special. We could have used change-of-active, but what we did (move the active forward while wrapping him around) was simpler. For WHEEL AND DEAL from lines back-to-back, we must have the active on the left-side couple—there is no simple trick that lets us avoid this.

The change-of-active operation changes the active to the corresponding person in the other four-person setup. The two setups are always identical formations, so anyone’s counterpart in the other setup is always of the same sex, and is facing the same way. We don’t call anything while doing this; it’s a silent mental operation. You need to be sufficiently skilled at mental image calling that you can do this quickly as part of the mental operation you go through for the call.

### Change of Active

We can change the active to the corresponding person on the other side. Mentally drop the current active and start using his counterpart in the other four-person group. The dancers don’t do anything; they don’t know that you are doing this. If the allemande spot is an  $\mathcal{X}$ , don’t do anything to it. If it is an  $\mathcal{O}$ , move it by 2 positions.

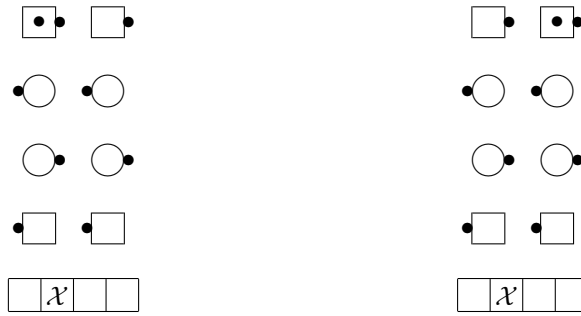
We have identical formations on each side at any time when we aren’t calling specifically to the centers. If we start with HEADS PASS THE OCEAN, the active has no counterpart anywhere else. Of course, we wouldn’t want to change the active in that setup anyway, because we need him in the center.

There is a proof of this in Appendix A, if you are interested.

Here is an example of this operation:

---

<sup>1</sup>WHEEL AND DEAL from a 2-faced line is a simple four-person  $\mathcal{O}$ .



In this case, the allemande spot didn't move, because it is an  $\mathcal{X}$ . The getout is SWING THRU, RIGHT AND LEFT GRAND (or RECYCLE, PASS THRU, ALLEMANDE LEFT) both times. When doing the SWING THRU, the active pulled the spot to the left in the first case, and to the right in the second case. Either way, the RIGHT AND LEFT GRAND getout is correct.

Here is another example, when the allemande spot is an  $\mathcal{O}$ :



In this case, the allemande spot moved. The getout is PASS THRU, ALLEMANDE LEFT both times.

You should not need to perform an explicit change of active unless you do some of the more sophisticated calls described later in this book.

## 8.1 Exercises

1. We have seen that we can do TRADE BY when the active is on the outside, by pushing him forward, off the end of the setup, and letting him “wrap around” to the position way behind him. Show that we could have gotten the same result by doing a change of active, which puts him in the center, doing the simpler action for TRADE BY from that position, and doing another change of active. By doing the change of active twice, we don't have to worry about whether the allemande spot was an  $\mathcal{X}$  or an  $\mathcal{O}$ —the two spot moves, if any, cancel.

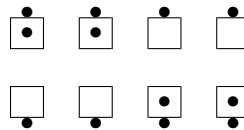
## 8.2 WHEEL AND DEAL from lines back-to-back

WHEEL AND DEAL from lines back-to-back is one of the more difficult calls to master. It requires both re-orientation and change of active. But since it is a staple of Mainstream, we will describe it here.

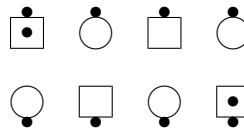
To do a WHEEL AND DEAL from lines back-to-back:

- Be sure the active is in the left-side couple of his/her line. Use change-of-active if necessary to make this so.
- Rotate the active's couple (including the active, of course) clockwise 90° around in its box of 4.
- Change an  $\mathcal{O}$  to an  $\mathcal{X}$  or  $\mathcal{X}$  to an  $\mathcal{O}$ , and push the spot away from the active in either case.
- The active is now in the center of a DPT setup.
- Reorient.

You must first make sure that the active is in the left-side couple, that is, one of these spots:



Of course, if your active is a man, and the couples are normal, it will be one of these spots:

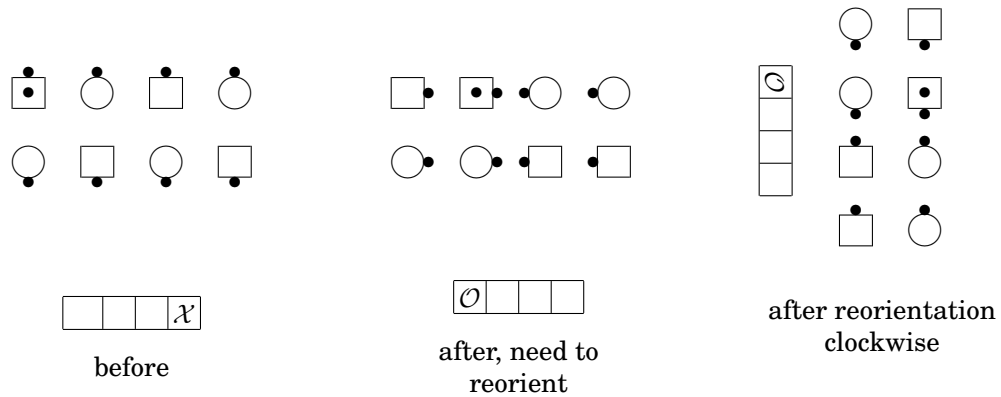


Next, rotate the active's group of four clockwise, for example, like this:



Don't worry about the couple behind them; they will magically take care of themselves.

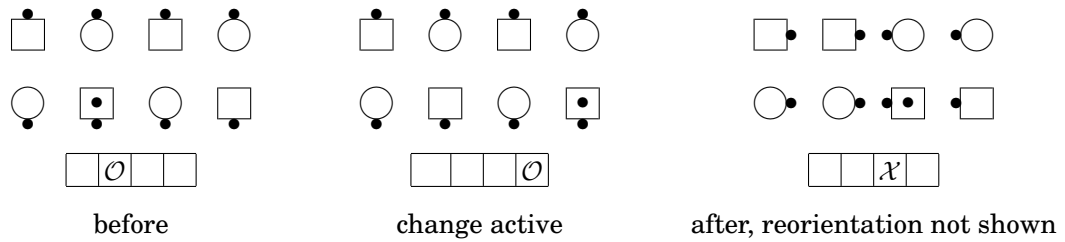
This will leave the active in the center if everything was done correctly. Here is an example:



Illustrated by this sequence:

HEADS FAN THE TOP  
 EXTEND  
 RECYCLE  
 PASS THRU  
 TRADE BY  
 TOUCH 1/4  
 WALK AND DODGE  
 WHEEL AND DEAL  
 CENTERS SQUARE THRU 3  
 PASS THRU  
 ALLEMANDE LEFT

Here is another case, requiring change of active:



Illustrated by this sequence:

HEADS SQUARE THRU 4  
 EVERYONE SQUARE THRU 4  
 WHEEL AND DEAL  
 CENTERS PASS THRU  
 TOUCH 1/4  
 WALK AND DODGE  
 BEND THE LINE  
 SLIDE THRU  
 ALLEMANDE LEFT

Note that the result of WHEEL AND DEAL from lines back-to-back is a starting DPT, which is not sex-symmetric. So the next call will have to be a 4-person call to the centers, or one of the special calls, described later, that can deal with a DPT. You can't just call four-person calls to each side in this case, because those four-person groups are not sex-symmetric.

### 8.3 Exercise, hard, not really essential, but fun

1. The mental image formulations for calls are almost always completely symmetrical—there is no mention of moving the active or the allemande spot “left” or “right”, or mention of handedness or “clockwise”/“counterclockwise”. But WHEEL AND DEAL from lines back-to-back is an exception to this. The reason is that this call has a handedness to it: the couple on the right goes in front. The formulation for a LEFT WHEEL AND DEAL<sup>2</sup> would involve putting the active on the *right* side couple, and turning his couple *counterclockwise* instead of clockwise, while changing the spot and pushing it away.

The difference between WHEEL AND DEAL and LEFT WHEEL AND DEAL is a ZOOM. So, if we are in a starting DPT (with the active in the center, of course), we could effectively do a ZOOM by *undoing* a WHEEL AND DEAL and then doing a LEFT WHEEL AND DEAL.

Work out the mental image formulation, from a starting DPT, of undoing a WHEEL AND DEAL and then doing a LEFT WHEEL AND DEAL. Show that one moves the allemande spot by 2 if and only if it is an  $\mathcal{O}$ , and, in all cases, takes the active's opposite. Note that this leaves the active in the center, as required for a starting DPT, and that it has no handedness asymmetry. This is how one does a ZOOM.

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<sup>2</sup>Is that a legal call? Not for us to say.

## Chapter 9

# Double Pass Thru Formation

The double pass thru (DPT) and completed double pass thru (CDPT) formations violate the rules of having a symmetric setup on each side, so it seems that we can't deal with them in a general way. However, we already know how to have the HEADS or SIDES STAR THRU and those four do some calls in the center. The trick was that, as long as we call only to the centers, the ends don't need to match them. We only need to match the centers and ends when we want to start calling to everyone.

What we are going to do now is add some full eight-person DPT and CDPT setups to our repertoire so that we can call, for example, FERRIS WHEEL, DOUBLE PASS THRU, and TRACK 2.

We make the following formulation:

DPT setup:

- A DPT setup is legal only if the active is in the center. Of course, we've been living with this since we called HEADS STAR THRU.
- A DPT is equivalent, for mental image purposes, to the trade by setup that would be obtained if we had the ends trade. It follows that we can only do DPT calls when we have the same sex in tandem with each other.

Like so many aspects of the mental image system, this "equivalence" statement sounds more forbidding than it really is. In practice, you don't have to worry about that trade on the outside. Things work out pretty well. You *do* need to worry about making sure the active is in the center.

To see that this formulation doesn't actually violate any of our rules, notice that we can call HEADS SQUARE THRU 4, yielding a legitimate 8-chain from which we can call TRADE on each side. These are all trivial  $\mathcal{O}$  calls, and leave the active and allemande spot exactly where they would be if we had simply called STAR THRU and then had the centers trade. What this means is that, while normally we don't allow calling just to the outsides or calling to a group that does not contain the active, a partner trade on the outside is harmless.

HEADS STAR THRU  
CENTERS TOUCH  
CENTERS RECYCLE  
CENTERS PASS THRU     (HEADS LEAD LEFT would also have gotten us here.)  
TOUCH 1/4  
WALK AND DODGE  
BEND THE LINE

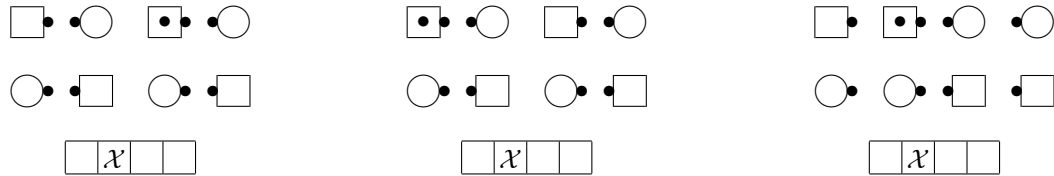
SLIDE THRU  
 PASS THRU  
 ALLEMANDE LEFT

## 9.1 PASS TO THE CENTER and DIVE THRU

These calls have been discussed previously. In their simplest form, just make sure the active is on the outside, and then do the call. If the active is not on the outside, use the change-of-active operation to get him there. So the rule for these two calls is just this:

DIVE THRU and PASS TO THE CENTER

- Be sure the active is on the outside. Use the change-of-active if necessary.
- Have the active PASS THRU.
- The setup is now a DPT, with the active in the center, as required.



after HEADS LEAD RIGHT    change active, spot doesn't move    after PASS TO THE CENTER

From here we could do CENTERS SWING THRU, CENTERS TURN THRU, ALLEMANDE LEFT.

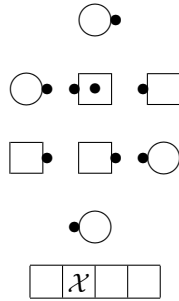
That's pretty simple for an eight-person call. Of course there are subtle differences between the two calls – DIVE THRU is considered tasteless if people are sashayed, and PASS TO THE CENTER can be done from waves, since it starts with a PASS THRU. You know all that.

So what can we do in a DPT setup? We will discuss the calls DOUBLE PASS THRU and ZOOM shortly. Other than that, we are largely limited to having the four people in the center do things. When they get into a back-to-back setup among themselves, so that they are facing the outsides, we can notice that we have an 8-chain setup, and start calling to everyone. The simplest thing to do along those lines is PASS THRU. We can also have the centers SQUARE THRU 3. In fact, many other things are possible, including  $\mathcal{X}$  calls (like SWAP AROUND) and complex things that temporarily go into other formations (TOUCH 1/4, BOX CIRCULATE, QUARTER THRU, EXTEND). The thing we have to be careful about is not to get them sashayed relative to the outsides. Common culprits in this regard are SWING THRU and SPIN THE TOP. If we called a CENTERS SWING THRU from a DPT, we couldn't then have them EXTEND to the outsides. (Remember that EXTEND is analyzed, for the purposes of mental image, as CENTERS STEP THRU to form an 8-chain, and then everyone STEP TO A WAVE. The dancers don't know that. To them it's just dancing.)

We could fix this problem by having the centers SWING THRU again before the EXTEND. Another thing we can do is tell the outsides to HALF SASHAY. If you are calling to the centers, and you see that they are going to come out sashayed relative to the outsides, just call OUTSIDES HALF SASHAY while they are waiting. (To see that this works, observe that it is equivalent to having the centers HALF SASHAY, which would give a legal 8-chain setup, followed by everyone HALF SASHAY, which is a legal call in each box. Note also that HALF SASHAY is an  $\mathcal{O}$ .)



HEADS SPIN THE TOP WHILE THE SIDES HALF SASHAY



From here we could do EXTEND, BOYS RUN, WHEEL AND DEAL, PASS THRU, ALLEMANDE LEFT.

## 9.2 FERRIS WHEEL

Another simple call we can do involving DPT setups is FERRIS WHEEL.

### FERRIS WHEEL

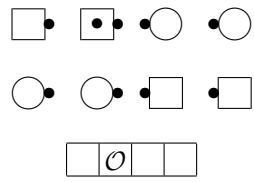
- Be sure the active is looking in. Use change-of-active (or call a COUPLES CIRCULATE) if necessary to make this so.
- Just do the call. The active is now in the center of a DPT setup.

## 9.3 ZOOM from a DPT setup

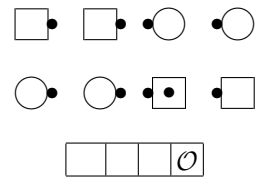
ZOOM is an  $\mathcal{X}$ -conditional equivalent to CENTERS RIGHT AND LEFT THRU. “ $\mathcal{X}$ -conditional” means it’s an equivalent if the allemande spot is an  $\mathcal{X}$ , and the spot needs to move by 2 if it is an  $\mathcal{O}$ . See Section 7.1 and 21.4 for more details about conditional equivalents.

### ZOOM in a DPT setup

- The active must be in the center, of course.
- Change to the active’s global opposite in the center, that is, have the active effectively do a RIGHT AND LEFT THRU in the center.
- It’s “ $\mathcal{X}$ -conditional”—if the allemande spot is an  $\mathcal{O}$ , move it by two. If it is an  $\mathcal{X}$ , leave it alone.



HEADS STAR THRU



after ZOOM

Note, by the way, that ZOOM from an ordinary box (e.g. columns) is just a normal 4-person call, and it is an  $\mathcal{O}$ .

## Chapter 10

# Completed Double Pass Thru Formation

Now we need to figure out how to represent a completed double pass thru (CDPT) setup. Strange as it may seem, we use a formulation that has the active on the *outside*, not in the center. The reason for making this formulation is that DOUBLE PASS THRU naturally goes into a CDPT with the active on the outside, and the common things that one would do from there (TRACK 2, CLOVERLEAF, and OUTSIDES TRADE lend themselves nicely to this.)

It follows that you must not call things to the centers (e.g. CENTERS CHASE RIGHT, THOSE BOYS RUN) while in a CDPT. The only things you may do are the few things we will discuss here.

Here is the formulation:

CDPT setup: A CDPT setup is legal only if the active is on the outside. It is equivalent to the Trade By setup that would be obtained by having the centers TRADE. A CDPT must have the same sex in tandem with each other.

### 10.1 ENDS TRADE

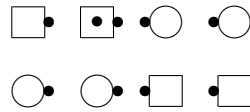
This is simple. Just do it. You will then have an 8-chain setup.

### 10.2 DOUBLE PASS THRU

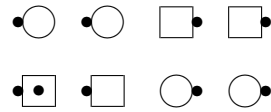
The call DOUBLE PASS THRU is somewhat peculiar, but it is well worth learning because it is very useful.

Starting in a DPT setup with the active in the center, mentally change to the active's local opposite on his side of the set, and turn him around. This mental action is like a TRADE and PASS THRU with the outside that he now faces. The allemande spot does not change. The setup is now a CDPT with the active on the outside, as required.

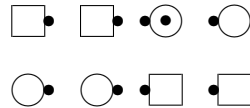
The mental action is like a TRADE and PASS THRU:



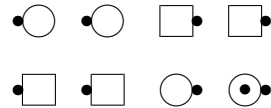
HEADS STAR THRU



after DOUBLE PASS THRU



before



after DOUBLE PASS THRU

The active's fictitious motion is actually quite easy once you get used to it.

#### DOUBLE PASS THRU

- The active starts in the center, as usual.
- Change the active to his local opposite, that is, the opposite corner of his 2x2 box.
- The active is now on the outside of a CDPT, as required.

### 10.3 ZOOM from a CDPT setup

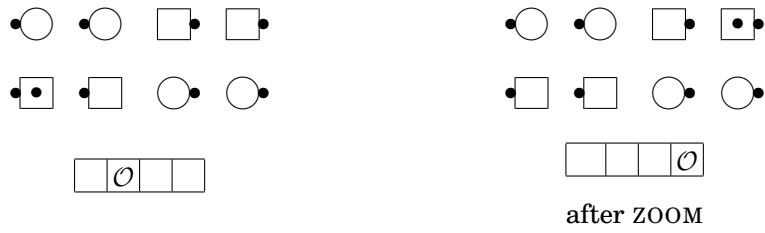
From a completed DPT, the call ZOOM is an  $\mathcal{X}$ -conditional equivalent to having the active switch with his opposite.

#### ZOOM in a CDPT setup

- The active starts on the outside, as usual.
- Change to the active's global opposite on the other side.
- If the allemande spot is an  $\mathcal{O}$ , move it by two. If it is an  $\mathcal{X}$ , leave it alone.

Example:

HEADS STAR THRU, DOUBLE PASS THRU



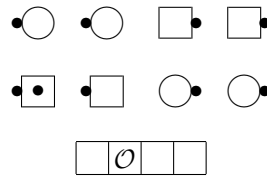
From here we could do OUTSIDES TRADE, ALLEMANDE LEFT.

## 10.4 CLOVERLEAF

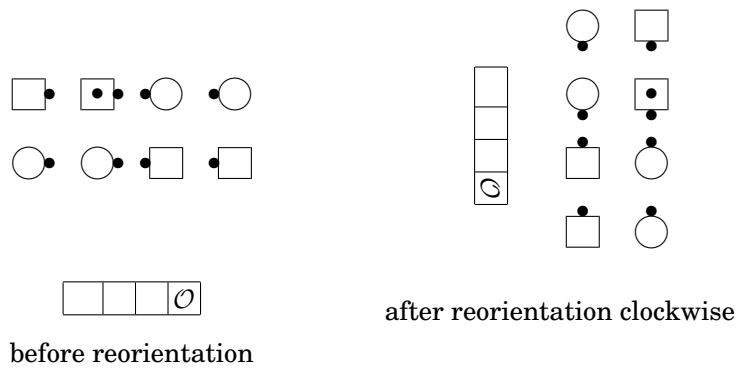
Do the opposite of the mental action you do for DOUBLE PASS THRU. This is effectively a TRADE and PASS THRU. Then move the spot by 2 in all cases. Finally, reorient the set.

Example:

HEADS STAR THRU, DOUBLE PASS THRU



CLOVERLEAF



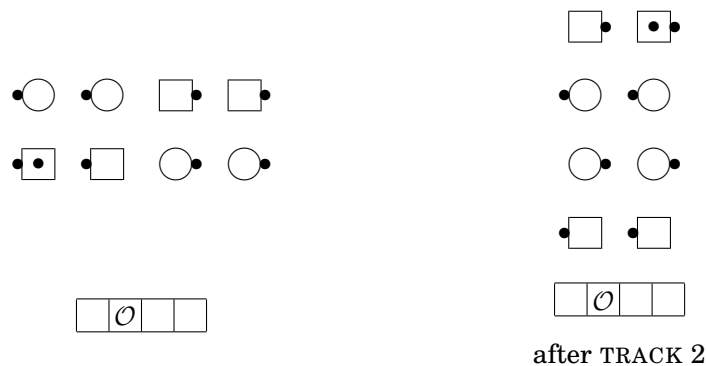
From here we could do CENTERS PASS THRU, SLIDE THRU, SLIDE THRU, ALLEMANDE LEFT.

## 10.5 TRACK 2

This is extraordinarily simple. It is an eight-person call, with all the potential for complexity that eight-person calls have, but the complexities happen to cancel each other. Just have the active do the call.

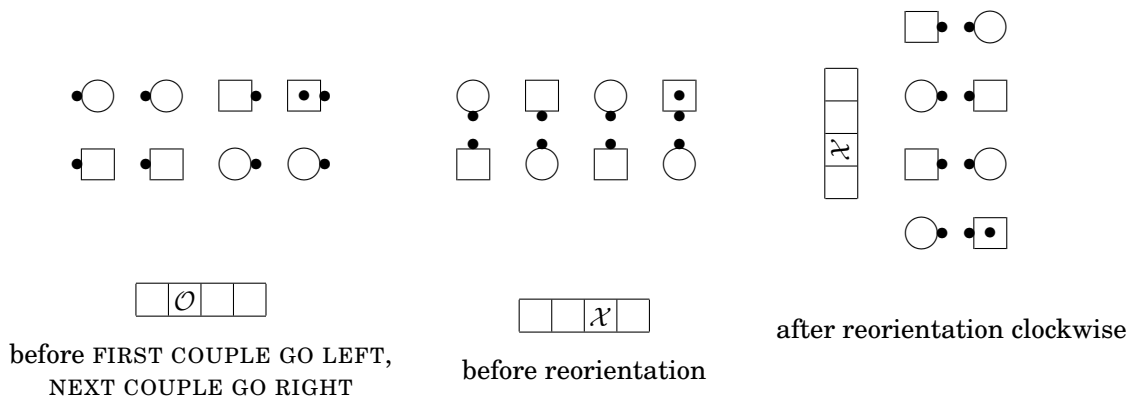
### TRACK 2

- The active starts on the outside, of course. Just do it. The other people will magically take care of themselves.



## 10.6 FIRST COUPLE GO LEFT, NEXT COUPLE GO RIGHT

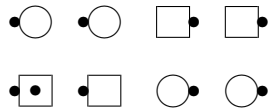
Have the active's couple undo the action of a LEAD LEFT. (If the active is a man and the couples are normal, he just does a QUARTER RIGHT.) Change the spot from  $\mathcal{O}$  to  $\mathcal{X}$  or  $\mathcal{X}$  to  $\mathcal{O}$ , and pull it toward the active. Finally, reorient the set.



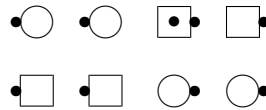
For FIRST COUPLE GO RIGHT, NEXT COUPLE GO LEFT, just undo the action of a LEAD RIGHT instead of LEAD LEFT.

## 10.7 Calling to the Centers of a CDPT

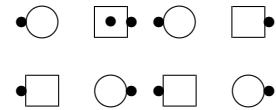
Actually, we *can* call to the centers of a CDPT, though it is probably not something that one wants to do very much of. To do this, after the DOUBLE PASS THRU that got into the CDPT with the active on the outside, do a special version of change-of-active. In this version, the active moves, not to the once-removed position, but to the (chess) “knight’s move” position. As usual, the allemande spot moves by 2 if it is an  $\emptyset$ .



Before weird  
change-of-active



after  
change-of-active



after centers chase right  
and the center boy run

# Chapter 11

## Columns

Columns with alternating sex are just two sex-symmetric box setups, and, as such, can be handled in a straightforward way by the mental image system. Any applicable four-person call can thus be called. Among the more obvious such calls are:

- TOUCH 1/4 (Facing lines to columns, this is an  $\mathcal{X}$ )
- BOYS/GIRLS RUN (Columns to 8-chain or trade by, or vice-versa, this is an  $\mathcal{X}$ )
- SPLIT CIRCULATE (not tasteful, this is an  $\mathcal{X}$ )
- TRIPLE SCOOT (technically eight-person call but is just a TRADE, it is an  $\mathcal{O}$ )
- HINGE (columns  $\Leftrightarrow$  tidal wave, this is an  $\mathcal{X}$ )
- CROSSFIRE (2-faced lines to columns, this is an  $\mathcal{O}$ )

The major problem is that COLUMN CIRCULATE is a difficult eight-person call that is nearly indispensable. So we just have to deal with it.

### COLUMN CIRCULATE

- If the active is a trailer in his box of four (that is, number 2 or 4 in the column), move the allemande spot in the direction that he faces. If the active is a leader in his box (number 1 or 3 in the column), move the spot in the opposite direction from his facing direction. The spot motion wraps around if necessary.
- Do not change the  $\mathcal{X}$  or  $\mathcal{O}$  nature of the spot.
- In any case, move the active backwards, wrapping around if needed. That is, if the active was initially number 4 in the column, the wraparound effectively pushes him forward 3 places to be number 1.

The spot motion could be described as “move the spot in the same direction as the direction from the active towards his tandem partner.” A person’s “tandem partner” is the person he is naturally paired with in tandem. This is analogous to the normal “lateral” partner, which is the person someone is naturally paired with laterally. So if the active is a leader, his tandem partner is behind him, so the spot moves “backward” relative to the way he faces. If the active is a trailer, his tandem partner is in front of him, so the spot moves “forward” relative to his facing direction.

It should be emphasized that, unlike many other calls, the spot motion is *not* characterized as being “toward” or “away from” the active. Which side of the set the active is on doesn’t matter.

If the active is in any of these indicated places:





the spot motion is left to right (as seen by the caller).

If the active is in any of these places:



the spot motion is right to left.

There is an important simplification we can make, so that we don't have to deal with the complexity of the two very different rules for which way the spot goes and which way the active goes. Most column circulates start with women in the lead and men as trailers. If you restrict yourself to that arrangement only, you will still be able to call reasonable figures with mental image. So, if your active is a man:

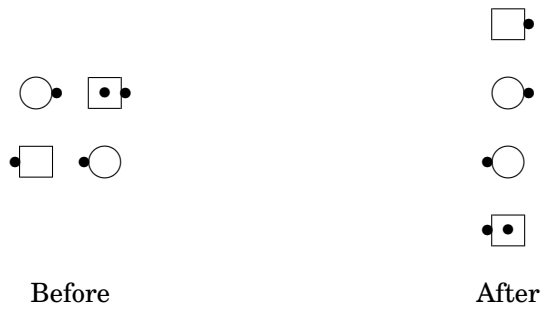
The active must be a trailer. The spot goes forward and he goes backward.

and don't bother learning the next rule. If your active is a woman, don't bother with the preceding rule. Learn this one instead:

The active must be a leader. Both she and the spot move backward.

## 11.1 COORDINATE

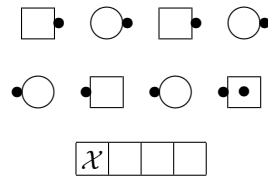
Once we have mastered COLUMN CIRCULATE, COORDINATE is easy. It is equivalent to COLUMN CIRCULATE and TRAIL OFF. Even if you don't call the A2 program, but call Plus, you should learn TRAIL OFF, just so you can do COORDINATE. It is a simple  $\mathcal{O}$  call. Remember that the men will be leads and the women trailers at this point. So, for a male active, TRAIL OFF is just this:



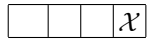
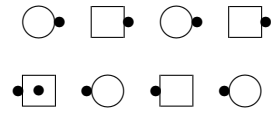
For a female active, just learn this:



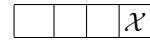
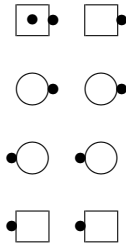
HEADS SQUARE THRU 2, SLIDE THRU, TOUCH 1/4



COORDINATE



after CIRCULATE



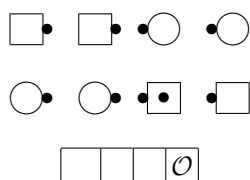
after TRAIL OFF

From here we could do BEND THE LINE, SLIDE THRU, EIGHT CHAIN 3, ALLEMANDE LEFT.

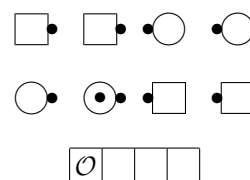
## Chapter 12

# Dixie Grand Getouts

While we are on the topic of using calls like PASS THRU and TRADE BY for getouts, we might as well look at another getout that is very similar. This is the DIXIE GRAND setup:



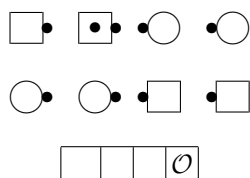
Male active



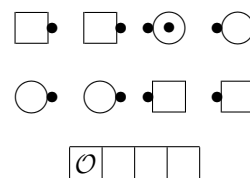
Female active

That is, the active must be in the column close to us, and must be in the center. The allemande spot must be an  $\mathcal{O}$  and must be “behind” him or her. When in this setup, you can call DIXIE GRAND, ALLEMANDE LEFT.

Likewise, from here:



Male active



Female active

you can call SQUARE THRU, BUT ON THE 3RD HAND, DIXIE GRAND.

## Chapter 13

# Diamonds

Diamond setups are unusual in that the usual analysis of calls as  $\mathcal{X}$  or  $\mathcal{O}$  doesn't work because some dancers are off  $90^\circ$  from others. We can nevertheless handle diamonds through a special trick.

The formulation that we make is:

For the purposes of  $\mathcal{X}$ s and  $\mathcal{O}$ s, a diamond is equivalent to the wave or 2-faced line that would result from FLIP THE DIAMOND or CUT THE DIAMOND.

It follows from this that FLIP THE DIAMOND and CUT THE DIAMOND are  $\mathcal{O}$  calls by definition. (FLIP THE DIAMOND and CUT THE DIAMOND differ only by a SLITHER, which is an  $\mathcal{O}$ .)

We can handle both normal and facing diamonds. As usual, you are responsible for formation management. You must be aware of which kind of diamond you have, and that FLIP THE DIAMOND turns normal diamonds into waves and facing diamonds into 2-faced lines, while CUT THE DIAMOND does the opposite.

Here are some simple four-person calls from diamonds:

DIAMOND CIRCULATE (normal or facing)	$\mathcal{X}$
FLIP THE DIAMOND	$\mathcal{O}$
CUT THE DIAMOND	$\mathcal{O}$
CENTERS HINGE (from diamond)	$\mathcal{X}$
CENTERS CAST OFF 3/4 (from diamond)	$\mathcal{O}$
CENTERS HINGE (from wave or 2-faced line)	$\mathcal{O}$
CENTERS CAST OFF 3/4 (from wave or 2-faced line)	$\mathcal{X}$
CENTERS TRADE (from diamond)	$\mathcal{X}$
CENTERS U-TURN BACK (from diamond)	$\mathcal{O}$ !!!!!
CENTERS SLIDE (from diamond)	$\mathcal{X}$ !!!!!
SPLIT CIRCULATE 1/2 (from mini-wave box)	$\mathcal{O}$
SPLIT CIRCULATE 1-1/2 (from mini-wave box)	$\mathcal{X}$
SWITCH TO A DIAMOND	$\mathcal{X}$

How about 6X2 ACEY DEUCEY from the Advanced program? Sorry, the system just can't handle it, though you can make up modules that contain it.

Here is something you need to be careful about. You are by now sufficiently familiar with  $\mathcal{X}$  and  $\mathcal{O}$  calls to know that any call that just has just one sex turn around is an  $\mathcal{X}$ . For example, from waves, BOYS/GIRLS/CENTERS/ENDS U-TURN BACK is an  $\mathcal{X}$ . This is *not true* for the centers of diamonds. Observe that FLIP THE DIAMOND and CENTERS U-TURN BACK, FLIP THE DIAMOND leave people

facing the same way, so the setup will be in the same  $\mathcal{X}$  or  $\mathcal{O}$  state. However, POINTS U-TURN BACK is an  $\mathcal{X}$ , as one would expect.

# Chapter 14

## Tag the Line

While the mental image system can't handle all possible varieties of TAG THE LINE-type calls, it can handle a reasonable number of them. They come in two broad categories:

- Setups that are two sex-symmetric lines, that is, waves or 2-faced lines. These are just ordinary 4-person calls, and the only issue is deciding whether they are  $\mathcal{X}$  or  $\mathcal{O}$  calls.
- Setups that are two sex-symmetric boxes in the form of lines, typically lines facing out. These require fictitious moves.

Surprisingly, these two categories have a lot in common. But first, there are some restrictions to be aware of.

The first restriction is that the system can't handle TAG THE LINE 1/4 or TAG THE LINE 3/4. Also, TAG THE LINE 1/2 is only permissible in the first category—sex-symmetric lines. In all other cases, it has to be TAG THE LINE ALL THE WAY.

A little checker pushing will also show why these restrictions exist: The result would be a formation that the system can't handle.

Another significant restriction is that the system requires that, after a full TAG THE LINE, a direction must be given. Just going to a completed DPT setup and continuing from there would give a result that is essentially useless. Also, the direction must be RIGHT, LEFT, ZIG-ZAG, or ZAG-ZIG when the setup is parallel waves or 2-faced lines, and must be IN, OUT, ZIG-ZAG, or ZAG-ZIG when the setup is boxes. For example, one couldn't call TAG THE LINE, FACE IN from parallel 2-faced lines, or TAG THE LINE, FACE RIGHT from lines facing out, because the result would not be two sex-symmetric setups.

That's a lot of confusing restrictions. But there is one unifying principle that makes things not quite so bad:

**In all cases**, if the complete call (including the final direction) preserves wave-ness or couple-ness, it is an  $\mathcal{O}$ . Otherwise it is an  $\mathcal{X}$ .

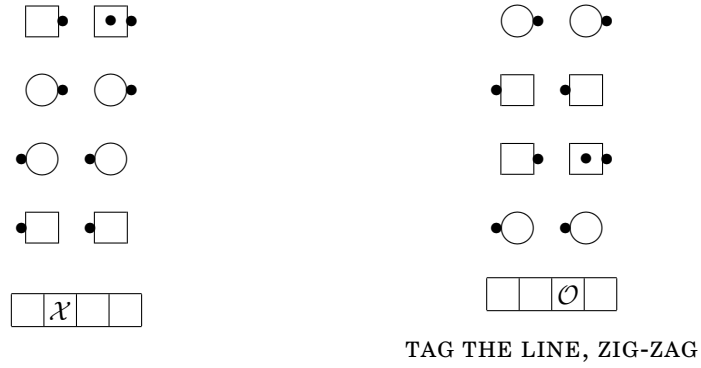
That is, if it starts in waves and ends in waves, it is an  $\mathcal{O}$ . This applies both to parallel waves or to side-by-side boxes that happen to be waves.

Similarly, if it starts in couples of any kind: 2-faced parallel lines, or side-by-side boxes that happen to be lines facing in or out, and ends in a similar formation, it is an  $\mathcal{O}$ .

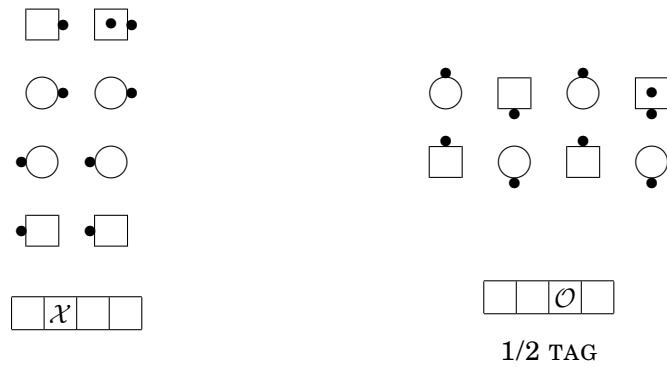
If it starts in a couple-like formation and ends in a wave-like formation, or vice-versa, it is an  $\mathcal{X}$

# 14.1 Tag the Line from Parallel Waves or 2-Faced Lines

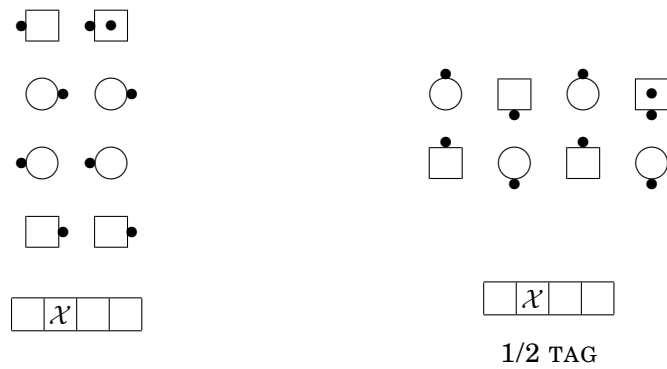
This example changes couples to waves, so it is an  $\mathcal{X}$ :



This also changes couples to waves/miniwaves, so it too is an  $\mathcal{X}$ :



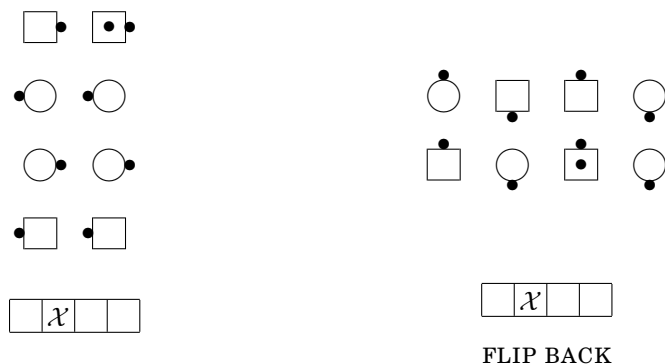
This one preserves wave-ness, so it is an  $\mathcal{O}$ :



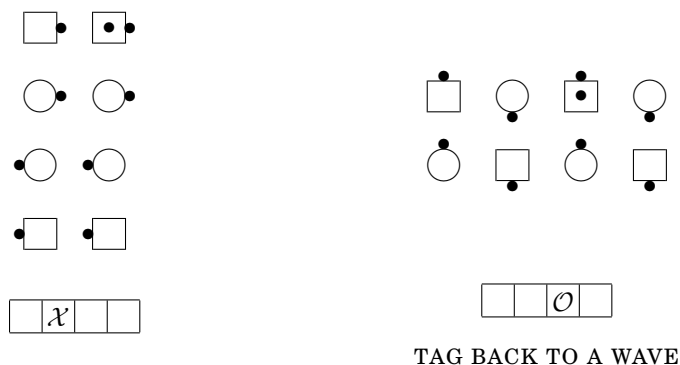
This trick applies to FLIP THE LINE also. Of course, the starting setup must be a wave. FLIP THE



LINE, ZIG ZAG and FLIP THE LINE, ZAG ZIG start and ends in miniwaves, so it is an  $\mathcal{O}$ . FLIP THE LINE, FACE RIGHT/LEFT starts in waves but ends in couples, so it is an  $\mathcal{X}$ . FLIP THE LINE 1/2 (or 2/3 RECYCLE) is an  $\mathcal{O}$ . FLIP BACK is also an  $\mathcal{O}$ , because SCOOT BACK is an  $\mathcal{O}$ . But FLIP YOUR NEIGHBOR is an  $\mathcal{X}$  because FOLLOW YOUR NEIGHBOR is an  $\mathcal{X}$ .



From a 2-faced line, TAG BACK TO A WAVE is an  $\mathcal{X}$ , and TAG YOUR NEIGHBOR is an  $\mathcal{O}$ .



## 14.2 Tag the Line from Back-to-Back (or Facing) Lines

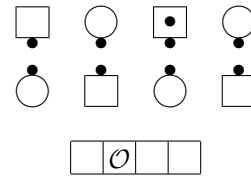
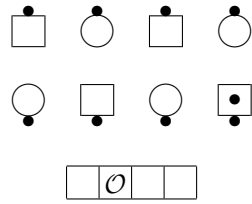
When the starting setup is back-to-back lines, the two sex-symmetric setups are 2x2 boxes, consisting of back-to-back couples, next to each other. The call takes people into the other box, so this is not a nice 4-person call. The boxes interact with each other, so it is an 8-person call, requiring a special rule and a fictitious motion, though it isn't very difficult.

From back-to-back lines, TAG THE LINE AND FACE OUT is done by taking the active's local opposite in his 4-person box. Similarly for other facing directions.

To see that this works, observe that the two actions (the actual call and the taking of one's local opposite) differ only by a complete 180° rotation of the entire set, which has no effect on the correctness of the resolution.

For other facing directions, just turn the active around as needed, applying the  $\mathcal{O}$ -if-wave-ness-is-preserved rule as needed.

HEADS SQUARE THRU 2, EVERYONE SQUARE THRU 2



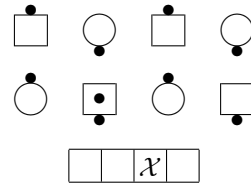
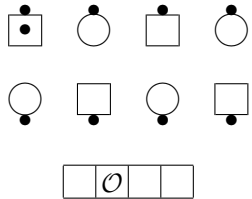
TAG THE LINE IN

From here we could do STAR THRU, TRADE BY, ALLEMANDE LEFT.

You can do this from lines facing either in or out, but many people consider it distasteful to call TAG THE LINE from lines facing in.

You can even do this from waves (they would be boy-girl-boy-girl waves), and/or give the final directions ZIG-ZAG, or ZAG-ZIG

HEADS SQUARE THRU 4, EVERYONE SQUARE THRU 2

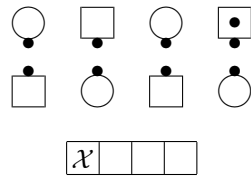
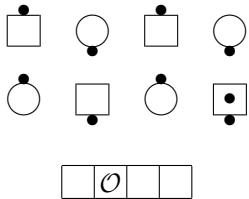


TAG THE LINE ZIG-ZAG

From here we could do FOLLOW YOUR NEIGHBOR, SCOOT BACK, ALLEMANDE LEFT.

In fact, it is even possible to do FLIP THE LINE followed by a direction of IN, OUT, ZIG-ZAG, or ZAG-ZIG. But since FLIP THE LINE swaps the order of people doing the tagging motion, change the active to the person directly in front or behind him instead of his local opposite. Make him face in the correct direction, and apply the O-if-wave-ness-is-preserved rule as usual.

HEADS SQUARE THRU 2, TOUCH 1/4, SPLIT CIRCULATE



FLIP THE LINE, FACE IN

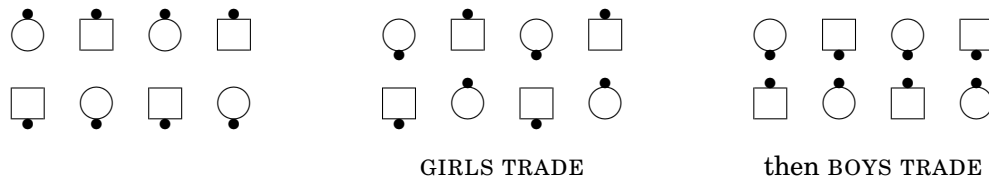
From here we could do PASS THRU, WHEEL AND DEAL, DIXIE GRAND, ALLEMANDE LEFT.

## Chapter 15

# Boys/Girls Trade Down the Line

Typically from back-to-back lines, the caller can say **GIRLS TRADE** or **GIRLS TRADE DOWN THE LINE**, and the same for the boys. The result is two sex-symmetric boxes, that is, waves with one sex looking in and one looking out. The lines can be facing in or out, normal or sashayed, and either sex can be doing the trade.

It is also possible to do the opposite. From side-by-side sex-symmetric boxes, have one or the other sex trade down the line, resulting in lines facing in or out.



While these calls can't be handled naturally by the mental image system, they have fairly simple formulations as fictitious moves.

In the following, "boys" actually means "the active's gender". If the active is a woman, swap the two formulations.

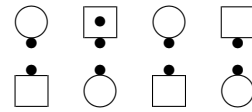
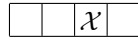
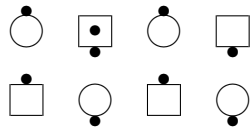
**GIRLS TRADE DOWN THE LINE**, from lines or parallel boxes

Move the allemande spot by 2 without changing it.

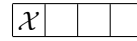
Be aware that the formation has changed, that is, that the girls are now facing the other way, but do not process that as a call.

The active does not move.

Do not process the apparent "GIRLS U-TURN BACK" as a call. Just be aware that, in the resulting setup, they will be facing the other way.



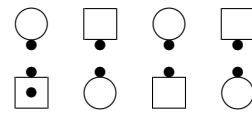
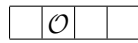
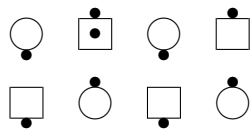
GIRLS TRADE



BOYS TRADE DOWN THE LINE, from lines or parallel boxes

Move the allemande spot by 2 without changing it.

Move the active to his local opposite spot, but facing the same direction as before. It is typically a “diagonal back up” motion. This means that, in the resulting setup, the boys have effectively turned around.



BOYS TRADE



# Chapter 16

## Boys/Girls Circulate

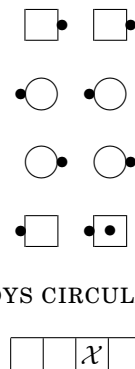
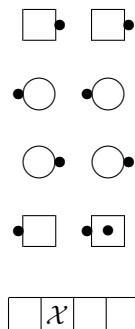
The system can handle BOYS CIRCULATE or GIRLS CIRCULATE from waves or 2-faced lines. By “boys” we actually means “the active’s gender”. If the active is a woman, swap the two formulations given here.

You can also call CENTERS CIRCULATE or ENDS CIRCULATE, making the appropriate verbal transformation.

BOYS CIRCULATE, from waves or 2-faced lines

Move the allemande spot one position, in the direction opposite the active’s facing direction, without changing it. You can think of this as the “wind in your face” direction.

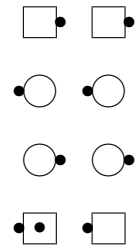
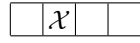
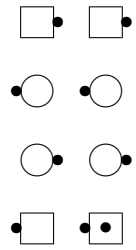
Do not move the active.



GIRLS CIRCULATE, from waves or 2-faced lines

Move the allemande spot one position, in the same direction as the active’s facing direction, without changing it. You can think of this as the “wind at your back” direction.

Move the active forward or backward as if doing an ALL 8 CIRCULATE.



GIRLS CIRCULATE



## Chapter 17

# Acey Deucey

This call is a little less straightforward than the calls we have been discussing, but it is very common, so you might want to learn it.

ACEY DEUCEY, from waves or 2-faced lines

- The active must be looking in. Use change of active, if required, to make this so.
- Move the active through the actual call—the motion is not fictitious. The active does a SLIP if in the center, or CIRCULATES forward if on the end.
- Change the nature of the allemande spot,  $\mathcal{X}$  to  $\mathcal{O}$  or  $\mathcal{O}$  to  $\mathcal{X}$ , without moving it.

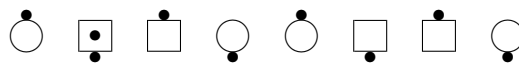
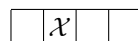
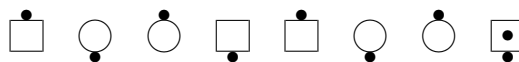
# Chapter 18

## Grand Swing Thru

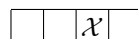
This is somewhat difficult because you need to keep track of the active's position in a row of eight spots instead of the usual four.

### GRAND SWING THRU

- Identify the direction going from the active's partner in his right-handed miniwave toward the active himself. If the active is facing away from you, that direction will be from your right to your left. If he is facing toward you, it will be from your left to your right.
- Move the spot one position in that direction, with wraparound. The nature of the spot does not change.
- Move the active *two* positions in that same direction, with wraparound in the line of 8.



### GRAND SWING THRU



The spot and the active both moved to the right. The active wrapped around.

From a left-handed tidal wave, a GRAND LEFT SWING THRU works analogously. The spot and the active both move in the direction from the active's partner (on his left hand this time) toward himself.



If you want to call (RIGHT) GRAND SWING THRU from a left-handed tidal wave, or GRAND LEFT SWING THRU from a right-handed tidal wave, move the spot and active one and two positions, respectively, in the opposite direction from that described above. The motions are in the direction from the active toward his partner in his miniwave.

## Chapter 19

# Spin Chain Thru

This call is also a little less straightforward than the calls we have been discussing, and you might not want to learn it.

It can be seen to be a TRADE followed by a CENTERS UN-CIRCULATE.

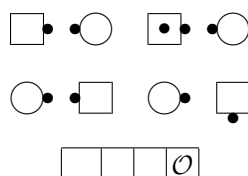
SPIN CHAIN THRU, from waves

- If the active is on the outside, have him do the usual TRADE. Then, without moving him further, move the allemande spot one position in the “wind at your back” direction (relative to his new facing direction.)
- If the active is in the center, have him do the usual TRADE, then move him forward or back to the other wave. Move the allemande spot one position in the “wind in your face” direction (relative to his new facing direction.)

## Chapter 20

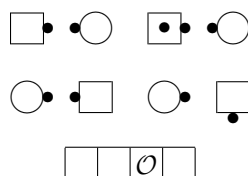
# Promenade and All 4 Ladies Chain

If you precede a normal sequence with 4 LADIES CHAIN, it will have the effect of moving the allemande spot by 2. So you can call a 4 LADIES CHAIN and then have the heads or sides move in and start a normal sequence, setting the initial allemande spot to be 2 different from what it would normally be.



4 LADIES CHAIN,  
HEADS SQUARE THRU 2

To precede a sequence with 4 LADIES CHAIN 3/4, move the allemande spot just one position to the right.

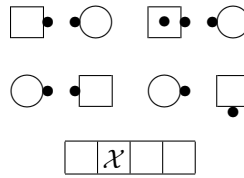


4 LADIES CHAIN 3/4,  
HEADS SQUARE THRU 2

If the active is a woman, move the allemande spot just one position to the left.

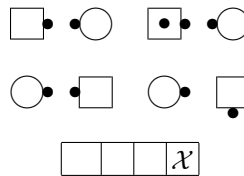
To do a 4 LADIES CHAIN 1/4 (do you actually call that?) move the allemande spot in the other direction.

Having 2 ladies chain, followed by the same couples moving in and starting the the sequence, is something you already know—the 2 LADIES CHAIN is just an  $\mathcal{X}$  in the center.



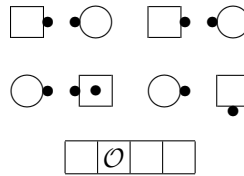
HEAD LADIES CHAIN,  
HEADS SQUARE THRU 2

To have the *other* 2 ladies chain at the start, treat it as a 4 LADIES CHAIN followed by the “correct” ladies chain. So it’s an  $\mathcal{X}$  in the center, and move the allemande spot by 2.



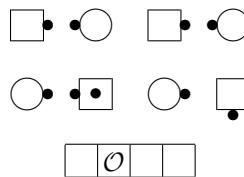
SIDE LADIES CHAIN,  
HEADS SQUARE THRU 2

To have a couple promenade halfway and then come in to the middle to start the sequence, just do it. The PROMENADE 1/2 is equivalent to RIGHT AND LEFT THRU.



HEADS PROMENADE 1/2,  
then SQUARE THRU 2

Having the other couples promenade is the same, keeping in mind that the final position of the square will be rotated.



SIDES PROMENADE 1/2,  
then HEADS SQUARE THRU 2

# Chapter 21

## A Few Miscellaneous Subjects

In this chapter we will discuss various topics about the mental image system that are not necessary to use the system, but will hopefully provide additional insight into mental image calling.

First, we will discuss the connection between the “S” (sequence) and “R” (relationship) of the FASR and the mental image state. As noted earlier, you are responsible for the “F” (formation) and “A” (arrangement). The mental image system only takes care of the other two.

### 21.1 In or Out of Sequence—the “S” of FASR

In most cases the in-or-out-of-sequence aspect of the boys, and of the girls, can easily be “read out” from the mental image state.

From lines facing in, lines facing out, 8-chain, trade by, or waves *only*: If the active is in front, his or her own sex dancers are in sequence. If in back, they are out of sequence.

If the allemande spot is an  $\mathcal{O}$ , the men and women are in the same sequence as each other (both in or both out). If the spot is an  $\mathcal{X}$ , they are in different sequence.

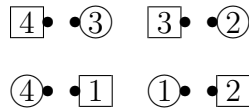
The converse is also true: boys in sequence means a male active must be in the front row, and boys and girls in different sequence means the spot must be an  $\mathcal{X}$ .

It needs to be emphasized that this is **not** true if the 4-person setup on each side is a 2-faced line or a normal (“BOX CIRCULATE”) box, that is, columns or boy-girl-boy-girl waves. See Section [A.14](#) for more information on this point.

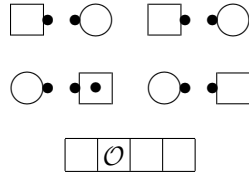
But you don’t need to learn this—the mental image system takes care of it for you.

### 21.2 How Far to an Allemande Left—the “R” of FASR

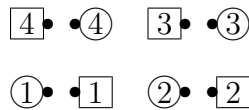
Consider this “HEADS SQUARE THRU position:



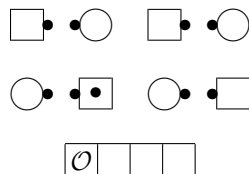
We know that this is an ALLEMANDE LEFT position, that the active can be the #1 boy, and he is standing on his allemande spot.



Now let's rotate the girls one position clockwise:



We haven't changed the sequence, so the active can still be the #1 boy and the spot is still an  $\mathcal{O}$ . But where is the allemande spot? It has moved one position to the left! This is obvious if you consider that you could call PASS THRU, ALLEMANDE LEFT from here. So the state is:



Further rotations of the girls with respect to the boys will simply move the spot further to the left. Also, although we won't work it out in detail here, this spot motion is the same whether the spot is an  $\mathcal{O}$  or an  $\mathcal{X}$ .

But you don't need to learn this—the mental image system takes care of it for you.

### 21.3 Reading Out the Mental Image State From Your Checkers

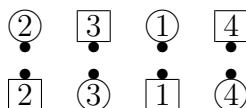
Here is a general method for reading the mental image state from normal or sashayed lines facing, back-to-back lines, 8-chain, or trade-by. This is not a method designed to be used on the fly, but

rather might be useful in writing cards or experimenting.

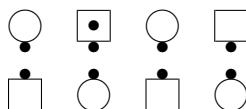
*This method is too unwieldy to use when calling, since it involves knowing everyone's couple number, and doing arithmetic on that. It is just a pencil-and-paper method.* But it might be reasonable for checker-pushing exercises. We will discuss methods for reading out the state at a live dance, and thereby finishing a sight-called sequence, in Chapters 23 and 24.

1. If the boys are in sequence, let the active is the leftmost boy in the front row, that is, the boy in the lower left quadrant. If the boys are out of sequence, let the active is the leftmost boy (from the caller's perspective) in the back row, that is, the boy in the upper left quadrant.
2. Look at the other girl in that quadrant. It will be the active's partner if in lines, or the girl the active is facing in an 8-chain, or the girl behind him in a trade-by. Place the allemande spot in the following position: 1 plus the active's couple number minus that other person's couple number. Wrap around as usual if this is less than one or more than 4.
3. If the boys and girls are in the same sequence, the spot is an  $\mathcal{O}$ . If they are in different sequence, the spot is an  $\mathcal{X}$ .

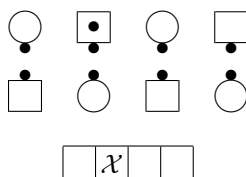
Let's try an example:



The boys are out of sequence so the active is here:



The active is boy #3, and he is adjacent to girl #2, so we place the allemande spot in position 2 ( $1 + 3 - 2 = 2$ ). The boys and girls are in a different sequence, so the spot is an  $\mathcal{X}$ . The final state is then:



This is too unwieldy to have worked out on the fly while sight calling, but, knowing the mental image state, we can now figure out getouts. A possible getout might be:

RIGHT AND LEFT THRU  
 FLUTTERWHEEL (at this point, many people would recognize an L2p setup)  
 SLIDE THRU  
 PASS THRU  
 ALLEMANDE LEFT

Let's look at resolving this same setup using mental image techniques to see if we can't produce a more interesting resolve:

SLIDE THRU  
 TOUCH 1/4 ( $\mathcal{X}$ )  
 FOLLOW YOUR NEIGHBOR AND SPREAD ( $\mathcal{X}$ )  
 GIRLS TRADE ( $\mathcal{X}$ )  
 SCOOT BACK  
 RIGHT AND LEFT GRAND

or perhaps this one:

SPIN THE TOP ( $\mathcal{X}$ )  
 HINGE ( $\mathcal{X}$ )  
 WALK AND DODGE  
 CHASE RIGHT ( $\mathcal{X}$ )  
 HINGE ( $\mathcal{X}$ )  
 LEFT SWING THRU ( $\mathcal{X}$ )  
 STEP THRU  
 ALLEMANDE LEFT

or if you're going for a quick getout:

FAN THE TOP ( $\mathcal{X}$ )  
 STEP THRU  
 ALLEMANDE LEFT

or, for a really quick getout:

SPIN THE TOP ( $\mathcal{X}$ )  
 RIGHT AND LEFT GRAND

Notice how much flexibility the mental image system gives you over canned getouts from "snapshots"!

This method can also be used from back-to-back lines, 8-chain, or trade-by, either normal or sashayed. It gets the same result, other than moving the active to the spot of the correct sex in the same quadrant. To see this, observe that the calls to move among these formations are all simple  $\mathcal{O}$  calls, such as HALF SASHAY, 1/4 IN 1/4 OUT, and PASS THRU (from an 8-chain). So, in addition to the simple example we had above:





We can do a HALF SASHAY, getting the same result in sashayed lines:



or 1/4 IN, getting the same result in a normal 8-chain:



This method is almost certainly too unwieldy to use at an actual dance, but it shows how powerful the mental image system is for deriving a getout, once we know the mental image state. Methods for reading out the state while actually calling will be discussed in Chapters 23 and 24.

## 21.4 Technical Zeros and Equivalentents

A *zero* is a call or module that, from a resolution standpoint, does nothing. (Such a thing is sometimes known as a “true zero”.) It might move dancers to a position other than their starting location, but it is transparent to the resolve. That is, it can be inserted into any legal place in a sequence without altering the correctness of that sequence. Perhaps the most famous is RELAY THE DEUCEY. It moves everyone to their opposite spot, so it will affect the promenade distance, but it will otherwise not affect correctness.<sup>1</sup> Perhaps a more surprising zero is 1/4 THRU 3 TIMES. It even changes between head-facing and side-facing orientation, but it is still a zero.

A *geographical zero* or *absolute zero* is a call or module that in fact leaves everyone on the same spot.

An *equivalent* is a call or module that has the same effect as some other call or module. It may be substituted for the other call or module without affecting correctness of the sequence. There are, of course, geographical equivalentents and non-geographical equivalentents.

Another type of zero (or equivalent) is what is often called a *technical zero* or *technical equivalent*. These are often deemed to be mysterious, and their mysterious properties have been written about extensively. SPIN CHAIN THE GEARS is perhaps the best-known example. There are places where it may be inserted into a sequence without affecting the correctness, and places where it can't.

Of course, if you don't know whether such a call is safe in a given situation, it isn't useful. It is often pointed out that SPIN CHAIN THE GEARS can be inserted at any point where the boys and girls are both in sequence or both out of sequence. That helps a little bit, but it probably isn't useful

<sup>1</sup>When doing singing calls, promenade distance (and timing) are important, so you should not insert zeros with wild abandon.

in practice. If you can keep track of who is in or out of sequence while calling, you probably don't need to use modules like this.

A somewhat less well-known fact is that some calls are zeros only when the boys and girls are in *different* sequence. ALL 8 CIRCULATE is an example of this. (Try it!)

When using the mental image system, there is a very simple explanation for these phenomena. SPIN CHAIN THE GEARS is an *O*-conditional zero. This means that you can freely insert it at any time, and, if the allemande spot is an *O*, nothing more needs to be done. If it is an *X*, move it by 2. You have already seen the concept of moving the spot by two depending on whether it is an *X* or an *O* in the change-of-active operation.

ALL 8 CIRCULATE is an *X*-conditional zero. You can freely insert it at any time, and, if the allemande spot is an *X*, nothing more needs to be done. If it is an *O*, move it by 2. This is easy to see in terms of change-of-active. The fictitious motion for ALL 8 CIRCULATE is to move the active forward or back to the corresponding position in the other wave. You can then use change-of-active to move him back to his original position, moving an *O* spot by 2.

The call COUPLES CIRCULATE is also an *X*-conditional zero. But the usual description of a technical zero as a call that is a zero if both sexes are in the same sequence would seem to put it in the same class as SPIN CHAIN THE GEARS, which is an *O*-conditional zero. Why does this discrepancy exist? Because the "rule" that the two sexes are in the same sequence if and only if the allemande spot is an *O* does not apply in 2-faced lines.

It is simpler just to think in terms of *O*-conditional or *X*-conditional zeros, and not worry about the literature of technical zeros. The mental image system makes it all simple.

Another example of "conditional zeros" being more powerful than "technical zeros" is the module GRAND SWING THRU TWICE. The geometrical notion of being in or out of sequence makes no sense in a tidal wave, but it is nevertheless an *O*-conditional zero.

The literature also sometimes speaks of "technical equivalents", which are sometimes equivalents and sometimes not. In the mental image system there are "conditional equivalents". For example, from waves, TRADE CIRCULATE is an *X*-conditional equivalent to SLIDE. Why? Because it is equivalent to ALL 8 CIRCULATE followed by SLIDE, and the former is an *X*-conditional zero.

Another conditional equivalent is that, from back-to-back lines, BEND THE LINE is an *O*-conditional equivalent to TRADE.

Knowing some calls that are conditional zeros may occasionally be useful. For example, if you are in an *X* state, and you wish the allemande spot were on the other side, you can call SPIN CHAIN THE GEARS to move it very cheaply.

What happens if you get it wrong? The allemande spot will be off by 2. As we saw earlier, this is just an error of one PASS THRU+TRADE BY pair. The net effect will be that everyone gets their opposite's partner instead of their own. This is a "ALL 4 LADIES CHAIN" error.

Here's a short table of conditional zeros.

Call	Property
ALL 8 CIRCULATE in waves or 2-faced lines	<i>X</i> -conditional zero
PING PONG CIRCULATE in 1/4 tag	<i>X</i> -conditional zero
BEND THE LINE in facing lines	<i>O</i> -conditional zero
GRAND SWING THRU TWICE	<i>O</i> -conditional zero
SPIN CHAIN THE GEARS	<i>O</i> -conditional zero
SPIN CHAIN THRU TWICE	<i>O</i> -conditional zero

To call a PING PONG CIRCULATE, the active must be in the center, as is always required for a 1/4 tag setup. Also, the gender arrangements of the centers and ends must be such that EXTEND would get admissible (boy-girl-girl-boy or girl-boy-boy-girl) waves. Just give the call, and move the allemande spot by 2 if it is an *O*. The active does not move.

# Chapter 22

## Singing Calls

The mental image system is very well suited to the creation of extemporaneous singing call progression figures. In fact, singing calls are probably the most common use of the mental image system in the real world.

The suitability of the mental image system probably arises because the system seems to give just the right amount of choreographic control to move people around in interesting ways and then bring them back in 48 beats of music. The mental image system creates a “goal” (the allemande spot) and a reasonably simple way for the caller to track the progress of the active toward that goal.

### 22.1 The Corner Progression

The rule for a corner progression is simple — start with the allemande spot artificially shifted by one position. If the active is a man, start with the spot here  $\overline{\square} \square \square \square$  instead of the usual spot here  $\square \overline{\square} \square \square$ .

HEADS SQUARE THRU  
PASS THRU (now standing on his allemande spot)  
ALLEMANDE LEFT (not the way we would usually do a singing call, but it works)  
COME BACK AND PROMENADE (this is his new corner; the progression has occurred)

If the active is a woman, shift the initial allemande spot one position to the right, so it is here  $\square \square \square \overline{\square}$  instead of the usual spot here  $\square \square \overline{\square} \square$ .

To get a backward (“right hand lady”) progression, shift the initial allemande spot the other way, like this  $\square \square \overline{\square} \square$ :

HEADS SQUARE THRU 2  
SQUARE THRU 3 (now on his spot)  
ALLEMANDE LEFT  
COME BACK AND PROMENADE (with right hand lady)

Be sure to progress in the same direction each time, of course. If you find that you have carelessly progressed the wrong way in the first figure, you can switch to reverse progressions for the whole song. More serious accidents can be fixed by more serious compensating movements.

## 22.2 The “Swing and Promenade” Getout

If we’re supposed to shift the allemande spot, why is it that

HEADS SQUARE THRU  
SWING AND PROMENADE

would perform a correct corner progression even though the active is standing on the *unshifted* allemande spot?

The reason is that SWING AND PROMENADE is an unusual getout. We have seen that the “allemande spot” is also the “right and left grand spot,” But it is not necessarily the “swing spot.”

When in a normal-sex 8-chain or trade by setup, and the allemande spot is **in front of** the active, you can call SWING AND PROMENADE. That is, if PASS THRU (or TRADE BY) would get to a correct ALLEMANDE LEFT, SWING AND PROMENADE will work directly.

The reason is that, if a PASS THRU or TRADE BY would get to the corner for an ALLEMANDE LEFT, the person being passed is the one you want the active to promenade home with. Just having the active SWING AND PROMENADE with that person will get the same effect.

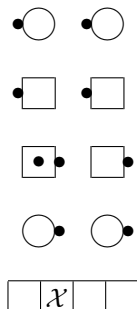
So why would we do such an obscure thing as moving the allemande spot and then saying that you can SWING AND PROMENADE when the active is where the spot had been before we moved it? The reason is that it gives us more flexibility in the getouts, as will be shown below. This additional flexibility can be very useful if an emergency arises, the 48 beat clock is ticking, and you need to get out fast.

When in a sashayed 8-chain or trade by setup, you can call SWING AND PROMENADE whenever the active is **directly** on the allemande spot. If a RIGHT AND LEFT GRAND would work, SWING AND PROMENADE will get the same person.

HEADS SQUARE THRU  
RIGHT AND LEFT THRU  
SWING THRU  
RECYCLE  
SWING AND PROMENADE (with corner)

## 22.3 The “Promenade Home” Getout

We know that this:



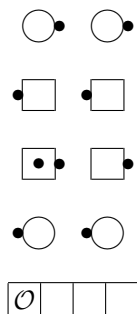
gives a PROMENADE HOME getout in patter sequences. In a singing call, it also gives a PROMENADE HOME with the progressed girl, due to the artificial shifting of the allemande spot.

Example (bad timing, just to show correctness):

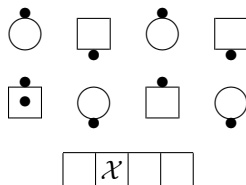
HEADS SQUARE THRU  
 DO-SA-DO TO A WAVE  
 GIRLS TRADE  
 TRADE THE WAVE  
 RECYCLE  
 VEER RIGHT  
 BOYS HINGE  
 DIAMOND CIRCULATE  
 CUT THE DIAMOND  $\square \mathcal{X} \square \square$   
 PROMENADE HOME (with corner)

## 22.4 “Swing and Promenade” From Boxes

We know that we can use a SWING AND PROMENADE getout from this setup:



How about this one?



They differ only by a HINGE; it’s the same people, so it works.

Whenever everyone is in a setup with right-handed miniwaves and the active in the front left quadrant, a SWING AND PROMENADE getout will work if in normal waves with this allemande spot:

⊙ □ □ □

or in side-by-side boxes with this allemande spot: □  $\mathcal{X}$  □ □.

(Due to change of active, you can also have the active on the right. If in normal waves, the allemande spot must be □ □ ⊙ □.)

This means that you can do things like this:

HEADS PROMENADE HALFWAY  
 DOWN THE MIDDLE AND PASS THE OCEAN  
 EXTEND  
 RECYCLE □  $\mathcal{X}$  □ □  
 VEER LEFT □  $\mathcal{X}$  □ □  
 1/2 TAG ⊙ □ □ □  
 SPLIT CIRCULATE □  $\mathcal{X}$  □ □  
 SWING AND PROMENADE

## 22.5 Promenade Distance

The usual timing of a singing call figure assumes that the promenade distance is one full trip around the set, or perhaps a tiny bit more, as though the sequence were equivalent to HEADS SQUARE THRU, SWING AND PROMENADE. The mechanisms we have been discussing will work this way, as long as

- The allemande spot stays in its original spot: ⊙ □ □ □ if the active is a man, □ □ □ ⊙ if a woman.
- The active retains his or her real identity throughout the sequence, that is, there are no fictitious moves in which the active changes, such as a CIRCULATE when he is in front.

For these reasons, it is a good idea to stay away from esoteric calls or change of active unless you have worked things out carefully. Singing calls made from simple four-person  $\mathcal{X}$  and  $\mathcal{O}$  calls are safe. If you do a CIRCULATE, the active should be a trailer, so that he will move forward the same as the physical dancer. Similarly, TRADE BY should only be called when the active is in the center.

If you start with HEADS PROMENADE HALFWAY, you should have the same people come into the middle and continue the sequence, to avoid fictitious moves, except as we will discuss in the next paragraph. Any violation of the rules for CIRCULATE, TRADE BY, and PROMENADE HALFWAY will result in the setup being 180° out. If you want to keep track of such things, you could use this fact. In this case, two wrongs make a right.

You could start with HEADS PROMENADE HALFWAY, SIDES SQUARE THRU.

The PROMENADE has effectively turned the SQUARE THRU into a SQUARE THRU 2, and we are now 180° out of position. PASS THRU, TRADE BY will compensate for it. So this figure will have the correct promenade distance:

HEADS PROMENADE HALFWAY  
 SIDES SQUARE THRU

PASS THRU  
TRADE BY  
RIGHT AND LEFT THRU  
TOUCH 1/4  
SCOOT BACK (some number of times)  
SWING AND PROMENADE

Other calls that have the 180° rotation property are LOAD THE BOAT and RELAY THE DEUCEY.

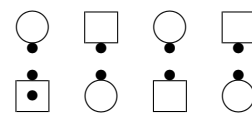
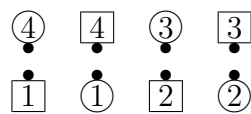
## Chapter 23

# Sight Resolving with Snapshot Resolves

Some callers are good at seeing “snapshots” (formations with a known FASR), and some are not. If you are good at it, sufficiently so that you can recognize them, or set them up, while you are calling, you can memorize the mental image state for your favorite snapshots. This effectively short-circuits the pencil method of Section 21.3. Instead of using “canned” getouts that you have memorized for the various snapshots, you can memorize the mental image state and proceed from there.

Research performed by Bill Davis and Kip Garvey has shown that the vast majority of sight callers see partner pairing as the first stage in sight resolution. Out of the 16 possible normal-sex lines, there are only six that have at least one couple paired with original partner. These six lines are shown below along with their mental image equivalent. Any sight caller who is able to snapshot one or more of these setups will be able to instantly know the mental image state, and thus could use the mental image system to resolve from then on. Most sight callers can probably identify the L1p and L2p setups, and the others can be recognized with practice.

An exhaustive list of these snapshots may be found in Appendix B. Here is an example.



Everyone paired, corners adjacent  
 CRaMS: 1(a)      CL: ZL  
 Litman: 1P2P      Big5: L1p



CIRCLE LEFT/RIGHT



## Chapter 24

# Sight Resolving

You will probably find the mental image system too limiting and error-prone to be useful for long patter sequences, though it seems to be well suited for singing calls. You are no doubt aware of its choreographic limitations. Its error-prone nature is perhaps even more serious. Any mistake in tracking the mental image state will probably doom the sequence.

Sight callers are generally accustomed to its forgiving nature. If your attention wanders (what is the lady in square 3 doing?) and you call DIXIE STYLE TO A WAVE when you meant to call FLUTTER WHEEL, you can easily repair the damage, as long as you notice the error before you call SWEEP 1/4.

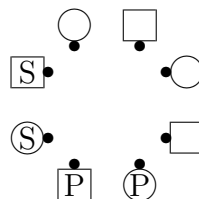
So being able to sight call, and then use mental image for the getout, is a useful way to call. In addition to the snapshot recognition method of the previous chapter, this chapter will describe two general algorithms. One is simple and confining (but based on skills you probably already have), and the second is more general but much more difficult.

With both methods, the goal is to sight call, and then make the transition to mental image by “reading out” the mental image state from an actual square.

There are nearly as many resolving techniques as there are callers. Because of this, we will attempt to describe things in a very general way, to make it applicable to a wide variety of calling styles. You will have to adapt this to your sight resolving technique.

Presumably your existing practice is to begin the resolution process by manipulating the square into what you consider a “reasonable” arrangement, such as normal facing lines, a normal 8-chain, waves, or whatever.

We will make the convention that the “primary” couple—the one that we find first, is counterclockwise from the “secondary” couple. The “secondary” couple is clockwise from the “primary” couple.



Primary is counterclockwise, secondary is clockwise from them.  
Absolute positions don't matter.

Many callers don't make a specific distinction between the primary and secondary couples, and think instead of either one of the key couples being together, followed by a recognition of corner relationship. Some callers think of the primary couple that they have memorized or written down, and the secondaries as the the fixed couple that started clockwise from them as in the diagram above. The primary couple is brought to the outside of a starting DPT setup, without regard for the specific locations of the secondary people.

Or you might prefer to think in terms of corner pairings rather than which couple was memorized as being clockwise from the other. You get some people paired (it doesn't matter who), and you bring them to the outside of a starting DPT setup. They could be considered primary, though that doesn't matter in this case.

## 24.1 Preparatory Work

In either case, you must first gain control of the formation, that is, normalize the setup to something that is admissible for mental image calling. You already know how to do that. Get rid of any hourglasses, galaxies, or parallelograms, and get people into admissible lines, waves, or whatever. If you form waves and then find that they are of the boy-boy-girl-girl type, SPLIT CIRCULATE will make them sex-symmetric. If they are boy-girl-boy-girl waves, that is side-by-side boxes, HINGE will turn them into nice waves.

You might next want to orient the setup to make it more comfortable for you. If you can call with equal confidence with both left-to-right orientation and front-to-back, you don't need to do anything here. However, if you prefer the left-to-right orientation, this is a very good time to set it up, since you don't have to keep track of the mental image state while doing this. Just call any of the calls that we discussed earlier that are reorienting. For example, if you are in facing lines, and you see that the orientation is front-to-back, and you would prefer left-to-right, just call PASS THRU and BEND THE LINE. You will find that BEND THE LINE is much less anxiety-provoking when you don't have to worry about moving an  $\mathcal{X}$  spot or tracking the mental image state through a reorientation.

## 24.2 Simple Method—Manipulate the “Primary Couple” to the Outside of a DPT Setup

Get the primary couple, whether they are a specific couple that you have memorized or just whomever you want to consider primary right now, next to each other on the outside of a starting DPT. You might do this by pairing them as the left-side couple of facing lines and doing a PASS THRU and WHEEL AND DEAL. Or you might do it by pairing them as the lead couple of two-faced lines and doing a FERRIS WHEEL. There is enormous variation in how callers conceptualize this action.

Once the primary couple is on the outside, sight callers typically manipulate the four people in the center, which must include the secondary couple<sup>1</sup>, as required to get an ALLEMANDE LEFT.

But one can do better than that. Once the secondaries are in the middle, one can read out the complete mental image state, and then proceed with the full power of the mental image system, including 8-person calls, to get to the resolve.

Assuming the square has been properly normalized in a normal DPT, there will be four possible configurations for the four people (the secondaries) in the center.

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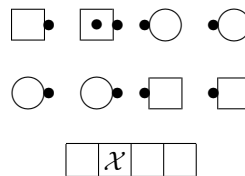
<sup>1</sup>Unless the square has made a mistake, in which case you are in trouble in any case.

**24.2.1 The secondary couple are paired next to each other, and can see the primary couple in front of them.**

Here are two physical configurations for this:



The mental image state of this configuration is:



You might think that these physical configurations can't both be right, but they are. What's important is that the secondaries can see the primaries. In both of these situations the mental-image active is in the back row, left of center, as shown. The active is not necessarily the secondary man when reading out the mental image state.

You might think of this situation in terms of the secondaries being able to see the primaries, or you might think in terms of the secondary woman being able to see her corner. Different callers have different ways of seeing things.

You can finish the resolve with some very simple modules like CENTERS PASS THRU, SWING THRU, RIGHT AND LEFT GRAND. Or you could use the full power of the mental image system with a getout like DOUBLE PASS THRU, TRACK 2, RECYCLE, PASS THRU, ALLEMANDE LEFT.

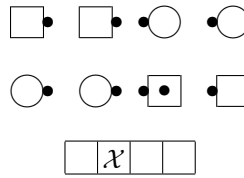
**24.2.2 The secondary couple are paired next to each other, and the primary couple are behind them.**

Here are two physical configurations for this:



As before, these two diagrams are equivalent. What's important is that the secondaries can't see the primaries. In both of these situations the mental-image active is in the front row, right of center.

The mental image state of this configuration is:



You might think of this situation in terms of the secondaries having the primaries behind them, or you might think in terms of the secondary man being able to see his corner.

You can resolve with things like DOUBLE PASS THRU, TRACK 2, LADIES TRADE, BOX THE GNAT, RIGHT AND LEFT GRAND.

**24.2.3 The secondary couple are facing each other. The secondary woman can see the primaries; the secondary man cannot.**

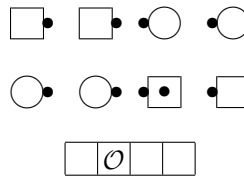
The secondary couple are not paired next to each other. They can both see their corner.

Here are two physical configurations for this:



What's important is that the secondaries can both see the primaries. In both of these situations the mental-image active is in the front row, right of center, and the state is an  $\mathcal{O}$ .

The mental image state of this configuration is:



In addition to the obvious CENTERS PASS THRU, ALLEMANDE LEFT, one could call ZOOM, CENTERS PASS THRU, SLIDE THRU, SLIDE THRU, ALLEMANDE LEFT.

**24.2.4 The secondary couple are facing each other. The secondary man can see the primaries; the secondary woman cannot.**

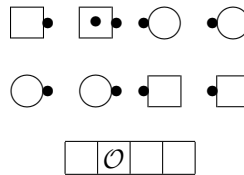
The secondary couple are not paired next to each other. Neither can see their corner.

Here are two physical configurations for this:



What’s important is that the secondaries can’t see their corners. In both of these situations the mental-image active is in the back row, left of center, and the state is an  $\mathcal{O}$ .

The mental image state of this configuration is:



In addition to the obvious CENTERS SQUARE THRU 3, ALLEMANDE LEFT, one could call DOUBLE PASS THRU, TRACK 2, EXPLODE, SQUARE THRU 2, TRADE BY, ALLEMANDE LEFT.

### 24.3 A Very General Way

This method is very powerful and general, in that it doesn’t require any particular setup, such as a starting DPT with the primary couple on the outside. Any legitimate mental image setup will do—parallel waves, 2-faced lines, facing lines, 8-chain, etc. It requires more mental work, but you can spread that work out. After locating the primary people, you can delay for a while as you search for the secondary people, while calling 4-person  $\mathcal{X}$  or  $\mathcal{O}$  calls.

No particular cliché or module (such as PASS THRU, WHEEL AND DEAL) is required. The full power of the mental image system is available, limited only by the requirement that only 4-person calls be used while searching for the secondary people.

This requires that you first get both the primary man and woman on your right-hand side in any legitimate formation. This is a much less intrusive requirement than being on the outside of a DPT. Always having that couple on your right when you are near a resolve is not nearly as noticeable as having them on the outside of a DPT. The primary man and woman do not need to be adjacent; they just both have to be on the right.

If you are comfortable dealing with a front-to-back orientation instead of a left-to-right one (and you should be), you can bring the primary people to whatever side corresponds to “right” in that orientation. That depends on which way you turn your counting hand when in that orientation. We will not discuss that further, and will always assume a left-to-right orientation.

The method operates in a piecemeal way. Information is extracted in a step-by-step fashion, with the mental information becoming progressively more detailed as the operation proceeds. You have to keep track of very little in the early stages. Furthermore, the piecemeal extraction of information may proceed as slowly as you wish. After finding the primary people, you can continue calling, keeping track of some limited amount of information, while you search for the secondary people. There is no instant at which you must know where all four key people are for a “snapshot.” Of course, if at any time you see a “snapshot” that you have memorized, you can use it directly.

The piecemeal nature of the method, and the relaxed pace at which it is able to proceed, makes it well suited for callers that (perhaps because of insufficient experience in live situations) do not have a great deal of skill in locating key couples rapidly.

The method involves locating the primary couple and bringing both those people to the right side, and then checking for the location of the secondary couple.

Because the key couples are found one at a time, the method can easily be used in emergency situations in which you have to ask the dancers for help. Continue sight calling, and ask “who’s your partner?” Consider some pair of people that identify as such to be primary, and bring them to the right side. While doing this, you have no idea who the secondary couple will be. Keep calling. Ask the dancers to point at their corners. Use this information, with further assistance from the dancers if necessary, to complete the job.

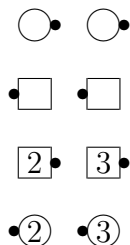
### 24.3.1 Normalize

Obviously, the setup needs to be normalized into a legitimate mental image setup. Waves, 2-faced lines, and 8-chain are best for what comes next. Waves are really best.

Depending on how skillful you are with back-to-front orientation, you probably want to stick with left-to-right orientation. The description here will be in terms of left-to-right orientation.

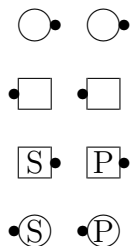
### 24.3.2 Bring the Primary Couple to the Right Side

To see what is meant by this, assume that the key couples are #2 and #3, so that #2 is clockwise and #3 is counterclockwise. If we have this:

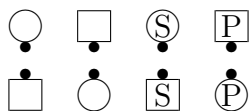


We have a RIGHT AND LEFT GRAND.

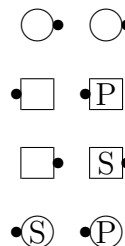
We can reformulate this in terms of the primary and secondary couples:



We don't actually need a setup this good; these diagrams simply illustrates the rationale for wanting this. Either of these next two setups is good enough for this initial step:



We want the primaries on the right; this is good enough. The secondaries can be anywhere; in this case they happen to be on the right also, though that's not important



We want the primaries on the right; this is good enough. The secondaries can be anywhere

There's a simple trick for this:

To bring the primary couple (or any couple) to the right side:

Get them both facing toward the right, and call an ALL 8 CIRCULATE, COUPLES CIRCULATE, or PASS THRU, TRADE BY, as the case may be. Anyone who is already on the right side will stay there, and anyone on the left side will move to the right.

In waves or 2-faced lines, getting people facing the way you want is very easy. Often it requires nothing more than a LADIES TRADE. This may be more difficult in an 8-chain. Waves are best.

To get the desired couple facing the right wall, if they are both facing the left wall, call a RIGHT AND LEFT THRU (from 8-chain), or SCOOT BACK (from waves). If they are facing opposite walls, call an appropriate  $\mathcal{X}$  first. This is extremely oversimplified and heavy-handed—with reasonable skill, you will be able to do much better than that. One possible improvement is to notice that, if one of the key people is already on the correct side, only the other person needs to do the circulate, and so only that person needs to have his or her facing direction set correctly. Another improvement is to notice that, when in waves or 2-faced lines, the women are typically in the center, and so an  $\mathcal{X}$  that changes their direction is quite easy. Therefore, getting the key man's facing direction correct requires more care. If he is on the end of a wave, and facing the wrong way, one can call RECYCLE and VEER LEFT, then check whether a GIRLS TRADE is needed, and then call COUPLES CIRCULATE.

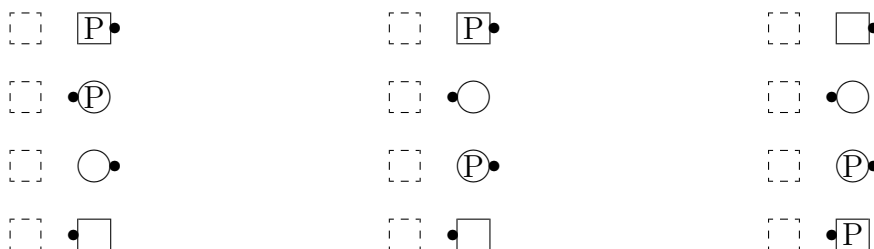
### 24.3.3 Determine the Preliminary $\mathcal{X}$ or $\mathcal{O}$ State

At this point, you do something a little bit strange, and a little bit miraculous. You have to come up with a *preliminary mental image state*, that is, the preliminary active and the preliminary allemande spot, based just on the primary people that you have manipulated onto the right side. Once you have figured out that state, just call 4-person mental image material in the normal way, while you look for the secondary people. This preliminary state is probably not the final state (since you haven't taken the secondary people into account), but don't worry about it. Just call, tracking the active and allemande spot in the usual way, but restricting yourself to plain 4-person calls.

The preliminary active is very simple; it will be the primary boy. If the preliminary allemande spot is an  $\mathcal{X}$ , it will always be here:  $\square \mathcal{X} \square$ . If it is an  $\mathcal{O}$ , it will be here:  $\square \square \mathcal{O} \square$ .

The rules are as follows:

- If the setup is parallel waves, the preliminary allemande spot is  $\mathcal{O}$  if the primary couple are together, and  $\mathcal{X}$  if not.



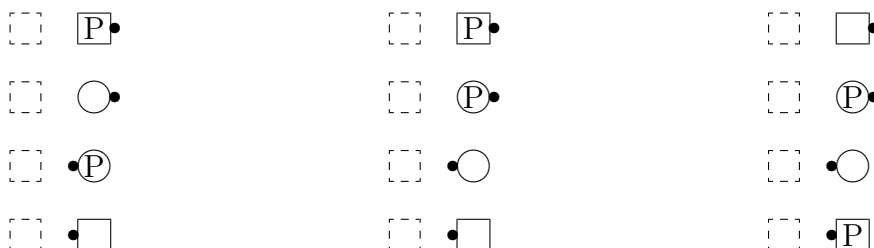
These people are in an  $\mathcal{O}$

These people are in an  $\mathcal{X}$

These people are in an  $\mathcal{O}$

Note that the adjacency will change with a GIRLS TRADE, which is an  $\mathcal{X}$  call, and that if you call an  $\mathcal{X}$  call on the active's side, the rules of mental image say that the nature of the allemande spot changes. This is not a coincidence. Once you have the primary couple on the right, even though the active and allemande spot aren't in their final configuration, you can call 4-person calls, tracking the preliminary active and allemande spot in the usual way.

- If the setup is parallel 2-faced lines, the preliminary allemande spot is  $\mathcal{X}$  if the primary couple are together, and  $\mathcal{O}$  if not.



These people are in an  $\mathcal{O}$

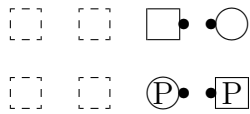
These people are in an  $\mathcal{X}$

These people are in an  $\mathcal{O}$

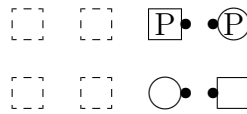
To see why the adjacency rule is different, consider that GIRLS U-TURN BACK is an  $\mathcal{X}$  call, changes between waves and 2-faced lines, and maintains the same adjacency.

- If the setup is an 8-chain, the preliminary allemande spot is  $\mathcal{O}$  if the primary couple are facing, and  $\mathcal{X}$  if they are adjacent.

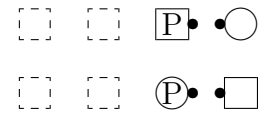




These people are in an  $\mathcal{O}$



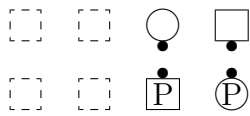
These people are in an  $\mathcal{O}$



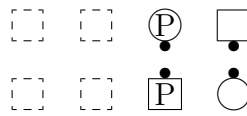
These people are in an  $\mathcal{X}$

Notice that the rules are the same as for waves, using the fact that TOUCH is an  $\mathcal{O}$ .

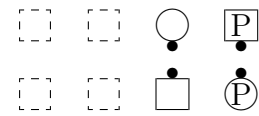
- If the setup is facing lines, the preliminary allemande spot is  $\mathcal{O}$  if the primary couple are adjacent, and  $\mathcal{X}$  if they are facing.



These people are in an  $\mathcal{O}$



These people are in an  $\mathcal{X}$



These people are in an  $\mathcal{X}$

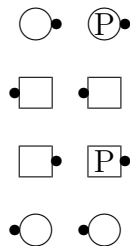
Notice that the rules are the same as for an 8-chain, using the fact that STAR THRU is an  $\mathcal{O}$ .

Now this sounds like a lot to remember. But you really only have to remember one of the setups, like the one for waves. Once you have the primary couple on the right, you can call 4-person calls until you figure out whether they are in an  $\mathcal{X}$  or  $\mathcal{O}$  state. At that instant, you have the primary couple “locked in”. The primary boy is the active for now, and the allemande spot is an  $\mathcal{X}$  or  $\mathcal{O}$  as described above. For an  $\mathcal{X}$ , it will be  $\square\mathcal{X}\square\square$ , and for an  $\mathcal{O}$ , it will be  $\square\square\mathcal{O}\square$ . From that instant onward, until you have finished the job, you keep track of the active and the allemande spot **exactly the way you do for normal mental image calling with 4-person calls**. When you call an  $\mathcal{X}$  call, the allemande spot switches between  $\mathcal{O}$  and  $\mathcal{X}$  in the completely natural way.

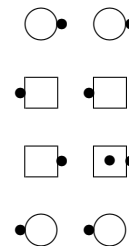
### 24.3.4 Determine the Preliminary Mental Image State

The primary couple, which includes the active, are on the right. The preliminary allemande spot is either this:  $\square\square\mathcal{O}\square$  or this:  $\square\mathcal{X}\square\square$ .

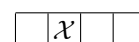
You might have a situation like this:



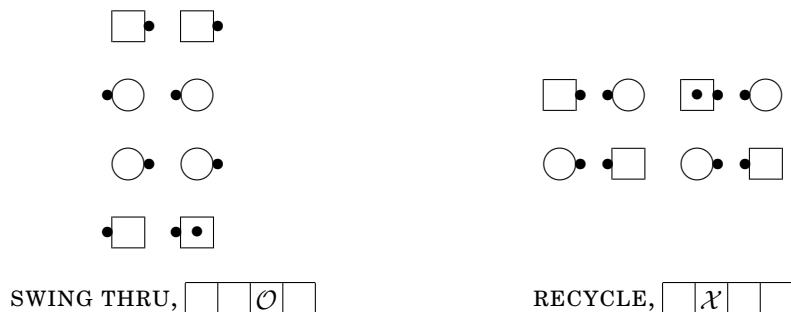
Primaries located, they are not adjacent, so they are in an  $\mathcal{X}$



The preliminary configuration



Once the preliminary mental image state has been found, you can call ordinary 4-person  $\mathcal{X}$  or  $\mathcal{O}$  calls naturally. You don't need to keep track of the primary girl—the  $\mathcal{X}$  and  $\mathcal{O}$  mechanism will track her.



Do **not** call PASS THRU, TRADE BY from here. The TRADE BY is not a plain 4-person call. Keep the primaries (and the active) on the right.

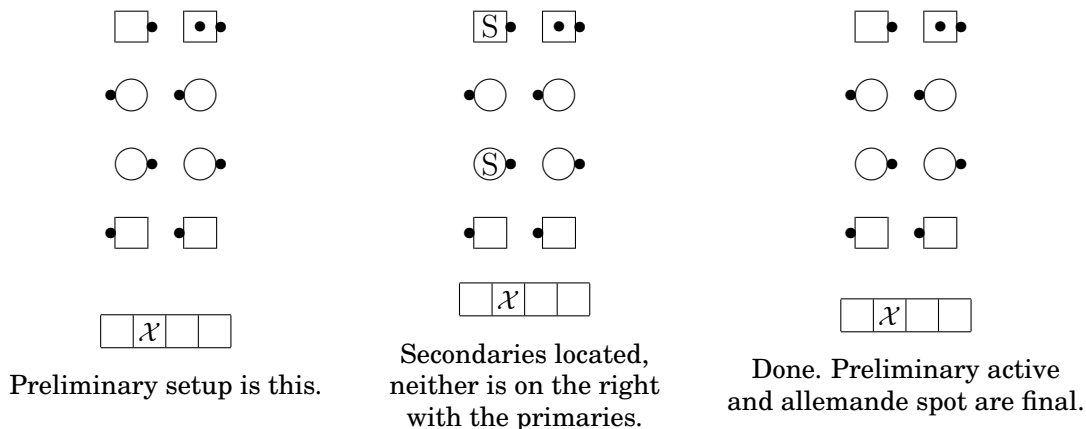
### 24.3.5 Search for the Secondary Couple

Next, while calling 4-person calls and tracking the preliminary active and the allemande spot in the usual way, search for the secondary people. Since you are calling only  $\mathcal{X}$  and  $\mathcal{O}$  calls on the right side, the allemande spot will always be     O   or   X    .

The final action will depend on which of the secondaries are on the same side as the primaries. There are four possibilities for the secondary people.

1. Neither is on the same side as the primary people. That is, they are both on the left-hand side. If this is the case, you are done. The preliminary active and allemande spot that you have been tracking are in fact correct, and you have fully read out the mental image state.

Here is an example:



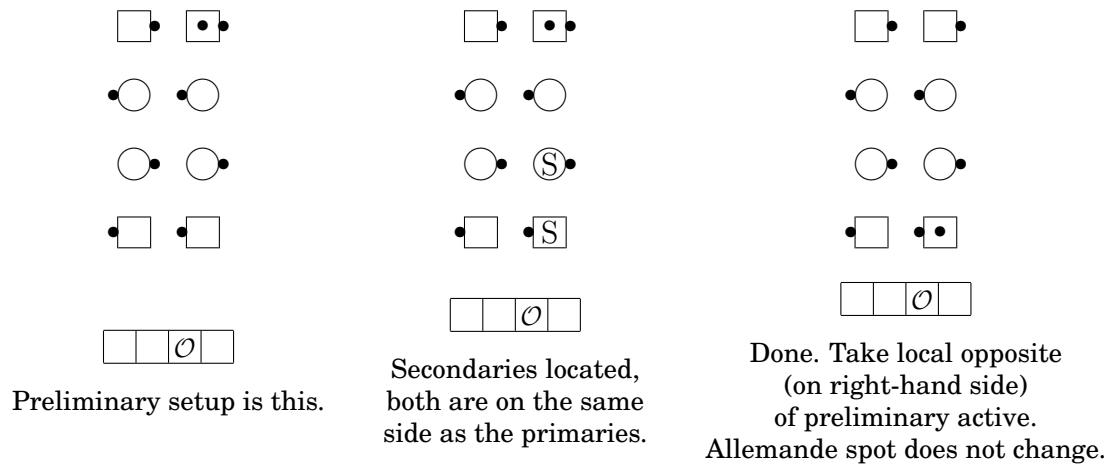
You can finish with RECYCLE, PASS THRU, ALLEMANDE LEFT, or whatever you choose.

A possible memory aid for this is that the primaries want to keep the secondaries away from them.

2. Both are on the same side as the primaries. That is, they are both on the right-hand side.

If this is the case, switch your preliminary active over to his local opposite in his 4-person setup. (That will in fact be the secondary boy.) He is the new final active. You are done.

Here is an example:

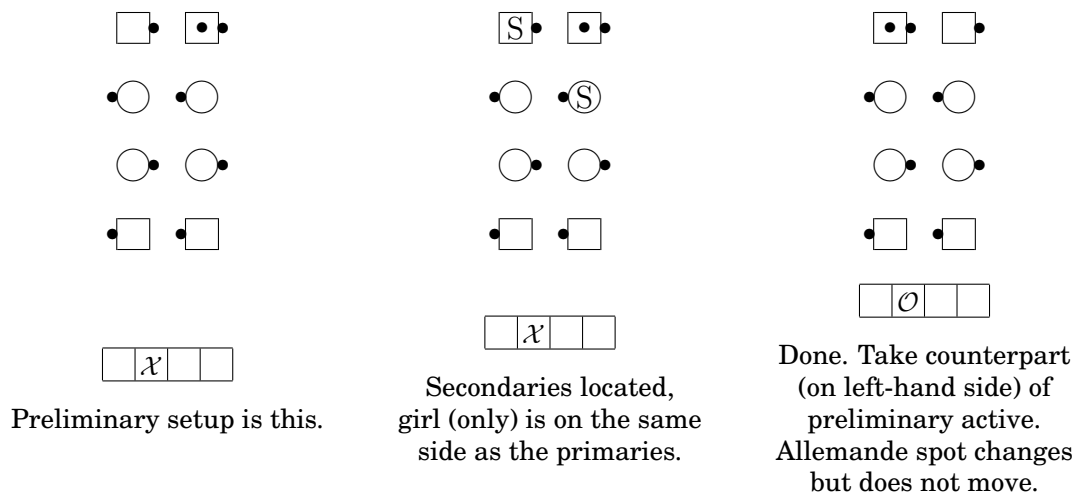


You can finish with SCOOT BACK, RIGHT AND LEFT GRAND, or whatever you choose.

3. Only the secondary girl is on the same side as the primaries. That is, she is on the right-hand side, but the secondary boy is on the left.

If this is the case, switch your preliminary active over to his counterpart on the other (left) side, same as if you were doing a change-of-active. He is the new final active. Change the allemande spot between  $\mathcal{X}$  and  $\mathcal{O}$  without moving it. You are done.

Here is an example:

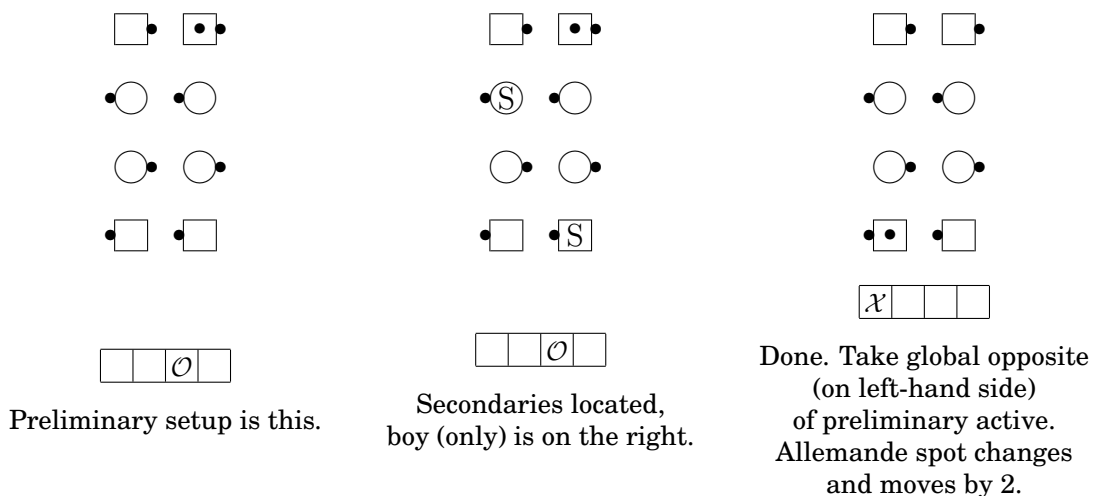


You can finish with LADIES TRADE, RECYCLE, ALLEMANDE LEFT, or whatever you choose.

4. Only the secondary boy is on the same side as the primaries. That is, he is on the right-hand side, but the secondary girl is on the left.

If this is the case, switch your preliminary active over to his global opposite in the entire setup. He is the new final active. Change the allemande spot between  $\mathcal{X}$  and  $\mathcal{O}$ , and move it by 2. You are done.

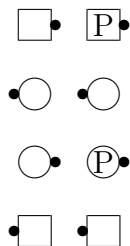
Here is an example:



You can finish with RECYCLE, SQUARE THRU 3, TRADE BY, ALLEMANDE LEFT, or whatever you choose.

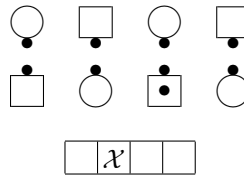
### 24.3.6 A Full Example

Suppose that, one way or another, we get the primaries over on the right side. The setup is waves:



Now we know, while reading this book at a leisurely pace, that they are in an  $\mathcal{X}$  state. But, while calling, we may not yet have figured that out, and we can't stop the flow of the dance. We have to keep calling, lest the dancers notice that we are struggling. We call LINEAR CYCLE, which is a nice easy  $\mathcal{O}$  call, and will keep the dancers busy for 8 beats.

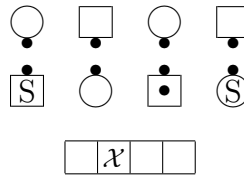
At the start of the LINEAR CYCLE, we notice that the primaries were separated in their wave, so the state is  $\square \mathcal{X} \square \square$ . We can think faster than they can dance, so, while they are doing the call, we figure out that the result of the LINEAR CYCLE will be this:



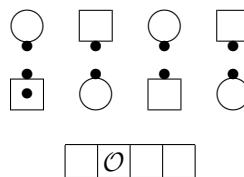
We quickly moved the active, who is the primary boy, through the call, and preserved the allemande spot, since LINEAR CYCLE has the nice property of being an  $\mathcal{O}$ .

While the dancers are finishing the call, we look for the secondaries. They are in motion, but they are not changing between the left and right sides, so we should be able to figure out which side they are on even while in motion.

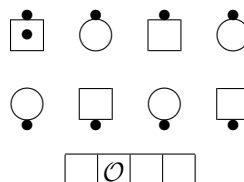
We can either look at the two non-primaries on the right, and ask “Which of them is secondary?”, or look for the secondaries, asking “Where are they? Which of them is on the right?” Different people have different ways of seeing this. In any case, we find the secondary boy on the left and the girl on the right. As the dancers come into position at the end of the LINEAR CYCLE, we in fact have this:



though the exact location of the secondaries is not important. Only the fact that the girl was on the right and the boy was not. Since the girl was on the right, we know what to do. While saying “PASS THRU”, we change the active to his counterpart on the left, and change the allemande spot without moving it.



After the PASS THRU, we have this:



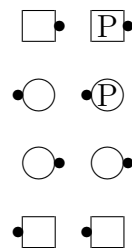
and we are pleased to note that the active is on the left, so no change-of-active is required to be ready for the WHEEL AND DEAL that we want to call.

While the dancers are doing that, our brain is clearing, and we decide on the getout: DOUBLE PASS THRU, TRACK 2, RECYCLE, ALLEMANDE LEFT.

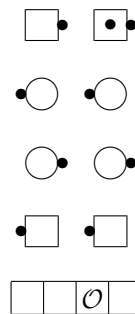
Or, instead of the PASS THRU after the LINEAR CYCLE, we could have done a RIGHT AND LEFT THRU, and then notice that SLIDE THRU, ALLEMANDE LEFT is a getout.

### 24.3.7 Second Example

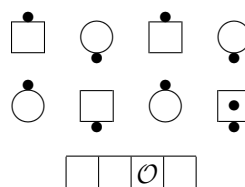
We bring the primaries to the right, perhaps by calling ALL 8 CIRCULATE while they were both facing right. As they come into position, we see that they are adjacent.



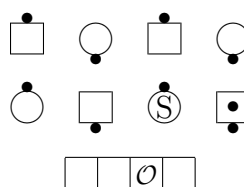
so we know that that means they are in an  $\mathcal{O}$  state, and that the preliminary configuration is this:



But the clock is ticking. We call HINGE, and then SPLIT CIRCULATE while we start looking for the secondaries. Both calls are  $\lambda$ 's, canceling each other, so we quickly figure out that the result will be:

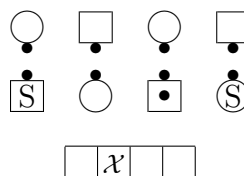


We have found the secondary girl; she's on the right. But where's the boy?



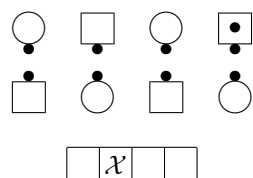
We can't stop, so we call BOYS RUN, which is an  $\mathcal{X}$ .

We found the secondary boy; he's on the left. So just the girl is on the right.

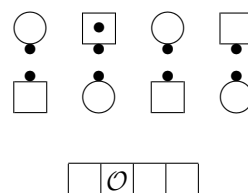


After BOYS RUN.  
Secondary boy is on left,  
Secondary girl is on right.

We call RIGHT AND LEFT THRU to buy a few seconds of time. While they are doing that, we perform the final transformation. We take the active's counterpart (*after* the RIGHT AND LEFT THRU) on the left side, and change the spot to an  $\mathcal{O}$ .



After RIGHT AND LEFT THRU,  
secondary girl (only) is on right.



Final configuration.

We finish with SLIDE THRU, ALLEMANDE LEFT.

### 24.3.8 Summary of the Final Calculation

First, get the primaries over to the right. Then determine whether they are in an  $\mathcal{O}$  or  $\mathcal{X}$  state.

If the preliminary allemande spot is an  $\mathcal{O}$ , it will be here:  $\square\square\mathcal{O}\square$ . If it is an  $\mathcal{X}$ , it will be here:  $\square\mathcal{X}\square$ . The preliminary active is the primary boy.

Then call plain 4-person mental image calls, with the active on the right, while you locate the secondaries.

1. Neither secondary is on the right.

You are done.

2. Both secondaries are on the right.

Switch your preliminary active over to his local opposite in his 4-person setup. He is the new final active. You are done.

3. Only the secondary girl is on the right; the secondary boy is not.

Switch your preliminary active over to his counterpart on the other side. He is the new final active. Change the allemande spot between  $\mathcal{X}$  and  $\mathcal{O}$  without moving it. You are done.

4. Only the secondary boy is on the right; the secondary girl is not.

Switch your preliminary active over to his global opposite in the entire setup. He is the new final active. Change the allemande spot between  $\mathcal{X}$  and  $\mathcal{O}$ , and move it by 2. You are done.



# Appendix A

## Proof

### **This is for reference only. You don't need to know this.**

In this chapter we prove the correctness of the system. It needs to be emphasized that one does not need to understand the proof to use the system effectively. In fact, the proof should be far from your mind while calling.

We will give the proof only for a male active. A similar proof could be worked out for a female active, of course.

We will start by restricting the setup to normal or sashayed eight-chain or trade-by setups only. Extension to facing lines, back-to-back lines, waves, and two-faced lines will follow easily by applying the simple  $\mathcal{O}$  calls 1/4 IN/OUT, TOUCH, or VEER LEFT/RIGHT.

We will describe the active's position in the 2x4 matrix as a spot number, designated as "j", counting from the left. The leftmost spot will be #1; the rightmost spot will be #4. This numbering applies whether the active is in the front row or the back row.

The allemande spot will be designated as "k", and will count the same way.

The active's identity (his original couple number) will be given as "i".

All arithmetic will be modulo 4. While this would be more mathematically natural, and things would be more appealing from a computer science point of view, if the numbering started with zero, we will use numbers starting with one, because that numbering is more familiar in most ways. For example, the couple starting one the caller's left is generally known as couple number four, not zero. Just remember that, in these proofs, 0 and 4 are the same number.

For the first 12 theorems, the setup is restricted to normal or sashayed eight-chain or trade-by setups. Other setups will be brought in with theorems 13 and 14.

## A.1 Theorem 1: The Big Theorem

- Case  $\mathcal{O}$ -FRONT: If the active is boy  $\#i$  and is in the front row of an eight-chain or trade-by setup, in location  $\#j$ , and the allemande spot is an  $\mathcal{O}$  and is in location  $\#k$ , then
  - The person next clockwise from him is girl  $\#(i + j - k - 1)$
  - The person next counterclockwise from him is girl  $\#(i + j - k)$
- Case  $\mathcal{O}$ -BACK: As before, if the active is boy  $\#i$  and is in the back row, behind location  $\#j$ , and the allemande spot is an  $\mathcal{O}$  and is in location  $\#k$ , then
  - The person next clockwise from him is girl  $\#(i + j - k)$
  - The person next counterclockwise from him is girl  $\#(i + j - k - 1)$
- Case  $\mathcal{X}$ -FRONT: As before, if the active is boy  $\#i$  and is in the front row, in location  $\#j$ , and the allemande spot is an  $\mathcal{X}$  and is in location  $\#k$ , then
  - If  $j$  is odd, the person next clockwise from him is girl  $\#(i + j - k + 1)$
  - If  $j$  is odd, the person next counterclockwise from him is girl  $\#(i + j - k)$
  - If  $j$  is even, the person next clockwise from him is girl  $\#(i + j - k - 1)$
  - If  $j$  is even, the person next counterclockwise from him is girl  $\#(i + j - k - 2)$
- Case  $\mathcal{X}$ -BACK: As before, if the active is boy  $\#i$  and is in the back row, behind location  $\#j$ , and the allemande spot is an  $\mathcal{X}$  and is in location  $\#k$ , then
  - If  $j$  is odd, the person next clockwise from him is girl  $\#(i + j - k)$
  - If  $j$  is odd, the person next counterclockwise from him is girl  $\#(i + j - k + 1)$
  - If  $j$  is even, the person next clockwise from him is girl  $\#(i + j - k - 2)$
  - If  $j$  is even, the person next counterclockwise from him is girl  $\#(i + j - k - 1)$

The four cases of the theorem are proved by showing that a sequence starts correctly and that the claims of the theorem are preserved by any four-person sex-symmetric things that we call. Remember that, for now, we are only allowing calls or modules that go from normal or sashayed eight-chain or trade-by setups to other normal or sashayed eight-chain or trade-by setups.

To show that a sequence starts correctly, observe that HEADS SQUARE THRU 4 leaves a mental image situation as in Case  $\mathcal{O}$ -FRONT, with  $i = 1$ ,  $j = 2$ , and  $k = 2$ , so the theorem says that the next clockwise person is girl  $\#0$ , that is girl  $\#4$ , and the next counterclockwise person is girl  $\#1$ . The setup in fact matches those claims.

Before proving this theorem, let's skip ahead to the final result:

## A.2 Theorem 2: The System Works

If the mental image system says it's resolved, it's resolved.

Proof: The mental image system requires that the active be in front, standing on his spot, and that the allemande spot be an  $\mathcal{O}$ . This is Case  $\mathcal{O}$ -FRONT, with  $j = k$ . By Theorem 1, the person next clockwise from him is girl  $\#(i - 1)$ . That's his corner. The person next counterclockwise from him is girl  $\#i$ . That's his partner. So, whether he's facing clockwise for an ALLEMANDE LEFT or counterclockwise for a RIGHT AND LEFT GRAND, the getout is correct.

### A.3 Theorem 3: $\mathcal{O}$ Call on Each Side

The claims of Theorem 1 are preserved by any  $\mathcal{O}$  call done on each side.

First, notice that, since we are restricting the formations to normal or sashayed eight-chain or trade-by setups, the only admissible  $\mathcal{O}$  calls or modules must be equivalent to U-TURN BACK, HALF SASHAY, TRADE, PASS THRU, or UN-PASS THRU. (You can call modules containing other calls and going through other formations, such as the module STAR THRU, PASS THE OCEAN, SLIP, RECYCLE, but, in order to satisfy the restriction on the final setup, the module must be equivalent to some combination of the above.)

The next thing to notice is that U-TURN BACK has no effect on anyone's location, whether people are in front or in back, or the nature or location of the allemande spot. So  $i$ ,  $j$ , and  $k$  don't change, nor do the identities of the next clockwise or counterclockwise girl. So the claims of Theorem 1 are completely transparent to U-TURN BACK.

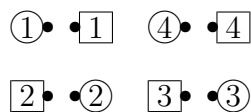
This means that the only calls we need to consider are HALF SASHAY, PASS THRU, and UN-PASS THRU. In other words, we only need to consider the act of swapping each pair of people, on each side of the set, left-to-right, or swapping them front-to-back. With these simplifications, we can effectively address the four cases for  $\mathcal{O}$  calls.

That said, here's the proof. The figures below are just to illustrate the proof cases.

Case  $\mathcal{O}$ -FRONT, swap left-to-right, that is, PASS THRU, or UN-PASS THRU:

If  $j$  was odd, the active moved to the right. The girl now clockwise from him had formerly been counterclockwise (she moved to the left), so she was girl  $\#(i + j - k)$ . Since  $j$  increased by 1, she is now girl  $\#(i + j - k - 1)$ , as required.

Continuing with odd  $j$ , the girl now counterclockwise from him is the opposite of the girl who was formerly clockwise, that is, the opposite of girl  $\#(i + j - k - 1)$ , that is, girl  $\#(i + j - k + 1)$ . (A person's opposite is the boy or girl numbered 2 higher or lower, mod 4.) Since  $j$  increased by 1, she is now girl  $\#(i + j - k)$ , as required.

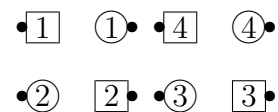


active is boy #2

$i = 2, j = 1, \text{ and } k = 1$

CW is girl  $\#(i + j - k - 1) = \text{girl \#1}$

CCW is girl  $\#(i + j - k) = \text{girl \#2}$



after PASS THRU

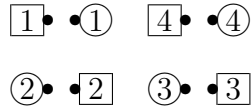
$i = 2, j = 2, \text{ and } k = 1$

CW is girl  $\#(i + j - k - 1) = \text{girl \#2}$

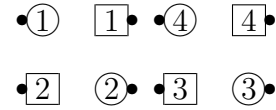
CCW is girl  $\#(i + j - k) = \text{girl \#3}$

If  $j$  was even, the active moved to the left. The girl now clockwise from him had formerly been the opposite of the girl who had been counterclockwise (she moved to the right), so she was the opposite of girl  $\#(i + j - k)$ , that is, girl  $\#(i + j - k - 2)$ . Since  $j$  decreased by 1, she is now girl  $\#(i + j - k - 1)$ , as required.

Continuing with even  $j$ , the girl now counterclockwise from him had formerly been clockwise, so she was girl  $\#(i + j - k - 1)$ . Since  $j$  decreased by 1, she is now girl  $\#(i + j - k)$ , as required.



active is boy #2  
 $i = 2, j = 2,$  and  $k = 1$   
 CW is girl  $\#(i + j - k - 1) =$  girl #2  
 CCW is girl  $\#(i + j - k) =$  girl #3



after PASS THRU  
 $i = 2, j = 1,$  and  $k = 1$   
 CW is girl  $\#(i + j - k - 1) =$  girl #1  
 CCW is girl  $\#(i + j - k) =$  girl #2

Case  $\mathcal{O}$ -FRONT, swap front-to-back, that is, HALF SASHAY:

This simply moves the active to the back row.  $i, j,$  and  $k$  do not change. The girl clockwise from him is now counterclockwise, and vice-versa. This simply becomes case  $\mathcal{O}$ -BACK, and the result follows from inspection of cases  $\mathcal{O}$ -FRONT and  $\mathcal{O}$ -BACK.

Case  $\mathcal{O}$ -BACK, swap front-to-back:

This is just the opposite of the case handled immediately above, going to case  $\mathcal{O}$ -FRONT.

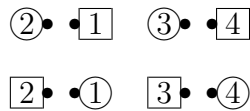
Case  $\mathcal{O}$ -BACK, swap left-to-right:

Do this as a front-to-back swap, getting Case  $\mathcal{O}$ -FRONT, then left-to-right, laboriously covered above, and then another swap front-to-back.

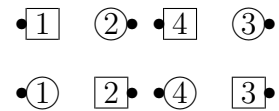
Case  $\mathcal{X}$ -FRONT, swap left-to-right:

If  $j$  was odd, the active moved to the right. The girl now clockwise from him had formerly been counterclockwise (she moved to the left), so she was girl  $\#(i + j - k)$ . Since  $j$  increased by 1 and is now even, she is now girl  $\#(i + j - k - 1)$ , as required.

Continuing with odd  $j$ , the girl now counterclockwise from him is the opposite of the girl who was formerly clockwise, that is, the opposite of girl  $\#(i + j - k + 1)$ , that is, girl  $\#(i + j - k - 1)$ . Since  $j$  increased by 1, she is now girl  $\#(i + j - k - 2)$ , as required.



active is boy #2  
 $i = 2, j = 1,$  and  $k = 2$   
 CW is girl  $\#(i + j - k + 1) =$  girl #2  
 CCW is girl  $\#(i + j - k) =$  girl #1



after PASS THRU  
 $i = 2, j = 2,$  and  $k = 2$   
 CW is girl  $\#(i + j - k - 1) =$  girl #1  
 CCW is girl  $\#(i + j - k - 2) =$  girl #4

If  $j$  was even, the active moved to the left. The girl now clockwise from him had formerly been the opposite of the girl who had been counterclockwise (she moved to the right), so she was the opposite of girl  $\#(i + j - k - 2)$ , that is, girl  $\#(i + j - k)$ . Since  $j$  decreased by 1 and is now odd, she is now girl  $\#(i + j - k + 1)$ , as required.

Continuing with even  $j$ , the girl now counterclockwise from him had formerly been clockwise, so she was girl  $\#(i + j - k - 1)$ . Since  $j$  decreased by 1, she is now girl  $\#(i + j - k)$ , as required.



active is boy #2  
 $i = 2, j = 2,$  and  $k = 2$   
 CW is girl  $\#(i + j - k - 1) =$  girl #1  
 CCW is girl  $\#(i + j - k - 2) =$  girl #4

after PASS THRU  
 $i = 2, j = 1,$  and  $k = 2$   
 CW is girl  $\#(i + j - k + 1) =$  girl #2  
 CCW is girl  $\#(i + j - k) =$  girl #1

Case  $\mathcal{X}$ -FRONT, swap front-to-back:

This simply moves the active to the back row.  $i, j,$  and  $k$  do not change. The girl clockwise from him is now counterclockwise, and vice-versa. This simply becomes case  $\mathcal{X}$ -BACK, and the result follows from inspection of cases  $\mathcal{X}$ -FRONT and  $\mathcal{X}$ -BACK.

Case  $\mathcal{X}$ -BACK, swap front-to-back:

This is just the opposite of the case handled immediately above, going to case  $\mathcal{X}$ -FRONT.

Case  $\mathcal{X}$ -BACK, swap left-to-right:

Do this as a front-to-back swap, getting Case  $\mathcal{X}$ -FRONT, then left-to-right, laboriously covered above, and then another swap front-to-back.

## A.4 Theorem 4: $\mathcal{X}$ Call on Each Side

The claims of Theorem 1 are preserved by any  $\mathcal{X}$  call done on each side.

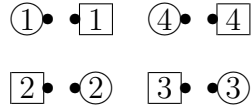
Once again, we can greatly simplify what the  $\mathcal{X}$  call is. Any call or module that is an  $\mathcal{X}$  and preserves the 4-person setup must be made of  $\mathcal{O}$  calls, with a single 2 LADIES CHAIN in it somewhere. We've already proved the result for  $\mathcal{O}$  calls, so we only need to handle the 2 LADIES CHAIN. In fact, we can go a step further—we just need to prove the result for a call that swaps the two girls in each 4-person group, leaving the boys where they were.

That said, here's the proof.

Case  $\mathcal{O}$ -FRONT, swap the girls on each side, goes to  $\mathcal{X}$ -FRONT:

If  $j = 1$ , the girl now clockwise from him had formerly been counterclockwise, so she was girl  $\#(i + j - k)$ . Since  $k$  increased by 1 due to the  $\mathcal{X}$  call, she is now girl  $\#(i + j - k + 1)$ , as required.

The girl now counterclockwise from him had formerly been clockwise, so she was girl  $\#(i + j - k - 1)$ . Since  $k$  increased by 1, she is now girl  $\#(i + j - k)$ , as required.

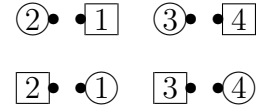


active is boy #2

$$i = 2, j = 1, \text{ and } k = 1$$

CW is girl  $\#(i + j - k - 1) = \text{girl \#1}$

CCW is girl  $\#(i + j - k) = \text{girl \#2}$



after swap 2 girls on each side

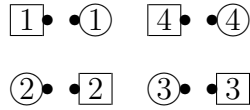
$$i = 2, j = 1, \text{ and } k = 2$$

CW is girl  $\#(i + j - k + 1) = \text{girl \#2}$

CCW is girl  $\#(i + j - k) = \text{girl \#1}$

If  $j = 2$ , the girl now clockwise from him is the opposite of the girl who had formerly been counterclockwise, that is, the opposite of the former girl  $\#(i + j - k)$ , or girl  $\#(i + j - k - 2)$ . Since  $k$  increased by 1, she is now girl  $\#(i + j - k - 1)$ , as required.

The girl now counterclockwise from him is the opposite of the girl who had formerly been clockwise, so she is the opposite of the former girl  $\#(i + j - k - 1)$ , or girl  $\#(i + j - k + 1)$ . Since  $k$  increased by 1, she is now girl  $\#(i + j - k + 2)$ , as required.

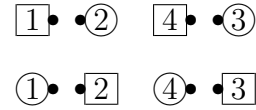


active is boy #2

$$i = 2, j = 2, \text{ and } k = 1$$

CW is girl  $\#(i + j - k - 1) = \text{girl \#2}$

CCW is girl  $\#(i + j - k) = \text{girl \#3}$



after swap 2 girls on each side

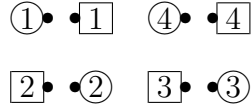
$$i = 2, j = 2, \text{ and } k = 2$$

CW is girl  $\#(i + j - k - 1) = \text{girl \#1}$

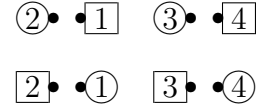
CCW is girl  $\#(i + j - k + 2) = \text{girl \#4}$

If  $j = 3$ , the girl now clockwise from him is the opposite of the girl who had formerly been counterclockwise, that is, the opposite of the former girl  $\#(i + j - k)$ , or girl  $\#(i + j - k + 2)$ . Since  $k$  decreased by 1 due to the  $\mathcal{X}$  call on the right side, she is now girl  $\#(i + j - k + 1)$ , as required.

The girl now counterclockwise from him is the opposite of the girl who had formerly been clockwise, that is, the opposite of the former girl  $\#(i + j - k - 1)$ , or girl  $\#(i + j - k + 1)$ . Since  $k$  decreased by 1, she is now girl  $\#(i + j - k)$ , as required.



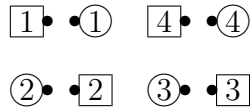
active is boy #3  
 $i = 3, j = 3, \text{ and } k = 3$   
 CW is girl  $\#(i + j - k - 1) = \text{girl \#2}$   
 CCW is girl  $\#(i + j - k) = \text{girl \#3}$



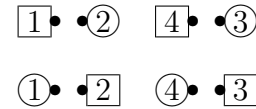
after swap 2 girls on each side  
 $i = 3, j = 3, \text{ and } k = 2$   
 CW is girl  $\#(i + j - k + 1) = \text{girl \#1}$   
 CCW is girl  $\#(i + j - k) = \text{girl \#4}$

If  $j = 4$ , the girl now clockwise from him had formerly been counterclockwise, so she was girl  $\#(i + j - k)$ . Since  $k$  decreased by 1, she is now girl  $\#(i + j - k - 1)$ , as required.

The girl now counterclockwise from him had formerly been clockwise, so she was girl  $\#(i + j - k - 1)$ . Since  $k$  decreased by 1, she is now girl  $\#(i + j - k - 2)$ , as required.



active is boy #3  
 $i = 3, j = 4, \text{ and } k = 3$   
 CW is girl  $\#(i + j - k - 1) = \text{girl \#3}$   
 CCW is girl  $\#(i + j - k) = \text{girl \#4}$



after swap 2 girls on each side  
 $i = 3, j = 4, \text{ and } k = 2$   
 CW is girl  $\#(i + j - k - 1) = \text{girl \#4}$   
 CCW is girl  $\#(i + j - k - 2) = \text{girl \#3}$

Case  $\mathcal{X}$ -FRONT, swap the girls on each side, goes to  $\mathcal{O}$ -FRONT:

This is just the reverse of the case above.

Case  $\mathcal{O}$ -BACK, swap the girls on each side, goes to  $\mathcal{X}$ -BACK:

As with Theorem 3, we just switch the front and back rows, so clockwise and counterclockwise are reversed.

Case  $\mathcal{X}$ -BACK, swap the girls on each side, goes to  $\mathcal{O}$ -BACK:

This is just the reverse of the case above.

## A.5 Theorem 5: $\mathcal{O}$ Call in the Center

The claims of Theorem 1 are preserved by any  $\mathcal{O}$  call done in the center.

A little analysis will show that the only  $\mathcal{O}$  calls in the center that correctly connect to the outsides under the 8-chain or trade by restrictions are either a zero or something that switches each of the

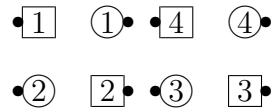
four people in the center with their opposite. (That is, a RIGHT AND LEFT THRU if facing directions are appropriate.) We only need to deal with that latter case. The active has to be in the center, of course, so  $j$  is 2 or 3. The “illicit” case of the active being on the outside will be handled later.

That said, here’s the proof.

Case  $\mathcal{O}$ -FRONT, swap the center 4 with their opposites, goes to  $\mathcal{O}$ -BACK:

If  $j = 2$ , the girl now clockwise from him is the opposite of the girl who had formerly been clockwise, so she is the opposite of the former girl  $\#(i + j - k - 1)$ , or girl  $\#(i + j - k + 1)$ . Since  $j$  increased by 1, she is now girl  $\#(i + j - k)$ , as required.

The girl now counterclockwise from him is the same girl who had formerly been counterclockwise, so she is the former girl  $\#(i + j - k)$ . Since  $j$  increased by 1, she is now girl  $\#(i + j - k - 1)$ , as required.

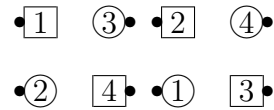


active is boy #2

$i = 2, j = 2, \text{ and } k = 1$

CW is girl  $\#(i + j - k - 1) = \text{girl \#2}$

CCW is girl  $\#(i + j - k) = \text{girl \#3}$



after swap center 4

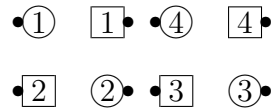
$i = 2, j = 3, \text{ and } k = 1$

CW is girl  $\#(i + j - k) = \text{girl \#4}$

CCW is girl  $\#(i + j - k - 1) = \text{girl \#3}$

If  $j = 3$ , the girl now clockwise from him is the same girl who had formerly been clockwise, so she is girl  $\#(i + j - k - 1)$ . Since  $j$  decreased by 1, she is now girl  $\#(i + j - k)$ , as required.

The girl now counterclockwise from him is the opposite of the girl who had formerly been counterclockwise, so she is the opposite of the former girl  $\#(i + j - k)$ , or girl  $\#(i + j - k - 2)$ . Since  $j$  decreased by 1, she is now girl  $\#(i + j - k - 1)$ , as required.

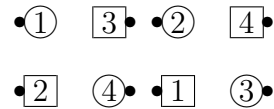


active is boy #3

$i = 3, j = 3, \text{ and } k = 3$

CW is girl  $\#(i + j - k - 1) = \text{girl \#2}$

CCW is girl  $\#(i + j - k) = \text{girl \#3}$



after swap center 4

$i = 3, j = 2, \text{ and } k = 3$

CW is girl  $\#(i + j - k) = \text{girl \#2}$

CCW is girl  $\#(i + j - k - 1) = \text{girl \#1}$

Case  $\mathcal{O}$ -BACK, swap the center 4 with their opposites, goes to  $\mathcal{O}$ -FRONT:

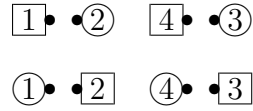


These cases ( $j = 2$  and  $j = 3$ ) are just the opposites of the above two cases.

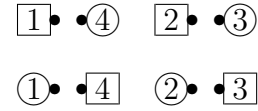
Case  $\mathcal{X}$ -FRONT, swap the center 4 with their opposites, goes to  $\mathcal{X}$ -BACK:

If  $j = 2$ , the girl now clockwise from him is the opposite of the girl who had formerly been clockwise, so she is the opposite of the former girl  $\#(i + j - k - 1)$ , or girl  $\#(i + j - k + 1)$ . Since  $j$  increased by 1, she is now girl  $\#(i + j - k)$ , as required.

The girl now counterclockwise from him is the same girl who had formerly been counterclockwise, so she is the former girl  $\#(i + j - k + 2)$ . Since  $j$  increased by 1, she is now girl  $\#(i + j - k + 1)$ , as required.



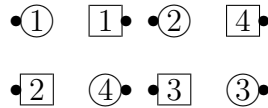
active is boy #2  
 $i = 2, j = 2, \text{ and } k = 2$   
 CW is girl  $\#(i + j - k - 1) = \text{girl \#2}$   
 CCW is girl  $\#(i + j - k + 2) = \text{girl \#1}$



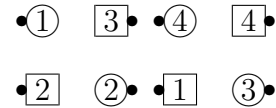
after swap center 4  
 $i = 2, j = 3, \text{ and } k = 2$   
 CW is girl  $\#(i + j - k) = \text{girl \#3}$   
 CCW is girl  $\#(i + j - k + 1) = \text{girl \#4}$

If  $j = 3$ , the girl now clockwise from him is the same girl who had formerly been clockwise, that is, girl  $\#(i + j - k + 1)$ . Since  $j$  decreased by 1, she is now girl  $\#(i + j - k + 2)$ , as required.

The girl now counterclockwise from him is the opposite of the girl who had formerly been counterclockwise, that is, the opposite of the former girl  $\#(i + j - k)$ , or girl  $\#(i + j - k - 2)$ . Since  $j$  decreased by 1, she is now girl  $\#(i + j - k - 1)$ , as required.



active is boy #3  
 $i = 3, j = 3, \text{ and } k = 3$   
 CW is girl  $\#(i + j - k + 1) = \text{girl \#4}$   
 CCW is girl  $\#(i + j - k) = \text{girl \#3}$



after swap center 4  
 $i = 3, j = 2, \text{ and } k = 3$   
 CW is girl  $\#(i + j - k + 2) = \text{girl \#4}$   
 CCW is girl  $\#(i + j - k - 1) = \text{girl \#1}$

Case  $\mathcal{X}$ -BACK, swap the center 4 with their opposites, goes to  $\mathcal{X}$ -FRONT:

These cases ( $j = 2$  and  $j = 3$ ) are just the opposites of the above two cases.

## A.6 Theorem 6: $\mathcal{X}$ Call in the Center

The claims of Theorem 1 are preserved by any  $\mathcal{X}$  call done in the center.

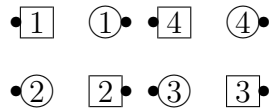
As above, the only admissible  $\mathcal{X}$  calls in the center are  $\mathcal{O}$  calls along with something equivalent to 2 LADIES CHAIN. Since we have already handled  $\mathcal{O}$  calls, we only have to deal with swapping the 2 girls in the center. The active has to be in the center, of course, so  $j$  is 2 or 3. The “illicit” case of the active being on the outside will be handled later.

That said, here’s the proof.

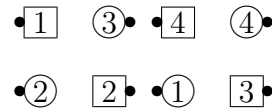
Case  $\mathcal{O}$ -FRONT, swap the center 2 girls, goes to  $\mathcal{X}$ -FRONT:

If  $j = 2$ , the girl now clockwise from him is the same girl who had formerly been clockwise, so she is the former girl  $\#(i + j - k - 1)$ , as required.

The girl now counterclockwise from him is the opposite of the girl who had formerly been counterclockwise, so she is the opposite of the former girl  $\#(i + j - k)$ , or girl  $\#(i + j - k - 2)$ , as required.



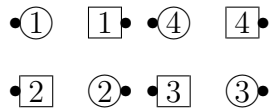
active is boy #2  
 $i = 2, j = 2$ , and  $k = 1$   
 CW is girl  $\#(i + j - k - 1) = \text{girl \#2}$   
 CCW is girl  $\#(i + j - k) = \text{girl \#3}$



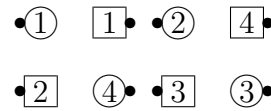
after swap center 2 girls  
 $i = 2, j = 2$ , and  $k = 1$   
 CW is girl  $\#(i + j - k - 1) = \text{girl \#2}$   
 CCW is girl  $\#(i + j - k - 2) = \text{girl \#1}$

If  $j = 3$ , the girl now clockwise from him is the opposite of the girl who had formerly been clockwise, that is, the opposite of the former girl  $\#(i + j - k - 1)$ , or girl  $\#(i + j - k + 1)$ . She is now girl  $\#(i + j - k)$ , as required.

The girl now counterclockwise from him is the same girl who had formerly been counterclockwise, that is, girl  $\#(i + j - k - 2)$ , as required.



active is boy #3  
 $i = 3, j = 3$ , and  $k = 3$   
 CW is girl  $\#(i + j - k - 1) = \text{girl \#2}$   
 CCW is girl  $\#(i + j - k) = \text{girl \#3}$



after swap center 2 girls  
 $i = 3, j = 3$ , and  $k = 3$   
 CW is girl  $\#(i + j - k + 1) = \text{girl \#4}$   
 CCW is girl  $\#(i + j - k) = \text{girl \#3}$

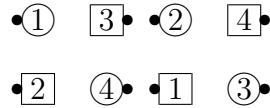
Case  $\mathcal{X}$ -FRONT, swap the center 2 girls, goes to  $\mathcal{O}$ -FRONT:

These cases ( $j = 2$  and  $j = 3$ ) are just the opposites of the above two cases.

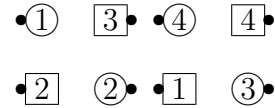
Case  $\mathcal{O}$ -BACK, swap the center 2 girls, goes to  $\mathcal{X}$ -BACK:

If  $j = 2$ , the girl now clockwise from him is the opposite of the girl who had formerly been clockwise, so she is the opposite of the former girl  $\#(i + j - k)$ , or girl  $\#(i + j - k - 2)$ , as required.

The girl now counterclockwise from him is the same girl who had formerly been counterclockwise, so she is the former girl  $\#(i + j - k - 1)$ , as required.



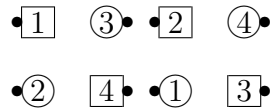
active is boy #3  
 $i = 3, j = 2$ , and  $k = 3$   
 CW is girl  $\#(i + j - k) = \text{girl \#2}$   
 CCW is girl  $\#(i + j - k - 1) = \text{girl \#1}$



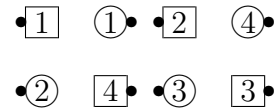
after swap center 2 girls  
 $i = 3, j = 2$ , and  $k = 3$   
 CW is girl  $\#(i + j - k - 2) = \text{girl \#4}$   
 CCW is girl  $\#(i + j - k - 1) = \text{girl \#1}$

If  $j = 3$ , the girl now clockwise from him is the same girl who had formerly been clockwise, that is, girl  $\#(i + j - k)$ , as required.

The girl now counterclockwise from him is the opposite of the girl who had formerly been counterclockwise, that is, the opposite of the former girl  $\#(i + j - k - 1)$ , or girl  $\#(i + j - k + 1)$ , as required.



active is boy #2  
 $i = 2, j = 3$ , and  $k = 1$   
 CW is girl  $\#(i + j - k) = \text{girl \#4}$   
 CCW is girl  $\#(i + j - k - 1) = \text{girl \#3}$



after swap center 2 girls  
 $i = 2, j = 3$ , and  $k = 1$   
 CW is girl  $\#(i + j - k) = \text{girl \#4}$   
 CCW is girl  $\#(i + j - k + 1) = \text{girl \#1}$

Case  $\mathcal{X}$ -BACK, swap the center 2 girls, goes to  $\mathcal{O}$ -BACK:

These cases ( $j = 2$  and  $j = 3$ ) are just the opposites of the above two cases.

## A.7 Theorem 7: $\mathcal{O}$ Call in the Center with active Outside

The claims of Theorem 1 are preserved by any  $\mathcal{O}$  call done in the center when the active is on the outside.

This is the “illicit” case that is handled in practice by changing the active, but we haven’t yet worked out the proof of that. As before, the only admissible  $\mathcal{O}$  call that we need to consider (other than doing nothing), is swapping each person in their group of 4 with their opposite in that group. By taking the appropriate liberties with facing direction, we will simply refer to that as a RIGHT AND LEFT THRU.

Proof.

Simply call that  $\mathcal{O}$  call in the center, while mentally doing this:

- RIGHT AND LEFT THRU on each side.
- RIGHT AND LEFT THRU in the center. The active is in the center now, so this is legitimate.
- RIGHT AND LEFT THRU on each side.

This will leave the mental image outsides, including the active, swapped with their opposites, while the centers are unmoved. The actual dancers will be rotated  $180^\circ$  from our mental image, but that’s OK.



before going through all this

after

Of course, in practice, you would use change-of-active, getting an equivalent result.

## A.8 Theorem 8: $\mathcal{X}$ Call in the Center with active Outside

The claims of Theorem 1 are preserved by any  $\mathcal{X}$  call done in the center when the active is on the outside.

This is the other “illicit” case that is handled in practice by changing the active. As before, the only admissible  $\mathcal{X}$  call that we need to consider, is swapping each girl in their group of 4 with their opposite in that group. By taking the appropriate liberties with position and facing direction, we will simply refer to that as a 2 LADIES CHAIN.

Proof.

Simply call that  $\mathcal{X}$  call in the center, while mentally doing this:

- 2 LADIES CHAIN on each side.
- PASS THRU on each side, to get the active in the center.
- 2 LADIES CHAIN in the center. The active is in the center now, so this is legitimate.
- UN-PASS THRU on each side, to get the active back where he belongs.
- 2 LADIES CHAIN on each side.

Of course, in practice, you would use change-of-active, getting an equivalent result.

By the way, the above sequence will change the nature of the allemande spot and move it by 2.

## A.9 Theorem 9: Meaning of active in Front

The boys are in sequence if and only if the active is in front.

**Note:** This isn't true for two-faced lines or boxes (columns or side-by-side boxes). We are not yet allowing those formations. See Section A.14.

Proof.

This is always satisfied at the start of a sequence, so we just need to show that it is preserved for all of the calls of theorems 2 through 8. As before, everything is reduced to various RIGHT AND LEFT THRU and 2 LADIES CHAIN calls, taking the usual liberties with these calls.

The  $\mathcal{X}$  calls are clear. No boy moves, so the boys' sequence, and the front-or-back location of the allemande spot, is unchanged. This is true even for the special operation of theorem 8—the active moves into the center and comes back out.

For the  $\mathcal{O}$  calls, any RIGHT AND LEFT THRU, on each side or in the center while the active is in the center, moves the active between front and back, and reverses the boys' sequence. For the special operations of theorem 7, the odd number of RIGHT AND LEFT THRU's in our mental image operation moved the active between front and back (in fact, it moved him to his opposite spot), and reversed the boys' sequence.

## A.10 Theorem 10: Meaning of $\mathcal{X}$ and $\mathcal{O}$

The girls are in sequence if the active is in front and the allemande spot is an  $\mathcal{O}$ , or the active is in back and the allemande spot is an  $\mathcal{X}$ . The girls are out of sequence otherwise.

Proof.

Case  $\mathcal{O}$ -FRONT:

The girl counterclockwise from the active is girl  $\#(i + j - k)$ , and the girl clockwise is girl  $\#(i + j - k - 1)$ , so the counterclockwise girl is higher numbered. Therefore the girls are in sequence.

Case  $\mathcal{O}$ -BACK:

The girl clockwise from the active is girl  $\#(i + j - k)$ , one higher than the counterclockwise girl, so the girls are out of sequence.

Case  $\mathcal{X}$ -FRONT:

The girl clockwise from the active is one higher than the counterclockwise girl, so the girls are out of sequence.

Case  $\mathcal{X}$ -BACK:

The girl counterclockwise from the active is one higher than the clockwise girl, so the girls are in sequence.

## A.11 Theorem 11: Real Meaning of $\mathcal{X}$ and $\mathcal{O}$

The boys' sequence and the girls' sequence are the same if the allemande spot is an  $\mathcal{O}$ , and different if it is an  $\mathcal{X}$ .

Proof:

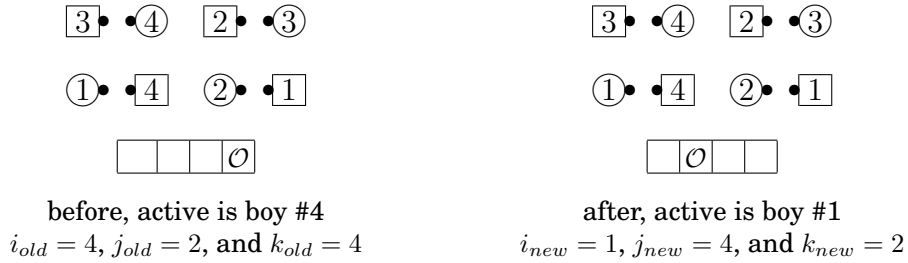
Clear from theorems 9 and 10.

## A.12 Theorem 12: Change of Active

Change of active works.

Proof:

- Case  $\mathcal{O}$ -FRONT: If the original active is in one of the two left positions, the new active is to the right of him, and the boys are in sequence, so  $i$  goes up by 1 and  $j$  goes up by 2. The girl counterclockwise from the original active is girl  $\#(i_{old} + j_{old} - k_{old})$ . The girl clockwise from the new active is girl  $\#(i_{new} + j_{new} - k_{new} - 1)$ .



But they are the same girl (#2 in this example), so  $i_{old} + j_{old} - k_{old} = i_{new} + j_{new} - k_{new} - 1$ . Working this out, one gets  $k_{new} = k_{old} + 2$

If the original active is in one of the two right positions, just reverse the above argument.

- Case  $\mathcal{O}$ -BACK:

If the original active is in one of the two left positions, the new active is to the right of him, and the boys are out of sequence, so  $i$  goes up by 1 and  $j$  goes up by 2. The girl clockwise from the original active is girl  $\#(i_{old} + j_{old} - k_{old})$ . The girl counterclockwise from the new active is girl  $\#(i_{new} + j_{new} - k_{new} - 1)$ .

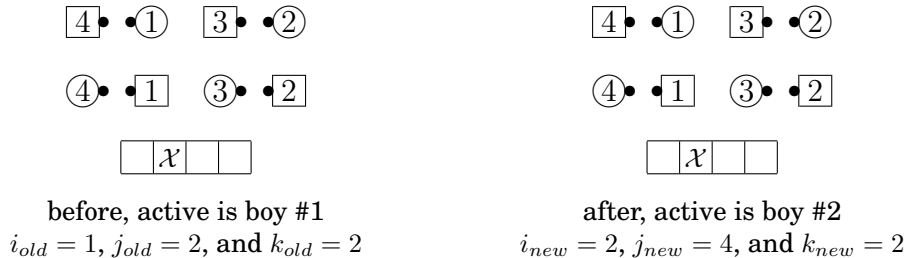
But they are the same girl, so the arithmetic is the same as in the previous case.

If the original active is in one of the two right positions, just reverse the above argument.

That takes care of the  $\mathcal{O}$  case. The allemande spot moves by 2.

- Case  $\mathcal{X}$ -FRONT:

If the original active is in one of the two left positions, the new active is to the right of him, and the boys are in sequence, so  $i$  goes up by 1 and  $j$  goes up by 2. The girl counterclockwise from the original active is one lower, relative to the original  $i, j$ , and  $k$ , than the girl clockwise from the new active.



But they are the same girl (#3 in this example), so  $i_{new} + j_{new} - k_{new} = i_{old} + j_{old} - k_{old} - 1$ . Working this out, one gets  $k_{new} = k_{old}$

If the original active is in one of the two right positions, just reverse the above argument.

- Case  $\mathcal{X}$ -BACK:

If the original active is in one of the two left positions, the new active is to the right of him, and the boys are out of sequence, so  $i$  goes up by 1 and  $j$  goes up by 2.  $(i_{new} + j_{new} - k_{new} + 1) = (i_{old} + j_{old} - k_{old})$ . Working this out, one gets  $k_{new} = k_{old}$

If the original active is in one of the two right positions, just reverse the above argument.

So for the  $\mathcal{X}$  case, the allemande spot does not move.

## A.13 Theorem 13: Some Other Setups

The system works for lines facing in or out, or waves, because all of the above theorems apply.

Proof:

1/4 in and 1/4 out are trivial  $\mathcal{O}$  calls, that don't change  $i$ ,  $j$ , or  $k$ .

The mental image system also works for waves, as described earlier in the book. The trick is that one can go in and out of waves by doing a TOUCH or REAR BACK, which are simple  $\mathcal{O}$  calls. But  $j$ , the active's position in an 8-chain, becomes meaningless. Instead, the theorems apply to the 8-chain that results from doing a REAR BACK. In particular, this means that change of active involves moving from one wave to the corresponding point in the other wave, as discussed earlier. The notion of the active being "in the front row" or "in the back row" now refers to the front or back miniwave.

## A.14 Theorem 14: The Rest of the Setups

The system works for 2-faced lines, or normal ("BOX CIRCULATE") boxes on each side, that is, columns or side-by-side boxes (boy-girl-boy-girl waves).

The previous theorem and this one cover all the setups that you should be using.

One needs to be careful in applying these results to boxes or 2-faced lines. The system works when these setups appear, but the statements about sequence **are not true**.

Statements about who is sequence, in terms of the  $\mathcal{X}$  or  $\mathcal{O}$  state or whether the active is in front, do not apply when in 2-faced lines or in boxes (either columns or side-by-side boxes).

To see how the problem arises, note that TOUCH 1/4 is an  $\mathcal{X}$  but does not affect anyone's sequence. Also, SLITHER is an  $\mathcal{O}$  but changes the sequence of whichever gender is in the center.

Does this mean that the system doesn't work? No it just means that the related insights in Chapter 21 don't apply. But insights about who is or is not in sequence **are not essential to the correctness of the system**.

In fact, when in 2-faced lines, this allemande spot position:  $\square \mathcal{X} \square \square$  is the "promenade home" position even though it is an  $\mathcal{X}$ . Everyone is with partner. If the active and his partner are in front, all couples are in sequence, and, if the couples are normal and facing counterclockwise, you can call PROMENADE HOME.

Now we have to revisit the proof of theorem 12 for change-of-active in 2-faced lines or boxes. In 2-faced lines it's obvious—do a SLITHER (it's an  $\mathcal{O}$ ), do the change of active, and do another SLITHER. This makes the operation equivalent to change-of-active in waves. Just change the active and move an  $\mathcal{O}$  by 2 if necessary.

How about boxes? Boxes (side-by-side or in columns) can be turned into admissible setups (lines or 8-chain/trade by) by having one or the other sex do a U-TURN BACK. Will it still work? Yes. We have to do this  $\mathcal{X}$  call once before the change-of-active, and again afterwards. This will move the spot, pushing it away from the active in one case and pulling it toward him in the other. These pushes and pulls will occur once when the active is on one side and once when on the other. That means that the spot will actually move in the same direction. This will move the spot by 2 in either case. But the difference between change-of-active in an  $\mathcal{O}$  and in an  $\mathcal{X}$  is a spot motion by 2 in either case, so the two “mistakes” cancel each other.

## A.15 Proofs of Specific Calls.

The correctness of our formulations for the calls TRADE BY and CIRCULATE was established in Section 5.1 and Section 5.2.

### A.15.1 BEND THE LINE from back-to-back lines

The call BEND THE LINE, followed by a rotation of the entire setup 90° clockwise, is equivalent to this module:

```
BACK UP  
WHEEL THRU  
TRADE BY  
WHEEL THRU  
BACK UP
```

(Push checkers!) Since the rotation doesn't affect the correctness, we just have to show that the formulation given in Section 7.2 works for the above module. The mental analysis of that module consists of an  $\mathcal{X}$  call on each side (the two WHEEL THRU's), moving to the other side (the TRADE BY), and backing to a position as though a COUPLES TRADE had been done. The two  $\mathcal{X}$  calls have the effect of moving the allemande spot by two always, since they are on opposite sides, so one pushes and the other pulls. The COUPLES TRADE is formulated as a change of active followed by a PARTNER TRADE. The two  $\mathcal{X}$  calls and the change of active have the effect of moving the allemande spot by two if and only if it is an  $\mathcal{X}$ , which is the required formulation from Section 7.2.

### A.15.2 WHEEL AND DEAL from back-to-back lines

This is equivalent to:

```
BEND THE LINE  
LEFT WHEEL THRU  
OUTSIDES TRADE
```

The active is required to be on the left, as per Section 8.2. When we perform the BEND THE LINE as the PARTNER TRADE of the preceding paragraphs, followed by the LEFT WHEEL THRU, the active will be in the appropriately rotated position from Section 8.2. The combined actions of moving the allemande spot by two if it is an  $\mathcal{X}$ , followed by the  $\mathcal{X}$  LEFT WHEEL THRU, has the effect of changing the nature of the allemande spot and pushing it away from the active's side in all cases, as required.



### **A.15.3** DOUBLE PASS THRU

This call, along with an inconsequential 180° rotation of the entire setup, is equivalent to this:

CENTERS TRADE (now in an 8-chain)  
PASS THRU  
NEW CENTERS TRADE

The active starts in the center, as required, and finishes on the outside, as required. The mental action is that of taking the active's local opposite, as described in Section 10.2.

### **A.15.4** ZOOM from a DPT or CDPT

From a starting DPT, ZOOM is equivalent to this:

CENTERS TRADE (now in an 8-chain)  
PASS THRU  
ENDS TRADE

After the PASS THRU, the active is on the outside, so a change of active is required to bring him into the center. This moves the allemande spot by two if it is an  $\mathcal{O}$ , and leaves him on his opposite's spot in the center, as described in Section 9.3.

From a completed DPT, ZOOM is equivalent to this:

ENDS TRADE (now in an 8-chain)  
PASS THRU  
CENTERS TRADE

The active is required to be on the outside at the start of this call. After the PASS THRU, the active is in the center, so a change of active is required to bring him back to the outside.

The effect is to move the allemande spot by two if it is an  $\mathcal{O}$ , and move him on his opposite's spot, as described in Section 10.3.

### **A.15.5** CLOVERLEAF

This call, along with an inconsequential 90° counterclockwise rotation of the entire setup, is equivalent to this:

CENTERS TRADE  
CENTER 2 LADIES CHAIN  
TRADE BY  
PASS THRU  
CENTER 2 LADIES CHAIN  
TRADE BY  
CENTERS TRADE

(Push checkers!) If the couples are sashayed, we take the usual liberties with the LADIES CHAIN.

The active starts on the outside. The mental action for the active is simply to take his local opposite, the same action as for a DOUBLE PASS THRU.

But the first LADIES CHAIN happens in the center while the active is on the outside, so we have to do a change of active before it, and another one after it, so that he will be in the center while the LADIES CHAIN is happening. One of the changes will take place while the allemande spot is an  $\mathcal{O}$ , and the other while it is an  $\mathcal{X}$ , so the net movement is two spots in either case. The allemande spot switches twice, so it maintains its  $\mathcal{X}$  or  $\mathcal{O}$  nature, though it moves by 2.

This is the mental image action described in Section 10.4.

### A.15.6 COLUMN CIRCULATE

This call is, for all positions of the active, equivalent to:

CENTERS CIRCULATE  
CENTERS TRADE  
ALL SPLIT CIRCULATE

Analysis of that module will show that the formulation given in Chapter 11 is correct.

### A.15.7 TRACK 2

This call is equivalent to:

OUTSIDES TRADE  
PASS TO THE CENTER (this takes care of the tandem trade)  
CENTERS PASS THRU  
TOUCH

The mental action is the same as the actual call. Just do it, as indicated in Section 10.5 .

### A.15.8 BOYS/GIRLS TRADE DOWN THE LINE

Assuming the lines are back-to-back, GIRLS TRADE DOWN THE LINE is equivalent to:

BEND THE LINE  
2 LADIES CHAIN (you know what we mean)  
UN-BEND THE LINE  
GIRLS U-TURN BACK

An  $\mathcal{X}$  call is done twice, on the active's side each time, once in an  $\mathcal{X}$  and once in an  $\mathcal{O}$ . One of them pushes the allemande spot away and the other pulls it back, so there is no net effect on the allemande spot from this. But there are two  $\mathcal{X}$ -conditional spot moves, one in an  $\mathcal{X}$  and one in an  $\mathcal{O}$ , so the allemande spot always moves by 2, as indicated in Chapter 15.

If the lines are facing (you really shouldn't call this when the lines are facing), just do a PARTNER TRADE before and after, getting the required result.

When going the other way, from side-by-side boxes to lines, just do a GIRLS U-TURN BACK before and after, getting the required result.

Assuming the lines are back-to-back, BOYS TRADE DOWN THE LINE is equivalent to:

BEND THE LINE  
2 GENTLEMEN CHAIN (or whatever you want to call it)  
UN-BEND THE LINE  
BOYS U-TURN BACK

As before, an  $\mathcal{X}$  call is done twice, with no net effect on the allemande spot. But there are two  $\mathcal{X}$ -conditional spot moves, with the effect of moving the allemande spot by 2. Also, since the 2 GENTLEMEN CHAIN results in the active finishing in a different spot from the one on which he started, you have to do the “diagonal back up”, as indicated in Chapter 15.

The cases of facing lines, and of side-by-side boxes, are handled the same as for GIRLS TRADE DOWN THE LINE.

### A.15.9 BOYS/GIRLS CIRCULATE

Start with the special case of BOYS CIRCULATE when the active is a trailer. The call is then equivalent to this:

GIRLS TRADE  
STEP THRU (or veer left/right if in 2-faced lines, now in a trade-by setup)  
CENTER 2 LADIES CHAIN  
TRADE BY  
TOUCH (or veer left/right if started in 2-faced lines, now back in same setup)

(Push checkers!) If people are sashayed, we take the usual liberties with the LADIES CHAIN. The reason we required the active to be a trailer was so that he would be in the center when the CENTER 2 LADIES CHAIN was called.

The mental image formulation is an  $\mathcal{X}$  on the active’s original side, followed by an  $\mathcal{X}$  in the center, while moving the active forward. If the allemande spot was on  $\mathcal{O}$ , it changes to an  $\mathcal{X}$  while being pushed forward, and then changed back to an  $\mathcal{O}$  without moving. If it was initially an  $\mathcal{X}$ , the net effect is to move it back toward the active.

Now perform a change of active operation. This brings the active back to his starting position. If the allemande spot was an  $\mathcal{O}$ , it changes the forward motion to a backward motion. If it was an  $\mathcal{X}$ , it is left as a backward motion. This can be thought of as a “wind in your face” motion either way, that is, the spot moves opposite the direction that the active is facing, as described in Chapter 16.

If the active is a trailer, perform a change of active before and after. This will have no effect except to make him a center during the CENTER 2 LADIES CHAIN.

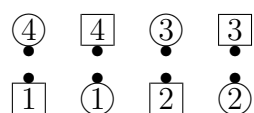
For the call GIRLS CIRCULATE, note that, when combined with a BOYS CIRCULATE, the mental image formulation must be that of ALL 8 CIRCULATE. That means that the active moves forward or back, and the allemande spot doesn’t move. It follows that, for GIRLS CIRCULATE, the active moves forward or back, and the allemande spot moves the same way he is facing, that is, in the “wind at your back” direction.

## Appendix B

# Snapshots and Standard Notation

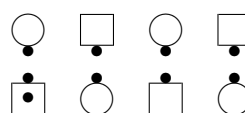
For the formation and arrangement (“FA”) of normal facing lines, there are 16 sequence and relationship (“SR”) possibilities, as shown below. Six of them (1(a), 1(b), 5(a), 5(b), 6(a), and 6(b)) involve at least one paired couple, making them particularly popular for sight resolving. We list all of them here, with the actual dancer numbers on the left and the mental image formulation on the right.

- “CRaMS” is the *Controlled Resolution and Manipulation System*, Callerlab, 2008.
- “CL” is the standard Callerlab FASR designation.
- “Litman” is a very widely used notation from some time ago, in *Instant Hash: An Advanced Text on Modern Square Dance Figures, with Over 230 Practical Examples and Also Hints on how to Analyze and Simplify Hash, and to Change Figures Quickly and Easily for More Dancing Fun*, Rickey Holden, Lloyd Litman, 1961.
- “Big5” is *The Big Five (MS, +, Advanced, C-1, C-2): Dictionary and Square Dance Manual, a Sequel to the Top Ten*, William Richard Davis, John Sybalsky, 1993

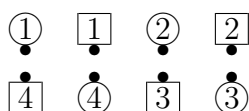


CRaMS: 1(a)  
Litman: 1P2P

CL: ZL  
Big5: L1p

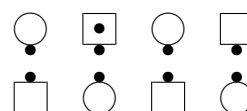


CIRCLE LEFT/RIGHT

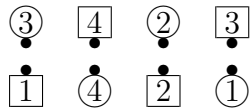


CRaMS: 1(b)  
Litman: 2P1P

CL: ZLo  
Big5: L2p

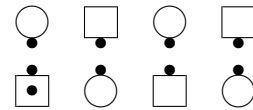


LEFT SQUARE THRU 2, ALLEMANDE LEFT

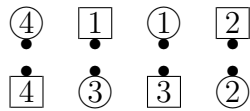
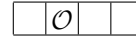


CRaMS: 2(a)  
Litman: 1C2C

CL: CL  
Big5: L1c

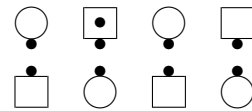


STAR THRU, DIVE THRU,  
SQUARE THRU 3, ALLEMANDE LEFT

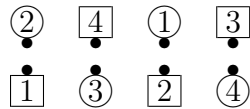
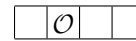


CRaMS: 2(b)  
Litman: 2C1C

CL: CLo  
Big5: L2c

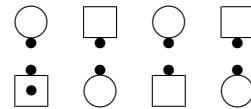


SLIDE THRU, ALLEMANDE LEFT

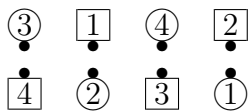


CRaMS: 3(a)  
Litman: 1O2O

CL: OL  
Big5: L1o

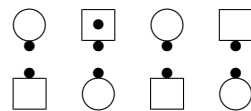


SQUARE THRU 4, TRADE BY,  
PASS THRU, ALLEMANDE LEFT

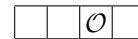


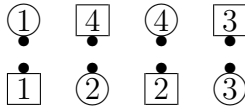
CRaMS: 3(b)  
Litman: 2O1O

CL: OLo  
Big5: L2o



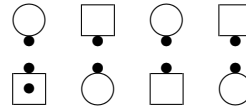
STAR THRU, EIGHT CHAIN 3, ALLEMANDE LEFT



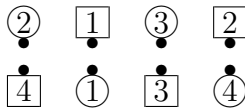


CRaMS: 4(a)  
Litman: 1R2R

CL: RL  
Big5: L1r

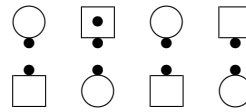


SQUARE THRU 4, TRADE BY, ALLEMANDE LEFT

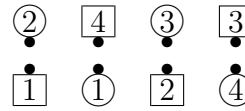


CRaMS: 4(b)  
Litman: 2R1R

CL: RLo  
Big5: L2r

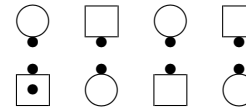


SQUARE THRU 2, TRADE BY, ALLEMANDE LEFT

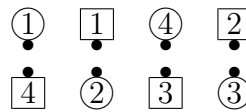


CRaMS: 5(a)  
Litman: 1P2O

CL: PLOL  
Big5: L3p

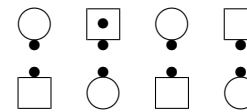


PASS THRU, WHEEL AND DEAL,  
CENTERS SQUARE THRU 3, ALLEMANDE LEFT



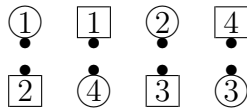
CRaMS: 5(b)  
Litman: 2O1P

CL: OLPLo  
Big5: L4o



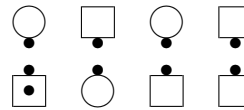
REVERSE FLUTTER, SQUARE THRU 2,  
TRADE BY, ALLEMANDE LEFT



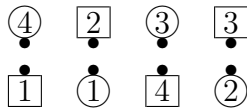


CRaMS: 6(a)  
Litman: 102P

CL: OLPL  
Big5: L3o

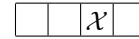
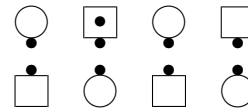


PASS THE OCEAN, RECYCLE, ALLEMANDE LEFT

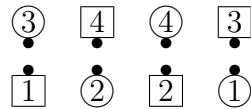


CRaMS: 6(b)  
Litman: 2P10

CL: PLOLo  
Big5: L4p

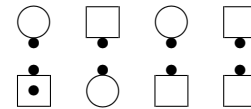


PASS THRU, WHEEL AND DEAL,  
CENTERS PASS THRU, ALLEMANDE LEFT

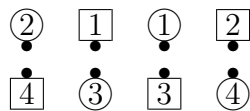


CRaMS: 7(a)  
Litman: 1R2C

CL: RLCL  
Big5: L3r

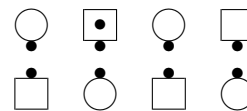


PASS THE OCEAN, RECYCLE,  
EIGHT CHAIN 3, ALLEMANDE LEFT

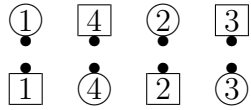


CRaMS: 7(b)  
Litman: 2C1R

CL: CLRLo  
Big5: L4c

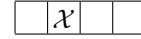
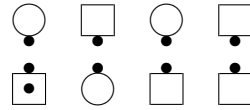


SPIN THE TOP, CIRCULATE, RIGHT AND LEFT GRAND

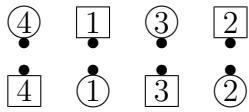


CRaMS: 8(a)  
Litman: 1C2R

CL: CLRL  
Big5: L3c

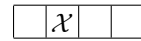
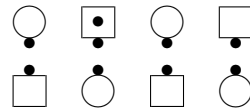


SLIDE THRU, SWING THRU, RIGHT AND LEFT GRAND



CRaMS: 8(b)  
Litman: 2R1C

CL: RLCLo  
Big5: L4r



SPIN THE TOP, RIGHT AND LEFT GRAND



# Appendix C

## Call Lists

### C.1 Mainstream and Plus Calls

All of these assume “normal” formations. For example, QUARTER IN/OUT is done from couples, and MIX is done from waves or 2-faced lines.

ACEY DEUCEY	17
BEND THE LINE (FROM 2-FACED LINE)	$\mathcal{X}$
BEND THE LINE (FROM LINES BACK-TO-BACK)	7.2
BOX THE GNAT	$\mathcal{O}$
CALIFORNIA TWIRL	$\mathcal{O}$
CAST OFF 3/4	$\mathcal{X}$
CHAIN DOWN THE LINE (FROM 2-FACED LINE)	$\mathcal{O}$
CHAIN DOWN THE LINE (FROM LH WAVES)	$\mathcal{X}$
CHASE RIGHT	$\mathcal{X}$
CIRCULATE (ALL 8)	5.2
CIRCULATE (SPLIT/BOX)	$\mathcal{X}$
CIRCULATE (COLUMN)	11
CLOVERLEAF	10.4
COORDINATE	11.1
COUPLES HINGE	$\mathcal{X}$
COUPLES TRADE	$\mathcal{O}$
CROSS RUN	$\mathcal{X}$
CROSSFIRE	$\mathcal{O}$
CUT THE DIAMOND	$\mathcal{O}$ , 13
DIAMOND CIRCULATE	$\mathcal{X}$ , 13
DIVE THRU	9.1
DIXIE STYLE TO A WAVE	$\mathcal{X}$
DOUBLE PASS THRU	10.2
EIGHT CHAIN THRU	5.1
EXPLODE AND. . .	$\mathcal{O}$
EXPLODE THE WAVE	$\mathcal{O}$
EXTEND	3.1
FAN THE TOP (FROM WAVE)	$\mathcal{X}$
FAN THE TOP (FROM 2-FACED LINE)	$\mathcal{O}$

FERRIS WHEEL	9.2
FIRST COUPLE GO LEFT, NEXT COUPLE GO RIGHT	10.6
FLIP THE DIAMOND	0, 13
(REVERSE) FLUTTER WHEEL	$\mathcal{X}$
FOLLOW YOUR NEIGHBOR	$\mathcal{X}$
GRAND SWING THRU	18
HALF SASHAY	0
HALF TAG	14
HINGE (FROM A MINIWAVE)	$\mathcal{X}$
HINGE (FROM A COUPLE)	0
2 LADIES CHAIN	$\mathcal{X}$
LEAD RIGHT/LEFT	$\mathcal{X}$
LINEAR CYCLE (FROM WAVE)	0
LOAD THE BOAT	0
PARTNER TAG (FROM A MINIWAVE)	$\mathcal{X}$
PARTNER TAG (FROM A COUPLE)	0
PASS THE OCEAN	0
PASS THRU	0
PASS TO THE CENTER	9.1
PEEL OFF	0
PEEL THE TOP	0
PING PONG CIRCULATE	21.4
RIGHT AND LEFT THRU	0
RECYCLE (FROM WAVES)	$\mathcal{X}$
RECYCLE (FROM FACING COUPLES)	$\mathcal{X}$
RELAY THE DEUCEY	0
ROLL AWAY	0
CENTERS/ENDS (OF A WAVE OR LINE) RUN	$\mathcal{X}$
SCOOT BACK	0
SINGLE CIRCLE TO A WAVE	0
SLIDE THRU (from boys facing girls)	0
SPIN CHAIN THE GEARS	21.4
SPIN CHAIN THRU	19
SPIN THE TOP	$\mathcal{X}$
SPREAD	0
SQUARE THRU $\langle n \rangle$	0
STAR THRU	0
STEP THRU	0
STEP TO A WAVE	0
SWEEP 1/4	$\mathcal{X}$
SWING THRU	$\mathcal{X}$
TAG THE LINE	14
TOUCH 1/4	$\mathcal{X}$
TRADE	0
TRACK 2	10.5
CENTERS (OF A WAVE OR LINE) TRADE	$\mathcal{X}$
TRADE BY	5.1
TRADE THE WAVE	0

TRIPLE SCOOT	○
TURN THRU	○
U-TURN BACK (EVERYONE)	○
VEER LEFT/RIGHT	○
WALK AND DODGE	○
WHEEL AND DEAL (FROM 2-FACED LINE)	○
WHEEL AND DEAL (FROM LINES BACK-TO-BACK)	8.2
WHEEL AROUND	○
ZOOM	○

## C.2 Advanced Calls

CROSS-OVER CIRCULATE	5.2
LOCKIT (from wave)	○
LOCKIT (from 2-faced line)	✗
MIX	○
PAIR OFF	○
PASS THE SEA	○
QUARTER IN/OUT	○
QUARTER RIGHT/LEFT	✗
QUARTER THRU	○
RECYCLE (from facing couples)	✗
SCOOT AND DODGE	✗
SCOOT AND WEAVE	○
SLIDE	○
SLIP	✗
SLITHER	○
SPLIT/BOX COUNTER ROTATE	✗
SPLIT/BOX TRANSFER	✗
SQUARE CHAIN THRU	✗
SWAP AROUND	✗
SWING	○
SWITCH THE WAVE	○
SWITCH TO A DIAMOND	✗
THREE QUARTER THRU	○
TRADE CIRCULATE	5.2
TURN AND DEAL (from 2-faced line)	○
TURN AND DEAL (FROM LINES BACK-TO-BACK)	8.2, then HALF SASHAY
WHEEL THRU	✗

## C.3 C-1 Calls

AH SO	○
ALTER THE WAVE	○
CROSS AND TURN	✗
CROSS ROLL TO A WAVE	○
DIXIE SASHAY	✗
DIXIE DIAMOND	○
FLIP BACK	○
FLIP THE LINE	14.1

FLIP YOUR NEIGHBOR	$\mathcal{X}$
FOLLOW THRU	$\mathcal{X}$
2/3 RECYCLE	$\mathcal{O}$
RELAY THE SHADOW	step back to facing lines, hinge, then reorient
SPLIT RECYCLE	$\mathcal{O}$
STEP AND FOLD	$\mathcal{X}$
SWING THE FRACTIONS	ends trade, then reorient
TAG BACK TO A WAVE	<a href="#">14.1</a>
TAG YOUR NEIGHBOR	<a href="#">14.1</a>
TALLY HO	from waves, same as SPIN CHAIN THRU, <a href="#">19</a>
WHEEL FAN THRU	$\mathcal{O}$