

**for saxophone quartet,
video,
electronic sound,
and audience participation**

**Score
Sax Quartet Version for San Jose**

Flock (2007)

for saxophone quartet, video, electronic sound, and audience participation

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Flock was commissioned by the Adrienne Arsht Center for the Performing Arts in Miami, Florida, Justin Macdonnell, artistic director. Additional support for the development of Flock and its premiere performances at the Adrienne Arsht Center has been provided by the Funding Arts Network, the Georgia Tech Foundation, the GVU Center at Georgia Tech, and generous underwriting by Mitchell & Elizabeth A. Taylor, Ms. Dale Moses, and Mr. and Mrs. Hebert A. Tobin. Flock's premiere performances are produced by iSAW, Gustavo Matamoros, director.

The Flock Development Team

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Special Thanks To

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1 About the Piece

Flock is a full evening performance work for saxophone quartet, conceived to directly engage audiences in the composition of music by physically bringing them out of their seats and enfolded into the creative process. During the performance, the four musicians and up to one hundred audience members move freely around the performance space. A computer vision system determines the locations of the audience members and musicians, and it uses that data to generate performance instructions for the saxophonists, who view them on wireless handheld displays mounted on their instruments. The data also drives the real-time generation of a video animation and an electronic soundtrack.

1.1 Duration

Approximately 60 minutes.

1.2 Performance Personnel

Four saxophonists (soprano, alto, tenor, and baritone).

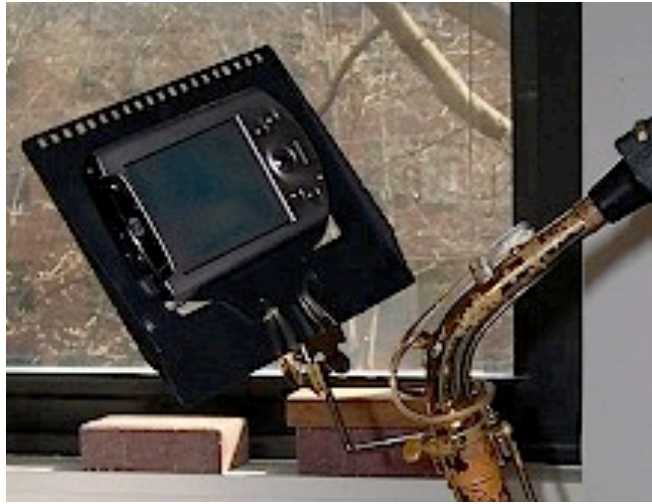
Four facilitators to lead the audience's participation in the piece and be featured in their own "solo" section with the saxophone quartet. These facilitators may have training in music, dance, or theater but this is not required.

Two or three personnel to oversee the computer vision system, notation system, and audio and video generation.

2 Background for Saxophonists

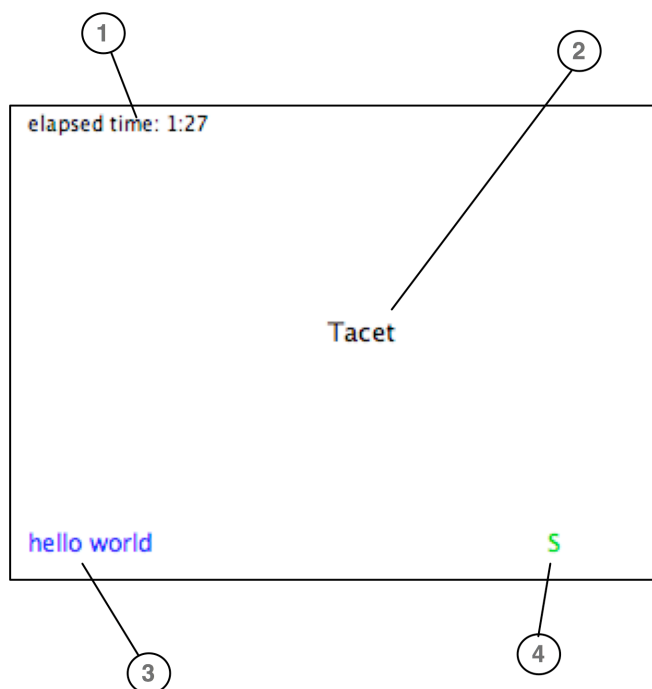
2.1 *Music Notation*

Music notation is generated by computer software in real time, based on the positions of the musicians, facilitators, and/or audience members. Saxophonists view it on wireless, battery-operated PDA displays mounted to their instruments with standard marching-band lyres.



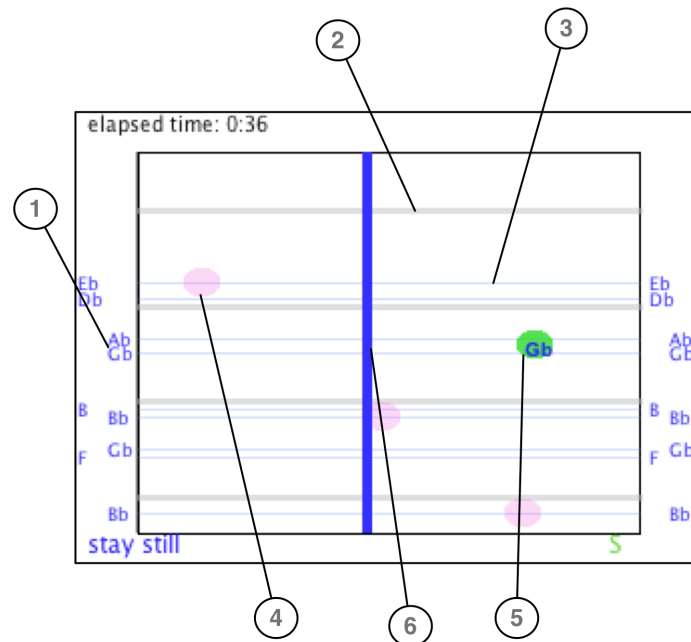
All notation is displayed in the written range of each instrument.

2.1.1 Notation Basics



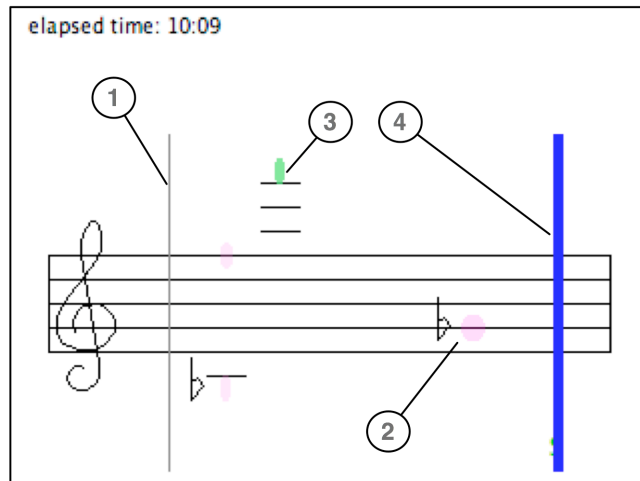
1. Time, in minutes and seconds, since the performance began.
2. When “tacet” is displayed, do not play and stay offstage. When “get ready” is displayed, come onstage and prepare to play.
3. Short text messages give cues and communicate specialized instructions and information.
4. The letter (S,A,T,B) of the saxophonist for whom this notation is intended. This insures that each player has the correct PDA device.

2.1.2 Graphical Notation



1. The active pitches are displayed on the left and right margins.
2. Gray horizontal lines indicate successive octaves in the saxophone's range. Each line is a written C, starting with the lowest C on the instrument on the bottom and working up to altissimo C at the top.
3. Blue horizontal lines indicate the pitches in the active pitch set.
4. The saxophonist does not play pink notes. These are notes played by other saxophonists. For display purposes, they may be transposed up or down an octave if necessary to fit within the display area.
5. The saxophonist plays the green notes. Some notes are labeled with the pitch name.
6. A scrolling vertical blue bar shows position within the measure. Measure position is always synchronized among all four players.

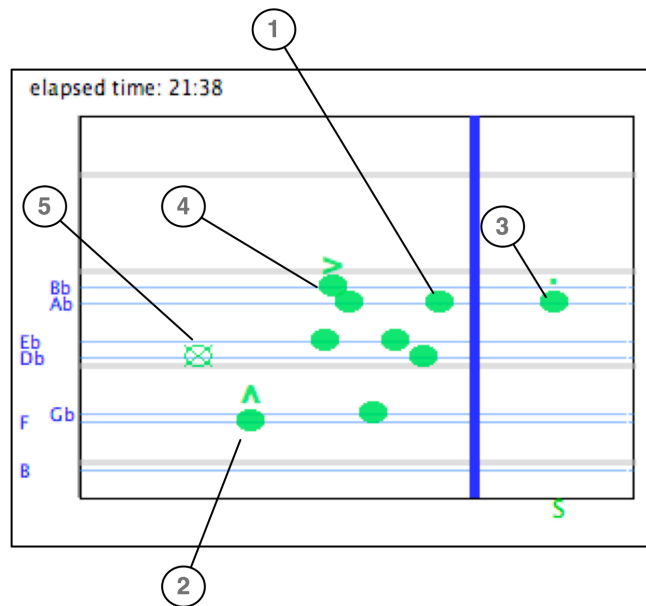
2.1.3 Staff-based Notation



1. A thin black vertical line indicates the starting point of the measure.
2. The saxophonist does not play pink notes, when displayed. These are notes played by other saxophonists. For display purposes, they may be transposed up or down an octave if necessary to fit within the display area.
3. The saxophonist plays the green notes.
4. A scrolling blue bar shows position within the measure. Measure position is always synchronized among all four players.

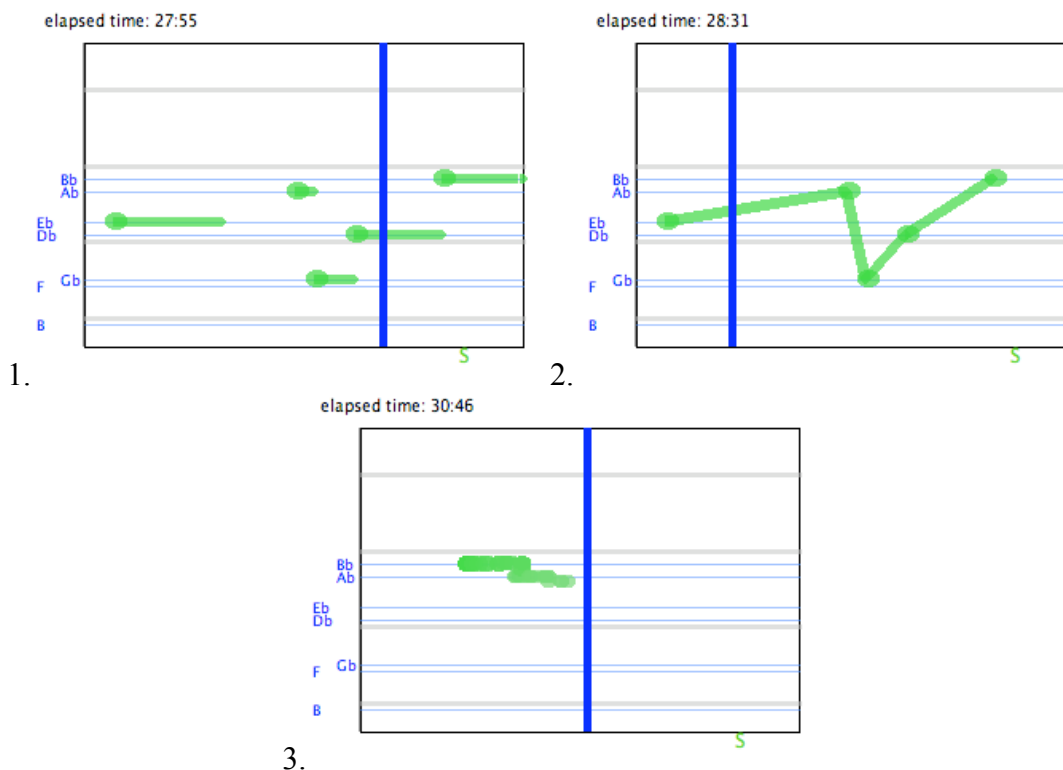
There is never a key signature or time signature. Time is proportional; there is no traditional notation for durations and rests. Accidentals hold for the duration of the measure, across both green and pink notes, but only in the octave in which they first appear. Courtesy accidentals are provided whenever possible; they are not enclosed in parenthesis.

2.1.4 Articulations



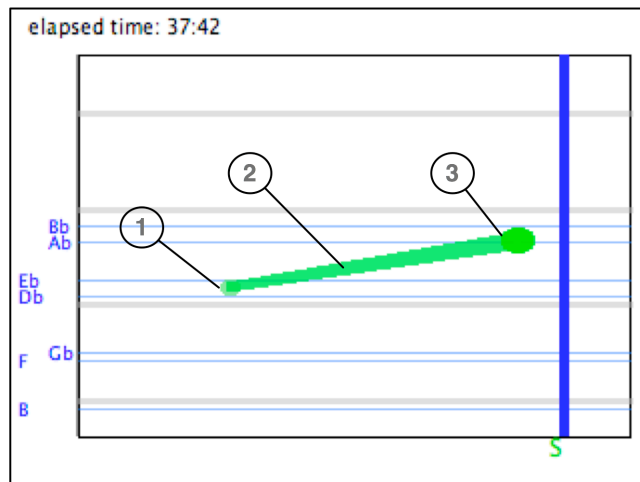
1. Normal articulation: no special marking.
2. Hard accent.
3. Staccato.
4. Regular accent.
5. "Special effect" articulation, such as a slap tongue or key click.

2.1.5 Lines and Curves



1. Horizontal lines are added onto the end of each note to indicate its approximate duration.
2. Diagonal lines connect successive points from left to right in the measure. Players use these to guide their improvisation, capturing the general melodic contour of the line rather than playing it as precisely as possible.
3. The movement of a person or group of people over time creates a gestural curve. Again, players use these to guide their improvisation, capturing the general melodic contour of the line. It is often, in fact, impossible to play the gesture precisely, as these contours can “fold back” over themselves. Players use their judgment in interpreting these polyphonic sections of the notation, either ignoring some elements, alternating between them, or utilizing multiphonics.

2.1.6 Dynamics



1. Pianissimo noteheads have a small area and a light color shade.
2. As the thickness of the line grows, the music crescendos.
3. Fortissimo noteheads have a large area and a dark color shade.

2.1.7 Measure Updates

Measures are updated in two ways:

- In continuous update mode, the contents of the measure are updated several times per second. Simply read whatever notes appear under the scrolling blue bar at any given moment.
- In fixed update mode, the contents of the measure are frozen at the beginning of each measure. As the scrolling blue cursor moves across the measure, the area behind it is updated for the following measure so you can read ahead in the notation.

2.2 Rehearsal

2.2.1 Individual Practice

- Read through this score carefully in order to fully understand how the piece works and how the performance is structured.
- Use the practice notation videos to practice playing with the real-time notation and develop strategies for responding to it.
- Study the harmonic structure outlined in this score.

2.2.2 Quartet Practice without PDAs

- Use the practice notation videos to practice playing the real-time notation in an ensemble context and to develop group strategies for creating compelling music in response to it.
- Discuss the performance structure as a group and brainstorm strategies for movement through the space, eye contact with other ensemble members, and interaction with the audience.

2.2.3 Quartet Practice with PDAs

Using software to simulate audience and musician position data, a single laptop and wireless router can simulate a performance of the piece and generate real-time notation on the PDAs for rehearsal purposes.

- Make sure you can securely mount the PDA on your instrument in a position suitable for viewing the display.
- Practice responding to the real-time notation as a group, reading it from the PDAs.
- Run through simulations of entire sections and eventually of the entire performance.

2.2.4 Quartet practice in performance space

- Practice moving around the performance space to develop a solid mental map of how positions map to video and notation in various sections of the work.
- Practice individual sections of the performance, especially those without audience participation, with a focus on developing movement strategies that produce interesting visual and musical results. For sections with audience participation, a small group of volunteers will be on hand to serve as the audience.
- Run through the entire performance.

2.3 Dress

Please wear all black to performances; this will help the computer vision system more accurately locate you as you move around the performance space. (You will also be given a special hat to wear to facilitate this tracking.)

3 Structure

This section explains how the evening is organized, with a particular focus on the role of the saxophonists in the performance. It is not important to understand all the details described in this section or to memorize anything described here.

3.1 Entrance Music: Covey

Duration: 10 minutes.

This section runs from the time the house doors open until the performance begins. It involves the audience, video, and electronic sound; the saxophonists and facilitators do not participate.

3.2 Verbal Introduction

Duration: 5 minutes.

We briefly explain and demonstrate the basic modes of interaction: cartesian and polar mappings, instantaneous points and motion trails, audio, video, and notation, and the roles of saxophonists, facilitators, and audience members.

The baritone saxophonist assists in the short demonstrations that are part of the introduction. (*Cue on PDA:* come onstage, then follow verbal instructions.)

3.3 Opening

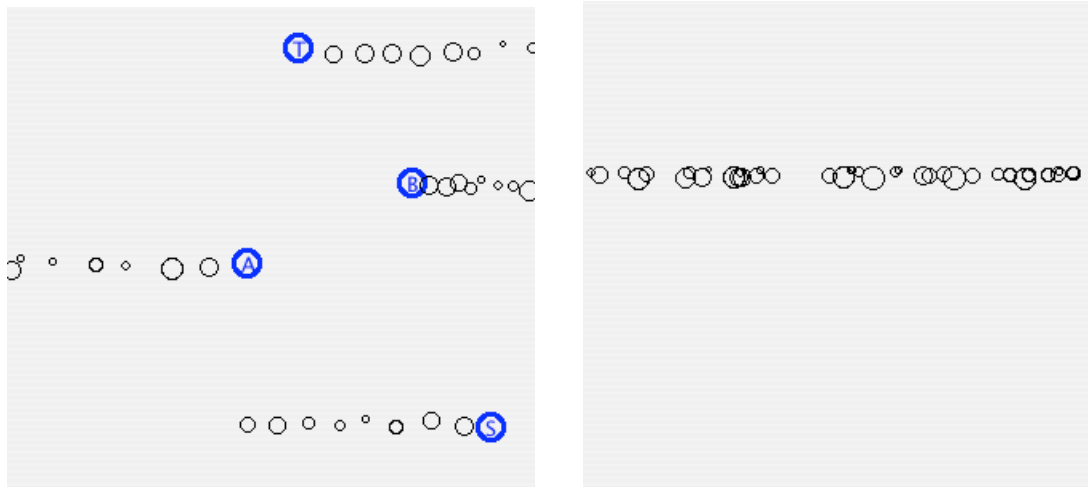
Duration: 15-20 minutes.

- **Quartet entry:**
 - *Script:* Each saxophonist (alto, then tenor, then soprano, then bari) comes out on stage (*Cue on PDA:* Come onstage), moves around freely for a short time (*Cue on PDA:* free movement), and then freezes in a location of their choice (*Cue on PDA:* stay still).
 - *Notation:* Staff-based notation, continuous updates. Each saxophonist generates a single note per measure for himself based on current position (x is measure position, y is quantized pitch).
 - *Electronic Sound:* None.
- **Facilitator entry:**
 - *Script:* Facilitators come onstage, move around, and freeze.
 - *Notation:* Same as above, plus each facilitator generates a note for whichever saxophonist is closest to him. Notes generated by a saxophonist for himself are accented; notes generated by facilitators are not. Switches to graphical mode.
 - *Electronic Sound:* None.
- **Audience entry:**
 - *Script:* One facilitator brings four audience members onto stage and freezes them.
 - *Notation:* Same as above, plus each audience member generates a note for whichever saxophonist is closest to him.
 - *Electronic Sound:* None.

- **Common-tone motion:**
 - *Script:* One facilitator moves one person at a time (saxophonist, facilitator, or audience member) to a new location on stage and instructs them to remain still. (Cue on PDA: Stay still until moved.)
 - *Notation:* Note extensions are added to each note. These extensions gradually grow longer and eventually wrap around the full duration of each measure.
 - *Electronic Sound:* None.
- **Build up:**
 - *Script:* Additional facilitator(s) begin moving people around the stage.
 - *Notation:* Switches to fixed update mode. Diagonal lines connect successive points instead of note extensions.
 - *Electronic Sound:* None.
- **Climax:**
 - *Script:* Everyone moves freely around the stage. (Cue on PDA: free movement.)
 - *Notation:* In addition to participant's current locations, their recent locations on stage also generate notes to play. Gradually, the music incorporates a longer and longer history of participants' movements to generate denser and denser textures.
 - *Electronic Sound:* None.
- **Transition:**
 - *Script:* Soprano, then alto, then tenor, then bari saxes stop playing and leave the stage (Cue on PDA: go offstage).
 - *Notation:* Audience members and facilitators stop generating notes for the saxophonists; they only generate electronic sound. Then the history of movements is gradually eliminated, and then the connecting lines are removed, leaving only a single note for each saxophonist per measure.
 - *Electronic Sound:* Electronic sound (struck percussion) begins almost imperceptibly and becomes more prominent by the end of the section, based on audience and facilitator (x,y) positions.

3.4 Horizontal Lines

Duration: 10 minutes.

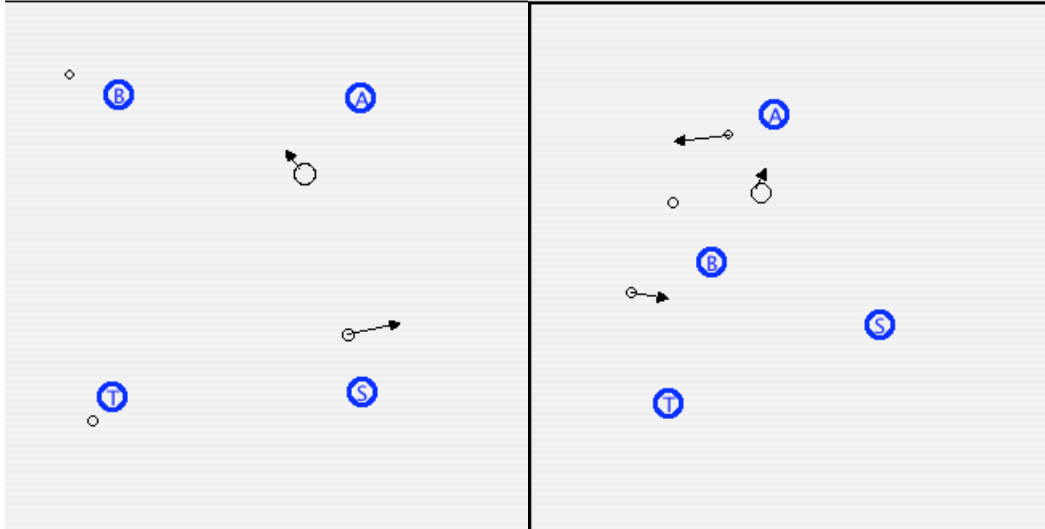


- **Building Lines:**
 - *Script:* Facilitators organize audience members into four horizontal lines. (*Cue on PDA:* Wait offstage.)
 - *Notation:* None.
 - *Electronic Sound:* Each audience member and facilitator generates a single note per measure on a modal-bar percussion instrument based on his current location (x is quantized measure position, y is quantized pitch).
- **Saxophonists Return:**
 - *Script:* Baritone, then tenor, then alto, then soprano sax come back on stage, each joining a different one of the audience lines. (*Cue on PDA:* Join an audience line.)
 - *Notation:* Staff-based notation, continuous updates. Each saxophonist generates a single note per measure for himself based on current position (x is measure position, y is quantized pitch).
 - *Electronic Sound:* Same as above.
- **Moving Lines:**
 - *Script:* Facilitators begin to move the lines around the stage. Saxophonists remain with their lines as the lines move. (*Cue on PDA:* Remain with audience line.)
 - *Notation:* Note extensions are added to each note. These extensions gradually grow longer and eventually wrap around the full duration of each measure. Then a short history of recent locations begins to generate additional notes, and the notation switches to graphical mode.
 - *Electronic Sound:* Gradual crossfade from modal bar to plucked string sound.
- **Merging Lines:**
 - *Script:* Facilitators direct all four lines to merge into a single, large line that spans the entire horizontal width of the space.
 - *Notation:* The history and note extensions are gradually removed, returning to a single note for each saxophonist per measure.
 - *Electronic Sound:* Crossfade to plucked string sound completes.

- **Transition:**
 - *Script:* Audience sits down. Each saxophonist goes to a separate quadrant of the stage and freezes. (*Cue on PDA:* To quadrant, then stay still.)
 - *Notation:* Single note per saxophonist per measure.
 - *Electronic Sound:* Plucked string sound until audience sits down, then nothing.

3.5 Polar Coordinates

Duration: 15-20 minutes.



3.5.1 Script

- **Facilitator Entry:**
 - *Script:* Saxophonists remain still in their quadrants. One by one, facilitators come on stage and each one dances around a different saxophonist. (*Cue on PDA:* Stay still.)
 - *Notation:* Graphical notation, continuous updates. Each saxophonist is the center of a polar coordinate system, and facilitators generate notes for any saxophonist within a maximum radius based on their position relative to the saxophonist: theta maps to measure position and radius maps to quantized pitch. A very short history of positions generates contours and squiggles instead of isolated notes.
 - *Electronic Sound:* None.
- **Audience Entry:**
 - *Script:* Audience members join facilitators onstage.
 - *Notation:* Same as above but switches to fixed update mode, and audience members generate notes for the saxophonists as well.
 - *Electronic Sound:* None.
- **Freer Movement:**
 - *Script:* The saxophonists begin moving freely around the stage and the facilitators and audience member groups move more freely as well. (*Cue on PDA:* Free movement.)
 - *Notation:* Same as above.
 - *Electronic Sound:* None.

- **Build up:**
 - *Script:* Saxophonists gradually move towards the center of the stage, where they form a tight clump with each other. Facilitators and audience members naturally move towards the center as well to follow the saxophonists. (Cue on PDA: Slowly towards center, then still.)
 - *Notation:* The length of the position history gradually increases and the notation becomes increasingly dense.
 - *Electronic Sound:* None.
- **Completely Free Movement:**
 - *Script:* Facilitators, saxophonists, and audience members move freely around the stage. (Cue on PDA: free movement.)
 - *Notation:* Same as above. Eventually, the history decreases and the music becomes less dense.
 - *Electronic Sound:* A “harmonic mush” spectrum based on audience member and facilitator (x,y) positions.
- **Audience is seated:**
 - *Script:* Audience gradually sits down.
 - *Notation:* Same as above, and position history length gradually decreases.
 - *Electronic Sound:* Same as above, but the spectrum becomes less complex.
- **Conclusion:**
 - *Script:* Soprano, then baritone, then alto, then tenor sax stop playing and go offstage. (Cue on PDA: Go backstage.) Then the facilitators, one by one, leave the stage, as the lights fade to black.
 - *Notation:* Same as above until saxophonists leave stage.
 - *Electronic Sound:* Same as above until all saxophonists and facilitators leave stage.

3.6 Q&A Session

After the performance, the audience is invited to stay for a brief Q & A session with the saxophonists, facilitators, and creators.

4 Harmonic Structure

The following pages outline the twenty-eight chords of *Flock*. *Flock* completes a single progression through these chords over the course of the performance, ending back on the first chord. The software cues chord changes automatically at regular time intervals.

In the harmonic outline below, each measure represents a single chord, and each staff or grand staff shows a different voicing available for the same chord. Voicings particular to each instrument are designated S (soprano), A (alto), T (tenor), and B (bari). Sparse voicings are labeled “sp” and dense voicings are labeled “dn.” F (full) indicates a full voicing that is played by all saxophonists and/or rendered by electronic sound.

It is not important to understand the complexities of the various voicings and when they are used. Instead, just try to get a sense of the chords so that when they do show up in the piece they will be familiar.

A final note about the harmonic structure: it is intended to help you in various sections of the piece by giving you a framework within which to improvise. It should never be followed so slavishly as to become a burden. If it becomes distracting rather than helpful, it can be shut off entirely in sections of the performance.

The notation below is transposed to written pitch for each instrument (S,A,T,B). The full (F) voicings are in concert pitch.

1 2 3 4 5 6 7

S/sp

S/dn

A/sp

A/dn

T/sp

T/dn

B/sp

B/dn

F/sp

F/dn

8 9 10 11 12 13 14

S/sp

S/dn

A/sp

A/dn

T/sp

T/dn

B/sp

B/dn

F/sp

F/dn

This musical score page contains measures 15 through 21. The vocal parts are arranged in four staves: Soprano (S), Alto (A), Tenor (T), and Bass (B). Each vocal part has a 'sp' (soprano) and 'dn' (alto/tenor/bass) line, indicating a two-part setting. The piano accompaniment consists of two staves: F/p (Forte/piano) and F/dn (Forte/dolce), also in two parts. The key signature is D major (two sharps). The time signature is not explicitly shown but appears to be common time (C). The notation includes various musical symbols such as notes, rests, and dynamic markings.

Measures 15-21 show a progression of chords and melodic lines. The vocal parts enter in measure 15 and continue through measure 21. The piano accompaniment provides harmonic support throughout. The score is written for a choir and piano.

22 23 24 25 26 27 28

S/sp

S/dn

A/sp

A/dn

T/sp

T/dn

B/sp

B/dn

F/sp

F/dn

5 Cheat Sheet

Section	Cue (on PDA)	Info	Action
1. Covey	—	Electronic sound only	Stay backstage
2. Verbal Introduction	Come onstage Follow verbal instruct	Bari only	Come onstage and assist with intro
3. Quartet Entry	Go onstage	Staff notation	Come onstage
	Free movement	“	Move around freely
	Stay still	“	Settle in a spot and do not move
3. Facilitator Entry	Stay still until moved	Graphic notation	“
3. Audience Entry	“	“	“
3. Common-tone Motion	“	Note lengths increase.	Stay still until told to move by facilitator
3. Build up	“	Diagonal lines create melodic contours.	“
3. Climax	Free movement	“Motion trails” generate more notes.	Move freely around the stage
3. Transition	“	Electronic snd begins; texture thins out	“
	Go offstage		Stop playing and go backstage
4. Building Lines	Wait offstage	Electronic sound only	Stay backstage.
4. Saxes Return	Join an audience line	“	Come onstage and join one of the four audience lines.
	Remain with audience line	Staff notation	—
4. Moving Lines	“	Audience lines move. Switch to graphical notation.	Stay with your line as it moves around stage.
4. Merging Lines	“	Audience lines merge into one big line.	“
4. Transition	To quadrant, then stay still	Audience sits down.	Pick a quadrant of the stage, go there, freeze.
5. Facilitator Entry	Stay still	Facilitators enter, polar mappings.	—
5. Audience Entry	“	Audience members join facilitators.	—
5. Freer Movement	Free movement	Audience members and facilitators follow you as you move.	Move slowly around stage.
5. Build Up	Slowly towards center, then still	Notation becomes denser (motion trails).	Move to form clump with other saxophonists ctr stage.
5. Completely Free	Free movement	Climax of the show. Electronic snd begins.	Move around freely.
5. Audience is Seated	“	Audience sits down.	“
5. Conclusion	Go backstage	—	Stop playing and go backstage.

