Four Voice Canons #13 & #15
("DIY Canon," "Shape Note Canon")

(and including Four Voice Canon #14 ("Kid Canon"),
Four Voice Canon #18 ("Trio Canon for Christian Wolff"))

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Four Voice Canon #13
("DIY Canon")

For Daniel Goode

Larry Polansky

Four Voice Canons
The four voice canons are a set of pieces I have been working on since around 1976. *#13 ("DIY Canon")* is intended as a general template for making new four voice canons: a kind of meta-canon. This "score" (*#13*) describes the ideas behind the previous canons (*permutation lists*, *mensuration canons*, *heterophony*), and suggests ideas for future ones. It is a how-to manual, a technical description, and an invitational "cookbook" for performers and composers to make their own pieces.

Permutation List
The basic material for each voice of the canon is a *permutation list*. The following is an example (4 *letters*, 24 *elements*):

CBAD	BCAD	BACD	BADC
BDAC	DBAC	DABC	DACB
DCAB	CDAB	CADB	CABD
ACBD	ABCD	ADCB	ACDB
BCDA	BDCA	DBCA	DCBA
ABDC	ADBC	CDBA	CBDA

Each set of four *letters* is called an *element* of the list. The list above is meant to be read from left to right, top to bottom.

Mensuration Canon
The second idea of the four voice canons is a variation on what is known as a *mensuration canon*. Voices start at different times, do the same thing (the list) at different tempi, and all end together

To make a mensuration canon, pick a tempo ratio for each voice. The first voice is considered to be 1:1. All other voices are successively faster. Begin each next voice at the point in the first voice which is inversely proportional to that voice's tempo ratio, in such a way that the voices end together. The latter is important: all voices should end exactly together, completing the permutation list.

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row row row your boat gently down the stream
        row row row your boat gently down the stream
                row row row your boat gently down the stream
                        row row row your boat gently down the stream
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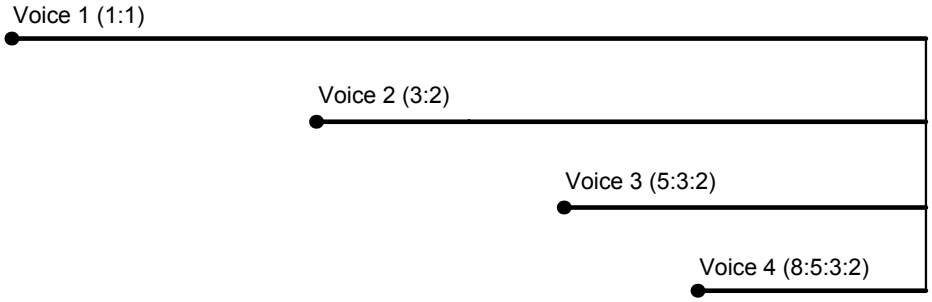
For example, if Voice 2 is twice as fast as Voice 1 (tempo ratio 2:1), it should begin $1/2^{th}$ way through the piece. A voice with tempo ratio of 3:2 should begin $1/3^{rd}$ of the way through the piece.

In other words, for a tempo ratio of a/b (relative to Voice 1, and a ≥ b), the starting point for a voice is:

1 – (b/a)

— where 1 is the length of the piece. For example, if a piece is 100 seconds long, and Voice 3 is 5:2 of Voice 1, Voice 3 (1 – (2/5)) should start at 60 seconds, 3/5^{ths} the total duration of the piece.

More complex ratios may be used, for example 4:5:6:7, 2:3:5:8, or even 2:π:5.12:7. The picture below illustrates the second of these (2:3:5:8).



The tempi and ratios should be chosen so that the first voice is not too slow and the last voice not too fast (whatever that might mean in the context of the piece).[1]

Although the piece is called a *four* voice canon, any number of voices ≥ 4 may be used.

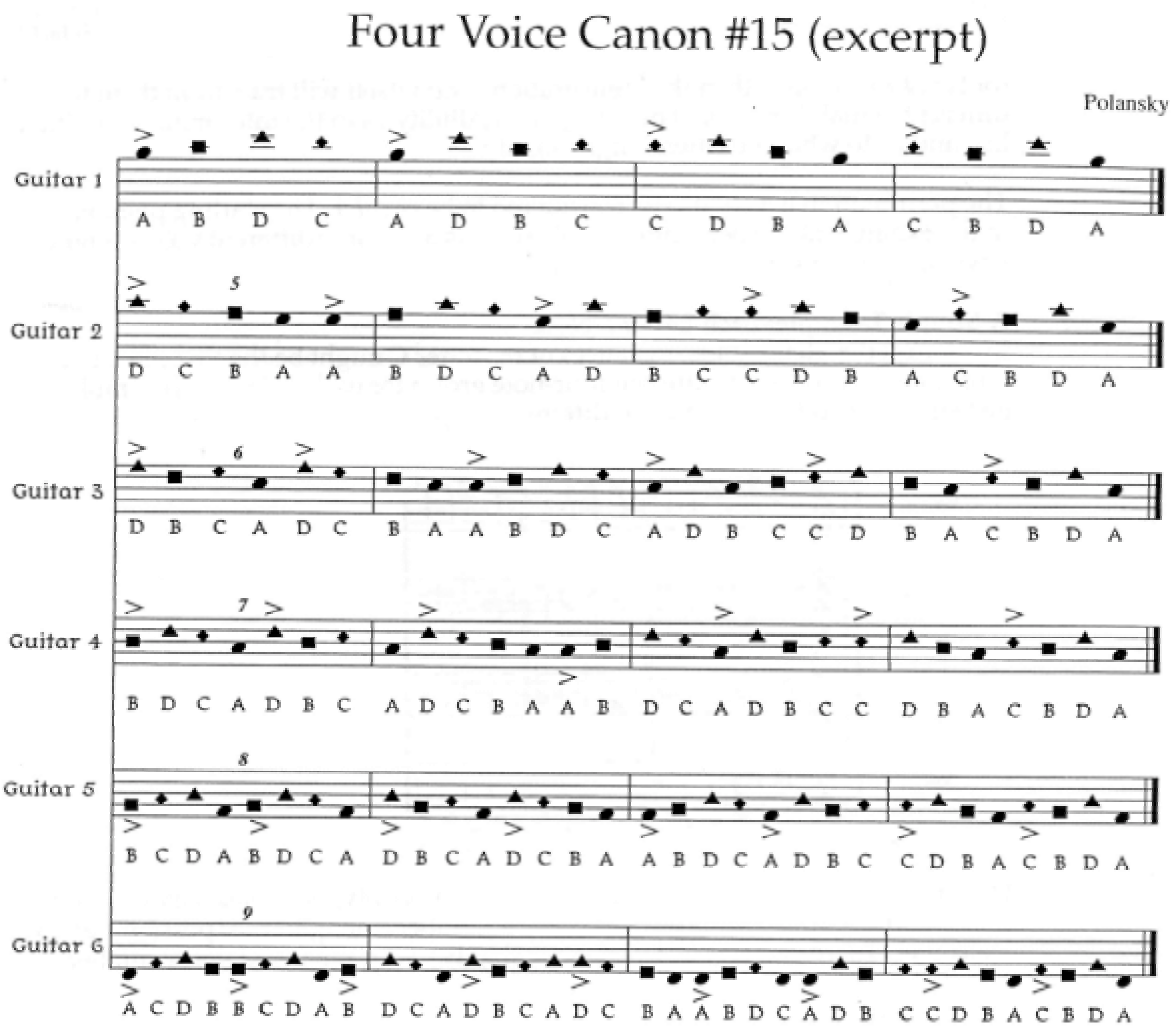
Realizing the List

- The same permutation list should be used by each voice.
- To make the piece longer, *elements* in the list may be repeated.
- The voices should all end together, and each should traverse the list.
- Generally, the first letter of each element should be accented (in terms of loudness, attack, or something like that). Secondary accents may also be used.

Each letter represents a distinct sound, musical idea, or set of musical ideas. Letters may represent pitches, rhythms, types of sound, actions, events (directly sonic or not), or anything else. Letters should *mean* more or less the same thing for all voices, but they do not have to *be* the same thing.

[1] A radical variation on this structure (which I've not tried), suggested to me in a conversation with Roz Hirst, is to make voices *discontinuous*. That is, sample the voices, spreading their actual durations over the course of the piece. In this way, faster voices might begin before slower ones, and starting points for the different voices need not correspond to their inverse duration ratios. Voices might not end together.

Ross Craig, in *Barbie's Phone Canon*, simply makes each successive list shorter (so that they each end in a different place).



Excerpt: Last 4 measures of *FVC #15 ("Shape Note Canon")*, for any instruments.
Tempo ratios are 4:5:6:7:8:9.

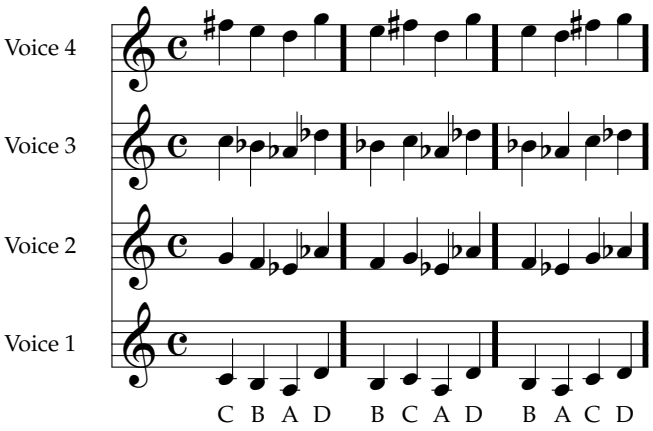
Each shape indicates some guitar "sound," for example:

triangle = natural harmonic
square = gliss
oval = mordant or squiggle or bend
diamond = stopped or open string

For example, all instances of the letter **A** could be sounds made on wooden objects, but a different wooden object could (probably should) be used for each voice. A rhythmic example: if each letter represents a different relative duration (or set of durations), then the mensuration canon itself will transform them to different actual durations. There is great flexibility as to the interpretation of the list, and as to what the letters might signify.[2]

The permutation list should be considered to be *circular*. The starting point given in the example at the beginning of this score is arbitrary (different voices might have different starting points as well).

A Simple Example: Each Letter a Note
In a four letter element list, instances of the letter **C** might be the first pitch of a four note group, with a different four-note group for each voice (this example just shows the pitch sets, not the different tempi).



In general, if pitch is important, there should (probably) be a *monotonic* or other clear relationship between pitch and voice number (though other possibilities are welcome). There should be *some* relationship between pitch and voice number.

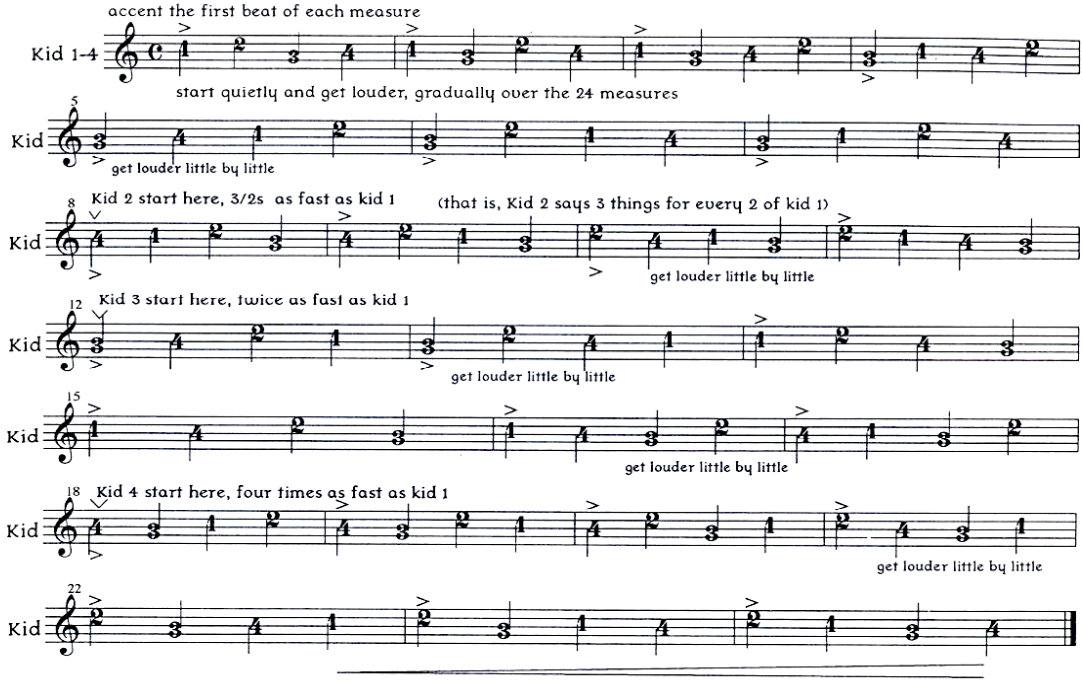
Heterophony
An important idea in the canons is *heterophony*: many voices doing the "same thing" independently of each other, but with the same or similar rules (or canon). An important

[2] Composer Bo Bell, in his *Metrocard Canon*, uses one of the letters as a kind of "conditional":

> Letter **D** changes with each element, or cell, of the list, depending on what letter is in the third place of the element. An **A** in the third place produces two eighth notes, **B** makes an eighth rest and eighth note, **C** calls for a "turn" and **D** in the third place gives a "ding."

Four Voice Canon #14
("Kid Canon")

Polansky
8/20/03



For four kids, in canon. All kids start at different times, speak at different speeds, do the complete 24 measures but end exactly together.

Kid 2 starts when Kid 1 is at measure 8, and does her part 3:2's as fast (3 beats for every 2 beats of Kid 1). Kid 3 starts at Kid 1's measure 12, and goes twice as fast as Kid 1. Kid 4 starts at Kid 1's measure 18, and goes 4 times as fast as Kid 1. In other words, it should take Kid 4 the same time to say her entire part as it does for Kid 1 to say the last 6 measures of her part. Kid 1 should not go too fast for Kid 4!

For each number, choose something to say or shout. For example:

1 = your name
2 = the town you live in
3 = your pet's name
4 = the month you were born in

Once, during each voice, for some number of beats, instead of their regular part, any kid may scream out the name of their favorite pop group or star, movie, book, teacher, opera, Shakespeare play, etc., as an interruption, but should be careful to stay in rhythm and come back in at the right place.

If you want, add some more kids, and find different places to start, and use any tempo ratios for the parts.

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heterophonic consideration is the perception of vertical vs. horizontal groupings among the voices.

For example, each voice may be a separate timbre, but all voices might use the same four pitches, or share certain ones. In that case, individual voices will group by timbre, but the four pitches will also cohere across the voices, constituting two simple but independent grouping mechanisms. When things get denser, the pitches will be heard as belonging together, but so will the timbres, causing an interesting effect (different vertical and horizontal grouping criteria).[3]

The performer/composer is encouraged to explore the ramifications of these ideas.

Recipe Example: Four Voice Canon #? (Pitch/Timbre Heterophony)

Pick a number of voices.
Pick a different instrument (or more than one), from a distinct instrumental family, for each voice.
Pick a different tempo ratio **b** for each voice, starting at **1 – 1/b** of the piece's total duration.
Pick **n** different pitches for each instrument (where **n** is the number of letters in the permutation list). Assign each pitch to a letter of the permutation list. Pitches may overlap between voices. Slower instrumental voices might typically play lower pitches.
Accent the first note of each **n** pitches.
Make your own tempo and loudness curves (see below), add other ideas to taste.

Tempo Modulation
Voice 1 might begin at one tempo and speed up gradually to another over the course of the piece, although not necessarily monotonically. Any sort of curve might be used (for example, a sinusoidal curve which first speeds up, then slows down, then speeds up even more towards the end). All other voices should, in the case of such a tempo modulation, move in accordance with Voice 1.

This modulation is optional.

Gradual Loudness Trajectory
Voice 1 might begin very softly and gradually get louder over the course of the piece, although not necessarily monotonically. As in tempo modulation, any sort of curve might be used. Voices might have independent loudness trajectories, or they may be strictly canonical (in the usual sense of the word — they all do the same thing, but at their own proportional rate).

[3] Composer George Zelenz has suggested that a mensuration canon be constructed in which no there are no simultaneous dyads, triads, tetrads, etc. This is possible if the products of the voice tempi and their "grupetto ratios" are all relatively prime, and all of the "first" beats were somehow avoided (say by having a four letter permutation list in with five beat phrases). In other words, if the tempi are all related by powers of two, if all the grupetti are multiples of (higher) prime numbers, no two beats (except the first of each grouping, which can be made rests) will ever coincide.

This modulation is optional.

Interruptions
Any sort of interruptions, variations, deviations, derailments and ammendations to the ideas of the canons are allowed, though the four voice canon idea should complete itself in some way. As a very simple example, *Four Voice Canon #14 ("Kid Canon")* asks for each kid to yell out an interruption somewhere in their part.[4]

Performance and Notation Considerations
When even the simplest rhythmic configurations are transformed by the mensuration canon, notation of the four voice canon as a conventional score may become prohibitively complex. A simple solution is to notate only one part (the first), specifying the tempi and starting points for the other voices (in the case where this is feasible, as in the "Kid Canon" example); or notate all parts as if they were independent, combining them in performance by means of multiple conductors, click tracks, or other multi-tempo aids.

Another important resource for the canons is the use of multi-track recording, where the realization of complex tempo relationships is simplified playing each part by itself, with an independent click track. This is how several of the canons have been realized in recording (although several of these have also been performed live, where they are more difficult).

The idea of complex multiple tempo relationships is particular amenable to computer realizations. Using software to make these pieces allows for nuanced control over loudness and tempo curves, diverse assignments of the permutation letters to multiple musical ideas (as in *Four Voice Canon #3* and *#8*), and (as in *Four Voice Canon #6*, where duration is equated to memory size), fundamentally different conceptions of time, and many other creative possibilities.

DIY: How to make a four voice canon

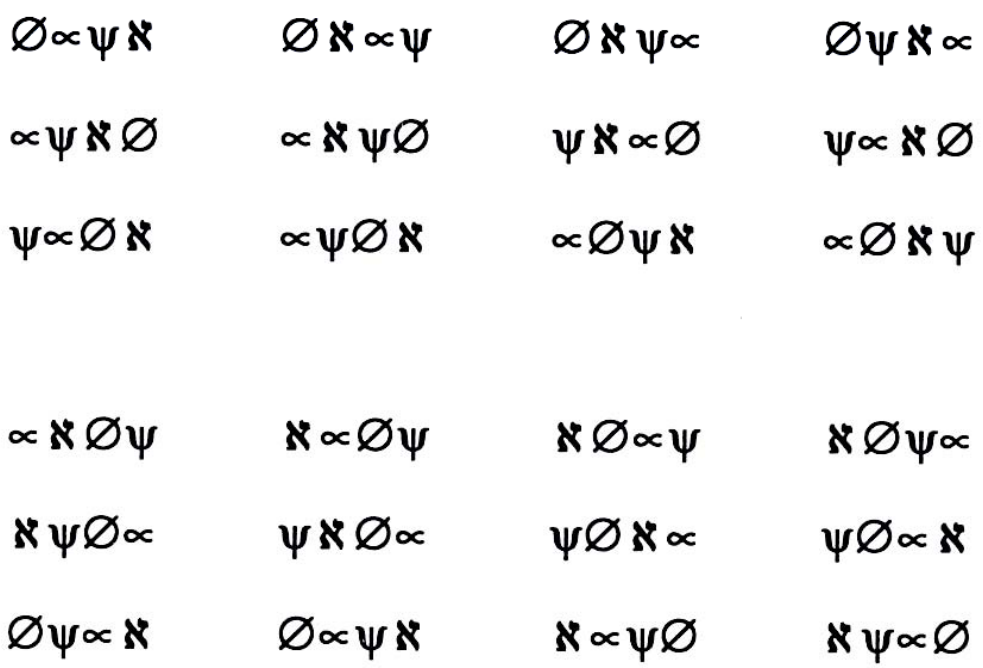
- Pick some some *number* of voices.
- Pick a number of *letters* (4, 5, 6).
- Pick *tempo ratios* for the voices.
- Compose your own system for interpreting the letters.This should include som consideration of how the letters proliferate up the voices (Higher pitch for the faster sounds? Same letter interpreted as the same sounds? Overlapping pitches? Overlapping sounds).
- Loudness trajectory? Accelerandi and decelerandi?
- Interruptions? Deviations? Add some of your own ideas.

[4] Ross Craig, in his *Barbie's Phone Canon*, uses dial tones, rings, and "a voice notifying us of the number of messages" as interruptions, or perhaps additions, to the canon process.

four voice canon #18
("trio canon")

for christian wolff

6/14/02
rev. 8/5/02



For trio, or groups of trios, or multi-tracked trio(s). Each player pick 2 or 3 sounds, or types of sounds, corresponding to 2 or 3 of the symbols. Play that sound for that symbol, rest on the unused symbol(s). For each trio, one players gets a solo (over the other two players), for whatever amount of time, instead of playing some part of the score. Each trio plays in the same tempo, each symbol equals one beat (spaces do not indicate pauses).

If groups of trios are used (in recording, or live), the piece should be played in the manner of my four voice canons (see *Four Voice Canon #13 ("DIY Canon")*). Alternately, one trio may play the score several times in succession, in different tempi, with different soloists, and with different sounds and symbol choices.

"trio canon" was written specifically for a recording with Nathan Davis (percussion), Ha-Yang Kim (cello) and myself (guitar), June, 2002.

Technical Appendix: Permutation Lists

A permutation list comes from a simple concept in abstract algebra, a permutation *group*. It is a way of listing and manipulating the possible orderings of a set of *n* objects. The number of elements in the list is *n!*, or *n factorial*:

$$n! = n * (n-1) * (n-2) * (n-3) * \ldots 1$$

For n=4 objects there are 24 elements, 120 for n=5, 720 for n=6, and so on.

The list may be generated in a number of ways, but the concept that has motivated the generation of lists in the previous four voice canons is that of *continuity*: the *next* elements in the list should be as *similar as possible* to the *previous*. Change should be as small as possible.

One way to achieve this is to try and ensure that the last letter of one element is the same as the first letter of the next. Another technique is to try and generate *two-transpositions*: elements that differ in only two places (two letters are switched).

The first criteria blurs the distinction between the end of one element and the beginning of the next. The second states that each successive element will be as similar as possible to the previous, by a simple and meaningful *measure of similarity* on permutation groups. These two criteria are mutually incompatible in the generation of a complete list. There is no way to have both. However, it is mathematically possible to generate the complete list using two-transpositions (called a *cyclic group* in algebra).

Various versions of my software for these pieces have experimented with different uses and combinations of these two criteria. Recent pieces (beginning with *FVC#9 ("Anna Canon")*) have used a simple and well-known inductive algorithm documented by Donald Knuth in *Fundamental Algorithms* (Vol. 1, pp. 45-46). Although the "Knuth algorithm" does not have as a stated goal the generation of 2-transpositions, in practice, it tends to do so (fortunately for me), as well as in general, generating highly similar "next" elements.

This algorithm, implemented in the computer language HMSL, was used to generate the two longer lists below. Note that the list might start anywhere, and should be considered more or less circular (the starting points below were chosen randomly).

The permutations lists below may be used for a performer/composer who wishes to use a longer list in the realization of a new canon. You may also generate your own, of any length, in any way you like.

Five Letter Permutation List
120 Elements

DABCE DBCEA DACEB DABEC CABED CABDE DCEBA DCEAB DBEAC CBEAD CBDAE DBECA
DAECB DAEBC CAEBD CADBE CBEDA CAEDB BAEDC BAECD BADCE CBDEA CADEB BADEC
BACED BACDE DECBA DECAB DEBAC CEBAD CDBAE DEBCA DEACB DEABC CEABD CDABE
CEBDA CEADB BEADC BEACD BDACE CDBEA CDAEB BDAEC BCAED BCADE CEDBA CEDAB
BEDAC BECAD BDCAE BEDCA AEDCB AEDBC AECBD ADCBE BECDA AECDB AEBDC AEBCD
ADBCE BDCEA ADCEB ADBEC ACBED ACBDE CDEBA CDEAB BDEAC BCEAD BCDAE BDECA
ADECB ADEBC ACEBD ACDBE BCEDA ACEDB ABEDC ABECD ABDCE BCDEA ACDEB ABDEC
ABCED ABCDE EDCBA EDCAB EDBAC ECBAD DCBAE EDBCA EDACB EDABC ECABD DCABE
ECBDA ECADB EBADC EBACD DBACE DCBEA DCAEB DBAEC CBAED CBADE ECDBA ECDAB
EBDAC EBCAD DBCAE EBDCA EADCB EADBC EACBD DACBE EBCDA EACDB EABDC EABCD

Six Letter Permutation List
720 Elements

DFEABC CFEABD CFDABE CEDABF CFEBDA CFEADB BFEADC BFEACD BFDACE
BEDACF CFDBEA CFDAEB BFDAEC BFCAED BFCADE BECADF CEDBFA CEDAFB
BEDAFC BECAFD BDCAFE BDCAEF CFEDBA CFEDAB BFEDAC BFECAD BFDCAE
BEDCAF BFEDCA AFEDCB AFEDBC AFECBD AFDCBE AEDCBF BFECDA AFECDB
AFEBDC AFEBCD AFDBCE AEDBCF BFDCEA AFDCEB AFDBEC AFCBED AFCBDE
AECBDF BEDCFA AEDCFB AEDBFC AECBFD ADCBFE ADCBEF CFDEBA CFDEAB
BFDEAC BFCEAD BFCDAE BECDAF BFDECA AFDECB AFDEBC AFCEBD AFCDBE
AECDBF BFCEDA AFCEDB AFBEDC AFBECD AFBDCE AEBDCF BFCDEA AFCDEB
AFBDEC AFBCED AFBCDE AEBCDF BECDFA AECDFB AEBDFC AEBCFD ADBCFE
ADBCEF CEDFBA CEDFAB BEDFAC BECFAD BDCFAE BDCEAF BEDFCA AEDFCB
AEDFBC AECFBD ADCFBE ADCEBF BECFDA AECFDB AEBFDC AEBFCD ADBFCE
ADBECF BDCFEA ADCFEB ADBFEC ACBFED ACBFDE ACBEDF BDCEFA ADCEFB
ADBEFC ACBEFD ACBDFE ACBDEF DEFCBA DEFCAB DEFBAC CEFBAD CDFBAE
CDEBAF DEFBCA DEFACB DEFABC CEFABD CDFABE CDEABF CEFBDA CEFADB
BEFADC BEFACD BDFACE BDEACF CDFBEA CDFAEB BDFAEC BCFAED BCFADE
BCEADF CDEBFA CDEAFB BDEAFC BCEAFD BCDAFE BCDAEF CEFDBA CEFDAB
BEFDAC BEFCAD BDFCAE BDECAF BEFDCA AEFDCB AEFDBC AEFCBD ADFCBE
ADECBF BEFCDA AEFCDB AEFBDC AEFBCD ADFBCE ADEBCF BDFCEA ADFCEB
ADFBEC ACFBED ACFBDE ACEBDF BDECFA ADECFB ADEBFC ACEBFD ACDBFE
ACDBEF CDFEBA CDFEAB BDFEAC BCFEAD BCFDAE BCEDAF BDFECA ADFECB
ADFEBC ACFEBD ACFDBE ACEDBF BCFEDA ACFEDB ABFEDC ABFECD ABFDCE
ABEDCF BCFDEA ACFDEB ABFDEC ABFCED ABFCDE ABECDF BCEDFA ACEDFB
ABEDFC ABECFD ABDCFE ABDCEF CDEFBA CDEFAB BDEFAC BCEFAD BCDFAE
BCDEAF BDEFCA ADEFCB ADEFBC ACEFBD ACDFBE ACDEBF BCEFDA ACEFDB
ABEFDC ABEFCD ABDFCE ABDECF BCDFEA ACDFEB ABDFEC ABCFED ABCFDE
ABCEDF BCDEFA ACDEFB ABDEFC ABCEFD ABCDFE ABCDEF FEDCBA FEDCAB
FEDBAC FECBAD FDCBAE EDCBAF FEDBCA FEDACB FEDABC FECABD FDCABE
EDCABF FECBDA FECADB FEBADC FEBACD FDBACE EDBACF FDCBEA FDCAEB
FDBAEC FCBAED FCBADE ECBADF EDCBFA EDCAFB EDBAFC ECBAFD DCBAFE
DCBAEF FECDBA FECDAB FEBDAC FEBCAD FDBCAE EDBCAF FEBDCA FEADCB
FEADBC FEACBD FDACBE EDACBF FEBCDA FEACDB FEABDC FEABCD FDABCE
EDABCF FDBCEA FDACEB FDABEC FCABED FCABDE ECABDF EDBCFA EDACFB
EDABFC ECABFD DCABFE DCABEF FDCEBA FDCEAB FDBEAC FCBEAD FCBDAE
ECBDAF FDBECA FDAECB FDAEBC FCAEBD FCADBE ECADBF FCBEDA FCAEDB
FBAEDC FBAECD FBADCE EBADCF FCBDEA FCADEB FBADEC FBACED FBACDE

EBACDF ECBDFA ECADFB EBADFC EBACFD DBACFE DBACEF EDCFBA EDCFAB
EDBFAC ECBFAD DCBFAE DCBEAF EDBFCA EDAFCB EDAFBC ECAFBD DCAFBE
DCAEBF ECBFDA ECAFDB EBAFDC EBAFCD DBAFCE DBAECF DCBFEA DCAFEB
DBAFEC CBAFED CBAFDE CBAEDF DCBEFA DCAEFB DBAEFC CBAEFD CBADFE
CBADEF FDECBA FDECAB FDEBAC FCEBAD FCDBAE ECDBAF FDEBCA FDEACB
FDEABC FCEABD FCDABE ECDABF FCEBDA FCEADB FBEADC FBEACD FBDACE
EBDACF FCDBEA FCDAEB FBDAEC FBCAED FBCADE EBCADF ECDBFA ECDAFB
EBDAFC EBCAFD DBCAFE DBCAEF FCEDBA FCEDAB FBEDAC FBECAD FBDCAE
EBDCAF FBEDCA FAEDCB FAEDBC FAECBD FADCBE EADCBF FBECDA FAECDB
FAEBDC FAEBCD FADBCE EADBCF FBDCEA FADCEB FADBEC FACBED FACBDE
EACBDF EBDCFA EADCFB EADBFC EACBFD DACBFE DACBEF FCDEBA FCDEAB
FBDEAC FBCEAD FBCDAE EBCDAF FBDECA FADECB FADEBC FACEBD FACDBE
EACDBF FBCEDA FACEDB FABEDC FABECD FABDCE EABDCF FBCDEA FACDEB
FABDEC FABCED FABCDE EABCDF EBCDFA EACDFB EABDFC EABCFD DABCFE
DABCEF ECDFBA ECDFAB EBDFAC EBCFAD DBCFAE DBCEAF EBDFCA EADFCB
EADFBC EACFBD DACFBE DACEBF EBCFDA EACFDB EABFDC EABFCD DABFCE
DABECF DBCFEA DACFEB DABFEC CABFED CABFDE CABEDF DBCEFA DACEFB
DABEFC CABEFD CABDFE CABDEF EDFCBA EDFCAB EDFBAC ECFBAD DCFBAE
DCEBAF EDFBCA EDFACB EDFABC ECFABD DCFABE DCEABF ECFBDA ECFADB
EBFADC EBFACD DBFACE DBEACF DCFBEA DCFAEB DBFAEC CBFAED CBFADE
CBEADF DCEBFA DCEAFB DBEAFC CBEAFD CBDAFE CBDAEF ECFDBA ECFDAB
EBFDAC EBFCAD DBFCAE DBECAF EBFDCA EAFDCB EAFDBC EAFCBD DAFCBE
DAECBF EBFCDA EAFCDB EAFBDC EAFBCD DAFBCE DAEBCF DBFCEA DAFCEB
DAFBEC CAFBED CAFBDE CAEBDF DBECFA DAECFB DAEBFC CAEBFD CADBFE
CADBEF DCFEBA DCFEAB DBFEAC CBFEAD CBFDAE CBEDAF DBFECA DAFECB
DAFEBC CAFEBD CAFDBE CAEDBF CBFEDA CAFEDB BAFEDC BAFECD BAFDCE
BAEDCF CBFDEA CAFDEB BAFDEC BAFCED BAFCDE BAECDF CBEDFA CAEDFB
BAEDFC BAECFD BADCFE BADCEF DCEFBA DCEFAB DBEFAC CBEFAD CBDFAE
CBDEAF DBEFCA DAEFCB DAEFBC CAEFBD CADFBE CADEBF CBEFDA CAEFDB
BAEFDC BAEFCD BADFCE BADECF CBDFEA CADFEB BADFEC BACFED BACFDE
BACEDF CBDEFA CADEFB BADEFC BACEFD BACDFE BACDEF EFDCBA EFDCAB
EFDBAC EFCBAD DFCBAE DECBAF EFDBCA EFDACB EFDABC EFCABD DFCABE
DECABF EFCBDA EFCADB EFBADC EFBACD DFBACE DEBACF DFCBEA DFCAEB
DFBAEC CFBAED CFBADE CEBADF DECBFA DECAFB DEBAFC CEBAFD CDBAFE
CDBAEF EFCDBA EFCDAB EFBDAC EFBCAD DFBCAE DEBCAF EFBDCA EFADCB
EFADBC EFACBD DFACBE DEACBF EFBCDA EFACDB EFABDC EFABCD DFABCE
DEABCF DFBCEA DFACEB DFABEC CFABED CFABDE CEABDF DEBCFA DEACFB
DEABFC CEABFD CDABFE CDABEF DFCEBA DFCEAB DFBEAC CFBEAD CFBDAE
CEBDAF DFBECA DFAECB DFAEBC CFAEBD CFADBE CEADBF CFBEDA CFAEDB
BFAEDC BFAECD BFADCE BEADCF CFBDEA CFADEB BFADEC BFACED BFACDE
BEACDF CEBDFA CEADFB BEADFC BEACFD BDACFE BDACEF DECFBA DECFAB
DEBFAC CEBFAD CDBFAE CDBEAF DEBFCA DEAFCB DEAFBC CEAFBD CDAFBE
CDAEBF CEBFDA CEAFDB BEAFDC BEAFCD BDAFCE BDAECF CDBFEA CDAFEB
BDAFEC BCAFED BCAFDE BCAEDF CDBEFA CDAEFB BDAEFC BCAEFD BCADFE
BCADEF DFECBA DFECAB DFEBAC CFEBAD CFDBAE CEDBAF DFEBCA DFEACB

Four Voice Canon #15
"Shape Note Canon"

Larry Polansky

Four Voice Canon #15 ("Shape Note Canon"), is for any ensemble. It is intended as a notational template for live ensembles, or smaller groups of musicians working in the recording studio, to make their own versions of the piece. It is a companion piece to *Four Voice Canon #13 ("DIY Canon")*, an even more abstract version of the work.

The score for *#15* is a canonic realization of a simple four element permutation list. The notation illustrates a mensuration canon (in the way that idea is used in my other four voice canons), along with some simple suggestions about dynamics, tempi, and accents.

For example, this score indicates that the piece may start at one tempo and speed up gradually to a faster ending tempo. This is just one version of what may happen: the tempo might change in the opposite direction, it might follow a sinusoidal kind of curve, or there might be no tempo change at all. The indication of dynamics in this score is intended, similarly, as one of several possibilities.

The "shapes" may be realized in a wide variety of ways. Interpretation is left to the musicians: each of the four shapes indicates some distinct musical event (pitch, pitch class, sound, action, idea). Graduated pitches (from the slowest voice to the fastest) may be used (so that, for example, each shape represents a timbral family). Shapes are not associated with particular staff lines. In the score, staves are used so that the "shapes" can be shown to rise gradually in pitch (for each voice) over the course of the work, but this is only a suggestion

Some specific realization suggestions:

- a guitar version where each voice plays on only one string, each shape indicates a different natural harmonic (with a guitar tuning of the players' choice).
- a version for celli in which each shape indicates a different type of sound (pizzicati, gliss, mordant, harmonic, arco, etc.), and each voice starts at the low end of the cello and moves to the high end over its duration. A guitar variation might be for each voice to remain on one string, using four different types of sounds (e.g bend, squiggle, harmonic, tap), rising on that string over the course of the work. These ideas, or variations, would work with other instruments as well, in many different ways.
- a vocal version where each shape is a type of word, or sonic idea, or pitch, or some combination.
- a percussion version where each shape corresponds to a different instrumental family, and each voice is in a different register.
- versions where the shapes are realized as rhythmic values. (These last two suggestions describe *Four Voice Canon #5*).

In this last case, since all voice are "the same," players (especially in recording), might find it simpler to play from the notation for voice 1.

Live ensembles are encouraged to consider the possibility of varying the score for different performances, or of leaving certain aspects undetermined for spontaneous choice by the performers.

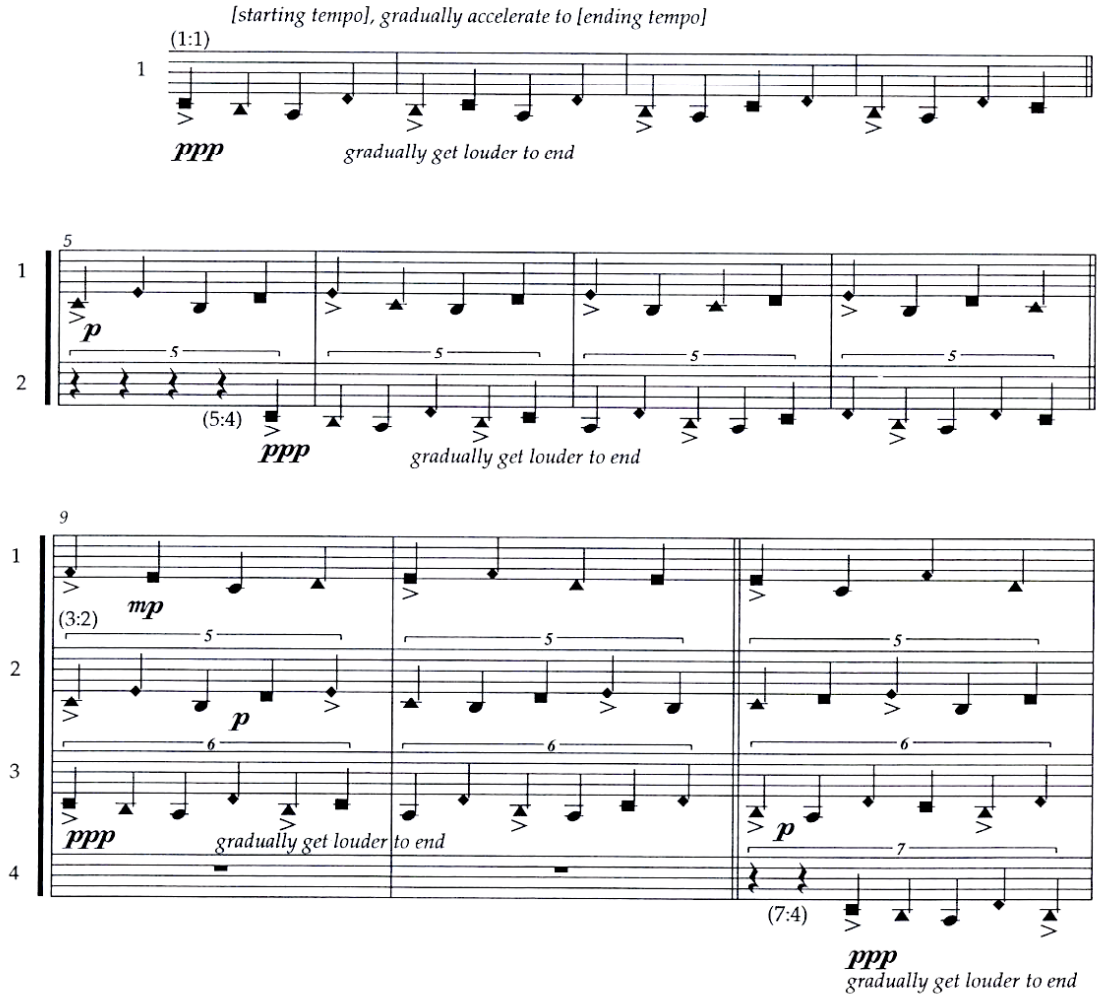
Other rhythmic ratios may be used, either adding to (up to any number of voices) or substituting for the ones in the score (in that case, the performers should probably write out the new part). If so, the four voice canon "mensuration" structure should be respected (see *Four Voice Canon #13* for an explanation of how that works). Simpler (2-, 3-, 4-, 5-voice) versions may be made as well.

Interruptions to the "process" are welcome.

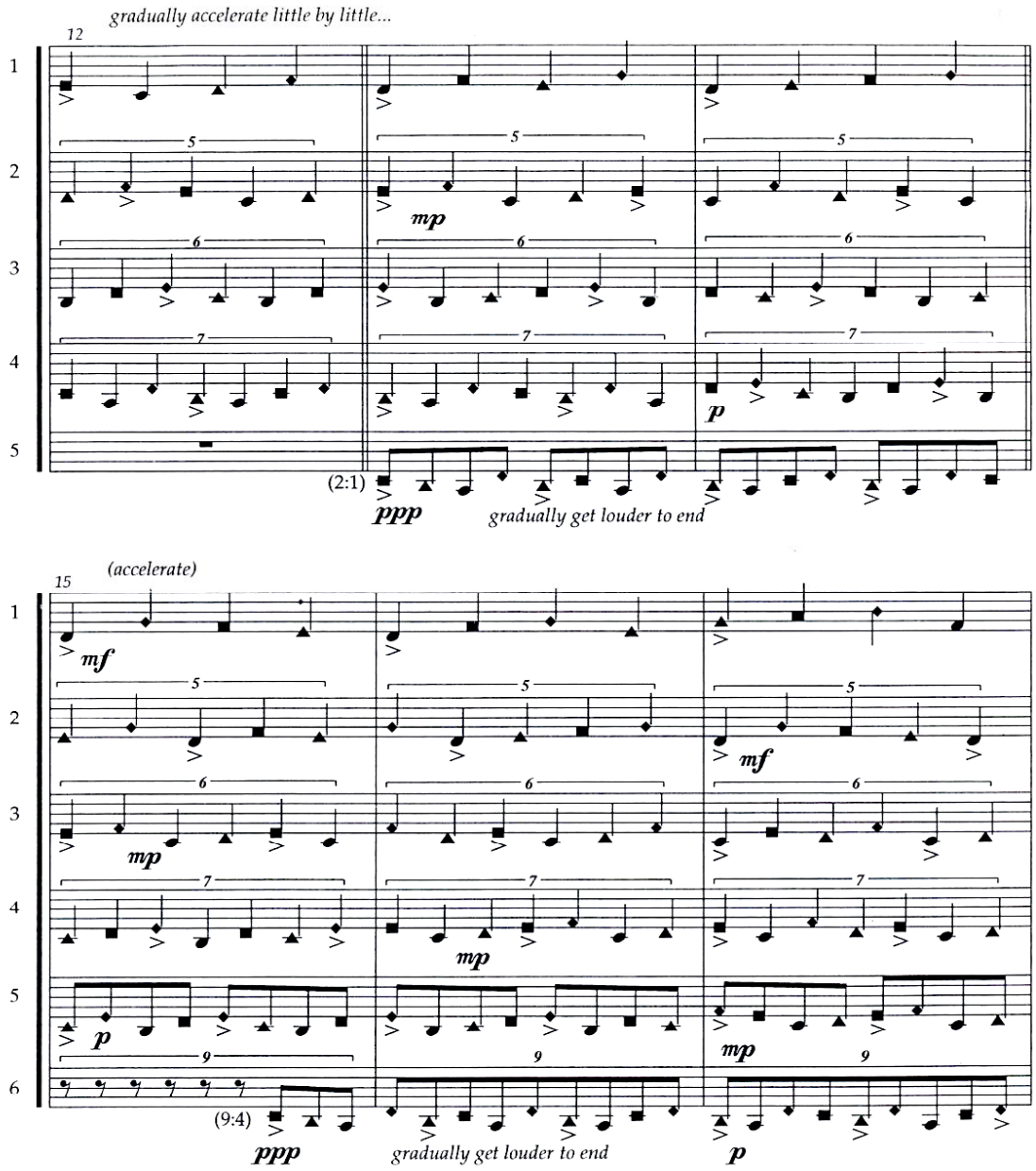
Larry Polansky
Lebanon, NH
11/26/03

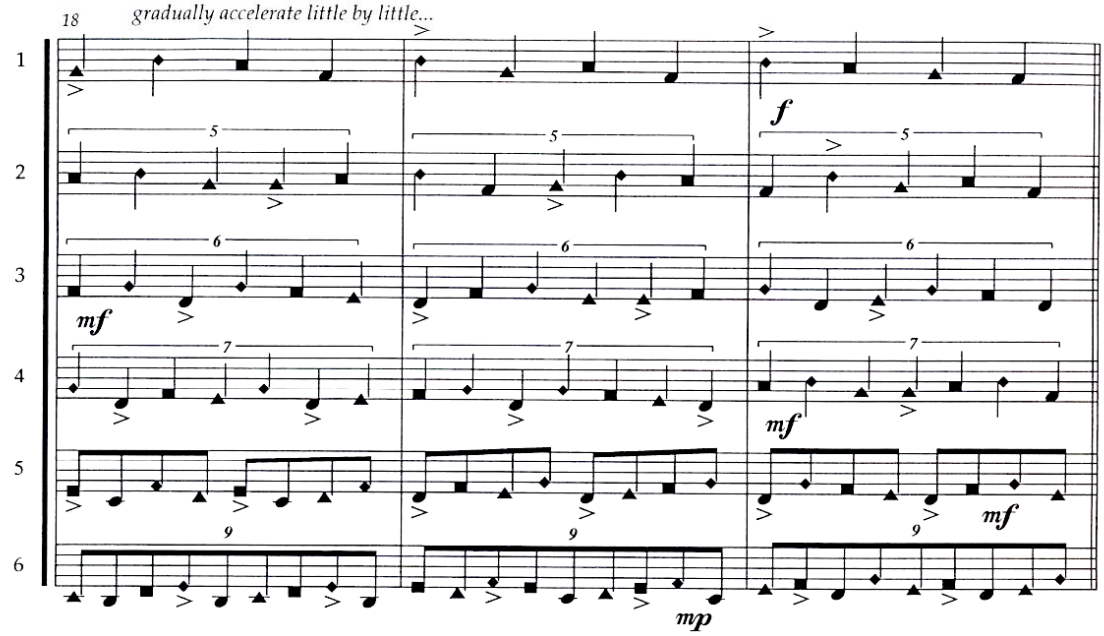
Four Voice Canon #15
("Shape Note Canon")

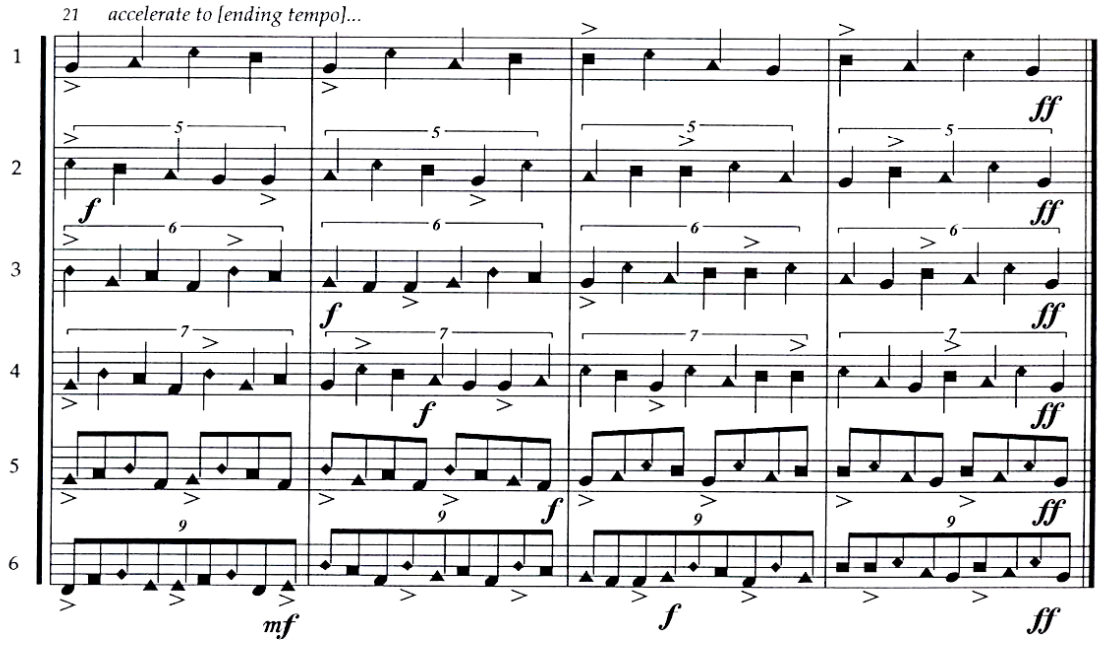
Polansky



Note: Dynamics, tempi, rising pitch trajectories, specific rhythmic ratios, and even the number of voices are suggestions only. Performers should make their own choices.


gradually accelerate little by little...
12
1
2
3
4
5
mp
p
(2:1)
ppp
gradually get louder to end
(accelerate)
15
mf
mp
p
mf
mp
mp
(9:4)
ppp
gradually get louder to end
p


18
gradually accelerate little by little...
1
2
3
4
5
6
f
mf
mf
mf
mp


21
accelerate to [ending tempo]...
1
2
3
4
5
6
ff
f
mf
f

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