

EXTENDED TRUMPET PERFORMANCE TECHNIQUES

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A Thesis Presented to the Graduate Faculty  
of  
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In Partial Fulfillment  
of the Requirements for the Degree  
Master of Arts in Music

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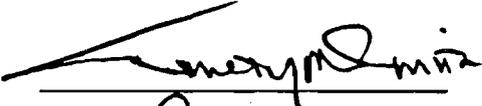
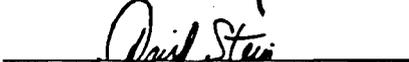
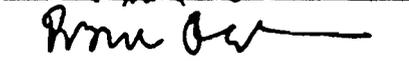
By  
Attilio N. Tribuzi  
September, 1992

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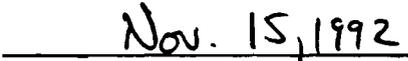
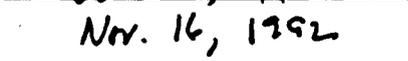
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## I. INTRODUCTION

It is difficult to find an instrument whose repertoire has changed more profoundly than the trumpet's. In the earliest times, the trumpet served as a signaling instrument for war. Despite incomplete documentation, we can say with certainty that trumpeters were among the first musicians hired by medieval courts, no doubt because of their martial and ceremonial functions.<sup>1</sup>

One of the most important events in the history of the trumpet was its acceptance into the art music of the seventeenth century.<sup>2</sup> This led to the addition of numerous pieces to the trumpet's repertoire, and a "Golden Age" of the natural trumpet occurred.<sup>3</sup>

As the Classical style of composition supplanted the Baroque, the trumpet's repertoire entered a state of gradual decline. The compositional style of the era reflected the societal idea that the old courtly culture (represented by

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<sup>1</sup>Edward H. Tarr, The Trumpet, trans. from the German by S.E. Plank (Portland, Ore.: Amadeus Press, 1988), p. 43.

<sup>2</sup>Ibid., p. 85.

<sup>3</sup>Ibid.

the trumpet) was out of date.<sup>4</sup> The "new" style made a tutti instrument out of the once "heroic" trumpet, which formerly had the melody.<sup>5</sup>

With the invention of piston valves in 1815, the function of the trumpet changed again. The trumpet now possessed true chromatic capability, and it slowly regained its place as a solo instrument in the works of Romantic, composers.

With the development of jazz in the early twentieth century, the newly-acquired chromatic ability of the trumpet enabled it to improvise, and this, coupled with its tone, gave it a lead role in this "new" music. Jazz performers not only added an immense wealth of music to American culture, but new performance techniques for the trumpet as well. Jazz musicians such as Louis Armstrong and Harry James have shown not only the great agility and compass of their instruments, but their wide tonal and expressive characteristics.<sup>6</sup> Rips, pops, smears, growls, shakes, glissandi, lip slurs and lip trill techniques were added to the trumpet player's repertoire and have since become standard practice in many contemporary styles.

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<sup>4</sup>Ibid., p. 138.

<sup>5</sup>Ibid., p. 144.

<sup>6</sup>Reginald Smith Brindle, The New Music (London: Oxford University Press, 1975), p. 157.

As a variety of compositional styles continued to evolve through the twentieth century, composers found it necessary to expand the modifications of their sound sources. Composers realized the vast quantities of untapped sounds available to the modern trumpet. Since the 1940's, new performance techniques, including lip produced and non-lip produced sounds, have been steadily added to the trumpet's repertoire.

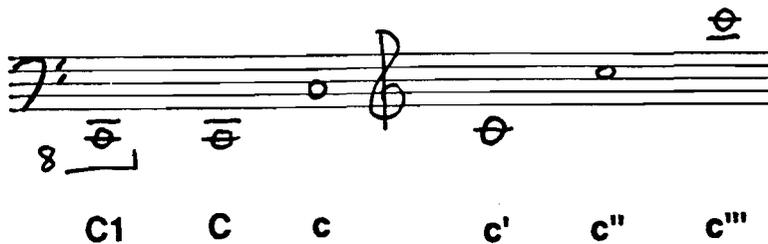
Many problems arise when attempting to perform these extended techniques. Often the composer of a work includes detailed instructions for the performance of these techniques, but this is by no means the rule. Also, as in the case of contemporary notation in general, similar techniques may actually be notated differently by different composers.

The compositions surveyed in this thesis exhibit a wide variety of extended techniques and present a broad sampling of new music for the trumpet since 1970. Each piece is either for unaccompanied or accompanied trumpet solo. Accompaniments range from piano, organ, and orchestra, to percussion and prerecorded audio tape. All musical examples have been selected to illustrate specific techniques or effects that are considered "extended," or outside of the technical demands found in the common practice of trumpet performance, and are in B flat unless otherwise indicated.

Each effect will be analyzed in five areas:

1. How it is notated
2. How it is produced
3. How to prepare it for performance
4. How practical it is to perform
5. What kind of musical effect it produces.

Specific pitches and octaves referred to in the text will use the designations found in The New Harvard Dictionary of Music. Middle C is designated c'. In this system, the form of the name changes with each "C," proceeding upward.<sup>7</sup>



This analysis will demonstrate the vast sound resources available to the trumpet and will help in the understanding and performance of these extended techniques.

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<sup>7</sup>Don Randel, "Pitch Names," The New Harvard Dictionary of Music, (Cambridge, Mass.: The Belknap Press of Harvard University Press, 1986), p. 640.

## II. SURVEY OF LIP PRODUCED SOUNDS

### A. Jazz Effects

#### 1. Glissandi

Trumpet techniques from various jazz styles are frequently borrowed by composers working in other musical idioms. Of these techniques, it is the glissando (uncommon in pre-twentieth century works for trumpet) that has been modified and employed in the greatest variety of ways. The conventional glissando is performed by "sliding" from one pitch to another by using a fast valved or half-valved progression of intermediate pitches. In Example 1, the glissando progresses from e''' to c''' sharp, passing through the e''' flat and d''', and is notated in a standard way.

Example 1. Basil Chapman, Impressions for Solo Trumpet and Tape, p.1.

The image shows a handwritten musical score for a trumpet and piano accompaniment. The trumpet part is on a single staff with a treble clef. It begins with a note marked 'MOLTO VIBRATO'. This is followed by a 'JAZZY' section with a fermata over a note marked 'f'. Then, a 'GLISS' section is indicated, showing a series of notes connected by a slur and an arrow, representing a glissando. The notes are marked with accidentals: a sharp (#), a flat (b), and another sharp (#). The piano accompaniment is on a second staff with a bass clef, showing chords and a '50' marking. The word 'CHORDS' is written below the piano staff. There are also some markings like '3' and '3' above the piano staff, possibly indicating triplets or fingerings.

Variations on the performance of the glissando usually involve the actual method of fingering the "slide." In *Zyklus*, by Gerhard Muller-Hornbach, three types of glissandi are used.<sup>8</sup> The first, shown in Example 2, includes the notation of the exact pitches sounded, all to be performed with the 1-3 valve position, simply ascending on the natural overtone series of that fundamental.

Example 2. *Zyklus*, p.1.

The image shows a musical staff with a treble clef. It begins with a wavy line representing a glissando. This is followed by a series of notes with stems and flags, indicating specific pitches. The notes are grouped together with a bracket and a '2)' above them. Below the staff, there are dynamics markings: 'f' followed by 'p', then 'f' followed by 'p'. The notation ends with a wavy line and a sharp sign (#).

The second type of glissando requires "flying valves" (rapid, uncontrolled valve movement) to produce the "slide."

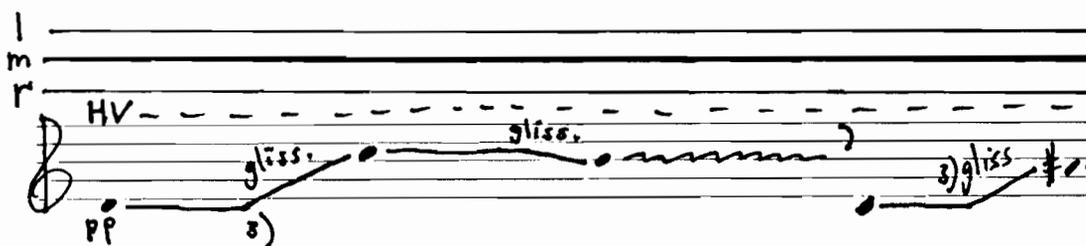
Example 3. *Zyklus*, p.4.

The image shows a musical staff with a treble clef. It begins with a wavy line representing a glissando. This is followed by a series of notes with stems and flags, indicating specific pitches. The notes are grouped together with a bracket and a '2)' above them. Below the staff, there are dynamics markings: 'p' followed by 'f', then 'p' followed by 'f'. The notation ends with a wavy line and a sharp sign (#).

<sup>8</sup>Gerhard Muller-Hornbach, *Zyklus* (Wiesbaden, West Germany: Breitkopf and Hartel, 1986), p.i.

The third type of glissando is produced by depressing all three valves halfway when sliding between pitches. In Example 4, "HV" stands for half-valves and the entire line is to be performed in this manner.

Example 4. *Zyklos*, p. 6.



Another type of half-valve glissando is found in Robert Erickson's *Kryl*, where "the 1/2 is not to be taken literally; rather, it means depress a valve or some combination of valves to produce the notated glissando."<sup>9</sup>

Example 5. Robert Erickson, *Kryl*, p.2.



<sup>9</sup>Edwin Harkins, in additional notes to *Kryl* (San Diego: Sonic Art Publications, 1980) p. iv.

A much less common form of glissando can also be found in Kryl, utilizing the third valve tuning slide to produce the pitch change. In Example 6, the boxed symbols are instructions to change the position of the third valve slide (arrow right= extend; arrow left= return to normal; the tails on arrows show specific points of change).

Example 6. Kryl, p.10.

The musical notation for Example 6 is on a single staff. It begins with a boxed 'B' and a boxed '3←' above the staff. The first note is a quarter note with a dynamic marking of *mp*. This is followed by a glissando line with a dynamic marking of *f*. The next note is a quarter note with a dynamic marking of *p*. This is followed by another glissando line with a dynamic marking of *f*. The final note is a quarter note with a dynamic marking of *f*. Above the staff, there is a boxed '3→' above the final note. The glissando lines are represented by triangles with arrows indicating the direction of the slide.

All of the above glissandi are readily produced by the performer and require only that the trumpet player follow the precise performance notes provided by the composer to ensure a consistent performance. They all offer a valid musical variation on the standard trumpet glissando. Trouble arises in Example 7, however, when a non-standard glissando notation is not accompanied by any performance notes.

Example 7. Enrico Banzola, Theme-c for Trumpet Alone, p.1.

The musical notation for Example 7 is on a single staff. It begins with the instruction *senza rigore di tempo* above the staff. The first note is a quarter note with a dynamic marking of *energico* and a tempo marking of  $\text{♩} = 75$ . This is followed by a glissando line with a dynamic marking of *legatissimo* and *mf*. The next note is a quarter note with a dynamic marking of *mf*. This is followed by another glissando line with a dynamic marking of *gliss*. The final note is a quarter note with a dynamic marking of *gliss.* and a plus sign before the word *gliss.*

In the preceding example, the double arrows are sometimes accompanied by the instruction "gliss.," sometimes not. Nevertheless, it is obvious that some sort of glissando is required each time. The exact method of producing the glissandi is not apparent from the notation, leaving the performer to interpret the composer's intentions.

Since there are many ways to perform glissandi on the trumpet, the following chart helps to summarize them. It compares the glissando timbre to the normal trumpet sound: timbre consistency throughout the glissando, the widest possible range of the glissando, step availability, instrument availability, and a guide to technical difficulty. The "+" and "-" signs indicate positive or negative traits.

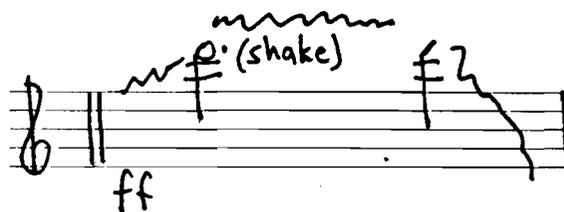
Chart 1. Edwin Harkins, "Aspects of Kryl- a Trumpet Piece", International Trumpet Guild Journal, (Oct., 1980), p.24

Means	Normal Sound	Timbre Consistency	Range	Step Availability	Instrument Availability	Difficulty
valve slides	+	+	1/2 step	+	+	easy
half valve	-	1/2+	total	+	+	medium difficult
"lip"	-	+	1 step	+	+	medium difficult
mutes	-	-	major 3rd	+	+	easy
slide trpt	+	+	tritone	1/2+	rare	easy
Slide/valve trpt combo	+	+	minor 3rd	+	rare	easy

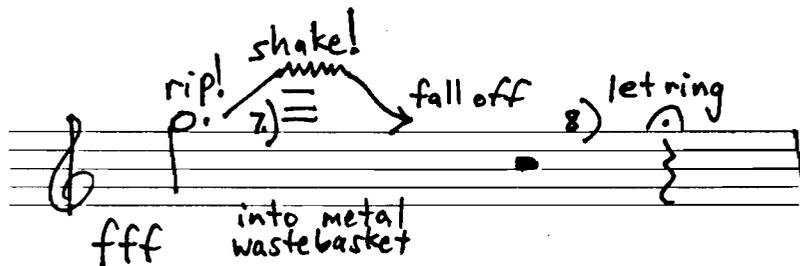
## 2. Other Effects

Besides glissandi, many other standard jazz techniques are borrowed by composers and are usually notated in the traditional way, even if found in music not considered "jazzy." Examples 8 through 11 are indicative of the employment of these effects. Examples 8 and 9 illustrate two types of "shake" notation: the first with a definite rhythmic value, the other indefinite. The shake can be produced by rapid lip motion (like an uncontrolled lip trill) or by rapid hand motion ("bouncing" the trumpet slightly on the embouchure), or by a combination of both, causing a rapid fluctuation of pitch and timbre. The "rips" found in Examples 9 and 10 are close relatives to the glissandi and only differ in the abruptness of the sound. Likewise, "fall off" and "quick drop" notations found in Examples 9 and 11 indicate an uncontrolled downward release of the pitch.

Example 8. Glenn Smith, ...to seek the center of quiet, p.4.



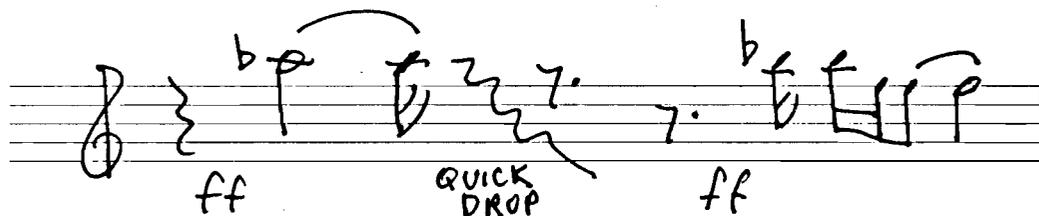
Example 9. Samuel Pellman, Trump-it, p.6.



Example 10. William Kraft, Encounters III, p.14.



Example 11. Edward Diamente, Something Else, p.7.



The inclusion of these traditional jazz effects, as well as others, in non-jazz music is common practice in contemporary compositions, and it mandates that classically trained trumpet players are now required to perform techniques that were once relegated strictly to jazz playing.

## B. Timbre Modification

### 1. Mutes

Timbre modification, or the alteration of the basic timbres available to the trumpet, is one of the most frequently extended trumpet techniques. The plethora of available mute types (straight, wa-wa, Solo tone, whisper, plunger, cup, and Harmon, to list but a few), as well as their method of employment, add a great variety of timbres to the trumpet's natural tone. In Example 12, a color-coded shape notation is used, with the shapes corresponding to the different mute types. A green shape instructs the player to insert the mute; a red shape, to remove it. The shape in Example 12 is that of the Solo tone mute.<sup>10</sup>

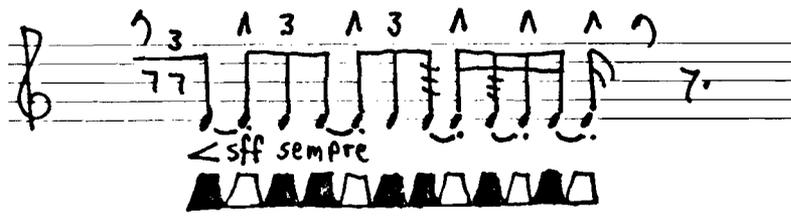
Example 12. Lucia Dlugoszewski, Space is a Diamond, p.2.

The image shows a musical staff with a treble clef and a key signature of one flat (B-flat). The notation includes a dynamic marking of *mf* at the beginning, followed by a *p* marking, a *f* marking, and a *pp* marking. Below the staff, three trumpet icons are shown, each with a colored shape indicating mute usage: a green shape (insert), a red shape (remove), and another green shape (insert). The shapes are labeled "(green)", "(red)", and "(green)" respectively.

<sup>10</sup>Lucia Dlugoszewski, Space is a Diamond, (Mass., Margun Music Inc., 1970), p.ii.

Example 13 provides another illustration of shape notation, but without the color. The blackened shape indicates that the mute is in the bell; the whitened shape indicates that the mute is removed but held near the bell to allow for quick alternation. It must be pointed out that the rapidity of this alternation does not allow for the mute to be completely inserted into the bell, but must be held in position with the hand. The mute called for in this example is a Harmon mute.

Example 13. Frank Tichelli, The First Voice, p.2.



Example 14 illustrates another extended muting technique that is commonly used--the gradual opening or enclosing of the trumpet's bell. Seven symbols are used to indicate seven positions of a derby (in this case) over the bell, from fully enclosed to fully open.



The most extensive notation for the gradual motion of mute placement in the works studied occurs in Example 18. The circled "W" above the staff indicates the use of a wa-wa mute. The differing degrees of openness are codified by a key using the phonetic alphabet, with each symbol placed beneath the corresponding note. The bracketed portions indicate a continuous transition between the various degrees of openness, and the vertical lines show the exact rhythmic placement of the changes in muting.<sup>11</sup>

Example 18. Karlheinz Stockhausen, Eingang und Formel, p.2.

The musical notation shows a staff with notes and rests. Above the staff, there is a circled 'W' and a '5/8' time signature. Two boxed measures are labeled '85' and '120'. Below the staff, phonetic symbols are written: [a-u] [o-u] [a u] and [o a a] [o u] [u-a].

[a]	= completely open
[a]	
[o]	
[o]	
[u]	
[u]	= completely closed by hand,

↓

[u—a], [o—o] etc. = continuous transition.

[a u o] etc. = sudden change.

<sup>11</sup>Karlheinz Stockhausen, Eingang und Formel, (Kurten, W. Germany, Stockhausen Verlag, 1978), p.ii.

All of the above techniques require that the performer learn the notational language employed by the composer. Once learned, however, these techniques are straightforward, but offer a challenge to the trumpet player's dexterity. When these techniques are used in addition to others, however, they become much more difficult. A demonstration of this is found in Example 19, where a Solo tone mute, gradually covered with the palm, is used in addition to a strictly regulated vibrato, necessitating a fine coordination of left and right hands to produce the intended effect, since the composer calls for a "hand" vibrato.<sup>12</sup>

Example 19. Samuel Pellman, Trump-it, p.4.

cover opening of mute w/ palm (solotone)

poco vib., ♩ = 56

dim

<sup>12</sup>See page 17 for discussion of vibrato effects.

## 2. Vibrato Effects

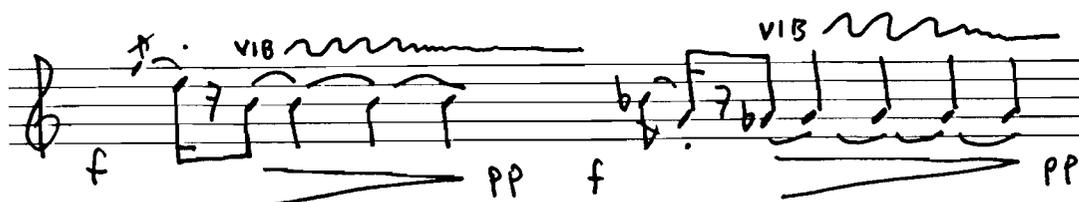
Muting is but one way to alter the trumpet's basic timbre. As illustrated previously by Example 19, vibrato is sometimes notated as well. Trumpet vibrato can be produced with the hand, jaw, throat or diaphragm, or by combining any of these methods. In all of the following excerpts, the actual method of vibrato production is left to the discretion of the performer. Example 20 portrays a vibrato regulated not by tempo, but by the number of "pulsations," notated by a consistent wave. Therefore, the d''' should be played with a wide vibrato with five wave "crests" before glissing down to the f sharp. In contrast, the following F sharp should be played with a slightly narrower vibrato.

Example 20. Lucia Dlugoszewski, Space is a Diamond, p.3.



Another method of notating vibrato is with a variable wave, in this case, diminishing the width of the vibrato as the volume of the passage decreases.

Example 21. Edward Diemente, Something Else, p.9.



While vibrato is usually notated by a wave, it is by no means a universal symbol. In Example 22, the vibrato is indicated by exact rhythmic subdivisions given above the note.

Example 22. Karlheinz Stockhausen, Eingang und Formel, p.2.

The problems inherent in the precise notation of vibrato become apparent after reflecting on the above four musical examples. To accurately notate vibrato, the "width" of the vibrato, as well as its "speed," must both be represented. Stockhausen's technique of indicating speed by using standard rhythmic notation is extremely efficient, but it lacks any definition as to the width. The "wave" notation used by other composers is less precise, and composers will vary in respect to what constitutes "wide" or "fast" vibrato, even though they use similar notational symbols. However, the relative speed and width can be made consistent by a thoughtful interpretation by the performer throughout the length of the piece. Ultimately, it is up to the performer to judge the musical application of this notation in these passages.

### 3. Other Effects

Timbre modifications other than muting and vibrato occur as extended techniques in the trumpet's repertoire but with much less frequency. The level of performance in these examples range from easy to difficult. Of the easiest, Examples 23 and 24 illustrate the use of the trumpet as a loud "noisemaker."

Example 23. Jere Hutcheson, Three Pictures of Satan, p.3.

Most blatant sound possible (ad lib)



Example 24. William Kraft, Encounters III, p.11.



The musicality of these "effects" may be open to debate, but in context are quite "effective." Other timbre alterations are much more involved. Two examples from Space is a Diamond are fascinating in their application. In this piece the composer calls for the trumpet player to perform the extreme

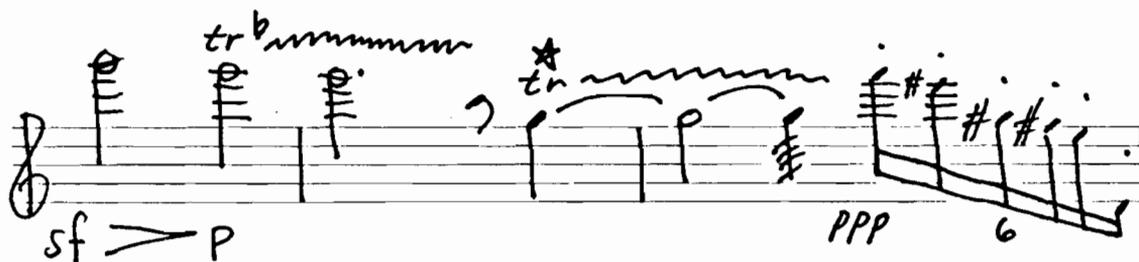
high register in a novel way. The valves are to be depressed slightly, and the embouchure aperture must be very small. The lips vibrate the correct pitch with hardly any pressure from the mouthpiece and instrument.<sup>13</sup> The pitches are then performed softly, making a distinct contrast to normal high register playing.

Example 25. Lucia Dlugoszewski, Space is a Diamond, p.1.



Elsewhere in this piece, the trumpet player is instructed to perform a normal valve trill on g''', breathe, and then trill an octave lower with the hand alternating in and out of the bell. This technique is indicated by the composer with a star.

Example 26. Space is a Diamond, p.3.



<sup>13</sup>Lucia Dlugoszewski, p.i.

Both of these techniques are very difficult to perform and require immense amounts of practice time to develop the consistency necessary to realize an authentic recreation of the composer's intentions. Both are accompanied by highly detailed composer's notes that greatly aid the performer. Space is a Diamond is full of extended techniques, and the piece is best summed up by the following quote by Glenn Watkins:

While extensions of playing techniques have been explored on virtually every wind instrument, perhaps no work for the trumpet provided a more complete catalog of the possible and the impossible (except for its dedicatee, Gerard Schwarz) than the tour de force Space is Diamond (1970) by Lucia Dlugoszewski.<sup>14</sup>

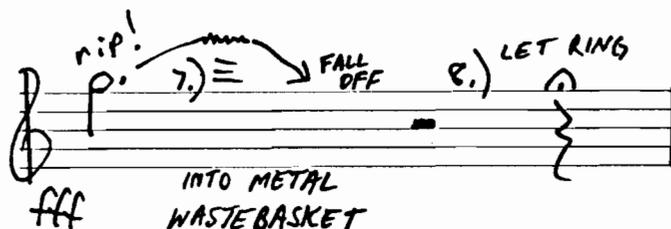
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<sup>14</sup>Glenn Watkins, Soundings, (New York: Schirmer, 1988), p.632.

### C. Spatial Modulation

Spatial modulation involves the active motion of sound from one point to another.<sup>15</sup> This has been achieved throughout music history with ensembles using antiphonal choirs but is rarely found in works for solo instruments. Spatial modulation can be achieved simply by having the performer play offstage during certain parts of a piece, as in Glenn Smith's ...to seek the center of quiet; or to enter the performance area while playing the opening measures of a piece, as in Karlheinz Stockhausen's Eingang und Formel; but these are not really extended techniques. However, other means of spatial modulation are found in the trumpet's repertoire that are extended. For example, simple bell movement by the performer can be indicated in a piece to produce this effect, as previously seen in Example 9 (on page 11) and reproduced again here.

Example 27. Samuel Pellman, Trump-it, p.6.



<sup>15</sup>David Cope, New Directions in Music, (Dubuque: Kendall Hunt Publishing Co., 1976), p.121.

This movement of the bell from up to down, into the metal wastebasket, modifies the timbral as well as the spatial characteristics of the trumpet sound, and is effective, if somewhat humorous (despite the composer's stated intentions).<sup>16</sup> Another example of simple bell motion (devoid of humor) is given in Examples 28 and 29 (on the following page). Here, the direction and motion of the trumpet bell create a unifying compositional device integral to the form of the piece. In measure one of Aries, the trumpet player is instructed to raise the instrument from pointing perpendicular down at the floor to pointing straight ahead. In measure five, the trumpet should sink down to original position (perpendicular pointing at the floor), and the player should play to the floor, at first in small jerks, one jerk per note. By measure twenty, the trumpet player should "play all signals high in space and in various directions."<sup>17</sup>

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<sup>16</sup>Samuel Pellman, Trump-it (New York: Edition Delusive Phantom, 1982), p.8.

<sup>17</sup>Karlheinz Stockhausen, Aries (Kurten, W. Germany, Stockhausen Verlag, 1981), p.i.

Example 28. Karlheinz Stockhausen, Aries, p.1.

**Tonband leiser**  
CAPRICORN - Rhythmus  
mit ARIES - Melodie

1 **J=127**  
alles etwas höher

Tonband

*p* sempre  
*mp* sempre  
*f* sempre

**J=127**

Tp. nach vorne unten senken, zunächst in kleinen Rucken pro Ton zum Boden spielen. **mit waaa** (quasi sprechen, elektrifizierend, diskontinuierlich)

ca. **mp** (meistens etwas leiser als das Tonband, aber mit

Example 29. Aries, p.4.

6

**f**

**2'17.8** [2,1]    **20'** [2]    **22'** [4,1]    **26.1** [2,1]    **28.1**

Von hier ab alle Signale hoch in den Raum in verschiedene Richtungen spielen.

**offen**

Flug

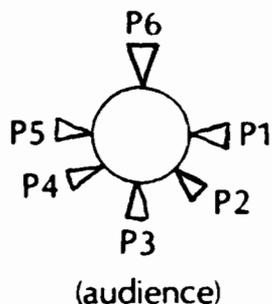
Flug

Tp

**f**    **f** (nicht zu laut)    **f**

While musically valid, the above extended techniques present little difficulty for the performer. A much more complex and meticulously detailed example of spatial modulation occurs in Zyklos by Gerhard Muller-Hornbach. In the performance notes the composer instructs the player to rotate to different positions for each of the six pages of the piece. A diagram is supplied to illustrate this, with P1 being page one, P2 page two, and so on.

Example 30. Zyklos, p.i.



Additional spatial modulation is included in this piece which is represented by a special notation that instructs the trumpet player to rotate the trumpet from left to right or vice versa. These motions are indicated above the normal staff on a continual three-line staff (l=left; m=middle; r=right).

Example 31. *Zyklus*, p.1.

The image shows a musical score for a trumpet. At the top, there is a three-line staff with a vertical axis on the left labeled 'l', 'm', and 'r' from top to bottom. A thick black line is drawn across this staff, with several downward-pointing 'V' shapes indicating spatial modulation. Below this is a standard musical staff with a treble clef. The notation includes dynamic markings: 'f' and 'pp' (pianissimo) in three sections. The first section is marked 'cup +'. The second section is marked 'f' and 'pp'. The third section is marked 'pp' and 'O dahinhuschend'. The final part of the score shows a series of notes with stems pointing downwards, indicating a specific playing technique.

The employment of the preceding technique adds another line of notation for the trumpet player to follow, in essence making the music twice as difficult to read (and twice as difficult to practice). Done properly, however, this technique effectively alters the directional dimension of the trumpet sound and can function as a motivic device as well. When spatial modulation is used in pieces with more than one trumpet, the effect is multiplied and is even more effective.<sup>18</sup>

<sup>18</sup>Cope, p.121.

#### D. Non-Standard Valve Techniques

The most commonly found extended valve technique is the use of "half valves," the semi-depression of valve combinations to produce a non-standard trumpet tone. This may be considered to be related to jazz techniques, but the musical applications and notations in contemporary "classical" music are quite different. Several methods of notation are used for these effects. In Example 32, the noteheads are notated normally, with the half valve instruction marked at the beginning of the passage, informing the player to half depress the appropriate standard fingerings throughout.

Example 32. Charles Whittenberg, Polyphony for C Trumpet, p.4.

Handwritten musical notation for Example 32, showing a trumpet part. The notation is written on a single staff in treble clef with a 4/4 time signature. The tempo is marked as  $\text{♩} = 116$  half valve. The piece is in C major, indicated by "IN C". The dynamics are marked as  $mp$  (mezzo-piano) and  $pp$  (pianissimo) for the first section, and  $mp$  and  $f$  (forte) for the second section. The first section consists of four notes: C4, D4, E4, and F4, with a half valve instruction above the first note. The second section consists of four notes: G4, A4, B4, and C5, with a half valve instruction above the first note. The notes are beamed together in groups of four.

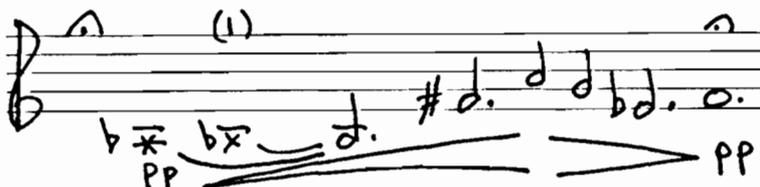
In Example 33, the noteheads are again written normally, but each half valved note is indicated with a "●":

Example 33. Diamente, Something Else, p.13.



When half valved notes are written without normal noteheads, an "X" is usually substituted. In Frank Tichelli's The First Voice, the performance notes stipulate that all half valved notes are to be fingered with all three valves at half position unless otherwise indicated by valve positions in parentheses above the note in question.<sup>19</sup>

Example 34. The First Voice, p.4.



<sup>19</sup>Frank Tichelli, The First Voice, (Cheltenham, Maryland: PP Music, 1987), p. ii.

The preceding half valve techniques are all fairly straightforward and require only a small amount of preparation time to perform successfully. The trumpet sound is obviously somewhat muffled, and the effects are slightly percussive, but the pitches are clearly audible. Half valve techniques can be (and have been) extended further, however, to include a variety of options. In Example 35, again from The First Voice, the half valved notes are to be played with all three valves at half position, but the "circa" markings indicate that the pitches are approximate and the trumpet player is to play according to the contour of the notes.<sup>20</sup>

Example 35. The First Voice, p.1.

The image shows a handwritten musical score for a trumpet part. The notation is on a single staff with a treble clef. It begins with a dynamic marking of *f* (forte) and a wedge-shaped decrescendo hairpin. The first note is marked with a triangle and the letters "tm". The second note is marked with a triangle and "tr m f l". A slur covers the first two notes, with "(0-3)" written above it. The third note is marked with a triangle and "circa". The fourth note is marked with a triangle and "ff" (fortissimo). The fifth note is marked with a triangle and "3", indicating a triplet. The sixth note is marked with a triangle and "circa". The seventh note is marked with a triangle and "sff" (sforzando). The eighth note is marked with a triangle and "b", indicating a flat. The notation includes various articulation marks such as triangles, slurs, and a triplet bracket.

The above example is more difficult to perform and requires significantly much more preparation time than the previous examples. The difficulty is compounded further due to the mute changes and the variations in articulation. Special care must be taken to learn the correct placement (even though approximate) of the desired pitches when the

<sup>20</sup>Ibid.

trumpet is played with all three valve depressed halfway, and the distinction between slurring and tonguing the "circa" passages must be practiced. It is best to begin practicing the correct pitch placement through lip slur drills, and once this is mastered, to proceed to the tonguing of the pitches. Once accomplished, it becomes possible for the performer to follow the composer's detailed instructions and reproduce the desired musical effect. When the piece lacks these detailed performance instructions by the composer, problems can arise, as evidenced in the following example. The composer indicates that the g' is to be half valved, but no valve position is indicated.

Example 36. Wayne Gorder, 1 Point 2, p.1.

$\text{♩} = 60$   $\frac{1}{2}$  valve

*p*

This passage leaves the performer to decide which fingering to use to produce the desired effect since g' is an open position. Logic dictates a 1-3 half valve position, but the composer should have stipulated this to avoid any possible ambiguity.



## E. Non-Standard Valve Slide Techniques

Non-standard valve slide techniques offer a challenge to the trumpet player's dexterity and flexibility. Following are two fairly straight-forward examples wherein the performer is instructed to extend the third, or first and third, valve slides and produce a pitch a half step lower than that which is normally produced with the stipulated valve combinations, thus creating a note that is not "officially" in the range of the trumpet. Example 38 asks the performer to play an E by extending the tuning slide, as well as the third valve slide, and fingering F sharp. Similarly, Example 39 directs the trumpet player to extend the first and third valve slides and produce a G flat and F by fingering a G and F sharp. Both of these techniques effectively extend the normal range of the trumpet downward by a half step. Time must be invested with a tuning device to determine the correct length of slide extension to accurately produce the indicated pitches. Once learned, however, it is a valid technique for producing these pitches without resorting to the use of a pedal tone and the inevitable timbre variation that would accompany its employment.

Example 38. William Kraft, Encounters III, p.5.

Pull tuning slide and extend 3rd valve slide. Finger  $\frac{1}{2}$   
3

The image shows a musical score for a trumpet. The notation is on a single staff with a treble clef. It features a series of notes with slurs and accents, indicating a specific playing technique. Above the staff, there is a handwritten instruction: "Pull tuning slide and extend 3rd valve slide. Finger 1/2 3".

Example 39. Karlheinz Stockhausen, Aries, p.12.

*pp poco cresc.*

7.53.8" [10.4]

1. und 3. Ventil ausziehen, g-f# greifen

The image shows a musical score for a trumpet. The notation is on a single staff with a treble clef. It features a series of notes with slurs and accents, indicating a specific playing technique. Above the staff, there is a handwritten instruction: "1. und 3. Ventil ausziehen, g-f# greifen". To the left, there is a box containing the text "7.53.8" [10.4] and "pp poco cresc.". Below the staff, there are circled numbers (84) and (85).

Another extended technique involving valve slides is much more rare: namely, the complete removal of certain valve slides from the instrument during certain passages of a piece. Example 40 introduces a fingered tremolo and calls for the removal of the second valve slide.

Example 40. Frank Tichelli, The First Voice, p.2.

with 2nd valve slide removed

+m

$(\frac{2}{3}-1)$

*f*

The image shows a musical score for a trumpet. The notation is on a single staff with a treble clef. It features a series of notes with slurs and accents, indicating a specific playing technique. Above the staff, there is a handwritten instruction: "with 2nd valve slide removed". To the left, there is a box containing the text "+m" and " $(\frac{2}{3}-1)$ ". Below the staff, there is a circled number (f). The notation includes a series of notes with slurs and accents, indicating a specific playing technique.

The rapid alternation of standard and non-standard fingerings in Example 40 combines a "leaking air" sound with the tremolo effect and only requires fast fingers to perform correctly.

When comparing the slideless sound with the normal trumpet sound, the former is:

a muted-trumpet type of timbre, is less focused, especially in the lower register, has less loudness potential, has more flexibility of intonation (each slot of the deformed overtone series is characterized by a wider than usual "lippable" range, causing considerable difficulty in attacking certain notes), and exits from a different part of the instrument, which may even be aimed in a different direction.<sup>21</sup>

The prolonged use of this technique in a passage elicits its primary interest not so much from the slideless sound itself but rather in the alternation between the slideless and normal sound.<sup>22</sup> In Robert Erickson's Kryl the performer is asked to remove the first valve slide from the instrument.

Example 41. Kryl, p.10.

The image shows two staves of musical notation. The top staff is a single line with a treble clef, containing a whole note followed by a half note. Below the notes are dynamic markings 'p' and 'pp'. A handwritten instruction in the middle of the staff reads 'REMOVE 1st VALVE SLIDE AND B...'. The bottom staff is also a single line with a treble clef, containing a sequence of eighth notes. Above the notes are fingerings: '3 2 3 2', '3 2 3 2 3', '3 2 3 2 3', and '2'. Below the notes are dynamic markings 'MF-' and 'P F'. A box containing the letter 'H' is positioned at the start of the bottom staff. Above the first few notes of the bottom staff is the tempo marking '♩ = c. 320 (♩ = ♩ Always)'.

<sup>21</sup>Edwin Harkins, "Aspects of Kryl-A Trumpet Piece", International Trumpet Guild Journal, October, 1980, p.25.

<sup>22</sup>Ibid.

Whenever one depresses the first valve in this condition, a part of the trumpet is short-circuited and the sound is directed backward toward the player, rather than out the bell of the instrument.<sup>23</sup> For this reason, it is wise to utilize some sort of sound reflecting device behind the performer, since it will do no good to attempt to force the sound to obtain a balance between the two outputs.<sup>24</sup> The predominant and intriguing feature of this type of "prepared trumpet" is the effortless hocket between two timbral systems, two intonational systems and two sound directions.<sup>25</sup>

Additionally, the reading problem encountered with alternate fingerings and microtones is even more pronounced in this situation. Undoubtedly, most trumpet players do not have these slideless fingerings memorized, and the fact that the fingerings must be looked at means that the performer is not going to be dealing with a sight-reading situation.<sup>26</sup>

Therefore, the performer must take a gradual approach in preparing a slideless passage. The passage should first be played normally, hopefully memorizing the sound of the line. Next, it should be practiced slowly with the

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<sup>23</sup>Ibid.

<sup>24</sup>Ibid.

<sup>25</sup>Ibid.

<sup>26</sup>Ibid.

appropriate slide(s) removed, using a tuning device to ensure proper pitch placement. The passage can then be rehearsed until it can be performed up to tempo. During this learning process, it is important for the performer to decide whether it is better to look at the notes or the fingerings as the passage is played in order to play as accurately as possible.<sup>27</sup>

Learning to play a trumpet without various slides demands that the performer learns a whole new set of intonation tendencies for the instrument. In addition, the player must learn to control a variety of incomplete and deformed overtone series. To aid trumpet players in this complex and time-consuming undertaking, the following charts are offered. Each section deals with the instrument in one of the six possible slideless attitudes (completely slideless playing is not included due to the insurmountable overtone inconsistencies). Affected fingerings are indicated on the left, followed by the most prevalent pitches available in the skewed overtone series. Each pitch is annotated with an arrow beneath it, indicating the usual sharpness (upward arrow) or flatness (downward arrow). In general, most of these combinations fluctuate wildly in the lower register, so only middle and upper register pitches are included.

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<sup>27</sup>Ibid.

Chart 2. Slideless Trumpet Overtone and Pitch Tendencies<sup>28</sup>

VALVE POSITION

THIRD VALVE SLIDE REMOVED

3

1-3

2-3

1-2-3

FIRST AND THIRD VALVE SLIDE REMOVED

2-3

1-2-3

SECOND AND THIRD VALVE SLIDE REMOVED

2-3

1-2-3

Detailed description of the chart: The chart is organized into three sections based on valve slide removal. Each section contains two staves representing different valve positions. The notes are written in treble clef with a key signature of one sharp (F#).  
 - **Section 1: THIRD VALVE SLIDE REMOVED**  
 - Staff 1 (Valve Position 3): Notes are G4 (F#), A4 (F#), B4 (F#), and C5. Arrows below indicate tendencies: up for G, down for A, up for B, and down for C.  
 - Staff 2 (Valve Position 1-3): Notes are G4, A4, B4 (F#), and C5 (F#). Arrows indicate: up for G, up for A, up for B, and down for C.  
 - Staff 3 (Valve Position 2-3): Notes are G4, A4, B4 (F#), and C5. Arrows indicate: up for G, up for A, up for B, and down for C.  
 - Staff 4 (Valve Position 1-2-3): Notes are G4 (F#), A4 (F#), B4, C5 (F#), and D5. Arrows indicate: up for G, down for A, down for B, down for C, and up for D.  
 - **Section 2: FIRST AND THIRD VALVE SLIDE REMOVED**  
 - Staff 1 (Valve Position 2-3): Notes are G4, A4 (F#), and B4 (F#). Arrows indicate: up for G, up for A, and up for B.  
 - Staff 2 (Valve Position 1-2-3): Notes are G4, A4, and B4 (F#). Arrows indicate: down for G, down for A, and down for B.  
 - **Section 3: SECOND AND THIRD VALVE SLIDE REMOVED**  
 - Staff 1 (Valve Position 2-3): Notes are G4, A4 (F#), B4 (F#), and C5. Arrows indicate: up for G, down for A, up for B, and down for C.  
 - Staff 2 (Valve Position 1-2-3): Notes are G4, A4 (F#), B4, and C5 (F#). Arrows indicate: up for G, down for A, up for B, and down for C.

<sup>28</sup>compiled by the author.

Chart 2. (continued)

**FIRST VALVE SLIDE REMOVED**

VALVE POSITION

1

1-2

1-3

1-2-3

Detailed description: This section contains four musical staves, each representing a different valve position. The notes are quarter notes on a treble clef staff. The first staff (labeled '1') has notes on G4, A4, B4, and C5, with arrows pointing down, up, up, and down respectively. The second staff (labeled '1-2') has notes on G4, A4, B4, and C5, with arrows pointing down, up, up, and up. The third staff (labeled '1-3') has notes on G4, A4, B4, and C5, with arrows pointing down, up, up, and down. The fourth staff (labeled '1-2-3') has notes on G4, A4, B4, and C5, with arrows pointing up, up, down, and up.

**SECOND VALVE SLIDE REMOVED**

2

1-2

2-3

1-2-3

Detailed description: This section contains four musical staves, each representing a different valve position. The notes are quarter notes on a treble clef staff. The first staff (labeled '2') has notes on G4, A4, B4, and C5, with arrows pointing up, up, up, and down. The second staff (labeled '1-2') has notes on G4, A4, B4, and C5, with arrows pointing up, down, up, and up. The third staff (labeled '2-3') has notes on G4, A4, B4, and C5, with arrows pointing down, up, up, and down. The fourth staff (labeled '1-2-3') has notes on G4, A4, B4, and C5, with arrows pointing up, down, down, up, and up.

**FIRST AND SECOND VALVE SLIDE REMOVED**

1-2

1-2-3

Detailed description: This section contains two musical staves, each representing a different valve position. The notes are quarter notes on a treble clef staff. The first staff (labeled '1-2') has notes on G4, A4, B4, and C5, with arrows pointing up, down, up, and up. The second staff (labeled '1-2-3') has notes on G4, A4, B4, and C5, with arrows pointing up, down, up, and up.

The slideless tendencies charts illustrated in Chart 2 are by no means offered as an exhaustive analysis of slideless trumpet playing. Variations in trumpet models, mouthpieces, and individual player embouchure characteristics will all affect the ultimate pitches that are produced in this manner. It also must be stressed that there is a great flexibility of intonation tendencies due to the ambiguous nature of the overtone series. There is an extremely wide, almost uncontrollable variation in pitch in the lowest register below the staff. In addition, all of the middle and upper range pitches indicated in the charts are easily "lipped" to further modify the intonation, so pitches other than those listed are also possible to produce. Therefore, the charts are offered primarily as a guide for composers, as well as performers, to highlight the most readily produced pitches. Likewise, the sharpness and flatness annotations beneath these pitches indicate directional tendencies only; the exact microtonal placement of these pitches will vary to differing degrees and must ultimately be decided upon by the performer on an individual basis. It is hoped that future performers, as well as composers, of this extended technique will profit from this information, using it as a starting point and a referential guideline for future performances and compositions.

## F. Microtones

A microtone is an interval smaller than a semitone.<sup>29</sup> The most common microtone is the quarter tone, but eighth, sixth, and third tones are also found in some pieces.<sup>30</sup>

The performance of microtones in normal trumpet playing may be produced by "lipping" the desired pitches with the embouchure, or by using normal and alternate valve combinations (with or without the extension of the first and third valve slides).<sup>31</sup> The easiest (and most common) of these techniques is the employment of alternate fingerings (sometimes called "color fingerings") to produce a slight pitch change. These fingerings are usually indicated above the note or notes in question with the standard valve number designations, as seen in the following examples.

Example 42. G. Dmitriev, Concertino, p.7.



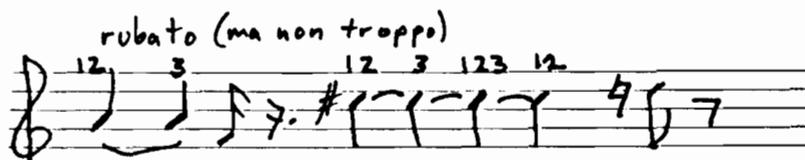

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<sup>29</sup>Zack D. Browning, "Trumpet Techniques in the Performance of Microtones", International Trumpet Guild Newsletter (Vol. 5, no. 6, 1979), p. 6.

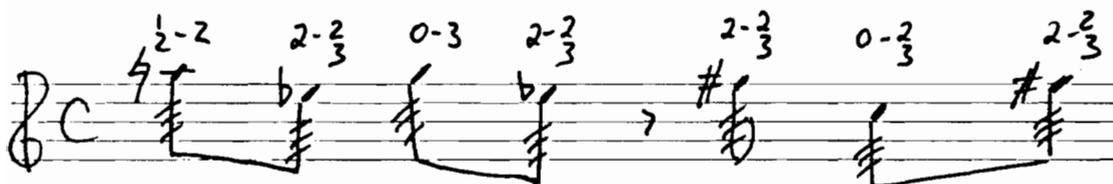
<sup>30</sup>Ibid.

<sup>31</sup>Ibid.

Example 43. Pellman, Trump-it, p.5.



Example 44. Andras Szollosy, Suoni di Tromba, p.3.



Example 45. Smith, ...to seek the center of quiet, p.3.



The passages illustrated in Examples 42 through 45 will produce slight microtonal variations, but it is important to point out that the notation does not indicate the extent to which these pitches will vary. Since the degree of sharpness or flatness of the altered notes is not specified, it is left to the performer to place them somewhere in the microtonal spectrum. A much more detailed method of notation is found in Example 46, where the 1-2-3 valve combination is accompanied by a  $\frac{3}{4}$  sharp sign, as stipulated in the performance notes.<sup>32</sup> This clearly identifies exactly where to place the pitch in question and allows the trumpet player to faithfully recreate the composer's intentions.

Example 46. Betsy Jolas, Episode Troisieme, p.2.

The image shows a musical staff with a treble clef and a key signature of one sharp (F#). The notation includes several measures of music. Above the first four measures, alternate fingerings are indicated: 1 2 3, 1 2, 1 2 3, and 1 2. Below the staff, dynamic markings are shown: *p* (piano) with a wedge-shaped crescendo leading to *f* (forte), followed by another wedge-shaped decrescendo leading to *p*. Further right, there is a *ppp* (pianissimo) marking with a wedge-shaped decrescendo leading to *poco* (poco) and then *molto* (molto). A wavy line above a note is marked with an asterisk (\*), and a circled 'e' is visible below the staff in the later measures.

When alternate fingerings are used in conjunction with valve slide motion to produce microtones, it is obvious that the difficulty of exact pitch placement will increase.

<sup>32</sup>Betsy Jolas, Episode Troisieme (Paris: Huegel & Co., Editions Alphonse Leduc, 1982), p. 1.

The problems can be compounded further through extended passages of microtones, as illustrated in the following example taken from the opening measures of *Kryl*.

Example 47. Robert Erickson, *Kryl*, p.1.

**A**  $\text{♩} = 50, \text{FREELY}$  **KRYL** Robert Erickson (1977)

GRADUALLY TO... **B**

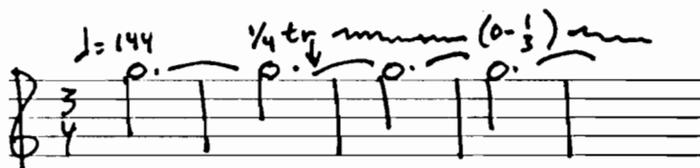
The musical score consists of four staves of music. The first staff is marked 'A' and 'FREELY'. It contains a melodic line with various rhythmic patterns (triplets, eighth notes) and dynamic markings (p, MP, MF, MP). The second staff continues the melody with similar patterns and dynamics (MF+, MP, p, F, MP+). The third staff features a '1/2 VALVE GLISS' instruction and includes slurs and dynamics (MF, F, p). The fourth staff is marked 'B' and contains a melodic line with dynamics (MP, F, P, F, P, F) and specific fingering or breath markings (ON 3, ON 1, ON 2). Vertical arrows are placed above several notes in all staves to indicate microtonal pitch deviations.

The microtones in the above example are the notes to which the composer has added vertical arrows to indicate the direction of pitch deviation from the standard tuning system. It is important to note that the degree of deviation (the size of the micro-intervals) is not specifically designated. The arrows merely indicate that the amount of deviation is less than a half step, so the label "microtones" is preferred

rather than quarter tones. The boxed "3" followed by a horizontal arrow requires the trumpet player to extend (or retract) the third valve slide (note that these are indications of position and not of movement).<sup>33</sup> The microtones found in Kryl usually appear in strings of notes, in a scalar context, and are usually heard as embellishments of a scale structure that is more basic. The microtones are hardly ever found at beginnings or ends of phrases, are fast notes, and are almost always slurred.<sup>34</sup> "The fact that the size of the intervals is inconsistent, yet do not sound difficult to produce, explains why these passages sound idiomatic--a tribute to Erickson's compositional skills."<sup>35</sup>

Another fairly common compositional device utilizing microtones in the trumpet's repertoire is the quarter tone trill. In Example 48, the notated trill on g' is easy to perform, in part, due to the indicated alternate fingering.

Example 48. Wayne Gorder, 1 Point 2, p.2.



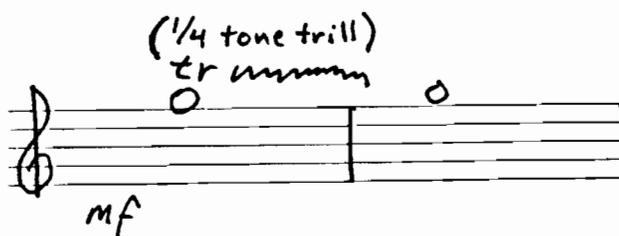
<sup>33</sup>Edwin Harkins, "Aspects of Kryl- a Trumpet Piece", International Trumpet Guild Journal, (Oct., 1980), p.23.

<sup>34</sup>Ibid., p.24.

<sup>35</sup>Ibid.

A similar quarter tone trill, illustrated in Example 49, is problematic due to the composer's omission of a preferred fingering.

Example 49. Space is a Diamond, p.2.

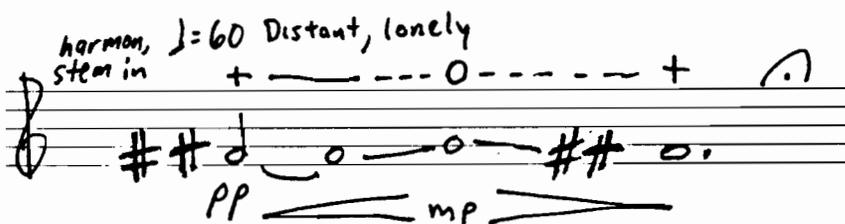


In the above example, the performer has a choice between "lipping" the trill or employing the alternate fingering. The two techniques are quite dissimilar in sound, as well as in execution (the fingered trill is much easier). To avoid this ambiguity, the composer should have indicated which technique to use in order to perform the trill.

The production of microtones by "lipping" is very difficult to perform consistently. Most composers realize this problem and include specialized notation as well as detailed performance notes explaining the reading and playing of the passages in question. A commonly used notational device is the altered accidental, such as the 3/4 sharp sign in Example 46. In Example 50, a variation of this applicable to a "lipped" microtone is illustrated by the opening note of

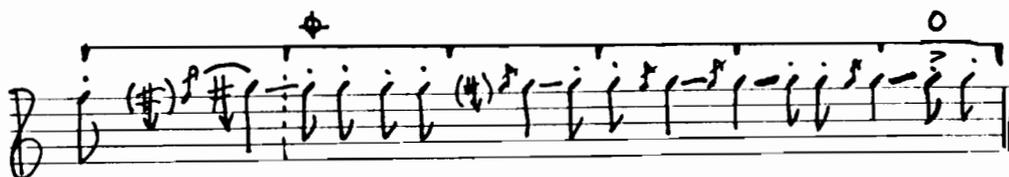
Tichelli's The First Voice, an  $f'$   $3/4$  sharp to be performed by "lipping an open  $g'$  down a quarter tone".<sup>36</sup>

Example 50. The First Voice, p. 1.



Accidentals are also altered by the addition of vertical arrows indicating the direction of microtonal variation. In Example 51, the arrows indicate that the notes should be read and performed as  $f''$   $1/4$  sharp and  $g''$   $1/4$  sharp.<sup>37</sup> It should be noted that the performance notes do not include specifications as to the method of producing these microtones; however, contextual clues from the piece strongly suggest that they should be "lipped."

Example 51. Samuel Pellman, Trump-it, p.7.



<sup>36</sup>Frank Tichelli, The First Voice, p. ii.

<sup>37</sup>Samuel Pellman, Trump-it, p. 2.

Another example using altered accidentals is found in Georges Couroupos' Hippos, where the quarter tones are arrived at by "lipped" glissandi from the nearest upper neighboring tone. The note is obtained by fingering the first note and "lipping" downward without changing valves for the second.<sup>38</sup>

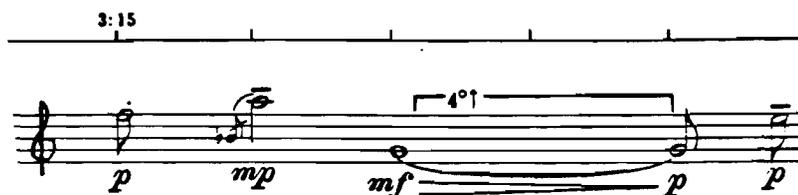
Example 52. Couroupos, Hippos, p.1.

The image shows three staves of musical notation. The first staff is in treble clef and contains a single note with a glissandi marking 'gl' above it and a dynamic marking 'mp (sans timbre)' below it. The second staff is in treble clef and contains a sequence of notes with a dynamic marking 'mf' above it. The third staff is in treble clef and contains a sequence of notes with dynamic markings 'cresc.' and 'mf' below it.

Examples 50 ,51 and 52 all demonstrate "lipped" microtones that are approached from the nearest neighbor, either normally or by glissandi, allowing the performer some leeway in intonation as the correct pitch is reached. These are by far the easiest type of "lipped" microtones to perform, in contrast to that found in the following example. The markings above the  $g'$  stipulate a  $g' 1/4$  sharp, which is to be "lipped."

<sup>38</sup>Georges Couroupos, Hippos, (Paris: Editions Rideau Rouge, 1973), p.i.

Example 53. David Ernst, *Exit*, p.2.



The difficulty of accurately pinpointing the g' 1/4 sharp when approached from a ninth above is acute, requiring a good deal of experimentation during practice to perfect. This demonstrates once again that producing microtones by "lipping" is very difficult to perform consistently, the most consistent way being through the use of alternate fingerings with or without the extension of the first and/or third valve slides. This performance technique depends on the trumpet player's knowledge of the resultant microtones of all the possible normal and alternate valve combinations.<sup>39</sup> While this technique makes for better performance, it also demands an extraordinary awareness from the trumpet player, as well as large blocks of preparation time. The chart found on the following page illustrates the microtonal placement of all possible trumpet fingerings and is included to aid the performer in the consistent production of microtones.

<sup>39</sup>Zack D. Browning, "Trumpet Techniques in the Performance of Microtones", p. 7.

Chart 3. Zack D. Browning, "Trumpet Techniques in the Performance of Microtones", International Trumpet Guild Newsletter, pp. 7-8.

Microtonal Placement of Possible Trumpet Fingerings

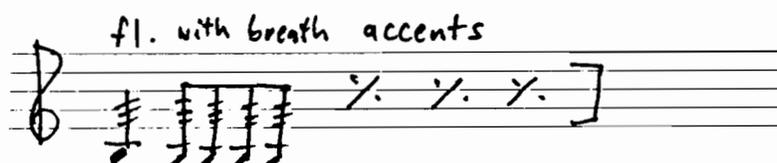
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(0)

The chart displays eight staves of music, each representing a different trumpet note. The notes are arranged in ascending order from bottom to top. The first staff includes a legend: 'o open' and '• closed (down)'. The chart shows various fingerings (represented by dots) and their corresponding microtonal positions (represented by notes on a staff) for different trumpet notes. The notes are arranged in ascending order from bottom to top across the staves.

## G. Extension of Traditional Effects

A variety of traditional trumpet techniques have been extended by composers to achieve novel musical effects. Many times these extensions call for the combination of two or more somewhat standard techniques, such as fluttertonguing with breath accents:

Example 54. Basil Chapman, Impressions for Trumpet and Tape, p. 3.



Or a "tongued tremolo" (produced by soft, rapid repeated tonguing of the indicated pitch):

Example 55. Whittenberg, Polyphony for C Trumpet, p.1



These are very simple combinations of techniques and are easily produced. More difficult is the next example, which calls for the trumpet player to play the indicated pitches with no valve change, requiring the player to "lip" the given pitches using a non-corresponding valve combination. In Example 56, the second valve is used to produce all of the pitches in the passage. This results in microtone-like glissandi between the pitches and is very difficult to perform consistently.

Example 56. Wayne Gorder, 1 Point 2, p.2.

Pedal tone production is another traditional technique which all trumpet players should be familiar with. The following is an example of normal pedal tones, notated in the bass clef.

Example 57. Gorder, 1 Point 2, p.1.

Less normal is this example of a pedal tone played with the second and third valves half depressed:

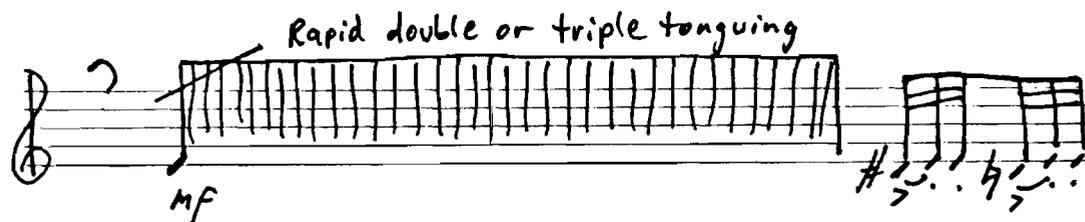
Example 58. Kryl, p.8.

Obviously, it will be very difficult for a listener to distinguish the pitch of this note, but in context it functions as a musical "comma," and works quite well. An extension of this idea is illustrated in Example 59, which calls for the performance of pedal tones with indefinite pitches (as indicated by the "X" noteheads), producing an almost percussive effect.

Example 59. 1 Point 2, p.1.

Another type of quasi-percussive effect calls for extremely rapid, unmeasured double or triple tonguing:

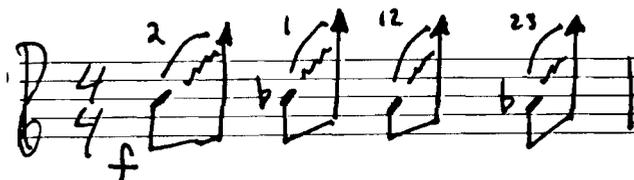
Example 60. Three Pictures of Satan, p.10.



In the preceding example, the rapidly repeated notes (which function as a recurring motif throughout the piece) occur on specific pitches and the effectiveness of the passage is determined (or limited) by the trumpet player's tonguing technique.

Another technique that relies on the trumpet player's innate abilities calls for pitches to be played "as high as possible." In the following two examples, an upward arrow is the notational device used. Example 61 includes the exact fingerings of the pitches in question; Example 62 does not, and leaves the matter up to the performer.

Example 61. Smith, ...to seek the center of quiet, p.3.



Example 62. Kraft, Encounters III, p. 12.



Strict coordination of complex rhythmic events are extremely difficult extended techniques that require a great amount of rehearsal time. In Example 63, the coordination between the trumpet and the bongos is notated in the solo part and is very difficult to achieve, especially at the given tempo. If mastered, however, it is very effective.

Example 63. Edgar Cosma, Concerto, p.4.

a *Vite (♩ = 138) quasi una cadenza*  
 TRP   
*p*  
 4 BONGOS  
 PER II   
*tempo immuable*

All of the techniques in this section can readily be learned and performed by the trumpet player through the simple combination of familiar skills. The final technique in this section, improvisation, does not fall into the above category; in fact, the extension of "ad lib" and improvised parts is perhaps the area of least familiarity for most trumpet players. Not all of these examples are difficult:

Example 64. Cosma, Concerto, p.3.

mf avec lyrisme et verve,  
comme une improvisation de jazz

Example 64 illustrates a notated "ad lib" on a repeated pitch with diminishing dynamic and speed values. This is an effective way to notate this simple technique for trumpet while still allowing the performer some freedom with the passage. It certainly is not difficult to decipher the composer's intentions for performance. Example 65 is similarly easy to interpret:

Example 65. Kraft, Encounters III, p. 9.

1.  
2. staccato e trem.  $2 \lt \begin{matrix} 2 \\ 3 \end{matrix}$

*f* rapid random stacc. *Crotale* *p*

*f* *p*

1. Stacc.-trem. = Combination of rapid free fragments and fingered tremolo.  
2. On B<sup>b</sup> Trumpet:  $1 \lt \begin{matrix} 1 \\ 3 \end{matrix}$

The top staff calls for the trumpet to produce a combination of rapid staccato free fragments and a fingered tremolo (with attendant fingerings), while accompanied by cymbals similarly improvising on the lower staff. Musically, it leads very well to the following measure and should be prepared with that in mind. A longer and freer improvisatory passage is found in Example 66, taken from the same piece, utilizing a unique notation. Each "?" symbolizes an improvised passage to be taken from "previous or original material."<sup>40</sup> The four passages are accompanied by drum kicks on the lower staff, which should be fit into the context of the trumpet player's improvised solo.

<sup>40</sup>William Kraft, Encounters III (Los Angeles: Avant Music, 1973) p.12.

Example 66. Encounters III, p.12.

The image shows a musical score for Example 66, 'Encounters III', p.12. It consists of two staves: a treble clef staff and a bass clef staff. The treble staff has three hand-drawn shapes labeled I, II, and III, each containing a question mark. A wavy line above the first measure indicates a tremolo. The bass staff has several measures with dynamic markings 'fz' and 'f'. Annotations include 'Intrude on trpt.' with a bracket over a measure and 'Closed roll' with a bracket over a measure.

"Controlled" improvisation is taken to an extreme in William Hellerman's Passages 13--The Fire for trumpet and tape. Example 67, found on the following page, is taken directly from the score. The instructions are located inside the circle, and the trumpet player improvises by choosing a boxed pattern to play in the spaces between the recited passages on the tape. The reader will note the many extended techniques included in the boxed passages.

This portion of Passages 13--The Fire will not really sound improvised in the context of the rest of the piece, even though the trumpet player must make creative decisions in performance. This is an excellent example of just how far "traditional" effects can be pushed within the repertoire of the trumpet.

Tape | [3:17] (high reg mod sound on tape continues) | [3:48] | [3:57] | [3:59.5] |  
 1 featherd, furd, leafy 2 boundaries where 3 even the Furies are birds 4

Tape | [4:04] (mid-range flutter sound begins) | [4:09] | [4:18] |  
 5 and blur 6 in higher harmonies Eumenides 7 whose animals, entering a char'd field

Tape | [4:20] | [4:24.5] | [4:42] |  
 7 in the light of his vision, a stillness, 8 have their dreamy glades and postures. 9 The flames,

Tape | [4:49] | [4:53] | [5:02] |  
 10 the smoke, 11 the curious 12 sharp focus in a glow 13 light → R.10

**A** PLUNGER

**H** CUP MUTE *very irregular rhythm*

**G** HARMON (plunger extended)

**F** CUP MUTE OUT CUP

**E** PLUNGER

**B** no vibrato  
gradually place SOLO TONE  
p (maintain constant dynamic)

**C** gradually remove SOLO TONE

**D** 1/2 VALVE

THERE ARE 10 SPACES BETWEEN THE RECITED PHRASES ON THE TAPE WHICH ARE WRITTEN ABOVE. THE 8 BOXES LETTERED A THROUGH H ARE TO BE PLAYED DURING THESE SPACES IN THE FOLLOWING MANNER:

1. BEGIN ON ANY BOX.
2. READ IN A CLOCKWISE DIRECTION.
3. DURATIONS ARE TO BE ADJUSTED TO FIT THE VARIOUS LENGTHS OF SPACES.
4. [TEXT] INDICATES WHERE THE RECITED PHRASES ARE TO OCCUR.
5. [TEXT] INDICATES WHERE A RECITED PHRASE CAN OR CANNOT OCCUR. FOR EXAMPLE, BOX A COULD BE PLAYED IN SPACE 2, OR 8 & 9. MUST END WITH BOXES B, E, OR G IN SPACE 9. IF YOU END WITH H, DO NOT PLAY LAST NOTE.
6. PLAY IN AN OBLIGATO STYLE. GO DIRECTLY TO PAGE 10.

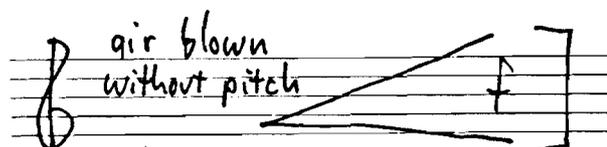
EXAMPLES: BEGIN WITH B, PLAY ONE BOX TO A SPACE. BOXES B, H, D, G REPEATED BEGIN WITH E. FILL 3 SPACES IN A & E FIRST TIME AROUND. 1 IN E SECOND TIME. REPEAT E. END WITH D (ONLY LAST NOTE).

### III. NON-LIP PRODUCED SOUNDS

#### A. Airstream Effects

Many late twentieth century composers have experimented with breath effects that differ from those used to produce normal tones.<sup>41</sup> Many examples of this technique abound in ensemble literature, as well as in the solo trumpet repertoire. The most common effect consists solely of blowing air through the instrument. This is coupled with dynamic variations in the following examples.

Example 68. Basil Chapman, Impressions for Solo trumpet and Tape, p.1.



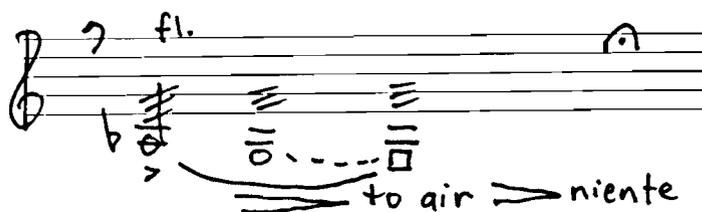
Example 69. David Ernst, Exit, for trumpet and tape recorder, p.1.



<sup>41</sup>Gardner Read, Contemporary Instrumental Techniques (New York: Schirmer, 1976), p. 141.

The combination of airstream and fluttertonguing produces another unique sound. This is most easily performed by widening the aperture of the trumpet embouchure and blowing air through the instrument while fluttertonguing. Example 70 illustrates the use of a square notehead to indicate this technique, while Example 71 shows a diamond shaped notehead.

Example 70. Tichelli, The First Voice, p.7.

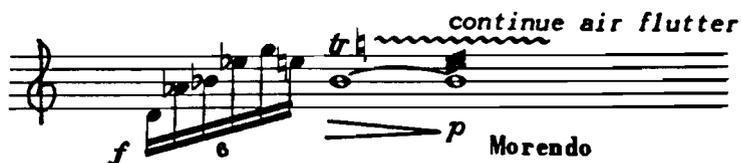


Example 71. Couroupos, Hippos, p.1.



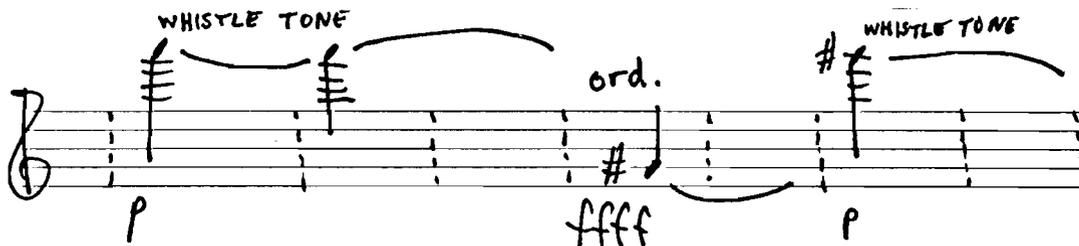
A related technique is found in Example 72, where a trill's tone is transformed into a continuous air flutter to complete the "morendo" passage:

Example 72. Encounters III, p.4.



A "hybrid" airstream technique called a whistle tone is found in Space is a Diamond. This is a thin whistle produced by whistling the desired pitch through the teeth into the trumpet without forming an embouchure and with only the slightest pressure against the mouthpiece. The whistle tones only occur softly on extreme high notes.<sup>42</sup>

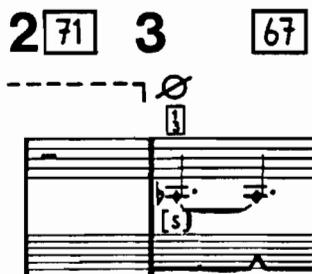
Example 73. Space is a Diamond, p.11.



<sup>42</sup>Note that this excerpt is different from Example 25 on page 21.

Another "hybrid" airstream technique is "the noise" found in Stockhausen's Eingang und Formel. It is notated by a "[s]" below the note, which instructs the trumpet player to blow the consonant "s" sound into the mouthpiece "without making the instrument speak."<sup>43</sup> On the trumpet, strangely enough, these noises sound a half step higher than the normal notes. For this reason, they have to be fingered a half step higher. These fingerings are shown in a box above the note.<sup>44</sup>

Example 74. Stockhausen, Eingang und Formel, p.2.



These "hybrid" airstream techniques are both relatively easy to perform and require little time to learn (especially, in the case of the whistle tone, if one already knows how to whistle).

<sup>43</sup>Stockhausen, Eingang und Formel, p. ii.

<sup>44</sup>Ibid.

## B. Percussive Effects

There is a virtually unlimited number of possible percussive sounds that can be produced by striking the trumpet with various items in various ways. Two of the most common are found in the following example:

Example 75. Ernst, Exit, p. 1.

0:35 Bb Tpt. strike bell w/ mouthpiece *mp* 0:40

0:45 strike bell w/ finger *p* 0:50 *pp* replace mouthpiece

While the above example may seem trivial and beyond the realm of "serious" music, other percussive techniques are found in the repertoire that are much more musical. A simple example, taken from Hippos, is the valve click, performed by slightly loosening two valves and alternating between them without blowing.

Example 76. Hippos, p. 1.

*dévisser légèrement deux pistons*

20 *loosen the two pistons slightly*

2H

*morendo pp*

An even more extended version of this technique occurs in *Kryl*. The upper staff includes square noteheads indicating which pitches are to be fingered, but not sounded, producing a percussive, rhythmic accompaniment for the lower staff which is both sung and played.

Example 77. *Kryl*, p.3.

The image displays two systems of musical notation. Each system consists of two staves. In the first system, the upper staff features square noteheads on a treble clef staff, while the lower staff contains a melody on a bass clef staff. A dynamic marking of *(MP)* is placed below the lower staff. The second system follows a similar structure, with square noteheads on the upper staff and a melody on the lower staff, accompanied by a dynamic marking of *(MP+)*.

A commonly used extended percussive technique is the palm tone. The palm tone is produced by striking the mouthpiece (still attached to the trumpet) with the palm of the hand and fingering the given pitches, resulting in a unique "popping" sound.



completely remedied; therefore, it is up to composers to notate palm tones accordingly, with this limitation in mind.

The tongue can also be used to produce percussive sounds on the trumpet. A unique device employed by Stockhausen is called the "tongue click," and is produced by clicking into the mouthpiece with the sound emanating from the bell of the instrument. In addition, the vowel coloring of the oral cavity for the click is indicated by the phonetic symbol underneath. The result is a click that is extremely specific. It is also interesting to note that this click is not notated with a definite pitch in mind but is left indefinite.

Example 80. Stockhausen, Eingang und Formel. p.2.

75,5

genau  
mit click

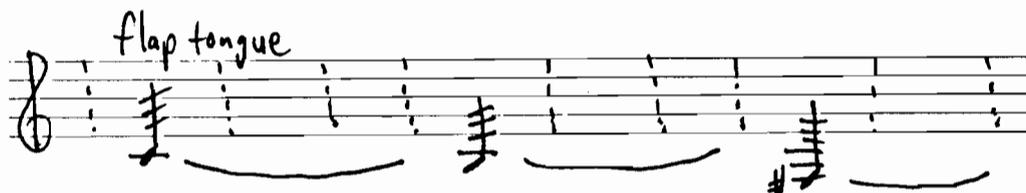
∅

λ

[ɔ]

The last technique to be discussed in this section is obviously related to the tongue click, the flap tongue. The flap tongue technique is produced with a wide embouchure, sending air through the trumpet, and either a) thrusting the tongue vigorously into the mouthpiece, creating a vacuum effect,<sup>45</sup> or b) thrusting the tongue forward and upward against the teeth and lip, thereby stopping the air and creating a percussive sound.<sup>46</sup> The sound is similar to that of the palm tone, except that it is usually amplified due to some sort of air support existing behind the tongue as it attacks the notes. In each case the tongue attacks more than once per note, creating a percussive stream. Example 81 is a rather simplistic excerpt:

Example 81. Space is a Diamond, p.5.



<sup>45</sup>Tichelli, The First Voice, p.ii.

<sup>46</sup>Dlugoszewski, Space is a Diamond, p. ii.



As with the palm tone, producing the specifically notated pitches while flap tonguing is very difficult. Flap tonguing is made somewhat easier, however, due to the fact that the tongue's position in the oral cavity can help to delineate the register of the desired pitches. But in the end, totally accurate pitch production can not realistically happen. It should be remembered that palm tones and flap tonguing are ultimately percussive techniques, and any "pitched" sounds that are notated for the performer are unlikely to be understood that way by an audience.

### C. Multiphonics

Of all the newer techniques available to wind instruments, none figure more prominently in the avant-garde than multiphonics. The result of certain combinations of embouchure, unusual fingerings and auxiliary keys, multiphonics create sounds that extend from a simple interval of two pitches to complex multi-voiced chords.<sup>47</sup> The concept of multiphonics also includes sung, spoken, and/or hummed pitches (hereafter referred to as vocal multiphonics) superimposed on blown notes, thus creating a simple two-voiced polyphony with two distinct timbres.<sup>48</sup> Because of the basic construction and sound producing principles of the trumpet, it is unable to create the more complex sonorities of the former multiphonic technique (which is generally reserved for the woodwind instruments). Therefore, it is no surprise that the latter technique of vocal multiphonics is the only one found in this survey of solo trumpet literature.

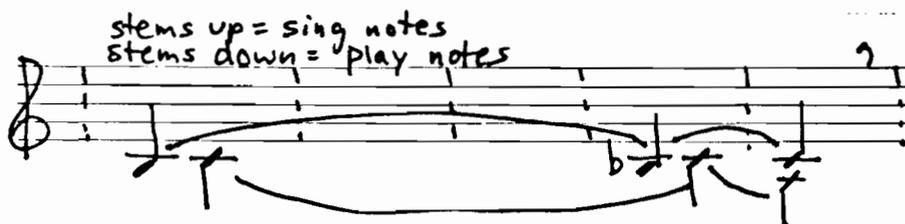
Vocal multiphonics always include two sets of notes to be performed--those with the trumpet and those with the voice. On the following page, Example 84 illustrates perhaps the easiest form of notation for the trumpet player to read.

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<sup>47</sup>Read, p. 150.

<sup>48</sup>Ibid., p.151.

Example 84. Space is a Diamond, p.11.

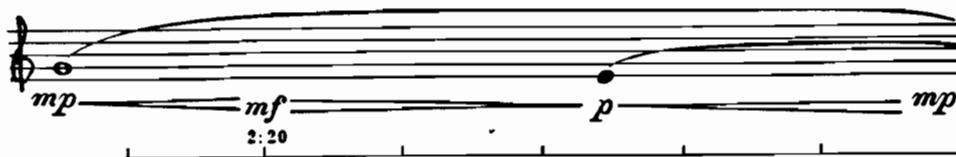


Example 85 illustrates a line notation to indicate the pitches to be sustained, and moved through, with the voice.

Example 85. Pellman, Trump-it, p.4.

Hummed multiphonics are produced similarly to sung ones, and are perhaps easier to perform due to their vibrational "feel" to the trumpet player. Example 86 demonstrates a simple two note chord, with the trumpet sustaining a g' while the e' a third lower is hummed:

Example 86. David Ernst, Exit, p.1.



Example 87 is a little more difficult, illustrating a hummed chromatic embellishment (notated with diamond shaped noteheads) added to the trumpet's pianissimo sustained a' flat:

Example 87. Gorder, 1 Point 2, p.2.



Composers sometimes combine multiphonics with other techniques. This significantly increases the complexity of the work and the difficulty of the performance. Examples 88 and 89 on the following page illustrate this point quite well.

Example 88. Ernst, Exit, p.2.

Example 89. The First Voice, p.1.

Both of these techniques, the addition of fluttertonguing to the hummed multiphonic in Example 88, as well as the addition of the Harmon mute "open-closed-open" technique found in Example 89, will affect the way the trumpet player hears his own humming. The altered trumpet timbre will make the hummed pitches much more difficult to perform.

The aural demand on the trumpet player is acute when attempting to sing (or hum) and play at the same time, and is perhaps the most difficult technique surveyed in these pages. Much practice time is required to perfect the technique of singing at a different pitch level from the trumpet. When learning this technique, the player should first attempt to sing at the same pitch level as the trumpet on long tones, experimenting with the effects various vocal dynamic levels have on the trumpet's tone. A steady tone is the goal, even though the tone quality will undoubtedly suffer at first. Once the ability to sing and play in unison is achieved, the player should attempt to sing scalar and arpeggiated lines derived from the fundamental long tone. Example 90 illustrates this.

Example 90. Multiphonic Exercises<sup>49</sup> (top line trumpet, bottom line voice).

The image shows two systems of musical notation. Each system consists of two staves: a top staff for trumpet and a bottom staff for voice. In the first system, the trumpet staff has a single long note with a fermata, and the voice staff has a scalar line of eighth notes. In the second system, the trumpet staff has a single long note with a fermata, and the voice staff has a scalar line of eighth notes.

<sup>49</sup>composed by the author.

These exercises make it easier for the performer to hear and produce vocal pitches that are not in unison with the trumpet. When they are mastered, it becomes possible for the player to prepare almost any manner of vocal multiphonic in the literature.

There is one further problem with the notation of vocal multiphonics. To be realistic, two vocal pitches ought to be indicated, one for a high (female) voice and one at the lower octave for a low (male) voice.<sup>50</sup>

So far in this survey, all of the multiphonic techniques have involved the voice and the normal trumpet tone together. In Kryl, six different types of vocal techniques are introduced. The following chart summarizes the various uses of the voice in this piece, in regard to notation, range, subjective indication of voice quality, direction of air, and voice/instrument interface. In these techniques, the lips are on the mouthpiece, but whether the corners are open, allowing normal vocal sounds due to the trumpet bypass, or closed, producing filtered vocal sounds, depends on the technique used.<sup>51</sup> It should be noted that not all of these techniques produce multiphonics.

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<sup>50</sup>Read, p.152.

<sup>51</sup>Harkins, "Aspects of Kryl", p.

"Technique" Label	Vocal Notation	Range	Vocal Quality	Air Direction	Voice/Trumpet Interface
voice alone		f' - g''	open	exhale	through trumpet
voice/trumpet alternating		f' - g''	open	exhale	by-pass trumpet
voice/trumpet simultaneously		f' - g''	tense	exhale	through trumpet
glottal fry, ingressive		as low as possible	open to tense	inhale	through to bypass
scream		high	tense	exhale	by-pass trumpet
loud breath		---	open	inhale	by-pass trumpet

Chart 4. Edwin Harkins, "Aspects of KRYL", p.26.

The techniques that concern us the most, of course, are those producing multiphonics. One type of multiphonic combines the voice, through the trumpet, with a steady sixteenth note pulse maintained by valve noise as the written notes are fingered. In the following example, the notes with square heads are to be fingered only; the notes with the "X" heads are to be sung; and the "normal" note is to be played normally. Note that the "normal" and "X" notes are not performed concurrently.

Example 91. Kryl, p.3.

The musical score consists of two staves. The upper staff is the right hand, playing a steady sixteenth-note pulse. The lower staff is the left hand, playing a melodic line. The score is divided into two measures by a vertical bar line. In the first measure, the right hand plays a continuous sixteenth-note pattern. The left hand plays a sequence of notes, including a note with a square head, a note with an 'X' head, and a normal note. In the second measure, the right hand continues the sixteenth-note pulse. The left hand plays a sequence of notes, including a note with a square head, a note with an 'X' head, and a normal note. Dynamic markings '(MP+)' are placed below the left hand in both measures. Accents are placed above the notes with square heads and 'X' heads in both measures.

The same notational system is used in Example 92; however, this time all three techniques are occurring simultaneously.

Example 92. Kryl, p.7.

The image shows a musical score for a piano. The top staff is a treble clef staff with six groups of sixteenth-note patterns. Each group is labeled with the sequence '2323' above it. The bottom staff is a bass clef staff with six vertical stems, each with an asterisk above it, indicating multiphonics. Below the bass clef staff, there are two handwritten notes: 'b0' and 'b0' with a bar over the zero.

Needless to say, much time is needed to prepare a piece like Kryl, or for that matter, any piece that includes multiphonics. Some may argue that the musical effects found in these pieces are not worth the time it takes to prepare them. I argue that the musical effects of these multiphonics are difficult to judge due to the variations that undoubtedly will occur from performer to performer. In general, the technique introduces a polyphonic texture in a striking way, and can not be ignored by an audience. When viewed and performed in this way, these techniques are musically very effective.

#### D. Dramatic Effects

For thoroughness, this survey would not be complete without discussing the dramatic effects included in some of these works. A subtle type of drama unfolds in Kryl, due to the composer's use of the voice. The piece includes a quick alternation between normally played notes and screams, loud breaths, sung notes, and "glottal fries"<sup>52</sup> (see Chart 4). As the piece progresses, these techniques help propel the listener toward the logical ending of the piece. Less subtle are the instructions for Three Pictures of Satan for trumpet and organ by Jere Hutcheson. The trumpet player is requested to don a long black cape for the performance. If the players wish to increase the melodramatic nature of the work, both players may wear black hoods. Also, several toy trumpets are required for a humorous toy horn duet in the middle of the second movement, entitled "Satan's Holiday." This comical effect is not subtle and would not be missed by the audience.

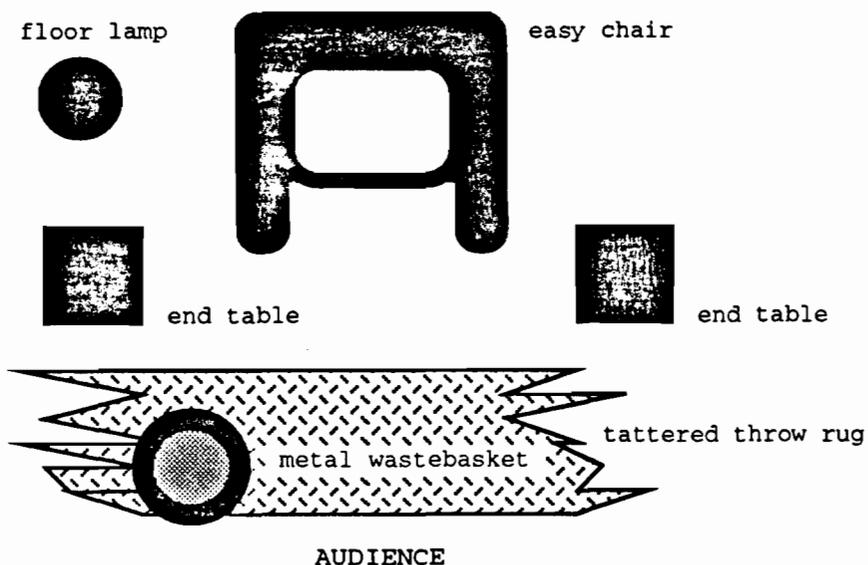
Much more involved than Three Pictures of Satan is Samuel Pellman's Trump-it. Accessories called for in the performance notes are: a derby, Solo tone mute, Harmon mute, Tom Crown metal straight mute, plunger, medium-sized metal wastebasket filled with two inches of warm water, 5-10 pounds of dry ice, a beat up armchair, two end tables, one tattered

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<sup>52</sup>Harkins, "Aspects of Kryl", p.26.

throw rug, one floor lamp, and one rubber chicken. The staging of this piece is given as a floor plan and is reproduced below.

Example 93. Trump-it, p.2.



The performer begins by adding some dry ice to the water in the wastebasket, then plays the "Intrada." Throughout the piece, the trumpet player is to continue adding dry ice as needed. In the final "Scherzo," the performer is instructed to bend down with the bell in the wastebasket, then sit up, assume a puzzled look, pull the rubber chicken out of the wastebasket, and then throw it offstage.

Although this may sound like a humorous event, the composer includes this precautionary advice in his performance notes for the "Scherzo":

In some places in this country a few people in the audience may think this movement is funny. These are the same people who would belch loudly at the dinner table and then point to the person sitting next to them. This movement is not at all funny and the performer should take care lest he give the audience any particular impression that it is.<sup>53</sup>

Despite this precautionary note, I find it difficult to envision a performance of the "Scherzo" movement of this work that would be devoid of humor. After all, a rubber chicken is still a rubber chicken.

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<sup>53</sup>Samuel Pellman, Trump-it (New York: Edition Delusive Phantom, 1982), p.8.

#### IV. CONCLUSIONS

It is interesting to observe that despite the International Conference on New Music Notation in 1974, at which an attempt was made to standardize the notation of extended techniques, numerous different methods of notation still persist and vary from composer to composer. Flap tonguing, palm tones, mute changes and alternations, half valving, and even pedal tones are all notated in a myriad of non-standardized ways. It certainly would be easier for the trumpet player if all notation of extended techniques were standardized, but that seems to be a highly unlikely possibility.

Of the pieces surveyed in this project, those that included copious performance notes (explaining not only the notational symbols but the production of the techniques they represent) made the music much easier to understand and decipher. The compositions of Robert Erickson, Gerhard Muller-Hornbach, and Karlheinz Stockhausen are excellent examples that provide these detailed types of performance notes and should serve as models for future composers of extended trumpet techniques. In contrast, those pieces that did not include enough instructions about these techniques left questions as to their composers' intentions, almost

always because of the ambiguities arising from deciphering and interpreting non-standard notation. In this latter case, it becomes the trumpet player's task to decipher the composer's intent for every notated extended technique in a piece. Obviously, this leaves the piece open to a wide variety of possible interpretations and is not conducive to uniform performances from one soloist to another. Therefore, the choice of notation and its lucid and detailed explanation should be primary considerations for a composer of a piece including extended techniques.

Once these extended techniques are identified, the obvious questions as to their practicality must be raised. Interestingly enough, almost all of the extended techniques surveyed in these pages are quite practical (even the most difficult multiphonics), given the proper amount of practice time by the trumpet player. They are all quite possible to reproduce if the techniques occur in isolation. This is truly the crux of the matter. When two or more of these techniques are combined in a single passage, the level of complexity rises exponentially, and the practicality is diminished as well. A passage such as that found in Example 94 (on the following page) includes at least four extended techniques, and may require hours to perfect (if "perfectible" at all).

Example 94. The First Voice, p.1.

Regarding musicality, almost all of the techniques surveyed in these pages may be considered musical in the context of the pieces from which they come. Without exception, any extended technique that may be regarded as unmusical is composed with that purpose in mind (see Example 23 on page 20, for instance). It is up to the trumpet player to understand the musical application of all of these extended techniques and relate them to the audience in performance. Certainly, individual listeners in an audience may prefer more traditional sounds in their concert experience. Nevertheless, the employment of extended techniques does provide the listener with a musical experience that can be interpreted and enjoyed, if the listener chooses to accept the composer's and performer's medium.

Obviously, then, trumpet players must learn competency and fluency with these extended techniques to translate the composer's intentions into meaningful music. This requires a determined investment of time and effort but is altogether necessary to insure a quality performance. Hopefully, this survey will lead to a greater understanding of these extended trumpet techniques and help trumpet players to increase their skills in preparing and performing them. The more adept the player, the better the performance.

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## C. SELECTED DISCOGRAPHY

The following recordings are listed here as potential sources of research (and enjoyment) for performers interested in contemporary music in the trumpet's repertoire.

## COMPACT DISCS

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Thomas Stevens, trumpet. Reynolds: Signals; Kraft: Encounters III; Chou Wen-chung: Soliloquy of a Bhiksuni; Henderson: Variation Movements; Revueltas: Two Little Serious Pieces; Campo: Times; Kupferman: The Fires of Prometheus. Crystal Records, CD667.

## RECORDS (LP'S)

Michael Chunn, trumpet. Bozza: Rustiques; Jean Maire: Coq et Frelon; Bitsch: Quatre Variations; Casterede: Sonatine; Maury: Premier Solo de Concours; Hartman: Facilita. Crystal Records, S662.

Ned Gardner, trumpet. Jolivet: Air de Bravoure; Enesco: Legend; Semier Collery: Evocation et Scerzetto; Sulpizi: Suite Trovadorica; Chardon: Sonata. Crystal Records, S369.

Mario Guarneri, trumpet. Hindemith: Concerto for trumpet and Bassoon; Wolpe: Piece for Trumpet and Seven Instruments. Crystal Records, S352.

David Hickman, trumpet. Kent Kennan: Sonata; Mendez: Scherzo; Dello Joio: Sonata; Turrin: Caprice. Crystal Records, S368.

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## VI. APPENDIX

### PERFORMANCE NOTES FOR YXKLYX

Yxklyx was composed by the author as an etude for the study and performance of extended techniques. The more obscure techniques are set off in the manuscript by a number followed by a parenthese. In order, these are:

- 1.)  $\ominus$  This symbol means to half-depress the indicated valve combination. The resulting pitch should match what is notated.
- 2.) "A.R.A." means "audibly release air", not necessarily in strict tempo, but at the performer's discretion. This is later indicated in the piece by a squiggly line.
- 3.) The trill should be done by trilling the indicated valve (which is already at half position) down another quarter of the way.
- 4.) The notes that are written for the voice are in the key of B-flat, so it is in unison with the trumpet.
- 5.) Although the indicated pitch should be fingered, other pitches will result due to the missing valve slide.
- 6.) These are third valve "clicks". The upper click is created by the slide being yanked in; the lower click by the slide being pushed out.

# YXRLYX

**I. OPENING**

$\text{♩} = 60$

1.)  $\theta 123$

2.) A.R.A.

3.)  $\theta 123$  tr 1<sup>st</sup> valve

4.) SING:

*p*

$\theta 123$  tr 1<sup>st</sup> valve

*mp*

*simile*

*mf*

*mp*

*mf*

*f*

*mp*

*sfz*

*mf*

*f*

Handwritten musical score for the first system. The top staff is in 4/4 time, starting with a common time signature 'C' in a box. It contains a whole note with a slur above it labeled '0123' and a dynamic marking 'mf'. The bottom staff is also in 4/4 time, starting with a dynamic marking 'f' and 'cres.' followed by a series of eighth notes. A double bar line is present. The second staff is in 2/4 time, starting with a dynamic marking 'f' and a whole note with a slur above it labeled '0123'. The third staff is in 2/4 time, starting with a dynamic marking 'ff' and a series of eighth notes. A double bar line is present. To the right of the second and third staves, the text 'REMOVE 2ND VALVE SLIDE' is written vertically.

## II. ANDANTE

Handwritten musical score for the second system, titled 'II. ANDANTE'. The tempo marking is '♩. = 80'. The first staff is in 6/8 time, starting with a dynamic marking 'mf' and containing eighth notes with slurs and accents, including a triplet marked '3'. The second staff continues the melody with a dynamic marking '(2<sup>nd</sup> x mp)'. The third staff features a series of eighth notes with a dynamic marking 'mf' and a slur above it. The fourth staff contains a series of eighth notes with a dynamic marking 'mf' and a slur above it. The fifth staff contains a series of eighth notes with a dynamic marking 'mf' and a slur above it.

Handwritten musical score for a piece in 6/8 time. The score consists of several systems of staves:

- System 1:** Treble clef, 6/8 time signature. Notes include flats and a triplet of flats. Dynamics include *sfz p* and *mp*. Performance markings include accents (>), slurs, and a fermata.
- System 2:** Treble clef. Features a triplet of flats (23) and a sixteenth-note triplet (6.). Dynamics include *sfz p* and *mp*. Performance markings include slurs and a fermata.
- System 3:** Treble clef. Starts with a square box containing a diamond and the word "stacc.". Includes a four-measure rest (4) and a sixteenth-note triplet (4). Dynamics include *p* and *mf*. Performance markings include slurs and a fermata.
- System 4:** Treble clef. Notes include flats and a sharp. Dynamics include *p* and *mp*. Performance markings include slurs and a fermata.
- System 5:** Treble clef. Notes include flats and a sharp. Dynamics include *sfz p* and *mf*. Performance markings include slurs and a fermata.

Handwritten musical notation on a grand staff (treble and bass clefs). The key signature has one flat (B-flat). The time signature is 6/8. The music starts with a dynamic marking of *sfz* and *f*. There are fingerings *23* and *7* above notes. A box labeled **E** is above a note. The notation includes various note values and slurs.

Handwritten musical notation on a grand staff. It includes a 4-measure phrase with notes *b7* and *#7*. Above the staff, it says "to H. mute" and "4". Below the staff, it says "(stem removed)" and *mp.*. A box labeled **F** is above a note. Dynamics *ff* and *mp.* are present.

Handwritten musical notation on a grand staff. It includes a 4-measure phrase with notes *b7* and *#7*. Above the staff, it says "Cantabile". Below the staff, it says "0123". A box labeled **F** is above a note.

Handwritten musical notation on a grand staff. It includes a 4-measure phrase with notes *b7* and *#7*. Above the staff, it says "3" and "12". Below the staff, it says "4".

Handwritten musical notation on a grand staff. It includes a 4-measure phrase with notes *b7* and *#7*. Above the staff, it says "remove mute" and a box labeled **G**. Below the staff, it says "3" and "replace valve slide".

Handwritten musical notation on a grand staff. It includes a 4-measure phrase with notes *b7* and *#7*. Above the staff, it says "3".

Handwritten musical notation on a grand staff. It includes a 4-measure phrase with notes *b7* and *#7*. Above the staff, it says "0123", "03", "03", and "03". Below the staff, it says "SING:" and "b0".

Handwritten musical notation on a grand staff. It includes a 4-measure phrase with notes *b7* and *#7*. Above the staff, it says "SING:" and "b0".