

**THE PASSION OF
- ALAN TURING -**

**THE GAY MATHEMATICIAN WHO
SAVED 14 MILLION LIVES**

JORDAN ALEXANDER KEY
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“THE PASSION OF ALAN TURING”

FOR

WOODWIND TRIO
Oboe – Clarinet in B-flat - Bassoon

Written for
~ TRIO DE BOIS ~
Summer, 2020

1. The Young Love of Christopher Morcom (c. 4'00")	1
2. “Profs Book” and the Enigma Machine (c. 4'50")	11
3. The “Bombe” that Broke Enigma (c. 9'10")	25
4. We Give Thanks to the One that Saved 14 Million Lives (c. 4'20")	57

Program Note:

At the age of 13 in 1926, Alan Turing (1912 – 1954) began high school at the Sherborne Boarding School in Britain. Turing's love for knowledge and education, even at a young age, was so much that, despite the 1926 General Strike, which effectively shut down the country's railroad systems and prevented Turing from getting to school, Turing was so determined to attend that he rode his bicycle unaccompanied overnight for 60 miles to get to Sherborne and promptly start his education. His passion for learning and discovery would persist for the next and last 28 years of his life.

At Sherborne, Turing formed a significant friendship with his fellow classmate, Christopher Morcom (1911-1930), who is often described as Turning's "first love." This first love - its companionship of the mind, compassion for the spirit, and tragic end - would inform the fervor of Turing's work for the rest of his life. Morcom was the one student at Sherborne with whom Turing felt most himself and could speak freely and equally about his thoughts on mathematics and science, which were prodigious for one so young, having already taught himself advanced mathematics well beyond calculus as well as read and annotated Einstein's Essays on Special and General Relativity before the age of 16. Morcom and Turing spent many of their holidays together and were inseparable. Tragically, Morcom died very suddenly in 1930, having contracted bovine tuberculosis. Turing was 18.

Turing was significantly heartbroken but coped with his grief by working more fastidiously on those studies and projects that he had shared with Morcom. In an archived letter Turing wrote to Morcom's mother:

"I am sure I could not have found anywhere another companion so brilliant and yet so charming and unconceited. I regarded my interest in my work, and in such things as astronomy (to which he introduced me) as something to be shared with him and I think he felt a little the same about me ... I know I must put as much energy if not as much interest into my work as if he were alive, because that is what he would like me to do."

The first movement of this Passion, *The Young Love of Christopher Morcom*, is in memory of this love story: an ebullient, passionate, cerebral, and possibly forbidden physical love that was cut too short but ultimately inspired a life of world changing work from Turing.

In 1936, Turing published his first seminal paper: "On Computable Numbers." In this paper, Turing reformulated Kurt Gödel's 1931 results on the limits of proof and computation, replacing Gödel's universal arithmetic-based formal language with the formal and simple hypothetical devices that became known as "Turing machines," essentially laying the ground work for what would become the modern computer, as recognized by seminal mathematician and computer scientist John von Neumann. To this day, Turing machines are a central object of study in the theory of computation. Turing was 24 years old.

Beginning in September of 1938, Turing worked part-time with the Government Code and Cypher School (GC&CS), the British codebreaking organization. His primary project was to decipher the German NAZI war code machine, called "Enigma."

While at Bletchley Park's Cypher research Lab, Turing had a reputation for eccentricity. He was known to his colleagues as "Prof" and his treatise on Enigma was known as the "Prof's Book." This book of Turing's various attempts to decipher the NAZI code machine's mechanisms, sometimes employing his own base-36 system of numbers, became the central treatise and textbook to ultimately design the device that would significantly help end the Second World War on the European Stage. The second movement, *Prof's Book and the Enigma Machine*, attempts to signify one of Turing's more simple base 36 deciphering algorithms. While the interior perpetual augmentation canon is simply a whimsical representation of the mathematical mind of Turing at work, the outer portions of the movement compress a simple base-36 numerical algorithm to a base-12 pitch and rhythm transformation that slowly changes the opening material from an atonal confusion to a delicate and pristine modal construct.

The machine that Turing was instrumental in designing and which would ultimately crack Enigma was called, "the Bombe." The Bombe, with an enhancement suggested by mathematician Gordon Welchman, became the primary rapid automated tool used decrypt and counter NAZI Enigma-enciphered messages. The machine immeasurably changed the course of the war. Today, Turing is recognized as having played a crucial role in cracking intercepted coded messages that enabled the Allies to defeat the Nazis in many crucial engagements, and in so doing helped win the war for the Allied Powers. Mathematicians, statisticians, historians, and biographers have reasonably estimated that Turing's work shortened the war in Europe by more than two years and saved over 14 million lives on both sides of the conflict. The third movement, *The Bombe that Broke Enigma*, is a musical fantasia that attempts to capture the sounds and processes of trial and error in creating one of the first electronic computers to decipher life-altering wartime messages. There are many starts and stops, changes in speed and texture, builds and decays, steps forwards and steps back, to ultimately arrive at the surprising and triumphant end of cracking the code of Enigma, presaged in the prior movement via the "Enigma Canon."

After the war, Turing's work did not end or diminish in importance. He worked on the first commercial computers in the late 1940s as well as began to tackle the question of artificial intelligence. He returned to one of his old passions, mathematical biology, wherein he outlined in a series of papers the first mathematical basis for biological processes, later incorporated into the study of the human genome and genetics generally, effectively founding a completely new field of mathematics essential to medical research today.

On 23 January 1952, Turing's house was burgled. Turing reported the crime to the police. During the investigation, he acknowledged that he was living with another man, with whom he was having sexual relations. Homosexual acts were criminal offences in the United Kingdom at that time, so, rather than continue the investigation of the burglary, the police arrested Turing and his lover and charged both with "gross indecency," one of Britain's sodomy laws of the time.

The case of *The Queen vs. Turing and Murray* was brought to trial on 31 March 1952. Turing was convicted and given the options of imprisonment or probation, for which he would undergo chemical sterilization and hormonal “therapy” designed to “cure” him of his homosexuality and “overactive” libido. He accepted the option of “therapy” so that he could continue his work on computers, artificial intelligence, and mathematical biology. The chemical injections persisted for the course of one year, rendering Turing impotent and likely severely depressed, given his subsequent suicide following this year of “treatment.”

On 8 June 1954, Turing's housekeeper found him dead at the age of 41; he had died the previous day by cyanide poisoning. When his body was discovered, an apple lay half-eaten beside his bed, and although the apple was not tested for cyanide due to the lackadaisical treatment of his death by authorities, it has been speculated that this was the means by which Turing had consumed the fatal dose. Many biographers now think that Turing was re-enacting the death scene from the Walt Disney film *Snow White and the Seven Dwarfs* (1937), his proclaimed favorite fairy tale.

He was cremated without ceremony and without honors. The man that should have been a national and world hero, the one whose mind saved millions of lives and arguably began our computer age was ignored and forgotten by most for decades due to his homosexuality. It is heartening that in the past decades of the 21st century, Turing is finally being recognized for his work. Through the efforts of many gay and allied politicians, mathematicians, and scientists Turing was given a posthumous pardon for his “crimes” and an official apology from the British government. In September 2016, the British government announced its intention to expand Turing’s retroactive exoneration to other men and women convicted of similar historical indecency offences, in what is now described as the “Alan Turing Law,” which to date has given pardons to over 75,000 other gay and lesbian people adversely effected by the past sodomy laws of the United Kingdom. Thus, with the final movement of this Passion, **We Give Thanks to the One Who Saved 14 Million Lives**, I wish to honor Turing and his work with a moving canon – poetic and cerebral – and recognize that many of us are here today because his work saved so many lives.

Alan Turing was a brilliant mathematician, a war hero, and an admitted homosexual in the 1950s United Kingdom. This placed him squarely amongst the most despised minority of the time: sodomites. Turing’s contributions to end World War II saved millions and possibly tens of millions of lives. He broke the German Enigma Code by reverse engineering the mechanical computer that created it and creating decryption algorithms to apply to it. His contributions to mathematics were far-reaching and included the creation of many active and important fields of mathematics including computer science and mathematical biology. Yet, his life was cut ignominiously short by a small-minded legal system and enforced “cures” for fabricated mental ailments by dangerous, nonsensical pseudoscientific quackery. Such myopic injustice ultimately plunged this genius into a suicidal depression at the very height of his mathematical prowess in his late 30s and early 40s. We can only imagine what else he might have given the world if the world had been more kind to him.

This is the Passion of Alan Turing, savior in the 20th century.

About the Composer:

Jordan Alexander Key (b. 1990) - blind, gay, composer of contemporary and classical music - has studied the intersections of music, art, philosophy, math, and science for all of his adult life, receiving bachelor's degrees in music composition, mathematics, and philosophy from The College of Wooster (2013), a master's degree in music composition from the University of Arizona (2015), as well as his PhD in composition from the University of Florida (2021). His significant recent projects that deal with the intersections of math and music include his Kennedy Center premier of his ballet, *To Say Pi*, as well as his residency at the Harn Museum of Art and the production of music for its various exhibitions including his Black-MIDI dance, "Nachi No Taki." Political and social activism is present in much of his music, which attempts to confront many issues of the present from LBGTQ+ rights, gun violence, as well as atheism and disability awareness and empowerment. Such socially oriented pieces include his octet, "Threnody on the Death of Children;" his sextet, "Verses from the Scroll of Sondering;" his trio, "March for the 12th Hour;" as well as his various collaborations with the Vancouver Queer Arts Festival and Calliope's Call for the premiers of his queer art songs, "God Ourselves," "Last Night I Touched Him," "Dream Season's Done," and "The Doctrine You Desire." His academic research has been featured around the world, most recently in the exhibition of some of his audio-visual projects as part of the Wolfsburg Kunstmuseum's exhibit, "Never Ending Stories: The Loop in Art, Film, Architecture, and Music, in Germany." Jordan is an active advocate for and member of the disabled and LBGTQ+ community of central Florida, frequently called upon to give guest talks at universities, museums, and public secondary schools across Florida about disability and queer studies and accessibility in the arts as well as the intersections of music, art, math, and science.

TRANSPOSING SCORE

THE YOUNG LOVE

OF CHRISTOPHER MORCOM

JORDAN ALEXANDER KEY
JULY 2020

SPIRITED ($\text{♪.} = 100\text{-}110$)

Musical score for three instruments: Oboe, Clarinet in B_b, and Bassoon. The score is in common time (indicated by '3/8'). The Oboe part starts with a rest followed by a melodic line. The Clarinet and Bassoon parts enter with eighth-note patterns. Dynamics include *mp* (mezzo-forte) and *mf* (mezzo-forte). The bassoon has a sustained note at the beginning.

Musical score for three staves. The top staff is a treble clef, the middle is a treble clef, and the bottom is a bass clef. The score consists of five measures. Measures 1-4 show eighth-note patterns. Measure 5 shows sixteenth-note patterns. Dynamics include *mf* (mezzo-forte).

Musical score for three staves. The top staff is a treble clef, the middle is a treble clef, and the bottom is a bass clef. The score consists of five measures. Measures 1-4 show eighth-note patterns. Measure 5 shows sixteenth-note patterns. Dynamics include *mf* (mezzo-forte).

16

9 16 *p*

9 16

9 16 *f*

21

6 16 *mf*

6 16 *mp*

6 16 *p*

6 16 *mf*

6 16 *mp*

6 16 *p*

6 16 *mf*

6 16 *p*

26 **B**

mf

f

f

f

31

36

41

4

46

D

mf

FIRST TIME ONLY

48

mp

mf

dolce

51

f

mf

mf

A musical score page featuring three staves of music for two pianos. The top staff uses a treble clef, the middle staff a treble clef with dynamic markings 'mf' and 'p', and the bottom staff a bass clef. The music consists of measures 58 through 62. Measure 58 starts with a forte dynamic in the treble clef staff. Measures 59-60 show a transition with eighth-note patterns and a key change to B-flat major. Measures 61-62 continue with eighth-note patterns and a return to G major.

Musical score for piano, page 10, measures 62-66. The score consists of three staves: treble, bass, and a middle staff. Measure 62 starts with a rest followed by three eighth-note grace marks. Measures 63-64 show a pattern of eighth-note pairs with grace marks, separated by a bar line. Measures 65-66 show eighth-note pairs with grace marks, followed by a bar line. Measure 67 begins with a rest. The right-hand part of the score includes dynamic markings *p* and *pp*. The page number 10 is repeated at the end of each measure.

6

65 **F**

10
16

p

10
16

10
16

10
16

10
16

10
16

68

10
16

p

3
8

DOLCE

10
16

3
8

10
16

3
8

q

q

q

q

q

q

q

q

72

10
16

mp

10
16

10
16

10
16

p

76

10
16 *f*

10
16 *f*

pp

10
16 *f*

pp

18 *mf*

79

mp

p

p

81

f

f

mp *f*

8

83

mp

f

fp

ff

ff

85

$\frac{3}{4}$

$\frac{3}{4}$

$\frac{3}{4}$

$\frac{3}{4}$

$\frac{3}{4}$

$\frac{3}{4}$

$\frac{9}{16}$

$\frac{9}{16}$

$\frac{9}{16}$

$\frac{9}{16}$

DOLCE

88

G

$\frac{9}{16}$

$\frac{5}{16}$

$\frac{4}{16}$

$\frac{8}{16}$

$\frac{6}{16}$

$\frac{5}{16}$

$\frac{4}{16}$

$\frac{8}{16}$

$\frac{6}{16}$

$\frac{5}{16}$

$\frac{4}{16}$

$\frac{8}{16}$

$\frac{6}{16}$

f

Musical score for orchestra, page 10, measures 91-92. The score consists of three staves: Violin 1, Violin 2, and Cello/Bass. The key signature is B-flat major (two flats). Measure 91 starts with a dynamic of $\frac{6}{16}$ followed by a fermata over two measures. The Violin 1 staff has a sixteenth-note pattern with grace notes. The Violin 2 staff has a sixteenth-note pattern with grace notes. The Cello/Bass staff has a sixteenth-note pattern with grace notes. Measures 92 begin with a dynamic of $\frac{4}{8}$. The Violin 1 staff has a sixteenth-note pattern with grace notes. The Violin 2 staff has a sixteenth-note pattern with grace notes. The Cello/Bass staff has a sixteenth-note pattern with grace notes. Measure 93 starts with a dynamic of $\frac{6}{16}$ followed by a fermata over two measures. The Violin 1 staff has a sixteenth-note pattern with grace notes. The Violin 2 staff has a sixteenth-note pattern with grace notes. The Cello/Bass staff has a sixteenth-note pattern with grace notes.

Musical score for piano, page 16, measures 94-100. The score consists of four staves: Treble, Alto, Bass, and Right Hand. Measure 94: Treble staff has a fermata over the first note. Alto staff: measure start, dynamic *mp*. Bass staff: measure start. Right Hand staff: measure start. Measure 95: Treble staff: fermata over the first note. Alto staff: dynamic *mp*, eighth-note pattern. Bass staff: eighth-note pattern. Right Hand staff: eighth-note pattern. Measure 96: Treble staff: fermata over the first note. Alto staff: dynamic *mp*, eighth-note pattern. Bass staff: eighth-note pattern. Right Hand staff: eighth-note pattern. Measure 97: Treble staff: fermata over the first note. Alto staff: dynamic *p*, eighth-note pattern. Bass staff: eighth-note pattern. Right Hand staff: eighth-note pattern. Measure 98: Treble staff: fermata over the first note. Alto staff: dynamic *mp*, eighth-note pattern. Bass staff: eighth-note pattern. Right Hand staff: eighth-note pattern. Measure 99: Treble staff: fermata over the first note. Alto staff: dynamic *mp*, eighth-note pattern. Bass staff: eighth-note pattern. Right Hand staff: eighth-note pattern. Measure 100: Treble staff: fermata over the first note. Alto staff: dynamic *mp*, eighth-note pattern. Bass staff: eighth-note pattern. Right Hand staff: eighth-note pattern.

Musical score for piano, page 11, measures 98-116. The score consists of three staves: treble, bass, and right hand. Measure 98 starts with a forte dynamic in the treble staff. Measure 99 begins with a fermata over the bass note. Measure 100 shows a melodic line in the treble staff. Measure 101 contains a single eighth note in the bass staff. Measures 102-103 show a melodic line in the treble staff. Measure 104 begins with a fermata over the bass note. Measures 105-106 show a melodic line in the treble staff. Measure 107 begins with a fermata over the bass note. Measures 108-109 show a melodic line in the treble staff. Measure 110 begins with a fermata over the bass note. Measures 111-112 show a melodic line in the treble staff.

10

101

11
16

11
16
p

11
16

12
16

12
16

12
16

103

12
16
p

12
16

12
16
dim.

13
16

-

10
8

13
16
pp

10
8

10
8

106

10
8

10
8

10
8

-

3
8

3
8

3
8

3
8

3
8

PROF'S BOOK

AND THE ENIGMA MACHINE

JORDAN ALEXANDER KEY
JULY 2020

ALGORITHM MUSIC, CRYPTIC ($\text{♩} = \text{c. } 150 - 160$)

Musical score for three instruments: Oboe, Clarinet in Bb, and Bassoon. The score consists of three staves. The Oboe staff is in treble clef, 4/4 time, and common time. The Clarinet in Bb staff is in treble clef, 4/4 time. The Bassoon staff is in bass clef, 4/4 time. The music is cryptic algorithmic notation. Measure 1: Oboe has a eighth note followed by a sixteenth note, Clarinet has a sixteenth note followed by a eighth note, Bassoon has a eighth note followed by a sixteenth note. Measure 2: Oboe has a sixteenth note followed by a eighth note, Clarinet has a eighth note followed by a sixteenth note, Bassoon has a eighth note followed by a sixteenth note. Measure 3: Oboe has a eighth note followed by a sixteenth note, Clarinet has a sixteenth note followed by a eighth note, Bassoon has a eighth note followed by a sixteenth note.

Musical score for three instruments. The score consists of three staves. The top staff is in treble clef, 4/4 time. The middle staff is in treble clef, 4/4 time. The bottom staff is in bass clef, 4/4 time. The music is cryptic algorithmic notation. Measure 4: Top staff has a eighth note followed by a sixteenth note, Middle staff has a sixteenth note followed by a eighth note, Bottom staff has a eighth note followed by a sixteenth note. Measure 5: Top staff has a sixteenth note followed by a eighth note, Middle staff has a eighth note followed by a sixteenth note, Bottom staff has a eighth note followed by a sixteenth note. Measure 6: Top staff has a eighth note followed by a sixteenth note, Middle staff has a sixteenth note followed by a eighth note, Bottom staff has a eighth note followed by a sixteenth note.

Musical score for three instruments. The score consists of three staves. The top staff is in treble clef, 4/4 time. The middle staff is in treble clef, 4/4 time. The bottom staff is in bass clef, 4/4 time. The music is cryptic algorithmic notation. Measure 7: Top staff has a eighth note followed by a sixteenth note, Middle staff has a sixteenth note followed by a eighth note, Bottom staff has a eighth note followed by a sixteenth note. Measure 8: Top staff has a eighth note followed by a sixteenth note, Middle staff has a eighth note followed by a sixteenth note, Bottom staff has a eighth note followed by a sixteenth note. Measure 9: Top staff has a eighth note followed by a sixteenth note, Middle staff has a sixteenth note followed by a eighth note, Bottom staff has a eighth note followed by a sixteenth note.

A

11

A

p

p

p

15

pp

p

mf

mf

19

p

mf

mp

mf

p

mp

mf

p

mf

22

mf
p
f
mf
p

25 **B**

mp
f
f
mp
f
f
mp
mf → f

29

p
mp
mf
b-flat
b-flat
b-flat
p
mp
mf
p
mp
mf

33

mf

35

37

39

Treble staff: Key signature of two sharps. Measures show eighth and sixteenth note patterns.

Bass staff: Key signature of one sharp. Measures show eighth and sixteenth note patterns.

Bass staff (continued): Key signature of one sharp. Measures show eighth and sixteenth note patterns.

42

Treble staff: Key signature of two sharps. Measures show eighth and sixteenth note patterns.

Bass staff: Key signature of one sharp. Measures show eighth and sixteenth note patterns.

Bass staff (continued): Key signature of one sharp. Measures show eighth and sixteenth note patterns.

44

Treble staff: Key signature of two sharps. Measures show eighth and sixteenth note patterns.

Bass staff: Key signature of one sharp. Measures show eighth and sixteenth note patterns.

Bass staff (continued): Key signature of one sharp. Measures show eighth and sixteenth note patterns.

46

f

mf

p

D

*THIS CANON MAY BE REPEATED AS MANY TIMES AS ONE LIKES, BUT SHOULD BE REPEATED AT LEAST ONCE.
IT IS POSSIBLE TO PLAY THE CANON THE FIRST TIME THROUGH WITHOUT OBOE, FOLLOWED WITH THE CANON A3.

48 *ENIGMA CANON PERPETUUM PER AUGMENTATIONEM, PRECISE BUT ENERGETIC (ROCKIN')

mp

p

mf

50

mf

mp

p

52

mp

3

3

54

p

3

mp

3

56

mp

p

p

58

mf

60

E

p

mp

p

62

mf

mf

64

mp

p

mf

66

mf

f

3

68

f

3

mf

70

mp CREB. sc.

mp CRESC.

mp CRESC.

F

72

mf

f

f CRESC.

mf

75

ff

mf

ff

mf

f

77

mf

mf

mf

mp

mf

mp

79

-

mp

mf

mp

fp

81

mf

f

mp

mf

f

mp

mf

f

f

83

mp

mf

85

p

p

p

87

mp

mf

f

mf

mp

mf

f

mf

89

f *mf* *mp* *p*

H

f

mp

p

93

mp

mp

mf

mp

96

mp

mf

mp

99

p
mp

104

p
p
p

108

pp
pp
pp

THE BOMBE

THAT BROKE ENIGMA

FURTIVE AND MECHANICAL (♩ = 88)

JORDAN ALEXANDER KEY
JULY 2020

Musical score for orchestra, page 10, measures 3-7.

Measure 3: Oboe (G clef, 4/4 time) plays eighth-note pairs. Dynamics: **f**, **mf**. Clarinet in B_b (F clef, 4/4 time) plays eighth-note pairs. Dynamics: **f**, **mf**. Bassoon (C clef, 4/4 time) plays eighth-note pairs. Dynamics: **f**, **mf**.

Measure 4: Oboe (G clef, 4/4 time) plays eighth-note pairs. Dynamics: **mf**. Clarinet in B_b (F clef, 4/4 time) plays eighth-note pairs. Dynamics: **mf**. Bassoon (C clef, 4/4 time) plays eighth-note pairs. Dynamics: **mf**.

Measure 5: Oboe (G clef, 4/4 time) plays eighth-note pairs. Dynamics: **p**. Clarinet in B_b (F clef, 4/4 time) plays eighth-note pairs. Dynamics: **p**. Bassoon (C clef, 4/4 time) plays eighth-note pairs. Dynamics: **p**.

11

p

pp

pp

15 A

mf

mf

19

f

f

f

8

27

PRESTO (♩ = c. 120)

Presto ($\text{\textit{d} = c. 120}}$)

25

3 3 3 3 3 3

3 3 3 3 3 3

3 3 3 3 3 3

f

3 3 3 3 3 3

3 3 3 3 3 3

3 3 3 3 3 3

f

3 3 3 3 3 3

3 3 3 3 3 3

3 3 3 3 3 3

f

Musical score for piano, page 29, measures 1-8. The score consists of three staves: treble, bass, and middle. Measure 1: Treble staff has a grace note followed by eighth-note pairs (mf). Bass staff has a quarter note. Middle staff has a half note. Measure 2: Treble staff has eighth-note pairs (3). Bass staff has a half note. Middle staff has a half note. Measure 3: Treble staff has eighth-note pairs (3). Bass staff has a half note. Middle staff has a half note. Measure 4: Treble staff has a half note. Bass staff has a half note. Middle staff has a half note. Measures 5-8: Treble staff has eighth-note pairs (3) with various accidentals. Bass staff has eighth-note pairs (3). Middle staff has eighth-note pairs (3).

33

36

39

42

Treble staff: Note, sixteenth-note pattern.

Bass staff: Sustained note with grace note, sixteenth-note pattern with '3' below it.

Bass staff: Sustained note with grace note, sixteenth-note pattern with '3' below it.

mf

45

Treble staff: Sixteenth-note pattern.

Bass staff: Sustained note with grace note, sixteenth-note pattern with '3' below it.

Bass staff: Sustained note with grace note, sixteenth-note pattern with '3' below it.

mf

3

3

mf

48

Treble staff: Sixteenth-note pattern.

Bass staff: Sustained note with grace note, sixteenth-note pattern with '3' below it.

Bass staff: Sustained note with grace note, sixteenth-note pattern with '3' below it.

3

3

3

Musical score for piano, page 51, measures 1-4. The score consists of three staves: Treble, Bass, and Pedal. Measure 1: Treble staff has a bass note with a fermata, followed by four eighth notes with grace marks. Bass staff has two eighth-note pairs. Pedal staff has a sustained note. Measure 2: Treble staff has two eighth-note pairs. Bass staff has two eighth-note pairs. Pedal staff has a sustained note. Measure 3: Treble staff has a dynamic *f*. Bass staff has a dynamic *f*. Pedal staff has a dynamic *f*. Measure 4: Treble staff has a dynamic *f*. Bass staff has a dynamic *f*. Pedal staff has a dynamic *f*.

A musical score for piano, page 54, featuring three staves. The top staff uses a treble clef, the middle staff a treble clef, and the bottom staff a bass clef. The key signature is one sharp. The score consists of six measures. Measure 1: Treble staff has two eighth notes with a dynamic '3' below them; Bass staff has two eighth notes with a dynamic '3' below them. Measure 2: Treble staff has a sixteenth-note cluster with a dynamic '3' below it; Bass staff has two eighth notes with a dynamic '3' below them. Measure 3: Treble staff has two eighth notes with a dynamic '3' below them; Bass staff has a sixteenth-note cluster with a dynamic '3' below it. Measure 4: Treble staff has a sixteenth-note cluster with a dynamic '3' below it; Bass staff has two eighth notes with a dynamic '3' below them. Measure 5: Treble staff has two eighth notes with a dynamic '3' above them; Bass staff has two eighth notes with a dynamic '3' below them. Measure 6: Treble staff has a sixteenth-note cluster with a dynamic '3' above it; Bass staff has two eighth notes with a dynamic '3' below them.

Musical score for piano, page 57, measures 3-8. The score consists of three staves: treble, middle, and bass. Measure 3 starts with a forte dynamic. Measure 4 begins with a piano dynamic. Measure 5 starts with a forte dynamic. Measure 6 begins with a piano dynamic.

61 **C**

mp PONDERSOME, SWEET

p MECHANICAL

p MECHANICAL

63

p

66

pp

p MECHANICAL

p

pp

69

72

D

75

PONDERSOME, SWEET

MECHANICAL

MECHANICAL

78

81

84

87

This section contains three staves of musical notation for a string quartet. The top staff uses a treble clef, the middle staff an alto clef, and the bottom staff a bass clef. The music consists of six measures, divided by vertical bar lines. Measure 87 starts with eighth-note patterns in common time. Measure 88 begins with a measure rest followed by eighth-note patterns. Measure 89 starts with a measure rest followed by eighth-note patterns. Measure 90 starts with a measure rest followed by eighth-note patterns.

90

This section contains three staves of musical notation for a string quartet. The top staff uses a treble clef, the middle staff an alto clef, and the bottom staff a bass clef. The music consists of four measures, divided by vertical bar lines. Measure 90 starts with eighth-note patterns in common time. Measure 91 starts with eighth-note patterns in common time. Measure 92 starts with eighth-note patterns in common time. Measure 93 starts with eighth-note patterns in common time.

93

This section contains three staves of musical notation for a string quartet. The top staff uses a treble clef, the middle staff an alto clef, and the bottom staff a bass clef. The music consists of four measures, divided by vertical bar lines. Measure 93 starts with eighth-note patterns in common time. Measure 94 starts with eighth-note patterns in common time. Measure 95 starts with eighth-note patterns in common time. Measure 96 starts with eighth-note patterns in common time.

E

96

PONDERSOME, LYRICAL

99

MECHANICAL

102

Musical score page 36, measures 105-106. The score consists of three staves: Treble, Alto, and Bass. The key signature is one sharp. Measure 105 starts with a forte dynamic (f) and a 4/4 time signature. The bass staff has a sixteenth-note pattern. The alto staff has a eighth-note pattern. The treble staff has a eighth-note pattern. Measure 106 begins with a dynamic of 4. The bass staff has a sixteenth-note pattern. The alto staff has a eighth-note pattern. The treble staff has a eighth-note pattern. Measure 107 starts with a dynamic of 4. The bass staff has a sixteenth-note pattern. The alto staff has a eighth-note pattern. The treble staff has a eighth-note pattern.

Musical score page 48, measures 108-111. The score consists of three staves: Treble, Alto, and Bass. Measure 108 starts with a rest in the Treble staff, followed by a grace note (x) and a sixteenth-note pattern. The Alto staff has a grace note (x). The Bass staff starts with a bass note. Measure 109 begins with a bass note. The Treble staff has a grace note (x) and a sixteenth-note pattern. The Alto staff has a grace note (x) and a sixteenth-note pattern. Measure 110 begins with a bass note. The Treble staff has a grace note (x) and a sixteenth-note pattern. The Alto staff has a grace note (x) and a sixteenth-note pattern. Measure 111 begins with a bass note. The Treble staff has a grace note (x) and a sixteenth-note pattern. The Alto staff has a grace note (x) and a sixteenth-note pattern. The Bass staff has a bass note.

Musical score for piano, three staves, dynamic markings, and measure numbers.

Measure 110 (top staff): $\text{F} \frac{4}{8}$, dynamic p . Measure 111 (middle staff): $\text{G} \frac{4}{8}$, dynamic p . Measure 112 (bottom staff): $\text{Bass} \frac{4}{8}$, dynamic p .

Measure 113 (top staff): $\text{F} \frac{4}{8}$, dynamic f . Measure 114 (middle staff): $\text{G} \frac{4}{8}$, dynamic f . Measure 115 (bottom staff): $\text{Bass} \frac{4}{8}$, dynamic f .

Measure 116 (top staff): $\text{F} \frac{4}{8}$, dynamic p . Measure 117 (middle staff): $\text{G} \frac{4}{8}$, dynamic p . Measure 118 (bottom staff): $\text{Bass} \frac{4}{8}$, dynamic p .

113

mf

mf

mf

G

116

p

pp

pp

LYRICAL, BUT DISTANT

LYRICAL, BUT DISTANT

p

pp

p

LYRICAL, BUT DISTANT

120

p

123

126

129

\overline{H}

$\leftarrow \text{♪} = \text{♩} \rightarrow \text{♩} = 120$

132

p MECHANICAL

p MECHANICAL

135

138

141

mp

mf

p

mp

144

f

mp

147

p

mf

mf

151

p

mf

mp

mf

154

mp

mf

mp

mf

mp

mp

mf

157

f

7:6

mp

mf

mp

(3+2+2)

7:6

mp

5:6

5

8

42

FURTIVE, LIKE A MACHINE ($\text{♩} = 120$)

160 ($\text{♩} = 135$)

($\text{♩} = 210$)
(3+2+2)

($\text{♩} = 200$)
(3+2)

163

mf

p CRESC.

p CRESC.

166

p mp

mp CRESC. mf

mp

169 *mf*

3 4 f
3 4 f 7:6
3 4 f 7:6

172 *mf*
7:6
ff 3:2
f 7:6
5:6
ff 3:2
ff 3:2

175 f
ff 3:2 f ff 3:2
7:6
f 7:6
5:6
f 5:6

178

ff 3:2
f 7:6
5:6
ff 3:2
7:6
ff 3:2
3:2

182

7:6
ff 3:2
5:6
f
7:6
ff 3:2
3:2
ff
f

185

f
5:4
5:4
5:4
4:3
5:6
10
16
10
16
10
16

R

DRIVING ($\text{♩} = \text{c. } 300$)

45

187

2+3+2+3

Musical score for measures 187-190. The score consists of three staves:

- Treble Staff:** Clef G, key signature 1 sharp. Dynamics: m_f . Measure 187: 2+3+2+3. Measure 188: 12+3+2+3. Measure 189: 2+3+2+3.
- Bass Staff:** Clef F, key signature 1 sharp. Dynamics: m_f .
- Alto Staff:** Clef C, key signature 1 sharp. Dynamics: m_f .

190

 p mp mp

192

 mp p p p

Musical score for measures 191-192. The score consists of three staves:

- Treble Staff:** Clef G, key signature 1 sharp.
- Bass Staff:** Clef F, key signature 1 sharp. Dynamics: p .
- Alto Staff:** Clef C, key signature 1 sharp. Dynamics: p .

194

3
4 pp < ff

3
4 pp < ff

3
4 pp < ff

197

DOLCE

3
4 f

3
4 f mp

3
4 mp

200

mp

p

mf

p

DOLCE

Musical score page 202, featuring three staves of music. The top staff is for the soprano voice, the middle staff for the alto voice, and the bottom staff for the basso continuo. The music consists of measures 1 through 6. Measure 1 starts with a forte dynamic. Measures 2-3 show eighth-note patterns. Measure 4 begins with a piano dynamic. Measures 5-6 continue the eighth-note patterns. Measure 7 starts with a forte dynamic.

205

DOLCE

1 2 3 4 5 6 7 8 9 10

Musical score for piano, page 207, measures 1-4. The score consists of three staves. The top staff uses treble clef, the middle staff uses alto clef, and the bottom staff uses bass clef. Measure 1: Treble staff has eighth-note rests. Middle staff has eighth-note rests. Bass staff has eighth-note rests. Measure 2: Treble staff starts with dynamic **f**. Middle staff starts with dynamic **mp**. Bass staff starts with dynamic **mp**. Measure 3: Treble staff has eighth-note rests. Middle staff has eighth-note rests. Bass staff has eighth-note rests. Measure 4: Treble staff has eighth-note rests. Middle staff has eighth-note rests. Bass staff has eighth-note rests.

210

mf

f

mf

f

mf

f

213

mf

f

f

mf

f

f

215

ff

fp

ff

fp

mf

mf

218

219

221

222

224

Musical score for piano, page 10, measures 227-228. The score consists of three staves: treble, bass, and a lower staff. Measure 227 starts with a forte dynamic in the treble staff. Measure 228 begins with a piano dynamic in the bass staff.

三

REMINISCENT, SLOWER THAN BEFORE (♪ = 106)

230

REMINISCENT, SLOWER THAN BEFORE ($\text{♩} = 106$)

PONDERSOME, SWEET, BUT DISTANT

MECHANICAL

233

236

p MECHANICAL

p MECHANICAL

239

p MECHANICAL

p MECHANICAL

242

p MECHANICAL

p MECHANICAL

245

0

$\leftarrow \text{ } \text{ } \text{ } \text{ } = \text{ } \text{ } \text{ } \text{ } \rightarrow = 106$

248

MECHANISTIC

251

254

3 3 3 3

257

3 3 3 3 3 3

mf *mf* *mf*

260

*#* *#* *#* *#* *#*

262

mp

p CRES.C.

f

265

mf

f UNBRIDLED ("ROCKIN")

mf

267

mf

mf

mf

269

f UNBRIDLED ("ROCKIN")

mf

f SOARING

3

271

mf

f

mf

273

f

f

f

277

f SOARING

3

(UPPER NOTE IF POSSIBLE)

279

3

f

WE GIVE THANKS

FOR THE ONE WHO SAVED 14 MILLION LIVES

JORDAN ALEXANDER KEY
JULY 2020

HEARTFELT & JOYOUS ($\text{♩} = \text{c. } 50$)

OBOE

CLARINET IN B_b

BASSOON

5

7

9

p

tr

5

mp — *fp*

mf

11 A

mf — *mp*

p

mf

mp — *p*

p

p

p

13

p

mp

mp

15

5

mp

17

p

19

mp

p

60

B

21

P

mp

mp

mp

P

23

P

P

mp

P

mp

mp

25

mp

f

f

(b)

mp

mf

f

27 **C**

mf

29

f

31 **D**

mf

33

mf

mp

p

p

35

p

mp

mf

mf

37

mf

mf

mp

p

5

mf

mf

39

mp

mp *mf* *mp*

mp

41

mp

mf 5

mf 5

43

E

mf 5

p *mp* *mf*

mp *p*

64

45

mp

p

mp

47

49

mp

mf

f

mf

5

8:9

5

51

F

p

mp

p

mp

p

mp

trrmmm

53

mf

mf

mf

55

p

mp

p

mp

57

f *mf*

f *mp*

f *mf* *p* *mp*

59 **G**

p *mp*

mf

mf *f*

mf

f

61

f

mf

5

5

mf

mf

63

H

f *fp < f*

p

mp *DELICATE BUT SOARING*

mp

mf

67

mf

mf *CRESC.*

trill

mf

f

69

MOLTO RALL.

f

mp *p* *pp*

f

mp *p* *pp*

p *pp*

p *pp*

*PLAY UPPER NOTE IF POSSIBLE AT A
COMFORTABLE AND DELICATE TIMBRE