



The Canadian Brass

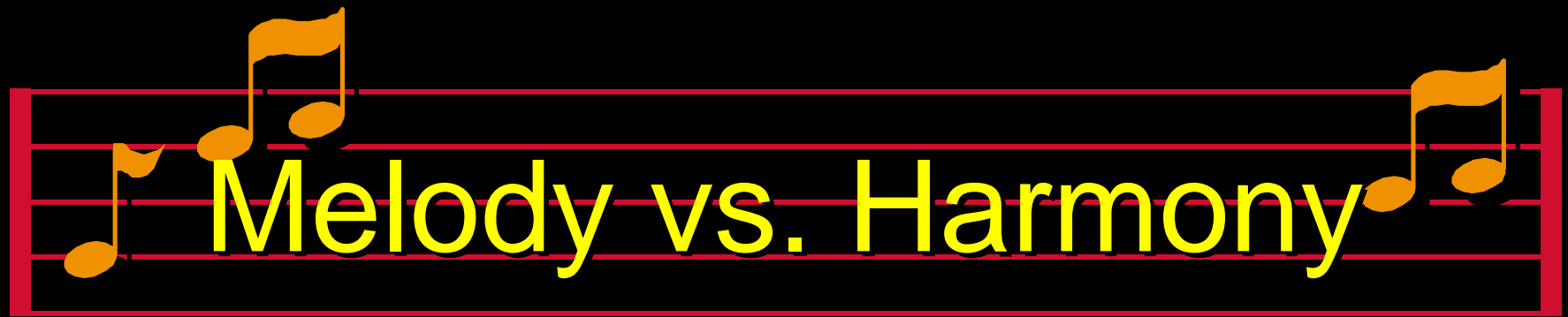
- Silver Bells
- White Christmas
- The Christmas song
- Winter Wonderland



- Why do certain chords or combos of sounds sound good and others not?
- For many it is a tension between familiar and new.

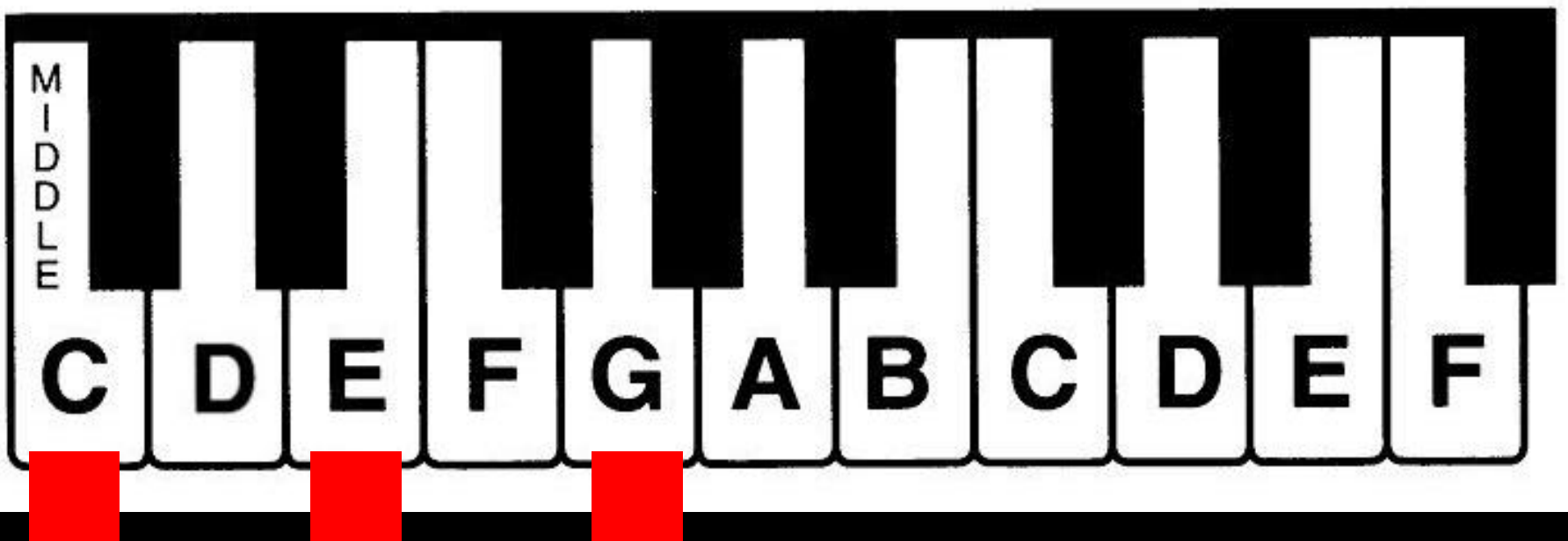


- Three note chord build on thirds.
- Four kinds: major, minor, augmented, and diminished.
- Major and minor are used most often.



- Melody is horizontal
- Harmony is vertical, but also has a horizontal aspect in the sequence or progression of chords.

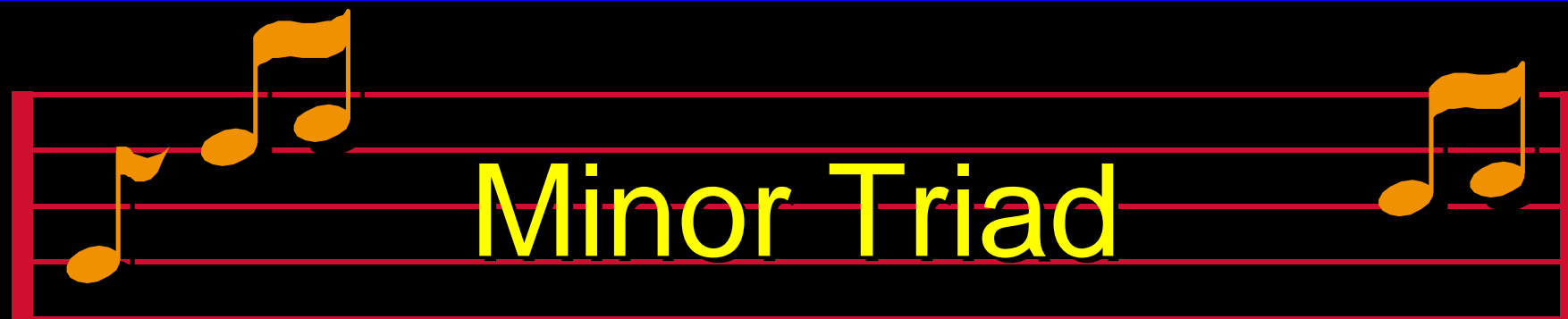
Major Triad



C – E = major third (4 s)

E – G = minor third (3 s)

Minor Triad



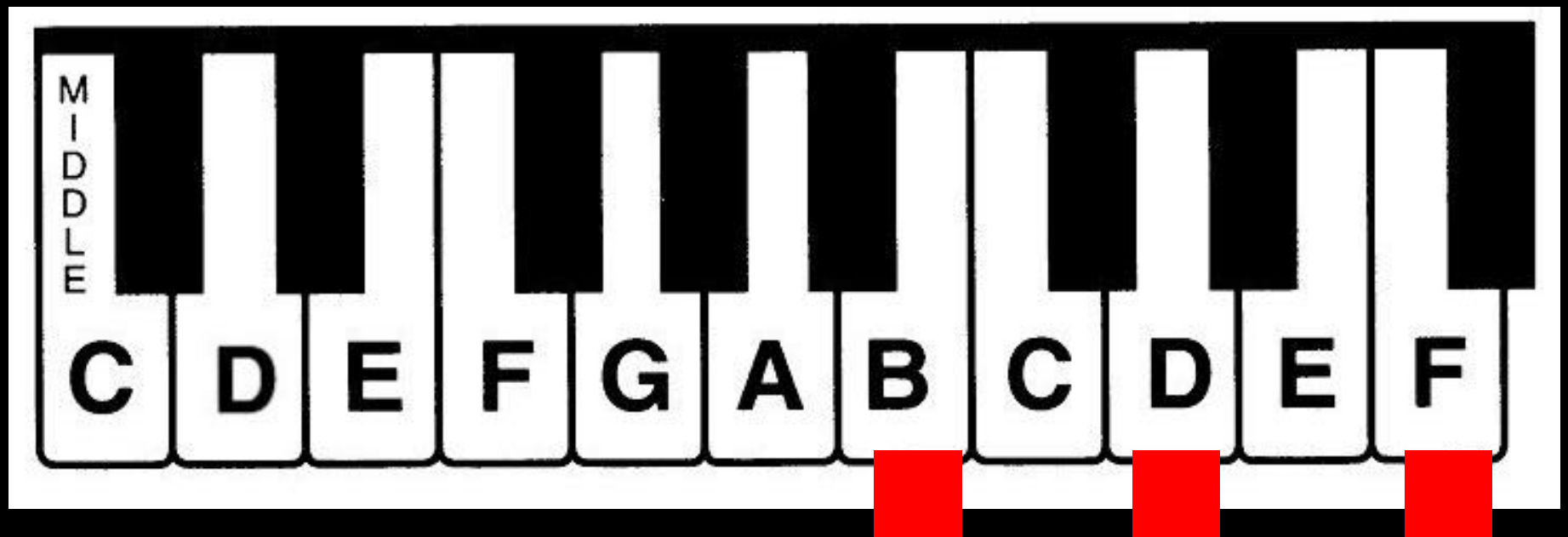
D – F = minor third (3 s)

F – A = major third (4 s)



A musical staff with five lines. It contains four notes: a G4 (first space), an A4 (second line), a B4 (second space), and a D5 (third line). The notes are G, A, B, and D, which form a diminished triad. The word "Diminished Triad" is written in yellow across the staff.



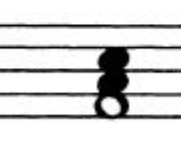
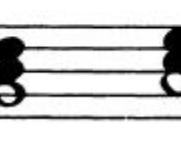

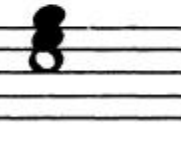
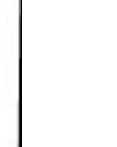
Diminished Triad



B – D = minor third (3 s)

D – F = minor third (3 s)

Triads

	CEG	DFA	EGB	FAC	GBD	ACE	BDF	CEG
C major								
scale number	1	2	3	4	5	6	7	8(1)
triad number	I	ii	iii	IV	V	vi	vii°	I



Note	Scale Degree	Degree Name	Triad
C	I	Tonic	C E G
D	ii	Supertonic	D F A
E	iii	Mediant	E G B
F	IV	Subdominant	F A C
G	V	Dominant	G B D
A	vi	Submediant	A C E
B	vii	Leading Tone	B D F

C Major Triad

Root Position - CEG

First Inversion - EGC

C Major Triad

Second Inversion - GCE

Root Position – CE(octave)G

Triad Inversions

The image displays a musical staff with three measures, each showing a different inversion of a CEG triad. The notes are half notes. The first measure is labeled 'root position' and shows C in the bass (labeled (1)) and E and G in the treble. The second measure is labeled 'first inversion' and shows E in the bass (labeled (3)) and C and G in the treble. The third measure is labeled 'second inversion' and shows G in the bass (labeled (5)) and C and E in the treble. The letters 'CEG' are written in the first measure. A blue dot is placed to the left of the 'root position' label.

CEG

(1) (3) (5)

root position first inversion second inversion

A musical staff with five red lines on a black background. On the left, there is a bracketed group of three notes: a quarter note on the first line, an eighth note on the second line, and a quarter note on the third line. On the right, there is a bracketed group of two notes: a quarter note on the second line and a quarter note on the third line. The text "Demo" is written in yellow in the center of the staff.

Demo

Triad Inversions

A musical staff with five red lines on a black background. On the left, there are four yellow notes: a quarter note on the first line, an eighth note on the second line, a quarter note on the third line, and a half note on the fourth line. On the right, there are two yellow notes: a quarter note on the fourth line and a half note on the fifth line. The title "Consonant vs. Dissonant" is written in large yellow letters across the middle of the staff.

Consonant vs. Dissonant

- Consonant = pleasant
- Dissonant = harsh
- All possible chords and intervals from the tones in a triad are consonant.
- All others are dissonant.



Which are consonant and
which are dissonant?

Consonant



For the C-E-G triad we have:

- C-E major third
- E-G minor third
- C-G perfect fifth

Consonant



For the first inversion E-G-C we have:

- E-G minor third
- G-C perfect fourth
- E-C major sixth

Consonant



For the second inversion G-C-E we have:

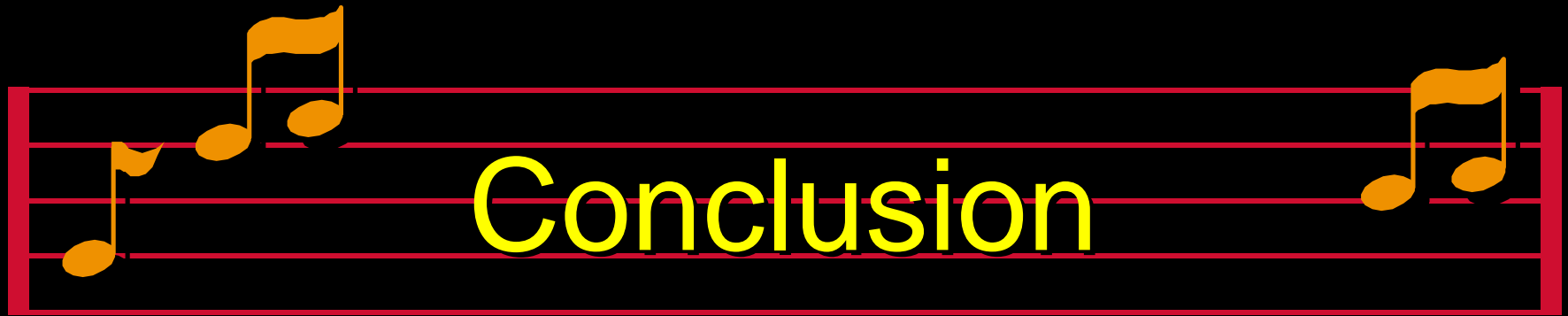
- G-C perfect fourth
- C-E major third
- G-E major sixth

Interval	# of Semitones	Character
Unison	0	Consonant
Minor Second	1	Dissonant
Major Second	2	Dissonant
Minor Third	3	Consonant
Major Third	4	Consonant
Perfect Fourth	5	Consonant
Aug. 4 th /Dim 5 th	6	Dissonant
Perfect Fifth	7	Consonant
Minor Sixth	8	Consonant
Major Sixth	9	Consonant
Minor Seventh	10	Dissonant
Major Seventh	11	Dissonant
Octave	12	Consonant



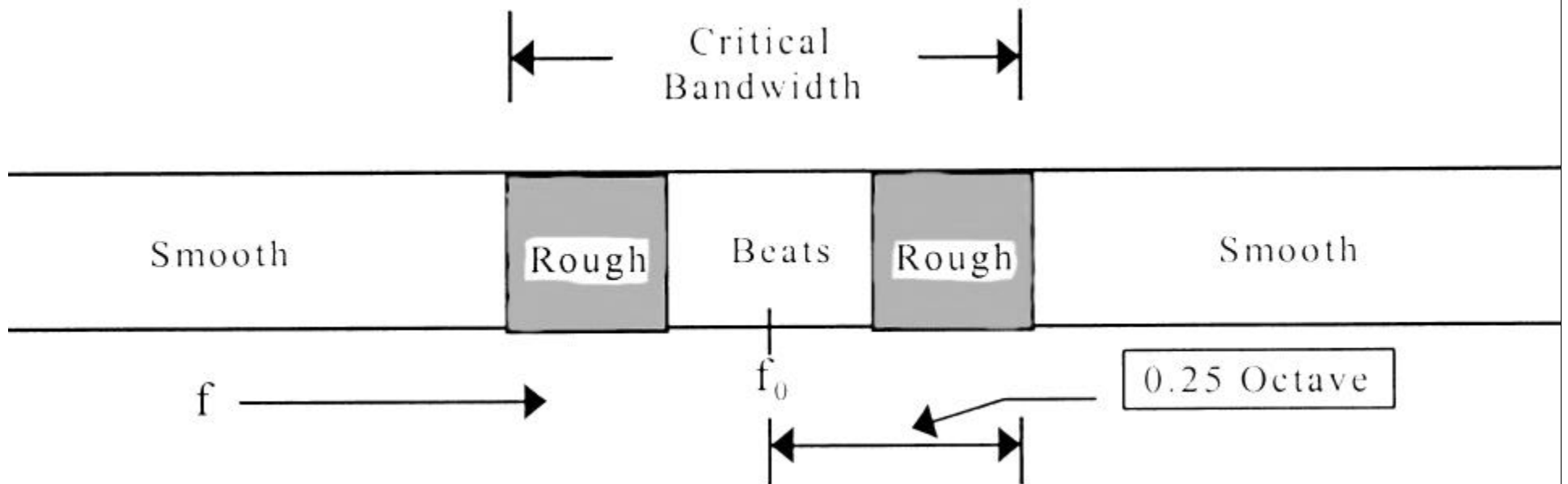
- What makes certain chords sound dissonant?

Demo with pure sounds.



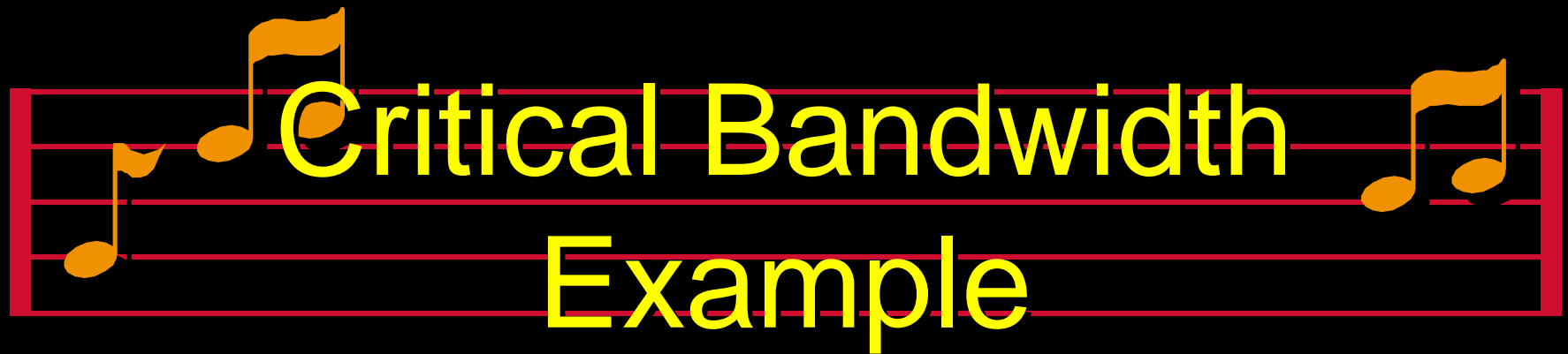
- Two sounds or tones are consonant when they are either identical (unison) or well separated.

Critical Bandwidth





- Region where we hear beats or roughness
- $\frac{1}{4}$ octave rule or minor third.

A musical staff with five red lines and a red vertical bar on the left. It contains three yellow musical notes: a quarter note on the first line, an eighth note on the second line, and a quarter note on the third line. The title "Critical Bandwidth Example" is written in yellow text across the staff.

Critical Bandwidth Example

What is the range of dissonance for $F_2=87.3$ Hz and $F_6=1397$ Hz?

Use Fig. 10.8 to find the third above each which is G#. $G_2^\# = 103.8$ Hz so the range is $103.8-87.3 = \mathbf{16.5}$ Hz, whereas $G_6^\# = 1661$ Hz and the range is $1661-1397 = \mathbf{264}$ Hz.

A graphic of a musical staff with five red lines. On the left, there are three yellow musical notes (quarter, eighth, and quarter notes) ascending. On the right, there are two yellow musical notes (quarter and eighth notes) descending. The title "Physiological Reason" is written in large yellow letters across the middle of the staff.

Physiological Reason

- If two tones are far enough apart they activate separate nerve cells in the ear.
- If they are close together they activated nerve cells overlap and a mixed signal goes to the brain.



- What do we hear if we replace pure tones by real instruments with rich harmonics?

Similar, except there is again roughness at some large intervals such as major sixth.



- We need to consider the harmonics of both pitches to understand why.
- We will consider only the first 6 harmonics.

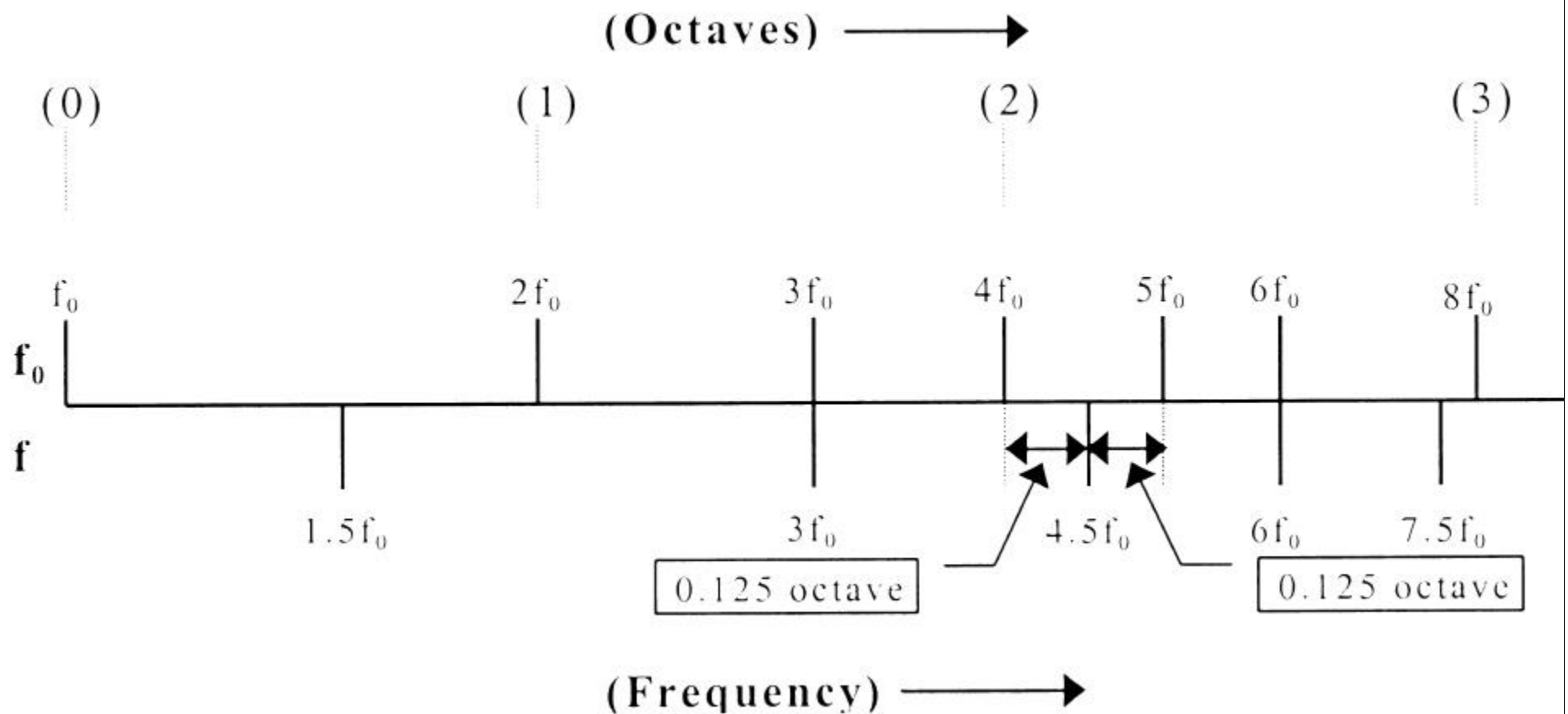


- $f, 2f, 3f, 4f, 5f, 6f, 7f, 8f$.
- $2f, 4f, 6f, 8f$.
- These either coincide or are widely spaced.



- $f, 2f, 3f, 4f, 5f, 6f,$
- $1.5f, 3f, 4.5f, 6f, 7.5f, 9f.$
- Only two intervals of the more than 10 are closer than $\frac{1}{4}$ octave. $4f-4.5f$ and $4.5f-5f.$

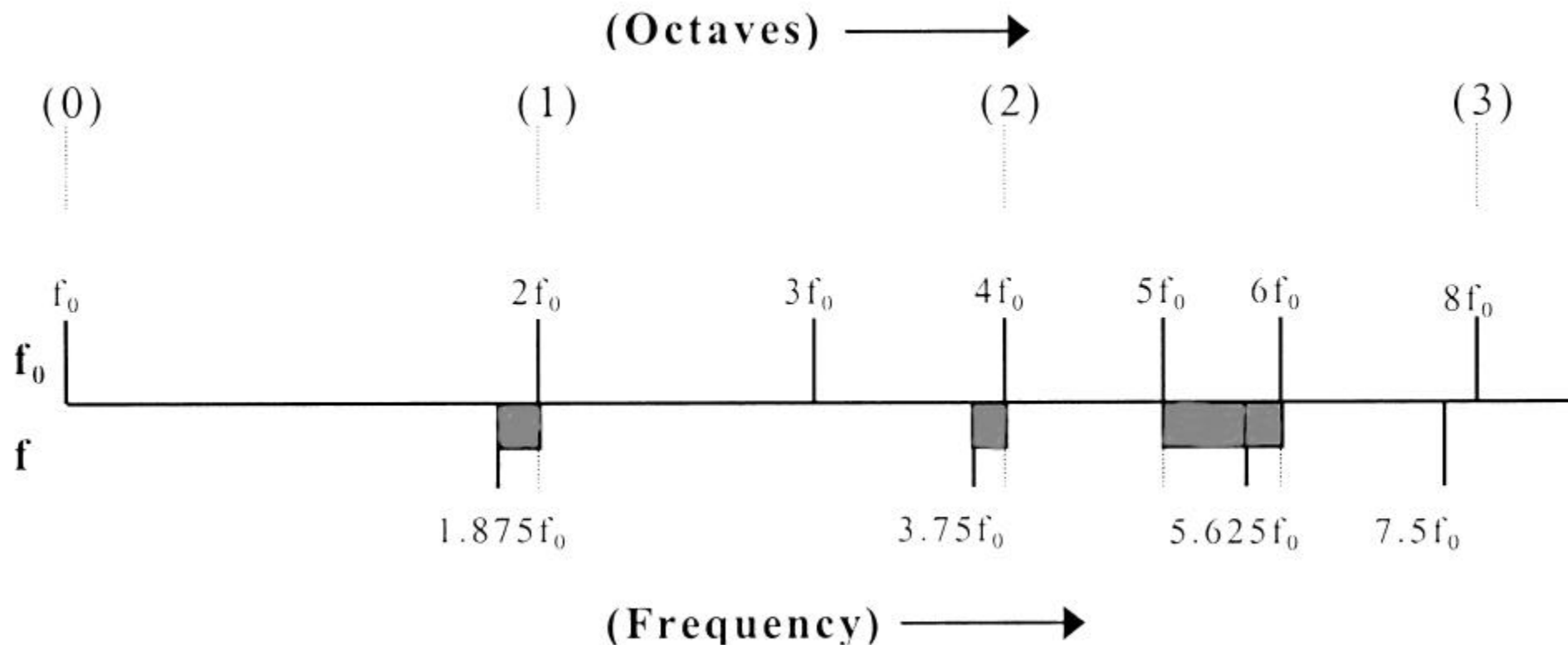
Perfect Fifth Harmonics





- $f, 2f, 3f, 4f, 5f, 6f,$
- $1.9f, 3.8f, 5.6f,$
- More intervals are closer than $\frac{1}{4}$ octave. Dissonant.

Major Seventh Harmonics





Fundamental Bass





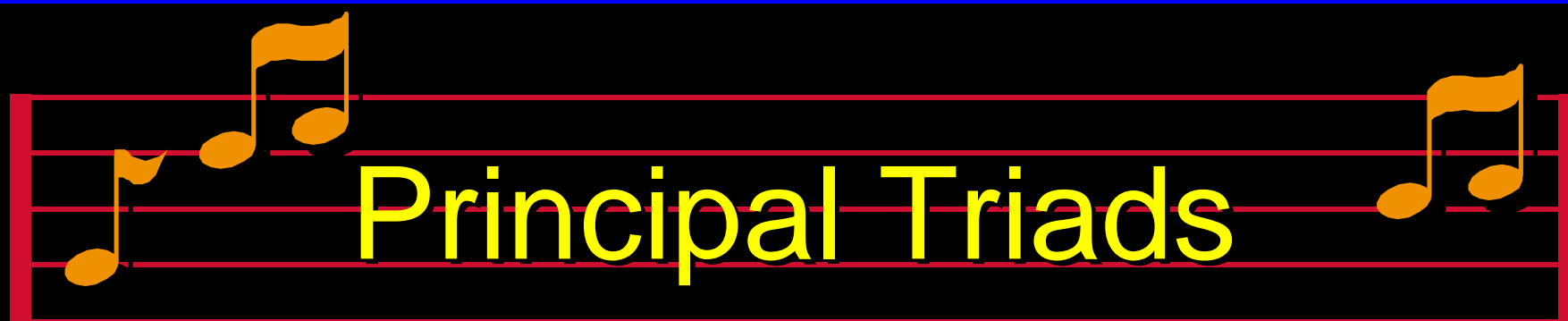
- $C = f_1$, $E = (5/4)f_1$, $G = (3/2)f_1$
- Let $f_b = (1/4)f_1$ then we get three harmonic series for the three notes. They are:



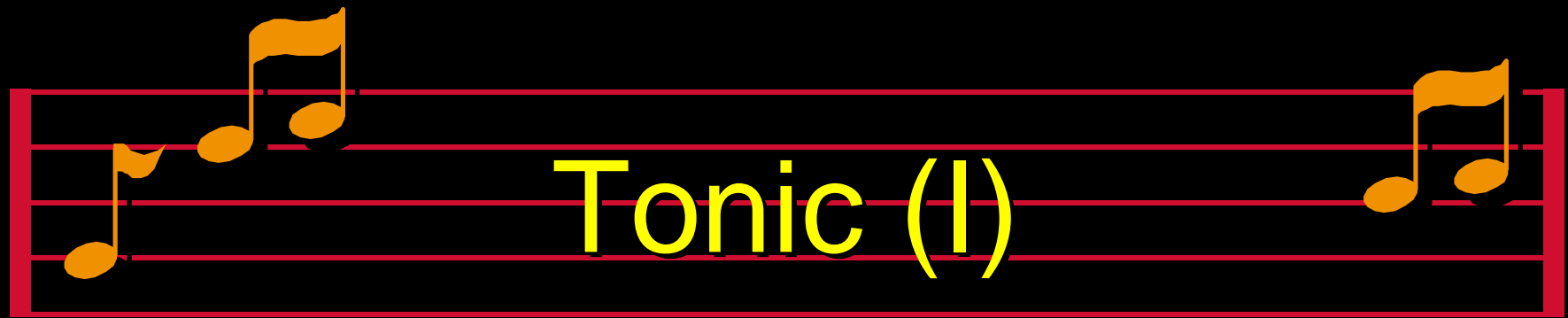
- C: $4f_b$, $8f_b$, $12f_b$, $16f_b$, $20f_b$, $24f_b$
- E: $5f_b$, $10f_b$, $15f_b$, $20f_b$, $25f_b$, $30f_b$
- C: $6f_b$, $12f_b$, $18f_b$, $24f_b$, $30f_b$, $36f_b$
- We hear a harmonic series of f_b !



- Tonic or I chord
- Dominant or V chord
- Subdominant or IV chord
- These three are called the
Principal Triads



Chord	Notes
Tonic (I)	C E G
Dominant (V)	G B D
Subdominant (IV)	F A C



- Establishes the key.
- Center of gravity about which the music moves.
- Feeling of release.
- Almost always ends a piece.



- Creates tension.

- Active



- Midway between Tonic and Dominant in terms of tension and release.



- A dominant chord (G B D) with another third added (the seventh) so it would be G B D F
- Particularly dissonant and creates great tension.
- Leading tone.



- Progression of chords that leads to a point of repose or end.
- Examples of I-V-I cadences on Studio.



- Does not end on the chord that you expect.
- Example in book.