Assessment Proposal:

Basics of Compressors, Limiters, and Gates

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## Previous Research

I am unaware of much formal research into the practical uses of compressors, limiters, and gates.  It is just such a gray area for study.  There are plenty of books that describe how they are used, and certainly there are very experienced and intelligent engineers who have written detailed explanations of how various versions of these tools are constructed, and what effect they have on sounds.  I do not believe there is much in the way of academic scrutiny for much of the area of music engineering and production.

While there are courses available, so much of the training for careers in engineering or production is on the job.  The system is not as formal because the subject matter is so subjective.

## Why is this Assessment Needed?

I'm designing a fictitious online course in music recording (which I use interchangeably with "engineering") and production.  The purpose of the course would be to help guide learners through some of the basics of production and engineering while also providing a support community for questions comments.

The course will be divided into sections such as "Basics of Compressors, Limiters, and Gates" which cover certain larger issues.  In this instance, the issue is "volume and noise control."  The section would also cover more creative uses of these tools, and students could post audio files that demonstrate certain aspects of the tools.

Because all of these tools can be used with almost no formal training and adjust strictly "by ear," the course will be designed to only provide a broad baseline of knowledge about their function.  A complete beginner would ideally feel like they have a handle on what to do in some

basic situations, and someone who has already been experimenting with, say, compressors would hopefully deepen their knowledge and use the tool with more grace and confidence.

## How Will This Assessment Be Different?

I am not very familiar with other recording courses.  I know there are some out there, but the ones I found were framed as "become an engineer today" or "let us review your recordings." Other courses at, say, a University that offers a Music Business and Engineering Degree, are probably more technologically in-depth.  That is not what I have in mind for my course, which is why I am creating an assessment from scratch.  Aside from the basics (which I am assessing the understanding of here), for many questions in recording and production there simply are no right and wrong answers.  There are only opinions.  This assessment is rooted firmly in the basics.

## Proposed Administration

The students here would be college aged (or older), taking an online course in music engineering and production.  Much of the course would be discussion and project based, but there would be some summative assessments at the ends of sections in order to make sure students have a full understanding of the fundamentals before moving on to the next section.

The assessment is shorter than a typical classroom assessment, and would be through an online teaching module towards the end of a synchronous portion of class.  I would think it would take twenty minutes to complete.  The assessment would be made up of fourteen multiple choice questions and two short essay questions.

If the instructor is using a tool like Blackboard Learn, they would likely need to administer the assessment in two pieces.  The multiple choice section would be created using the assessment tool, while the essay questions might be better graded using the assignment tool.  The multiple choice section would have its own time limit, after which the students would be given

the essay questions.  Each student could then type out their essays in their own word processing

program and submit them as an attachment.  I believe both sections could be completed in

twenty-five minutes, which is what I have put in my example, but the time given is ultimately up

to the discretion of the instructor.

## Use of the Assessment

The point of the assessment is to ensure that a student understands the basics of the

section before the class moves on to the next section.  It would be factored in as part of their

grade, though there would also be heavy emphasis on projects and discussions in the course.

The grading would be done on a ten point scale (90-100 being an A, 80-89 being a B,

etc.).  If more than half of the class scores a C or lower, it would be worth taking time to go

through the answer together in the next class and take questions before moving on to the next

section.

# Appendix:

## Instructions for Instructor and Rubrics

*Multiple Choice Administration:*

This portion should be created in the Blackboard Learn assessment tool (or its equivalent). Students should be given 10 minutes to complete this section before the essay section is administered. Students who request accommodations for things such as ADHD, the use of reading software, or other similar needs can be given more time as needed.

*Multiple Choice Scoring:*

Each question is worth 6 points apiece. Correct answers are listed below.

1. a

2. c

3. d

4. b

5. a

6. d

7. b

8. d

9. a

10. c

11. b

12. c

*Essay Question Administration:*

Both questions should be displayed to the students at the same time, and then asked to compose their essays in Microsoft Word or a similar word processing program. Documents should then be submitted through the Blackboard Assignment tool (or its equivalent). They should be given 15 minutes for this section of the assessment. Students who request accommodations for things such as ADHD, the use of reading software, or other similar needs can be given more time as needed.

*Essay Question Scoring:*

Example essays:

13. Parallel compression is where you run two copies of a track simultaneously, one with compression applied, and one without. The compressed and uncompressed signals are then mixed together. This is generally used on something like drums, where you might want an extremely compressed sound, but you don't want to eliminate the transients. Another use would be to get the character out of a compressor for something like a vocal, and then blend it with a dry, uncompressed sound. In a digital audio workstation (DAW), you could either make a copy of the track or tracks you'd like to parallel compress, and then put the compressor on the copy, or you could use a "send" buss to route a copy to an aux channel with compression on it.

14. A compressor can be set up as a de-esser using a sidechain input. A copy of the vocal would be sent to an EQ, where it would have everything but the sibilance attenuated, either with an EQ shelf, a hi pass filter, or a narrow boost of the sibilant frequency. This copy would then be fed into the sidechain input of the compressor that is put on the vocal. Sibilant sounds in the vocal will exceed the threshold on the compressor and cause the volume at the moment of sibilance to

be turned down, acting as a de-esser.  One way to accomplish this "manually in the box" is to reduce the volume for every "ess" sound using automation.  Another would be to apply an EQ that reduces high frequencies only to "ess" sounds throughout the vocal.

Essay Rubrics:

Question 13

|  | **No Understanding** | **Partial Understanding** | **Full Understanding** |
|---|---|---|---|
| **a)** | Incorrect or no definition (0 points) | Vague definition that does not use terms such as "double" or "copy" or "compressed and uncompressed." (1-2 points) | Full definition that uses correct terms.  (3-4 points) |
| **b)** | Incorrect or no description of uses (0 points) | Some description of use that shows no insight. Might say "big drums" without any explanation of how that comes about. (1-3 points) | Complete explanation that uses terms such as "transient" or "attack" and shows full understanding of the technique (4-5 points) |
| **c)** | Incorrect or no explanation (0 points) | Partial description of setup. Partially correct setup. Shows the idea, but might not work in practice. (1-3 points) | Full description of setup, including relevant routing and describing which tracks receive compression and which don't. (4-5 points) |

Question 14

|  | **No Understanding** | **Partial Understanding** | **Full Understanding** |
|---|---|---|---|
| **a)** | Incorrect or no definition (0 points) | Vague definition that does not use terms such as "high frequencies, sibilance, syllables" or "ess sounds." (1-2 points) | Full definition that uses correct terms. (3-4 points) |
| **b)** | Incorrect or no description of setup (0 points) | Partial description of setup. Partially correct setup. Shows the idea, but might not work in practice. (1-3 points) | Full description of setup, including relevant routing use of EQ, and sidechain input. (4-5 points) |
| **c)** | Incorrect or no explanation (0 points) | Partial description of process. Partially correct process. Shows the idea, but might not work in practice. (1-3 points) | Full description of process, including relevant routing or automation. (4-5 points) |

**Instructions for Students:**

For this assessment, please answer the multiple choice questions about the functions and uses for compressors, limiters, and gates.  There is only one correct answer for each of these questions.  Each multiple choice question will be worth 6 points.  You will be given 10 minutes for this section.

There are two short essay questions, each worth 14 points.  Each essay should be roughly a paragraph, not to exceed 600 words.  You will be given 15 minutes for this section.

If you need special accommodations for either of these sections, please inform the instructor.

**Sample Assessment**

Basics of Compressors, Limiters, and Gates

You have 10 minutes to complete this section. For the following questions, please select the correct answer from the choices given:

1) Without the use of makeup gain, a compressor controls volume by

   a) making loud signal quieter

   b) making quiet signal louder

   c) making both loud signal quieter AND quiet signal louder

   d) making all signal quieter

2) For signal ABOVE the threshold, which ratio results in the most compression?

   a) 2:1

   b) 4:1

   c) 20:1

   d) None of these. No compression is happening above the threshold.

3) For signal BELOW the threshold, which ratio results in the most compression?

   a) 2:1

   b) 4:1

   c) 20:1

   d) None. No compression is happening.

4) A snare drum track and a single long organ note are being fed into the same compressor. When the snare drum is struck, the compressor activates and then releases. What happens to the long organ note when the snare drum is struck?

a) It gets momentarily louder

b) It gets momentarily softer

c) It changes pitch briefly

d) Nothing about the organ note changes

5) The term for the sound of compression when it is obviously working in an extreme, potentially unpleasant way is called:

a) Pumping

b) Breathing

c) Breaking

d) Ducking

6) A limiter is a compressor with an infinite

a) Release

b) Threshold

c) Attack

d) Ratio

7) Peak limiters are generally used to control

a) Bass notes

b) Transients

c) Sibilance

d) Long notes

8) In mastering, peak limiters are used to

a) Improve the sound quality of a recording

b) Increase the dynamic range of a recording

c) Make the overall volume of a recording quieter

d) Make the overall volume of a recording louder

9) When a peak limiter is used to an extreme degree in mastering

a) All parts of the program material are the same volume

b) The dynamic range of the program material covers the entire spectrum of human hearing

c) Distortion is eliminated entirely from the program material

d) Transients become their most present

10) With a simple gate, any signal below the threshold

a) Is made louder

b) Is made quiter

c) Is not allowed to pass

d) Is distorted

11) On a gate, the "hold" function

   a)  Delays the opening of the gate

   b)  Delays the closing of the gate

   c)  Changes the shape of the sound envelope

   d)  Freezes the gate's threshold


12) When recording a drum kit, if gates are being used, they're most commonly used on:

   a)  Overhead microphones

   b)  Room microphones

   c)  Close microphones

   d)  All microphones used on the drum kit


Short essays:

   You have 15 minutes to complete this section and submit it through the Assignment tool. The answer to each question should not exceed 600 words.  Full points are given for showing full understanding of the concepts and using correct terms we've discussed in class.  Partial credit will be given for incomplete explanations that only show partial understanding of the concepts. No points will be given for unanswered portions or answers that are completely incorrect or show no understanding.

13) Describe parallel compression:

   a)  What does it mean?  (4 points)

   b)  What is it used?  (5 points)

   c)  How would you set it up in a digital audio workstation?  (5 points)

14) You are an assistant engineer on a session.  The main engineer asks you to set up a

compressor as a de-esser for a vocalist.

a) What is a de-esser?  (4 points)

b) How could you set up a compressor as a de-esser on a vocal?  (5 points)

c) Describe one "manual" way you could accomplish de-essing "in the box."  (5 points)