

# 21M.380 MUSIC AND TECHNOLOGY

## SOUND DESIGN

### READING ASSIGNMENT 9 (RD9)

#### AM AND FM SYNTHESIS

DUE: MONDAY, APRIL 11, 2016, NOON  
SUBMIT TO: MIT LEARNING MODULES ▶ ASSIGNMENTS  
0.5% OF TOTAL GRADE

## 1 Materials to study

Farnell, Andy (2010). "Technique 4. Modulation." In: *Designing Sound*. Cambridge, MA and London: MIT Press. Chap. 20, pp. 291–303. ISBN: 978-0-262-01441-0. MIT LIBRARY: [001782567](#). Hardcopy and electronic resource.

## 2 Required preparation

For your written response to this reading, you will need to download the Pd code examples that accompany Farnell's book, which are available at [http://mitpress.mit.edu/sites/default/files/titles/content/ds\\_pd\\_examples.tar.gz](http://mitpress.mit.edu/sites/default/files/titles/content/ds_pd_examples.tar.gz).

Try the Pd patch from figure 12.2 (which you find in the unpacked code tarball under `☞ PUREDATA ▶ TECHNIQUE ▶ fm-basic03.pd` on your own machine). Turn on the DSP and bring the carrier frequency into the audible range. Observe the effect on the carrier that increasing the FM index and modulator frequency has. Then play around with all three numbers to get a feel for the resulting sounds.

## 3 Questions to respond to

1. Try to describe the effect that each of the three parameters above has on the resulting sound. Do this primarily by ear, but you can use a realtime spectrum analyzer such as *Baudline*<sup>1</sup> for assistance.
2. Are there "special" relations between any parameter pair that affect the degree of *harmonicity* in the resulting sound?
3. For the synthesis of which kinds of sounds do you think this technique might be particularly suitable for?

<sup>1</sup> <http://www.baudline.com>

## 4 Guidelines

- Your answers need not be very extensive (a short paragraph per question is enough), but they should demonstrate that you have actually read the article and understood its main points.
- Try to be concise and pay attention to form, grammar, spelling, etc.

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21M.380 Music and Technology: Sound Design  
Spring 2016

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