



DFAM & SUBHARMONICON

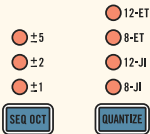
EXPLORATION PATCHBOOK

LESSON 1

HOW TO CREATE A SEQUENCE ON SUBHARMONIC

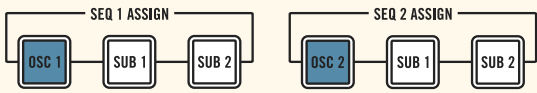
1

Select an octave range and quantizer setting for the sequencer using the **SEQ OCT** and **QUANTIZE** buttons.



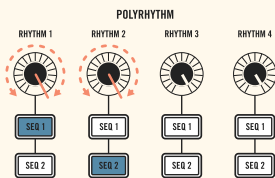
2

Assign **SEQUENCER 1** to control **VCO 1**, and **SEQUENCER 2** to control **VCO 2**, using the **SEQ ASSIGN** buttons.



3

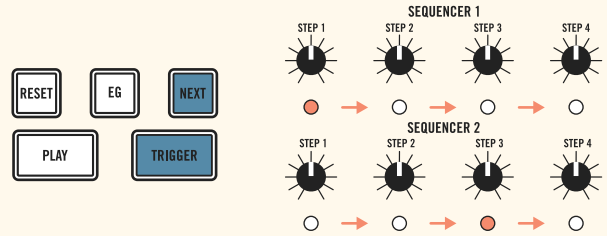
In the polyrhythm section, assign **RHYTHM 1** to control **SEQUENCER 1**, and **RHYTHM 2** to control **SEQUENCER 2**, then adjust both **RHYTHM** knobs to your desired tempo divisions.



NOTE:
RHYTHMS 3 and 4 can also be added to either sequence to further the rhythmic variation.

4

Using the **NEXT** and **TRIGGER** buttons, manually adjust each sequencer's steps to your desired pitches. Pressing the **TRIGGER** button will allow you to hear your selected notes.



5

Press **PLAY** to listen to your sequence, and make adjustments as needed.



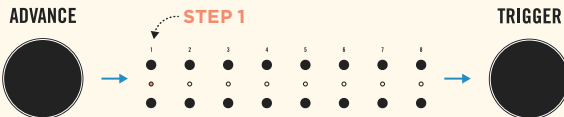
Keep exploring. Try different octave ranges, quantization settings, rhythm combinations, and sequencer assignment settings to craft your perfect sequence.

LESSON 2

HOW TO CREATE A SEQUENCE ON DFAM

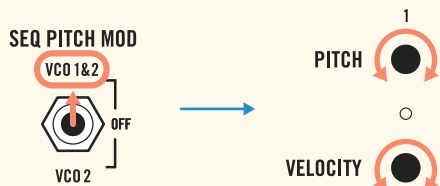
1

Use the **ADVANCE** button to set the sequencer to step 1. Press the **TRIGGER** button to audition the selected step.



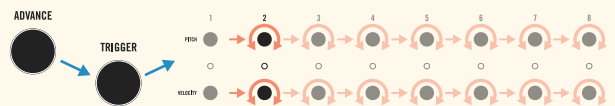
2

Set the **SEQ PITCH MOD** switch to **VCO 1&2**. Adjust the **PITCH** knob for step 1 until you reach your desired note. Then, adjust the **VELOCITY** knob for that step until you reach your desired volume.



3

Use the **ADVANCE** button to repeat this procedure for each step.



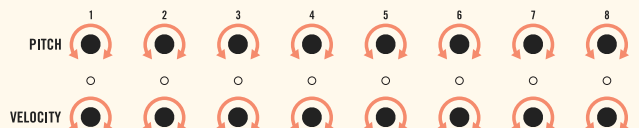
4

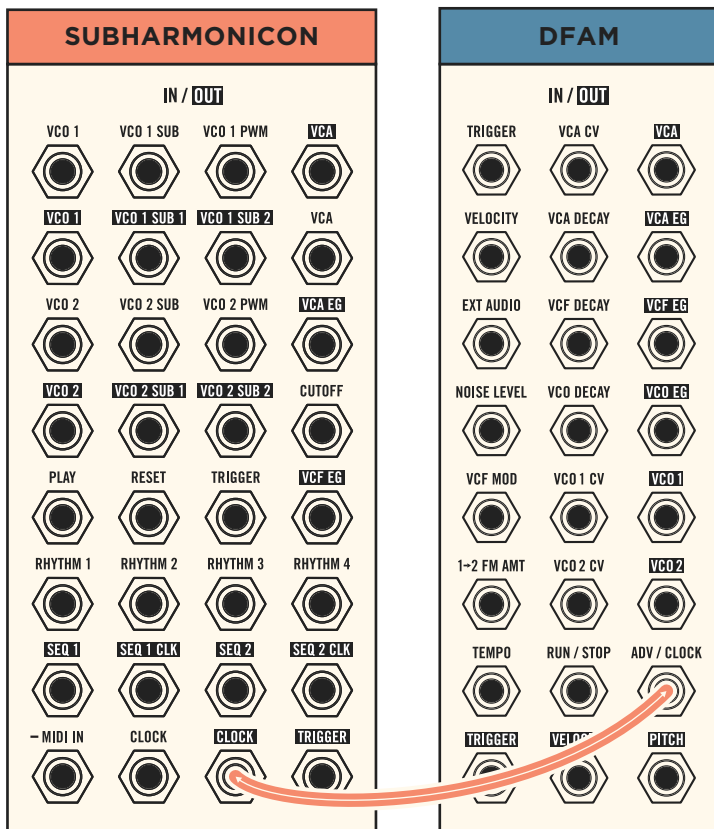
Press the **RUN/STOP** button to listen to the sequence you created.



NOTE

Further adjustments can be made while the sequencer is running.





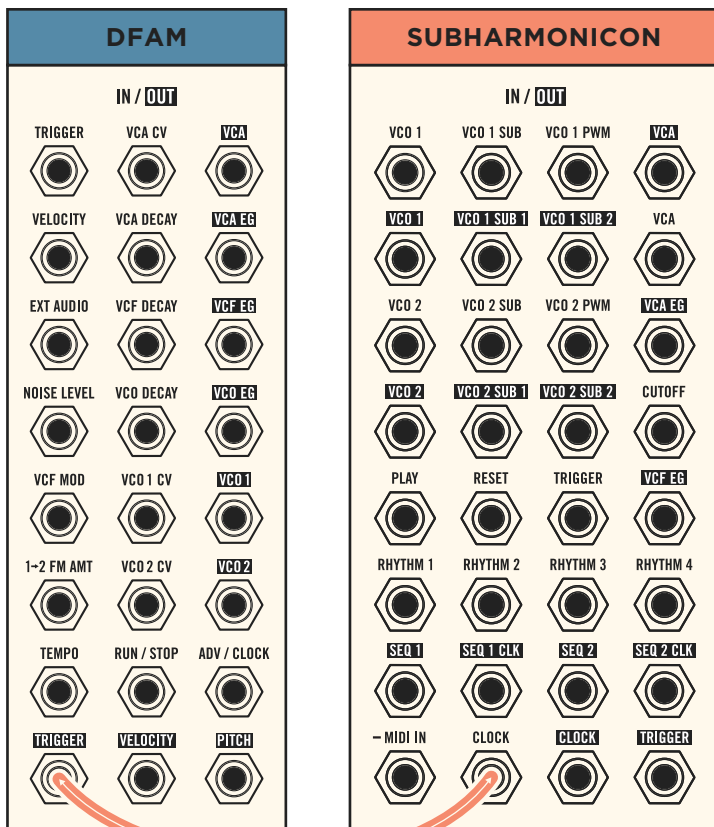
To sync DFAM to Subharmonic, simply patch from the **CLOCK** output jack on Subharmonic into the **ADV/CLOCK** input on DFAM.

1 Use the **ADVANCE** button on DFAM to set the sequencer to step 8.

ADVANCE **STEP 8**

2 Press the **RUN/STOP** button on DFAM to arm the sequencer for playback. Now when you press **PLAY** on Subharmonic, both instruments will play in sync.

RUN / STOP



To sync Subharmonic to DFAM, simply patch from the **TRIGGER** output jack on DFAM into the **CLOCK** input on Subharmonic.

1 Use the **ADVANCE** button on DFAM to set the sequencer to step 8.

ADVANCE **STEP 8**

2 Press the **PLAY** button on Subharmonic to arm the sequencer for playback. Now when you press **RUN/STOP** on DFAM, both instruments will play in sync.

RESET, EG, NEXT, PLAY, TRIGGER

Pitch Quantization is used to restrict the voltages that control the pitch of an oscillator so that they only play notes within a specific musical scale. Subharmonic has four quantized settings. Pressing the **QUANTIZE** button will cycle through the available settings, with an LED indicating the current selection. With all LEDs off, no Quantization value is selected, and the Quantize function is off.



12-ET

8-ET

12-JI

8-JI

QUANTIZE

12-ET

This option selects a Chromatic (12-step) scale using Equal Temperament (ET), which is the basis for Western keyboard music.

8-ET

This option selects a Diatonic (8-step) scale using Equal Temperament (ET).

12-JI

This option uses a Chromatic (12-step) scale using Just Intonation* (JI).

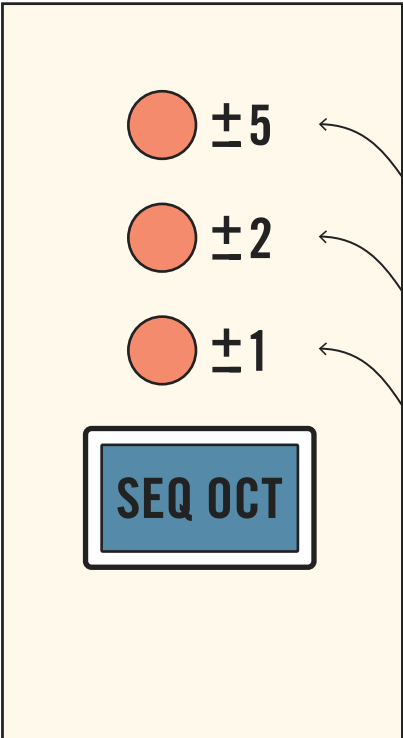
8-JI

This option uses a Diatonic (8-step) scale using Just Intonation* (JI).

**For more information on tuning systems, refer to page 17 in the Subharmonic manual.*

NOTE: By default, the **SEQ 1** and **SEQ 2** output jacks will output control voltages that follow the internal Quantize settings. This behavior can be altered by pressing and holding the **QUANTIZE** button until the LED flashes, at which point the **SEQ 1** and **SEQ 2** output jacks will output unquantized voltages, regardless of the internal quantizer settings.

This function specifies the octave range available for each of the **STEP** knobs in the sequencers. There are three values for this parameter. Repeatedly pressing the **SEQ OCT** button will cycle through the available options, with an LED indicating the current selection.



±5

±2

±1

SEQ OCT

±5

This option provides five octaves above and five octaves below the current **VCO FREQ** knob value for each individual step.

±2

This option provides two octaves above and two octaves below the current **VCO FREQ** knob value for each individual step.

±1

This option provides one octave above and one octave below the current **VCO FREQ** knob value for each individual step.

NOTE: By default, the **SEQ 1** and **SEQ 2** output jacks will output a control voltage that reflects the current Seq Oct settings. This behavior can be altered by pressing and holding the **SEQ OCT** button until the LED flashes, at which point the **SEQ 1** and **SEQ 2** output jacks will output at ±5, regardless of the Seq Oct setting. In this mode, the oscillators will continue to respect the Seq Oct settings. Press and hold the **SEQ OCT** button until the LED stops flashing to return to the default.

Jumping-Off Point

This patch is a good starting point for your exploration of DFAM and Subharmonic. Use this patch to play the included synthesizer dice game.

Match all knobs, switches, and patch locations to the graphics below.

DFAM

DFAM DRUMMER FROM ANOTHER MOTHER | SEMI-MODULAR ANALOG PERCUSSION SYNTHESIZER

moog

The DFAM control panel features a variety of knobs and switches. Key controls include: VCO DECAY, SEQ PITCH MOD (VCO 1&2), VCO 1 EG AMOUNT, VCO 1 FREQUENCY, VCO 1 WAVE, VCO 1 LEVEL, NOISE / EXT LEVEL, VCF HP, CUTOFF (200Hz, 2kHz), RESONANCE, VCA EG (FAST/SLOW), VOLUME, TRIGGER, IN / OUT (VCA CV, VCA DECAY, VCF DECAY, VCO DECAY), VELOCITY, EXT AUDIO, NOISE LEVEL, VCF MOD, 1-2 FM AMT, VCO 1 EV, VCO 2 EV, VCO 2 CV, VCO 2, VCF DECAY, VCF EG AMOUNT, NOISE / VCF MOD, VCA DECAY, TRIGGER, RUN / STOP, ADVANCE, PITCH, VELOCITY, and 8 numbered buttons (1-8).

SUBHARMONIC

SUBHARMONIC | SEMI-MODULAR ANALOG POLYRHYTHMIC SYNTHESIZER

moog

The SUBHARMONIC control panel includes: SEQUENCER 1 (STEP 1-4), SEQUENCER 2 (STEP 1-4), POLYRHYTHM (RHYTHM 1-4), TEMPO, OSCILLATORS (VCO 1 FREQ, VCO 1 WAVE, SUB 1 FREQ, SUB 2 FREQ, VCO 2 FREQ, VCO 2 WAVE, SUB 1 FREQ, SUB 2 FREQ), CUTOFF, VOLUME, RESONANCE, VCF EG AMT, VCF ATTACK, VCF DECAY, VCA ATTACK, VCA DECAY, IN / OUT (VCO 1, VCO 1 SUB, VCO 1 PWM, VCA, VCO 2, VCO 2 SUB, VCO 2 PWM, VCA, VCO 2 SUB 1, VCO 2 SUB 2, CUTOFF, VCF EG, VCF DECAY, TRIGGER, RHYTHM 1-4, SEQ 1-2, SEQ 1 CLK, SEQ 2 CLK, SEQ 2 CV, MID IN, CLOCK, TRIGGER, RESET, TRIGGER, SEQ 1, SEQ 2, PLAY, TRIGGER, RESET, NEXT, PLAY, TRIGGER).

NOTES

Use the suggested sequences, or create new sequences on Subharmonic ([Lesson 1](#)).

Use the **ADVANCE** button on DFAM to set the sequencer to step 8.

Press **RUN/STOP** on DFAM, and press **PLAY** on Subharmonic.

Adjust DFAM **1→2 FM AMOUNT** to add “click” to the kick drum.

Incorporate **RHYTHM 3** and **RHYTHM 4** on Subharmonic to add rhythmic variation to your sequences.

Satin Sun

Match all knobs, switches, and patch locations to the graphics below.

DFAM

DFAM DRUMMER FROM ANOTHER MOTHER | SEMI-MODULAR ANALOG PERCUSSION SYNTHESIZER

SUBHARMONICON

SUBHARMONICON | SEMI-MODULAR ANALOG POLYRHYTHMIC SYNTHESIZER

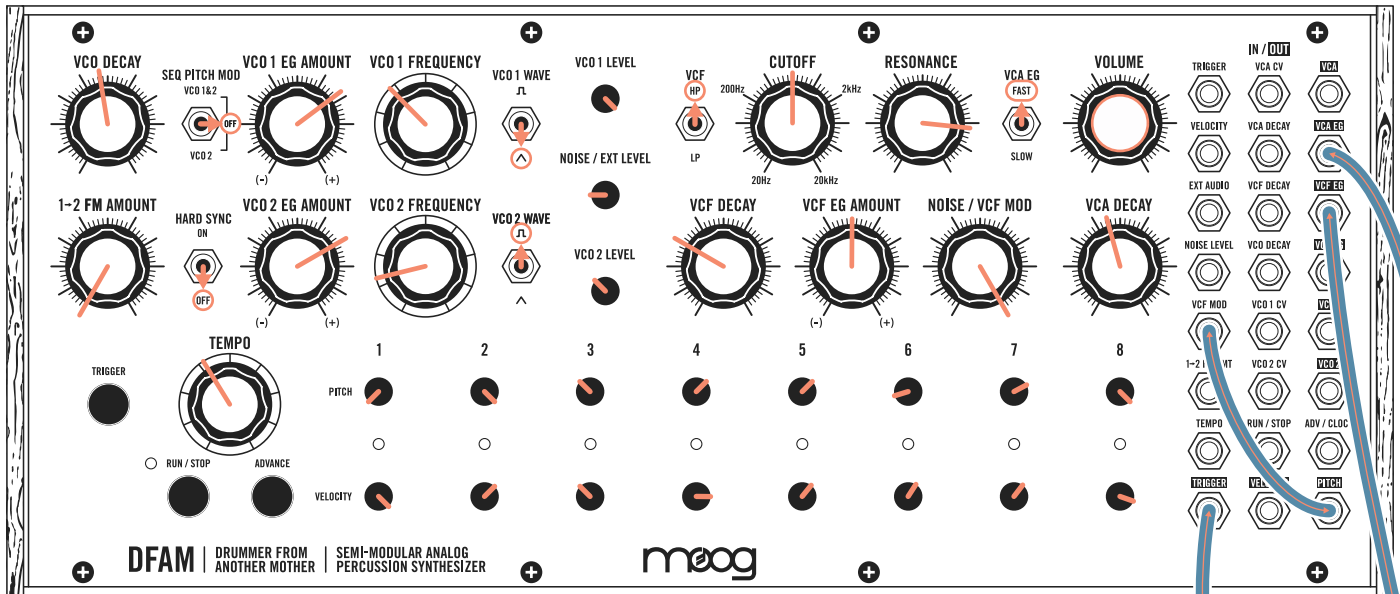
NOTES

- Use the suggested sequences, or create new sequences on Subharmonic ([Lesson 1](#)).
- Use the **ADVANCE** button on DFAM to set the sequencer to step 8.
- Press **PLAY** on Subharmonic, and press **RUN/STOP** on DFAM.
- Press and hold the **SEQ OCT** button on Subharmonic until the ± 2 LED indicator starts blinking.
- Adjust DFAM **PITCH SEQUENCER** to control the snare sound or add snares to other steps.
- Adjust DFAM **VELOCITY SEQUENCER** to control both DFAM note velocity and Subharmonic filter cutoff.

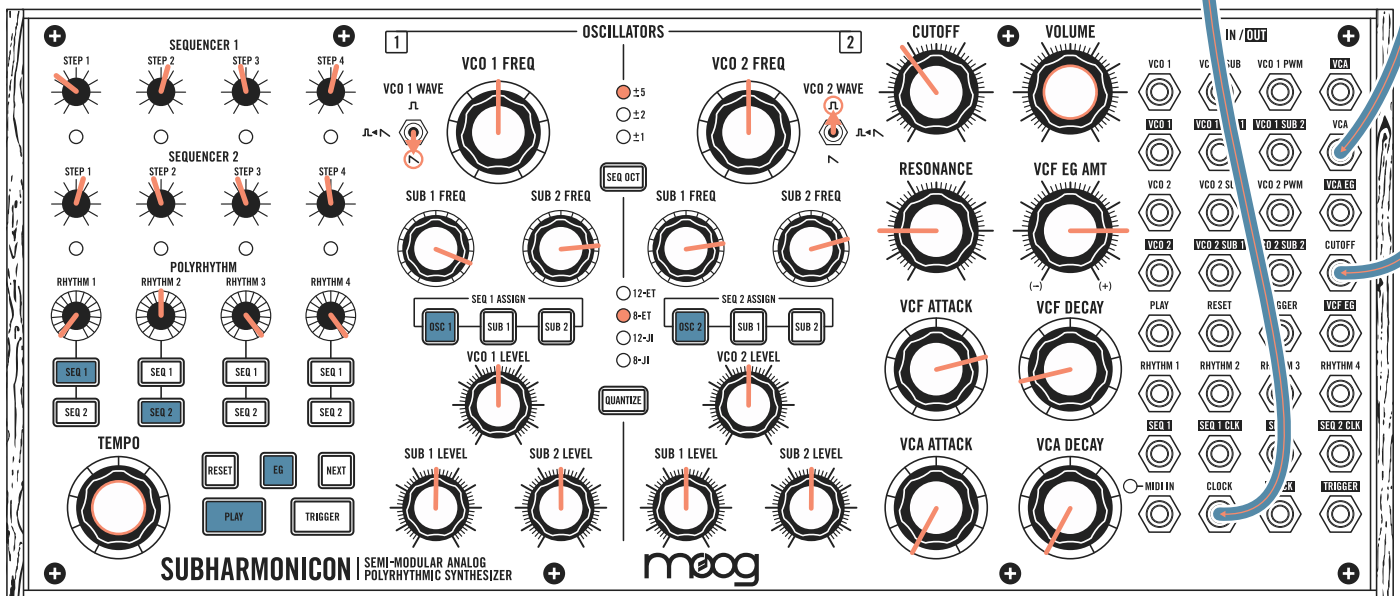
Grapefruit And Honey

Match all knobs, switches, and patch locations to the graphics below.

DFAM



SUBHARMONICON



NOTES

Use the suggested sequences, or create new sequences on Subharmonic ([Lesson 1](#)).

Use the **ADVANCE** button on DFAM to set the sequencer to step 8.

Press **PLAY** on Subharmonic, and press **RUN/STOP** on DFAM.

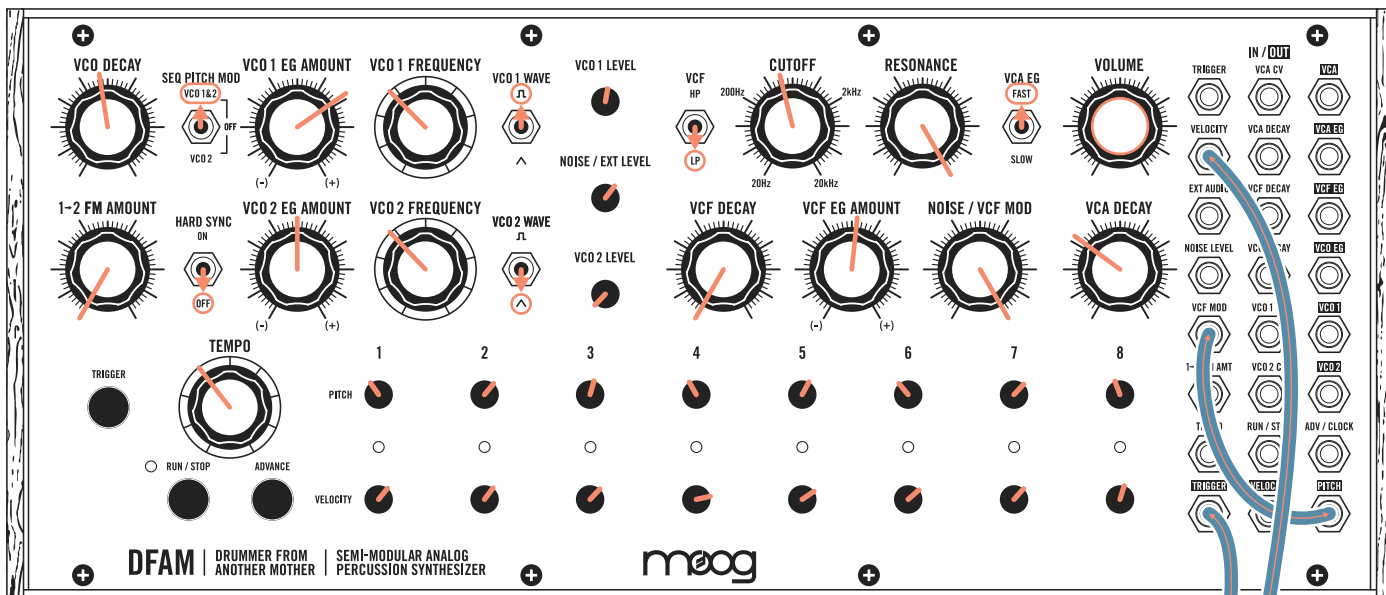
Adjust DFAM **PITCH SEQUENCER** to control DFAM's filter cutoff.

Adjusting the **VCF** and **VCA** envelopes on DFAM will also impact Subharmonic.

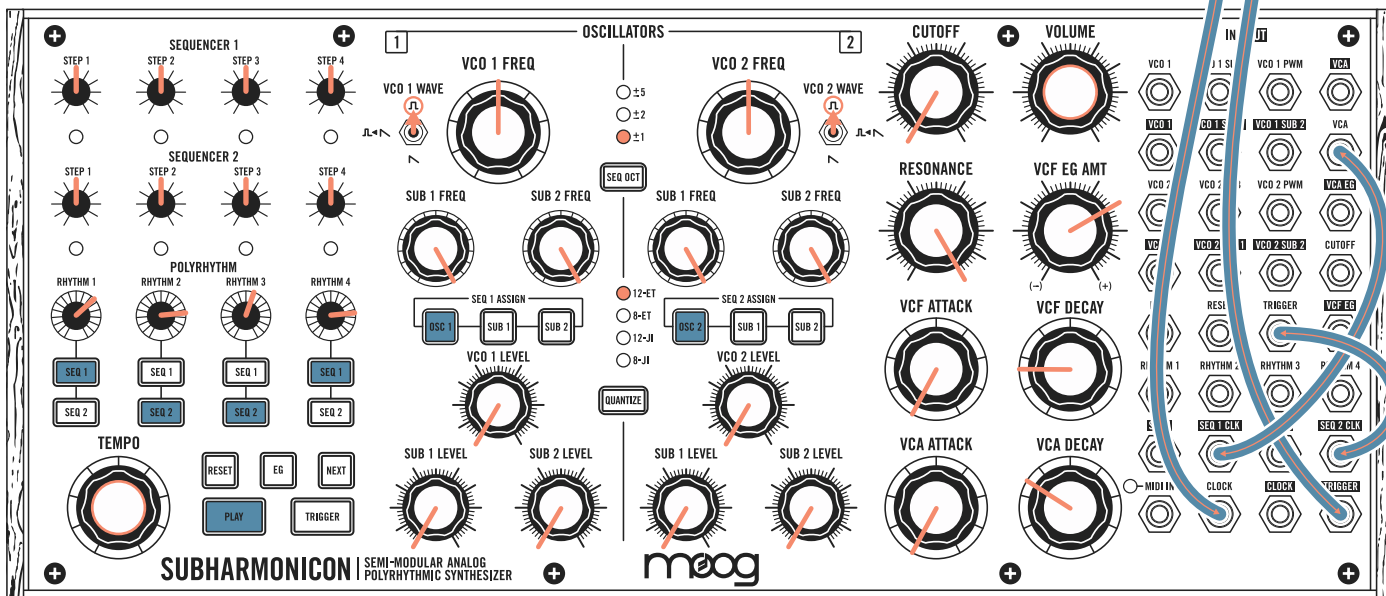
Freaky Friday

Match all knobs, switches, and patch locations to the graphics below.

DFAM



SUBHARMONICON



NOTES

Use the suggested sequences, or create new sequences on Subharmonic ([Lesson 1](#)).

Use the **ADVANCE** button on DFAM to set the sequencer to step 8.

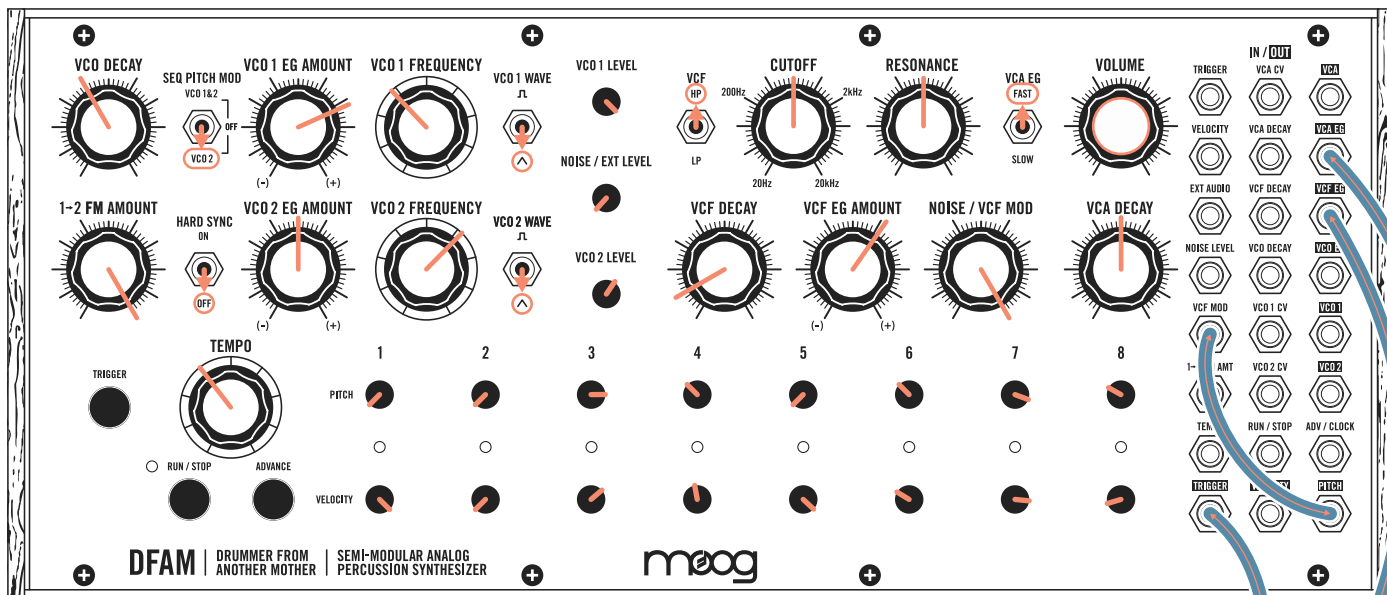
Press **PLAY** on Subharmonic, and press **RUN/STOP** on DFAM.

Adjust **RHYTHM** knobs on Subharmonic for pattern variation.

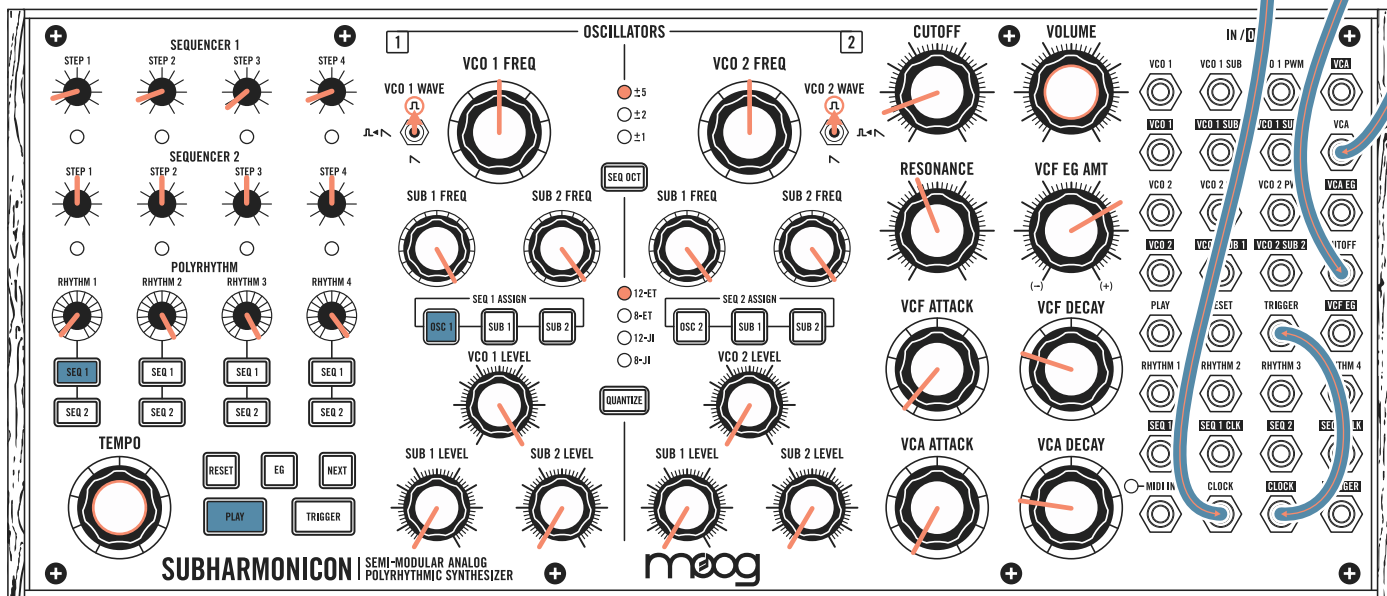
Thumper

Match all knobs, switches, and patch locations to the graphics below.

DFAM



SUBHARMONICON



NOTES

Use the suggested sequences, or create new sequences on Subharmonic ([Lesson 1](#)).

Use the **ADVANCE** button on DFAM to set the sequencer to step 8.

Press **PLAY** on Subharmonic, and press **RUN/STOP** on DFAM.

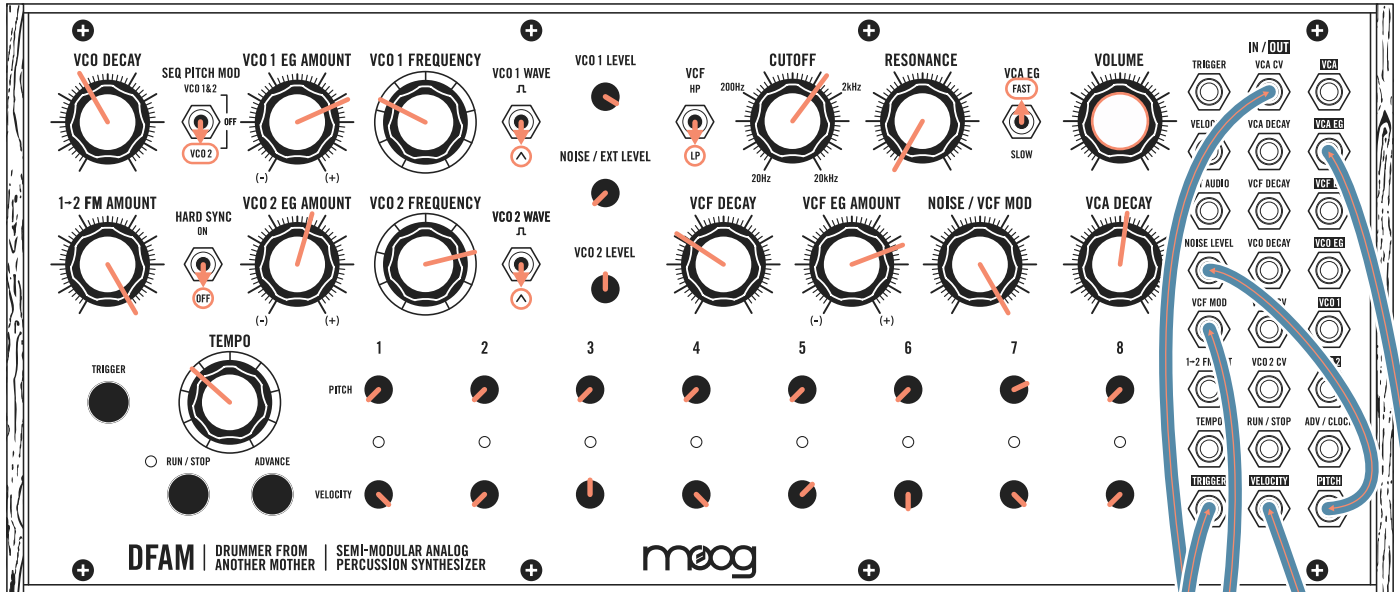
Adjust DFAM **PITCH SEQUENCER** for tonal variations on the rhythm.

Adjust Subharmonic's **CUTOFF** knob for acidic goodness.

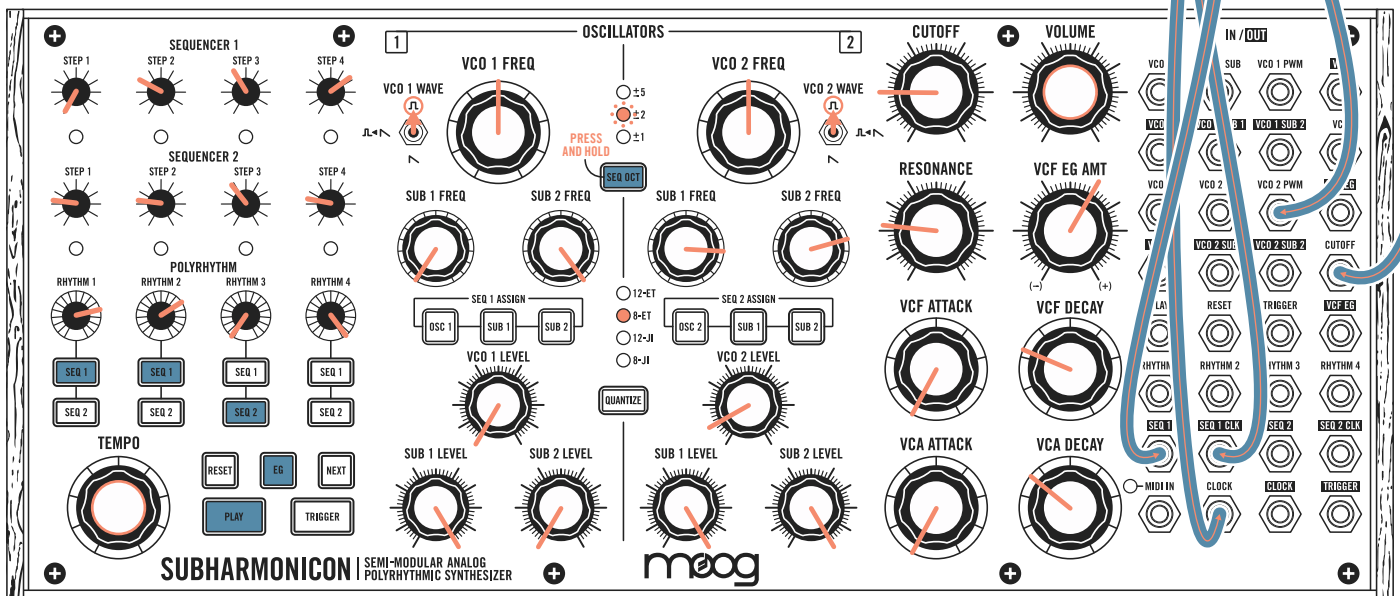
With Yr Hips

Match all knobs, switches, and patch locations to the graphics below.

DFAM



SUBHARMONICON



NOTES

Use the suggested sequences, or create new sequences on Subharmonic ([Lesson 1](#)).

Use the **ADVANCE** button on DFAM to set the sequencer to step 8.

Press **PLAY** on Subharmonic, and press **RUN/STOP** on DFAM.

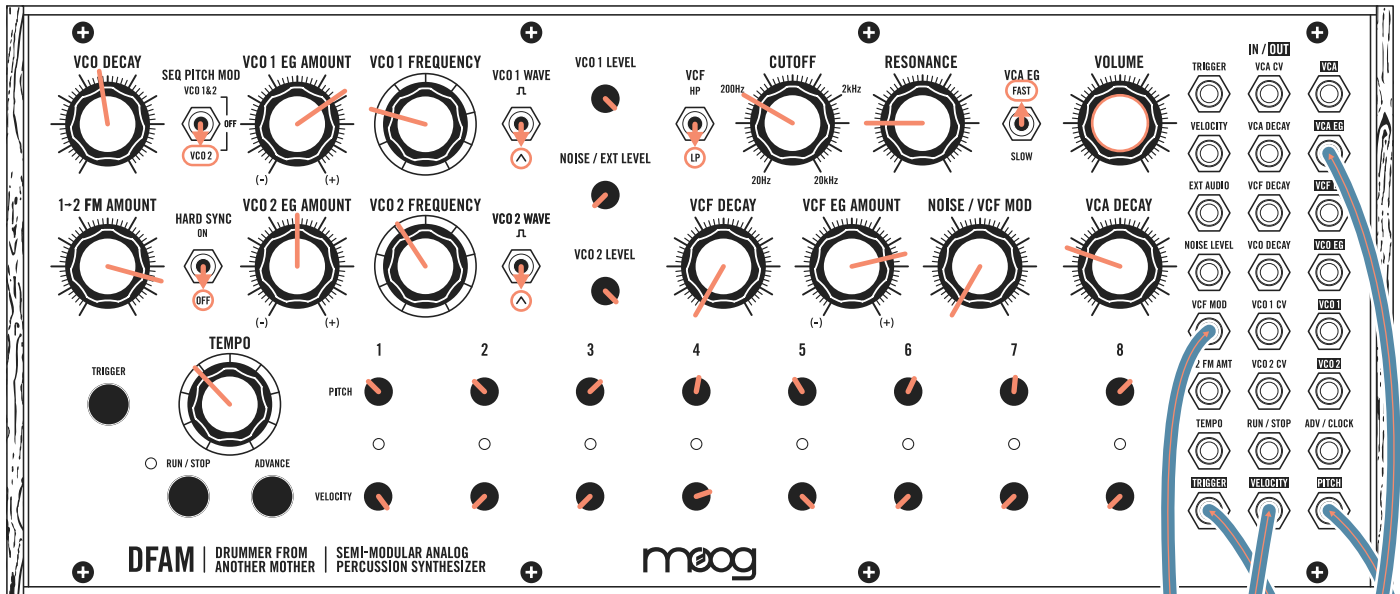
Press and hold the **SEQ OCT** button on Subharmonic until the ± 2 LED indicator starts blinking.

Adjusting the **VCA DECAY** setting on DFAM will have a dramatic effect on the whole patch.

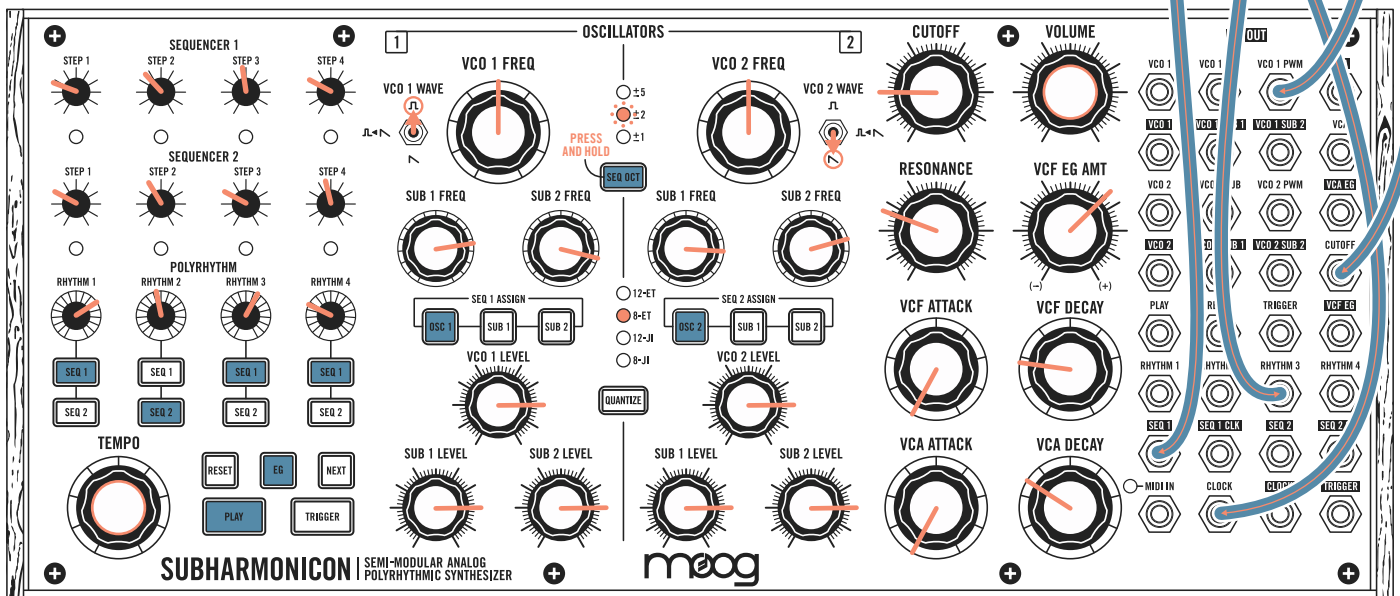
Open Windows

Match all knobs, switches, and patch locations to the graphics below.

DFAM



SUBHARMONICON



NOTES

- Use the suggested sequences, or create new sequences on Subharmonic ([Lesson 1](#)).
- Use the **ADVANCE** button on DFAM to set the sequencer to step 8.
- Press **PLAY** on Subharmonic, and press **RUN/STOP** on DFAM.
- Press and hold the **SEQ OCT** button on Subharmonic until the ± 2 LED indicator starts blinking.
- Adjust DFAM **VELOCITY SEQUENCER** for interesting rhythmic variation.
- Adjust Subharmonic **SEQUENCER 1** to control the filtering on DFAM.

Growing Through The Cracks

Match all knobs, switches, and patch locations to the graphics below.

DFAM

DFAM DRUMMER FROM ANOTHER MOTHER | SEMI-MODULAR ANALOG PERCUSSION SYNTHESIZER

moog

SUBHARMONICON

SUBHARMONICON | SEMI-MODULAR ANALOG POLYRHYTHMIC SYNTHESIZER

moog

NOTES

Use the suggested sequences, or create new sequences on Subharmonic ([Lesson 1](#)).

Use the **ADVANCE** button on DFAM to set the sequencer to step 8.

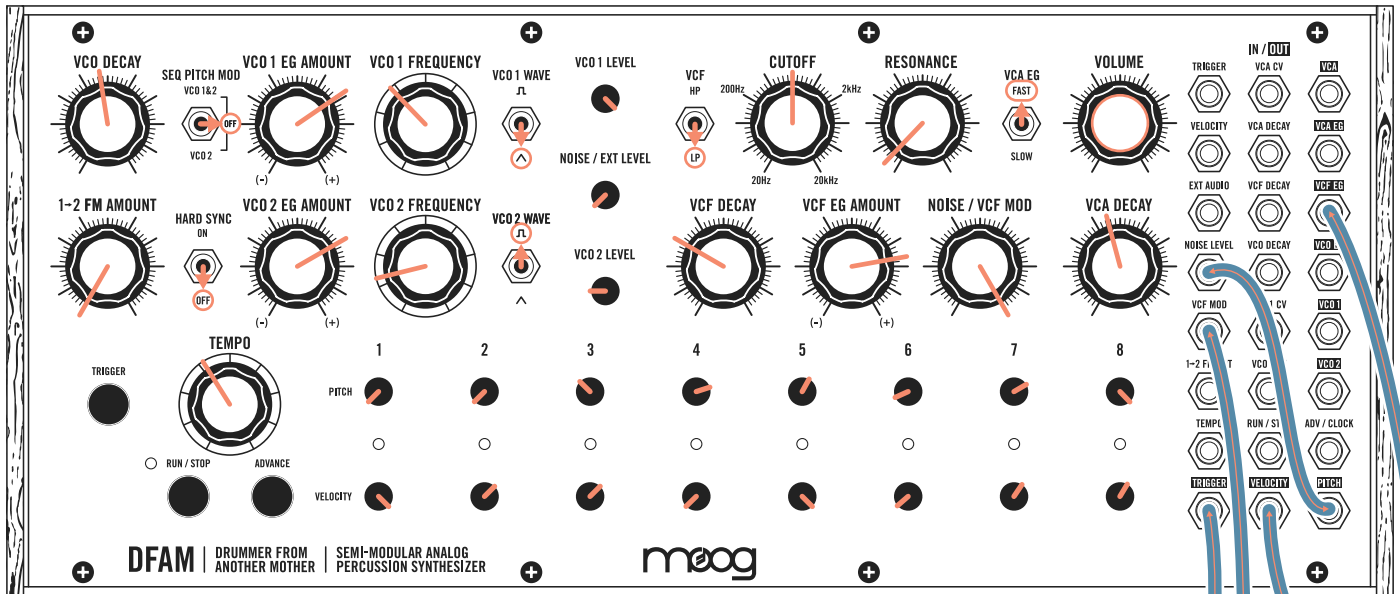
Press **PLAY** on Subharmonic, and press **RUN/STOP** on DFAM.

Each instrument's sequencers will impact the other instrument. Adjust all sequences to explore this relationship.

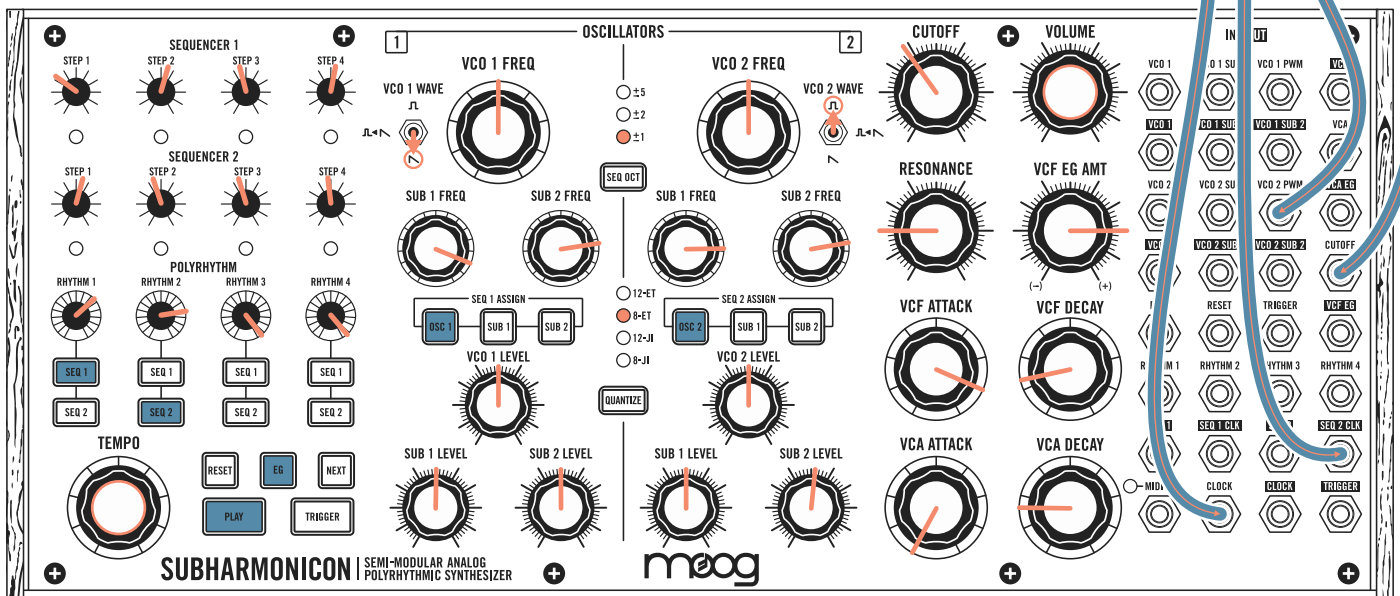
Hot Steps

Match all knobs, switches, and patch locations to the graphics below.

DFAM



SUBHARMONICON



NOTES

Use the suggested sequences, or create new sequences on Subharmonic ([Lesson 1](#)).

Use the **ADVANCE** button on DFAM to set the sequencer to step 8.

Press **PLAY** on Subharmonic, and press **RUN/STOP** on DFAM.

Adjust DFAM VCF EG AMT knob to control both instruments' filters.

Stretch Before It's Strenuous

Match all knobs, switches, and patch locations to the graphics below.

DFAM

DFAM DRUMMER FROM ANOTHER MOTHER | SEMI-MODULAR ANALOG PERCUSSION SYNTHESIZER

meoog

SUBHARMONICON

SUBHARMONICON | SEMI-MODULAR ANALOG POLYRHYTHMIC SYNTHESIZER

meoog

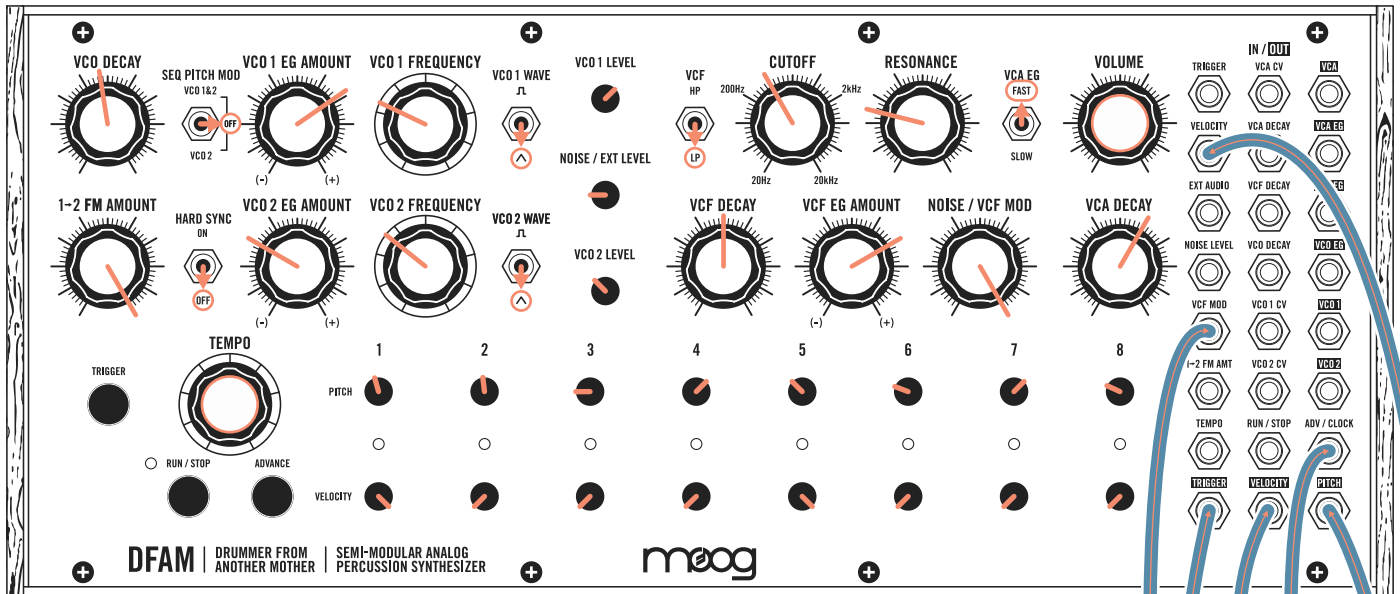
NOTES

- Use the suggested sequences, or create new sequences on Subharmonic ([Lesson 1](#)).
- Use the **ADVANCE** button on DFAM to set the sequencer to step 8.
- Press **PLAY** on Subharmonic, and press **RUN/STOP** on DFAM.
- Adjust DFAM **VELOCITY SEQUENCER** knobs for rhythmic variation on both instruments.

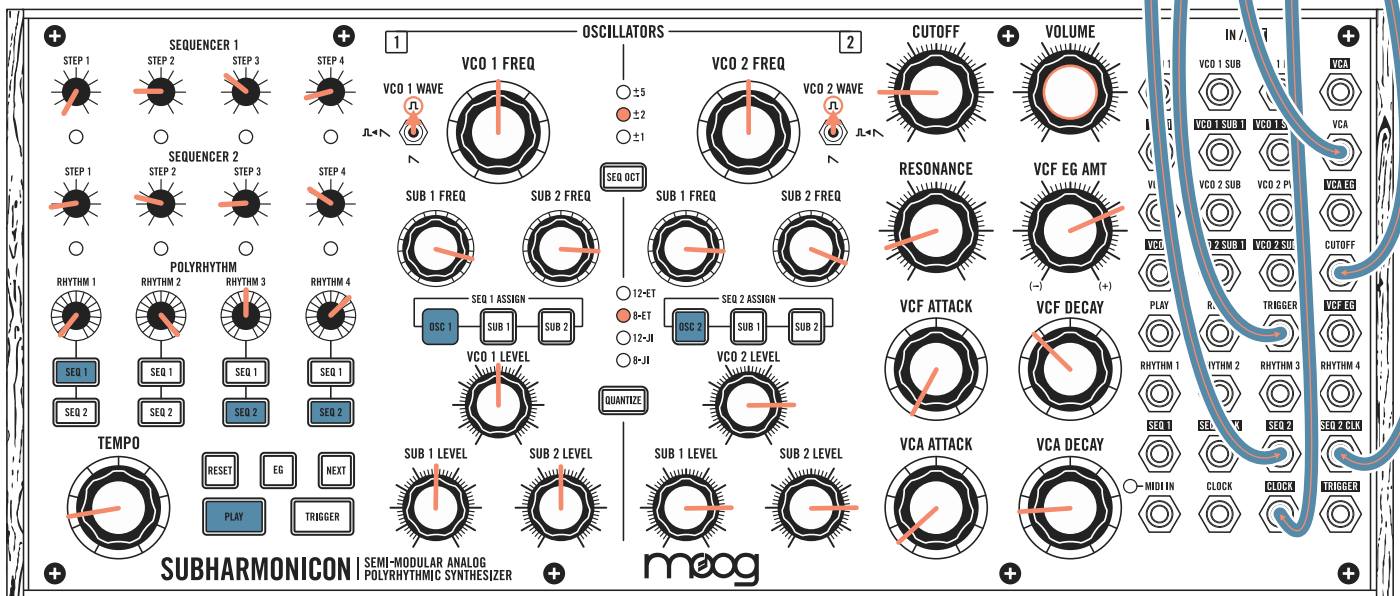
Mixed Messages

Match all knobs, switches, and patch locations to the graphics below.

DFAM



SUBHARMONICON



NOTES

Use the suggested sequences, or create new sequences on Subharmonic ([Lesson 1](#)).

Use the **ADVANCE** button on DFAM to set the sequencer to step 8.

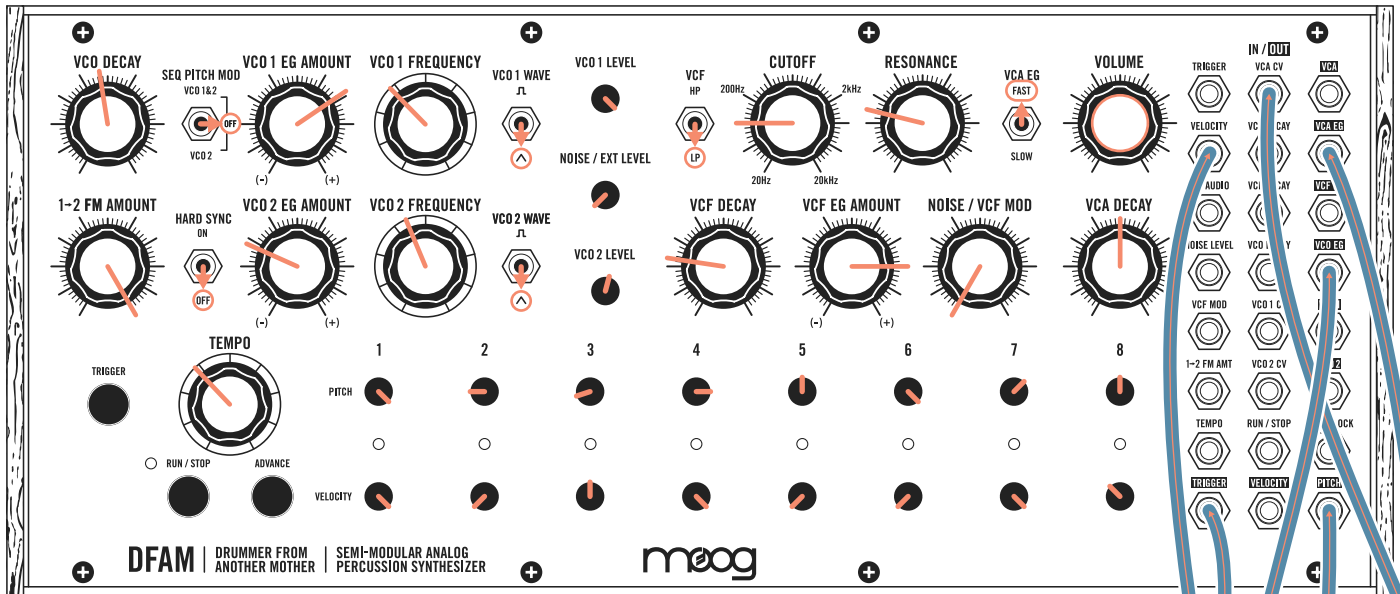
Press **RUN/STOP** on DFAM, and press **PLAY** on Subharmonic.

Adjust DFAM **PITCH SEQUENCER** and Subharmonic **SEQUENCER 2** for interesting filter variation.

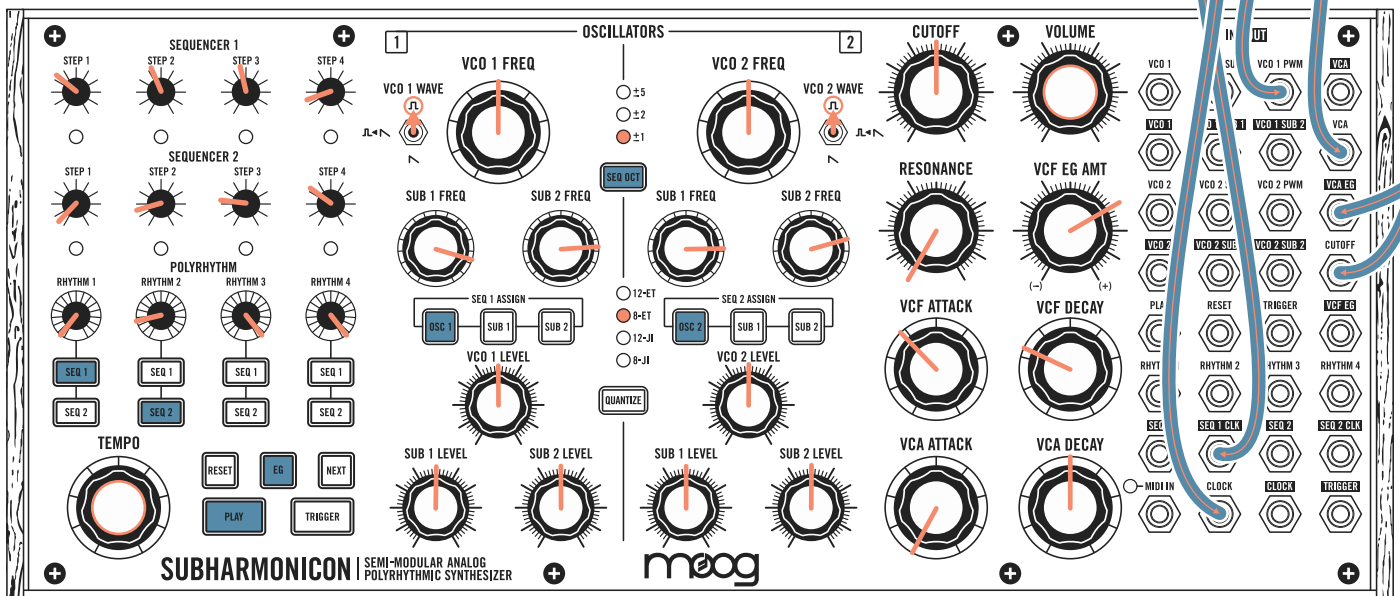
Salute The Morning

Match all knobs, switches, and patch locations to the graphics below.

DFAM



SUBHARMONICON



NOTES

Use the suggested sequences, or create new sequences on Subharmonic ([Lesson 1](#)).

Use the **ADVANCE** button on DFAM to set the sequencer to step 8.

Press **PLAY** on Subharmonic, and press **RUN/STOP** on DFAM.

Adjusting either instrument's VCA envelopes will impact the other instrument.

Alien Drum Circle

Match all knobs, switches, and patch locations to the graphics below.

DFAM

The DFAM interface includes the following controls and their patch settings:

- VCO DECAY: 10 o'clock
- SEQ PITCH MOD: OFF
- VCO 1 EG AMOUNT: 12 o'clock
- VCO 1 FREQUENCY: 12 o'clock
- VCO 1 WAVE: Sine
- VCO 1 LEVEL: 12 o'clock
- VCF HP: OFF
- CUTOFF: 200Hz
- RESONANCE: 10 o'clock
- VCA EG: FAST
- VOLUME: 12 o'clock
- 1-2 FM AMOUNT: 10 o'clock
- HARD SYNC: OFF
- VCO 2 EG AMOUNT: 12 o'clock
- VCO 2 FREQUENCY: 12 o'clock
- VCO 2 WAVE: Sine
- VCO 2 LEVEL: 12 o'clock
- VCF DECAY: 10 o'clock
- VCF EG AMOUNT: 12 o'clock
- NOISE / VCF MOD: 10 o'clock
- VCA DECAY: 12 o'clock
- TRIGGER: ON
- TEMPO: 10 o'clock
- PITCH: 12 o'clock
- VELOCITY: 10 o'clock
- IN / OUT: VCA CV, VCA EG, VCF DECAY, VCF EG, VCO 1 CV, VCO 2, 1-2 FM AMT, 12 CV, ADV / CLOCK, TRIGGER, VELOCITY, PITCH

SUBHARMONICON

The SUBHARMONICON interface includes the following controls and their patch settings:

- SEQUENCER 1: STEP 1, 2, 3, 4
- SEQUENCER 2: STEP 1, 2, 3, 4
- POLYRHYTHM: RHYTHM 1, 2, 3, 4
- TEMPO: 10 o'clock
- OSCILLATORS: VCO 1 FREQ: 12 o'clock, VCO 2 FREQ: 12 o'clock, SUB 1 FREQ: 12 o'clock, SUB 2 FREQ: 12 o'clock, VCO 1 WAVE: Sine, VCO 2 WAVE: Sine, VCO 1 LEVEL: 12 o'clock, VCO 2 LEVEL: 12 o'clock, SUB 1 LEVEL: 12 o'clock, SUB 2 LEVEL: 12 o'clock
- CUTOFF: 200Hz
- RESONANCE: 10 o'clock
- VOLUME: 12 o'clock
- VCF EG AMT: 12 o'clock
- VCF ATTACK: 10 o'clock
- VCF DECAY: 12 o'clock
- VCA ATTACK: 10 o'clock
- VCA DECAY: 12 o'clock
- IN / OUT: VCO 1, VCO 2, VCF DECAY, VCF EG, VCO 1 CV, VCO 2, 1-2 FM AMT, 12 CV, ADV / CLOCK, TRIGGER, VELOCITY, PITCH

NOTES

- Use the suggested sequences, or create new sequences on Subharmonic ([Lesson 1](#)).
- Use the **ADVANCE** button on DFAM to set the sequencer to step 8.
- Press **PLAY** on Subharmonic, and press **RUN/STOP** on DFAM.
- Adjusting both DFAM sequencers will control the whole patch.

Better Together

Match all knobs, switches, and patch locations to the graphics below.

DFAM

The DFAM control panel features various knobs and switches. The highlighted elements are:

- VCO 1 EG AMOUNT knob
- VCO 1 FREQUENCY knob
- VCO 1 WAVE switch
- VCO 1 LEVEL knob
- VCF HP switch
- CUTOFF knob
- RESONANCE knob
- VCA EG FAST/SLOW switch
- VOLUME knob
- TRIGGER patch location
- VELOCITY patch location
- VCO 2 EG AMOUNT knob
- VCO 2 FREQUENCY knob
- VCO 2 WAVE switch
- VCO 2 LEVEL knob
- VCF DECAY knob
- VCF EG AMOUNT knob
- NOISE / VCF MOD knob
- VCA DECAY knob
- TRIGGER patch location
- VELOCITY patch location
- PITCH patch location

SUBHARMONICON

The SUBHARMONICON control panel features various knobs and switches. The highlighted elements are:

- VCO 1 FREQ knob
- VCO 1 WAVE switch
- VCO 2 FREQ knob
- VCO 2 WAVE switch
- CUTOFF knob
- VOLUME knob
- RESONANCE knob
- VCF EG AMT knob
- VCF ATTACK knob
- VCF DECAY knob
- VCA ATTACK knob
- VCA DECAY knob
- TRIGGER patch location
- VELOCITY patch location
- PITCH patch location

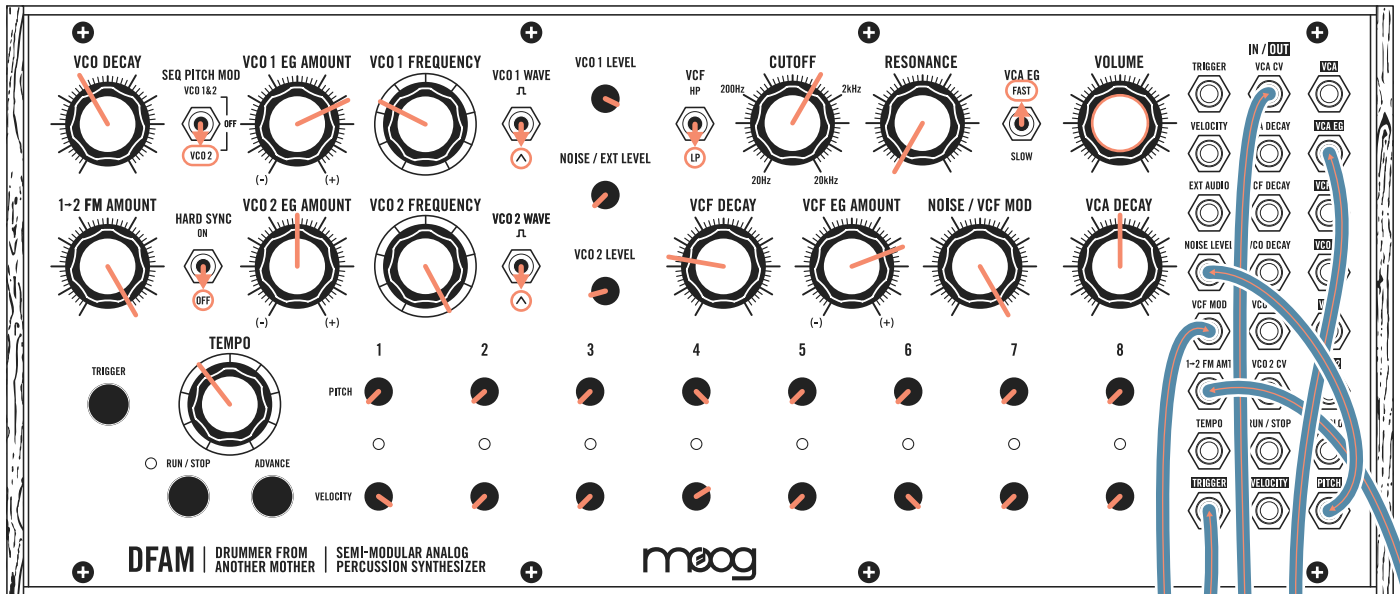
NOTES

- Tune DFAM oscillators to a unison by matching **VCO 1 FREQUENCY** and **VCO 2 FREQUENCY** knob positions.
- Tune Subharmonic oscillators to a unison a perfect fifth above the DFAM oscillators (or tune to preference).
- Tune Subharmonic sub oscillators to taste creating four-note chords between the two instruments.
- Use the suggested sequences, or create new sequences on Subharmonic ([Lesson 1](#)).
- Use the **ADVANCE** button on DFAM to set the sequencer to step 8.
- Press **RUN/STOP** on DFAM, and press **PLAY** on Subharmonic.

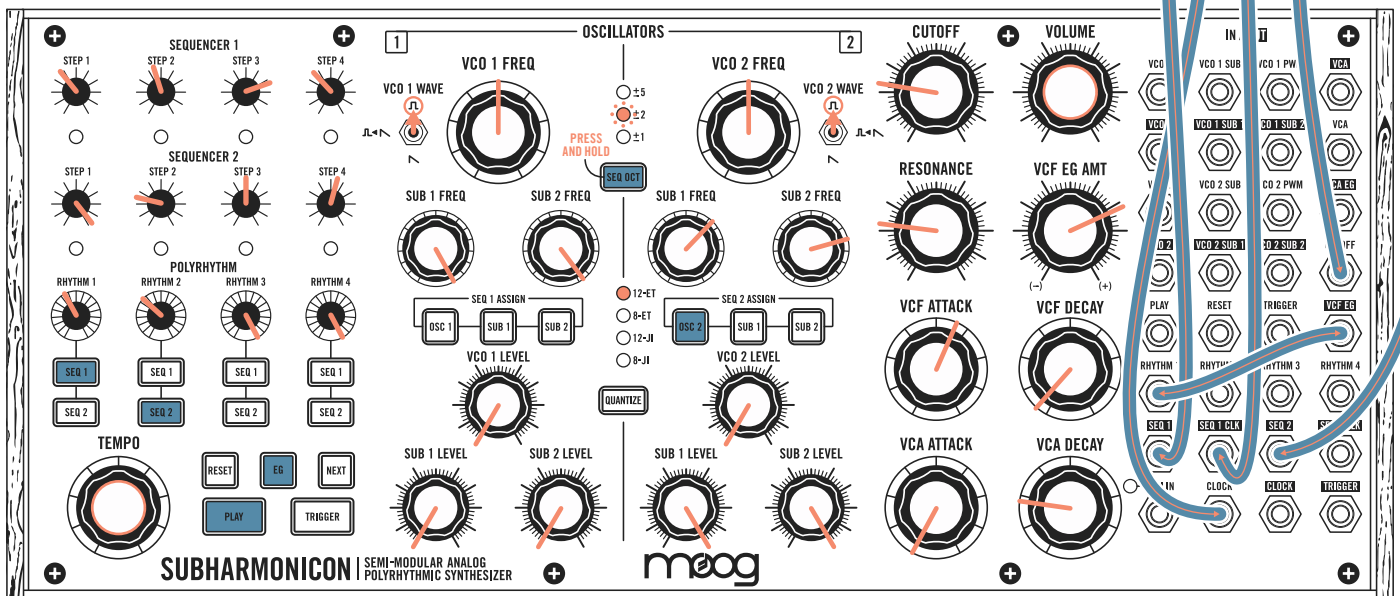
Constant Elevation

Match all knobs, switches, and patch locations to the graphics below.

DFAM



SUBHARMONICON



NOTES

Use the suggested sequences, or create new sequences on Subharmonic ([Lesson 1](#)).

Use the **ADVANCE** button on DFAM to set the sequencer to step 8.

Press **PLAY** on Subharmonic, and press **RUN/STOP** on DFAM.

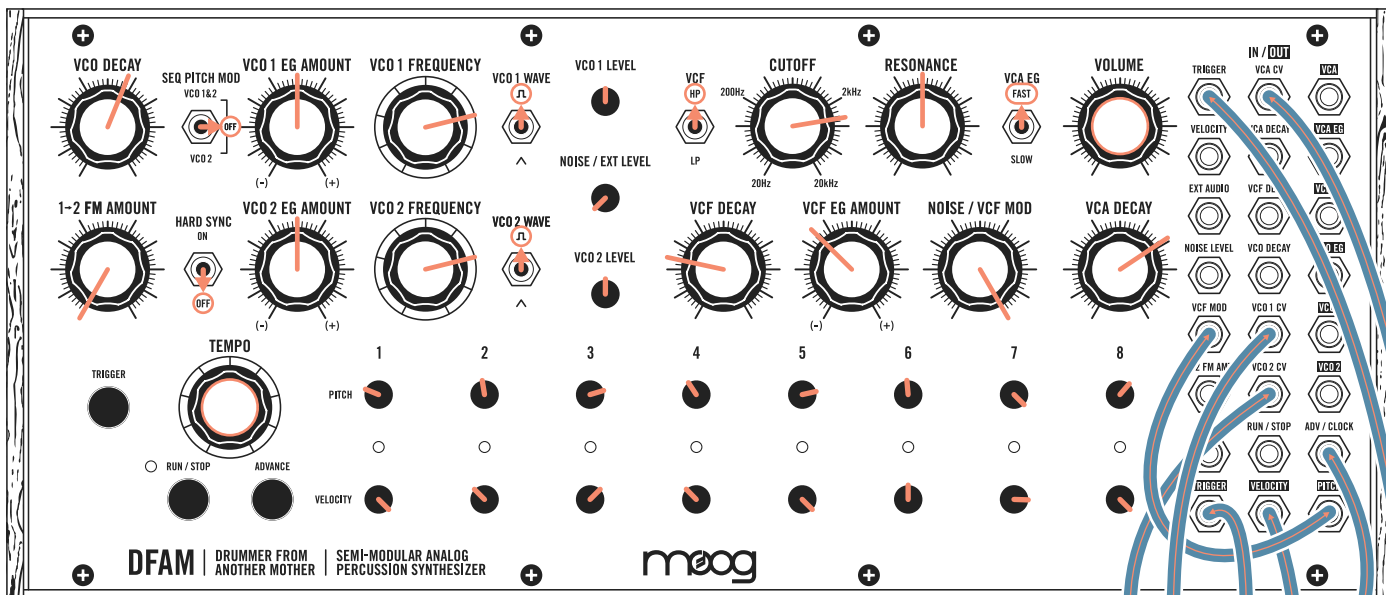
Press and hold the **SEQ OCT** button on Subharmonic until the ± 2 LED indicator starts blinking.

Adjusting Subharmonic **SEQUENCER 1** or **2** will affect the tone of DFAM.

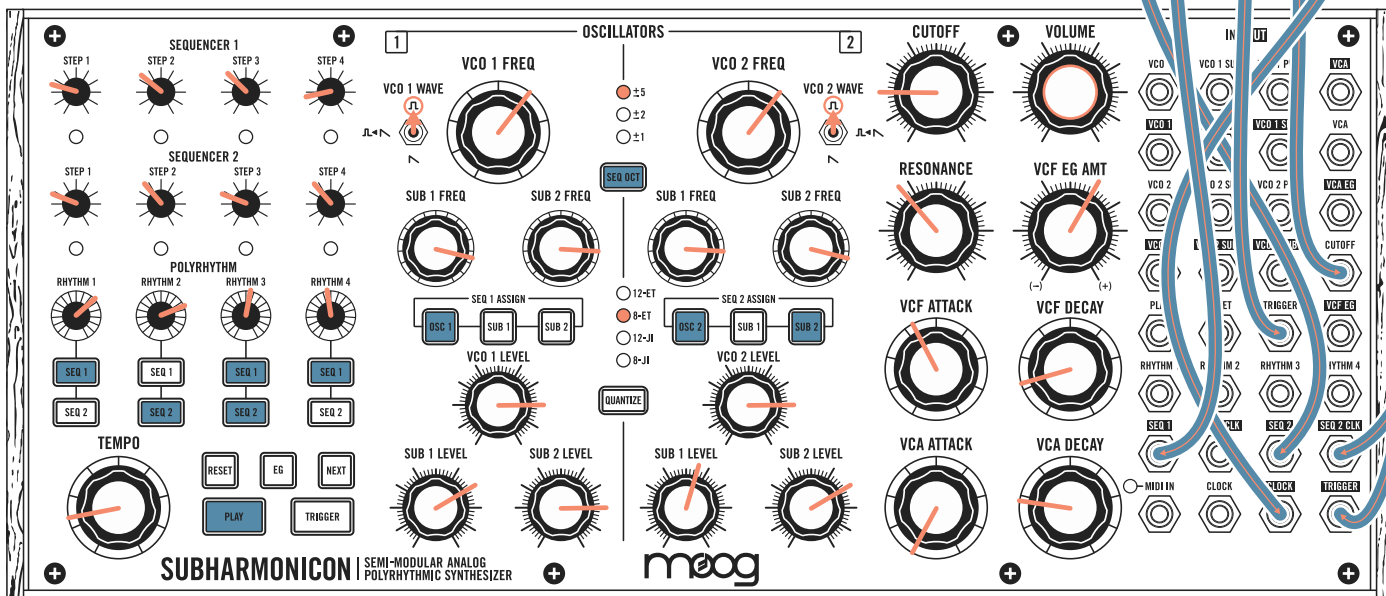
Lattice

Match all knobs, switches, and patch locations to the graphics below.

DFAM



SUBHARMONICON

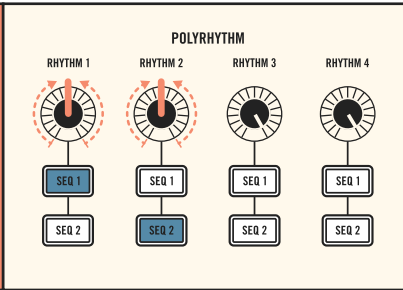


NOTES

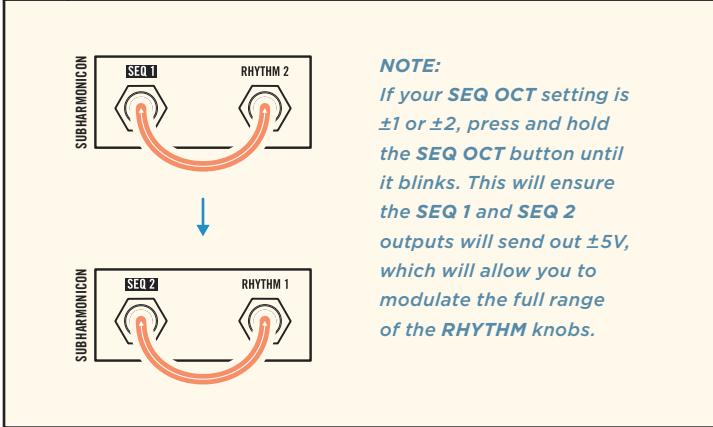
- Tune DFAM oscillators to a unison by matching **VCO 1 FREQUENCY** and **VCO 2 FREQUENCY** knob positions.
- Tune Subharmonic oscillators to a pleasing interval.
- Tune Subharmonic sub oscillators to taste for extra intervals.
- Use the suggested sequences, or create new sequences on Subharmonic ([Lesson 1](#)).
- Use the **ADVANCE** button on DFAM to set the sequencer to step 8.
- Press **RUN/STOP** on DFAM, and press **PLAY** on Subharmonic.

TIPS & TRICKS + VARYING SUBHARMONICON'S RHYTHMS WITH MODULATION +

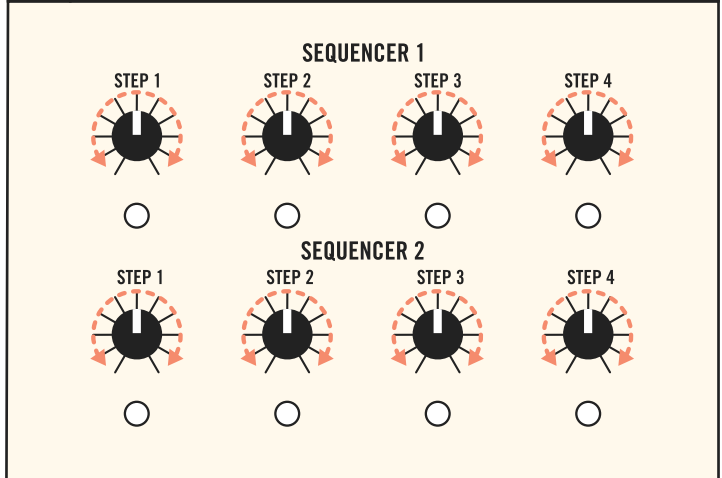
1 Assign RHYTHM 1 to SEQ 1, and RHYTHM 2 to SEQ 2. Set both RHYTHM knobs to their middle position.



2 Patch the output of SEQ 1 to the input of RHYTHM 2, and patch the output of SEQ 2 to the input of RHYTHM 1.



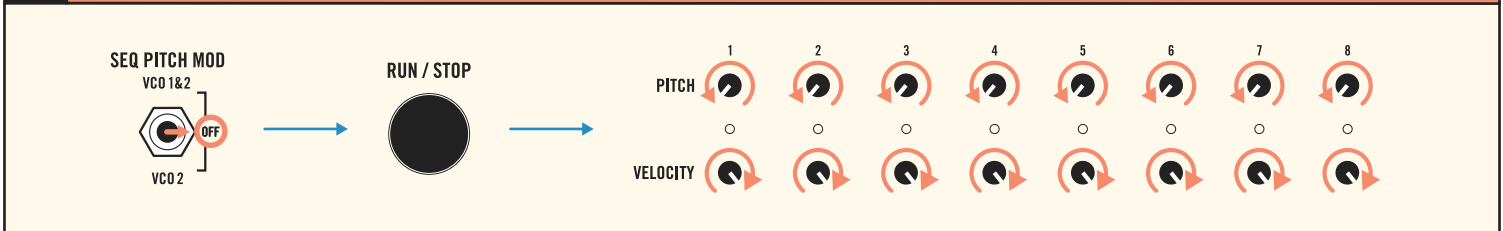
3 Play with the SEQ 1 and SEQ 2 note settings and notice how they alter the opposing sequence's timing.



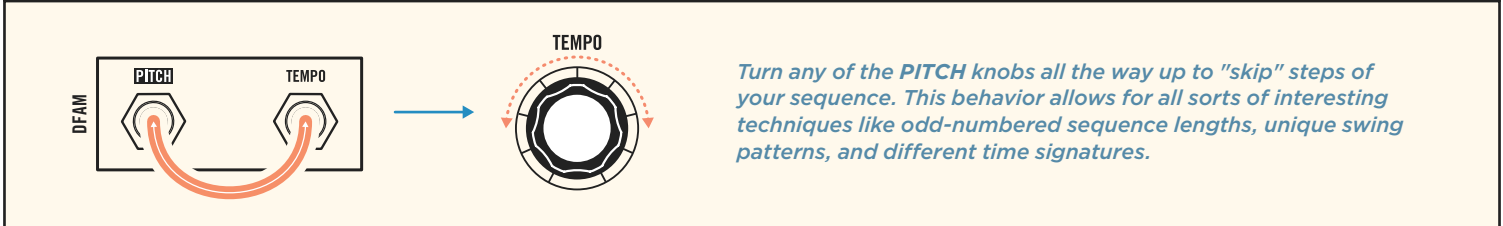
TRY THIS! Use different voltage outputs like the VCF EG or VCA EG, and explore how they affect the rhythms differently.

TIPS & TRICKS + EXPLORING ALTERNATE METERS AND PATTERN LENGTHS ON DFAM +

1 Begin by making sure the SEQ PITCH MOD switch on DFAM is set to OFF. Next, press the RUN/STOP button to start a sequence. In the sequencer section, turn all the VELOCITY knobs all the way up so you can hear a note on each step, then turn all the PITCH knobs all the way down.

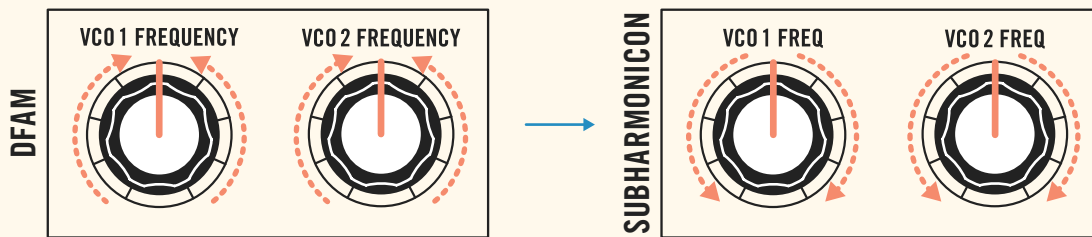


2 Next, patch a cable from the PITCH output to the TEMPO input on DFAM. You'll notice that the tempo will slow down considerably. Use the TEMPO knob to readjust the sequencer speed to your liking.

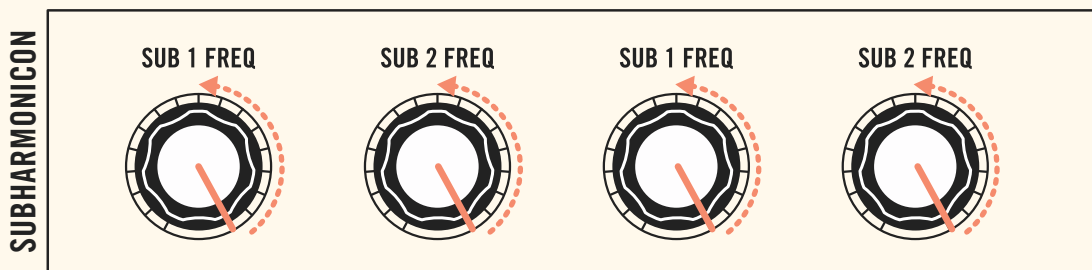


TRY THIS! Patch DFAM's VELOCITY output to one of Subharmonicon's RHYTHM inputs (1-4) for further interrelated rhythmic variation.

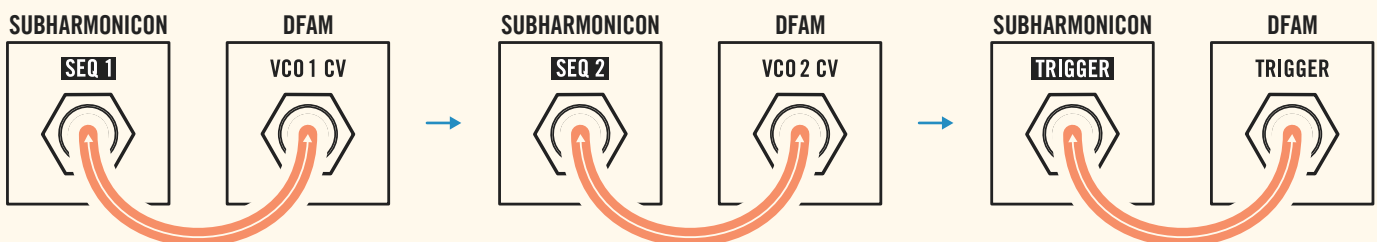
1 Tune both VCOs on DFAM to a unison (the same note). Then tune the VCOs on Subharmonic to a pleasing interval.



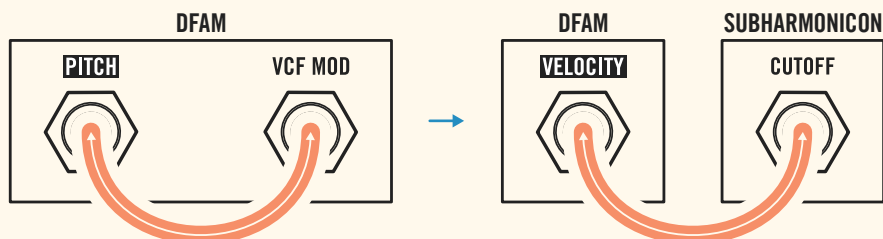
2 Tune the two pairs of Subharmonic's sub oscillators to pleasing intervals with their respective oscillators.



3 Patch the **SEQ 1** output from Subharmonic to the **VCO 1** input on DFAM, and patch the **SEQ 2** output from Subharmonic to the **VCO 2** input on DFAM. Then, patch the **TRIGGER** output on Subharmonic to the **TRIGGER** input on DFAM. Now both sequencers on Subharmonic will each control two VCOs and two sub oscillators, allowing for more complex voicings.



TRY THIS! Patch the **PITCH** output on DFAM to the **VCF MOD** input on DFAM, and the **VELOCITY** output on DFAM to the **CUTOFF** input on Subharmonic to add filter variation within your paraphonic voices.



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