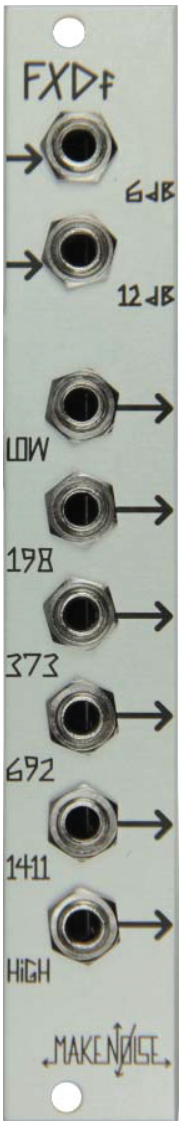
FXDf



v2.3

FXDf

Limited WARRANTY:

Make Noise warrants this product to be free of defects in materials or construction for a period of one year from the date of purchase (proof of purchase/invoice required).
Malfunction resulting from wrong power supply voltages, backwards or reversed eurorack bus board cable connection, abuse of the product or any other causes determined by Make Noise to be the fault of the user are not covered by this warranty, and normal service rates will apply.

During the warranty period, any defective products will be repaired or replaced, at the option of Make Noise, on a return-to-Make Noise basis with the customer paying the transit cost to Make Noise. Please contact technical@makenoisemusic.com for Return To Manufacturer Authorization.

Make Noise implies and accepts no responsibility for harm to person or apparatus caused through operation of this product.

Please contact technical@makenoisemusic.com with any questions, needs & comments, otherwise...
go MAKE NOISE!

http://www.makenoisemusic.com

About This Manual:
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Edited by Walker Farrell
Illustrated by W.Lee Coleman

Special Thanks to RxMx and Op-Amps

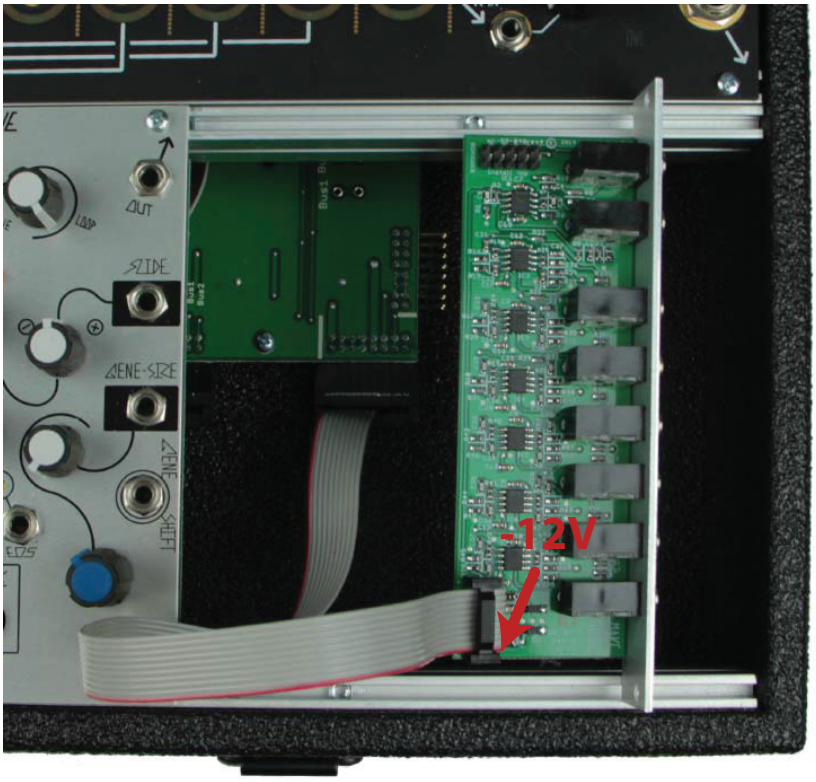
Electrocution hazard!

Always turn the Eurorack case off and unplug the power cord before plugging or un-plugging any Eurorack bus board connection cable cable.
Do not touch any electrical terminals when attaching any Eurorack bus board cable.

The Make Noise FXDf is an electronic music module requiring 27 of +12VDC and 27 mA of -12VDC regulated voltages and a properly formatted distribution receptacle to operate. It must be properly installed into a Eurorack format modular synthesizer system case.

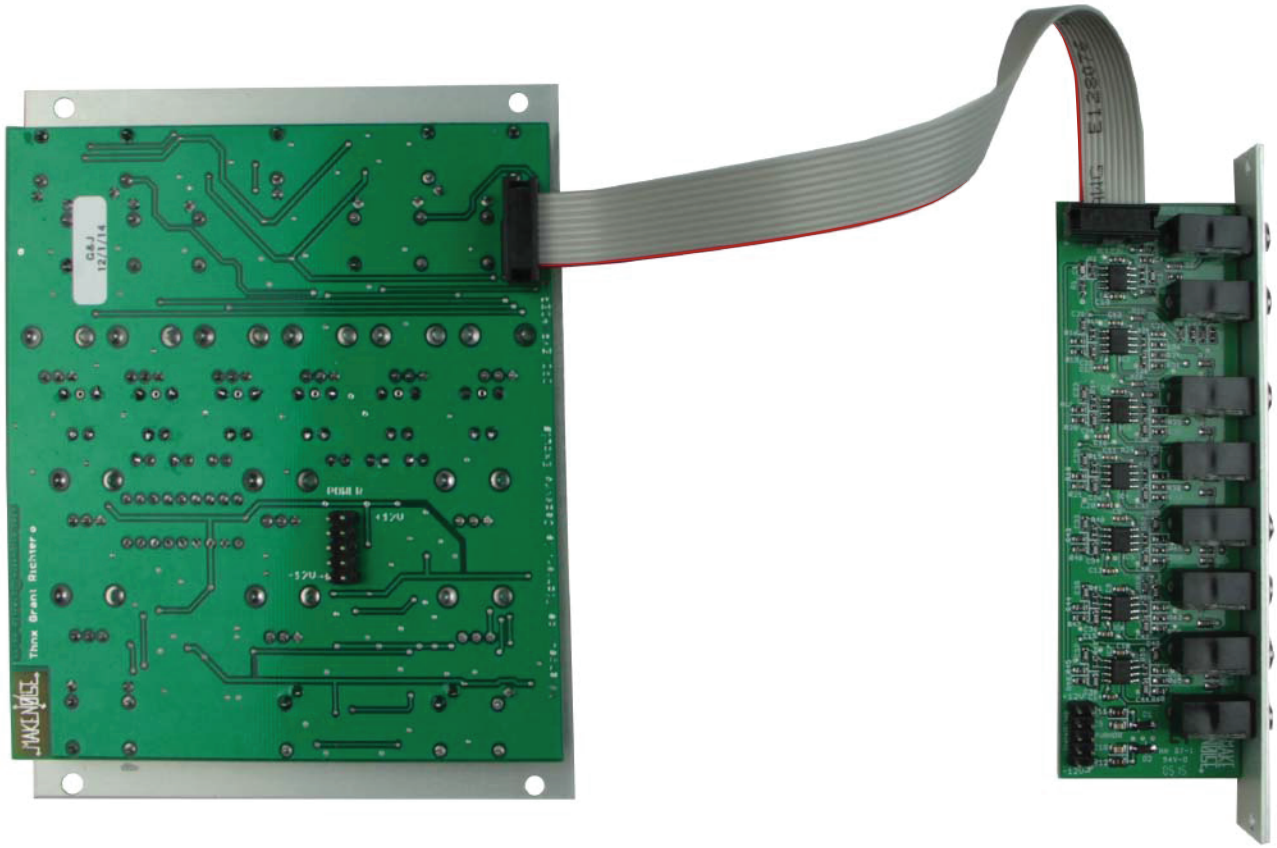
Go to http://www.makenoisemusic.com/systems.shtml for examples of Eurorack Systems and Cases.

To install, find 4HP in your Eurorack synthesizer case, confirm proper installation of included eurorack bus board connector cable on backside of module (see picture below), plug the bus board connector cable into the Eurorack style bus board, minding the polarity so that the RED stripe on the cable is oriented to the NEGATIVE 12 Volt line on both the module and the bus board. On the Make Noise 6U or 3U Busboard, the negative 12 Volt line is indicated by the white stripe.



Please refer to your case manufacturers' specifications for location of the negative supply.

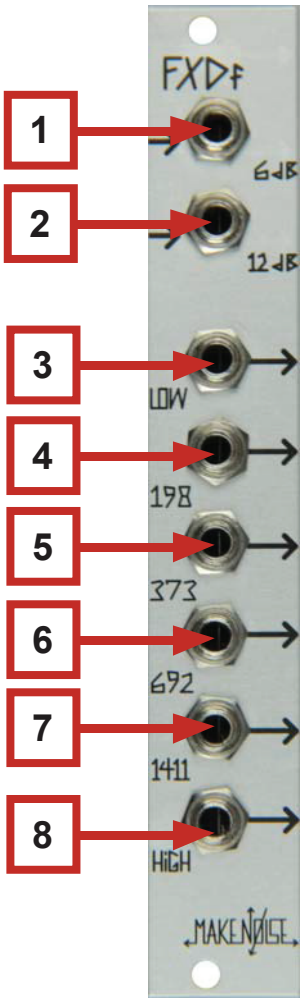
The OUTputs of the Make Noise FXDf can be normalled to the 6 Channels of the RxMx by using a 10-pin chain connector cable included with the RxMx) and connected as indicated below.



The FXDf is a 6 Band Fixed Filter bank, offering simultaneous 6db/ Octave and 12db/ Octave inputs. The 6 filter bands are spaced at roughly 11 to 13 semitones, covering a range of around 6 octaves. The FXDf is useful for isolating a particular portion of the spectrum for mixing and analog or digital signal processing such as ring modulation, amplitude modulation, pitch-shifting and reverberation. The module also has a header behind the faceplate allowing for normalled connection of the 6 filter band outputs to the 6 inputs of RxMx allowing for Voltage-Controlled, percussive, spectral animation. See page 4 for instructions on connecting the FXDf expansion header to the RxMx.

In the past, the Serge System Fixed Filter used a 6db/ Octave filters, while the Moog Modular used 12db/ Octave filters. We liked the sound of both filter slopes, so we implemented a way to use either or both simultaneously. In this way, the FXDf also allows for blending of two audio signals. Traditionally, Fixed Filters are large modules having 8 to 10 bands-- each with a manual level control, but rarely having any Voltage Control. The FXDf is so small, we even had to abbreviate the words Fixed Filter! Also, by providing individual outputs, in addition to a header for normalled connection to our RxMx 6-Channel Macro-Low Pass Gate module, Voltage Control over the Level of each Filter band is possible through patching. We selected the 6 bands we found to produce the most sonic energy within a typical Make Noise system patch. We also took care to space them wide enough that each of the bands could be distinct from the others. This makes for quite an impactful sound when independently modulating the amplitudes of the 6 bands using the RxMx or VCAs.

The FXDf contains 100% analog filters for musical applications and is not suitable for laboratory use.



FXDf Panel Controls (Note: All frequency values are approximate)

1. 6db In: Inverting INput for 6db/ Octave filter slope. AC Coupled. Expects 10Vpp Audio signal.

2. 12db In: Non-inverting INput for 12db/ Octave filter slope. AC Coupled. Expects 10Vpp Audio signal.

3. LOW Out: Low Bass Range band output set to 78hz. Output amplitude dependent on source material, typically 5Vpp to 15Vpp.

4. 198hz Out: Bass Range band output. Output amplitude dependent on source material, typically 5Vpp to 15Vpp.

5. 373hz Out: Low Mid Range band output. Output amplitude dependent on source material, typically 5Vpp to 15Vpp.

6. 692hz Out: Mid Range band output. Output amplitude dependent on source material, typically 5Vpp to 15Vpp.

7. 1411hz Out: Upper Mid Range band output. Output amplitude dependent on source material, typically 5Vpp to 15Vpp.

8. HIGH Out: Low Treble Range band output set to 3000 hz. Output amplitude dependent on source material, typically 5Vpp to 15Vpp.

The FXDf is a small utility module, designed with the assumption the user already has some of the modules that will benefit from and/ or support the FXDf.

Both inputs on the FXDf are designed to accept typical 10Vpp modular signal levels; however, it could be highly useful to have a VCA, Attenuator, or some other form of Level Control in series with the inputs on the FXDf. Modules such as the Optomix, modDemix or MATHS are handy in providing level control prior to the inputs of the FXDf. This will allow for greater control over the drive of the filter circuits. Signals that are larger and more powerful will have the potential to overdrive the filter circuits, which may or may not be desired.

The 6db INput is milder and less resonant. The resulting sounds at the band outputs will retain more of the original character of the input signal. The 12db INput is aggressive and more resonant. The resulting sounds at the band OUTputs will have a character that is more distinct from the original sound at the INput. Keep in mind that both INputs could be used simultaneously to combine two sounds. The result is not exactly like typical mixing, as the two signals are combined using the filter circuits. Using both INputs also makes it easier to overdrive the filter circuits. In some cases, this makes for high harmonic signals at the band OUTputs, which is especially useful when percussively animating the spectrum.

The outputs of the FXDf have many uses, but almost all will be associated with other modules such as mixers, VCAs, Low Pass Gates, reverberation, echo, pitch-shifting, etc. A traditional use would be to patch some combination of the 6 filter band outputs to a mixer, and manually set the level of each band, thus recombining the bands at varied levels to sculpt the timbre of the sound. When patched this way, the FXDf combined with mixer will operate in a way similar to the original Moog Fixed Filter bank.

One combination that is certain to please is the FXDf and RxMx. In fact, there are headers on these modules that allows the user to make normalized connection (a connection that happens between the circuit boards) so that the 6 filter band outputs from the FXDf are connected to the 6 Channel INputs of the RxMx-- no patch cables required (**See Page 4, Expansion**). This combination allows for Voltage-Controlled, percussive animation of the spectrum.It is also possible to remove frequency bands from a sound by mixing the original, un-filtered signal with filter bands generated from the 6db Input, as those bands are inverted and will thus subtract from the original signal when mixed with it. This will also work with bands generated from the 12db Input as long as your mixer is capable of inverting the incoming signal, as the MATHS.

The FXDf could also be used as a static filter for a sound where one of the bands is selected based on the desired frequency range for the sound. This allows for fitting a sound into a mix by limiting the frequency range to a single band. For this, the 6db INput might be the better choice. In some cases, you might want to do parallel processing of a patch or sound. The FXDf allows for this by splitting the sounds into 6 bands: each of which could be processed in a number of ways. For instance, Amplitude or Ring Modulation using the modDemix, pitch-shifting using the Echophon, Reverberation using the Erbe-Verb, Low Pass or High Pass filtering using the MMG, Low Pass Gaing using the Optomix, etc. processing each band independently and then recombining using a mixer, it is possible to create highly complex sounds.

In some cases, you might desire to reverberate only Mid-Range frequencies, while you might want to Amplitude Modulate and distort Bass-Range frequencies. This usage treats the FXDf like an audio crossover. Other possible uses would be band-limiting feedback paths in patches, or selecting a single band for signal source in a MATHS Envelope Follower patch. As a utility, splitting the spectrum into individual bands has many creative uses that are sure to inspire when combined with a few other modules.

SpectralPlexer
-Take all six outputs of the FXDf as source cables for touching the Teleplexer.
-Patch the Teleplexer's outputs to three destinations of your choice and send pieces of sound through at will or randomly. If you have a RxMx, consider chaining it to the FXDf and patching the A, B and C outputs to the Aux INputs of the Teleplexer. Switch back and forth between automatic and manual distribution by modulating or not modulating the RxMx, and playing or not playing the source cables.

Redshift
-Sequence a DPO or STO and patch its sine wave output to either of the FXDf inputs. -Tailor the pitch range of the sequence so that the sound comes periodically through at least three of the FXDf outputs. -Patch each OUTput to a different processing destination. The different INputs will emphasize portions of the sequence differently.

Wormhole
-Patch an audio signal of your choice into either of the FXDf inputs. -Pick one of the three lower-frequency bands and patch its output to the Echophon.
-Patch the Echophon's Feedback output to the other FXDf input, and patch another band's output to the Echophon's Feedback input.
-Monitor the Signal Out from the Echophon. Consider adding a VCA in series with the signal path at any or multiple point(s). If FXDf is chained to a RxMx, try substituting the B OUTput for one of the frequency band outputs, and manipulate the RxMx animation controls for playable variation within the feedback path. All parameters of the Echophon will also have a great effect on the sound.

Reanimation
-Record a rhythmic motif into the Phonogene using a static low-frequency waveform with little harmonic content, such as a sine or triangle, as the sound source (ideally, this wave will be patched through a VCA or LPG and rhythmically animated).
-Splice to taste, then, setting SOS to noon, overdub a different but related rhythm using a higher-frequency waveform.
-Set SOS to Loop and patch the Phonogene's output to the 6dB input of the FXDf.
-Find the two bands that sound loudest and patch them to Ch1 and Ch4 of MATHS, or to two Functions.
-Set both Channels up as Envelope Followers using the patch from the MATHS/Function manual.
-Patch the MATHS or Function signal outs to recreate the two rhythms. Manipulate rhythms using Gene Size and Slide controls on the Phonogene. If you have more than two MATHS channels, you could overdub a third rhythm at its own frequency, or shift the rhythms up or down the FXDf outputs by manipulating the Phonogene's Vari-Speed control, allowing new envelope followers to be sent to new destinations.

Click and Pop Beat Box patch (requires FXDf normalled to RxMx)
-Record Loop into Phonogene.
-Patch Phonogene Out to FXDf 12db In.
-Set Phonogene Gene Size to NOON, and later adjust to taste.
-Patch master clock or division of master clock to Gene Shift.
-Set Phonogen Vari-Speed to taste.
-Generate Cycling Function using either MATHS or FUNCTION module.
-Set Rise to about 1 o' Clock and Fall to about NOON, and later adjust for variation.
-Patch non-inverted Output from MATHS/FUNCTION Channel used to the RxMx Channel SELect CV In 1.
-Set CHANNEL panel control to Full CCW. Set CH SEL Attenuator to 5 o' Clock.
-Set RADIATE to Full CCW. -Patch master clock or gate sequence to RxMx Strike In and Set LEVEL to Full CCW. Monitor RxMx Out B. Now adjusting Rise and Fall times will generate variations. Adjusting Gene Size and Vari-Speed will vary the timbre. Use RxMx CH. Input Attenuators to adjust the mix.

Frequency Dependent FM
-Patch Modulating VCO Triangle or Sine to FXDf 6db or 12db IN. -Select Bands to patch to FM Destinations (carriers) such as the Linear and/ or Expo FM Inputs on the DPO or STO.
-Patch note sequence to the Modulating VCO (and Carrier VCO as well if used). As note sequence changes fundamental of the Modulating VCO, the different bands of the FXDf will produce more or less signal power and thus the FM Index will increase or decrease at each band output depending upon the frequency of the fundamental.