



For additional information, please visit the Bybee web site at www.BybeeLabs.com

INSTRUCTIONS FOR THE 2AMP Music Rail™ and the 15AMP Music Rail™.

Performance data, power supply information, installation and mounting notes and high-voltage information.

Performance Data, Rev A

Parameter	2A Typ	15A Typ
Vin, J1/J2 grounded	30V max	30V max
Vin, J1/J2 floating ¹	550V max	550V max
Dropout	0.5V	2.1V
Quiescent current	11.5mA	11.5mA
Input C	> 33uF	> 33uF
Output C ²	< 0.1uF	< 0.1uF
input ripple, max ³	300mV	1.8V
Vin min.	Vout + dropout	Vout + dropout
Vout min. ⁴	4.5V	4.5V
Power dissipation ⁵	1W max	31.5W max
Noise suppression	45dB	45dB
Noise floor ⁶	19nV/RtHz	9nV/RtHz

- ¹ See high-voltage schematic on high-voltage information below
- ² See app note J0409 for exceptions, Bypass Capacitors
- ³ See app note J0310 for exceptions, Tube Amp Applications
- ⁴ See app note J0308 for exceptions, DAC Applications
- ⁵ 15A Music Rails require heat sinks and insulators
- ⁶ Actual output noise will be input noise after suppression, or noise floor, whichever is greater

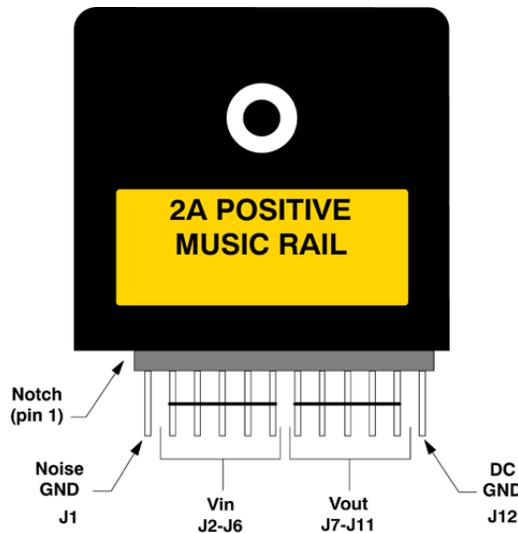


Fig. 1. Pin-Out Guide

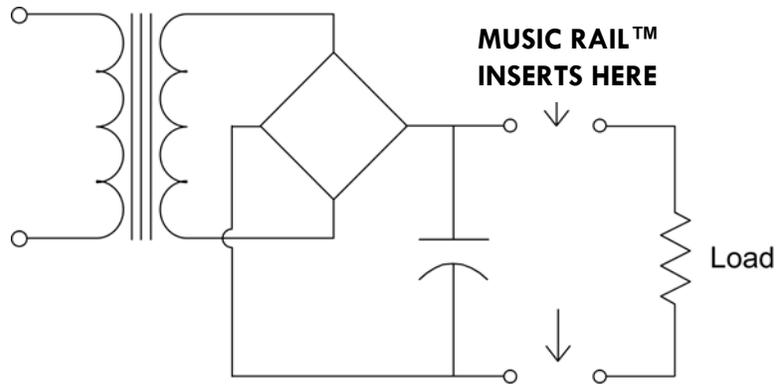


Fig. 2. Simplified DC power supply

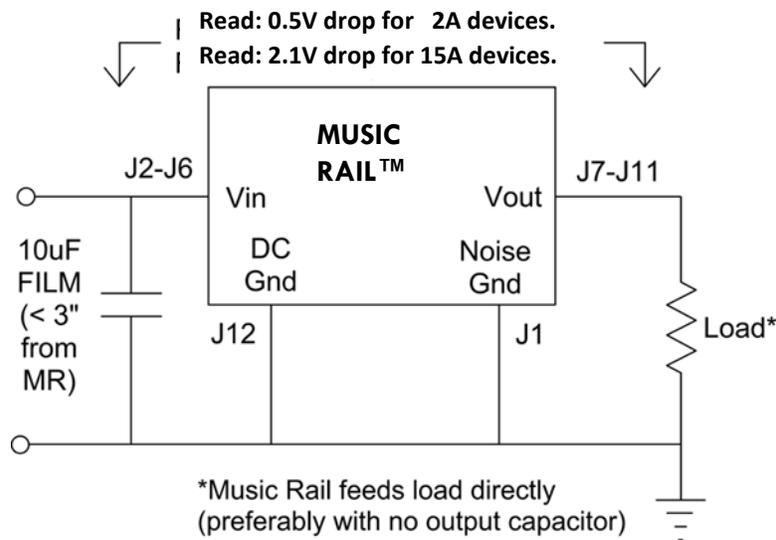


Fig. 3. Music Rail modified power supply

MUSIC RAIL Installation Notes

1. Vin must supply 11.5mA idle current to the Music Rail circuit (plus an additional 5mA to ZD1 when a high-voltage adaptor is used).
2. J1 is the AC ground that bypasses noise currents and input ripple to ground.
3. J12 is the DC ground that returns idle current to the input source.
4. J1 and J12 may be tied together or run separately to optimize noise floor (experimentally).
5. J2-J6 (Vin) can carry 3A each and should be ganged together to carry higher currents.
6. J7-J11 (Vout) can carry 3A each and should be ganged together to carry higher currents.
7. 15A Music Rails must use appropriate heat sink ($P_d=2.1V \times$ load current).
8. Transistor on 15A Music Rails must be isolated from ground with thermal insulator.
9. Output capacitor not recommended (see app note J0409: Bypass Capacitors).
10. After installing each unit, insure that correct voltage drop appears from input to output (0.5V for 2A modules, 2.1V for 15A modules). See data sheet for additional test data.

11. When negative polarity modules are used above 30V, the zener clamps in the hi-voltage adapter must be reversed. All other connections remain the same.
12. As a final test, ensure that the output noise is lower than the input noise (if not, see FAQ).

MUSIC RAIL Mounting Notes

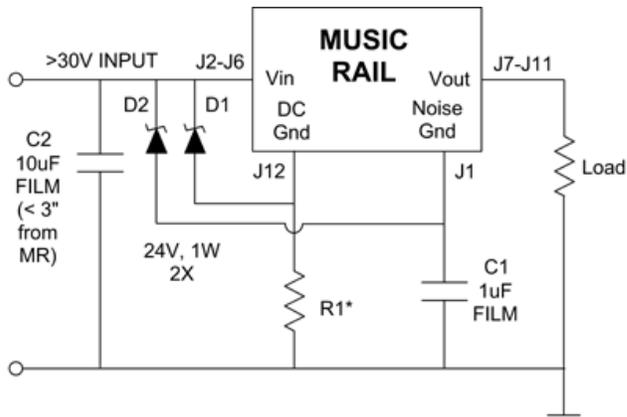
1. Try to locate the high-voltage adapter parts within 6" of the associated Music Rail.
2. Try to locate each Music Rail within 12" of the stage it feeds.
3. Power resistors in high-voltage adapters should be derated 5-7 times and should be at least 10mm distance from noise cap. Leave resistor leads 10-20mm long for increased cooling.
4. The Music Rails can be bypassed for demonstration purposes. Simply jumper the input to the output. Wire guage must be appropriate for load current.
5. For coplanar PC board mounting, a set screw can be used to mount each module to an existing board standoff.
6. The mounting collar in each module is isolated and can be mounted directly to the chassis.
7. The mounting collar accepts #4 screws, but can be drilled out to accept 6-32 screws if required. Mounting screw heads and standoffs should be 0.25 diameter max. Do not exceed mounting pad diameter unless nylon or fiber washers are used for isolation.
8. 15A modules can be mounted to existing heat sinks. Simply drill and tap into the heat sink. **Use caution.** Taps are hard and brittle. Take care not to over twist the tap.

MUSIC RAIL™ HIGH-VOLTAGE INFORMATION

All Music Rail applications above 30V require High-Voltage Adaptation.

YOU WILL NEED:

1. One or more resistors optimized for your app. (See selection chart on app note J0413).
2. Two 24V, 1W zener diodes (high-voltage clamps). For negative supplies, D1 and D2 must be reversed.
3. One 1uF capacitor (noise drain). For a list of recommended parts and suggested suppliers, please see app note J0412.
4. Two terminal strips for mounting parts. (See Mounting Instructions above).

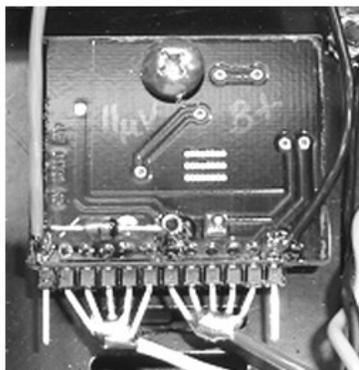


*R1 = (Vin-24V) / (.005A + .0115A) = (D1 + Music Rail Current)

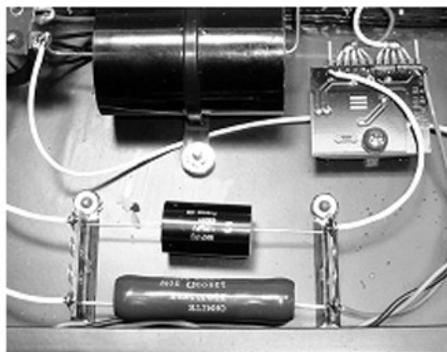
*W = (Vin-24V) X (.005A + .0115A) X 5 (5X derating factor)

Fig. 4. Bybee High-Voltage Power Supply

Photos showing typical layouts



Diode location on PC board



High-voltage parts mounted & wired.

##

MUSIC RAILS are manufactured in the United States.

2011 Bybee Labs, Inc.

8390 East Via de Ventura F-110

Scottsdale, Arizona 85258, USA

1-480-998-2880 / info@BybeeLabs.com