

## Alinco DM-330MV Power Supply

By Bob Grove, W8JHD

While a new power supply is not really big news, this one is different. Not just because it's a switching power supply rather than the conventional linear transformer variety, but because of a proprietary patented circuit that suppresses the radio-frequency noise that commonly accompanies switching power supplies.

Switching power supplies are increasing in popularity for several reasons, but primarily because of their considerably reduced size and weight (see accompanying photo). The little Alinco DM-330MV measures only 6.9" wide, by 2.6" high, by 6.6" deep.



### ❖ A Little Theory

In its simplest form, a DC power supply contains a transformer, rectifier and filter capacitors. A husky power transformer can make these beasts big and heavy. Switching supplies, however, contain active circuitry to regulate the DC voltage. Therein lies the noise problem.

The switching circuitry, generally in the 10-20 kHz range, produces square waves capable of generating a spectrum of harmonics which can interfere with receiving equipment. Alinco's answer is splendidly simple: If you hear the noise, simply change the switching frequency so that the harmonic is out of the receiver's passband! A front panel "Noise Offset" control is provided for that function.

Fortunately, the harmonics grow weaker as the frequency grows higher, so switching noise is most troublesome in the low and medium frequency bands, but virtually disappears in the VHF and UHF spectrum. Alinco's all-metal case and internal filtering help shield the harmonics as well.

Our test of this noise offset feature is described below.

### ❖ Full featured

Powered by a standard 120 VAC 60 Hz main, the DM-330MV produces variable 5-15 VDC at currents of at least 30 amps continuously (32 amps intermittently). Regulation is better than 2%, with less than 15 mV p-p ripple, and any short circuits drawing more than 32 amps, or excessive heat, activates the protection circuitry, shutting down the power supply delivery.



A back-lit front panel meter indicates voltage and current. Light-duty accessories can be powered by two pairs of 5 amp spring terminals, a 10 amp cigarette lighter jack, or the husky 32 amp rear-panel terminals. The front-panel voltage control has a midpoint detent set to deliver nominal 13.8 VDC to emulate the mobile DC environment for typical base/mobile radios.

A rear-panel memory preset allows the user to define the desired output voltage so that at turn-on, that voltage will be provided regardless of the setting of the front-panel voltage control (which is then disabled).

The voltage control may be operated remotely by the inveterate experimenter with the addition of a user-provided 10K potentiometer and two resistors (4.7K and 15K ohms), plugged into the 1/8" (3.5 mm) rear-panel jack.

### ❖ Let's Test It

While we had no doubt that the little package could deliver the power it promised, we were curious just how well the RF noise reduction system worked. The unit was set up with a worst-case scenario: a portable, multi-band radio, whip fully extended, was set right on top of it. If anything would pick up radiated noise, that would!

Sure enough, when the radio was tuned to the AM broadcast band, harmonic whistles (heterodynes of the harmonic carriers beating against the broadcast carriers) abounded. However, true to the advertising, when the noise offset knob was carefully tuned, the interference moved away from the tuned frequency.

Moving up in frequency to the lower shortwave ranges, the whistles could still be



heard – and tuned out. Above approximately 10 MHz the whistles were pretty well gone.

In reality, of course, very few serious shortwave or AM broadcast listeners are going to park a portable radio on top of the power supply. An outdoor antenna connected via coaxial cable to the radio virtually eliminates the problem to begin with, and at the higher frequencies, VHF/UHF scanner listeners have nothing to concern themselves with.

### ❖ And Finally, Power Delivery

So how well does it do its job of delivering high current levels? For this task, I attached a resistive load to a pair of home-made test leads and plugged the rig into the high-current rear terminals. Then I cranked up the voltage to deliver a current drain of a constant 30 amps, the maximum continuous-current rating for the supply. After a minute or so, my test leads began to melt, and my resistive load started to smoke, but the power supply just sat there cranking out the load without varying in its regulated voltage!

To prevent overheating of the power supply, a thermistor-activated fan, visible on the rear panel photo, assists heat transfer from the case. I began to wonder when the fan would come on, but the case was only warm, not hot. Just out of curiosity, I looked at the fan and it was on; it's just so silent I didn't hear it! An impressive touch in design.



### ❖ The Bottom Line

This power supply really delivers its promise. Its small footprint makes it an easy fit on any equipment bench, desk or table. The stable, variable voltage gives it universal application for a wide variety of electronic equipment and accessories, and its reasonable cost is an invitation to any radio or electronics enthusiast.

*Alinco DM-330MV variable voltage power supply, available for \$189.95 from Grove Enterprises and from other MT advertisers.*