

THE MIRAGE D26N AMPLIFIER ON ATV

The Mirage D26N all mode 70cm amplifier from P.C. Electronics has been specially designed to not only work with CW, SSB and FM but also ATV. Despite all mode claims by other manufacturers, few have the proper additional capacitors required for low power supply and bias supply impedance at all video frequencies up to 5 MHz. Without wideband video amplitude modulation in mind when the amp is designed and tested, the result can be color shift, distorted sync and low color and sound subcarrier output.

The D26N input power and linear gain curve properly matches the P.C. Electronics KPA5, TXA5-RC, TC70-1 and TX70-1 1.5 Watt ATV transmitters for full output. The D26N has automatic RF sense T/R switching. With 13.8Vdc applied, typical peak envelope power at the video sync tip is between 50 and 65 Watts. The blanking pedestal must be set to about 60% (56% is broadcast standard, see waveform sketch below) of maximum output to maintain the proper video to sync ratio. Typically this is about 35 Watts when driven by .7 Watts out of one of the P.C. Electronics exciters. The sync stretcher circuit in the transmitter modulator found in all P.C. Electronics ATV transmitters compensates for the last 3 dB of output change nonlinearity (gain compression) found in most amateur linear amplifiers.

Once the blanking pedestal has been set in the transmitter modulator, the proper video to sync ratio will be automatically maintained regardless of camera scene or video gain changes. Since there will be variation in the output of the exciters, amp, and applied voltage, each system must have it's blanking pedestal set up by the user. Also if the applied voltage is changed by more than .5 Volts such as going from a base station power supply set to the nominal 13.8 Vdc to a mobile or portable application where the battery may drop to 12.6 Vdc, the pedestal must be reset. The sound subcarrier injection may also have to be reset (decreased).

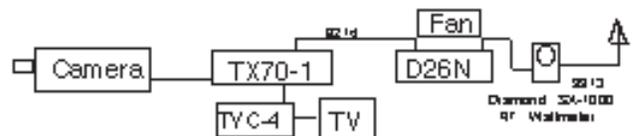
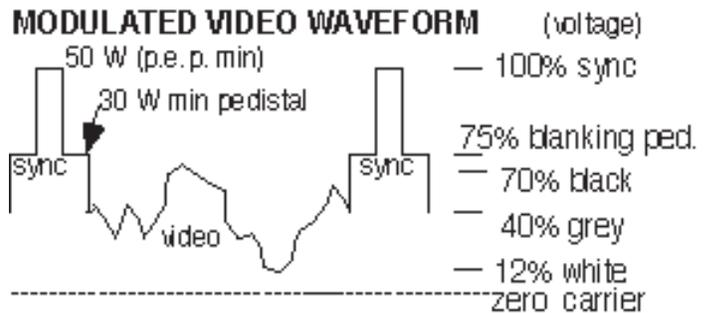
Do not drive the D26N with more than 3 Watts input in any mode or you may damage the amps first transistor. For instance the D26N cannot be driven by the P.C. Electronics 10 or 20 Watt ATV systems without a 10 or 13 dB 50Ω coaxial RF power attenuator between the units. Remember that the sync stretcher will still pull the sync up over 10 Watts output even if you can reset the blanking pedestal low enough without video applied. Excessive drive from any video modulated source will result in a distorted picture. ATV is an AM mode which must have the video waveform preserved by driving each amplifier within its linear range.

Normal all mode duty cycle for the D26N is 10 minutes on and 5 minutes off. For ATV it is 20 minutes on since the normal average power is about half the peak power. However this will vary depending on the heat dissipation. Therefore it is best placed where free air can come in from the sides and rise up from the heatsink fins. A fan (Radio Shack has both 12 Vdc 273-243 and 120 Vac 273-241) blowing across the fins will help lengthen the duty cycle and life time. In fact with an efficient fan moving enough air across the fins, the amp can be run continuously in the ATV mode as has been done with many repeaters. If at any time the thermal relays shut down the amp while in operation, this says that your duty cycle is too long and cooling insufficient. While this protects the amp initially, any repetition can only stress and weaken the parts and PC board in the amp. If for any reason your amp does not seem to work, first check all cables, power supply, RF drive and VSWR before sending back to Mirage for repair. Do not send to us, we do not have repair parts or facilities to fix them, and your expressed warrenty is with Mirage. Call technical support at (601) 323-9715, then ship it to them at 300 Industrial Park, Starkville, MS 39757.

The 50Ω coax between the driver and amp as well as to the antenna must be of good quality and at least 95% shielding. Belden 8214 or 9913 are suggested. Take no shortcuts when putting together the coax and connectors as small bumps in the coax line can cause a VSWR at UHF and possible stray RF getting into your camera. See the ARRL Handbook for proper connector assembly. Do not use any right angle connectors, and minimize any adaptors or extensions to keep losses down.

SET UP:

1. Connect to a regulated 13.8Vdc supply capable of >12 Amps. Keep leads short and direct to the power supply and a separate supply for the amp or exciter works best.
2. Connect a RF power meter (Diamond SX-1000 200 Watt scale) to the amp output. See system block diagram.
3. With no video connected to the transmitter, turn the transmitter pedestal pot for max RF out. Note this power. It is your peak envelope power on the sync tip. Now reduce it to 55 to 60% of that value for the proper blanking level.
4. Remove the power meter from the antenna line as it has no further relevance under video modulation. Except for special RF watt meters used by broadcast TV, most RF wattmeters do not read accurate average power with AM modulations above 50 kHz. Your peak (sync) power will be constant at the maximum you read with no video applied and pedestalpot wide open during video modulation due to the modulator pedestal clamp and sync stretcher.
5. Connect and have a distant station talk in your video gain level to the point just before white clipping or smearing - do not over modulate and splatter. If excessive crosshatch is noted with color video, the sound subcarrier injection level may also have to be turned down a little.



System Block Diagram with RF wattmeter for intial setup. Antenna must be a resonant 50Ω broadband 70cm type such as OAL 5L-70cm or DSFO-25 for ATV. Please read the Mirage D26N booklet that comes in the bag with the amp, and also fill out and mail the warrenty card to Mirage.

