

MIRAGE BD-38-G

DUAL BAND POWER AMPLIFIER

INTRODUCTION:

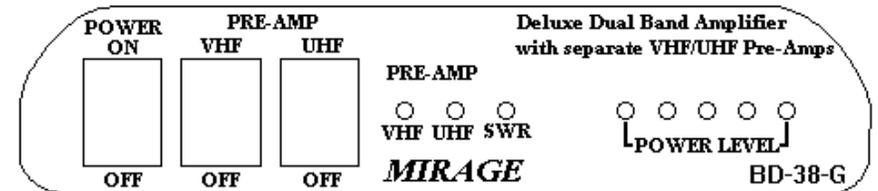
The Mirage BD-38-G is a 80/60 watt dual band power amplifier for use with today's dual band handie talkies operating in the 144/440MHz bands. We have succeeded in the development of a cross-band full duplex function and have incorporated it into this design. The BD-38-G is a **remarkable** and **useful** dual band power amplifier for the **discriminating** Amateur Radio operator. This compact dual band power amplifier has two independent GasFET pre-amp for VHF and UHF bands.

FEATURES:

- High output power
Up to 80 watts at 144MHz or up to 60 watts at 440MHz. Output is achieved with 2 to 5 watts input.
- Input power from 0.25 to 5 watts.
With an input power of 5 watts maximum, the Mirage is compatible with most modern hand-held transceivers.
- Automatic Frequency selection and control circuit. This allows the amplifier to have only one input connector and makes for a perfect match for today's dual band radios and dual band antennas.
- Separate VHF and UHF Pre-Amps.
- Separate LED Indicators for VHF and UHF Pre-Amp usage.
- LED Bargraph Power Level indicator.
- Hi-SWR and Over Temperature Protection.
- Patch Cable included (BNC to PL-259).
- Input: 13.8 VDC at 15 amps.
- Size: 6.5" W x 2.5" H x 9" D
- One Year Warranty

SPECIFICATIONS:

FREQUENCY:	144 TO 148MHz / 430 TO 450MHz
RF INPUT:	0.25 - 5 watts
RF OUTPUT:	Up to 60 watts at 440MHz and up to 80 watts at 144MHz
DUTY CYCLE:	INTERMITTENT (ICAS)
MODES:	F3 (FM)
KEYING:	AUTOMATIC SENSING
SUPPLY VOLTAGE:	13.8 Vdc
RF CONNECTORS:	TWO (2) SO-239 UHF
SUPPLY CURRENT:	15 AMPS TYPICAL
FUSE:	8 AMP, FAST BLOW
INPUT/OUTPUT IMPEDANCE:	50 OHMS



EXPLANATION OF FEATURES:

Front Panel

- **POWER ON Switch**

This switch turns on the power to the amplifier. When the power switch is engaged the amplifier is ready to amplify any signal of the proper frequency applied to its input.

- **VHF Pre-Amp Switch**

This switch turns the pre-amp on for the VHF (144~148MHz) band.

- **Pre-Amp VHF LED**

This LED indicates status of the VHF (144~148MHz) band pre-amp. When the LED is ON, the pre-amp is active.

- **UHF Pre-Amp Switch**

This switch turns the pre-amp on for the UHF (430 - 450MHz) band.

- **Pre-Amp UHF LED**

This LED indicates status of the UHF (430~450MHz) band pre-amp. When the LED is ON, the pre-amp is active.

- **SWR LED**

This LED will turn ON if the SWR of the antenna used is too high. When this light is on, there will be no amplified output from the BD-38-G due to the protection circuit inside the amplifier.

Back Panel

- **ANT (RF OUTPUT)**

The coax from your antenna is connected to this port.

- **RADIO (RF INPUT)**

The coax from your radio or exciter is connected to this port.

- **DC PWR (13.8V)**

This port has two wires. The **Red** wire is for positive and incorporates a FUSE holder. The **Black** wire is for negative. The Mirage BD-38-G amplifier requires a source of 13.8 Vdc at 15 amps.

INSTALLATION AND OPERATION:

The Mirage BD-38-G may be mounted using the bracket (not supplied) or simply placed in a convenient operating position. In either case, there must be adequate ventilation for the finned heat sink. This generally means at least 1 inch clearance from the heat-sink to any surrounding enclosure and an unobstructed flow from the front to the back of the heat sink. Do not operate the amplifier in places where it will be exposed to direct sunlight or a nearby heat source such as heaters, radiator, etc.

+ CAUTION: *With extended use, the heat sink becomes VERY HOT!*

If it is necessary to extend the DC power leads, use wire of the same gauge in order to avoid a voltage drop on your power leads. Be careful that the DC power supplied is no higher than 15 Volts or damage may result. A source voltage of 13.8 Vdc and 16 amps is recommended and should be used whenever available. Some automobiles will generate a high current surge when started. It is recommended that the amplifier be placed in the **OFF** position when starting your vehicle.

Use a minimum length of good quality 50 Ohm cable between the radio and the amplifier. The antenna system should have a VSWR of 1.5 : 1 or better for best performance. If used in a mobile installation, choose a good mobile antenna which will withstand the power of this amplifier. Be sure to check the SWR for any degrading once the antenna has been heated by a few minutes of operation. An antenna with a rating of 100 watts is recommended.

Never connect the "rubber duck" antenna supplied with your transceiver directly to the antenna connector of the amplifier unit by use of a SO-239 to BNC converting unit, or by any other means; It may cause damage to both the amplifier and the "rubber duck."

When utilizing a mono band antenna, check the transmitting frequency of your radio and be sure that it is matched to the type of antenna you are using prior to operation. Furthermore, when inserting coaxial switches to either or both input or output of the power amplifier in order to operate two sets of transceivers and antennas of which the frequencies differ, be sure to carefully check switch positions.

A typical connection of this amplifier with duplex type dual band transceiver and a dual band antenna is shown in **Figure 1**. If connection of this amplifier is made with either two transceivers or two antennas, please refer to **Figures 2** or **3**.

FIGURE 1

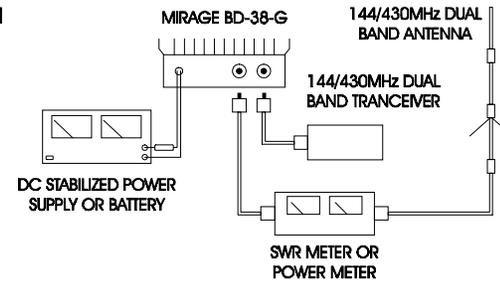


FIGURE 2

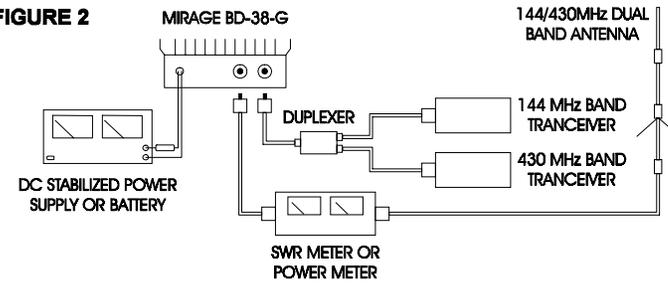
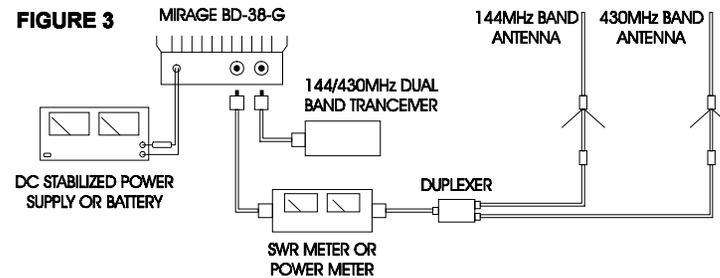


FIGURE 3



During 144MHz / 440MHz crossband full duplex operation, there may be some minor interferences such as noise on certain frequencies (depending on the combination of Transmit / Receive frequencies selected). Select TX/RX frequencies which show no interferences and/or trouble especially with a 144MHz band transmission and a 440MHz reception. Select frequencies that are not mutually harmonic.

With some regulated DC power supplies, the output voltage may rise to an abnormal level, resulting from malfunctions due to RF signal intrusion. Therefore, use a power supply with sufficient current capacity as well as with good protection against RF intrusion. If the power supply malfunctions, discontinue operation by turning the power switch off.

If the amplifiers power cables are connected in reverse polarity, the cables could sustain damage, especially when your source is a battery. Be sure to check the polarity before connection!

After confirmation of proper connections, etc., turn the power switch **ON**. Transmit either a 144MHz or a 440MHz signal to the antenna and confirm the SWR is at the proper level. Switch the band of operation opposite of the one selected above and transmit again to confirm that the amplifier has detected the proper band and the SWR is at the proper level.

To operate the pre-amp, simply turn the switch corresponding to the proper band to the **ON** position. The LED for this band will light up and indicate that the pre-amp is in use.

TROUBLESHOOTING:

The Mirage BD-38-G is designed for long, trouble-free performance and should not require extensive troubleshooting in the field. If difficulty is encountered, check the following before assuming the amplifier has a malfunction:

1. Loose antenna or power supply connections
2. VSWR of the antenna system
3. Coaxial cables from radio to amplifier, and amplifier to antenna
4. Output voltage of power supply
5. Power output of radio
6. Improper fuse rating

TECHNICAL ASSISTANCE:

If you have any problem with this unit, first check the appropriate section of this manual. If the manual does not reference your problem or your problem is not solved by reading the manual you may call **MIRAGE** at **601-323-8287**. You will be best helped if you have your unit, manual and all information on your station handy so you can answer any questions the technicians may ask.

You can also send questions by FAX to **601-323-6551**. Send a complete description of your problem, an explanation of exactly how you are using your unit, and a complete description of your station.

MIRAGE
COMMUNICATIONS EQUIPMENT

300 Industrial Park Road
Starkville, MS 39759 USA
TEL: (601) 323-8287
FAX: (601) 323-6551

ONE YEAR LIMITED WARRANTY

Any Mirage Communications product found to be defective in materials or workmanship will be repaired or replaced (at Mirage's option) for a period of one year from the date of original purchase.

During the warranty period Mirage Communications will provide, free of charge, both parts and labor necessary to correct defects in material or workmanship.

- To obtain such warranty service, the original purchaser must:
 - (1) Provide "proof of purchase"
 - (2) Ship the product in its original container or equivalent, fully insured and shipping charges prepaid, to Mirage, as addressed below.
 - (3) Mirage agrees to repair without charge to the original owner any defective product under warrantee provided the product is returned with postage prepaid to Mirage with a personal check, cashiers check, or money order for \$10.00 covering postage and handling.
- All internal adjustments are factory set for best performance consistent with reliable operation. Changing internal adjustments may void this warranty.
- Improper maintenance or repair may also void this one year warranty. We recommend that units requiring repair during the warranty period be returned to the factory.
- This unit was not designed for repeater operation, and its use in such service is at your own risk.
- Mirage assumes no responsibility for any item connected to or used in conjunction with this product.
- The foregoing constitutes Mirage's entire obligation with respect to this product and the original purchaser and any user or owner shall have no remedy and no claim for incidental or consequential damages.
- All Mirage products to be serviced, in-warranty or out-of-warranty, should be shipped, freight paid to: **Mirage, 921 Louisville Road, Starkville, MS 39759, USA.** Product must be accompanied by a letter describing the problem in detail. Be sure to include **YOUR NAME, ADDRESS, AND TELEPHONE NUMBER!**
- This warranty gives specific legal rights and you may also have other rights which vary from state to state.

WARNING: This unit should not be operated with the cover removed. The cover confines RF radiation. The harmonic filters contained in the circuit will not suppress direct radiation that may result if the cover is removed.