

## MIRAGE BD-35

### DUAL BAND POWER AMPLIFIER

#### INTRODUCTION:

The Mirage BD-35 is a 45/35 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 compact design of the power amplifier unit employs the new *"two band / one RF power transistor"* technique. The BD-35 is a **remarkable** and **useful** dual band power amplifier for the **discriminating** Amateur Radio operator.

#### FEATURES:

- High output power  
Up to 45 watts at 144MHz or up to 35 watts at 440MHz. 30 to 35 watts is achieved with 2 to 6 watts input.
- Input power from 0.3 to 7 watts  
With an input power of 7 watts maximum, the Mirage is compatible with most modern hand-held transceivers.
- Small size  
This amplifier's size makes it the perfect companion for field operation without the added weight.
- 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.
- Reverse DC power polarity protection circuit  
Protects the amplifier from accidental reversing of the power leads.
- "ON-AIR" indicator  
Lets you know that you are transmitting.

**SPECIFICATIONS:**

FREQUENCY:	144 TO 148MHz / 430 TO 450MHz
RF INPUT:	0.3 - 7 watts
RF OUTPUT:	Up to 35 watts at 440MHz and up to 45 watts at 144MHz
DUTY CYCLE:	INTERMITTENT (ICAS)
MODES:	F3 (FM)
KEYING:	AUTOMATIC SENSING
SUPPLY VOLTAGE:	12 -15 Vdc
RF CONNECTORS:	TWO (2) SO-239 UHF
SUPPLY CURRENT;	7 AMPS TYPICAL
FUSE:	8 AMP, FAST BLOW
INPUT/OUTPUT IMPEDANCE:	50 OHMS

**EXPLANATION OF FEATURES:**

- **VHF ON AIR LAMP**  
This LED indicates that the power amplifier is transmitting in the VHF (144 - 148MHz) band.
- **UHF ON AIR LAMP**  
This LED indicates that the power amplifier is transmitting in the UHF (430 - 450MHz) band.
- **POWER ON LAMP**  
When the power switch is engaged the amplifier will illuminate the **POWER ON** lamp. This lets you know that the amplifier is ready to amplify any signal of the proper frequency applied to its input.
- **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-35 amplifier will accept from 12 to 15 Vdc.

## **INSTALLATION AND OPERATION:**

The Mirage BD-35 may be mounted using the bracket 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 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.

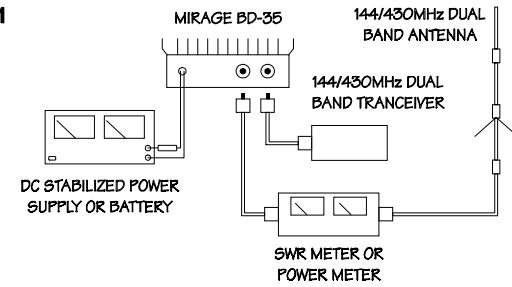
Use a minimum length of good quality 50 Ohm cable between the radio and the amplifier. The antenna system should have a VSWR of 1.5 : 1 or better for best performance. If used in a mobile installation, choose a good mobile antenna which will withstand the power of this amplifier. Be sure to check the 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."

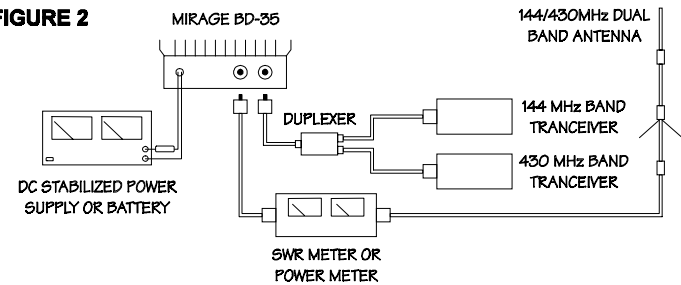
When utilizing a mono band antenna, check the transmitting frequency of your radio and be sure that it is matched to the type of antenna you are using prior to operation. Furthermore, when inserting coaxial switches to either or both input or output of the power amplifier in order to operate two sets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

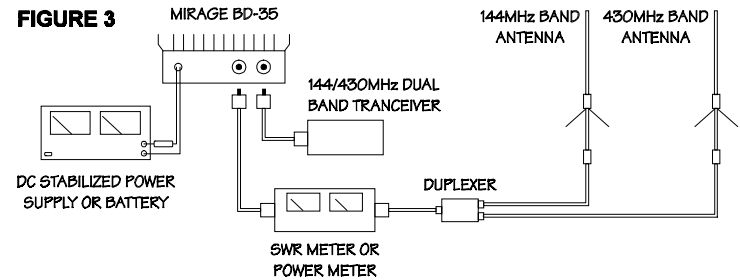
**FIGURE 1**



**FIGURE 2**



**FIGURE 3**



During 145MHz / 435MHz 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 145MHz band transmission and a 435MHz 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 146MHz or a 440MHz signal to the antenna and confirm the SWR and that the proper LED is illuminated for the band of operation. Switch the band of operation to the opposite and of the one selected above and transmit again to confirm that the amplifier has detected the proper band (once again, by the illuminated LED) and SWR.

#### **TROUBLESHOOTING:**

The Mirage BD-35 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.