

MIRAGE

COMMUNICATIONS EQUIPMENT, INC.

MIRAGE REPEATER AMPLIFIERS: B1016R/B3016R

Your MIRAGE repeater amplifier has several improvements over our standard model amplifier.

RACK-MOUNT HEATSINK

The large rack-mount heatsink with vertical fins keeps the transistor temperature low for longer life in high duty cycle applications.

AIR-FLOW CHASSIS

The perforated chassis cover allows heat that builds up on the printed circuit board and components to escape outside the amplifier. This, of course, will increase component and PC board life in high duty cycle.

DUAL OVER-TEMP PROTECTION

The amplifier has two temperature protection sensors; one on the heatsink and one on the circuit board. If the amplifier is used under conditions that cause it to overheat, the relay will drop into the bypassed condition. Your repeater will then operate at the power level normally going into the amp.

REDUCED RELAY WEAR

Repeater operation greatly increases the number of times the relays must change over. We have modified the relay drop-out time to hold the relay in for up to 5 seconds when in the "SSB" position. This allows one station to stop transmitting, allows the repeater to stop transmitting, and allows the next station to transmit with no relay action in the power amplifier. This should greatly increase relay life for repeaters that reset when the transmitter output drops. For repeaters that reset on the input or receive squelch, use the "FM" position of the switch.

ON-SITE CONTROL

The amplifier has built in switches that control DC voltages to the transmit power amp and relay delay time circuits. If a more convenient switching panel is desired, the MIRAGE RC1 plugs directly into the repeater amplifier and duplicates the switching functions in a compact box at the end of an 18 foot cable.

REMOTE CONTROL

If it is desired to turn the amplifier on or off via an RF link or landline link, the RF sensing detector inside the MIRAGE amp can be defeated. The amplifier relay must then be activated by shorting the connections on the RCA jack on the rear panel. The amplifier switch

REMOTE CONTROL (cont.)

must be "ON". To remove the RF sensing feature, clip out the 120 ohm $\frac{1}{4}$ watt resistor next to the Guardian 1365 relay. This resistor connects a 2 pf disc cap to a pair of 1N6263 diodes.

REMOTE TTL CONTROL

If you have a TTL logic "high" available during the transmit time of your repeater, you may rewire the RCA jack so a TTL high will engage the MIRAGE amplifier. The delay function of the relay control circuitry will still operate if you desire it.

If you have a logic line which is controllable remotely, you can remotely activate the MIRAGE amp. A NAND gate tied both to your repeater COR and the remote control line would engage the amp on transmit when your remote control line was at the correct level.

To modify the amp for TTL control, defeat the RF sensing by removing the 120 ohm resistor that connects to the two 1N6263 diodes near the Guardian 1365 relay. Next, find the wire that connects to the center pin of the RCA jack. Remove the other end of the wire from the PCB where it connects to a 1N4002 diode. Resolder this wire to the junction of the two 1N6263 detector diodes. The wire should connect where the 120 ohm resistor was connected to the diodes. Remove the 1N6263 diode that has one side soldered to the ground plane of the PCB. A positive voltage of greater than 2.1 volts will now put the MIRAGE amp into its transmit mode.

RF DRIVE LEVELS

We recommend reducing the RF drive into your amplifier to reduce transistor heating. The B3016R should be driven with 15 watts or less for longer transistor life.

The B1016R should be driven with 3 watts or less for longer transistor life. These drive levels result in about 125 watts output from either amplifier.

WARRANTY

MIRAGE repeater amplifiers have a one year warranty on the RF power transistors. The rest of the unit has a two year warranty. All other conditions of the warranty are as stated in the standard MIRAGE warranty.

AR/tof

7/06/84

MIRAGE

COMMUNICATIONS EQUIPMENT, INC.

B3016

2 METER POWER
AMPLIFIER

The MIRAGE B3016 represents the latest in 2 Meter Power Amplifiers. It incorporates features that make it the most useful and versatile amplifier available today. The B3016 has a built-in receive preamp, variable SSB delay, remote keying and complete remote control when using the optional RC-1, Remote Head. It will amplify both FM and SSB signals. It has built-in thermal protection to prevent over heating.

SPECIFICATIONS:

FREQUENCY RANGE	144 to 148 MHz
POWER	INPUT 15-45 Watts (50 Watts max.)
	OUTPUT 160 Watts or more for 30 Watts input intermittent duty cycle
MODES	FM, SSB and CW
RECEIVE PREAMP	10 db gain with $2 \pm .5$ db noise figure
DC POWER	13.6 VDC at 18-22 Amps nominal
FUSE	35 Amps (internally mounted)
IMPEDANCE	50 Ohm input and output
SIZE	12" X 3" X 5½"
WEIGHT	5 LBS.

INSTALLATION:

The B3016 may be mounted by using the brackets supplied. The B3016 must have adequate ventilation around the heat sink. Use of # 8 or larger wire to connect the B3016 to the battery is recommended. Use good quality 50 Ohm co-ax, between the radio and the B3016. RG-8U or the equivalent should be used between the B3016 and the antenna. The antenna should be matched, to better than 1.5:1 for best performance. SWR less than 3:1 will degrade system performance. SWR greater than 3:1 may cause damage to the amplifier voiding any warranty.

Front Panel Functions:

POWER—ON/OFFThis switch turns the power amplifier ON and OFF.

- SSB/FMSelects the relay time delay for the mode of operation. In either the SSB or FM position, the amplifier is still biased for linear operation.
- PREAMP—ON/OFFTurns ON and OFF the receive preamp. This works independent from the power ON/OFF switch. When either the Preamp or Power Amp is turned on the Amplifier automatically switches the antenna using its internal circuitry. If it is desired to key the antenna relay externally a connection is provided on the rear panel (see Rear Panel Functions).
- LED (Power On)This LED will go out if the amplifier over heats. It will come back on when the amplifier has cooled.

Rear Panel Functions:

- "RADIO"This connects to the transmitter or transceiver.
- "ANT"This connects to the antenna.
- RCA JACKThis is for Remote Keying — Connect to ground to key the antenna relay.
- 6 PIN REMOTE CONNECTOR—The RC-1 Remote Control Head connects here.

PRECAUTIONS:

- OUTPUT POWERThe B3016 puts out enough power to cause heating of the antenna co-ax. RG-8 or equivalent is recommended between

the amplifier and the antenna.

HEAT-SINK TEMPERATURE — Along with high power output comes the possibility of high heat-sink temperatures. The B3016 must be mounted where air can circulate over the heat-sink. The B3016 has a built in thermostat that will turn it off at 170 degrees F. The amplifier will not come back on until the temperature drops to 140 degrees F.

INPUT POWER Input power should not exceed 45 to 50 Watts. Higher power than this may cause failure of the input transistor. This will VOID ANY WARRANTY.

Internal Adjustments:

"SSB DELAY" This allows the relay delay to be adjusted to any desired delay. Access to this adjustment is through the hole in the left side of the cover, behind the front panel. Use a small screwdriver to adjust the control.

"INPUT" and "OUTPUT" MATCH These are factory adjusted and do not normally require adjustment. The cover must be removed to make these adjustments. Connect an SWR meter between the radio and the input to the amplifier. Adjust the "INPUT" trimmer capacitor (marked yellow) for lowest SWR. Connect

a power meter to the output and adjust the "OUTPUT" trimmer capacitor (marked red) for maximum output at minimum DC current drain

PREAMP TUNING These trimmers are factory set for the best gain and noise figure. They should not be re-adjusted unless connected to the proper equipment to set the noise figure.

FUSE A 35 Amp fuse is located under the cover on the P C Board. Should the fuse "blow", determine the cause before replacement.

IN CASE OF DIFFICULTY:

1. Check for loose antenna or B + connections.
2. Check S.W.R. of antenna.
3. Look for bad or lossy co-ax.

5 YEAR LIMITED WARRANTY

Any MIRAGE COMMUNICATIONS product found defective in materials or workmanship (except RF Power Transistors), within 5 years from date of purchase, by the original owner, will be replaced or repaired at no charge, if the product is returned to the factory, freight prepaid. RF Power Transistors are warranted for 1 year from date of purchase.

All internal adjustments are factory set for best performance consistent with reliable operation. Changing internal adjustments may void the 5 year warranty.

Unauthorized repairs may void the 5 year warranty. We suggest that repair problems be returned to the factory.

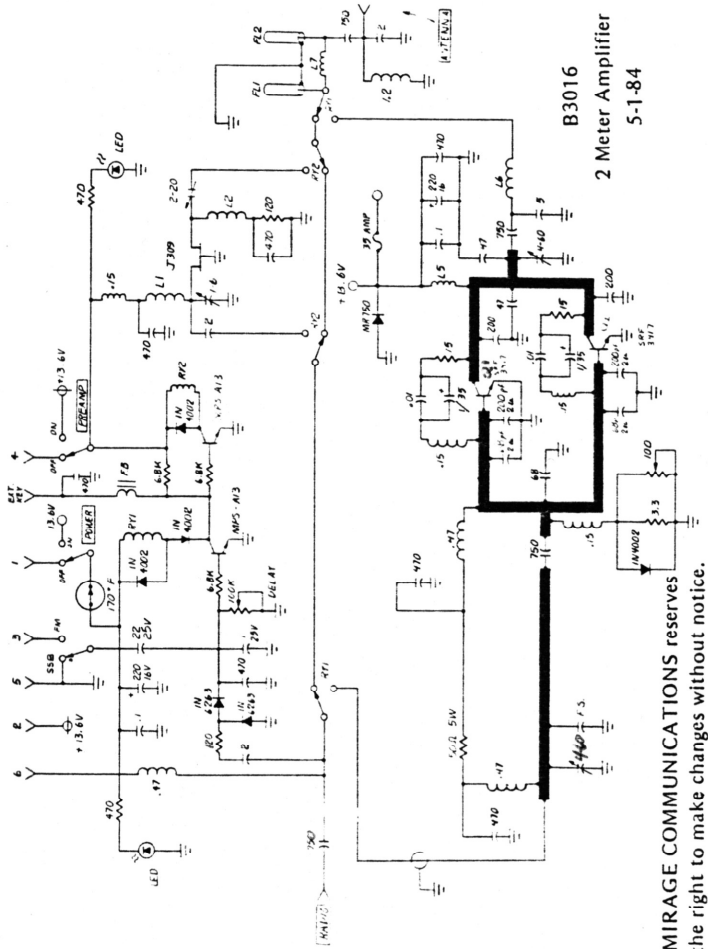
RF power transistor replacement beyond the 1 year warranty period must be done at the factory to maintain the 5 year warranty on the rest of the unit.

This unit was not designed for repeater operation. The use of Mirage amplifiers in repeater service is at your own discretion. Consult the factory for recommendations regarding repeater service.

The Warranty Registration card must be submitted within 10 days from date of purchase, to obtain warranty service.

MIRAGE COMMUNICATIONS assumes no responsibility for any antenna, or accessories connected to this product.

This warranty does not apply to units that have been misused, accidentally damaged, subjected to more than the rated input power, manufactured prior to June 1978 or subjected to unauthorized service or repair.



B3016
2 Meter Amplifier
5-1-84

MIRAGE COMMUNICATIONS reserves the right to make changes without notice.