Section 6 Troubleshooting

6-1 Introduction

This section contains a list of problems and a few suggested actions that may correct the problem. If the suggested corrective action does not eliminate the problem, please contact your Powerwave field representative or the factory for further instructions.

NOTE

Check your sales order and equipment warranty before attempting to service or repair the unit. Do not break the seals on equipment under warranty or the warranty will be null and void. Do not return equipment for warranty or repair service until proper shipping instructions are received from the factory.

6-2 Troubleshooting

The following are general guidelines established to aid Field Engineers or Cell Site Technicians in the proper method of Powerwave equipment fault resolution by fault mode.

6-2.1 DC Voltage Indicators Not Illuminated

1. Check the front panel ON/OFF switch.
2. Check the power plant circuit breaker.
3. Check for +27 ± 1.0 VDC at the amplifier subrack input.
   A. If the voltage is low, verify that all DC connections between the power plant and the amplifier subrack are tight.
   B. If the voltage is correct,
      1. Remove the amplifier from the subrack slot and move the amplifier to another amplifier subrack slot.
      2. Check the voltage on the power pins of the mating amplifier and amplifier subrack connector.
      3. Verify that the amplifier DC connections are not damaged.
4. Return the amplifier to the factory for repair.

6-2.2 OVER PWR Illuminated or Blinking

1. If all the amplifiers in a given amplifier subrack are in Over Pwr and the LPA Disable LED is illuminate, then the input RF power level is too high and the amplifiers have been turned off. RF power may be incorrectly set during equipment commissioning. This may be due to a faulty jumper cable. Verify the amplifier subrack output cables, transmit filter, and directional coupler are in proper working order. The loss between the amplifier subrack and the hatch plate is typically less than 2.0 dB.
2. If all the amplifiers in a given amplifier subrack are in Over Pwr and the LPA Disable LED is not illuminated, then the input RF power level is too high. The amplifier subrack is attempting to maintain a safe power output level (smart subracks with True RMS power detectors and voltage variable attenuators only). RF power may be incorrectly set during equipment commissioning. This may be due to a faulty jumper cable. Verify the amplifier subrack output cables, transmit filter, and directional coupler are in proper working order. The loss between the amplifier subrack and the hatch plate is typically less than 2.0 dB.

3. If only one or two amplifiers in a given amplifier subrack are in Over Pwr and the LPA Disable LED is blinking, then the amplifier subrack is probably in Sleep Mode (smart subracks with True RMS power detectors and voltage variable attenuators only).
   A. Pressing the On/Off/Reset switch momentarily in the Up position or cycling DC power on the amplifier should bring the amplifier back on-line.
   B. Sleep Mode firmware may be disabled in the field with a PC interface and software available from Powerwave.
4. Move the amplifier to another slot in a different subrack, if available. Mark the amplifier with a sticker or place a tie wrap on the handle to identify the amplifier. Monitor for future failure.
   A. If the same amplifier fails again, return the amplifier to the factory for repair.
   B. If the replacement amplifier in the original subrack fails, replace the amplifier subrack.

6-2.3 HIGH TEMP Illuminated

5. If an amplifier is in HIGH TEMP and the LPA Disable LED is illuminate, then the amplifier heat sink temperature is too high. This may be due to:
   A. High ambient temperature.
   B. Fan failure.
   C. Insufficient air-volume capacity. Most of Powerwave's amplifiers require a certain amount of free-space to allow proper airflow.
6. Correct the heat problem, then reset the amplifier by momentarily pressing the Reset button on the amplifier front panel up.

6-2.4 VSWR Illuminated

7. If all the amplifiers in a given amplifier subrack are in VSWR and the LPA Disable LED is illuminate, then the output RF reflected power level is too high and the amplifiers have been turned off. This may be due to a faulty jumper cable or transmit filter. Verify the amplifier subrack output cables, transmit filter, and directional coupler are in proper working order. The loss between the amplifier subrack and the hatch plate is typically less than 2.0 dB. This fault normally occurs during site or just following site power setting and normally takes about 10 to 15 minutes to reveal itself. This fault may not occur at low power levels (i.e. when just one or two channels are up).
8. If one amplifier in an amplifier subrack is in VSWR and the LPA Disable LED is illuminated, then the output RF reflected power level is too high for that amplifier. This may be due to
   A. A damaged or recessed amplifier RF output connector. Return the amplifier to the factory for repair.

      Mishandling of the amplifier normally causes recessed pins. Before installing an amplifier, look at the D-sub connector to ensure none of the pins are recessed, bent or that the outer connector shield is not damaged. When installing the amplifier, do not force the amplifier into the slot. Gentle even pressure is all that is needed to properly seat the amplifier.
   B. Improper seating of the amplifier.
      1. Ensure the amplifier thumbscrews are properly tightened.
      2. Try seating the amplifier in another subrack slot.
      3. Try seating the amplifier in a subrack in another sector.

6-2.5 DC FAIL Illuminated

If an amplifier is in DC FAIL and the LPA Disable LED is illuminate, then one of the four amplifier DC voltages is either out of tolerance or not present. Return the amplifier to the factory for repair.

6-2.6 FAN FAIL Illuminated

If an amplifier is in FAN FAIL, then the one of the amplifier's cooling fans has failed. Replace the fan.

Fan failure does not cause the amplifier to shut down; amplifier shut down is determined by heat sink temperature.

6-2.7 LOOP FAIL Illuminated

9. Loop Fail is always accompanied by LPA Disable LED illuminated. This may be due to
    A. Inability of the amplifier to maintain a 180° phase shift between the first and second loops.
    B. A damaged error amplifier. This can be caused by
        1. Out of band spurious or intermods being applied at too high of a level at the amplifier input port. An input band-pass filter may be necessary to correct this problem.
        2. Disconnecting amplifier RF output cables while the amplifier is still turned on. Always turn the amplifier off when moving output RF cables from the hatch plate to test equipment and back again.
    C. Improper power balance between amplifiers in a given subrack.
        1. Ensure the amplifier thumbscrews are properly tightened. Reset the amplifier by momentarily pressing the Reset button on the amplifier front panel up.
        2. Try seating the amplifier in another subrack slot.
        3. Try seating the amplifier in a subrack in another sector.

6-2.8 LOW PWR Illuminated

Low Power is always accompanied by the LPA Disable LED illuminated. This is due to the gain of either the internal preamplifier or main amplifier being 0.5 dB (typically) or more below the amplifier specification. The amplifier should be returned to the factory.

6-2.9 LPA DISABLE Illuminated

10. LPA Disable LED illuminated indicates that the amplifier RF section is turned off. This may be due to
    A. An accompanied alarm indicating a critical amplifier fault (i.e. Loop Fail fault).
    B. A response to a subrack command, purposely inhibiting the amplifier (i.e. Sleep Mode activation)
    C. Improper seating of the amplifier in the subrack.
11. Ensure the amplifier thumbscrews are properly tightened. Reset the amplifier by momentarily pressing the Reset button on the amplifier front panel up.
12. Try seating the amplifier in another subrack slot.
13. Try seating the amplifier in a subrack in another sector.

6-3 Return For Service Procedures

When returning products to Powerwave, the following procedures will ensure optimum response.

6-3.1 Obtaining An RMA

A Return Material Authorization (RMA) number must be obtained prior to returning equipment to the factory for service. Please contact our Repair Department at (888) 797-9283 or (714) 466-1000 to obtain this number, or FAX your request to (714) 466-5816. Failure to obtain this RMA number may result in delays in receiving repair service.

6-3.2 Repackaging For Shipment

To ensure safe shipment of the amplifier, it is recommended that the package designed for the amplifier be used. The original packaging material is reusable. If it is not available, contact Powerwave's Customer Service Department for packing materials and information.