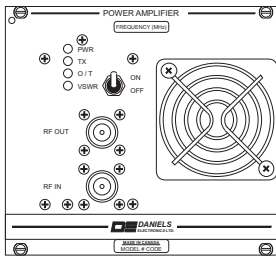


MT-3/4 Radio Systems

TN440 AMP-2/150 VHF 30 Watt Power Amplifier



The AMP-2/150 30 Watt power amplifier operates in one of three frequency bands: 138 to 150 MHz, 150 to 162 MHz or 162 to 174 MHz. The power amplifier is rated for continuous duty at an adjustable RF output power of 20 to 30 Watts. The RF power output is set by the exciter module. The input to the power amplifier cannot exceed 4.0 Watts or 6.0 Watts depending on the label on the front panel of the amplifier.

Specifications

Frequency Bands	138 - 150 MHz / 150 - 162 MHz / 162 - 174 MHz
RF Output Power	20 to 30 Watts adjustable (set by exciter)
RF Input Power Range	2.0 to 4.0 Watts or 2.0 to 6.0 Watts from exciter
Undesired Emissions (Conducted Spurious)	≤ -70 dBc @ 30 Watts RF output
Radiated Spurious	≤ -20 dBm @ 3 m
Thermal	Thermal interlock disables @ $+80^{\circ}\text{C}$ (175°F)
Fan	Fan activates @ $+40^{\circ}\text{C}$
Output Impedance	50 Ω
Standby Current Drain	≤ 5 mA
Transmit Current Drain	≤ 5.50 A / 4.50 A (typical)

Models Available

AMP-2/145-30-00	FM, 20 - 30 Watts continuous duty, 138 - 150 MHz
AMP-2/155-30-00	FM, 20 - 30 Watts continuous duty, 150 - 162 MHz
AMP-2/170-30-00	FM, 20 - 30 Watts continuous duty, 162 - 174 MHz

Power Amplifier Operating Frequency

The AMP-2/150 is installed in the subrack (taking up a transmitter and receiver slot) and is mated with a transmitter exciter. The AMP-2/150 has a heavy duty aluminum heatsink and a thermally switched cooling fan. The power amplifier has two standard LEDs, two optional LEDs, and a power switch on the front panel. The TX LED illuminates when an RF signal is present. The O/T (Over Temperature) LED will illuminate (and the power amplifier will shut down) when the heatsink temperature exceeds 80°C (175°F) and will reset when the temperature falls below 63°C (145°F).

The power amplifier is initially aligned at the factory for the frequency shown on the label on the front panel. It is recommended to re-align the power amplifier for any change in frequency, however this may not be required. For a small frequency change, no re-alignment of the power amplifier may be required. If the frequency change is greater than ± 2 MHz from the frequency at which the last complete power amplifier alignment was performed, the power amplifier will need to be realigned.

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MT-3/4 Radio Systems**TN440 AMP-2/150 VHF 30 Watt Power Amplifier****Transmitter Exciter Alignment:**

Before aligning the 30 Watt Power Amplifier, the Transmitter Exciter should be tuned properly following the alignment procedures in the Technical Notes or Instruction Manual for the transmitter. **Disable the output power alarm, VSWR alarm, and VSWR overload** (if applicable, depending on use and model). Set the RF output power at **3.5 Watts** or **5.0 Watts** depending on the label on the front panel of the amplifier.

Key the transmitter exciter with a 50 Ω dummy load connected to the RF output and measure the total current draw of the radio system. Note this value.

Power Amplifier Alignment:

To align and / or adjust the power amplifier the outer wrap-around cover needs to be removed, the power amplifier needs to be plugged into the subrack via a cable and extender card and power must be applied to the system. Connect a Wattmeter capable of forward and reverse power measurements between the exciter RF output and the power amplifier RF input. Connect the transmitter exciter RF output to the Wattmeter using the 37 cm cable supplied with the power amplifier. Connect the Wattmeter to the power amplifier input using a 1/2 wavelength cable (for accurate VSWR readings). As a guideline, for an RF frequency of 136 - 150 MHz use a 69 cm cable; 150 - 162 MHz use a 63 cm cable; and 162 - 174 MHz use a 59 cm cable. **Do not exceed 4 Watts or 6 Watts** (depending on the label) at any time into the power amplifier. Connect an ammeter to the power input of the radio system to measure system current draw. Set the input power voltage at +13.8 Volts nominal (if possible). When the power amplifier is connected using the extender card, there is typically a 1 to 1.5 Volt drop of the input power voltage. Measuring the input power voltage of +13.8 Volts at the power amplifier (Pins B2 or Z2) will accommodate for this voltage drop.

Ensure that capacitor C17 is turned so that the screw is flush with the top of the capacitor. C17 does not require any further tuning. Turn capacitors C2 and C19 all the way to the bottom, then up two turns from the bottom.

Turn the power switch on the front of the amplifier to ON. Key the exciter by flipping the switch on the front panel to KEY TX. Adjust C2 and C19 to get maximum RF power output with minimum current draw of the power amplifier. Power Amplifier current draw should not exceed **7 Amps**. Measure the total current draw of the system with the power amplifier operating and subtract the current draw, measured WITHOUT the amplifier, to determine the power amplifier current draw. RF power output should not exceed 35 Watts at any time during alignment. If the RF power output exceeds 35 Watts, turn the exciter down slightly from 3.5 Watts or 5.0 Watts.

Adjust L7, L8, L9 and L10 for maximum power output with minimum current draw. L7, L8, L9 and L10 are inductor coils that can be adjusted by moving the coil loops closer together or further apart.

Adjust C2 and C19 for minimum reflective power (**0.20 Watts maximum**). C2 tends to affect VSWR the most and C19 tends to affect current draw the most. Repeat tuning of C2 and C19 until the VSWR and current draw meet the specified requirements.

Connect the output of the power amplifier to a Spectrum Analyzer and check for spurs (harmonics). If possible, adjust the input power voltage from +11 to +16 volts and continue to check for spurs. If spurs are present, re-adjust C2 and C19 for all four conditions: VSWR, current draw, RF power output and spectral purity.

Note: For complete alignment procedures, refer to the instruction manual. These notes are for reference only.

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