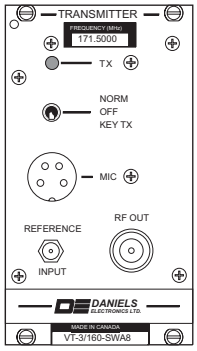
TN342 VT-3/150-S VHF Synthesized Transmitter



The VT-3/150-S transmitter is a low power, synthesized FM transmitter capable of operating in 12.5 kHz (narrowband) or 25 kHz (wideband) channels. The VT-3/150-S transmitter operates in one of two frequency bands: 132 to 150 MHz or 150 to 174 MHz. A modular design allows each of the transmitter's modules, MT-3 Transmitter Main Board, MT-3 Audio Processor, VT-3/150 Amplifier, and OS-3H150 Synthesizer, to be individually assembled and tested. This facilitates construction, tuning and maintenance as well as troubleshooting procedures. The synthesizer module can be programmed to have up to 16 channels exclusive to one frequency band.

Specifications

Frequency Bands	132 - 150 MHz / 150 - 174 MHz
Channel Spacing	12.5 KHz or 25 KHz
Transmitter Switching Range	± 2 MHz
RF Output Power	2.0 to 8.0 Watts adjustable
Duty Cycle	100% (-40 °C to +60 °C)
Undesired Emissions (Conducted Spurious)	< -80 dBc (narrowband) / < -90 dBc (wideband)
Undesired Emissions (Conducted Harmonics)	< -90 dBc
FM Hum & Noise Ratio (300 Hz - 3.4 KHz)	> 50 dB (narrowband) / > 55 dB (wideband)
Carrier Frequency Stability	± 1.0 ppm (-30 °C to +60 °C) (-40 °C to +60 °C optional)
Modulation Type	11K0F3E (FM) or 16K0F3E (FM)
VSWR Protection	< 20:1 (All Phase Angles)
Audio Distortion	< 2.0% @ 25 °C (< 2.5% @ -40 °C to +60 °C)
Output Impedance	(Type N Connector)
Operating Temperature	-30 °C to +60 °C (-40 °C to +60 °C optional)
Standby Current	< 15 mA
Transmit Current (8.0 W)	< 2.50 A

Models Available

VT-3/140-SWA800	Enhanced Synthesized, 25 KHz Bandwidth, 8.0 W, 132 - 150 MHz
VT-3/140-SNA800	Enhanced Synthesized, 12.5 KHz Bandwidth, 8.0 W, 132 - 150 MHz
VT-3/160-SWA800	Enhanced Synthesized, 25 KHz Bandwidth, 8.0 W, 150 - 174 MHz
VT-3/160-SNA800	Enhanced Synthesized, 12.5 KHz Bandwidth, 8.0 W, 150 - 174 MHz

Transmitter Operating Frequency

The transmitter is initially aligned at the factory for the frequency stamped on the 'Factory Set Operating Frequency' label on the front panel. For a small frequency change, no re-alignment of the transmitter may be required. If the frequency change is greater than **±2 MHz** from the frequency at which the last complete transmitter alignment was performed, the **synthesizer** and **audio processor** will need to be realigned. To align and / or adjust the transmitter the outer cover needs to be removed, the transmitter needs to be plugged into the subrack via a cable and / or extender card and power must be applied to the system. A 50 Ω dummy load should be connected to the RF output when transmitting.

43 Erie Street
Victoria, B.C.
Canada V8V 1P8

Toll Free Canada & U.S.A.
Phone: 1-800-664-4066
Fax: 1-877-750-0004

International
Phone: 250-382-8268
Fax: 250-382-6139

Internet
e-mail: sales@danelec.com
web: www.danelec.com

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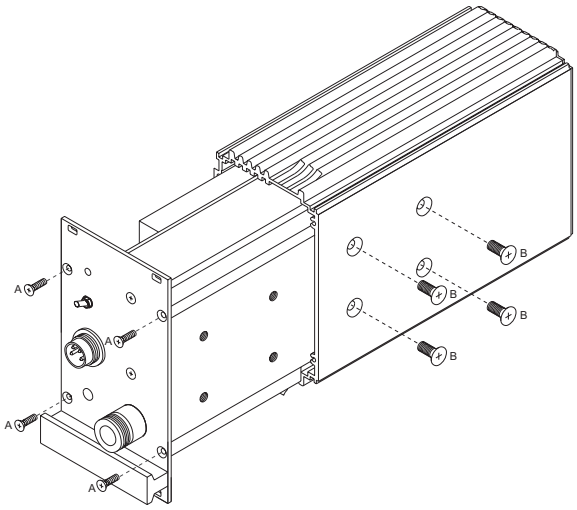
Transmitter Alignment Procedures



Remove the four front panel screws (A) and four side panel screws (B) to slide the transmitter outer cover off and expose the Main Board, Local Oscillator, Audio Processor Board and Amplifier.

Synthesizer Alignment:
The enhanced synthesizer is manufactured with two different synthesizer chips. Depending on the version of the chip, the loop control voltage (TP4) will be set at a "center voltage". To determine the "center voltage", use a small standard blade screwdriver, and turn the VCO frequency "tune" trimmer capacitor C24 fully clockwise until it stops. Using a high impedance (10 MΩ) DC Voltmeter, measure the PLL control voltage at TP4 located on the synthesizer module main circuit board. Access to TP4 is available through the synthesizer top cover. If the maximum TP4 voltage is approximately **+8.0 Vdc** the "center voltage" is **+4.5 Vdc**. If the maximum TP4 voltage is approximately **+5.0 Vdc** the "center voltage" is **+2.3 Vdc**. As of the year 2001 all new products have a +2.3 Vdc "center voltage" FM enhanced synthesizer. Labels have been applied to MOST enhanced synthesizers that have a "center voltage" of +2.3 Vdc. At room temperature, adjust C24 until the "center voltage" is obtained. Access to TP4 and C24 is available through the synthesizer top cover. **Note:** In order to measure the loop control voltage (TP4) the synthesizer is required to be turned on by keying the transmitter.

Audio Processor Alignment:
For circuit board version 43-911916 through 43-911923 refer to Technical Note TN130 Audio Processor Tuning Procedure. For other circuit board versions, refer to the appropriate manual.

Amplifier Output Power Adjustment:
No adjustment is necessary for the output power level when a change in frequency is made. To change the power output level, adjust RV1, the output power adjustment, until the desired output power is measured.

* Older amplifier modules may require R7, the output power adjustment, to be set back to the desired transmitter ouptut power when a change in frequency is made, however the newer models will remain with a constant output power level.

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

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International
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Fax: 250-382-6139

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e-mail: sales@danelec.com
web: www.danelec.com