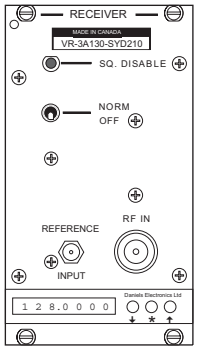
TN212 VR-3A130-SYD VHF AM Enhanced Receiver



The VR-3A130-S receiver is a high performance synthesized multichannel AM receiver capable of operating in 25 / 8.333 KHz channels. The VR-3A130-S receiver operates in the 118 to 138 MHz aviation band. A modular design allows each of the receiver's three internal modules, 21.4 MHz AM IF/Audio Main Board, FE3A Front End, and OSR-3A130 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 in the 118 to 138 MHz frequency band. Channel 16 can be programmed from the front panel frequency select handle.

Specifications

Frequency Band	118 - 138 MHz
Channel Spacing	8.333 KHz and 25 KHz
Receiver Switching Range	Unlimited
Sensitivity (for 6 dB S/N)	< -111 dBm
Sensitivity (for 10 dB SINAD)	< -107 dBm
Selectivity (Nose Bandwidth ± 3 KHz)	< 6dB
Selectivity (Skirt Bandwidth ± 22 KHz)	> 75 dB
Spurious Response Rejection	> 75 dB
Intermodulation Response Rejection	> 70 dB
Noise Level	< -40 dB
L.O. Frequency Stability	± 1.0 ppm (-30 °C to +60 °C) (-40 °C to +60 °C optional)
Modulation Type	6K00A3
Distortion (THD) (@ 25 °C)	< 5% @ 85% modulation
Distortion (THD) (-40 °C to +60 °C)	< 10% @ 85% modulation
AGC Attack Time / AGC Decay Time	< 40 ms / < 50 ms
Audio Squelch Sensitivity	> 8 dB SINAD close point / < 20 dB SINAD open point
Squelch Hysteresis	0 to 8 dB
Input Impedance	50 Ω (Type N Connector)
Operating Temperature	-30 °C to +60 °C (-40 °C to +60 °C optional)
Operating Current (Squelched)	< 117 mA

Specifications tested using RTCA DO-186A, TIA/EIA-603 and ETSI Section 8.8 EN300 676

Models Available

VR-3A130-SYD210 Enhanced Synthesized, AM, 118 - 138 MHz, with FP frequency select handle

Receiver Operating Frequency

The receiver is initially aligned at the factory for the center of the 118 to 138 MHz frequency range. **No re-alignment of the receiver is required to change frequencies**. The receiver operating frequency can be set as follows:

- Channel 1 is programmed by the four BCD switches located on the Receiver Main Board.
- Channels 2 through 15 are programmed in the synthesizers internal memory (done at the factory, or by a synthesizer channel programmer)
- Channel 16 is programmed by the front panel frequency select handle (exclusive to the AM product)

Control of the channel selection for a receiver module can be made through four channel select jumpers mounted on the motherboard. Optionally, control of the channel selection can be made through the control modules optional rotary switches or the auxiliary control connector (for external control of channel selection).

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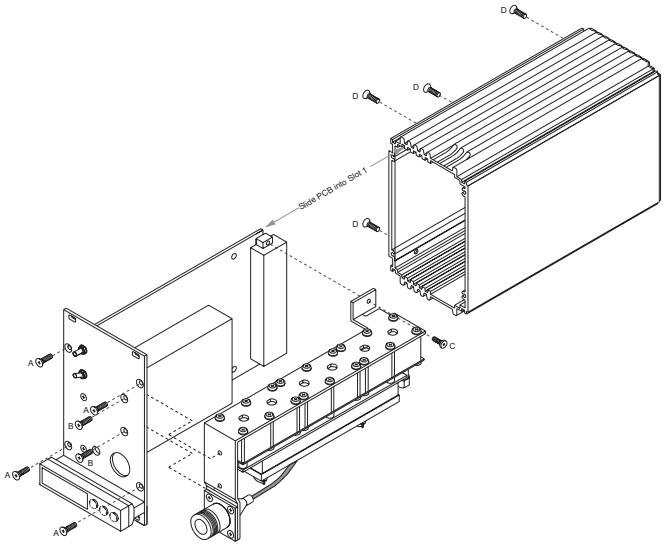
Receiver Alignment Procedures



Remove the four front panel screws (A) and four side panel screws (D) to slide the receiver outer cover off and expose the IF / Audio Main Board Local Oscillator and Front End Assemblies. Remove the two front panel screws (B) and internal screw (C) to remove the Front End for easier access to the Local Oscillator.

Squelch Adjustments:
Receiver squelch action is factory set to establish a squelch hysteresis window of 4 dB, such that the squelch closes at the 8 dB SINAD point and opens 4 dB above**.** eg. If the receiver 8 dB SINAD point is -108 dBm the receiver should be set to unsquelch at -104 dBm and squelch at -108 dBm. Rotate the squelch hysteresis adjust potentiometer (R42) and the squelch threshold potentiometer (R56) fully counter clockwise. Inject a 1 KHz tone at 30% modulation at the 8 dB SINAD level. Slowly adjust the squelch threshold potentiometer (R56) counter clockwise until the receiver squelches. Advance R42 (hysteresis) clockwise until sufficient hysteresis prevents any oscillating COR action at the squelch threshold point. Cycle the RF source off and on while adjusting R56 (threshold) until squelch triggering occurs at the desired signal level. Adjust R42 (hysteresis) clockwise to increase the squelch hysteresis window. Slowly lower the RF source signal level and monitor the point at which the receiver squelches. Increase or decrease R42 (hysteresis) to achieve the desired hysteresis window.

Front End Alignment:
No front end alignment is required. The enhanced synthesized receiver uses an elliptical band pass filter that is tuned at the factory for the entire frequency band of 118 - 138.

Synthesizer Alignment:
No synthesizer alignment is required. The synthesizer is aligned at the factory for use over the entire frequency range.

Frequency Select Handle Operation:
The frequency select handle is used to designate the operating frequency for channel 16 of the AM RF module. To operate the frequency select handle, set the AM module on channel 16 (using the motherboard jumpers, external control or rotary switch option) and ensure jumper JU73 on the Motherboard is installed.

1) The display is normally in a low power sleep mode. To display the current frequency press either the ↓ (decrease frequency) or the ↑ (increase frequency) buttons. This will display the current channel number (for 2 seconds), then the current frequency (for 3 seconds). The display will then go back to sleep.

2) Press the * (center) button to display the current lock status (“Locked” or “Unlocked”). To lock the buttons, press the ↑ button, and to unlock the buttons, press the ↓ button.

3) To change the current operating frequency, ensure the lock status is “unlocked” , then press either ↓ or ↑ to wake up the display, then use the ↓ or ↑ buttons to change the frequency. The ↓ or ↑ buttons have two modes of operation. Single press the buttons for single channel steps (8.333 KHz). Hold the button in for 6 seconds and the frequency will change by 66.66 KHz per step, and after 9 seconds of the button being pressed the frequency will change by 166.66 KHz per step. The operating frequency is set to the displayed value once the ↓ or ↑ buttons are released.

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

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