Tracking Receiver – Model 500 Series

High performance tracking and acquisition

Key Features

- Configurable for tracking receiver, spectrum analyzer, UPC or carrier monitoring via M&C
- Single or dual polarization inputs
- Single or dual internal receiver options
- Monopulse capability (with optional RF plate)
- Inputs for 950-2150 MHz L-Band, single or multi-band with converters for S/C/X/Ku/Ka
- Acquire C/No: 35 dB-Hz digital, 40 dB-Hz Analog
- Dynamic range: > 90 dB
- Quick-Lock acquisition (<1 second)

System

The Model 500 series of tracking receivers provides a high quality, cost effective solution as a beacon receiver for satellite tracking, spectrum analyzer, or carrier monitoring and uplink power control (UPC) receiver source for the NetMAC® M&C system.

The Receiver is an integrated rack mounted (2RU) chassis that includes:

- Dual touch screen display system with intuitive user interface and scroll wheel
- Embedded control and DSP processors
- Digital or analog receiver(s), or both
- DVB receiver for aiding target identification
- Up to 5 internal block down converters for any frequency band combination from L through Ka
- Dual 100MB Ethernet and EIA-422 serial ports (fiber optic interface optional)
- Internal L-Band test signal generator
- Available as 900 series Antenna Control Unit with integral 500 series receivers
- Ultra-Wideband 18/36/72 MHz instantaneous bandwidth version optional

The RF front end down-converts input signals in two stages: from L-band to an 869 MHz IF and then from 869 to 10.7 MHz. For analog operation, the 10.7 MHz signals are down-converted to 455 kHz. For digital receiver operation, the 10.7 MHz signals are passed through a high order passive anti-aliasing filter and coupled via a differential transformer to the inputs of an A/D converter. The ADC inputs are digitized at 16 MHz and are transferred to a 500 MHz, 32-bit Digital Signal Processor for real-time analysis.

Models

- **Model 520** - Analog receiver with optional internal BDCs
- **Model 550** – Digital receiver with spectrum analyzer and optional internal BDCs.
- **Model 570** – Dual Digital/Analog receiver with full range spectrum analyzer and optional internal BDCs
## Technical Specifications

### Internal RF Options

<table>
<thead>
<tr>
<th>Option</th>
<th>Band(s)</th>
<th>Input Frequency - GHz</th>
<th>VSWR</th>
<th>Image Rejection</th>
<th>Stability</th>
</tr>
</thead>
<tbody>
<tr>
<td>L1</td>
<td>L</td>
<td>0.95-2.150</td>
<td>2:1</td>
<td>40 dB</td>
<td>± 5 kHz</td>
</tr>
<tr>
<td>S1</td>
<td>S</td>
<td>2.0-2.8</td>
<td>1.5:1</td>
<td>40 dB</td>
<td>± 25 kHz</td>
</tr>
<tr>
<td>C1</td>
<td>C</td>
<td>3.4-4.2</td>
<td>1:1</td>
<td>40 dB</td>
<td>± 15 kHz</td>
</tr>
<tr>
<td>C2</td>
<td>C</td>
<td>3.4-4.8</td>
<td>1:1</td>
<td>40 dB</td>
<td>± 15 kHz</td>
</tr>
<tr>
<td>C3</td>
<td>C</td>
<td>4.0-4.8</td>
<td>1:1</td>
<td>40 dB</td>
<td>± 15 kHz</td>
</tr>
<tr>
<td>X1</td>
<td>X</td>
<td>7.25-7.75</td>
<td>1:1</td>
<td>40 dB</td>
<td>± 25 kHz</td>
</tr>
<tr>
<td>X2</td>
<td>X</td>
<td>7.6-8.5</td>
<td>1:1</td>
<td>40 dB</td>
<td>± 25 kHz</td>
</tr>
<tr>
<td>Ku1</td>
<td>Ku</td>
<td>10.7-11.9</td>
<td>1:1</td>
<td>40 dB</td>
<td>± 25 kHz</td>
</tr>
<tr>
<td>Ku2</td>
<td>Ku</td>
<td>11.8-13.0</td>
<td>1:1</td>
<td>40 dB</td>
<td>± 25 kHz</td>
</tr>
<tr>
<td>Ku3</td>
<td>Ku</td>
<td>10.7-13.0</td>
<td>1:1</td>
<td>40 dB</td>
<td>± 25 kHz</td>
</tr>
<tr>
<td>Ka1</td>
<td>Ka</td>
<td>17.0-18.1</td>
<td>1:1</td>
<td>40 dB</td>
<td>± 50 kHz</td>
</tr>
<tr>
<td>Ka2</td>
<td>Ka</td>
<td>18.1-19.2</td>
<td>1:1</td>
<td>40 dB</td>
<td>± 50 kHz</td>
</tr>
<tr>
<td>Ka3</td>
<td>Ka</td>
<td>19.2-20.3</td>
<td>1:1</td>
<td>40 dB</td>
<td>± 50 kHz</td>
</tr>
<tr>
<td>Ka4</td>
<td>Ka</td>
<td>20.2-21.3</td>
<td>1:1</td>
<td>40 dB</td>
<td>± 50 kHz</td>
</tr>
<tr>
<td>Ka5</td>
<td>Ka</td>
<td>21.2-22.3</td>
<td>1:1</td>
<td>40 dB</td>
<td>± 50 kHz</td>
</tr>
</tbody>
</table>

Note – some BDC configurations available with external 10 MHz reference input, please consult factory.

### Receiver Specifications

#### Analog (Model 520)
- **Input Frequency Range**: 950-2150 MHz
- **Total Input Power Level**: +10 dBm max
- **Input Beacon Level Range**: 0 to -96 dBm
- **Beacon Tuning Step Size**: 1 kHz
- **Predetection Bandwidth**: 280, 25, 6, 2.5 kHz
- **Signal Strength Linearity Error**: +/- 2 dB
- **C/No for Narrowband Acquisition**: 40 dB-Hz
- **Detection Type**: PLL
- **Sweep Width**: +/- 40 to +/- 150 kHz
- **Acquisition Time**: 1 sec (6 kHz BW, 120 kHz sweep)
- **ADC Resolution**: 16 bits

#### Digital (Models 550/570)
- **Input Frequency Range**: 950-2150 MHz
- **Total Input Power Level**: +10 dBm max
- **Input Beacon Level Range**: 0 to -94 dBm
- **Beacon Tuning Step Size**: 1 kHz
- **Predetection Bandwidth**: 250, 4, 1 kHz
- **Signal Strength Linearity Error**: +/- 1 dB
- **C/No for Narrowband Acquisition**: 35 dB-Hz (1 kHz BW)
- **Detection Type**: FFT-Based, No Integration
- **Sweep Width**: 16 to 300 kHz
- **Acquisition Time**: 300 ms (4 kHz BW, 150 kHz Sweep)

### Spectrum Analyzer

- **Span**: 0.1 MHz to 1.0 GHz
- **Signal Level Error**: 3 dB Max
- **Dynamic Range**: 85 dB
- **Spurious Free Dynamic Range**: 55 dB
- **Resolution Bandwidth**: 1 to 2 % of Span
- **Sweep Rate**: 3 to 8 Sweeps Per Second
- **Points Per Sweep**: 512 to 1024
- **Single Measurement Span**: 100 kHz to 2.4 MHz
- **Multiple Measurement Span**: 2.4 MHz to 1 GHz

#### Sweep Time

<table>
<thead>
<tr>
<th>Span</th>
<th>360 ms</th>
<th>200 ms</th>
<th>260 ms</th>
<th>230 ms</th>
<th>230 ms</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0.1 MHz</td>
<td>1.0 MHz</td>
<td>10.0 MHz</td>
<td>100.0 MHz</td>
<td>1000.0 MHz</td>
</tr>
</tbody>
</table>

### Carrier Monitoring

- **C/No Measurements/Minute**: 228
- **Power Measurement Error**: < 1 dB, Relative
- **Noise Measurement Error**: Noise power levels between -120 and -80 dBm-Hz

### Physical Data

- **Dimensions**: 3.5H x 19W x 20D
- **Weight (shipping)**: 23.5 Lbs (28Lbs)
- **Power**: 90-264 VAC, 47-63 Hz, 200VA
- **Temperature, Operating**: 0° to 50° C
- **Temperature, Storage**: -40° to +60° C
- **Humidity**: 0 to 95%, non-condensing
- **MTBF**: > 30,000 hrs
- **Data Interfaces**: Serial RS-422, DB-9, Ethernet, RJ45 x2
- **Track Signal Outputs**: Analog and streaming digital (serial or Ethernet)

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**L-Band configuration**

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