The Path Align-R™ test set is a high performance, complete test solution designed to quickly and accurately optimize the transmission path between two microwave antenna sites. The Path Align-R directly drives the site’s antennas, allowing the optimization process to be done without the need for on-site radios, complex test equipment, ground technicians, on-site AC power, cell phones, or two-way radios.

Antenna Alignment Test Set
Each Path Align-R is a tuneable, synthesized signal source and a narrow-band receiver. The transmitter’s fixed output level (0 dBm) is powerful enough for long path lengths, yet low enough to virtually eliminate the possibility of interference to adjacent links. The receiver’s sensitivity and narrow bandwidth allow for accurate measurement of the received signal while providing a very high rejection of adjacent signals. Front panel thumbwheel switches provide tuning within the frequency bands to a resolution of 1 MHz. Both test sets transmit to and receive from one another continuously.

Four Frequency Bands Available
The Path Align-R Model 2200 comes ready to use with four frequency bands. The 2400 extends the ranges of these bands. Models ending in “A” (e.g. 2200A, 2240A, etc.) are custom configured for at least one or more frequency band options. Each test set of two is delivered in custom designed, weather-resistant instrument backpacks that include pockets for carrying the headset, cable, waveguide-to-coax adapters, and a spare battery. The backpack also contains a large “D” ring to facilitate attaching the test set to the tower using a carabiner and nylon runner, sling or lanyard.

Record-R™ Internal Data Logging (Model 2241)
The results of the antenna path alignment are logged into the internally installed Record-R. The Record-R contains an embedded GPS receiver, which provides accurate date/time and position information to be added to the frequency and path loss data. This logged data is saved in non-volatile memory for later transfer to a PC. A single front panel pushbutton activates the logging process. Up to 250 separate data records can be saved in the field for later download. Access to stored records is provided via USB or RS-232 connectors located on the rear panel. The Log View-R™ software utility is provided for interface between a PC and the instrument.
### Transmitter

**Transmission:**
Full-duplex (simultaneous transmission and reception)

**Transmitter Output Power:**
0 dBm, nominal

**Transmitter Stability:**
5.1x10^{-7}/day (aging) + 1 x 10^{-6} (temperature 0°C to 50°C)

### Tuneable Frequency Bands

#### Standard Bands

**2200/2200A**

<table>
<thead>
<tr>
<th>Band</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1.5-2.5 GHz</td>
</tr>
<tr>
<td>2</td>
<td>3.5-5.6 GHz</td>
</tr>
<tr>
<td>3</td>
<td>7.5-12.0 GHz</td>
</tr>
<tr>
<td>4</td>
<td>18.1-19.4 GHz</td>
</tr>
</tbody>
</table>

**Resolution:** 1.0 MHz

#### Extended Bands

**2240/2240A/2241/2241A**

<table>
<thead>
<tr>
<th>Band</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1.5-2.5 GHz</td>
</tr>
<tr>
<td>2</td>
<td>3.5-5.6 GHz</td>
</tr>
<tr>
<td>3</td>
<td>7.5-12.0 GHz</td>
</tr>
<tr>
<td>4</td>
<td>18.1-19.4 GHz</td>
</tr>
<tr>
<td>5</td>
<td>11.0-12.0 GHz</td>
</tr>
<tr>
<td>6</td>
<td>18.1-19.4 GHz</td>
</tr>
</tbody>
</table>

**Resolution:** 1.0 MHz

#### Band Options for Models

**2200/2200A**

<table>
<thead>
<tr>
<th>Band</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1.5-2.5 GHz</td>
</tr>
<tr>
<td>2</td>
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<td>3</td>
<td>7.5-12.0 GHz</td>
</tr>
<tr>
<td>4</td>
<td>18.1-19.4 GHz</td>
</tr>
</tbody>
</table>

**Resolution:** 1.0 MHz

**Power**
Self-contained 12V, 2.3 Ah, rechargeable sealed lead-acid camcorder battery

**Transmitter Sensitivity:**
-95 dBm (damage level: +10 dBm)

**Receiver Sensitivity:**
2200/2200A: 160 dBm
ddBm (need to add bands)

**Receiver Bandwidth:**
100 kHz, nom.

**Receiver Overload Point:**
-30 dBm (damage level: +10 dBm)

**Receiver Readout:**
LCD direct and earpiece

**Environmental Data**

**Operating Temperature:**
-10°C to 40°C (14°F to 104°F)

**Storage Temperature:**
-40°C to 71°C (-40°F to 160°F)

**Relative Humidity:**
95%±5% at 30°C; 75%±5% at 40°C; 45%±5% at 40°C

**Accuracy Position:**
±2 meters CEP (50%)

**Accuracy Timing:**
±95 ns.

**Time to Lock:**
Cold start: <130 seconds (90%);
Warm start: <45 seconds (90%);
Hot start: <20 seconds (90%)

**Reacquisition Time:**
<2 seconds (90%) after loss of signal

**Moving Velocity:**
32 correlators

**GPS**

**Frequency:**
L1 (1575.42 MHz), C/A code (SPS), 8-channel cont. tracking, 32 correlators

**Accuracy Position:**
±2 meters CEP (50%)

**Accuracy Timing:**
±95 ns.

**Position Fix Update:**
1 second

**Environmental Data**

**Designated to meet MIL-T-28800D**

**Type III, Class 5 or 6, Style E and EN 61326-1**

**CE (European Union):**
EN 55011: 1998 w/A1: 1999 Group 1 Class B (emissions);
EN 61326-1: 1997 w/A1: 1998 (immunity)

**Ordering Information**

### Supplemental Specs

#### Warranty:
One year limited warranty

**Included with Instrument**
Each Path Align-R set of two comes with (1 per each instrument):
- Headset (mic and earpiece) with 10ft cord
- Coax cable assembly (SMA[m] to SMA[m], 3 meters)
- Battery (12 VDC/2.3 Ah rechargeable sealed lead/acid)
- Battery charger (AC MAINS powered 90-264 YAC/47-63 Hz with IEC-320 input)
- AC MAINS Power Cord (IEC-320 to NEMA type 5-15p plug)
- Weather-resistant instrument backpack
- Operating manual and user card

Models ending in “A” must be ordered with at least one frequency band option.

**Band Options for Models**

**2200/2200A**

<table>
<thead>
<tr>
<th>Opt</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>1.5-2.5 GHz</td>
</tr>
<tr>
<td>02</td>
<td>5.8-6.6 GHz</td>
</tr>
<tr>
<td>03</td>
<td>11.0-12.0 GHz</td>
</tr>
<tr>
<td>04</td>
<td>18.1-19.4 GHz</td>
</tr>
</tbody>
</table>

**Band Options for Models**

**2240(A) and 2241(A)**

<table>
<thead>
<tr>
<th>Opt</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>1.5-2.5 GHz</td>
</tr>
<tr>
<td>02</td>
<td>3.5-5.6 GHz</td>
</tr>
<tr>
<td>03</td>
<td>7.5-12.0 GHz</td>
</tr>
<tr>
<td>04</td>
<td>18.1-19.4 &amp; 22.0-23.5 GHz</td>
</tr>
</tbody>
</table>

### Accessories

Spectracom offers various optional accessories, such as waveguide adaptors, cables, carrying cases, spare batteries and more. See our Path Align-R Accessories data sheet for more information.

For more information, visit our Path Align-R Accessories data sheet.