MTSU Radio Antenna System
25-Mar-2017 C. Higgins v.6
Scale: None Sheet: 1 of 1

**Measured Path Loss**

<table>
<thead>
<tr>
<th>Component</th>
<th>Loss (dB)</th>
<th>Cumulative Loss (dB)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Antenna 16:1 balun</td>
<td>0.60</td>
<td>0.60</td>
</tr>
<tr>
<td>24 ft coax feed lines (4 in parallel)</td>
<td>0.28</td>
<td>0.88</td>
</tr>
<tr>
<td>Combiners ZSC-2-1W+ (2 in parallel)</td>
<td>0.21</td>
<td>1.09</td>
</tr>
<tr>
<td>30° S zenith angle phasing</td>
<td>0.10</td>
<td>1.19</td>
</tr>
<tr>
<td>160 ft coax (2 in parallel)</td>
<td>1.16</td>
<td>2.35 Cal Plane</td>
</tr>
<tr>
<td>90° Hybrid DQK-701B</td>
<td>0.29</td>
<td>2.64</td>
</tr>
<tr>
<td><strong>Total Feed System Loss to Receiver</strong></td>
<td><strong>2.64</strong></td>
<td></td>
</tr>
</tbody>
</table>

**Hardware**

- **Antenna:** Square 24 ft TFD array, 16:1 balun, 800 Ω terminator
- **Antenna Feedline Coax:** Belden 8259 RG-58, 24 ft (Loss = 0.28 dB)
- **Antenna Phasing Coax:** Belden 8259 RG-58, 8.5 ft (Loss ≈ 0.1 dB)
- **Receiver Feedline Coax:** LMR-400, 160 ft (Loss = 1.16 dB)
- **Combiners:** Mini-Circuits ZSC-2-1W+ (Loss = 0.21 dB)
- **90° Hybrid:** DQK-701B (Loss = 0.29 dB)

**Calibration Flowchart**

- **HP 461A** 3 ft **Kay 432D** 3 ft **ZSC-2-1W+** 9 ft **FSX-6S Spectrograph** 4 ft
- **Cal Plane** Loss from Cal plane to feed points 2.35 dB
- **90° Hybrid Coax**