Quadrature Tower-Top Amplifier Systems provide a high degree of reliability in a TTA system through the use of a redundant amplifier configuration in both the tower box and base-mounted receiver multicoupler. Amplifier redundancy is realized through the use of quadrature-coupled amplifiers (also called quad-amplifier). This type of amplifier provides two, essentially parallel paths of amplification. Failure of one amplifier results in an overall gain reduction of only 6 dB. A quad-amplifier also provides the same level of reliability in the receiver multicoupler.

Fault detection circuitry senses any significant change in the DC power consumption of the tower box or base amplifier and provides a visual alarm along with a change of state in a set of Form C contacts thus providing a warning that trouble has developed. In most cases, near normal operation will continue on one-half of a quad-amplifier thus allowing time for repair without an abrupt change in performance. Separate fault indicators for the tower amplifier and base unit help pinpoint the problem area. The quad-amplifier used in the tower box can be replaced using only a pair of cable pliers and a screw driver so a repair can be affected with only a brief interruption of service (all mounting hardware is captive). Please note that proper operation of this system requires the installation of a test transmission line in addition to the main receive line because both lines carry necessary voltages in addition to RF. Operation is possible with only the main transmission line but proper alarm functions will be disabled.

Standard Features:

• Tower amplifier in weatherproof stainless steel enclosure.
• Redundant amplifier circuitry using quadrature-coupled amplifiers for reliability.
• Polyphaser impulse suppressors on all tower box I/O ports.
• On the tower replacement of the quad-amplifier using only a screwdriver and cable pliers.
• Expandable, rack-mounted, 16-port receiver multicoupler with integrated tower box monitoring.
  System gain remains constant when expanding to 32 ports.
• Reserve gain setting pads (3 & 6 dB) installed on the receiver multicoupler chassis.
• Test Port allows gain measurement from ground level.
• LCD current meter readout and multicolored, panel-mounted LEDs for status reporting.
• Form C contacts for fault reporting through a supervisory system are available through screw terminals on the rear of the control-panel.
• Operation on 85-264 VAC with automatic reverting to a backup 24 VDC source upon loss of AC.

Available Options:

• Sixteen-port receiver multicoupler expansion shelf for 32 total outputs.
• Backup AC and -48 VDC power supplies.
• Polyphaser impulse suppressor with DC pass-thru for transmission line entry into the radio room.

System Specifications

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>System Noise Figure: 4.0 dB max.</td>
<td></td>
</tr>
<tr>
<td>3rd Order IIP: &gt;10 dBm</td>
<td></td>
</tr>
<tr>
<td>Reserve Gain: 13 dB max.</td>
<td></td>
</tr>
<tr>
<td>Net Weight: 46 lbs (20.9 kg)</td>
<td></td>
</tr>
<tr>
<td>Ship Weight: 56 lbs (25.4 kg)</td>
<td></td>
</tr>
<tr>
<td>Out-of-Band Rejection: &gt;110 dB @ 928 MHz, &gt;70 dB @ 894 MHz, &lt;30 dB Flyback</td>
<td></td>
</tr>
</tbody>
</table>
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A steep skirted combline bandpass filter in the tower box provides a selective 5 MHz system window.

A second preselector mounted below the multicoupler adds more selectivity to the system for exceptional out-of-band rejection, particularly at cellular radio frequencies as the overall system response shown below illustrates.

### Simplified block diagram of tower amplifier

#### Tower Top Amplifier Specifications

**ELECTRICAL:**
- Frequency Range: 896 - 901 MHz
- TTA Net Gain / Noise Figure: 20 dB / 2.5 dB
- Impedance (ohms): 50 ohms
- VSWR: < 2.1
- Preselector: Type: 6-Pole Combline Bandpass, 5 MHz BW
  - Loss: 1 dB
- Preamplifier: Type: Quadrature Coupled, Single Stage
  - Gain: 21 dB min.
  - Noise Figure: 1.6 dB max.
  - 1 dB Compression Point: 27.5 dBm
  - 3rd Order Input / Output IP: 15 / 36 dBm
- Power Requirements: 24 VDC @ 700 mA
- Lightning Protection: Impulse suppressor on RF Input and Output.
- Operating Temperature Range: -30°C to +60°C

**MECHANICAL:**
- Enclosure: NEMA 4x, Stainless Steel
- Connectors: N (f)
- Dimensions (HWD): not including mounting tabs or connectors
  - 24” x 6” x 6” (610 x 152 x 152 mm)
- Net Weight: 29 lbs (13.2 kg)

### RECEIVER MULTICOPPLER SPECIFICATIONS

**ELECTRICAL:**
- Frequency Range: 896 - 901 MHz
- Multicoupler Net Gain: 4 dB
- Preselector: Type: Separate deck, 8 Pole w/reject notches
  - Loss: 1.25 dB
- Preamplifier: Type: Two-stage, Quadrature-Coupled
  - Gain: 21 dB min.
  - Noise Figure: 3.5 dB max.
  - 1 dB Compression Point: 33 dBm
  - 3rd Order Input / Output IP: 27 dBm / 48 dBm
- Identity: Two Form C contacts provided
- Power Requirements: 85 - 264 VAC @ 47 - 63 Hz
- Operating Temperature Range: 0°C to +50°C

**MECHANICAL:**
- Enclosure: Standard EIA 19” rack mounting
- Connectors: N(f) feedline & test port input, BNC(f) output
- Dimensions (HWD): 5.25” x 19” x 14” (134 x 483 x 356 mm)
- Net Weight: 17 lbs (7.8 kg)