1/3 Rack Mount Amplitude/Slope Equalizer Systems

TRE Series

Model TRE-100200 is ARSTRAT Compliant
With Options 11 and 16: 2nd harmonic is 60 dBc at 2 GHz with 0 dBm output

<table>
<thead>
<tr>
<th>Frequency (MHz)</th>
<th>Model Numbers</th>
</tr>
</thead>
<tbody>
<tr>
<td>50 – 90</td>
<td>TRE-050090</td>
</tr>
<tr>
<td>100 – 180</td>
<td>TRE-100180</td>
</tr>
<tr>
<td>950 – 1450</td>
<td>TRE-950145</td>
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<tr>
<td>950 – 1750</td>
<td>TRE-950175</td>
</tr>
<tr>
<td>950 – 2150</td>
<td>TRE-950215</td>
</tr>
<tr>
<td>1000 – 2000</td>
<td>TRE-100200</td>
</tr>
</tbody>
</table>

TRE Series 1/3 Rack Mount 1RU Configurations Available
See rear page of this brochure for detailed illustrations

- Up to three amplifier/equalizer channels in 1RU package
- 1:1 configuration: via use of RSU-TR switchover unit (see D-322)
- 1:2* and up to 1:12* configurations: via use of NSU2/NSUN controller (see D-323B)
  *1:2 and up to 1:12 configurations require additional rack height for NSUN controller and additional channels

These third rack amplitude/slope equalizer systems offer independent gain and slope adjustment in the IF and L frequency bands. These systems are designed to compensate for long cable run loss and can be configured to provide system redundancy in a 1RU package.

TRE Units Feature
- RF hot-swappable units
- Rack mountable
- Current fault alarm/summary alarm
- Independent power supplies
- Remote status (Option 17 only)
- Module current fault detection
- CE Mark

Options
- Remote control for attenuation/slope adjustment, fault alarms
- Input/output signal monitors
- Increased gain
- Increased output power

U.S. Patent #7,510,090
### General Specifications

#### Primary Power Requirements

- **Voltage** ................................................................. 95-250 VAC
- **Frequency** .......................................................... 47-63 Hz
- **Consumption** .................................................. 10 W typical

#### Summary Alarm

- Contact closure/open for DC voltage and/or amplifier alarm
- Status alarm readout on remote control bus (digital front panel required, Option 17)

#### Physical

- **Weight** ................................................................. 3 pounds (1.36 kg) typical
- **Overall dimensions** .............................................. 5.70” [144.8mm] x 1.48” [37.6mm] x 18” [457.2mm] (excluding connectors)
- **Connectors**
  - Primary power input ............................................ IEC 320
  - RF connectors ................................................... SMA female
  - Status interface .................................................. DE-9S
  - Redundancy interface ......................................... DE-9P
  - Remote interface (Option 17) ............................ RJ-45 female for Ethernet, RS422/485 available on status connector

#### Environmental

- **Operating**
  - Ambient temperature ........................................ 0 to 50°C
  - Relative humidity ......................................... Up to 95% at 30°C
  - Atmospheric pressure .................................. Up to 10,000 feet
- **Nonoperating**
  - Ambient temperature ....................................... -50 to +70°C
  - Relative humidity ...................................... Up to 95% at 40°C
  - Atmospheric pressure .................................. Up to 40,000 feet
  - Shock and vibration .................................... Normal handling by commercial carriers

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### Specifications

<table>
<thead>
<tr>
<th></th>
<th>IF-Band</th>
<th>L-Band</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gain</strong></td>
<td>20 dB minimum (at center frequency and 6 dB slope adjustment)</td>
<td>15 dB minimum (at center frequency and 6 dB slope adjustment)</td>
</tr>
<tr>
<td></td>
<td>10 dB nominal (at 0 dB slope)</td>
<td>18 dB nominal (at 0 dB slope)</td>
</tr>
<tr>
<td><strong>Gain adjustment range</strong></td>
<td>20 dB minimum</td>
<td>20 dB minimum</td>
</tr>
<tr>
<td><strong>Amplitude slope adjustment range</strong></td>
<td>0 to 6 dB (see Figure 1)</td>
<td>0 to 6 dB (see Figure 2)</td>
</tr>
<tr>
<td><strong>Amplitude flatness</strong></td>
<td>0.5 dB p-p maximum (at 0 dB slope)</td>
<td>1.5 dB p-p maximum (at 0 dB slope)</td>
</tr>
<tr>
<td><strong>Power output</strong></td>
<td>+10 dBm minimum (at maximum gain and 6 dB slope)</td>
<td>+10 dBm minimum (at maximum gain and 0 dB slope)</td>
</tr>
<tr>
<td>(1 dB compression)</td>
<td>(at maximum gain and 6 dB slope)</td>
<td>(at maximum gain and 0 dB slope)</td>
</tr>
<tr>
<td><strong>Third order intercept point</strong></td>
<td>+20 dBm minimum (at maximum gain and 6 dB slope)</td>
<td>+20 dBm minimum (at maximum gain and 0 dB slope)</td>
</tr>
<tr>
<td><strong>Noise figure</strong></td>
<td>10 dB maximum (at maximum gain and 6 dB slope)</td>
<td>10 dB maximum (at maximum gain and 0 dB slope)</td>
</tr>
<tr>
<td><strong>Spurious</strong></td>
<td>Below thermal noise</td>
<td>Below thermal noise</td>
</tr>
<tr>
<td><strong>AM/PM conversion</strong></td>
<td>0.5°/dB maximum at 0 dBm output</td>
<td>0.5°/dB maximum at 0 dBm output</td>
</tr>
<tr>
<td><strong>Input/output return loss</strong></td>
<td>18 dB minimum</td>
<td>18 dB minimum</td>
</tr>
<tr>
<td><strong>Input/output impedance</strong></td>
<td>75 ohms (50 ohms optional)</td>
<td>50 ohms</td>
</tr>
</tbody>
</table>

Note: TRE-100200 with Options 11 and 16, 2nd harmonic: 60 dBc at 2 GHz with 0 dBm output (ARSTRAT Compliant).
**Options**

1. Input monitor with -20 dBc nominal level.

2. Output monitor with -20 dBc nominal level.

11. Increased output power (L-band only).
   - Power output (1 dB compression): +20 dBm minimum (at maximum gain and 0 dB slope).
   - Third order intercept point: +30 dBm minimum (at maximum gain and 0 dB slope).
   - Output return loss: 14 dB minimum.

15. Impedance, 50 ohm (IF-band only).

16. Increased gain, 30 dB minimum (at center frequency and 6 dB slope adjustment).

17. Remote control ................................................ 10/100Base-T Ethernet interface providing:
   - HTTP-based web server
   - SNMP 1.0 configuration
   - Alarm reporting via SNMP Trap
   - Telnet access
   - Password protection and selectable RS485/422
   - Gain control is 30 dB in 0.2 dB steps
   - Slope control is 6.0 dB in 0.1 dB steps

Notes: Missing option numbers are not applicable for this product.
Option 1 will degrade noise figure proportional to loss of device inserted before amplifier/equalizer.
Option 2 will degrade output power compression point proportional to insertion loss of device inserted after the amplifier/equalizer.
For literature describing local control (front panel) and remote control (bus control), refer to MITEQ’s Technical Note 25T066.

**Accessories**

1/3 Rack mount frame
- Model number................................. OL-TR3-20
- Weight ............................................... 1.5 lbs. [0.68 kg] nominal
- Dimensions........................................ 19” [482.6mm] x 1.75” [44.5mm] x 20” [508.0mm]

Single unit frame (includes rack slides)
- Model number................................. OL-TR1-20
- Weight ............................................... 2 lbs. [0.9 kg] nominal
- Dimensions........................................ 19” [482.6mm] x 1.75” [44.5mm] x 18” [457.2mm]

Dual unit frame (includes rack slides)
- Model number................................. OL-TR2-20
- Weight ............................................... 3 lbs. [1.35 kg] nominal
- Dimensions........................................ 19” [482.6mm] x 1.75” [44.5mm] x 18” [457.2mm]
Some Configurations Using MITEQ’s Patented 1/3 Rack Mount Equipment

**Three Channel Amplifier/Equalizer System:** 3 - Standard TRE amplifier/equalizer models are shown, TRE amplifier/equalizer models (with Option 17 display) can be substituted.

**1:1 Redundant Amplifier/Equalizer System:** 2 - TRE amplifier/equalizer models (with Option 17 display) are shown, standard TRE amplifier/equalizer models can be substituted and 1 - 1/3 rack RSU switchover unit.

**1:2 Redundant Amplifier/Equalizer System:** 1:2 Redundant Configuration shown using 3 - TRE amplifier/equalizer models (with Option 17 display) and 1 - NSU2 switchover unit.

**Configure Up To 1:12 Redundant Equalizer System:** 1:11 Redundant Configuration shown with 12 - TRE amplifier/equalizer models (with Option 17 display) and 1 - NSUN control unit.