Figure 1. Model H810B Slotted Section

in slotted-line measurement systems. The 810B consists of an accurately machined waveguide section with a narrow longitudinal slot tapered to ensure low SWR; sections are available for measurements over the 3.95-
to 18-Gc range.

3. PRINCIPLES OF OPERATION.

4. A Model 810B slotted section is installed in an 809C Universal Probe Carriage shown in Figure 2. In operation, RF power is applied through the slotted section to the device under investigation. The fields in the line are sampled by means of a probe which protrudes into the slotted section. The output of the probe is fed to a high-gain voltmeter such as the HP Model 415E Standing Wave Indicator. With this type of setup, information about variations along the entire length of probe travel can be obtained.

5. OPERATION.

6. See the Operating and Service Manual for the Model 809C Universal Probe Carriage for installation instructions.

Table 1. Specifications

<table>
<thead>
<tr>
<th>Model</th>
<th>Frequency Range (Hz)</th>
<th>Waveguide I.D. (in.)</th>
<th>Waveguide Size Nom. O.D. (EIA)</th>
<th>Equiv. Flange</th>
</tr>
</thead>
<tbody>
<tr>
<td>G810B</td>
<td>3.95 - 5.85</td>
<td>47.5 x 22.1 (1.872 x 0.872)</td>
<td>50.8 x 25.4 (2 x 1)</td>
<td>UG-407/U</td>
</tr>
<tr>
<td>J810B</td>
<td>5.30 - 8.20</td>
<td>34.8 x 15.8 (1.372 x 0.622)</td>
<td>38.10 x 19.05 (1-1/3 x 3/4)</td>
<td>UG-441/U</td>
</tr>
<tr>
<td>H810B</td>
<td>7.05 - 10.00</td>
<td>28.5 x 12.6 (1.122 x 0.497)</td>
<td>31.75 x 15.83 (1-1/4 x 5/8)</td>
<td>UG-138/U</td>
</tr>
<tr>
<td>X810B</td>
<td>8.20 - 12.40</td>
<td>22.9 x 10.2 (0.900 x 0.400)</td>
<td>25.40 x 12.70 (1 x 1/2)</td>
<td>UG-135/U</td>
</tr>
<tr>
<td>M810B</td>
<td>10.0 - 15.0</td>
<td>0.750 ± 0.002 x 0.375 ± 0.001</td>
<td>0.650 x 0.475</td>
<td>WR75</td>
</tr>
<tr>
<td>P810B</td>
<td>12.40 - 18.00</td>
<td>15.8 x 7.90 (0.622 x 0.311)</td>
<td>17.83 x 9.93 (0.702 x 0.391)</td>
<td>UG-419/U</td>
</tr>
</tbody>
</table>

Slope and irregularities: < 1.01 SWR
Discontinuity due to slot results in SWR of less than 1.01

Length: 10-1/4 inches (250 mm)
Carriage: Fits HP 809C Universal Probe Carriage
7. OPERATING PRECAUTIONS.

Protect the flanges from damage. Any scoring or
burring of the mating surfaces causes discontinuity;
the resulting increase in SWR degrades performance.
Protective flange caps are included with new slotted
line sections. Replacement caps are available with
the following HP part numbers.

- G810B 5040-0356
- J810B 5040-0352
- HS10B 5040-0353
- X810B 5040-0354
- M810B 5040-0370
- P810B 5040-0358

c. Set the SWR meter to the -50 dB EXPAND scale.

d. Adjust signal generator OUTPUT for an indication
   on the SWR meter.

e. Move the carriage through its full travel while
   observing amplitude variation in the peaks of the stand-
   ing waves. If necessary, loosen socket-head cap screws
   slightly on end of carriage with the higher reading and
   tighten the slope adjustment screw (small hex socket-
   head setscrew at centerline of endframes). Continue
   this adjustment until variation is equal to or less than
   0.2 dB. This is the slope adjustment.

f. Test at lowest frequency of waveguide section and
   intermediate frequencies. Variation must be equal to
   or less than 0.2 dB at all frequencies (without readjust-
   ment).

9. PERFORMANCE CHECK.

10. The following procedures check 810B performance
    for incoming inspection, periodic evaluation, calibration
    and troubleshooting. Specifications given in the
    specification table are the performance standards.

11. TEST EQUIPMENT REQUIRED.

12. Instruments and accessories required to make the
    performance tests are listed in Table 2. Test instru-
    ments other than the ones listed can be used provided
    performance equals or exceeds the critical specifi-
    cations listed.

13. SLOPE AND IRREGULARITIES.

14. Connect the equipment as shown in Figure 3.

   a. Adjust probe depth about 1/8" less than maximum
      penetration.

   b. Set the signal generator for highest frequency of
      waveguide section with 1000-Hz squarewave modula-
      tion.

   c. Move the carriage to a minimum and move the
      sliding load to obtain the minimum SWR reading on
      the SWR meter. Again this adjustment requires some
      care since these settings are also interdependent. This
      reading is the residual SWR. This value must be equal
to or less than 1.01.
### Table 2. Recommended Test Equipment

The following test equipment is recommended for performance testing of the Model 810B. Other equipment may be substituted provided it meets or exceeds the specifications in the Critical Specifications column.

<table>
<thead>
<tr>
<th>Instrument</th>
<th>Critical Specifications</th>
<th>HP Model Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Signal Generator</td>
<td>Frequency: band of interest Modulation: 1000 Hz squarewave</td>
<td>618C (3.8 to 7.6 GHz)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>620B (7 to 11 GHz)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>626A (10 to 15.5 GHz)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>628A (15 to 21 GHz)</td>
</tr>
<tr>
<td>Low-pass Filter</td>
<td>Passband: band of interest Reject: second harmonics</td>
<td>360D (cutoff 4.1 GHz)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>X362A (X-band)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>M362A (M-band)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>P362A (P-band)</td>
</tr>
<tr>
<td>Adapter (if needed)</td>
<td>Frequency: band of interest Coaxial to waveguide</td>
<td>281A</td>
</tr>
<tr>
<td>Carriage</td>
<td>Fits 810B</td>
<td>809C</td>
</tr>
<tr>
<td>Detector</td>
<td>Frequency: band of interest Fits 3/4&quot; mounting hole</td>
<td>442B or 444A</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(442B needs 440A Detector Mount also)</td>
</tr>
<tr>
<td>SWR Meter</td>
<td>Compatible with detector Expanded SWR scale</td>
<td>415E</td>
</tr>
<tr>
<td>Sliding Load</td>
<td>To fit waveguide Frequency : band of interest Movable Load</td>
<td>914A</td>
</tr>
</tbody>
</table>

### Table 3. Performance Check Test Card

<table>
<thead>
<tr>
<th>Model 810B</th>
<th>Date</th>
<th>Waveguide Slotted Section</th>
<th>Tested by</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>SWR (≤ 1.01)</td>
<td></td>
</tr>
</tbody>
</table>