Programming Code Compatibility
Suite Guide Option 266

Agilent Technologies
PSA Spectrum Analyzers

This manual provides documentation for the following instruments with Option 266 Installed:

PSA Series
E4440A (3 Hz - 26.5 GHz)
E4443A (3 Hz - 6.7 GHz)
E4445A (3 Hz - 13.2 GHz)
E4446A (3 Hz - 44.0 GHz)
E4447A (3 Hz - 42.98 GHz)
E4448A (3 Hz - 50.0 GHz)

Manufacturing Part Number: E4440-90628
Supersedes: E4440-90352
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Documentation is updated periodically. For the latest information about Agilent PSA Spectrum Analyzers, including firmware upgrades, software upgrades, application information, and product information, please visit the Internet URL listed below:

http://www.agilent.com/find/psa
### 1. Getting Started

- Option 266 Description ................................................................. 26
- Option 266 Limitations ............................................................... 26
- Hardware and Firmware Requirements for Option 266 .................. 28
- Installing Option 266 ................................................................. 30
- Installing Optional Measurement Personalities ......................... 30
- Configuring Option 266 on PSA Analyzers ................................. 37
- The Configure Remote Lang Screen Menu - PSA Analyzers .......... 40
- Running Software that Requires SCPI Commands ....................... 45
- Service and Calibration ............................................................. 47
- Documentation for Option 266 .................................................. 48
- Spectrum Analyzers with Option 266 ....................................... 48
- Spectrum Analyzer Updates ..................................................... 48

### 2. Legacy Analyzer Command List

- Table of All Legacy Analyzer Commands .................................. 50

### 3. Hints and Tips

- A Few Helpful Hints and Tips .................................................. 82

### 4. Programming Commands

- Command Syntax ....................................................................... 86
- Programming Command Descriptions ...................................... 88
- A1 [one]
  - Clear Write for Trace A ........................................................... 89
  - Syntax ................................................................................. 89
  - Description ......................................................................... 89
- A2 [two]
  - Maximum Hold for Trace A .................................................... 90
  - Syntax ................................................................................. 90
  - Description ......................................................................... 90
- A3 [three]
  - View Mode for Trace A .......................................................... 91
  - Syntax ................................................................................. 91
  - Description ......................................................................... 91
- A4 [four]
  - Blank Trace A ..................................................................... 92
  - Syntax ................................................................................. 92
  - Description ......................................................................... 92
- ACP
  - Adjacent Channel Power ....................................................... 93
  - Syntax ................................................................................. 93
  - Description ......................................................................... 93
- ACPALPHA
  - Adjacent Channel Power Alpha Weighting .............................. 94
  - Syntax ................................................................................. 94
  - Description ......................................................................... 94
- ACPALTCH
<table>
<thead>
<tr>
<th>Table Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adjacent Channel Power Alternate Channels</td>
<td>95</td>
</tr>
<tr>
<td>Syntax</td>
<td>95</td>
</tr>
<tr>
<td>Description</td>
<td>95</td>
</tr>
<tr>
<td>ACPBRPER</td>
<td></td>
</tr>
<tr>
<td>Adjacent Channel Power Burst Period</td>
<td>96</td>
</tr>
<tr>
<td>Syntax</td>
<td>96</td>
</tr>
<tr>
<td>Description</td>
<td>96</td>
</tr>
<tr>
<td>ACPBRWID</td>
<td></td>
</tr>
<tr>
<td>Adjacent Channel Power Burst Width</td>
<td>97</td>
</tr>
<tr>
<td>Syntax</td>
<td>97</td>
</tr>
<tr>
<td>Description</td>
<td>97</td>
</tr>
<tr>
<td>ACPBW</td>
<td></td>
</tr>
<tr>
<td>Adjacent Channel Power Bandwidth</td>
<td>98</td>
</tr>
<tr>
<td>Syntax</td>
<td>98</td>
</tr>
<tr>
<td>Description</td>
<td>98</td>
</tr>
<tr>
<td>ACPCOMPUTE</td>
<td></td>
</tr>
<tr>
<td>Adjacent Channel Power Compute</td>
<td>99</td>
</tr>
<tr>
<td>Syntax</td>
<td>99</td>
</tr>
<tr>
<td>Description</td>
<td>99</td>
</tr>
<tr>
<td>ACPFRQWT</td>
<td></td>
</tr>
<tr>
<td>Adjacent Channel Power Frequency Weighting</td>
<td>100</td>
</tr>
<tr>
<td>Syntax</td>
<td>100</td>
</tr>
<tr>
<td>Description</td>
<td>100</td>
</tr>
<tr>
<td>ACPLOWER</td>
<td></td>
</tr>
<tr>
<td>Lower Adjacent Channel Power</td>
<td>101</td>
</tr>
<tr>
<td>Syntax</td>
<td>101</td>
</tr>
<tr>
<td>Description</td>
<td>101</td>
</tr>
<tr>
<td>ACPMAX</td>
<td></td>
</tr>
<tr>
<td>Maximum Adjacent Channel Power</td>
<td>102</td>
</tr>
<tr>
<td>Syntax</td>
<td>102</td>
</tr>
<tr>
<td>Description</td>
<td>102</td>
</tr>
<tr>
<td>ACPMEAS</td>
<td></td>
</tr>
<tr>
<td>Measure Adjacent Channel Power</td>
<td>103</td>
</tr>
<tr>
<td>Syntax</td>
<td>103</td>
</tr>
<tr>
<td>Description</td>
<td>103</td>
</tr>
<tr>
<td>ACPMSTATE</td>
<td></td>
</tr>
<tr>
<td>Adjacent Channel Power Measurement State</td>
<td>104</td>
</tr>
<tr>
<td>Syntax</td>
<td>104</td>
</tr>
<tr>
<td>Description</td>
<td>104</td>
</tr>
<tr>
<td>ACPPAR</td>
<td></td>
</tr>
<tr>
<td>Adjacent Channel Power Manual or Auto</td>
<td>105</td>
</tr>
<tr>
<td>Syntax</td>
<td>105</td>
</tr>
<tr>
<td>Description</td>
<td>105</td>
</tr>
<tr>
<td>ACPPWRTX</td>
<td></td>
</tr>
<tr>
<td>Adjacent Channel Power Total Power Transmitted</td>
<td>106</td>
</tr>
<tr>
<td>Syntax</td>
<td>106</td>
</tr>
<tr>
<td>Description</td>
<td>106</td>
</tr>
<tr>
<td>ACPRLTS</td>
<td></td>
</tr>
<tr>
<td>Adjacent Channel Power Measurement Results</td>
<td>107</td>
</tr>
<tr>
<td>Syntax</td>
<td>107</td>
</tr>
</tbody>
</table>
## Contents

<table>
<thead>
<tr>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACPSP</td>
<td>107</td>
</tr>
<tr>
<td><strong>Adjacent Channel Power Channel Spacing</strong></td>
<td>108</td>
</tr>
<tr>
<td>Syntax</td>
<td>108</td>
</tr>
<tr>
<td>Description</td>
<td>108</td>
</tr>
<tr>
<td>ACPT</td>
<td>109</td>
</tr>
<tr>
<td><strong>Adjacent Channel Power T Weighting</strong></td>
<td>109</td>
</tr>
<tr>
<td>Syntax</td>
<td>109</td>
</tr>
<tr>
<td>Description</td>
<td>109</td>
</tr>
<tr>
<td>ACPUPPER</td>
<td>110</td>
</tr>
<tr>
<td><strong>Upper Adjacent Channel Power</strong></td>
<td>110</td>
</tr>
<tr>
<td>Syntax</td>
<td>110</td>
</tr>
<tr>
<td>Description</td>
<td>110</td>
</tr>
<tr>
<td>ADJALL</td>
<td>111</td>
</tr>
<tr>
<td><strong>LO and IF Adjustments</strong></td>
<td>111</td>
</tr>
<tr>
<td>Syntax</td>
<td>111</td>
</tr>
<tr>
<td>Description</td>
<td>111</td>
</tr>
<tr>
<td>AMB</td>
<td>112</td>
</tr>
<tr>
<td><strong>A minus B into A</strong></td>
<td>112</td>
</tr>
<tr>
<td>Syntax</td>
<td>112</td>
</tr>
<tr>
<td>Description</td>
<td>112</td>
</tr>
<tr>
<td>AMBPL</td>
<td>113</td>
</tr>
<tr>
<td><strong>(A minus B) plus Display Line into A</strong></td>
<td>113</td>
</tr>
<tr>
<td>Syntax</td>
<td>113</td>
</tr>
<tr>
<td>Description</td>
<td>113</td>
</tr>
<tr>
<td>ANNOT</td>
<td>115</td>
</tr>
<tr>
<td><strong>Annotation</strong></td>
<td>115</td>
</tr>
<tr>
<td>Syntax</td>
<td>115</td>
</tr>
<tr>
<td>Description</td>
<td>115</td>
</tr>
<tr>
<td>APB</td>
<td>116</td>
</tr>
<tr>
<td><strong>Trace A Plus Trace B to A</strong></td>
<td>116</td>
</tr>
<tr>
<td>Syntax</td>
<td>116</td>
</tr>
<tr>
<td>Description</td>
<td>116</td>
</tr>
<tr>
<td>AT</td>
<td>117</td>
</tr>
<tr>
<td><strong>Input Attenuation</strong></td>
<td>117</td>
</tr>
<tr>
<td>Syntax</td>
<td>117</td>
</tr>
<tr>
<td>Description</td>
<td>118</td>
</tr>
<tr>
<td>AUNITS</td>
<td>119</td>
</tr>
<tr>
<td><strong>Absolute Amplitude Units</strong></td>
<td>119</td>
</tr>
<tr>
<td>Syntax</td>
<td>119</td>
</tr>
<tr>
<td>Description</td>
<td>119</td>
</tr>
<tr>
<td>AUTO</td>
<td>121</td>
</tr>
<tr>
<td><strong>Auto Couple</strong></td>
<td>121</td>
</tr>
<tr>
<td>Syntax</td>
<td>121</td>
</tr>
<tr>
<td>Description</td>
<td>121</td>
</tr>
<tr>
<td>AUTOCPL</td>
<td>123</td>
</tr>
<tr>
<td><strong>Auto Coupled</strong></td>
<td>123</td>
</tr>
<tr>
<td>Syntax</td>
<td>123</td>
</tr>
<tr>
<td>Description</td>
<td>123</td>
</tr>
</tbody>
</table>
## Contents

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>AXB</td>
<td>124</td>
</tr>
<tr>
<td>Exchange Trace A and Trace B</td>
<td>124</td>
</tr>
<tr>
<td>Syntax</td>
<td>124</td>
</tr>
<tr>
<td>Description</td>
<td>124</td>
</tr>
<tr>
<td>B1 [one]</td>
<td>125</td>
</tr>
<tr>
<td>Clear Write for Trace B</td>
<td>125</td>
</tr>
<tr>
<td>Syntax</td>
<td>125</td>
</tr>
<tr>
<td>Description</td>
<td>125</td>
</tr>
<tr>
<td>B2 [two]</td>
<td>126</td>
</tr>
<tr>
<td>Maximum Hold for Trace B</td>
<td>126</td>
</tr>
<tr>
<td>Syntax</td>
<td>126</td>
</tr>
<tr>
<td>Description</td>
<td>126</td>
</tr>
<tr>
<td>B3 [three]</td>
<td>127</td>
</tr>
<tr>
<td>View Mode for Trace B</td>
<td>127</td>
</tr>
<tr>
<td>Syntax</td>
<td>127</td>
</tr>
<tr>
<td>Description</td>
<td>127</td>
</tr>
<tr>
<td>B4 [four]</td>
<td>128</td>
</tr>
<tr>
<td>Blank Trace B</td>
<td>128</td>
</tr>
<tr>
<td>Syntax</td>
<td>128</td>
</tr>
<tr>
<td>Description</td>
<td>128</td>
</tr>
<tr>
<td>BL</td>
<td>129</td>
</tr>
<tr>
<td>Trace B minus Display Line to Trace B</td>
<td>129</td>
</tr>
<tr>
<td>Syntax</td>
<td>129</td>
</tr>
<tr>
<td>Description</td>
<td>129</td>
</tr>
<tr>
<td>BLANK</td>
<td>130</td>
</tr>
<tr>
<td>Blank Trace</td>
<td>130</td>
</tr>
<tr>
<td>Syntax</td>
<td>130</td>
</tr>
<tr>
<td>Description</td>
<td>130</td>
</tr>
<tr>
<td>BML</td>
<td>131</td>
</tr>
<tr>
<td>Trace B Minus Display Line</td>
<td>131</td>
</tr>
<tr>
<td>Syntax</td>
<td>131</td>
</tr>
<tr>
<td>Description</td>
<td>131</td>
</tr>
<tr>
<td>BTC</td>
<td>132</td>
</tr>
<tr>
<td>Transfer Trace B to Trace C</td>
<td>132</td>
</tr>
<tr>
<td>Syntax</td>
<td>132</td>
</tr>
<tr>
<td>Description</td>
<td>132</td>
</tr>
<tr>
<td>BXC</td>
<td>133</td>
</tr>
<tr>
<td>Exchange Trace B and Trace C</td>
<td>133</td>
</tr>
<tr>
<td>Syntax</td>
<td>133</td>
</tr>
<tr>
<td>Description</td>
<td>133</td>
</tr>
<tr>
<td>C1 [one]</td>
<td>134</td>
</tr>
<tr>
<td>Set A Minus B Mode Off</td>
<td>134</td>
</tr>
<tr>
<td>Syntax</td>
<td>134</td>
</tr>
<tr>
<td>Description</td>
<td>134</td>
</tr>
<tr>
<td>C2 [two]</td>
<td>135</td>
</tr>
<tr>
<td>A Minus B Into A</td>
<td>135</td>
</tr>
<tr>
<td>Syntax</td>
<td>135</td>
</tr>
<tr>
<td>Description</td>
<td>135</td>
</tr>
<tr>
<td>CA</td>
<td>135</td>
</tr>
</tbody>
</table>
## Contents

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Couple Attenuation</td>
<td>136</td>
</tr>
<tr>
<td>Syntax</td>
<td>136</td>
</tr>
<tr>
<td>Description</td>
<td>136</td>
</tr>
<tr>
<td>CAL</td>
<td>137</td>
</tr>
<tr>
<td>Calibration</td>
<td>137</td>
</tr>
<tr>
<td>Syntax</td>
<td>137</td>
</tr>
<tr>
<td>Description</td>
<td>137</td>
</tr>
<tr>
<td>CARRON</td>
<td>138</td>
</tr>
<tr>
<td>Carrier On Power</td>
<td>138</td>
</tr>
<tr>
<td>Syntax</td>
<td>138</td>
</tr>
<tr>
<td>Description</td>
<td>138</td>
</tr>
<tr>
<td>CF</td>
<td>139</td>
</tr>
<tr>
<td>Center Frequency</td>
<td>139</td>
</tr>
<tr>
<td>Syntax</td>
<td>139</td>
</tr>
<tr>
<td>Description</td>
<td>139</td>
</tr>
<tr>
<td>CHANNEL</td>
<td>140</td>
</tr>
<tr>
<td>Channel Selection</td>
<td>140</td>
</tr>
<tr>
<td>Syntax</td>
<td>140</td>
</tr>
<tr>
<td>Description</td>
<td>140</td>
</tr>
<tr>
<td>CHANPWR</td>
<td>141</td>
</tr>
<tr>
<td>Channel Power</td>
<td>141</td>
</tr>
<tr>
<td>Syntax</td>
<td>141</td>
</tr>
<tr>
<td>Description</td>
<td>141</td>
</tr>
<tr>
<td>CHP</td>
<td>142</td>
</tr>
<tr>
<td>Channel Power</td>
<td>142</td>
</tr>
<tr>
<td>Syntax</td>
<td>142</td>
</tr>
<tr>
<td>Description</td>
<td>142</td>
</tr>
<tr>
<td>CHPWRBW</td>
<td>143</td>
</tr>
<tr>
<td>Channel Power Bandwidth</td>
<td>143</td>
</tr>
<tr>
<td>Syntax</td>
<td>143</td>
</tr>
<tr>
<td>Description</td>
<td>143</td>
</tr>
<tr>
<td>CLRAVG</td>
<td>144</td>
</tr>
<tr>
<td>Clear Average</td>
<td>144</td>
</tr>
<tr>
<td>Syntax</td>
<td>144</td>
</tr>
<tr>
<td>Description</td>
<td>144</td>
</tr>
<tr>
<td>CLRWR</td>
<td>145</td>
</tr>
<tr>
<td>Clear Write</td>
<td>145</td>
</tr>
<tr>
<td>Syntax</td>
<td>145</td>
</tr>
<tr>
<td>Description</td>
<td>145</td>
</tr>
<tr>
<td>CLS</td>
<td>146</td>
</tr>
<tr>
<td>Clear Status Byte</td>
<td>146</td>
</tr>
<tr>
<td>Syntax</td>
<td>146</td>
</tr>
<tr>
<td>Description</td>
<td>146</td>
</tr>
<tr>
<td>CONTSS</td>
<td>147</td>
</tr>
<tr>
<td>Continuous Sweep</td>
<td>147</td>
</tr>
<tr>
<td>Syntax</td>
<td>147</td>
</tr>
<tr>
<td>Description</td>
<td>147</td>
</tr>
<tr>
<td>CORREK</td>
<td>148</td>
</tr>
<tr>
<td>Correction Factors On</td>
<td>148</td>
</tr>
</tbody>
</table>
## Contents

<table>
<thead>
<tr>
<th>Command</th>
<th>Syntax</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>COUPLE</td>
<td>Syntax</td>
<td>Description</td>
</tr>
<tr>
<td>CR</td>
<td>Couple Resolution Bandwidth</td>
<td>Description</td>
</tr>
<tr>
<td>CS</td>
<td>Couple Frequency Step Size</td>
<td>Description</td>
</tr>
<tr>
<td>CT</td>
<td>Couple Sweep Time</td>
<td>Description</td>
</tr>
<tr>
<td>CV</td>
<td>Couple Video Bandwidth</td>
<td>Description</td>
</tr>
<tr>
<td>DA</td>
<td>Display Address</td>
<td>Description</td>
</tr>
<tr>
<td>DELMKBW</td>
<td>Occupied Power Bandwidth Within Delta Marker</td>
<td>Description</td>
</tr>
<tr>
<td>DET</td>
<td>Detection Mode</td>
<td>Description</td>
</tr>
<tr>
<td>DL</td>
<td>Display Line</td>
<td>Description</td>
</tr>
<tr>
<td>DLE</td>
<td>Display Line Enable</td>
<td>Description</td>
</tr>
<tr>
<td>DONE</td>
<td>Done</td>
<td>Syntax</td>
</tr>
</tbody>
</table>
# Contents

<table>
<thead>
<tr>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>E1 [one]</td>
<td>162</td>
</tr>
<tr>
<td>Peak Marker</td>
<td>163</td>
</tr>
<tr>
<td>Syntax</td>
<td>163</td>
</tr>
<tr>
<td>Description</td>
<td>163</td>
</tr>
<tr>
<td>E2 [two]</td>
<td>164</td>
</tr>
<tr>
<td>Marker to Center Frequency</td>
<td>164</td>
</tr>
<tr>
<td>Syntax</td>
<td>164</td>
</tr>
<tr>
<td>Description</td>
<td>164</td>
</tr>
<tr>
<td>E3 [three]</td>
<td>165</td>
</tr>
<tr>
<td>Delta Marker Step Size</td>
<td>165</td>
</tr>
<tr>
<td>Syntax</td>
<td>165</td>
</tr>
<tr>
<td>Description</td>
<td>165</td>
</tr>
<tr>
<td>E4 [four]</td>
<td>166</td>
</tr>
<tr>
<td>Marker to Reference Level</td>
<td>166</td>
</tr>
<tr>
<td>Syntax</td>
<td>166</td>
</tr>
<tr>
<td>Description</td>
<td>166</td>
</tr>
<tr>
<td>EDITDONE</td>
<td>167</td>
</tr>
<tr>
<td>End of Limit Line Edits</td>
<td>167</td>
</tr>
<tr>
<td>Syntax</td>
<td>167</td>
</tr>
<tr>
<td>Description</td>
<td>167</td>
</tr>
<tr>
<td>EDITLIML</td>
<td>168</td>
</tr>
<tr>
<td>Edit Limit Line</td>
<td>168</td>
</tr>
<tr>
<td>Syntax</td>
<td>168</td>
</tr>
<tr>
<td>Description</td>
<td>168</td>
</tr>
<tr>
<td>ERR</td>
<td>169</td>
</tr>
<tr>
<td>Error</td>
<td>169</td>
</tr>
<tr>
<td>Syntax</td>
<td>169</td>
</tr>
<tr>
<td>Description</td>
<td>169</td>
</tr>
<tr>
<td>ET</td>
<td>170</td>
</tr>
<tr>
<td>Elapsed Time</td>
<td>170</td>
</tr>
<tr>
<td>Syntax</td>
<td>170</td>
</tr>
<tr>
<td>Description</td>
<td>170</td>
</tr>
<tr>
<td>EX</td>
<td>171</td>
</tr>
<tr>
<td>Exchange Trace A and Trace B</td>
<td>171</td>
</tr>
<tr>
<td>Syntax</td>
<td>171</td>
</tr>
<tr>
<td>Description</td>
<td>171</td>
</tr>
<tr>
<td>FA</td>
<td>172</td>
</tr>
<tr>
<td>Start Frequency</td>
<td>172</td>
</tr>
<tr>
<td>Syntax</td>
<td>172</td>
</tr>
<tr>
<td>Description</td>
<td>172</td>
</tr>
<tr>
<td>FB</td>
<td>173</td>
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<tr>
<td>Stop Frequency</td>
<td>173</td>
</tr>
<tr>
<td>Syntax</td>
<td>173</td>
</tr>
<tr>
<td>Description</td>
<td>173</td>
</tr>
<tr>
<td>FDSP</td>
<td>174</td>
</tr>
<tr>
<td>Frequency Display Off</td>
<td>174</td>
</tr>
<tr>
<td>Syntax</td>
<td>174</td>
</tr>
<tr>
<td>Description</td>
<td>174</td>
</tr>
<tr>
<td>Command</td>
<td>Description</td>
</tr>
<tr>
<td>----------</td>
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<td>KS,</td>
<td>Mixer Level</td>
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<td>Marker Counter Resolution</td>
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<tr>
<td>Description</td>
<td>Page</td>
</tr>
<tr>
<td>--------------------------------------------------</td>
<td>------</td>
</tr>
<tr>
<td><strong>Amplitude in dBm</strong></td>
<td>188</td>
</tr>
<tr>
<td>Syntax</td>
<td>188</td>
</tr>
<tr>
<td>Description</td>
<td>188</td>
</tr>
<tr>
<td><strong>KSa Normal Detection</strong></td>
<td>189</td>
</tr>
<tr>
<td>Syntax</td>
<td>189</td>
</tr>
<tr>
<td>Description</td>
<td>189</td>
</tr>
<tr>
<td><strong>KSB Amplitude in dBmV</strong></td>
<td>190</td>
</tr>
<tr>
<td>Syntax</td>
<td>190</td>
</tr>
<tr>
<td>Description</td>
<td>190</td>
</tr>
<tr>
<td><strong>KSb Positive Peak Detection</strong></td>
<td>191</td>
</tr>
<tr>
<td>Syntax</td>
<td>191</td>
</tr>
<tr>
<td>Description</td>
<td>191</td>
</tr>
<tr>
<td><strong>KSC Amplitude in dBuV</strong></td>
<td>192</td>
</tr>
<tr>
<td>Syntax</td>
<td>192</td>
</tr>
<tr>
<td>Description</td>
<td>192</td>
</tr>
<tr>
<td><strong>KSc A Plus B to A</strong></td>
<td>193</td>
</tr>
<tr>
<td>Syntax</td>
<td>193</td>
</tr>
<tr>
<td>Description</td>
<td>193</td>
</tr>
<tr>
<td><strong>KSD Amplitude in Volts</strong></td>
<td>194</td>
</tr>
<tr>
<td>Syntax</td>
<td>194</td>
</tr>
<tr>
<td>Description</td>
<td>194</td>
</tr>
<tr>
<td><strong>KSd Negative Peak Detection</strong></td>
<td>195</td>
</tr>
<tr>
<td>Syntax</td>
<td>195</td>
</tr>
<tr>
<td>Description</td>
<td>195</td>
</tr>
<tr>
<td><strong>KSE Title Mode</strong></td>
<td>196</td>
</tr>
<tr>
<td>Syntax</td>
<td>196</td>
</tr>
<tr>
<td>Description</td>
<td>196</td>
</tr>
<tr>
<td><strong>KSe Sample Detection</strong></td>
<td>197</td>
</tr>
<tr>
<td>Syntax</td>
<td>197</td>
</tr>
<tr>
<td>Description</td>
<td>197</td>
</tr>
<tr>
<td><strong>KSG Video Averaging On</strong></td>
<td>198</td>
</tr>
<tr>
<td>Syntax</td>
<td>198</td>
</tr>
<tr>
<td>Description</td>
<td>198</td>
</tr>
<tr>
<td><strong>KSG Video Averaging Off</strong></td>
<td>200</td>
</tr>
<tr>
<td>Syntax</td>
<td>200</td>
</tr>
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<td>Description</td>
<td>200</td>
</tr>
<tr>
<td>Command</td>
<td>Syntax</td>
</tr>
<tr>
<td>--------------------</td>
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<td>KSh</td>
<td>200</td>
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<td>Display On</td>
<td>201</td>
</tr>
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<td>202</td>
</tr>
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<td>Extend Analyzer Reference Level</td>
<td>202</td>
</tr>
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<td>KSi</td>
<td>203</td>
</tr>
<tr>
<td>Exchange Trace B and Trace C</td>
<td>203</td>
</tr>
<tr>
<td>KSi</td>
<td>204</td>
</tr>
<tr>
<td>View Trace C</td>
<td>204</td>
</tr>
<tr>
<td>KSK</td>
<td>205</td>
</tr>
<tr>
<td>Marker to Next Peak</td>
<td>205</td>
</tr>
<tr>
<td>KSk</td>
<td>206</td>
</tr>
<tr>
<td>Blank Trace C</td>
<td>206</td>
</tr>
<tr>
<td>KSL</td>
<td>207</td>
</tr>
<tr>
<td>Marker Noise Off</td>
<td>207</td>
</tr>
<tr>
<td>KSI</td>
<td>208</td>
</tr>
<tr>
<td>Transfer Trace B to Trace C</td>
<td>208</td>
</tr>
<tr>
<td>KSM</td>
<td>209</td>
</tr>
<tr>
<td>Marker Noise On</td>
<td>209</td>
</tr>
<tr>
<td>KSn</td>
<td>211</td>
</tr>
<tr>
<td>Graticule Off</td>
<td>211</td>
</tr>
<tr>
<td>KSN</td>
<td>212</td>
</tr>
<tr>
<td>Marker Minimum</td>
<td>212</td>
</tr>
<tr>
<td>KSnm</td>
<td>213</td>
</tr>
</tbody>
</table>
## Contents

<table>
<thead>
<tr>
<th>Description</th>
<th>KSO</th>
<th>213</th>
</tr>
</thead>
<tbody>
<tr>
<td>Marker Span</td>
<td>Syntax</td>
<td>Description</td>
</tr>
<tr>
<td>KSOo</td>
<td>Annotation Off</td>
<td>Syntax</td>
</tr>
<tr>
<td>KSp</td>
<td>Annotation On</td>
<td>Syntax</td>
</tr>
<tr>
<td>KST</td>
<td>Fast Preset</td>
<td>Syntax</td>
</tr>
<tr>
<td>KSV</td>
<td>Frequency Offset</td>
<td>Syntax</td>
</tr>
<tr>
<td>KSx</td>
<td>External Trigger</td>
<td>Syntax</td>
</tr>
<tr>
<td>KSy</td>
<td>Video Trigger</td>
<td>Syntax</td>
</tr>
<tr>
<td>KSZ</td>
<td>Reference Level Offset</td>
<td>Syntax</td>
</tr>
<tr>
<td>L0 [zero]</td>
<td>Display Line Off</td>
<td>Syntax</td>
</tr>
<tr>
<td>LF</td>
<td>Low Frequency Preset</td>
<td>Syntax</td>
</tr>
<tr>
<td>LG</td>
<td>Logarithmic Scale</td>
<td>Syntax</td>
</tr>
<tr>
<td>LIMD</td>
<td>Limit Line Delta Value</td>
<td>Syntax</td>
</tr>
</tbody>
</table>
Contents

LIMF
Limit Line Frequency Value ........................................... 227
Syntax ................................................................. 227
Description ......................................................... 227
LIMIDEL
Delete Limit Line Table ................................................ 228
Syntax ................................................................. 228
Description ......................................................... 228
LIMIDISP
Limit Line Display ...................................................... 229
Syntax ................................................................. 229
Description ......................................................... 229
LIMIFAIL
Limits Failed ............................................................ 230
Syntax ................................................................. 230
Description ......................................................... 230
LIMIFT
Select Frequency or Time Limit Line .................................. 231
Syntax ................................................................. 231
Description ......................................................... 231
LIMIPURGE
Delete Current Limit Line ............................................... 232
Syntax ................................................................. 232
Description ......................................................... 232
LIMIREL
Relative Limit Lines .................................................... 233
Syntax ................................................................. 233
Description ......................................................... 233
LIMITEST
Enable Limit Line Testing ............................................... 234
Syntax ................................................................. 234
Description ......................................................... 234
LIML
Lower-Limit Amplitude .................................................. 235
Syntax ................................................................. 235
Description ......................................................... 235
LIMM
Limit Middle-Amplitude .................................................. 236
Syntax ................................................................. 236
Description ......................................................... 236
LIMU
Upper-Limit Amplitude .................................................. 237
Syntax ................................................................. 237
Description ......................................................... 237
LN
Linear Scale ........................................................... 238
Syntax ................................................................. 238
Description ......................................................... 238
LSPAN
## Contents

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Previous Span</td>
<td>239</td>
</tr>
<tr>
<td>Syntax</td>
<td>239</td>
</tr>
<tr>
<td>Description</td>
<td>239</td>
</tr>
<tr>
<td>M1 [one] Marker Off</td>
<td>240</td>
</tr>
<tr>
<td>Syntax</td>
<td>240</td>
</tr>
<tr>
<td>Description</td>
<td>240</td>
</tr>
<tr>
<td>M2 [two] Marker Normal</td>
<td>241</td>
</tr>
<tr>
<td>Syntax</td>
<td>241</td>
</tr>
<tr>
<td>Description</td>
<td>241</td>
</tr>
<tr>
<td>M3 [three] Delta Marker</td>
<td>242</td>
</tr>
<tr>
<td>Syntax</td>
<td>242</td>
</tr>
<tr>
<td>Description</td>
<td>242</td>
</tr>
<tr>
<td>M4 [four] Marker Zoom</td>
<td>244</td>
</tr>
<tr>
<td>Syntax</td>
<td>244</td>
</tr>
<tr>
<td>Description</td>
<td>244</td>
</tr>
<tr>
<td>MA</td>
<td>245</td>
</tr>
<tr>
<td>Marker Amplitude Output</td>
<td>245</td>
</tr>
<tr>
<td>Syntax</td>
<td>245</td>
</tr>
<tr>
<td>Description</td>
<td>245</td>
</tr>
<tr>
<td>MC0 [zero] Marker Frequency Counter Off</td>
<td>246</td>
</tr>
<tr>
<td>Syntax</td>
<td>246</td>
</tr>
<tr>
<td>Description</td>
<td>246</td>
</tr>
<tr>
<td>MC1 [one] Marker Frequency Counter On</td>
<td>247</td>
</tr>
<tr>
<td>Syntax</td>
<td>247</td>
</tr>
<tr>
<td>Description</td>
<td>247</td>
</tr>
<tr>
<td>MDS</td>
<td>248</td>
</tr>
<tr>
<td>Measurement Data Size</td>
<td>248</td>
</tr>
<tr>
<td>Syntax</td>
<td>248</td>
</tr>
<tr>
<td>Description</td>
<td>248</td>
</tr>
<tr>
<td>MEAN</td>
<td>249</td>
</tr>
<tr>
<td>Trace Mean</td>
<td>249</td>
</tr>
<tr>
<td>Syntax</td>
<td>249</td>
</tr>
<tr>
<td>Description</td>
<td>249</td>
</tr>
<tr>
<td>MEANPWR</td>
<td>250</td>
</tr>
<tr>
<td>Mean Power measurement</td>
<td>250</td>
</tr>
<tr>
<td>Syntax</td>
<td>250</td>
</tr>
<tr>
<td>Description</td>
<td>250</td>
</tr>
<tr>
<td>MEASOFF</td>
<td>251</td>
</tr>
<tr>
<td>Measurement Off</td>
<td>251</td>
</tr>
<tr>
<td>Syntax</td>
<td>251</td>
</tr>
<tr>
<td>Description</td>
<td>251</td>
</tr>
<tr>
<td>MF</td>
<td>252</td>
</tr>
<tr>
<td>Command</td>
<td>Description</td>
</tr>
<tr>
<td>-----------</td>
<td>------------------------------</td>
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<tr>
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<td>Minimum Hold</td>
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<td>Minimum X Position</td>
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<td>MKA</td>
<td>Marker Amplitude</td>
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<td>Activate Marker</td>
</tr>
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<td>MKBW</td>
<td>Marker Bandwidth</td>
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<td>Marker to Center Frequency</td>
</tr>
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<td>Marker Delta</td>
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<td>Marker Counter Resolution</td>
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<td>Marker Normal</td>
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## Contents

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<thead>
<tr>
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<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
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<td>265</td>
</tr>
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<td>Marker Noise</td>
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<td>Syntax</td>
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<td>266</td>
</tr>
<tr>
<td>Description</td>
<td></td>
<td>266</td>
</tr>
<tr>
<td>MKOFF</td>
<td></td>
<td>268</td>
</tr>
<tr>
<td>Marker Off</td>
<td></td>
<td>268</td>
</tr>
<tr>
<td>Syntax</td>
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<td>268</td>
</tr>
<tr>
<td>Description</td>
<td></td>
<td>268</td>
</tr>
<tr>
<td>MKP</td>
<td></td>
<td>269</td>
</tr>
<tr>
<td>Marker Position</td>
<td></td>
<td>269</td>
</tr>
<tr>
<td>Syntax</td>
<td></td>
<td>269</td>
</tr>
<tr>
<td>Description</td>
<td></td>
<td>269</td>
</tr>
<tr>
<td>MKPK</td>
<td></td>
<td>270</td>
</tr>
<tr>
<td>Marker Peak</td>
<td></td>
<td>270</td>
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<td>Syntax</td>
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<td>270</td>
</tr>
<tr>
<td>Description</td>
<td></td>
<td>270</td>
</tr>
<tr>
<td>MKPT</td>
<td></td>
<td>271</td>
</tr>
<tr>
<td>Marker Threshold</td>
<td></td>
<td>271</td>
</tr>
<tr>
<td>Syntax</td>
<td></td>
<td>271</td>
</tr>
<tr>
<td>Description</td>
<td></td>
<td>271</td>
</tr>
<tr>
<td>MKPX</td>
<td></td>
<td>272</td>
</tr>
<tr>
<td>Marker Peak Excursion</td>
<td></td>
<td>272</td>
</tr>
<tr>
<td>Syntax</td>
<td></td>
<td>272</td>
</tr>
<tr>
<td>Description</td>
<td></td>
<td>272</td>
</tr>
<tr>
<td>MKREAD</td>
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<td>273</td>
</tr>
<tr>
<td>Marker Readout</td>
<td></td>
<td>273</td>
</tr>
<tr>
<td>Syntax</td>
<td></td>
<td>273</td>
</tr>
<tr>
<td>Description</td>
<td></td>
<td>273</td>
</tr>
<tr>
<td>MKRL</td>
<td></td>
<td>275</td>
</tr>
<tr>
<td>Marker to Reference Level</td>
<td></td>
<td>275</td>
</tr>
<tr>
<td>Syntax</td>
<td></td>
<td>275</td>
</tr>
<tr>
<td>Description</td>
<td></td>
<td>275</td>
</tr>
<tr>
<td>MKSP</td>
<td></td>
<td>276</td>
</tr>
<tr>
<td>Marker to Span</td>
<td></td>
<td>276</td>
</tr>
<tr>
<td>Syntax</td>
<td></td>
<td>276</td>
</tr>
<tr>
<td>Description</td>
<td></td>
<td>276</td>
</tr>
<tr>
<td>MKSS</td>
<td></td>
<td>277</td>
</tr>
<tr>
<td>Marker to Step Size</td>
<td></td>
<td>277</td>
</tr>
<tr>
<td>Syntax</td>
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<td>277</td>
</tr>
<tr>
<td>Description</td>
<td></td>
<td>277</td>
</tr>
<tr>
<td>MKT</td>
<td></td>
<td>278</td>
</tr>
<tr>
<td>Marker Time</td>
<td></td>
<td>278</td>
</tr>
<tr>
<td>Syntax</td>
<td></td>
<td>278</td>
</tr>
<tr>
<td>Description</td>
<td></td>
<td>278</td>
</tr>
<tr>
<td>MKTBL</td>
<td></td>
<td>279</td>
</tr>
<tr>
<td>Marker Table</td>
<td></td>
<td>279</td>
</tr>
<tr>
<td>Syntax</td>
<td></td>
<td>279</td>
</tr>
<tr>
<td>Description</td>
<td></td>
<td>279</td>
</tr>
</tbody>
</table>
# Contents

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>MKTRACE</td>
<td>Marker Trace</td>
<td>280</td>
</tr>
<tr>
<td>Syntax</td>
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<td>280</td>
</tr>
<tr>
<td>Description</td>
<td></td>
<td>280</td>
</tr>
<tr>
<td>MKTRACK</td>
<td>Marker Track</td>
<td>281</td>
</tr>
<tr>
<td>Syntax</td>
<td></td>
<td>281</td>
</tr>
<tr>
<td>Description</td>
<td></td>
<td>281</td>
</tr>
<tr>
<td>MKTYPE</td>
<td>Marker Type</td>
<td>282</td>
</tr>
<tr>
<td>Syntax</td>
<td></td>
<td>282</td>
</tr>
<tr>
<td>Description</td>
<td></td>
<td>282</td>
</tr>
<tr>
<td>ML</td>
<td>Mixer Level</td>
<td>283</td>
</tr>
<tr>
<td>Syntax</td>
<td></td>
<td>283</td>
</tr>
<tr>
<td>Description</td>
<td></td>
<td>283</td>
</tr>
<tr>
<td>MT0 [zero]</td>
<td>Marker Track Off</td>
<td>285</td>
</tr>
<tr>
<td>Syntax</td>
<td></td>
<td>285</td>
</tr>
<tr>
<td>Description</td>
<td></td>
<td>285</td>
</tr>
<tr>
<td>MT1 [one]</td>
<td>Marker Track On</td>
<td>286</td>
</tr>
<tr>
<td>Syntax</td>
<td></td>
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<td>O1 [one]</td>
<td>Format - Display Units</td>
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<tr>
<td>O4 [four]</td>
<td>Format - One 8-Bit Byte</td>
<td>291</td>
</tr>
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<td>Description</td>
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</tr>
<tr>
<td>OCCUP</td>
<td>Percent Occupied Power Bandwidth</td>
<td>292</td>
</tr>
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<tr>
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</tr>
<tr>
<td>OL</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Contents

Output Learn String .......................................................... 293
Syntax ........................................................................ 293
Description ................................................................. 293
OT
Output Trace Annotations ..................................................... 294
Syntax ........................................................................ 294
Description ................................................................. 294
PEAKS
Peaks ........................................................................... 295
Syntax ........................................................................ 295
Description ................................................................. 295
PKPOS
Peak Position .................................................................... 296
Syntax ........................................................................ 296
Description ................................................................. 296
PLOT
Plot .............................................................................. 297
Syntax ........................................................................ 297
Description ................................................................. 297
PP
Preselector Peak ................................................................ 298
Syntax ........................................................................ 298
Description ................................................................. 298
PREAMPG
External Preamplifier Gain ................................................... 299
Syntax ........................................................................ 299
Description ................................................................. 299
PRINT
Print ............................................................................ 300
Syntax ........................................................................ 300
Description ................................................................. 300
PWRBW
Power Bandwidth ................................................................. 301
Syntax ........................................................................ 301
Description ................................................................. 301
PWRUPTIME
Power Up Time ................................................................. 302
Syntax ........................................................................ 302
Description ................................................................. 302
Q0 [zero]
EMI Peak Detection ............................................................... 303
Syntax ........................................................................ 303
Description ................................................................. 303
Q1 [one]
Quasi-Peak Detection .............................................................. 304
Syntax ........................................................................ 304
Description ................................................................. 304
R1 [one]
Illegal Command SRQ .......................................................... 305
<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>S1 [one]</td>
<td>Continuous Sweep</td>
<td>320</td>
</tr>
<tr>
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<td>Syntax</td>
<td>320</td>
</tr>
<tr>
<td></td>
<td>Description</td>
<td>319</td>
</tr>
<tr>
<td>S2 [two]</td>
<td>Single Sweep</td>
<td>321</td>
</tr>
<tr>
<td></td>
<td>Syntax</td>
<td>321</td>
</tr>
<tr>
<td></td>
<td>Description</td>
<td>320</td>
</tr>
<tr>
<td>SADD</td>
<td>Add Limit Line Segment</td>
<td>322</td>
</tr>
<tr>
<td></td>
<td>Syntax</td>
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</tr>
<tr>
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<td>Description</td>
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</tr>
<tr>
<td>SAVES</td>
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</tr>
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<tr>
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<td>322</td>
</tr>
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</tr>
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<td>SDON</td>
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</tr>
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<td>SENTER</td>
<td>Segment Entry for Frequency</td>
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</tr>
<tr>
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</tr>
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<td>User-Defined SRQ</td>
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</tr>
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</tr>
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<td>ST</td>
<td>Sweep Time</td>
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<td>Trigger Polarity</td>
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<td></td>
</tr>
</tbody>
</table>
5. A Brief Introduction to the SCPI Language
   SCPI Language Basics ............................................. 374
   Command Keywords and Syntax .................................. 374
   Creating Valid Commands ........................................ 374
   Special Characters in Commands ................................ 375
   Parameters in Commands ......................................... 377
   Putting Multiple Commands on the Same Line .................. 379
1 Getting Started
Option 266 Description

Option 266 (PSA Series Programming Code Compatibility Suite) for Agilent Technologies' PSA series of spectrum analyzers allows the analyzer to be controlled using many of the remote programming commands from the following analyzers:

- 8560 E/EC Series Portable Spectrum Analyzers, comprising:
  - 8560E
  - 8560EC
  - 8561E
  - 8561EC
  - 8562E
  - 8562EC
  - 8563E
  - 8563EC
  - 8564E
  - 8564EC
  - 8565E
  - 8565EC
- 8566A/B
- 8568A/B
- 8590 E/L Series Portable Spectrum Analyzers, comprising:
  - 8590L
  - 8591E
  - 8592L
  - 8593E
  - 8594E
  - 8594L
  - 8595E
  - 8596E

NOTE

The 8566A/B and the 8568A/B are not considered part of the 8560 series of analyzers.

Option 266 is designed to replace these analyzers in many automated systems with minimal or no modification to the currently used measurement software.

Option 266 Limitations

The Agilent Option 266 (PSA Series Programming Code Compatibility Suite) has been designed to emulate as closely as possible the operation of the specified spectrum analyzers. It is not, however, intended as an absolute direct replacement for these analyzers.
Supported commands

Only a subset of the 8566/8568/8560 Series/8590 Series commands is supported in this option (through a GPIB interface). These supported commands were determined by feedback from our customers combined with technical considerations and constraints.

Predefined Functions

In the 8566/8568/8560 Series/8590 Series analyzers, a “predefined function” is an analyzer command that returns a number that can be operated on by other analyzer commands. “Predefined variables” follow the same idea, except the value to be passed as a parameter to the next command is stored in a variable.

Option 266 does not support this type of behavior, so any commands that originally acted as predefined functions or variables, or that allowed predefined functions or variables as arguments in the 8566/8568/8560 Series/8590 Series analyzers, will no longer do so.

User-defined Functions

No user-defined functions, traces, or variables (FUNCDEF, TRDEF or VARDEF) can be used as arguments or commands in programs controlling any analyzer running Option 266. In addition, the behavior of certain commands that rely on the “active functions” (UP, DN, etc.) may be slightly different.
Hardware and Firmware Requirements for Option 266

One of the following Agilent spectrum analyzers and associated hardware options is required to run Option 266.

### Table 1-1 Compatible Agilent PSA Series Spectrum Analyzers

<table>
<thead>
<tr>
<th>Analyzer Model Number</th>
<th>Upper Frequency Limit</th>
<th>Firmware</th>
<th>PSA Series Programming Code Compatibility Suite Personality</th>
</tr>
</thead>
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<tr>
<td>E4440A</td>
<td>26.5 GHz</td>
<td>A.10.00 or later</td>
<td>Option 266</td>
</tr>
<tr>
<td>E4443A</td>
<td>6.7 GHz</td>
<td>A.10.00 or later</td>
<td>Option 266</td>
</tr>
<tr>
<td>E4445A</td>
<td>13.2 GHz</td>
<td>A.10.00 or later</td>
<td>Option 266</td>
</tr>
<tr>
<td>E4446A</td>
<td>44.0 GHz</td>
<td>A.10.00 or later</td>
<td>Option 266</td>
</tr>
<tr>
<td>E4447A</td>
<td>42.98 GHz</td>
<td>A.10.00 or later</td>
<td>Option 266</td>
</tr>
<tr>
<td>E4448A</td>
<td>50.0 GHz</td>
<td>A.10.00 or later</td>
<td>Option 266</td>
</tr>
</tbody>
</table>

For maximum compatibility, you should select a PSA Series analyzer that best matches the frequency range of your chosen remote language. The frequency limits of the remote languages are listed below.

### Table 1-2 Frequency Ranges of the Remote Languages

<table>
<thead>
<tr>
<th>Remote Language</th>
<th>Start Frequency</th>
<th>Stop Frequency&lt;sup&gt;a&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>8560E/EC</td>
<td>0 Hz</td>
<td>2.9 GHz</td>
</tr>
<tr>
<td>8561E/EC</td>
<td>0 Hz</td>
<td>6.5 GHz</td>
</tr>
<tr>
<td>8562E/EC</td>
<td>0 Hz</td>
<td>13.2 GHz</td>
</tr>
<tr>
<td>8563E/EC</td>
<td>0 Hz</td>
<td>26.5 GHz</td>
</tr>
<tr>
<td>8564E/EC</td>
<td>0 Hz</td>
<td>40.0 GHz</td>
</tr>
<tr>
<td>8565E/EC</td>
<td>0 Hz</td>
<td>50.0 GHz</td>
</tr>
<tr>
<td>8566A</td>
<td>0 Hz</td>
<td>22.0 GHz</td>
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<tr>
<td>8566B</td>
<td>0 Hz</td>
<td>22.0 GHz</td>
</tr>
<tr>
<td>8568A</td>
<td>0 Hz</td>
<td>1.5 GHz</td>
</tr>
<tr>
<td>8568B</td>
<td>0 Hz</td>
<td>1.5 GHz</td>
</tr>
<tr>
<td>8590L</td>
<td>0 Hz</td>
<td>1.8 GHz</td>
</tr>
<tr>
<td>8591E</td>
<td>0 Hz</td>
<td>1.8 GHz</td>
</tr>
</tbody>
</table>
Table 1-2  Frequency Ranges of the Remote Languages

<table>
<thead>
<tr>
<th>Remote Language</th>
<th>Start Frequency</th>
<th>Stop Frequency&lt;sup&gt;a&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>8592L&lt;sup&gt;b&lt;/sup&gt;</td>
<td>0 Hz</td>
<td>22.0 GHz</td>
</tr>
<tr>
<td>8593E&lt;sup&gt;b&lt;/sup&gt;</td>
<td>0 Hz</td>
<td>22.0 GHz</td>
</tr>
<tr>
<td>8594E</td>
<td>0 Hz</td>
<td>2.9 GHz</td>
</tr>
<tr>
<td>8595E</td>
<td>0 Hz</td>
<td>6.5 GHz</td>
</tr>
<tr>
<td>8596E&lt;sup&gt;b&lt;/sup&gt;</td>
<td>0 Hz</td>
<td>12.8 GHz</td>
</tr>
</tbody>
</table>

<sup>a</sup> Or the upper frequency range of the PSA (whichever one is lower). For example, the E4445A will only have a stop frequency of 13.2 GHz when emulating an 8563E/EC.

<sup>b</sup> The command HNLOCK (Harmonic Lock) is not supported in Option 266. Thus, the different frequency spans associated with the various harmonic bands are also not supported.
Installing Option 266

You must load the desired personality option into the instrument memory. Loading can be done from a firmware CD-ROM or from the internet location. An automatic loading program comes with the files and runs from your PC.

Installing Optional Measurement Personalities

When you install a measurement personality, you need to follow a three step process:

1. Determine whether your memory capacity is sufficient to contain all the options you want to load. If not, decide which options you want to install now, and consider upgrading your memory. Details follow in “Do You Have Enough Memory to Load All Your Personality Options?” on page 1-30.

2. Install the measurement personality firmware into the instrument memory. Details follow in “Loading an Optional Measurement Personality” on page 34.

3. Enter a license key that activates the measurement personality. Details follow in “Obtaining and Installing a License Key” on page 34.

Adding measurement personalities requires the purchase of an upgrade kit for the desired option. The upgrade kit contains the measurement personality firmware and an entitlement certificate that is used to generate a license key from the internet website. A separate license key is required for each option on a specific instrument serial number and host ID.

For the latest information on Agilent Spectrum Analyzer options and upgrade kits, visit the following web location:

http://www.agilent.com/find/sa_upgrades

Do You Have Enough Memory to Load All Your Personality Options?

If you do not have memory limitations then you can skip ahead to the next section “Loading an Optional Measurement Personality” on page 1-34. If after installing your options you get error messages relating to memory issues, you can return to this section to learn more about how to optimize your configuration.

If you have 64 MBytes of memory installed in your instrument, you should have enough memory to install at least four optional personalities, with plenty of memory for data and states.

The optional measurement personalities require different amounts of memory. So the number of personalities that you can load varies. This is
also impacted by how much data you need to save. If you are having memory errors you must swap the applications in or out of memory as needed. If you only have 48 MBytes of memory, you can upgrade your hardware to 64 MBytes.

Additional memory can be added to any PSA Series analyzer by installing Option 115. With this option installed, you can install all currently available measurement personalities in your analyzer and still have memory space to store more state and trace files than would otherwise be possible.

To see the size of your installed memory for PSA Series Spectrum Analyzers:

1. Ensure that the spectrum analyzer is in spectrum analyzer mode because this can affect the screen size.


3. Read Flash Memory size in the table. If Option 115 is installed, the table will also show Compact Flash Type and Compact Flash Size.

<table>
<thead>
<tr>
<th>PSA Flash Memory Size</th>
<th>Available Memory Without Option B7J and Option 122 or 140</th>
<th>Available Memory With Option B7J and Option 122 or 140</th>
</tr>
</thead>
<tbody>
<tr>
<td>64 Mbytes</td>
<td>32.5 MBytes</td>
<td>30.0 MBytes</td>
</tr>
<tr>
<td>48 Mbytes</td>
<td>16.9 MBytes</td>
<td>14.3 MBytes</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PSA Compact Flash Memory Size</th>
<th>Available Additional Memory for Measurement Personalities</th>
</tr>
</thead>
<tbody>
<tr>
<td>512 Mbytes (Opt. 115)</td>
<td>512 MBytes</td>
</tr>
</tbody>
</table>

If you have 48 MBytes of memory, and you want to install more than 3 optional personalities, you may need to manage your memory resources. The following section, “How to Predict Your Memory Requirements” on page 1-31, will help you decide how to configure your installed options to provide optimal operation.

How to Predict Your Memory Requirements

If you plan to install many optional personalities, you should review your memory requirements, so you can determine whether you have enough memory (unless you have a PSA Series with Option 115). There is an Agilent “Memory Calculator” available online that can help you do this, or you can make a calculated approximation using the information that follows. You will need to know your instrument’s installed memory size as determined in the previous section and then select your desired applications.
NOTE

If you have a PSA Series analyzer with Option 115, there is adequate memory
to install all of the available optional personalities in your instrument.

To calculate the available memory on your PSA, see:

http://sa.tm.agilent.com/PSA/memory/

Select the “Memory Calculator” link. You can try any combination of
available personalities to see if your desired configuration is compatible
with your installed memory.

NOTE

After loading all your optional measurement personalities, you should
have a reserve of ~2 MBytes memory to facilitate mode switching. Less
available memory will increase mode switching time. For example, if
you employ excessive free memory by saving files of states and/or data,
your mode switching time can increase to more than a minute.

You can manually estimate your total memory requirements by adding
up the memory allocations described in the following steps. Compare
the desired total with the available memory that you identified in the
previous section.

1. Program memory - Select option requirements from the table
   “Measurement Personality Options and Memory Required” on
   page 1-33.

2. Shared libraries require 7.72 MBytes.

3. Recommended mode swap space is 2 MBytes.

4. Screens - .gif files need 20-25 kBytes each.

5. State memory - State file sizes range from 21 kB for SA mode to
   40 kB for W-CDMA. The state of every mode accessed since power-on
   will be saved in the state file. File sizes can exceed 150 kB each when
   several modes are accessed, for each state file saved.

TIP

State memory retains settings for all states accessed before the Save State
command. To reduce this usage to a minimum, reduce the modes accessed
before the Save State is executed. You can set the PSA to boot into a selected
mode by accessing the desired mode, then pressing the System, Power
On/Preset, Power On keys and toggle the setting to Last.
### Measurement Personality Options and Memory Required

<table>
<thead>
<tr>
<th>Personality Options for PSA Series Spectrum Analyzers (^a)</th>
<th>Option</th>
<th>File Size (PSA Rev: A.10)</th>
</tr>
</thead>
<tbody>
<tr>
<td>cdmaOne measurement personality</td>
<td>BAC</td>
<td>1.91 Mbytes</td>
</tr>
<tr>
<td>NADC and PDC measurement personalities (not available separately)</td>
<td>BAE</td>
<td>2.43 Mbytes</td>
</tr>
<tr>
<td>W-CDMA or W-CDMA, HSDPA, HSUPA measurement personality</td>
<td>BAF, 210</td>
<td>5.38 Mbytes(^b)</td>
</tr>
<tr>
<td>cdma2000 or cdma2000 w/ 1xEV-DV measurement personality</td>
<td>B78, 214</td>
<td>4.00 Mbytes(^b)</td>
</tr>
<tr>
<td>1xEV-DO measurement personality</td>
<td>204</td>
<td>5.61 Mbytes(^b)</td>
</tr>
<tr>
<td>GSM (with EDGE) measurement personality</td>
<td>202</td>
<td>3.56 Mbytes(^b)</td>
</tr>
<tr>
<td>Shared measurement library(^b)</td>
<td>n/a</td>
<td>7.72 Mbytes</td>
</tr>
<tr>
<td>Phase Noise measurement personality</td>
<td>226</td>
<td>2.82 Mbytes(^c)</td>
</tr>
<tr>
<td>Noise Figure measurement personality</td>
<td>219</td>
<td>4.68 Mbytes(^c)</td>
</tr>
<tr>
<td>Basic measurement personality with digital demod hardware</td>
<td>B7J</td>
<td>Cannot be deleted (2.64 Mbytes)</td>
</tr>
<tr>
<td>Programming Code Compatibility Suite(^d) (8560 Series, 8590 Series, and 8566/8568)</td>
<td>266</td>
<td>1.18 Mbytes(^c)</td>
</tr>
<tr>
<td>TD-SCDMA Power measurement personality</td>
<td>211</td>
<td>5.47 Mbytes(^c)</td>
</tr>
<tr>
<td>TD-SCDMA Modulation Analysis or TD-SCDMA Modulation Analysis w/ HSDPA/8PSK measurement personality</td>
<td>212, 213</td>
<td>1.82 Mbytes</td>
</tr>
<tr>
<td>Flexible Digital Modulation Analysis</td>
<td>241</td>
<td>2.11 Mbytes(^b)</td>
</tr>
<tr>
<td>WLAN measurement personality</td>
<td>217</td>
<td>3.24 Mbytes(^b)</td>
</tr>
<tr>
<td>External Source Control</td>
<td>215</td>
<td>0.72 Mbytes(^c)</td>
</tr>
<tr>
<td>Measuring Receiver Personality (available with Option 23A - Trigger support for AM/FM/PM and Option 23B - CCITT filter)</td>
<td>233</td>
<td>2.91 Mbytes(^b)</td>
</tr>
<tr>
<td>EMC Analyzer</td>
<td>239</td>
<td>4.06 Mbytes(^b)</td>
</tr>
</tbody>
</table>

\(^a\) Available as of the print date of this guide.
\(^b\) Many PSA Series personality options use a 7.72 Mbyte shared measurement library. If you are loading multiple personalities that use this library, you only need to add this memory allocation once.
\(^c\) Shared measurement library allocation not required.
\(^d\) This is a no charge option that does not require a license key.
Memory Upgrade Kits

The PSA 64 MByte Memory Upgrade kit part number is E4440AU-ANE. The PSA Compact Flash Upgrade kit part number is E4440AU-115.

For more information about memory upgrade kits contact your local sales office, service office, or see:
http://www.agilent.com/find/sa_upgrades

Loading an Optional Measurement Personality

You must use a PC to load the desired personality option into the instrument memory. Loading can be done from a firmware CD-ROM or by downloading the update program from the internet. An automatic loading program comes with the files and runs from your PC.

You can check the Agilent internet website for the latest PSA firmware versions available for downloading:

http://www.agilent.com/find/psa_firmware

NOTE
When you add a new option, or update an existing option, you will get the updated versions of all your current options as they are all reloaded simultaneously. This process may also require you to update the instrument core firmware so that it is compatible with the new option.

Depending on your installed hardware memory, you may not be able to fit all of the available measurement personalities in instrument memory at the same time. You may need to delete an existing option file from memory and load the one you want. Use the automatic update program that is provided with the files. Refer to the table showing “Measurement Personality Options and Memory Required” on page 1-33. The approximate memory requirements for the options are listed in this table. These numbers are worst case examples. Some options share components and libraries, therefore the total memory usage of multiple options may not be exactly equal to the combined total.

Obtaining and Installing a License Key

If you purchase an optional personality that requires installation, you will receive an “Entitlement Certificate” which may be redeemed for a license key specific to one instrument. Follow the instructions that accompany the certificate to obtain your license key.

To install a license key for the selected personality option, use the following procedure:

NOTE
You can also use this procedure to reinstall a license key that has been deleted
Getting Started
Installing Option 266

1. Press **System, More, More, Licensing, Option** to accesses the alpha editor. Use this alpha editor to enter letters (upper-case), and the front-panel numeric keys to enter numbers for the option designation. You will validate your option entry in the active function area of the display. Then, press the **Enter** key.

2. Press **License Key** to enter the letters and digits of your license key. You will validate your license key entry in the active function area of the display. Then, press the **Enter** key.

3. Press the **Activate License** key.

### Viewing a License Key

Measurement personalities purchased with your instrument have been installed and activated at the factory before shipment. The instrument requires a **License Key** unique to every measurement personality purchased. The license key is a hexadecimal number specific to your measurement personality, instrument serial number and host ID. It enables you to install, or reactivate that particular personality.

Use the following procedure to display the license key unique to your personality option that is already installed in your PSA:

Press **System, More, More, Licensing, Show License**. The **System, Personality** key displays the personalities loaded, version information, and whether the personality is licensed.

---

**NOTE**

*You will want to keep a copy of your license key in a secure location. Press **System, More**, then **Licensing, Show License**, and print out a copy of the display that shows the license numbers. If you should lose your license key, call your nearest Agilent Technologies service or sales office for assistance.*

---

**Using the Delete License Key on PSA**

This key will make the option unavailable for use, but will not delete it from memory. Write down the 12-digit license key for the option before you delete it. If you want to use that measurement personality later, you will need the license key to reactivate the personality firmware.

---

**NOTE**

Using the **Delete License** key does not remove the personality from the instrument memory, and does not free memory to be available to install another option. If you need to free memory to install another option, refer to the instructions for loading firmware updates located at the URL:

http://www.agilent.com/find/psa/

---

1. Press **System, More, More, Licensing, Option**. Pressing the **Option** key will activate the alpha editor menu. Use the alpha editor to enter the letters (upper-case) and the front-panel numeric keyboard to enter the digits (if required) for the option, then press the **Enter** key. As you
enter the option, you will see your entry in the active function area of
the display.

2. Press **Delete License** to remove the license key from memory.

**Ordering Optional Measurement Personalities**

When you order a personality option, you will receive an entitlement
certificate. Then you will need to go to the Web site to redeem your
entitlement certificate for a license key. You will need to provide your
instrument serial number and host ID, and the entitlement certificate
number.

<table>
<thead>
<tr>
<th>Required Information:</th>
<th>Front Panel Key Path:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model #: (Ex. E4440A)</td>
<td></td>
</tr>
<tr>
<td>Host ID: ______________</td>
<td>System, Show System</td>
</tr>
<tr>
<td>Instrument Serial Number:</td>
<td>System, Show System</td>
</tr>
</tbody>
</table>
Configuring Option 266 on PSA Analyzers

Figure 1-1 shows the menu map to configure Option 266 (Programming Code Compatibility Suite) on your spectrum analyzer. Pressing System, Config I/O, Configure Remote Lang, Language on a PSA Series analyzer allows you to select the remote programming language for the instrument you are replacing.
Figure 1-1  System Menu Map for Option 266 on PSA Series Analyzers

Figure 1-2  Language Link Menu Map for All Analyzers

NOTE  The language softkeys are not in alphanumeric order.
Figure 1-3  Error Handling Link Menu Map

Figure 1-4  Preferences Link Menu Map
The Configure Remote Lang Screen Menu - PSA Analyzers

Configure Remote Lang

This key displays a menu allowing you to select the remote language you wish to use, and to determine how command error messages are stored and displayed.

Language

This key allows you to select which remote programming language you wish to use.

SCPI

Selects the SCPI remote programming language. This is the default setting after installation.

HP8560E/EC

Selects the HP8560E/EC remote programming language and sets the response to the remote programming command ‘ID?’ to HP8560E. It also performs an instrument preset and sets Span, Trace Points, couplings, VBW/RBW ratio, and Span/RBW ratio appropriately as shown in Table 1-3 on page 42.

HP8561E/EC

Selects the HP8561E/EC remote programming language and sets the response to the remote programming command ‘ID?’ to HP8561E. It also performs an instrument preset and sets Span, Trace Points, couplings, VBW/RBW ratio, and Span/RBW ratio appropriately as shown in Table 1-3 on page 42.

HP8562E/EC

Selects the HP8562E/EC remote programming language and sets the response to the remote programming command ‘ID?’ to HP8562E. It also performs an instrument preset and sets Span, Trace Points, couplings, VBW/RBW ratio, and Span/RBW ratio appropriately as shown in Table 1-3 on page 42.

HP8563E/EC

Selects the HP8563E/EC remote programming language and sets the response to the remote programming command ‘ID?’ to HP8563E. It also performs an instrument preset and sets Span, Trace Points, couplings, VBW/RBW ratio, and Span/RBW ratio appropriately as shown in Table 1-3 on page 42.

HP8564E/EC

Selects the HP8564E/EC remote programming language and sets the response to the remote programming command ‘ID?’ to HP8564E. It also performs an instrument preset and sets Span, Trace Points, couplings, VBW/RBW ratio, and Span/RBW ratio appropriately as shown in Table 1-3 on page 42.

HP8565E/EC

Selects the HP8565E/EC remote programming language and sets the response to the remote programming command ‘ID?’ to HP8565E. It also performs an
instrument preset and sets Span, Trace Points, couplings, VBW/RBW ratio, and Span/RBW ratio appropriately as shown in Table 1-3 on page 42.

**HP8566A** Selects the **HP8566A** remote programming language and sets the response to the remote programming command ‘ID?’ to **HP8566A**. It also performs an instrument preset and sets Span, Trace Points, couplings, VBW/RBW ratio, and Span/RBW ratio appropriately as shown in Table 1-3 on page 42.

**HP8566B** Selects the **HP8566B** remote programming language and sets the response to the remote programming command ‘ID?’ to **HP8566B**. It also performs an instrument preset and sets Span, Trace Points, couplings, VBW/RBW ratio, and Span/RBW ratio appropriately as shown in Table 1-3 on page 42.

**HP8568A** Selects the **HP8568A** remote programming language and sets the response to the remote programming command ‘ID?’ to **HP8568A**. It also performs an instrument preset and sets Span, Trace Points, couplings, VBW/RBW ratio, and Span/RBW ratio appropriately as shown in Table 1-3 on page 42.

**HP8568B** Selects the **HP8568B** remote programming language and sets the response to the remote programming command ‘ID?’ to **HP8568B**. It also performs an instrument preset and sets Span, Trace Points, couplings, VBW/RBW ratio, and Span/RBW ratio appropriately as shown in Table 1-3 on page 42.

**HP8590L** Selects the **HP8590L** remote programming language and sets the response to the remote programming command ‘ID?’ to **HP8590L**. It also performs an instrument preset and sets Span, Trace Points, couplings, VBW/RBW ratio, and Span/RBW ratio appropriately as shown in Table 1-3 on page 42.

**HP8591E** Selects the **HP8591E** remote programming language and sets the response to the remote programming command ‘ID?’ to **HP8591E**. It also performs an instrument preset and sets Span, Trace Points, couplings, VBW/RBW ratio, and Span/RBW ratio appropriately as shown in Table 1-3 on page 42.

**HP8592L** Selects the **HP8592L** remote programming language and sets the response to the remote programming command ‘ID?’ to **HP8592L**. It also performs an instrument preset and sets Span, Trace Points, couplings, VBW/RBW ratio, and Span/RBW ratio appropriately as shown in Table 1-3 on page 42.

**HP8593E** Selects the **HP8593E** remote programming language and
sets the response to the remote programming command ‘ID?’ to **HP8593E**. It also performs an instrument preset and sets Span, Trace Points, couplings, VBW/RBW ratio, and Span/RBW ratio appropriately as shown in Table 1-3 on page 42.

**HP8594E** Selects the **HP8594E** remote programming language and sets the response to the remote programming command ‘ID?’ to **HP8594E**. It also performs an instrument preset and sets Span, Trace Points, couplings, VBW/RBW ratio, and Span/RBW ratio appropriately as shown in Table 1-3 on page 42.

**HP8594L** Selects the **HP8594L** remote programming language and sets the response to the remote programming command ‘ID?’ to **HP8594L**. It also performs an instrument preset and sets Span, Trace Points, couplings, VBW/RBW ratio, and Span/RBW ratio appropriately as shown in Table 1-3 on page 42.

**HP8595E** Selects the **HP8595E** remote programming language and sets the response to the remote programming command ‘ID?’ to **HP8595E**. It also performs an instrument preset and sets Span, Trace Points, couplings, VBW/RBW ratio, and Span/RBW ratio appropriately as shown in Table 1-3 on page 42.

**HP8596E** Selects the **HP8596E** remote programming language and sets the response to the remote programming command ‘ID?’ to **HP8596E**. It also performs an instrument preset and sets Span, Trace Points, couplings, VBW/RBW ratio, and Span/RBW ratio appropriately as shown in Table 1-3 on page 42.

---

**NOTE**

Setting the remote language to anything other than ‘SCPI’ does not affect the response to the SCPI command ‘*IDN?’ This command will still return the model number and firmware version number of the PSA Series spectrum analyzer.

---

**Table 1-3 Span, Trace Points, Couplings, VBW/RBW Ratio, and Span/RBW Ratio Settings**

<table>
<thead>
<tr>
<th>Remote Language</th>
<th>Start Freq.</th>
<th>Stop Freq.</th>
<th>Number of Trace Points</th>
<th>RF Coupling</th>
<th>VBW/RBW Ratio</th>
<th>Span/RBW Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>HP8560E/EC</td>
<td>0 Hz</td>
<td>2.9 GHz</td>
<td>601</td>
<td>AC</td>
<td>1</td>
<td>91</td>
</tr>
<tr>
<td>HP8561E/EC</td>
<td>0 Hz</td>
<td>6.5 GHz</td>
<td>601</td>
<td>AC</td>
<td>1</td>
<td>91</td>
</tr>
<tr>
<td>HP8562E/EC</td>
<td>0 Hz</td>
<td>13.2 GHz</td>
<td>601</td>
<td>AC</td>
<td>1</td>
<td>91</td>
</tr>
<tr>
<td>HP8563E/EC</td>
<td>0 Hz</td>
<td>26.5 GHz</td>
<td>601</td>
<td>AC</td>
<td>1</td>
<td>91</td>
</tr>
</tbody>
</table>
**Table 1-3**  
Span, Trace Points, Couplings, VBW/RBW Ratio, and Span/RBW Ratio Settings

<table>
<thead>
<tr>
<th>Remote Language</th>
<th>Start Freq.</th>
<th>Stop Freq.</th>
<th>Number of Trace Points</th>
<th>RF Coupling</th>
<th>VBW/RBW Ratio</th>
<th>Span/RBW Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>HP8564E/EC</td>
<td>0 Hz</td>
<td>40 GHz</td>
<td>601</td>
<td>AC</td>
<td>1</td>
<td>91</td>
</tr>
<tr>
<td>HP8565E/EC</td>
<td>0 Hz</td>
<td>50 GHz</td>
<td>601</td>
<td>AC</td>
<td>1</td>
<td>91</td>
</tr>
<tr>
<td>HP8566A</td>
<td>2 GHz</td>
<td>22 GHz</td>
<td>1001</td>
<td>DC</td>
<td>3 (VBW one step wider than RBW)</td>
<td>106</td>
</tr>
<tr>
<td>HP8566B</td>
<td>2 GHz</td>
<td>22 GHz</td>
<td>1001</td>
<td>DC</td>
<td>3 (VBW one step wider than RBW)</td>
<td>106</td>
</tr>
<tr>
<td>HP8568A</td>
<td>0 Hz</td>
<td>1.5 GHz</td>
<td>1001</td>
<td>DC</td>
<td>3 (VBW one step wider than RBW)</td>
<td>106</td>
</tr>
<tr>
<td>HP8568B</td>
<td>0 Hz</td>
<td>1.5 GHz</td>
<td>1001</td>
<td>DC</td>
<td>3 (VBW one step wider than RBW)</td>
<td>106</td>
</tr>
<tr>
<td>HP8590L</td>
<td>0 Hz</td>
<td>1.8 GHz</td>
<td>401</td>
<td>DC</td>
<td>0.3</td>
<td>106</td>
</tr>
<tr>
<td>HP8591E</td>
<td>0 Hz</td>
<td>1.8 GHz</td>
<td>401</td>
<td>DC</td>
<td>0.3</td>
<td>106</td>
</tr>
<tr>
<td>HP8592L</td>
<td>2.75 GHz</td>
<td>22 GHz</td>
<td>401</td>
<td>DC</td>
<td>0.3</td>
<td>106</td>
</tr>
<tr>
<td>HP8593E</td>
<td>2.75 GHz</td>
<td>22 GHz</td>
<td>401</td>
<td>DC</td>
<td>0.3</td>
<td>106</td>
</tr>
<tr>
<td>HP8594E</td>
<td>0 Hz</td>
<td>2.9 GHz</td>
<td>401</td>
<td>AC</td>
<td>0.3</td>
<td>106</td>
</tr>
<tr>
<td>HP8594L</td>
<td>0 Hz</td>
<td>2.9 GHz</td>
<td>401</td>
<td>DC</td>
<td>0.3</td>
<td>106</td>
</tr>
<tr>
<td>HP8595E</td>
<td>0 Hz</td>
<td>6.5 GHz</td>
<td>401</td>
<td>AC</td>
<td>0.3</td>
<td>106</td>
</tr>
<tr>
<td>HP8596E</td>
<td>0 Hz</td>
<td>12.8 GHz</td>
<td>401</td>
<td>AC</td>
<td>0.3</td>
<td>106</td>
</tr>
</tbody>
</table>

**Command Err**

This key determines whether or not command errors are displayed on the screen. When set to **On**, error messages generated by unrecognized commands or command arguments are displayed on the screen. When set to **Off**, error messages generated by unrecognized commands are not displayed. The current setting is underlined on the key label, and this setting is toggled each time the key is pressed.
Getting Started
The Configure Remote Lang Screen Menu - PSA Analyzers

Cmd Error Log
This key sets command error logging On or Off. When set to On, all error messages are stored in a log file, regardless of whether they have been displayed on the screen. When set to Off, no further command error messages are written to the log file.

The log file is an ASCII text file called LOGFILE.TXT on the C: drive. It has a maximum size of 32 KB. Once it has reached its maximum size, no further error messages will be recorded, but a message will be displayed prompting you to clear the log file. Switching Cmd Error Log to Off does not clear the log file. Only the Clear Command Error Log softkey will clear the error log.

Clear Command Error Log
This key allows you to clear all messages from the command error log file LOGFILE.TXT. You will be asked to press the key a second time to confirm your decision to clear the log file.

Limit RBW/VBW
This key toggles the Limit RBW/VBW between On and Off. Setting it to On causes the range of values for resolution and video bandwidths to be limited, dependent on the remote language selected.

NOTE
This restriction on RBW and VBW range changes to use the base PSA range of bandwidths if the detector type is set to Quasi Peak, MIL Peak, EMI Average, or Average.

Setting this key to Off causes the resolution bandwidth and video bandwidth filters to use the base PSA range of values for all remote languages.

Atten Offset
This key toggles a supplemental attenuation On and Off. The default state is Off. Setting it to On sets a fixed 12 dB supplemental attenuation in the hardware to prevent too great a signal at the input to the mixer (0 dBm maximum) for reference level settings of up to +12 dBm. The selected condition is preserved when Preset is pressed or power is cycled.

Save Reg 7
This key enables or disables the saving of the Preset State in Register 7 (RC 7). Setting this to On causes the Preset State to be saved in Register 7, but it can slow your analyzer down. Setting this to Off will make your analyzer run faster, but the Preset State is not saved in Register 7.
Running Software that Requires SCPI Commands

When a Remote Language other than SCPI has been selected, you will only have access to a very small subset of SCPI commands. If you are not familiar with the SCPI remote programming language, Chapter 5, “A Brief Introduction to the SCPI Language,” on page 373 contains some useful information.

The SCPI commands available while using other remote languages are:

- **:*IDN?**
  Queries and returns the instrument identification string.

- **:*RST**
  Performs an instrument preset.

- **:*SYSTEM:LANGUAGE SCPI | HP8560E | HP8561E | HP8562E | HP8563E | HP8564E | HP8565E | HP8566E | HP8566A | HP8566B | HP8568A | HP8568B | HP8590L | HP8591E | HP8592L | HP8593E | HP8594E | HP8594L | HP8595E | HP8596E**
  Sets the current remote language. This command is only available if you have Option 266 installed on your analyzer.

**NOTE**
Agilent Technologies recommends that you do not repeatedly swap to and from the SCPI language within your programs.

- **:*SYSTEM:LANGUAGE?**
  Queries and returns the current remote language. This command is only available if you have Option 266 installed on your analyzer.

- **[:SENSe]:SWEep:TYPE AUTO|SWEep|FFT**
  Sets the Sweep Type. This command is only valid on the PSA Series of analyzers.

- **[:SENSe]:SWEep:TYPE?**
  Queries and returns the Sweep Type. This command is only valid on the PSA Series of analyzers.

- **[:SENSe]:SWEep:TYPE:AUTO:RULes SPEed|DRAnge**
  Sets the auto rule setting for FFT and Sweep Type. This command is only valid on the PSA Series of analyzers.

- **[:SENSe]:SWEep:TYPE:AUTO:RULes?**
  Queries and returns the auto rule setting for FFT and Sweep Type. This command is only valid on the PSA Series of analyzers.

- **:*SYSTEM:OPTion?**
Returns a list of installed options.

If Option 266 is installed on your analyzer, the string “266” will appear in the returned string. In the following example, options B7J, 266, and 110 are all installed.

Example: “B7J, 266, 110”

To return the analyzer to its full PSA SCPI capability, you must specify the remote language as SCPI.
Service and Calibration

Since the Performance Verification and Adjustment Software uses the SCPI command language, you will need to set Remote Language to SCPI prior to calibration or service of your Agilent spectrum analyzer.

When your analyzer is returned from an Agilent Technologies service center, you may have to reinstall Option 266. Refer to “Installing Option 266” on page 30.
Documentation for Option 266

Spectrum Analyzers with Option 266

When you purchase your PSA Series spectrum analyzer with the Programming Code Compatibility Suite (Option 266), you will receive this manual - the Programming Code Compatibility Suite Guide. For information on PSA series analyzers and other related documentation, refer to the PSA web site at http://www.agilent.com/find/psa/.

This Programming Code Compatibility Suite Guide is not designed to be a comprehensive guide to all legacy commands. It gives brief descriptions of the supported commands, and highlights important functional or behavioral differences that you should be aware of when transferring your existing code to your PSA Series analyzer. For a fuller description of these commands, refer to the manuals supplied with your original analyzer.

Spectrum Analyzer Updates

For the latest information about this instrument, including software upgrades, application information, and product information, please visit the URL below.

Updating the Firmware and Software

Updated versions of the Agilent Spectrum Analyzers' firmware and software will be available via several sources. Information on the latest firmware and software revision can be accessed through the following URL:

http://www.agilent.com/find/psa/

NOTE

If you have received Option 266 as an upgrade, the latest version of the analyzer's firmware has been included and should be loaded into your instrument before installing the Option 266.
2 Legacy Analyzer Command List
### Table of All Legacy Analyzer Commands

The following table lists all of the original programming commands from the legacy analyzers (that is, the 8566A/B, the 8568A/B, the 8560 Series and the 8590 Series), and indicates which are supported in Option 266. Refer to the alphabetical listing of commands in Chapter 4, “Programming Commands,” on page 85 for more detailed information about each supported command.

#### Table 2-1 Alphanumeric List of all Legacy Commands Showing their Option 266 Support

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
<th>8566</th>
<th>8568</th>
<th>8590 Series</th>
<th>8560 Series</th>
<th>Page for Further Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1</td>
<td>Clear-writes trace A</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Page 89</td>
</tr>
<tr>
<td>A2</td>
<td>Max Holds trace A</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Page 90</td>
</tr>
<tr>
<td>A3</td>
<td>View trace A</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Page 91</td>
</tr>
<tr>
<td>A4</td>
<td>Blanks trace A</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Page 92</td>
</tr>
<tr>
<td>ABORT</td>
<td>Interrupt operation of all user-defined functions</td>
<td>N/A</td>
<td>N/A</td>
<td>No</td>
<td>No</td>
<td>Page 92</td>
</tr>
<tr>
<td>ABS</td>
<td>Absolute</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>ACP</td>
<td>Performs the adjacent channel power measurement</td>
<td>N/A</td>
<td>N/A</td>
<td>Yes</td>
<td>N/A</td>
<td>Page 93</td>
</tr>
<tr>
<td>ACPACCL</td>
<td>Accelerate adjacent channel power measurement</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>ACPALPHA</td>
<td>Adjacent channel power alpha weighting</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>Yes</td>
<td>Page 94</td>
</tr>
<tr>
<td>ACPALTCH</td>
<td>Adjacent channel power alternate channels</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>Yes</td>
<td>Page 95</td>
</tr>
<tr>
<td>ACPBRPER</td>
<td>Adjacent channel power burst period</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>Yes</td>
<td>Page 96</td>
</tr>
<tr>
<td>ACPBRWID</td>
<td>Adjacent channel power burst width</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>Yes</td>
<td>Page 97</td>
</tr>
<tr>
<td>ACPBW</td>
<td>Specifies channel bandwidth for ACP measurement</td>
<td>N/A</td>
<td>N/A</td>
<td>Yes</td>
<td>Yes</td>
<td>Page 98</td>
</tr>
<tr>
<td>ACPCOMPUTE</td>
<td>Compute adjacent channel power</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>Yes</td>
<td>Page 99</td>
</tr>
<tr>
<td>Command</td>
<td>Description</td>
<td>8566</td>
<td>8568</td>
<td>8590 Series</td>
<td>8560 Series</td>
<td>Page for Further Details</td>
</tr>
<tr>
<td>--------------</td>
<td>------------------------------------------------------------</td>
<td>------</td>
<td>------</td>
<td>-------------</td>
<td>-------------</td>
<td>--------------------------</td>
</tr>
<tr>
<td>ACPCONTM</td>
<td>Performs ACP measurement in continuous sweep</td>
<td>N/A</td>
<td>N/A</td>
<td>No</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>ACPE</td>
<td>Adjacent channel power extended</td>
<td>N/A</td>
<td>N/A</td>
<td>No</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>ACPERR</td>
<td>ACP measurement error query</td>
<td>N/A</td>
<td>N/A</td>
<td>No</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>ACPFRQWT</td>
<td>Adjacent channel power frequency weighting</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>Yes</td>
<td>Page 100</td>
</tr>
<tr>
<td>ACPGR</td>
<td>Adjacent channel power graph on or off</td>
<td>N/A</td>
<td>N/A</td>
<td>No</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>ACPGRAPH</td>
<td>Compute adjacent channel power graph</td>
<td>N/A</td>
<td>N/A</td>
<td>No</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>ACPLower</td>
<td>Lower adjacent channel power</td>
<td>N/A</td>
<td>N/A</td>
<td>Yes</td>
<td>Yes</td>
<td>Page 101</td>
</tr>
<tr>
<td>ACPMAX</td>
<td>Maximum adjacent channel power</td>
<td>N/A</td>
<td>N/A</td>
<td>Yes</td>
<td>Yes</td>
<td>Page 102</td>
</tr>
<tr>
<td>ACPMEAS</td>
<td>Measure adjacent channel power</td>
<td>N/A</td>
<td>N/A</td>
<td>Yes</td>
<td>Yes</td>
<td>Page 103</td>
</tr>
<tr>
<td>ACPMETHOD</td>
<td>Adjacent channel power measurement method</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>ACPMK</td>
<td>Adjacent channel power marker on or off</td>
<td>N/A</td>
<td>N/A</td>
<td>No</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>ACPMSTATE</td>
<td>Adjacent channel power measurement state</td>
<td>N/A</td>
<td>N/A</td>
<td>Yes</td>
<td>Yes</td>
<td>Page 104</td>
</tr>
<tr>
<td>ACPPAR</td>
<td>ACP manual or auto</td>
<td>N/A</td>
<td>N/A</td>
<td>Yes</td>
<td>N/A</td>
<td>Page 105</td>
</tr>
<tr>
<td>ACPPWRTX</td>
<td>Total power transmitted</td>
<td>N/A</td>
<td>N/A</td>
<td>Yes</td>
<td>Yes</td>
<td>Page 106</td>
</tr>
<tr>
<td>ACPRSLTTS</td>
<td>Adjacent channel power measurement results</td>
<td>N/A</td>
<td>N/A</td>
<td>Yes</td>
<td>Yes</td>
<td>Page 107</td>
</tr>
<tr>
<td>ACPSNGLM</td>
<td>Performs ACP measurement in single sweep</td>
<td>N/A</td>
<td>N/A</td>
<td>No</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>ACPSLP</td>
<td>Channel spacing</td>
<td>N/A</td>
<td>N/A</td>
<td>Yes</td>
<td>Yes</td>
<td>Page 108</td>
</tr>
<tr>
<td>ACPT</td>
<td>Adjacent channel power T weighting</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>Yes</td>
<td>Page 109</td>
</tr>
</tbody>
</table>

Table 2-1: Alphanumeric List of all Legacy Commands Showing their Option 266 Support
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<th>Description</th>
<th>8566</th>
<th>8568</th>
<th>8590 Series</th>
<th>8560 Series</th>
<th>Page for Further Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACPUPPER</td>
<td>Upper adjacent channel power</td>
<td>N/A</td>
<td>N/A</td>
<td>Yes</td>
<td>Yes</td>
<td>Page 110</td>
</tr>
<tr>
<td>ACTDEF</td>
<td>Give user-defined function active status</td>
<td>N/A</td>
<td>N/A</td>
<td>No</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>ACTVF</td>
<td>Active function</td>
<td>N/A</td>
<td>N/A</td>
<td>No</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>ACTVFUNC</td>
<td>Creates a user defined active function</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>ADD</td>
<td>Add</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>ADJALL</td>
<td>LO &amp; IF adjustment</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>Yes</td>
<td>Page 111</td>
</tr>
<tr>
<td>ADJCRT</td>
<td>Adjust CRT alignment</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>ADJIF</td>
<td>Adjust IF</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>AMB</td>
<td>Trace A – trace B -&gt; trace A</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Page 112</td>
</tr>
<tr>
<td>AMBPL</td>
<td>Trace A – trace B + Display Line -&gt; trace A</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Page 113</td>
</tr>
<tr>
<td>AMPCOR</td>
<td>Applies amplitude correction at specified frequencies</td>
<td>N/A</td>
<td>N/A</td>
<td>No</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>AMPCORDATA</td>
<td>Amplitude correction data</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>AMPCORSAVE</td>
<td>Save amplitude correction data</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>AMPCORSIZE</td>
<td>Amplitude correction data array size</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>AMPCORRCL</td>
<td>Amplitude correction recall</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>AMPLEN</td>
<td>Amplitude correction length</td>
<td>N/A</td>
<td>N/A</td>
<td>No</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>ANLGPLUS</td>
<td>Turns on or off the Analog+ display mode</td>
<td>N/A</td>
<td>N/A</td>
<td>No</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>ANNOT</td>
<td>Display Annotation</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Page 115</td>
</tr>
<tr>
<td>APB</td>
<td>Trace A + trace B -&gt; trace A</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Page 116</td>
</tr>
<tr>
<td>ARRAYDEF</td>
<td>Defines an array</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>AT</td>
<td>Input Attenuation</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Page 117</td>
</tr>
<tr>
<td>AUNITS</td>
<td>Amplitude Units</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Page 119</td>
</tr>
<tr>
<td>Command</td>
<td>Description</td>
<td>8566</td>
<td>8568</td>
<td>8590 Series</td>
<td>8560 Series</td>
<td>Page for Further Details</td>
</tr>
<tr>
<td>-----------</td>
<td>--------------------------------------------------</td>
<td>------</td>
<td>------</td>
<td>-------------</td>
<td>-------------</td>
<td>--------------------------</td>
</tr>
<tr>
<td>AUTO</td>
<td>Auto couple</td>
<td>N/A</td>
<td>N/A</td>
<td>Yes</td>
<td>N/A</td>
<td>Page 121</td>
</tr>
<tr>
<td>AUTO CPL</td>
<td>Auto couple</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>Yes</td>
<td>Page 123</td>
</tr>
<tr>
<td>AUTO EXEC</td>
<td>Turns on or off the function defined with AUTO FUNC</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>AUTO FUNC</td>
<td>Defines a function for automatic execution</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>AUTOSAVE</td>
<td>Automatically saves trace</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>AVG</td>
<td>Average</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>AXB</td>
<td>Exchange Traces A &amp; B</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Page 124</td>
</tr>
<tr>
<td>B1</td>
<td>Clear-writes trace B</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Page 125</td>
</tr>
<tr>
<td>B2</td>
<td>Max Holds trace B</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Page 126</td>
</tr>
<tr>
<td>B3</td>
<td>View trace B</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Page 127</td>
</tr>
<tr>
<td>B4</td>
<td>Blanks trace B</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Page 128</td>
</tr>
<tr>
<td>BAUDRATE</td>
<td>Baud rate of spectrum analyzer</td>
<td>N/A</td>
<td>N/A</td>
<td>No</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>BIT</td>
<td>Return or receive state of bit</td>
<td>N/A</td>
<td>N/A</td>
<td>No</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>BITF</td>
<td>Bit flag</td>
<td>N/A</td>
<td>N/A</td>
<td>No</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>BL</td>
<td>Trace B → Display line -&gt; trace B</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>N/A</td>
<td>Page 129</td>
</tr>
<tr>
<td>BLANK</td>
<td>Blanks specified trace</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Page 130</td>
</tr>
<tr>
<td>BML</td>
<td>Trace B → Display line -&gt; trace B</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Page 131</td>
</tr>
<tr>
<td>BRD</td>
<td>Bus Read</td>
<td>No</td>
<td>No</td>
<td>N/A</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>BTC</td>
<td>Transfer trace B to C</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>N/A</td>
<td>Page 132</td>
</tr>
<tr>
<td>BWR</td>
<td>Bus Write</td>
<td>No</td>
<td>No</td>
<td>N/A</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>BXC</td>
<td>Exchange Traces B &amp; C</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>N/A</td>
<td>Page 133</td>
</tr>
<tr>
<td>C1</td>
<td>Turns off A - B</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Page 134</td>
</tr>
<tr>
<td>C2</td>
<td>A – B -&gt; A</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Page 135</td>
</tr>
<tr>
<td>CA</td>
<td>Couples Attenuation</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Page 136</td>
</tr>
<tr>
<td>CAL</td>
<td>Calibrate</td>
<td>N/A</td>
<td>N/A</td>
<td>Yes</td>
<td>N/A</td>
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### Table 2-1 Alphanumeric List of all Legacy Commands Showing their Option 266 Support

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
<th>8566</th>
<th>8568</th>
<th>8590 Series</th>
<th>8560 Series</th>
<th>Page for Further Details</th>
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<tbody>
<tr>
<td>CARDLOAD</td>
<td>Copies data from memory card to module memory</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>No</td>
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<tr>
<td>CARDSTORE</td>
<td>Copies data to memory card</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>No</td>
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<tr>
<td>CARROFF</td>
<td>Carrier off power</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>No</td>
<td></td>
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<tr>
<td>CARRON</td>
<td>Carrier on power</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>Yes</td>
<td>Page 138</td>
</tr>
<tr>
<td>CAT</td>
<td>Catalog</td>
<td>N/A</td>
<td>N/A</td>
<td>No</td>
<td>N/A</td>
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<td>CATALOG</td>
<td>Catalog</td>
<td>N/A</td>
<td>N/A</td>
<td>No</td>
<td>No</td>
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<td>CF</td>
<td>Center Frequency</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Page 139</td>
</tr>
<tr>
<td>CHANNEL</td>
<td>Channel selection</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>Yes</td>
<td>Page 140</td>
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<tr>
<td>CHANPWR</td>
<td>Channel power</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>Yes</td>
<td>Page 141</td>
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<tr>
<td>CHP</td>
<td>Performs the channel power measurement</td>
<td>N/A</td>
<td>N/A</td>
<td>Yes</td>
<td>N/A</td>
<td>Page 142</td>
</tr>
<tr>
<td>CHPGR</td>
<td>Channel power graph on or off</td>
<td>N/A</td>
<td>N/A</td>
<td>No</td>
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<td>CHPWRBW</td>
<td>Channel power bandwidth</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>Yes</td>
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<tr>
<td>CLRMAV</td>
<td>Reset avg. counter to 1</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>N/A</td>
<td>Page 144</td>
</tr>
<tr>
<td>CLRBOX</td>
<td>Clears a rectangular area on the analyzer display</td>
<td>N/A</td>
<td>N/A</td>
<td>No</td>
<td>N/A</td>
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<td>CLRDSP</td>
<td>Clear display</td>
<td>N/A</td>
<td>N/A</td>
<td>No</td>
<td>No</td>
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<td>CLRSCHED</td>
<td>Clears autosave &amp; autoexec schedule buffer</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
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<td>CLRW</td>
<td>Clear-writes specified trace</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Page 145</td>
</tr>
<tr>
<td>CSL</td>
<td>Clear status byte</td>
<td>N/A</td>
<td>N/A</td>
<td>Yes</td>
<td>N/A</td>
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<tr>
<td>CMDERRQ</td>
<td>Command error query</td>
<td>N/A</td>
<td>N/A</td>
<td>No</td>
<td>N/A</td>
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<td>CNF</td>
<td>Confidence test</td>
<td>N/A</td>
<td>N/A</td>
<td>No</td>
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<tr>
<td>CNTLA</td>
<td>Auxiliary interface control line A</td>
<td>N/A</td>
<td>N/A</td>
<td>No</td>
<td>No</td>
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<td>CNTLB</td>
<td>Auxiliary interface control line B</td>
<td>N/A</td>
<td>N/A</td>
<td>No</td>
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<td>CNTLC</td>
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<td>N/A</td>
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## Table 2-1  Alphanumeric List of all Legacy Commands Showing their Option 266 Support

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
<th>8566</th>
<th>8568</th>
<th>8590 Series</th>
<th>8560 Series</th>
<th>Page for Further Details</th>
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<tbody>
<tr>
<td>CNTLD</td>
<td>Auxiliary interface control line D</td>
<td>N/A</td>
<td>N/A</td>
<td>No</td>
<td>No</td>
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<td>CNTLI</td>
<td>Auxiliary interface control line input</td>
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<td>N/A</td>
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<td>No</td>
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<td>CNVLOSS</td>
<td>Selects ref level offset to calibrate amplitude display</td>
<td>No</td>
<td>N/A</td>
<td>N/A</td>
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<td>COMB</td>
<td>Turns the comb generator on or off</td>
<td>N/A</td>
<td>N/A</td>
<td>No</td>
<td>N/A</td>
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<td>No</td>
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<td>No</td>
<td>No</td>
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<td>CONTS</td>
<td>Continuous sweep mode</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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<tr>
<td>CORREK</td>
<td>Correction factors on</td>
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<td>N/A</td>
<td>Yes</td>
<td>N/A</td>
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<tr>
<td>COUPLE</td>
<td>Selects AC or DC coupling</td>
<td>N/A</td>
<td>N/A</td>
<td>Yes</td>
<td>Yes</td>
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<td>CR</td>
<td>Couples Resolution BW</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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</tr>
<tr>
<td>CRTHPOS</td>
<td>Horizontal position of CRT display</td>
<td>N/A</td>
<td>N/A</td>
<td>No</td>
<td>N/A</td>
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<tr>
<td>CRTVPOS</td>
<td>Vertical position of CRT display</td>
<td>N/A</td>
<td>N/A</td>
<td>No</td>
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<td>CS</td>
<td>Couples Step Size</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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<tr>
<td>CT</td>
<td>Couples Sweep Time</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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<tr>
<td>CTA</td>
<td>Converts display units to dBm</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>N/A</td>
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<td>CTM</td>
<td>Converts dBm to display units</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>N/A</td>
<td></td>
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<tr>
<td>CTRLHPIB</td>
<td>Allows SA to control HP-IB</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>No</td>
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<td>CV</td>
<td>Couples Video Bandwidth</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Page 153</td>
</tr>
<tr>
<td>D1</td>
<td>Sets display to normal size</td>
<td>No</td>
<td>No</td>
<td>N/A</td>
<td>N/A</td>
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<tr>
<td>D2</td>
<td>Sets display to full CRT size</td>
<td>No</td>
<td>No</td>
<td>N/A</td>
<td>N/A</td>
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</tr>
<tr>
<td>D3</td>
<td>Sets display to expanded size</td>
<td>No</td>
<td>No</td>
<td>N/A</td>
<td>N/A</td>
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<tr>
<td>DA</td>
<td>Display Memory Address</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>N/A</td>
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</tr>
<tr>
<td>DATEMODE</td>
<td>Set the date display format</td>
<td>N/A</td>
<td>N/A</td>
<td>No</td>
<td>No</td>
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### Table 2-1: Alphanumerical List of all Legacy Commands Showing their Option 266 Support

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
<th>8566</th>
<th>8568</th>
<th>8590 Series</th>
<th>8560 Series</th>
<th>Page for Further Details</th>
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</thead>
<tbody>
<tr>
<td>DD</td>
<td>Display write binary</td>
<td>No</td>
<td>No</td>
<td>N/A</td>
<td>N/A</td>
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<tr>
<td>DELMKBW</td>
<td>Occupied power bandwidth within delta marker</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>Yes</td>
<td>Page 155</td>
</tr>
<tr>
<td>DEMOD</td>
<td>Turns the demodulator on or off</td>
<td>N/A</td>
<td>N/A</td>
<td>No</td>
<td>No</td>
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<tr>
<td>DEMODAGC</td>
<td>Demodulation automatic gain control</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
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<td>DEMODT</td>
<td>Demodulation time</td>
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<td>N/A</td>
<td>N/A</td>
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<tr>
<td>DET</td>
<td>Detection Mode</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Page 156</td>
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<tr>
<td>DISPOSE</td>
<td>Frees Memory</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
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<td>DIV</td>
<td>Divide</td>
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<td>No</td>
<td>No</td>
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<td>DL</td>
<td>Display Line Level</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Page 158</td>
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<tr>
<td>DLE</td>
<td>Turns the display line on/off</td>
<td>Yes</td>
<td>Yes</td>
<td>N/A</td>
<td>N/A</td>
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<td>DLYSWP</td>
<td>Delay sweep</td>
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<td>N/A</td>
<td>N/A</td>
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<td>DN</td>
<td>Reduces the active function by applicable step size</td>
<td>N/A</td>
<td>N/A</td>
<td>No</td>
<td>N/A</td>
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<td>DONE</td>
<td>Synchronizing function</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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<tr>
<td>DOTDENS</td>
<td>Sets the dot density value in Analog+ display mode</td>
<td>N/A</td>
<td>N/A</td>
<td>No</td>
<td>N/A</td>
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<td>DR</td>
<td>Display Memory Address Read</td>
<td>No</td>
<td>No</td>
<td>N/A</td>
<td>N/A</td>
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<tr>
<td>DRAWBOX</td>
<td>Draws a rectangular box on analyzer display</td>
<td>N/A</td>
<td>N/A</td>
<td>No</td>
<td>N/A</td>
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<td>DSPLY</td>
<td>Display</td>
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<td>No</td>
<td>No</td>
<td>No</td>
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<td>DT</td>
<td>Define Terminator</td>
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<td>No</td>
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<td>DW</td>
<td>Display Memory Address Write</td>
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<tr>
<td>E1</td>
<td>Active marker to maximum signal</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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<tr>
<td>E2</td>
<td>Active marker to center frequency</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Page 164</td>
</tr>
<tr>
<td>E3</td>
<td>Active marker frequency to CF step size</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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Table 2-1  Alphanumeric List of all Legacy Commands Showing their Option 266 Support

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
<th>8566</th>
<th>8568</th>
<th>8590 Series</th>
<th>8560 Series</th>
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<tr>
<td>E4</td>
<td>Active marker to reference level</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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<td>EDITDONE</td>
<td>Indicates limit line editing is complete</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
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<td>Page 167</td>
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<td>EDITLIML</td>
<td>Allows current limit line to be edited</td>
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<td>N/A</td>
<td>N/A</td>
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<td>EE</td>
<td>Enable entry</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>N/A</td>
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<tr>
<td>EK</td>
<td>Enable knob</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>N/A</td>
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<td>ELSE</td>
<td>Conditional Programming (If...then...else...endif)</td>
<td>No</td>
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<td>Erase trace C memory</td>
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<td>No</td>
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<td>ENDF</td>
<td>Conditional Programming (If...then...else...endif)</td>
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<td>N/A</td>
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<td>ENTER</td>
<td>Enter from HP-IB</td>
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<td>No</td>
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<td>Enter parameter function</td>
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<td>ERASE</td>
<td>User memory &amp; registers erased</td>
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<td>No</td>
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<td>Queries the error queue</td>
<td>Yes</td>
<td>Yes</td>
<td>N/A</td>
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<td>ET</td>
<td>Elapsed time</td>
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<td>EX</td>
<td>Exchanges trace A &amp; B</td>
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<td>Yes</td>
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<td>EXTMXR</td>
<td>Presets external mixing mode</td>
<td>No</td>
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<td>FA</td>
<td>Start frequency</td>
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<td>Yes</td>
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<td>FB</td>
<td>Stop frequency</td>
<td>Yes</td>
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<td>FDIAG</td>
<td>Frequency diagnostics</td>
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<td>Frequency display off</td>
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<td>N/A</td>
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<td>FFT</td>
<td>Fast fourier transform</td>
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<td>FFTAUTO</td>
<td>Marker to Auto FFT</td>
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<td>FFT signal clipped</td>
<td>N/A</td>
<td>N/A</td>
<td>No</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>FFTCONT</td>
<td>FFT continuous sweep</td>
<td>N/A</td>
<td>N/A</td>
<td>No</td>
<td>N/A</td>
<td></td>
</tr>
</tbody>
</table>
# Table 2-1

## Alphanumeric List of all Legacy Commands Showing their Option 266 Support

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
<th>8566</th>
<th>8568</th>
<th>8590 Series</th>
<th>8560 Series</th>
<th>Page for Further Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>FFTKNL</td>
<td>Fast fourier transform kernel</td>
<td>No</td>
<td>No</td>
<td>N/A</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>FFTMKR</td>
<td>FFT markers</td>
<td>N/A</td>
<td>N/A</td>
<td>No</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>FFTMM</td>
<td>FFT marker to midscreen</td>
<td>N/A</td>
<td>N/A</td>
<td>No</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>FFTMS</td>
<td>FFT marker to FFT stop frequency</td>
<td>N/A</td>
<td>N/A</td>
<td>No</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>FPTOFF</td>
<td>FFT off</td>
<td>N/A</td>
<td>N/A</td>
<td>No</td>
<td>N/A</td>
<td></td>
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<tr>
<td>FFTPCTAM</td>
<td>FFT percent amplitude modulation</td>
<td>N/A</td>
<td>N/A</td>
<td>No</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>FFTPCTAMR</td>
<td>FFT percent amplitude modulation readout</td>
<td>N/A</td>
<td>N/A</td>
<td>No</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>FTTSNGLS</td>
<td>FFT single sweep</td>
<td>N/A</td>
<td>N/A</td>
<td>No</td>
<td>N/A</td>
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<tr>
<td>FTSTAT</td>
<td>FFT status</td>
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<td>N/A</td>
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<td>FFTSTOP</td>
<td>FFT stop frequency</td>
<td>N/A</td>
<td>N/A</td>
<td>No</td>
<td>N/A</td>
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</tr>
<tr>
<td>FMGAIN</td>
<td>FM gain</td>
<td>N/A</td>
<td>N/A</td>
<td>No</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>FOFFSET</td>
<td>Frequency offset</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Page 175</td>
</tr>
<tr>
<td>FORMAT</td>
<td>Erase &amp; format the selected memory device</td>
<td>N/A</td>
<td>N/A</td>
<td>No</td>
<td>No</td>
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<tr>
<td>FPKA</td>
<td>Fast preselector peak</td>
<td>Yes</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>Page 176</td>
</tr>
<tr>
<td>FREF</td>
<td>Frequency reference</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>Yes</td>
<td>Page 177</td>
</tr>
<tr>
<td>FS</td>
<td>Full frequency span</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Page 178</td>
</tr>
<tr>
<td>FULBAND</td>
<td>Set start/stop freq for ext mixing bands</td>
<td>No</td>
<td>N/A</td>
<td>N/A</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>FUNCDEF</td>
<td>Function definition</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td></td>
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<tr>
<td>GATE</td>
<td>Turn time-gating on or off</td>
<td>N/A</td>
<td>N/A</td>
<td>No</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>GATECTL</td>
<td>Gate control</td>
<td>N/A</td>
<td>N/A</td>
<td>No</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>GC</td>
<td>Gate preset</td>
<td>N/A</td>
<td>N/A</td>
<td>No</td>
<td>N/A</td>
<td></td>
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<tr>
<td>GD</td>
<td>Gate delay</td>
<td>N/A</td>
<td>N/A</td>
<td>No</td>
<td>No</td>
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<tr>
<td>GDRVCLPAR</td>
<td>Clear pulse parameters</td>
<td>N/A</td>
<td>N/A</td>
<td>No</td>
<td>N/A</td>
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<tr>
<td>GDRVGDEL</td>
<td>Gate Delay for the frequency window</td>
<td>N/A</td>
<td>N/A</td>
<td>No</td>
<td>N/A</td>
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</table>
Table 2-1  Alphanumeric List of all Legacy Commands Showing their Option 266 Support

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
<th>8566</th>
<th>8568</th>
<th>8590 Series</th>
<th>8560 Series</th>
<th>Page for Further Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>GDRVGLEN</td>
<td>Gate length for frequency &amp; time windows</td>
<td>N/A</td>
<td>N/A</td>
<td>No</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>GDRVGT</td>
<td>Turns gate in frequency window on or off</td>
<td>N/A</td>
<td>N/A</td>
<td>No</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>GDRVGTIM</td>
<td>Gate trigger to marker position for time window</td>
<td>N/A</td>
<td>N/A</td>
<td>No</td>
<td>N/A</td>
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<tr>
<td>GDRVPRI</td>
<td>Pulse repetition interval</td>
<td>N/A</td>
<td>N/A</td>
<td>No</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>GDRVPWID</td>
<td>Pulse width</td>
<td>N/A</td>
<td>N/A</td>
<td>No</td>
<td>N/A</td>
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<tr>
<td>GDRVRBW</td>
<td>Couple resolution bandwidth to pulse width</td>
<td>N/A</td>
<td>N/A</td>
<td>No</td>
<td>N/A</td>
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<tr>
<td>GDRVREFE</td>
<td>Enter reference edge</td>
<td>N/A</td>
<td>N/A</td>
<td>No</td>
<td>N/A</td>
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</tr>
<tr>
<td>GDRVST</td>
<td>Couple sweep time to pulse repetition interval</td>
<td>N/A</td>
<td>N/A</td>
<td>No</td>
<td>N/A</td>
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</tr>
<tr>
<td>GDRVSWAP</td>
<td>Update the time or frequency window</td>
<td>N/A</td>
<td>N/A</td>
<td>No</td>
<td>N/A</td>
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</tr>
<tr>
<td>GDRVSWDE</td>
<td>Delay sweep for time window</td>
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<td>N/A</td>
<td>No</td>
<td>N/A</td>
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<tr>
<td>GDRVSWP</td>
<td>Sweep time for the time window</td>
<td>N/A</td>
<td>N/A</td>
<td>No</td>
<td>N/A</td>
<td></td>
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<tr>
<td>GDRVUTIL</td>
<td>Turns the gate utility on or off</td>
<td>N/A</td>
<td>N/A</td>
<td>No</td>
<td>N/A</td>
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</tr>
<tr>
<td>GDRVVBW</td>
<td>Couple video bandwidth to the gate length</td>
<td>N/A</td>
<td>N/A</td>
<td>No</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>GETPLOT</td>
<td>Get plot</td>
<td>N/A</td>
<td>N/A</td>
<td>No</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>GETPRNT</td>
<td>Get print</td>
<td>N/A</td>
<td>N/A</td>
<td>No</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>GL</td>
<td>Gate length</td>
<td>N/A</td>
<td>N/A</td>
<td>No</td>
<td>No</td>
<td></td>
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<tr>
<td>GP</td>
<td>Sets the polarity (positive/negative) of the gate trigger</td>
<td>N/A</td>
<td>N/A</td>
<td>No</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>GR</td>
<td>Plot GPIB input as Graphs</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>GRAT</td>
<td>Graticule on/off</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Page 180</td>
</tr>
<tr>
<td>HAVE</td>
<td>Checks for options installed</td>
<td>N/A</td>
<td>N/A</td>
<td>No</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>HD</td>
<td>Holds data entry</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>Page 181</td>
</tr>
</tbody>
</table>
# Table 2-1  Alphanumeric List of all Legacy Commands Showing their Option 266 Support

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
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<th>8568</th>
<th>8590 Series</th>
<th>8560 Series</th>
<th>Page for Further Details</th>
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<tbody>
<tr>
<td>HN</td>
<td>Harmonic number</td>
<td>N/A</td>
<td>N/A</td>
<td>No</td>
<td>N/A</td>
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<tr>
<td>HNLOCK</td>
<td>Harmonic lock</td>
<td>No</td>
<td>N/A</td>
<td>No</td>
<td>No</td>
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<tr>
<td>HNUNLK</td>
<td>Harmonic band unlock</td>
<td>No</td>
<td>N/A</td>
<td>No</td>
<td>No</td>
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<tr>
<td>IB</td>
<td>Input to trace B memory</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>I1</td>
<td>Sets the RF coupling to AC</td>
<td>N/A</td>
<td>Yes</td>
<td>N/A</td>
<td>N/A</td>
<td>Page 182</td>
</tr>
<tr>
<td>I2</td>
<td>Sets the RF coupling to DC</td>
<td>N/A</td>
<td>Yes</td>
<td>N/A</td>
<td>N/A</td>
<td>Page 183</td>
</tr>
<tr>
<td>ID</td>
<td>Instrument identification</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
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<tr>
<td>IDCF</td>
<td>Identified signal to center frequency</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>No</td>
<td></td>
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<tr>
<td>IDFREQ</td>
<td>Identified signal frequency</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>No</td>
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<tr>
<td>IDSTAT</td>
<td>Signal identifier status</td>
<td>No</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>IF</td>
<td>Conditional Programming (If…then…else…endif)</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
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</tr>
<tr>
<td>IFTKNL</td>
<td>16 bit discrete fourier transform</td>
<td>No</td>
<td>No</td>
<td>N/A</td>
<td>N/A</td>
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<tr>
<td>INT</td>
<td>Integer</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
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<td>INZ</td>
<td>Input impedance</td>
<td>N/A</td>
<td>N/A</td>
<td>No</td>
<td>N/A</td>
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<tr>
<td>IP</td>
<td>Instrument preset</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Page 185</td>
</tr>
<tr>
<td>KEYCLR</td>
<td>Clear user defined keys</td>
<td>N/A</td>
<td>N/A</td>
<td>No</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>KEYCMD</td>
<td>Define function &amp; label of softkey</td>
<td>N/A</td>
<td>N/A</td>
<td>No</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>KEYDEF</td>
<td>Assign function to soft key</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td></td>
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<tr>
<td>KEYENH</td>
<td>Key enhance</td>
<td>N/A</td>
<td>N/A</td>
<td>No</td>
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<td>KEYEXC</td>
<td>Executes specified soft key</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td></td>
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<tr>
<td>KEYLBL</td>
<td>Relabels softkey without changing its function</td>
<td>N/A</td>
<td>N/A</td>
<td>No</td>
<td>N/A</td>
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<tr>
<td>KS,</td>
<td>Mixer level</td>
<td>Yes</td>
<td>Yes</td>
<td>N/A</td>
<td>N/A</td>
<td>Page 186</td>
</tr>
<tr>
<td>KS=</td>
<td>HP8566: Selects factory preselector setting HP8568: Marker counter frequency resolution</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>Page 187</td>
</tr>
<tr>
<td>KS(</td>
<td>Locks the save registers</td>
<td>No</td>
<td>No</td>
<td>N/A</td>
<td>N/A</td>
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</tr>
</tbody>
</table>
Table 2-1  Alphanumeric List of all Legacy Commands Showing their Option 266 Support

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<th>Command</th>
<th>Description</th>
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<th>8568</th>
<th>8590 Series</th>
<th>8560 Series</th>
<th>Page for Further Details</th>
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</thead>
<tbody>
<tr>
<td>KS)</td>
<td>Unlocks the save registers</td>
<td>No</td>
<td>No</td>
<td>N/A</td>
<td>N/A</td>
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<tr>
<td>KS&gt;</td>
<td>Specifies preamp gain for signal input 2</td>
<td>N/A</td>
<td>No</td>
<td>N/A</td>
<td>N/A</td>
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<tr>
<td>KS&lt;</td>
<td>Specifies preamp gain for signal input 1</td>
<td>N/A</td>
<td>No</td>
<td>N/A</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>KS1</td>
<td>Display memory address write</td>
<td>No</td>
<td>No</td>
<td>N/A</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>KS#</td>
<td>Turns off YTX self-heating correction</td>
<td>No</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>KS/</td>
<td>Allows preselector to be peaked manually</td>
<td>No</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>KS123</td>
<td>Returns up to 1001 words display memory</td>
<td>No</td>
<td>No</td>
<td>N/A</td>
<td>N/A</td>
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</tr>
<tr>
<td>KS125</td>
<td>Writes up to 1001 display memory words</td>
<td>No</td>
<td>No</td>
<td>N/A</td>
<td>N/A</td>
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<tr>
<td>KS126</td>
<td>Returns every Nth value of a trace</td>
<td>No</td>
<td>No</td>
<td>N/A</td>
<td>N/A</td>
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</tr>
<tr>
<td>KS127</td>
<td>Sets analyzer to accept binary display write</td>
<td>No</td>
<td>No</td>
<td>N/A</td>
<td>N/A</td>
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</tr>
<tr>
<td>KS39</td>
<td>Writes display memory address in fast binary</td>
<td>No</td>
<td>No</td>
<td>N/A</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>KS43</td>
<td>Sets SRQ 102 when frequency limit exceeded</td>
<td>No</td>
<td>No</td>
<td>N/A</td>
<td>N/A</td>
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</tr>
<tr>
<td>KS91</td>
<td>Returns the amplitude error</td>
<td>No</td>
<td>No</td>
<td>N/A</td>
<td>N/A</td>
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</tr>
<tr>
<td>KS92</td>
<td>Specifies value DL, TH, active mkr in display units</td>
<td>No</td>
<td>No</td>
<td>N/A</td>
<td>N/A</td>
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<tr>
<td>KS94</td>
<td>Returns code for harmonic number in binary</td>
<td>No</td>
<td>No</td>
<td>N/A</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>KSA</td>
<td>Sets amplitude units to dBm</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>N/A</td>
<td>Page 188</td>
</tr>
<tr>
<td>KSa</td>
<td>Selects normal detection</td>
<td>Yes</td>
<td>Yes</td>
<td>N/A</td>
<td>N/A</td>
<td>Page 189</td>
</tr>
<tr>
<td>KSB</td>
<td>Sets amplitude units to dBmV</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>N/A</td>
<td>Page 190</td>
</tr>
</tbody>
</table>
# Legacy Analyzer Command List

## Table of All Legacy Analyzer Commands

## Table 2-1: Alphanumeric List of all Legacy Commands Showing their Option 266 Support

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<th>Command</th>
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<th>8560 Series</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Ksb</td>
<td>Selects positive peak detection</td>
<td>Yes</td>
<td>Yes</td>
<td>N/A</td>
<td>N/A</td>
<td>Page 191</td>
</tr>
<tr>
<td>KSC</td>
<td>Sets amplitude units to dBuV</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>N/A</td>
<td>Page 192</td>
</tr>
<tr>
<td>KSc</td>
<td>Trace A + trace B -&gt; trace A</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>N/A</td>
<td>Page 193</td>
</tr>
<tr>
<td>KSD</td>
<td>Sets amplitude units to V</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>N/A</td>
<td>Page 194</td>
</tr>
<tr>
<td>Ksd</td>
<td>Selects negative peak detection</td>
<td>Yes</td>
<td>Yes</td>
<td>N/A</td>
<td>N/A</td>
<td>Page 195</td>
</tr>
<tr>
<td>KSE</td>
<td>Sets the analyzer title mode</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>N/A</td>
<td>Page 196</td>
</tr>
<tr>
<td>KSe</td>
<td>Selects sample detection</td>
<td>Yes</td>
<td>Yes</td>
<td>N/A</td>
<td>N/A</td>
<td>Page 197</td>
</tr>
<tr>
<td>KSF</td>
<td>HP8566: Shifts the YTO HP8568: Measures the Sweep Time</td>
<td>No</td>
<td>No</td>
<td>N/A</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>KSf</td>
<td>Recover last instrument state at power on</td>
<td>No</td>
<td>No</td>
<td>N/A</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>KSG</td>
<td>Turns on video averaging</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>N/A</td>
<td>Page 198</td>
</tr>
<tr>
<td>Ksg</td>
<td>Turns off the display</td>
<td>Yes</td>
<td>Yes</td>
<td>N/A</td>
<td>N/A</td>
<td>Page 199</td>
</tr>
<tr>
<td>KSH</td>
<td>Turns off video averaging</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>N/A</td>
<td>Page 200</td>
</tr>
<tr>
<td>KSh</td>
<td>Turns on the display</td>
<td>Yes</td>
<td>Yes</td>
<td>N/A</td>
<td>N/A</td>
<td>Page 201</td>
</tr>
<tr>
<td>KSI</td>
<td>Allows the reference level to be extended</td>
<td>No</td>
<td>No</td>
<td>N/A</td>
<td>N/A</td>
<td>Page 202</td>
</tr>
<tr>
<td>KSi</td>
<td>Exchanges traces B &amp; C</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>N/A</td>
<td>Page 203</td>
</tr>
<tr>
<td>KSJ</td>
<td>Manual control of DACs</td>
<td>No</td>
<td>No</td>
<td>N/A</td>
<td>N/A</td>
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<tr>
<td>KSj</td>
<td>Views trace C</td>
<td>Yes</td>
<td>Yes</td>
<td>N/A</td>
<td>N/A</td>
<td>Page 204</td>
</tr>
<tr>
<td>KSK</td>
<td>HP8566: Active Mkr to next highest peak HP8568: Counts pilot IF at marker</td>
<td>Yes</td>
<td>No</td>
<td>N/A</td>
<td>N/A</td>
<td>Page 205</td>
</tr>
<tr>
<td>KSk</td>
<td>Blanks trace C</td>
<td>Yes</td>
<td>Yes</td>
<td>N/A</td>
<td>N/A</td>
<td>Page 206</td>
</tr>
<tr>
<td>KSL</td>
<td>Turns off marker noise function</td>
<td>Yes</td>
<td>Yes</td>
<td>N/A</td>
<td>N/A</td>
<td>Page 207</td>
</tr>
<tr>
<td>KSl</td>
<td>Moves trace B into trace C</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>N/A</td>
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</tr>
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### Table 2-1  Alphanumeric List of all Legacy Commands Showing their Option 266 Support

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
<th>8566</th>
<th>8568</th>
<th>8590 Series</th>
<th>8560 Series</th>
<th>Page for Further Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>KSM</td>
<td>Turns on marker noise function</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>N/A</td>
<td>Page 209</td>
</tr>
<tr>
<td>KSm</td>
<td>Turns off the graticule</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>N/A</td>
<td>Page 211</td>
</tr>
<tr>
<td>KSN</td>
<td>Marker minimum value detected</td>
<td>Yes</td>
<td>No</td>
<td>N/A</td>
<td>N/A</td>
<td>Page 212</td>
</tr>
<tr>
<td>KSn</td>
<td>Turns on the graticule</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>N/A</td>
<td>Page 213</td>
</tr>
<tr>
<td>KSO</td>
<td>Marker span</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>N/A</td>
<td>Page 214</td>
</tr>
<tr>
<td>KSo</td>
<td>Turns off the annotation</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>N/A</td>
<td>Page 215</td>
</tr>
<tr>
<td>KSP</td>
<td>GPIB address</td>
<td>No</td>
<td>No</td>
<td>N/A</td>
<td>N/A</td>
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<tr>
<td>KSp</td>
<td>Turns on the annotation</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>N/A</td>
<td>Page 216</td>
</tr>
<tr>
<td>KSQ</td>
<td>Unlocks frequency band</td>
<td>No</td>
<td>No</td>
<td>N/A</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>KSq</td>
<td>Decouples IF gain and input attenuation</td>
<td>No</td>
<td>No</td>
<td>N/A</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>KSR</td>
<td>Turns on service diagnostics</td>
<td>No</td>
<td>No</td>
<td>N/A</td>
<td>N/A</td>
<td></td>
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<tr>
<td>KSr</td>
<td>Sets service request 102</td>
<td>No</td>
<td>No</td>
<td>N/A</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>KSS</td>
<td>HP8566: Fast GPIB operation</td>
<td>No</td>
<td>No</td>
<td>N/A</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>KST</td>
<td>HP8566: Fast preset HP8568: Shifts second LO down</td>
<td>Yes</td>
<td>No</td>
<td>N/A</td>
<td>N/A</td>
<td>Page 217</td>
</tr>
<tr>
<td>KSt</td>
<td>HP8566: Locks frequency band HP8568: Continues sweep from marker</td>
<td>No</td>
<td>No</td>
<td>N/A</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>KSU</td>
<td>HP8566: External mixer preset HP8568: Shift second LO up</td>
<td>No</td>
<td>No</td>
<td>N/A</td>
<td>N/A</td>
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</tr>
<tr>
<td>KSu</td>
<td>Stops the sweep at the active marker</td>
<td>No</td>
<td>No</td>
<td>N/A</td>
<td>N/A</td>
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</tr>
<tr>
<td>KSV</td>
<td>Frequency offset</td>
<td>Yes</td>
<td>Yes</td>
<td>N/A</td>
<td>N/A</td>
<td>Page 218</td>
</tr>
</tbody>
</table>
## Table 2-1  Alphanumeric List of all Legacy Commands Showing their Option 266 Support

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
<th>8566</th>
<th>8568</th>
<th>8590 Series</th>
<th>8560 Series</th>
<th>Page for Further Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>KSv</td>
<td>HP8566: External mixer frequency identifier HP8568: Inhibits phase lock</td>
<td>No</td>
<td>No</td>
<td>N/A</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>KSW</td>
<td>Amplitude error correction routine</td>
<td>No</td>
<td>No</td>
<td>N/A</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>KSw</td>
<td>Displays amplitude error correction routine</td>
<td>No</td>
<td>No</td>
<td>N/A</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>KSX</td>
<td>Amplitude correction factors on</td>
<td>No</td>
<td>No</td>
<td>N/A</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>Ksx</td>
<td>Sets trigger mode to external</td>
<td>Yes</td>
<td>Yes</td>
<td>N/A</td>
<td>N/A</td>
<td>Page 219</td>
</tr>
<tr>
<td>KSY</td>
<td>Amplitude correction factors off</td>
<td>No</td>
<td>No</td>
<td>N/A</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>KSy</td>
<td>Sets trigger mode to video</td>
<td>Yes</td>
<td>Yes</td>
<td>N/A</td>
<td>N/A</td>
<td>Page 220</td>
</tr>
<tr>
<td>KSZ</td>
<td>Reference level offset</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>N/A</td>
<td>Page 221</td>
</tr>
<tr>
<td>KSz</td>
<td>Sets the display storage address</td>
<td>No</td>
<td>No</td>
<td>N/A</td>
<td>N/A</td>
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<tr>
<td>L0</td>
<td>Turns off the display line</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Page 222</td>
</tr>
<tr>
<td>LB</td>
<td>Writes text label</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
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<tr>
<td>LCLVAR</td>
<td>Defines a local variable for use</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>LF</td>
<td>Preset 0–2.5GHz</td>
<td>Yes</td>
<td>N/A</td>
<td>Yes</td>
<td>N/A</td>
<td>Page 223</td>
</tr>
<tr>
<td>LG</td>
<td>Selects log scale</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Page 224</td>
</tr>
<tr>
<td>LIMD</td>
<td>Delta amplitude value for limit line segment</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>Yes</td>
<td>Page 226</td>
</tr>
<tr>
<td>LIMF</td>
<td>Frequency value for limit-line segment</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>Yes</td>
<td>Page 227</td>
</tr>
<tr>
<td>LIMIDEL</td>
<td>Erase contents of limit line table</td>
<td>N/A</td>
<td>N/A</td>
<td>Yes</td>
<td>N/A</td>
<td>Page 228</td>
</tr>
<tr>
<td>LIMIDISP</td>
<td>Controls when the limit line(s) are displayed</td>
<td>N/A</td>
<td>N/A</td>
<td>Yes</td>
<td>N/A</td>
<td>Page 229</td>
</tr>
<tr>
<td>LIMIFAIL</td>
<td>Limit line fail</td>
<td>N/A</td>
<td>N/A</td>
<td>Yes</td>
<td>Yes</td>
<td>Page 230</td>
</tr>
</tbody>
</table>
### Table 2-1 Alphanumeric List of all Legacy Commands Showing their Option 266 Support

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
<th>8566</th>
<th>8568</th>
<th>8590 Series</th>
<th>8560 Series</th>
<th>Page for Further Details</th>
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<tbody>
<tr>
<td>LIMIFT</td>
<td>Select frequency or time limit line</td>
<td>N/A</td>
<td>N/A</td>
<td>Yes</td>
<td>N/A</td>
<td>Page 231</td>
</tr>
<tr>
<td>LIMIHI</td>
<td>Upper limit</td>
<td>N/A</td>
<td>N/A</td>
<td>No</td>
<td>N/A</td>
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<tr>
<td>LIMILINE</td>
<td>Limit line</td>
<td>N/A</td>
<td>N/A</td>
<td>No</td>
<td>N/A</td>
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<tr>
<td>LIMILO</td>
<td>Lower limit</td>
<td>N/A</td>
<td>N/A</td>
<td>No</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>LIMIMIRROR</td>
<td>Mirror limit line</td>
<td>N/A</td>
<td>N/A</td>
<td>No</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>LIMIMODE</td>
<td>Limit line entry mode</td>
<td>N/A</td>
<td>N/A</td>
<td>No</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>LIMIPURGE</td>
<td>Disposes of current limit line, not limit line table</td>
<td>N/A</td>
<td>N/A</td>
<td>No</td>
<td>N/A</td>
<td>Page 232</td>
</tr>
<tr>
<td>LIMIRCL</td>
<td>Load stored limit line into limit line table</td>
<td>N/A</td>
<td>N/A</td>
<td>No</td>
<td></td>
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<tr>
<td>LIMIREL</td>
<td>Determine whether limit line values absolute/relative</td>
<td>N/A</td>
<td>N/A</td>
<td>Yes</td>
<td>Yes</td>
<td>Page 233</td>
</tr>
<tr>
<td>LIMISAV</td>
<td>Save contents of limit line table for recall</td>
<td>N/A</td>
<td>N/A</td>
<td>No</td>
<td></td>
<td></td>
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<tr>
<td>LIMISEG</td>
<td>Define slope &amp; offset of limit line segments</td>
<td>N/A</td>
<td>N/A</td>
<td>Yes</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>LIMISEGDT</td>
<td>Enter limit line segment for sweep time</td>
<td>N/A</td>
<td>N/A</td>
<td>No</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>LIMITEST</td>
<td>Compare active trace data to limit line parameters</td>
<td>N/A</td>
<td>N/A</td>
<td>Yes</td>
<td>Yes</td>
<td>Page 234</td>
</tr>
<tr>
<td>LIML</td>
<td>Amplitude value for limit line segment in lower limit line</td>
<td>N/A</td>
<td>N/A</td>
<td>Yes</td>
<td>N/A</td>
<td>Page 235</td>
</tr>
<tr>
<td>LIMM</td>
<td>Middle amplitude value for limit-line segment</td>
<td>N/A</td>
<td>N/A</td>
<td>Yes</td>
<td>N/A</td>
<td>Page 236</td>
</tr>
<tr>
<td>LIMTFL</td>
<td>Specifies a flat limit-line segment</td>
<td>N/A</td>
<td>N/A</td>
<td>No</td>
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<tr>
<td>LIMTSNL</td>
<td>Specifies a sloped limit-line segment</td>
<td>N/A</td>
<td>N/A</td>
<td>No</td>
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</tr>
<tr>
<td>LIMU</td>
<td>Amplitude value for limit line segment in upper limit line</td>
<td>N/A</td>
<td>N/A</td>
<td>Yes</td>
<td>N/A</td>
<td>Page 237</td>
</tr>
<tr>
<td>LINFILL</td>
<td>Line fill</td>
<td>N/A</td>
<td>N/A</td>
<td>No</td>
<td>N/A</td>
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</tr>
</tbody>
</table>
## Table 2-1  Alphanumeric List of all Legacy Commands Showing their Option 266 Support

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
<th>8566</th>
<th>8568</th>
<th>8590 Series</th>
<th>8560 Series</th>
<th>Page for Further Details</th>
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</thead>
<tbody>
<tr>
<td>LL</td>
<td>Provides lower left recorder output voltage at rear</td>
<td>No</td>
<td>No</td>
<td>N/A</td>
<td>N/A</td>
<td></td>
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<tr>
<td>LN</td>
<td>Selects linear scale</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Page 238</td>
</tr>
<tr>
<td>LOAD</td>
<td>Load article/file into internal memory</td>
<td>N/A</td>
<td>N/A</td>
<td>No</td>
<td>N/A</td>
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<tr>
<td>LOG</td>
<td>Log</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>LOLIMOFF</td>
<td>LO Limit Off</td>
<td>No</td>
<td>No</td>
<td>N/A</td>
<td>N/A</td>
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<tr>
<td>LSPAN</td>
<td>Last span</td>
<td>N/A</td>
<td>N/A</td>
<td>Yes</td>
<td>N/A</td>
<td>Page 239</td>
</tr>
<tr>
<td>M1</td>
<td>Turns off all markers</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Page 240</td>
</tr>
<tr>
<td>M2</td>
<td>Marker Normal</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Page 241</td>
</tr>
<tr>
<td>M3</td>
<td>Marker Delta</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Page 242</td>
</tr>
<tr>
<td>M4</td>
<td>Marker zoom</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>N/A</td>
<td>Page 244</td>
</tr>
<tr>
<td>MA</td>
<td>Returns the amplitude of active marker</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Page 245</td>
</tr>
<tr>
<td>MBIAS</td>
<td>Mixer bias</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>MBRD</td>
<td>Processor memory block read</td>
<td>No</td>
<td>No</td>
<td>N/A</td>
<td>N/A</td>
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<tr>
<td>MBWR</td>
<td>Processor memory block write</td>
<td>No</td>
<td>No</td>
<td>N/A</td>
<td>N/A</td>
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<tr>
<td>MC0</td>
<td>Turns off the marker frequency counter</td>
<td>N/A</td>
<td>Yes</td>
<td>Yes</td>
<td>N/A</td>
<td>Page 246</td>
</tr>
<tr>
<td>MC1</td>
<td>Turns on the marker frequency counter</td>
<td>N/A</td>
<td>Yes</td>
<td>Yes</td>
<td>N/A</td>
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</tr>
<tr>
<td>MDS</td>
<td>Measurement data size</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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</tr>
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<td>MDU</td>
<td>Measurement data units</td>
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<td>Returns mean value of trace in display units</td>
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<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Page 249</td>
</tr>
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<td>MEANPWR</td>
<td>Mean power measurement</td>
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<td>MEANTH</td>
<td>Trace mean above threshold</td>
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<td>8590 Series</td>
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<td>------</td>
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<td>MEM</td>
<td>Returns amount of memory available</td>
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<td>MERGE</td>
<td>Merge two traces</td>
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<td>MF</td>
<td>Returns frequency of the active marker</td>
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<td>Yes</td>
<td>Yes</td>
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<td>MIN</td>
<td>Minimum</td>
<td>No</td>
<td>No</td>
<td>No</td>
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<td>MINH</td>
<td>Min Hold</td>
<td>N/A</td>
<td>N/A</td>
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<td>Yes</td>
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<tr>
<td>MINPOS</td>
<td>Returns the minimum position in the trace</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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<tr>
<td>MIRROR</td>
<td>Mirror image of the trace</td>
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<td>Amplitude of the active marker</td>
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<td>MKACT</td>
<td>Specifies the active marker</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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<td>MKACTV</td>
<td>Marker as the active function</td>
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<td>N/A</td>
<td>No</td>
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<td>Marker bandwidth</td>
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<td>N/A</td>
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<td>MKCF</td>
<td>Moves the active marker to center frequency</td>
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<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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<tr>
<td>MKCHEDGE</td>
<td>Marker to channel edge</td>
<td>N/A</td>
<td>N/A</td>
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<td>Continues sweeping from the marker after stop</td>
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<td>MKD</td>
<td>Delta marker</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Page 259</td>
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<td>MKDELCHBW</td>
<td>Delta markers to channel power bandwidth</td>
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<td>MKDR</td>
<td>Reciprocal of marker delta</td>
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<td>MKF</td>
<td>Specifies the frequency of the active marker</td>
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<td>Yes</td>
<td>Yes</td>
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<td>MKFC</td>
<td>Turns the marker frequency counter on or off</td>
<td>N/A</td>
<td>Yes</td>
<td>Yes</td>
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## Table 2-1  Alphanumeric List of all Legacy Commands Showing their Option 266 Support

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
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<th>8568</th>
<th>8590 Series</th>
<th>8560 Series</th>
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<tr>
<td>MKFCR</td>
<td>Specifies the marker frequency counter resolution</td>
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<tr>
<td>MKMCF</td>
<td>Marker mean to center frequency</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
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<td>MKMIN</td>
<td>Moves active marker to minimum signal detected</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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<td>MKN</td>
<td>Normal marker</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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<td>MKNOISE</td>
<td>Marker noise function</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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<tr>
<td>MKOFF</td>
<td>Turns all markers or the active marker off</td>
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<td>MKP</td>
<td>Specifies the horizontal position of the marker</td>
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<td>Yes</td>
<td>Yes</td>
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<td>MKPAUSE</td>
<td>Pauses the sweep at the active marker</td>
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<td>MKPK</td>
<td>Marker peak</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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<td>MKPT</td>
<td>Marker peak threshold</td>
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<td>MKPX</td>
<td>Marker peak excursion</td>
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<td>Yes</td>
<td>Yes</td>
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<td>MKREAD</td>
<td>Specifies marker readout mode</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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<td>MKRL</td>
<td>Moves the active marker to reference level</td>
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<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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</tr>
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<td>MKSP</td>
<td>Marker span</td>
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<td>Yes</td>
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<td>MKSS</td>
<td>Marker step size</td>
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<td>Yes</td>
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<td>MKSTOP</td>
<td>Stops the sweep at the active marker</td>
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<td>Position marker in units of time</td>
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<td>N/A</td>
<td>N/A</td>
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<td>MKTBL</td>
<td>Marker table</td>
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<td>MKTRACE</td>
<td>Marker trace</td>
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<td>Yes</td>
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<td>MKTRACK</td>
<td>Turns the marker signal track on or off</td>
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<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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<td>MKTYPE</td>
<td>Specifies the type of active marker to be used</td>
<td>Yes</td>
<td>Yes</td>
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</table>
## Table 2-1  
**Alphanumeric List of all Legacy Commands Showing their Option 266 Support**

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
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<th>8568</th>
<th>8590 Series</th>
<th>8560 Series</th>
<th>Page for Further Details</th>
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<tr>
<td>ML</td>
<td>Mixer Level</td>
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<td>Yes</td>
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<td>MOD</td>
<td>Modulo</td>
<td>No</td>
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<td>MODRCLT</td>
<td>Recalls trace from module memory</td>
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<td>MODSAVT</td>
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### Table 2-1  Alphanumeric List of all Legacy Commands Showing their Option 266 Support

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
<th>8566</th>
<th>8568</th>
<th>8590 Series</th>
<th>8560 Series</th>
<th>Page for Further Details</th>
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<td>OA</td>
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<td>ONSRQ</td>
<td>On service request</td>
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<td>ONSWP</td>
<td>On sweep</td>
<td>No</td>
<td>No</td>
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## Table 2-1  Alphanumeric List of all Legacy Commands Showing their Option 266 Support

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
<th>8566</th>
<th>8568</th>
<th>8590 Series</th>
<th>8560 Series</th>
<th>Page for Further Details</th>
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<tbody>
<tr>
<td>ONTIME</td>
<td>On time</td>
<td>N/A</td>
<td>N/A</td>
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<td>OP</td>
<td>Output parameters</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
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<tr>
<td>OR</td>
<td>Set position of origin</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
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<td>OT</td>
<td>Output trace annotations</td>
<td>Yes</td>
<td>Yes</td>
<td>N/A</td>
<td>N/A</td>
<td>Page 294</td>
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<tr>
<td>OUTPUT</td>
<td>Output - sending data to the GPIB from function</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
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<tr>
<td>PA</td>
<td>Plot absolute</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
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<td>PARSTAT</td>
<td>Parallel status</td>
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<td>PCTAM</td>
<td>Turns the percent AM measurement on or off</td>
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<td>N/A</td>
<td>No</td>
<td>N/A</td>
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<td>PCTAMR</td>
<td>Percent AM response</td>
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<td>N/A</td>
<td>No</td>
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<td>Pen down</td>
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<td>No</td>
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<td>PDA</td>
<td>Probability distribution amplitude</td>
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<td>No</td>
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<td>PDF</td>
<td>Probability distribution frequency</td>
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<td>PEAKS</td>
<td>Sorts the signal peaks by amplitude/frequency</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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<td>PKDLMODE</td>
<td>Peak table delta display line mode</td>
<td>N/A</td>
<td>N/A</td>
<td>No</td>
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<td>PKPOS</td>
<td>Peak position</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>N/A</td>
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<td>PKRES</td>
<td>Peak result</td>
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<td>N/A</td>
<td>No</td>
<td>N/A</td>
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<td>PKSORT</td>
<td>Selects how to sort signal peaks listed in peak table</td>
<td>N/A</td>
<td>N/A</td>
<td>No</td>
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<td>PKTBL</td>
<td>Turns the peak table on or off</td>
<td>N/A</td>
<td>N/A</td>
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<td>PKZMOK</td>
<td>Peak zoom okay</td>
<td>N/A</td>
<td>N/A</td>
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<td>Peak zoom</td>
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<td>PLOT</td>
<td>Prints the screen</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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<td>PLOTORG</td>
<td>Display origins</td>
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<td>N/A</td>
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<td>PLOTSRC</td>
<td>Plot source</td>
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<td>Plot port</td>
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### Table 2-1: Alphanumeric List of all Legacy Commands Showing their Option 266 Support

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
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<th>8568</th>
<th>8590 Series</th>
<th>8560 Series</th>
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<tbody>
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<td>POWERON</td>
<td>Power on state</td>
<td>N/A</td>
<td>N/A</td>
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<td>PP</td>
<td>Peaks the preselector</td>
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<td>N/A</td>
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<td>Yes</td>
<td>Page 298</td>
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<td>PR</td>
<td>Plot relative</td>
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<td>No</td>
<td>No</td>
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<td>External preamplifier gain</td>
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<td>N/A</td>
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<td>PREFIX</td>
<td>Change user memory entries file prefix</td>
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<td>Print</td>
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<td>PRNPRT</td>
<td>Print port</td>
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<td>Pen up</td>
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<td>PWRUPTIME</td>
<td>Power up time</td>
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<td>Q0</td>
<td>Sets detector to EMI Peak detection</td>
<td>Yes</td>
<td>Yes</td>
<td>N/A</td>
<td>N/A</td>
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</tr>
<tr>
<td>Q1</td>
<td>Sets detector to Quasi Peak detection</td>
<td>Yes</td>
<td>Yes</td>
<td>N/A</td>
<td>N/A</td>
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<td>R1</td>
<td>Resets service request 140</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>N/A</td>
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<tr>
<td>R2</td>
<td>Allows service request 140 &amp; 104</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>N/A</td>
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<tr>
<td>R3</td>
<td>Allows service request 140 &amp; 110</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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<tr>
<td>R4</td>
<td>Allows service request 140 &amp; 102</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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<tr>
<td>RB</td>
<td>Resolution bandwidth</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Page 309</td>
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<tr>
<td>RBR</td>
<td>Resolution bandwidth/Span ratio</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
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<td>RC</td>
<td>Recalls state register</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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### Table 2-1 Alphanumeric List of all Legacy Commands Showing their Option 266 Support

<table>
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<tr>
<th>Command</th>
<th>Description</th>
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<th>8568</th>
<th>8590 Series</th>
<th>8560 Series</th>
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<tbody>
<tr>
<td>RCLOSCAL</td>
<td>Recall open/short average</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
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<td>RCLS</td>
<td>Recall state</td>
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<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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<tr>
<td>RCLT</td>
<td>Recall trace</td>
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<td>N/A</td>
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<td>Yes</td>
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<td>RCLTHRU</td>
<td>Recall internal thru-reference trace into trace B</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>No</td>
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<td>RELHPIB</td>
<td>Release control of GPIB</td>
<td>N/A</td>
<td>N/A</td>
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<td>No</td>
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<td>REPEAT</td>
<td>Conditional Programming (Repeat ... Until ...)</td>
<td>No</td>
<td>No</td>
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<td>RESETRL</td>
<td>Reset reference level</td>
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<td>N/A</td>
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<td>No</td>
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<td>RETURN</td>
<td>Return to user defined function origination point</td>
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<td>N/A</td>
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<td>REV</td>
<td>Returns the revision string to the controller</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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<td>RL</td>
<td>Reference level</td>
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<td>RLCAL</td>
<td>Reference level calibration</td>
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<td>RMS</td>
<td>Root mean square</td>
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<td>ROFFSET</td>
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<td>Yes</td>
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<td>SRQ mask</td>
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<td>Yes</td>
<td>Yes</td>
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<td>S1</td>
<td>Continuous sweep mode</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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<td>S2</td>
<td>Single sweep mode</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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<td>SADD</td>
<td>Adds a limit line segment</td>
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<td>N/A</td>
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<td>SAVEMENU</td>
<td>Save menu</td>
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<td>N/A</td>
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<td>SAVES</td>
<td>Saves analyzer state to specified register</td>
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<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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<td>SAVET</td>
<td>Save trace</td>
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<td>Deletes a limit line segment</td>
<td>N/A</td>
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<td>No</td>
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Table 2-1  Alphanumeric List of all Legacy Commands Showing their Option 266 Support

<table>
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<tr>
<th>Command</th>
<th>Description</th>
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<th>8568</th>
<th>8590 Series</th>
<th>8560 Series</th>
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<td>SDON</td>
<td>Indicates limit line segment is done</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
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<td>Page 325</td>
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<td>SEDI</td>
<td>Edits limit line segment</td>
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<td>N/A</td>
<td>N/A</td>
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<td>SEGDEL</td>
<td>Delete specified segment from limit line tables</td>
<td>N/A</td>
<td>N/A</td>
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<td>Segment entry for frequency limit lines</td>
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<td>SETDATE</td>
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<td>Smooths given trace over specified number points</td>
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<td>Yes</td>
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<td>SNGLS</td>
<td>Single sweep mode</td>
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<td>Yes</td>
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<td>SP</td>
<td>Frequency Span</td>
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<td>SPEAKER</td>
<td>Turns the internal speaker on or off</td>
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<td>SQR</td>
<td>Square root</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SQUELCH</td>
<td>Adjusts squelch level</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>SRCALC</td>
<td>Selects internal or external level control</td>
<td>N/A</td>
<td>N/A</td>
<td>No</td>
<td>No</td>
<td></td>
</tr>
</tbody>
</table>
## Table 2-1  Alphanumeric List of all Legacy Commands Showing their Option 266 Support

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
<th>8566</th>
<th>8568</th>
<th>8590 Series</th>
<th>8560 Series</th>
<th>Page for Further Details</th>
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<tbody>
<tr>
<td>SRCAT</td>
<td>Attenuate source output level</td>
<td>N/A</td>
<td>N/A</td>
<td>No</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>SRCCRSTK</td>
<td>Coarse tracking adjust</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>SRCFINNK</td>
<td>Fine tracking adjust</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>SRCNORM</td>
<td>Source normalization</td>
<td>N/A</td>
<td>N/A</td>
<td>No</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>SRCPOFS</td>
<td>Offset source power level</td>
<td>N/A</td>
<td>N/A</td>
<td>No</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>SRCPSTP</td>
<td>Select source power step size</td>
<td>N/A</td>
<td>N/A</td>
<td>No</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>SRCPSWP</td>
<td>Select sweep range of source output</td>
<td>N/A</td>
<td>N/A</td>
<td>No</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>SRCPWR</td>
<td>Select source power level</td>
<td>N/A</td>
<td>N/A</td>
<td>No</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>SRCTK</td>
<td>Adjust tracking of source output with SA sweep</td>
<td>N/A</td>
<td>N/A</td>
<td>No</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>SRCTKPK</td>
<td>Auto adjust tracking of source output with SA sweep</td>
<td>N/A</td>
<td>N/A</td>
<td>No</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>SRQ</td>
<td>Service request</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Page 335</td>
</tr>
<tr>
<td>SS</td>
<td>Frequency Step Size</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Page 336</td>
</tr>
<tr>
<td>ST</td>
<td>Sweep Time</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Page 338</td>
</tr>
<tr>
<td>STB</td>
<td>Status byte query</td>
<td>N/A</td>
<td>N/A</td>
<td>Yes</td>
<td>Yes</td>
<td>Page 340</td>
</tr>
<tr>
<td>STDEV</td>
<td>Standard deviation of trace amplitude</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Page 341</td>
</tr>
<tr>
<td>STOR</td>
<td>Store file</td>
<td>N/A</td>
<td>N/A</td>
<td>No</td>
<td>N/A</td>
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<tr>
<td>STOREOPEN</td>
<td>Save current instrument state</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>No</td>
<td></td>
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<tr>
<td>STORESHORT</td>
<td>Store short</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>STORETHRU</td>
<td>Store thru-calibration trace in trace B</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>No</td>
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<tr>
<td>SUB</td>
<td>Subtract</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>SUM</td>
<td>Sum of trace element amplitudes in display units</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>SUMSQR</td>
<td>Squares trace element amplitudes &amp; returns sum</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
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</table>
# Table 2-1 Alphanumeric List of all Legacy Commands Showing their Option 266 Support

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<tr>
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<th>8590 Series</th>
<th>8560 Series</th>
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<tbody>
<tr>
<td>SV</td>
<td>Saves state</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Page 343</td>
</tr>
<tr>
<td>SW</td>
<td>Skip to next control instruction</td>
<td>No</td>
<td>No</td>
<td>N/A</td>
<td>N/A</td>
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</tr>
<tr>
<td>SWPCPL</td>
<td>Sweep couple</td>
<td>N/A</td>
<td>N/A</td>
<td>No</td>
<td>No</td>
<td></td>
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<tr>
<td>SWPOUT</td>
<td>Sweep output</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>SYNCMODE</td>
<td>Synchronize mode</td>
<td>N/A</td>
<td>N/A</td>
<td>No</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>T0</td>
<td>Turns the threshold level off</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>N/A</td>
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<tr>
<td>T1</td>
<td>Sets the trigger mode to free run</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Page 344</td>
</tr>
<tr>
<td>T2</td>
<td>Sets the trigger mode to line</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Page 345</td>
</tr>
<tr>
<td>T3</td>
<td>Sets the trigger mode to external</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Page 346</td>
</tr>
<tr>
<td>T4</td>
<td>Sets the trigger mode to video</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Page 347</td>
</tr>
<tr>
<td>T7</td>
<td>Sets the trigger mode to level</td>
<td>N/A</td>
<td>N/A</td>
<td>No</td>
<td>N/A</td>
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<tr>
<td>T8</td>
<td>Sets the trigger mode to edge</td>
<td>N/A</td>
<td>N/A</td>
<td>No</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>TA</td>
<td>Returns trace A amplitude values to controller</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Page 348</td>
</tr>
<tr>
<td>TB</td>
<td>Returns trace B amplitude values to controller</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Page 349</td>
</tr>
<tr>
<td>TDF</td>
<td>Trace data format</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Page 350</td>
</tr>
<tr>
<td>TEXT</td>
<td>Writes text on the analyzer screen</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td></td>
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<tr>
<td>TH</td>
<td>Threshold</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Page 351</td>
</tr>
<tr>
<td>THE</td>
<td>Turns the threshold on or off</td>
<td>No</td>
<td>No</td>
<td>N/A</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>THEN</td>
<td>Conditional Programming (If…then…else…endif)</td>
<td>No</td>
<td>No</td>
<td>N/A</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>TIMEDATE</td>
<td>Allows setting of time &amp; date for analyzer</td>
<td>N/A</td>
<td>N/A</td>
<td>Yes</td>
<td>Yes</td>
<td>Page 352</td>
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</table>
## Table 2-1  Alphanumeric List of all Legacy Commands Showing their Option 266 Support

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
<th>8566</th>
<th>8568</th>
<th>8590 Series</th>
<th>8560 Series</th>
<th>Page for Further Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>TIMEDSP</td>
<td>Enables display of time &amp; data on analyzer display</td>
<td>N/A</td>
<td>N/A</td>
<td>No</td>
<td>N/A</td>
<td></td>
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<tr>
<td>TITLE</td>
<td>Title entry</td>
<td>N/A</td>
<td>N/A</td>
<td>Yes</td>
<td>Yes</td>
<td>Page 353</td>
</tr>
<tr>
<td>TM</td>
<td>Trigger Mode</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Page 354</td>
</tr>
<tr>
<td>TOI</td>
<td>Third order intermodulation measurement</td>
<td>N/A</td>
<td>N/A</td>
<td>No</td>
<td>N/A</td>
<td></td>
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<tr>
<td>TOIR</td>
<td>Third order intermodulation response</td>
<td>N/A</td>
<td>N/A</td>
<td>No</td>
<td>N/A</td>
<td></td>
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<tr>
<td>TRA</td>
<td>Returns trace A amplitude values to controller</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Page 355</td>
</tr>
<tr>
<td>TRB</td>
<td>Returns trace B amplitude values to controller</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Page 356</td>
</tr>
<tr>
<td>TRC</td>
<td>Returns trace C amplitude values to controller</td>
<td>N/A</td>
<td>N/A</td>
<td>Yes</td>
<td>N/A</td>
<td>Page 357</td>
</tr>
<tr>
<td>TRCMEM</td>
<td>Trace C memory</td>
<td>N/A</td>
<td>N/A</td>
<td>No</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>TRDEF</td>
<td>Trace define</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>TRDSP</td>
<td>Trace display</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>N/A</td>
<td>Page 358</td>
</tr>
<tr>
<td>TRGRPH</td>
<td>Trace graph display</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>N/A</td>
<td></td>
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<tr>
<td>TRIGPOL</td>
<td>Trigger polarity</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>Yes</td>
<td>Page 359</td>
</tr>
<tr>
<td>TRMATH</td>
<td>Executes specified trace math at end of sweep</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>TRPRST</td>
<td>Sets trace operations to their preset values</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>N/A</td>
<td>Page 360</td>
</tr>
<tr>
<td>TRSTAT</td>
<td>Returns current trace states to controller</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>N/A</td>
<td>Page 361</td>
</tr>
<tr>
<td>TS</td>
<td>Takes a sweep</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Page 362</td>
</tr>
<tr>
<td>TVLINE</td>
<td>Selects which horizontal line of video to trigger on</td>
<td>N/A</td>
<td>N/A</td>
<td>No</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>TVLSFRM</td>
<td>Selects the type of video frame to trigger on</td>
<td>N/A</td>
<td>N/A</td>
<td>No</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>TVSTND</td>
<td>TV standard</td>
<td>N/A</td>
<td>N/A</td>
<td>No</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>TVSYNC</td>
<td>Selects polarity of video modulation to trigger on</td>
<td>N/A</td>
<td>N/A</td>
<td>No</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>Command</td>
<td>Description</td>
<td>8566</td>
<td>8568</td>
<td>8590 Series</td>
<td>8560 Series</td>
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<td>------</td>
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<tr>
<td>TWNDOW</td>
<td>Formats trace information for FFT.</td>
<td>N/A</td>
<td>N/A</td>
<td>No</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>UNTIL</td>
<td>Conditional Programming (Repeat…Until…)</td>
<td>No</td>
<td>No</td>
<td>N/A</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>UP</td>
<td>Increases active function value by applicable step</td>
<td>N/A</td>
<td>N/A</td>
<td>No</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>UR</td>
<td>Upper right x-y recorder output voltage at rear</td>
<td>No</td>
<td>No</td>
<td>N/A</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>USTATE</td>
<td>Configures user defined states</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>VARDEF</td>
<td>Variable definition</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
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<td>VARIANCE</td>
<td>Returns the amplitude variance of specified trace</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>VAVG</td>
<td>Turns video averaging on or off</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Page 363</td>
</tr>
<tr>
<td>VB</td>
<td>Video Bandwidth</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Page 365</td>
</tr>
<tr>
<td>VBO</td>
<td>Video Bandwidth Coupling Offset</td>
<td>Yes</td>
<td>Yes</td>
<td>N/A</td>
<td>N/A</td>
<td>Page 367</td>
</tr>
<tr>
<td>VBR</td>
<td>Video Bandwidth Ratio</td>
<td>N/A</td>
<td>N/A</td>
<td>Yes</td>
<td>Yes</td>
<td>Page 368</td>
</tr>
<tr>
<td>VIEW</td>
<td>Stores and views the specified trace</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Page 369</td>
</tr>
<tr>
<td>VTL</td>
<td>Video trigger level</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>Yes</td>
<td>Page 370</td>
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<tr>
<td>WAIT</td>
<td>Suspend program operation for specified time</td>
<td>N/A</td>
<td>N/A</td>
<td>No</td>
<td>N/A</td>
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<tr>
<td>WINNEXT</td>
<td>Next window</td>
<td>N/A</td>
<td>N/A</td>
<td>No</td>
<td>N/A</td>
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<tr>
<td>WINOFF</td>
<td>Turns off the window display mode</td>
<td>N/A</td>
<td>N/A</td>
<td>No</td>
<td>N/A</td>
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<tr>
<td>WINON</td>
<td>Turns on the window display mode</td>
<td>N/A</td>
<td>N/A</td>
<td>No</td>
<td>N/A</td>
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<tr>
<td>WINZOOM</td>
<td>Window zoom</td>
<td>N/A</td>
<td>N/A</td>
<td>No</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>XCH</td>
<td>Exchanges the two specified traces.</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>N/A</td>
<td>Page 371</td>
</tr>
<tr>
<td>ZMKCNTR</td>
<td>Zone marker at center frequency</td>
<td>N/A</td>
<td>N/A</td>
<td>No</td>
<td>N/A</td>
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</tr>
</tbody>
</table>
### Table 2-1  Alphanumeric List of all Legacy Commands Showing their Option 266 Support

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<tr>
<th>Command</th>
<th>Description</th>
<th>8566</th>
<th>8568</th>
<th>8590 Series</th>
<th>8560 Series</th>
<th>Page for Further Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>ZMKPKNL</td>
<td>Zone marker for next peak left</td>
<td>N/A</td>
<td>N/A</td>
<td>No</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>ZMKPKNR</td>
<td>Zone marker for next peak right</td>
<td>N/A</td>
<td>N/A</td>
<td>No</td>
<td>N/A</td>
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</tr>
<tr>
<td>ZMKSPAN</td>
<td>Zone marker span</td>
<td>N/A</td>
<td>N/A</td>
<td>No</td>
<td>N/A</td>
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</tbody>
</table>
3 Hints and Tips

This chapter includes a list of helpful hints and tips that will help you get the most from Option 266 on your PSA Series analyzer.
A Few Helpful Hints and Tips

These pages list a few hints and tips that will help you get the most from your analyzer and Option 266.

- **Compatibility - speed and consistency** - for best compatibility with your legacy analyzer, Option 266 should be used on the analyzer whose frequency range most closely matches the frequency range of your legacy analyzer. For example, the best match for the 8565E with its 50 GHz upper frequency limit is the PSA E4448A analyzer which also has an upper frequency limit of 50 GHz.

- **Compatibility and Sweep Times** - for best compatibility between PSA Series analyzers and the legacy analyzers, use the Manual Swept mode for 8566A/B, 8568A/B, or 8590 Series analyzers. Manual Swept mode is the default setting on PSA Series analyzers with Option 266 installed.

  When analyzing stationary signals, you can change to the Best Speed setting, which is accessed from the Auto Couple hardkey and the FFT & Sweep menu. This results in faster sweep times on a PSA analyzer than on the legacy analyzers because of the PSA's better performance. In the majority of applications, this faster speed would be desirable, but that is not always the case.

  When you are using the Best Speed setting, you cannot change the sweep time manually as the sweep time is always coupled to give the fastest sweep times based on the current settings.

- **Time-out (1)** - Agilent suggests that you increase the timeout when performing MA and MF commands to allow previous marker functions to complete correctly.

- **Time-out (2)** - Agilent recommends increasing the timeout on a serial poll (SPOLL) due to differences in Sweep Times on some settings. Note, however, that this may not be necessary when using the Best Speed setting on the FFT & Sweep menu (accessed from the Auto Couple hardkey).

- **Synchronization (1)** - to synchronize after an IP command, Agilent recommends that you use the DONE command. We also suggest that the DONE command is used in conjunction with a timeout of about 5 seconds in case the analyzer starts to auto align. Alternatively, you could set auto alignment to Off. To set auto alignment to Off, press System, Alignments, Auto Align on the front panel.

- **Synchronization (2)** - Agilent recommends that synchronization (using the DONE command) is used with marker functions when signal tracking is turned on.
• **AC and DC Coupling** - The 8568A/B has two RF input ports:
  
  — DC Coupled (with a BNC connector) to handle a frequency range of 100 Hz to 1.5 GHz
  
  — AC Coupled (with an N Type connector) to handle a frequency range of 100 kHz to 1.5 GHz
  
  The 8560 Series and the 8590 Series of legacy analyzers only have one RF input port, and support AC and DC coupling through the COUPLE command (page 149).

  The PSA series analyzers only have a single RF input port.

  When using PSA models E4440A, E4443A, and E4445A with the UKB option, you must use DC coupling to see calibrated frequencies of less than 10 MHz. Signals of less than 10 MHz are not calibrated when using AC coupling on these analyzers.

  **NOTE**  PSA models E4446A, E4447A, and E4448A do not allow AC coupling.

• **Overloading** - if you are overloading the analyzer, connect a 10 dB attenuator to the RF input and set the **Ext Amp Gain** (external amplifier gain) to -10 dB. This softkey is accessed via the Amplitude hardkey and the **More 1 of 3** softkey.

• **Instrument Presets** - consecutive instrument presets (using the IP command, that is, issuing a command such as IP;IP;IP;) are not required.

• **SCPI Language** - Agilent recommends that you do not repeatedly swap to and from the SCPI language within your programs.

• **GPIB, LAN, and USB Connectivity** - Option 266 only works via the GPIB bus on the PSA. While using Option 266, you can send SCPI commands using the LAN or USB to the instruments. This may be helpful to set certain SCPI parameters on the instrument without the need to turn off the code compatibility application.
This chapter lists all the supported 8566A/B, 8568A/B, 8560 Series, and 8590 Series compatible commands in alphanumeric order, and gives brief details on their syntax and operation. For more detailed information on these commands, see your 8566A/B, 8568A/B, 8560 Series or 8590 Series Operating and Programming Manual.
Command Syntax

Command syntax is represented pictorially.

- Ovals enclose command mnemonics. The command mnemonic must be entered exactly as shown.
- Circles and ovals surround secondary keywords or special numbers and characters. The characters in circles and ovals are considered reserved words and must be entered exactly as shown.
- Rectangles contain the description of a syntax element defined in Table 4-1, “Syntax Elements.”
- A loop above a syntax element indicates that the syntax element can be repeated.
- Solid lines represent the recommended path.
- Dotted lines indicate an optional path for bypassing secondary keywords or using alternate units.
- Arrows and curved intersections indicate command path direction.
- Semicolons are the recommended command terminators. Using semicolons makes programs easier to read, prevents command misinterpretation, and is recommended by IEEE Standard 728.

**NOTE**

Uppercase is recommended for entering all commands unless otherwise noted.

Syntax Elements are shown in the syntax diagrams as elements within rectangles. In the syntax diagrams, characters and secondary keywords are shown within circles or ovals. Characters and secondary keywords must be entered exactly as shown.
### Table 4-1 Syntax Elements

<table>
<thead>
<tr>
<th>Syntax Component</th>
<th>Definition/Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Analyzer command</td>
<td>Any spectrum analyzer command in this chapter, with required parameters and terminators.</td>
</tr>
<tr>
<td>Character</td>
<td>S p a b c d e f g h i j k l m n o p q r s t u v w x y z databyte.</td>
</tr>
<tr>
<td>Character &amp; EOI</td>
<td>8-bit byte containing only character data and followed by end-or-identify (EOI) condition, where the EOI control line on GPIB is asserted to indicate the end of the transmission. END signifies the EOI condition.</td>
</tr>
<tr>
<td>Character string</td>
<td>A list of characters.</td>
</tr>
<tr>
<td>Data byte</td>
<td>8-bit byte containing numeric or character data.</td>
</tr>
<tr>
<td>Data byte &amp; EOI</td>
<td>8-bit byte containing numeric or character data followed by end-or-identify (EOI) condition, where the EOI control line on GPIB is asserted to indicate the end of the transmission. END signifies the EOI condition.</td>
</tr>
<tr>
<td>Delimiter</td>
<td></td>
</tr>
<tr>
<td>Digit</td>
<td>0 1 2 3 4 5 6 7 8 9</td>
</tr>
<tr>
<td>lsb length</td>
<td>Represents the least significant byte of a two-byte word that describes the number of bytes returned or transmitted. See msb length.</td>
</tr>
<tr>
<td>msb length</td>
<td>Represents the most significant byte of a two-byte word that describes the number of bytes returned or transmitted. See lsb length.</td>
</tr>
<tr>
<td>Number</td>
<td>Expressed as integer, decimal, or in exponential (E) form.</td>
</tr>
<tr>
<td></td>
<td>Real Number Range: $\pm 1.797693134862315 \times 10^{308}$, including 0.</td>
</tr>
<tr>
<td></td>
<td>Up to 15 significant figures allowed.</td>
</tr>
<tr>
<td></td>
<td>Numbers may be as small as $\pm 2.225073858507202 \times 10^{-308}$</td>
</tr>
<tr>
<td></td>
<td>Integer Number Range: $-32,768$ through $+32,767$</td>
</tr>
<tr>
<td>Output termination</td>
<td>Carriage return (CR) and line feed (LF), with end-or-identify (EOI) condition. ASCII codes 13 (carriage return) and 10 (line feed) is sent via GPIB, then the end-or-identify control line on GPIB sets to indicate the end of the transmission.</td>
</tr>
<tr>
<td>Units</td>
<td>Represent standard scientific units.</td>
</tr>
<tr>
<td></td>
<td>Frequency Units: GZ, GHZ, MZ, MHZ, KZ, KHZ, HZ</td>
</tr>
<tr>
<td></td>
<td>Amplitude Units: DB, DBMV, DM, DBM, DBUV, V, MV, UV</td>
</tr>
<tr>
<td></td>
<td>Time Units: SC, S, MS, US</td>
</tr>
</tbody>
</table>
Programming Command Descriptions

All supported commands are listed here, along with their descriptions and cross-references to similar commands.

This chapter is not designed to be a comprehensive guide to all 8566A/B, 8568A/B, 8560 Series, or 8590 Series commands. It gives brief descriptions of the supported commands, and highlights important functional or behavioral differences that you should be aware of when transferring existing 8566A/B, 8568A/B, 8560 Series or 8590 Series code to your PSA Series analyzer. For a fuller description of the commands, refer to the 8566A/B, 8568A/B, 8560 Series or 8590 Series Operating and Programming Manual.

In the descriptions of the commands, TRA corresponds to Trace 1, TRB corresponds to Trace 2, and TRC corresponds to Trace 3.

To avoid confusion between numbers and letters, all commands that incorporate numbers have had the number spelled out and placed in square brackets after the command. For example, the command ‘I1’ is shown as ‘I1 [one]’ - that is, the capital letter ‘I’ followed by the number ‘1’, and then the word ‘one’ italicized in square brackets. The italicized word in brackets does not form part of the command.
A1 [one] Clear Write for Trace A

Syntax

A1 ;

Description

The A1 command sets Trace A to clear write. That is, it continuously displays any signal present at the spectrum analyzer input. The A1 command initially clears Trace A, setting all elements to zero. The sweep trigger then signals the start of the sweep, and Trace A is continually updated as the sweep progresses. Subsequent sweeps send new amplitude information to the display addresses.

NOTE

The functions of the command A1 are identical to the CLRWT A command (page 145).


**A2 [two] Maximum Hold for Trace A**

**Syntax**

```
A2 ;
```

**Description**

The A2 command updates each trace element with the maximum level detected during the period that the trace has been active.

**NOTE**

The functions of the command A2 are identical to the MXMH TRA command (page 287).
A3 [three]  
View Mode for Trace A

Syntax

```
A3;
```

Description

The A3 command displays Trace A and then stops the sweep if no other traces are active. Trace A does not get updated with new data.

NOTE

The functions of the command A3 are identical to the VIEW TRA command (page 369).
A4 [four] Blank Trace A

Syntax

![A4 Command Syntax](image)

Description

The A4 command blanks Trace A and stops the sweep if no other traces are active. Trace A is not updated.

**NOTE**

The functions of the command A4 are identical to the BLANK TRA command (page 130).
ACP
Adjacent Channel Power

Syntax

```
ACP
```

Description

ACP measures the power of the carrier and the power of the channels that are adjacent to the carrier, and then computes a power ratio for each of the adjacent channels, using the carrier power as a reference. ACP performs the adjacent channel power measurement using the values for channel spacing (ACPSP) and channel bandwidth (ACPBW).

**NOTE**
Option 266 supports this measurement using the ANALOG method only.
ACPALPHA
Adjacent Channel Power Alpha Weighting

Syntax

```
ACPALPHA So real ;
```

Description

This command sets the alpha weighting for ACP measurements.

Range: Any real number between 0 and 1
ACPALTCH
Adjacent Channel Power Alternate Channels

Syntax

Description
The ACPALTCH command sets the number of alternate channels to be measured by an adjacent channel power measurement to either 0, 1, or 2. The number of alternate channels is used with the ACPRSLTS command (page 107).

Range: 0, 1, or 2.
Default value: 0.
**ACPBRPER**

Adjacent Channel Power Burst Period

**Syntax**

```
ACPBRPER Sp real S ;
```

**Description**

The ACPBRPER command sets the cycle time (period) of the burst RF signal. The cycle time is needed to set the sweep times when using the peak, two bandwidth, burst power, and gated methods for adjacent channel power measurements.

**NOTE** Option 266 supports the ACP measurement using the ANALOG method only.
ACPBRWID
Adjacent Channel Power Burst Width

Syntax

```
ACPBRWID SP real S ;
```

Description

The ACPBRWID command sets the on-time (pulse width) of the burst RF signal. The pulse width is needed to set the gating times when using the gated method for adjacent channel power measurements.

Range  5 µs to 9.5 seconds

NOTE  Option 266 supports the ACP measurement using the ANALOG method only.
ACPBW
Adjacent Channel Power Bandwidth

Syntax

Description

The ACPBW command sets the bandwidth of the channels as an active function for the ACPMEAS (page 103) and ACPCOMPUTE (page 99) commands. The channel bandwidth cannot be greater than the channel spacing. If the channel bandwidth is greater than the channel spacing, the measurement is not performed.
ACPCOMPUTE Adjacent Channel Power Compute

Syntax

ACPCOMPUTE ;

Description

Calculates the ACP of a transmitter based on data on the display. This function does not make a new measurement before computing. The measurement must have been made with ANALOG or PEAK method selected so the appropriate data is available for the calculation.

NOTE

Option 266 supports the ACP measurement using the ANALOG method only.
ACPFRQWT
Adjacent Channel Power Frequency Weighting

Syntax

```
ACPFRQWT $p$ RRCOS OFF
```

Description

The ACPFRQWT command is used to control the frequency weighting when making an Adjacent Channel Power measurement. Weighting is not used in the measurement if OFF has been selected. Root-raised-cosine weighting is selected with the RRCOS parameter.

Default value: OFF

NOTE

Option 266 supports the ACP measurement using the ANALOG method only.
ACPLOWER
Lower Adjacent Channel Power

Syntax

```
ACPLOWER ? ;
```

Description
The ACPLOWER query command returns the power ratio result of the Adjacent Channel Power measurement for the lower frequency channel.

NOTE
Option 266 supports the ACP measurement using the ANALOG method only.
ACPMAX
Maximum Adjacent Channel Power

Syntax

The ACPMAX query command returns the maximum adjacent channel power of the adjacent channel power measurement.

NOTE
Option 266 supports the ACP measurement using the ANALOG method only.
ACPMEAS
Measure Adjacent Channel Power

Syntax

ACPMEAS ;

Description

The ACPMEAS command makes a measurement and calculates the adjacent channel power (ACP) of a transmitter. The measurement determines the leakage power that is in the channels adjacent to the carrier. The result is the ratio of the leakage power in the channel adjacent to the total power transmitted by the transmitter.

NOTE
Option 266 supports the ACP measurement using the ANALOG method only.
**ACPMSTATE**
Adjacent Channel Power Measurement State

**Syntax**

```
ACPMSTATE SP CURR DFLT ?
```

**Description**

Sets the parameters of the measurement state to either the default state (determined by the setup) or the current state. The state parameters that could change between the default state and a current state include:

- Resolution bandwidth
- Video bandwidth
- Span
- Sweep time
- Detector mode
- Gating parameters
- Trigger parameters
- Video averaging

Default value: DFLT

**NOTE**
Option 266 supports the ACP measurement using the ANALOG method only.
ACPPAR
Adjacent Channel Power Manual or Auto

Syntax

![Diagram of ACPPAR Syntax]

Description

Determines whether the spectrum analyzer settings for the ACP (page 93), CHP (page 142) or OBW (currently not supported) measurements are set automatically or manually.

If ACPPAR is set to 1 (automatic), the analyzer does the following before making the measurement:

- Performs the Trace Preset (TRPRST (page 360)) command.
- Changes Trigger Mode to Free Run.
- Changes Detector Mode to Sample.
- Changes the amplitude scale to 10 dB per division.
- Sets the frequency span, resolution bandwidth, video bandwidth, center frequency step size and sweep time based on the channel spacing (ACPS (page 108)) and channel bandwidth (ACPBW (page 98)).
- Takes a sweep

Default value: 1 (auto)

NOTE

Option 266 supports the ACP measurement using the ANALOG method only.
ACPPWRTX
Adjacent Channel Power Total Power Transmitted

Syntax

ACPPWRTX ? ;

Description

The ACPPWRTX query command returns the result of the total power transmitted calculation of the adjacent channel power measurement. The measurement must be made with the analog or burst power method selected.

NOTE
Option 266 supports the ACP measurement using the ANALOG method only.
ACPRSLTS
Adjacent Channel Power Measurement Results

Syntax

```
ACPRSLTS
```

Description

Returns an array of power data resulting from an ACP measurement of an RF signal. The number of alternate channel pairs selected by the ACPALTCH (page 95) command determines the size of the array.

**NOTE**

Option 266 supports the ACP measurement using the ANALOG method only.
ACPSP
Adjacent Channel Power Channel Spacing

Syntax

```
ACPSP S_p real HZ ;
```

- **S_p**: real
- **HZ**: KHZ, MHZ, GHZ, KZ, MZ, GZ

**Description**

Sets the channel spacing for the ACPMEAS (page 103) and ACPCOMPUTE (page 99) commands.

**NOTE**

Option 266 supports the ACP measurement using the ANALOG method only.
ACPT
Adjacent Channel Power T Weighting

Syntax

Description
The ACPT command is used to set the T used in weighting for an adjacent channel power measurement.

NOTE
Option 266 supports the ACP measurement using the ANALOG method only.
ACPUPPER
Upper Adjacent Channel Power

Syntax

```
ACPUPPER
?
;
```

Description

The ACPUPPER query command returns the power ratio result of the adjacent channel power measurement for the upper frequency channel.

---

**NOTE**
Option 266 supports the ACP measurement using the ANALOG method only.
ADJALL
LO and IF Adjustments

Syntax

```
ADJALL
```

Description

The ADJALL command activates the RF local oscillator (LO) and intermediate frequency (IF) alignment routines. These are the same routines that occur when the spectrum analyzer is switched on. They are also the same routines that are performed when you press **System, Alignments, Align Now, All**.

Commands following ADJALL are not executed until after the analyzer has finished the alignment routines.
**Programming Commands**

**AMB**  
*A minus B into A*

**Syntax**

![Diagram showing the AMB command flow]

**Description**

The AMB command subtracts the points in Trace B from the corresponding points in Trace A, and sends the results to Trace A. Thus, AMB can restore the original trace after an APB (page 116) or a KSc (page 193) command has been executed.

The query command AMB? returns different responses depending on the language being used. The 8560 Series languages return either a 1 or a 0 to indicate the On or Off status. The 8566, 8568, and the 8590 Series languages all return either **ON** or **OFF**.

**NOTE**  
On the legacy analyzers, the AMB command operates continuously. That is, it continuously updates Trace A to display the results of Trace A minus Trace B until AMB is switched off.

This is not the case with Option 266 - Code Compatibility. The AMB command is performed once only, using the trace data available at the time of execution.

**NOTE**  
The functions of the command AMB are identical to the C2 [two] command (page 135).
AMBPL
(A minus B) plus Display Line into A

Syntax

8566 and 8568 Remote Language

```
AMBPL ;
```

8560 Series and 8590 Series Remote Language

```
AMBPL SP ON ;
```

Description

The AMBPL command does a point-by-point subtraction of Trace B from Trace A, and then adds the display line point values to the difference. The results are sent to Trace A.

**NOTE**

On the legacy analyzers, the AMBPL command operates continuously. That is, it continuously updates Trace A to display the results of Trace A minus Trace B until AMBPL is switched off.

This is not the case with Option 266 - Code Compatibility. The AMBPL command is performed once only, using the trace data available at the time of execution.
The query command AMBPL? returns different responses depending on the language being used.

8560 Series  Query response is either 1 or 0, indicating ON or OFF state.
8566A    Query response is either ON or OFF.
8566B    Query response is either ON or OFF.
8568A    Query response is either ON or OFF.
8568B    Query response is either ON or OFF.
8590 Series  Query response is either ON or OFF.
ANNOT Annotation

Syntax

Preset State: ANNOT ON

Description

The ANNOT command turns on or off all annotation on the spectrum analyzer display. Softkey labels are not affected by this command and remain displayed.

NOTE

The functions of the command ANNOT are identical to the KSo command (page 215) and KSp command (page 216). Note also that these two alternative commands, KSo and KSp, are only valid when the remote language is either HP8566A, HP8566B, HP8568A, or HP8568B.
**APB**

**Trace A Plus Trace B to A**

**Syntax**

```
APB → ;
```

**Description**

The APB command does a point-by-point addition of Trace A and Trace B, and sends the results to Trace A. Thus, APB can restore the original trace after an AMB (page 112) or a C2 (page 135) command has been executed.

---

**NOTE**

The functions of the command APB are identical to the KSc command (page 193). Note also that the alternative command, KSc, is only valid when the remote language is either HP8566A, HP8566B, HP8568A, or HP8568B.

---

**NOTE**

On the legacy analyzers, the AMB command operates continuously. That is, it continuously updates Trace A to display the results of Trace A minus Trace B until AMB is switched off.

This is not the case with Option 266 - Code Compatibility. The AMB command is performed once only, using the trace data available at the time of execution.
AT Input Attenuation

Syntax

8560 Series Remote Language

8566 and 8568 Remote Language

8590 Series Remote Language
Table 4-2

<table>
<thead>
<tr>
<th>Item</th>
<th>Description/Default</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number</td>
<td>Any real number or integer. If the value you enter is not a valid value for the analyzer you are using, it will switch automatically to the closest valid setting. Default units are dB.</td>
<td>0 to 70 dB specified absolutely and 10 to 70 dB in 10 dB steps</td>
</tr>
</tbody>
</table>

Preset State: 10 dB

Step Increment: 10 dB

**Description**

Specifies the RF input attenuation.

Although any attenuation level from 0 dB to 70 dB in PSA series analyzers can be specified using absolute values, you can never set attenuation below 10 dB using the DOWN steps. This is a safety feature to prevent inadvertent setting of attenuation to a level that could damage the analyzer.

**CAUTION**

Signal levels above +30 dBm will damage the spectrum analyzer.

**NOTE**

You cannot step down below 10 dB. To set levels below 10 dB, you must specify the attenuation absolutely. For example, to set attenuation to 0 dB, you must use the command AT 0DB.
AUNITS
Absolute Amplitude Units

Syntax

8560 Series Remote Language

AUNITS → S0 → AUTO → ;
   → MAN
   → DBM
   → DBMV
   → DBUV
   → V
   → W
   → DM

8566 and 8568 Remote Language

AUNITS → S0 → DBM → ;
   → DBMV
   → DBUV
   → V

8590 Series Remote Language

AUNITS → S0 → DBM → ;
   → DBMV
   → DBUV
   → V
   → W

Description

Specifies the amplitude readout units for the reference level, the marker, and the display line.
**NOTE**

If your selected remote language is any of the 8560 Series and you use either the AUTO or the MAN parameter, a warning will be displayed informing you that the command is not supported with either of these parameters.

**NOTE**

The functions of the command AUNITS are identical to the commands KSA (page 188), KSB (page 190), KSC (page 192), and KSD (page 194). Note also that these four alternative commands, KSA, KSB, KSC, and KSD are only valid when the remote language is either HP8566A, HP8566B, HP8568A, or HP8568B.
AUTO
Auto Couple

Syntax

```
KEYWORD Sp AUTO ;
```

Description

The AUTO command couples the active functions automatically. Sending the command HD; AUTO will cause all functions to be auto coupled.

**NOTE**

On the legacy analyzers, if the currently active function is not represented by one of the keywords listed below when the command AUTO is executed, all functions are auto coupled. If the active function is represented by one of the keywords below, only that function is auto coupled.

This does not happen with Option 266 Programming Code Compatibility Suite on the PSA Series analyzers because they do not recognize active functions.

Keywords Used in the Command

- **AT**: Couples attenuation to the reference level.
- **DL**: Turns the display line off but does not change the value of the line.
- **MKA**: Turns the marker off.
- **MKD**: Turns the delta marker off. It does not turn the current marker off.
- **MKFCR**: Deactivates the use of user-supplied counter resolution value, but the value remains unchanged.
- **MKN**: Turns the marker off.
- **RB**: Couples the resolution bandwidth to the frequency span.
- **SRCPSTP**: Sets the source power step to 0 (zero).
- **SRCPSWP**: Turns power sweep off.
- **SCRPRWR**: Turns source power off.
- **SS**: Couples the step size to the frequency span.
### Programming Commands

#### AUTO Auto Couple

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ST</td>
<td>Couples the sweep time to the frequency span.</td>
</tr>
<tr>
<td>TH</td>
<td>Turns the display of the threshold off, but does not change its value or prevent its usage in peak searching.</td>
</tr>
<tr>
<td>VAVG</td>
<td>Stops averaging.</td>
</tr>
<tr>
<td>VB</td>
<td>Couples the video bandwidth to the resolution bandwidth.</td>
</tr>
<tr>
<td>VBR</td>
<td>Sets the video to bandwidth ratio to 0.3.</td>
</tr>
</tbody>
</table>
AUTOCPL
Auto Coupled

Syntax

AUTOCPL ;

Description

Sets video bandwidth, resolution bandwidth, input attenuation, sweep time and center frequency step-size to coupled mode.
Programming Commands
AXB Exchange Trace A and Trace B

AXB
Exchange Trace A and Trace B

Syntax

AXB

Description
This command exchanges Trace A and Trace B, point by point.

NOTE
The functions of the command AXB are identical to the EX command (page 171) and to the XCH TRA,TRB command (page 371).
B1 [one]
Clear Write for Trace B

Syntax

```
B1
```

Description

The B1 command sets Trace B to clear write. That is, it continuously displays any signal present at the spectrum analyzer input. The B1 command initially clears Trace B, setting all elements to zero. The sweep trigger then signals the start of the sweep, and Trace B is continually updated as the sweep progresses. Subsequent sweeps send new amplitude information to the display addresses.

NOTE

The functions of the command B1 are identical to the CLRW TRB command (page 145).
B2 [two]
Maximum Hold for Trace B

Syntax

```
B2 ;
```

Description
The B2 command updates each trace element with the maximum level detected while the trace is active.

NOTE
The functions of the command B2 are identical to the MXMH TRB command (page 287).
B3 [three]
View Mode for Trace B

Syntax

B3 ;

Description

The B3 command displays Trace B and then stops the sweep if no other traces are active. Trace B does not get updated.

NOTE

The functions of the command B3 are identical to the VIEW TRB command (page 369).
B4 [four] Blank Trace B

Syntax

```
B4 ;
```

Description

The B4 command blanks Trace B and stops the sweep if no other traces are active. Trace B is not updated.

NOTE

The functions of the command B4 are identical to the BLANK TRB command (page 130).
BL
Trace B minus Display Line to Trace B

Syntax

BL

Description
The BL command subtracts the display line from Trace B and sends the results to Trace B.

NOTE
The command BL is calculated differently depending on the language being used.

8560 Series The calculation is performed in units of dBm.
8566A The calculation is performed in display units.
8566B The calculation is performed in display units.
8568A The calculation is performed in display units.
8568B The calculation is performed in display units.
8590 Series The calculation is performed in display units.

NOTE
The functions of the command BL are identical to the BML command (page 131).
BLANK
Blank Trace

Syntax

**8560 Series Remote Language**

![Diagram of syntax for 8560 Series Remote Language]

**8566, 8568, and 8590 Series Remote Language**

![Diagram of syntax for 8566, 8568, and 8590 Series Remote Language]

Preset State: BLANK TRB, BLANK TRC

**Description**

Blanks Trace 1, trace 2, or trace 3, and stops taking new data into the specified trace. TRA corresponds to Trace 1, TRB corresponds to Trace 2, and TRC corresponds to Trace 3.

---

**NOTE**

The functions of the command BLANK are identical to the A4 command (page 92), the B4 command (page 128), and KSk command (page 206).
BML Trace B Minus Display Line

Syntax

```
BML ;
```

Description

The BML command subtracts the display line from trace B (point by point), and sends the difference to trace B. Trace B corresponds to Trace 2.

NOTE
Remote language 8560 - the BML command is performed in dBm units.
Remote languages 8566A, HP8566B, HP8568A, 8568B, and the 8590 Series - the BML command is performed in display units.

NOTE
The functions of the command BML are identical to the BL command (page 129).
BTC
Transfer Trace B to Trace C

Syntax

BTC

Description

The BTC command transfers Trace B data to Trace C

NOTE

Trace C cannot be an active trace. This means that the data in Trace C cannot be updated as the analyzer sweeps. To ensure that the current settings of the analyzer are reflected in the data transferred from Trace B to Trace C, you must follow the four step process below.

- Select single sweep mode (S2 or SNGLS command)
- Select the desired analyzer settings
- Take one complete sweep
- Transfer the data

NOTE

The functions of the command BTC are identical to the KSI command (page 208).
Programming Commands

BXC Exchange Trace B and Trace C

Syntax

```
BXC
```

Description

The BXC command exchanges Trace B data with Trace C data.

**NOTE**

Trace C must not be an active trace. This means that the data in Trace C cannot be updated as the analyzer sweeps. To ensure that the current settings of the analyzer are reflected in the data exchanged between Trace B and Trace C, you must follow the four step process below.

- Select single sweep mode (S2 or SNGLS command)
- Select the desired analyzer settings
- Take one complete sweep
- Exchange the data

**NOTE**

The functions of the command BXC are identical to the KSi command (page 203) and to the XCH TRB,TRC command (page 371).
C1 [one]
Set A Minus B Mode Off

Syntax

\[ C1 \rightarrow ; \]

Description

The C1 command turns the A Minus B mode off. That is, it switches off the functionality that was switched on by the C2 command (page 135) or by the AMB ON command (page 112).

NOTE

The functions of the command C1 are identical to the AMB OFF command (page 112).
C2 [two] A Minus B Into A

Syntax

```
C2 ;
```

Description

The C2 command subtracts the points in Trace B from the corresponding points in Trace A, and sends the results to Trace A. Thus, if your input signal remains unchanged, C2 can restore the original trace after an APB command (page 116) or a KSc (page 193) command has been executed.

NOTE

The functions of the command C2 are identical to the AMB ON command (page 112).

NOTE

On the legacy analyzers, the C2 command operates continuously. That is, it continuously updates Trace A to display the results of Trace A minus Trace B until C2 is switched off by issuing the C1 command.

This is not the case with Option 266 - Programming Code Compatibility. The C2 command is performed once only, using the trace data available at the time of execution.
CA Couple Attenuation

Syntax

```
CA ;
```

Description

During normal operation, the spectrum analyzer’s input attenuation is coupled to the reference level. This coupling keeps the mixer input at a level such that a continuous wave signal displayed at the reference level is at or below -10 dBm (or the value specified in the ML command.)

The CA command sets the threshold to -10 dBm (or to the value specified by the ML command (page 283) or the KS, command (page 186)). The counterpart to the CA command is the AT command (page 117), which allows levels less than the threshold value at the mixer input.
CAL Calibration

Syntax

```
CAL ALL ;
```

Description

Calibrates the logarithmic and step gain amplifiers, the attenuator and the amplitude and frequency of the resolution bandwidth filters.
CARRON
Carrier On Power

Syntax

Description
Measures the average power of the carrier during the portion of time when it is on and within 20dB of its peak level.
CF
Center Frequency

Syntax

![Syntax Diagram]

**Table 4-3**

<table>
<thead>
<tr>
<th>Item</th>
<th>Description/Default</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>REAL</td>
<td>Any real or integer number. Default unit is HZ.</td>
<td>Frequency range of the spectrum analyzer</td>
</tr>
</tbody>
</table>

**Description**

The CF command specifies the value of the center frequency.

The step size depends on whether the frequency has been coupled to the span width using the CS command (page 151). When coupled, the step size is 10% of the span, or one major graticule division; when uncoupled, the step size is determined by the SS command (page 336).

**NOTE**

Although the spectrum analyzer allows entry of frequencies not in the specified frequency range, using frequencies outside the frequency span of the spectrum analyzer is not recommended and is not warranted to meet specifications.
CHAPTER Channel Selection

Syntax

\[ \text{CHANNEL} \rightarrow \text{SP} \rightarrow \text{UP} \rightarrow ; \rightarrow \text{DN} \]

Description

Increments or decrements the spectrum analyzer center frequency by one channel spacing.

NOTE

The channel spacing value is set using the ACPSP command (page 108).
**CHANPWR**  
**Channel Power**

**Syntax**

```
CHANPWR SP TRA TRB real HZ, ?, 
```

**Description**

Measures the power within the specified channel bandwidth.

**NOTE**  
If no channel bandwidth is specified in the command, the channel bandwidth is set using the CHPWRBR command (page 143).
CHP
Channel Power

Syntax

CHP

Description
The CHP command performs the channel power measurement.

NOTE
The channel bandwidth is set with the ACPBW command (page 98). Channel spacing is set with the ACPSP command (page 108).
CHPWRBW
Channel Power Bandwidth

Syntax

Queries or sets the current value of the channel power bandwidth. Channel power can be measured with the CHANPWR command (page 141).
CLRAVG
Clear Average

Syntax

CLRAVG ;

Description
The command restarts the VAVG command by resetting the number of averaged sweeps to one. The video averaging routine resets the number of sweeps, but does not stop video averaging. Use “VAVG OFF,” to stop video averaging.
CLRW
Clear Write

Clears the specified trace and enables trace data acquisition.

Syntax

8560 Series Remote Language

Preset State: CLRW TRA

8566, 8568, and 8590 Series Remote Language

Description

The CLRW command places the indicated trace in clear-write mode. Data acquisition begins at the next sweep. (See the TS command (page 362) for more information about data acquisition.)

TRA corresponds to Trace 1, TRB corresponds to Trace 2, and TRC corresponds to Trace 3.

NOTE

The functions of the command CLRW are identical to the A1 command (page 89) and B1 command (page 125).
CLS Clear Status Byte

Syntax

CLS

Description

Clears all the status bits from the status byte.
CONTS
Continuous Sweep

Syntax

```
CONTS 
```

Preset State: CONTS

Description

The CONTS command sets the spectrum analyzer to continuous sweep mode. In the continuous sweep mode, the spectrum analyzer takes its next sweep as soon as possible after the current sweep (as long as the trigger conditions are met). A sweep may temporarily be interrupted by data entries made over the remote interface or from the front panel.

NOTE

The functions of the command CONTS are identical to the S1 command (page 320).
CORREK
Correction Factors On

Syntax

Description
The CORREK command queries the state of the analyzer frequency corrections. It returns a “1” if the correction factors are on, a “0” if they are off.
COUPLE
Input Coupling

Syntax

```
COUPLE SP AC ;
```

Description
The COUPLE command selects AC or DC coupling.

NOTE PSA models E4446A, E4447A, and E4448A do not allow AC coupling.
CR
Couple Resolution Bandwidth

Syntax

```
CR ;
```

Description

The CR command couples the resolution bandwidth to the video bandwidth and to the sweep time.

The counterpart to the CR command is the RB command (page 309) which breaks the coupling. Use the CR command to re-establish coupling after executing an RB command.

NOTE

CR uses the coupling settings from the PSA analyzer. These may differ from the settings that you would have seen on the legacy analyzer being emulated here.
CS
Couple Frequency Step Size

Syntax

Description

The CS command couples the center frequency step size to the span width so that the step size equals 10\% of the span width, or one major graticule division.

The counterpart to the CS command is the SS command (page 336) which breaks the coupling. Use the CS command to re-establish coupling after an SS command has been executed.
CT
Couple Sweep Time

Syntax

```
CT ;
```

Description

The CT command couples the sweep time to the span, resolution bandwidth and video bandwidth.

The counterpart to the CT command is the ST command (page 338) which breaks the coupling. Use the CT command to re-establish coupling after an ST command has been executed.
CV
Couple Video Bandwidth

Syntax

```
CV ;
```

Description

The CV command couples the video bandwidth to the resolution bandwidth.

The counterpart to the CV command is the VB command (page 365) which breaks the coupling. Use the CV command to re-establish coupling after executing a VB command.

NOTE

CV uses the coupling settings from the PSA analyzer. These may differ from the settings that you would have seen on the legacy analyzer being emulated here.
DA Display Address

Syntax

```
DA Sp number ;
```

Description

The DA command returns the contents of the given display address to the controller.

**NOTE**

This command only supports the use of the DA 1, DA 1025, and DA 3073; these display addresses contain the trace data and are equivalent to using the commands TRA? (page 355), TRB? (page 356), TRC? (page 357), TA (page 348) and TB (page 349).
DELMKBW
Occupied Power Bandwidth Within Delta Marker

Syntax

```
DELMKBW SP TRA, real?, ;
```

Description

Calculates the OBW with respect to the power between the displayed delta markers. The power between the displayed markers is then used as the reference, rather than using the total power in the frequency span as is done in the PWRBW (page 301) command.

---

**NOTE**

If the DELMKBW command is used when no marker is active, a delta marker is activated at the center frequency, and the returned bandwidth is 0. If the active marker is a normal marker when the DELMKBW command is used, the marker type is changed to delta, and the returned bandwidth is 0.
DET Detection Mode

Syntax

8566 and 8568 Remote Language

Preset State: DET NRM

Description

The DET command selects the type of spectrum analyzer detection (positive-peak, negative peak, sample, normal, and so on).
<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>POS</td>
<td>enables positive-peak detection, which displays the maximum video signal detected over a number of instantaneous samples for a particular frequency.</td>
</tr>
<tr>
<td>SMP</td>
<td>enables sample detection, which uses the instantaneous video signal value. Video averaging and noise-level markers, when activated, activate sample detection automatically.</td>
</tr>
<tr>
<td>NEG</td>
<td>enables negative peak detection in sweep times of less than or equal to 200 ms.</td>
</tr>
<tr>
<td>NRM</td>
<td>enables the ‘rosenfell’ detection algorithm that selectively chooses between positive and negative values.</td>
</tr>
<tr>
<td>QPD</td>
<td>enables quasi-peak detection for EMC measurements.</td>
</tr>
<tr>
<td>EPK</td>
<td>enables EMI peak detection for EMC measurements.</td>
</tr>
<tr>
<td>MPK</td>
<td>enables MIL peak detection to meet military specifications when making EMC measurements.</td>
</tr>
<tr>
<td>AVG</td>
<td>enables EMI average detection for EMC measurements.</td>
</tr>
<tr>
<td>AVE</td>
<td>enables average peak detection (non-EMC measurements).</td>
</tr>
<tr>
<td>AUTO</td>
<td>sets the detector function selection to auto.</td>
</tr>
<tr>
<td>MAN</td>
<td>sets the detector function selection to manual.</td>
</tr>
</tbody>
</table>

**NOTE**
The functions of the DET command are identical to the KSa command (page 189), the KSb command (page 191), the KSD command (page 195), the KSe command (page 197), the Q0 command (page 303), and the Q1 command (page 304).
DL Display Line

Syntax

8566 and 8568 Remote Language

8590 Series and 8590 Series Remote Language

Table 4-4

<table>
<thead>
<tr>
<th>Item</th>
<th>Description/Default</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>NUMBER</td>
<td>Any real or integer number. Default units are dBm.</td>
<td>Dependent on the reference level</td>
</tr>
</tbody>
</table>
Preset State: DL OFF
Step Increment: 1 major graticule division

**Description**
Defines the level of the display line and displays it on the spectrum analyzer screen.
DLE
Display Line Enable

Syntax

Description
The DLE command enables or disables the display line.
**DLYSWP**

**Delay Sweep**

**Syntax**

```
DLYSWP SP number US MS SC S

SP OFF

SP ON

SP 1

SP 0

? 
```

**Description**

Delays the start of the sweep until the specified time after the trigger event has elapsed.

**NOTE**

A query response of 0 indicates that DLYSWP is switched off.
DONE
Done

Syntax

8566 and 8568 Remote Language

TS

Command List

DONE

;  

8590 Series and 8590 Series

DONE

?

;  

Description

Allows you to determine when the spectrum analyzer has parsed a list of spectrum analyzer commands and has executed all commands prior to and including DONE. The DONE command returns a value of “1” when all commands in a command string or command list have been completed.

If a take sweep (TS command (page 362)) precedes the command list, the TS command acts as a synchronizing function since the command list execution begins after the sweep has been completed.
E1[one]
Peak Marker

Syntax

E1

Description
The E1 command positions the marker at the signal peak.

NOTE
The functions of the E1 command are identical to MKPK (no secondary keyword) and MKPK HI (page 270).
E2 [two]
Marker to Center Frequency

Syntax

![E2 Command]

Description
The E2 command positions the marker on the screen at the center frequency position.

NOTE: The functions of the E2 command are identical to the MKCF command (page 258).
E3 \textit{[three]}
Delta Marker Step Size

Syntax

\begin{center}
\text{E3} \quad ;
\end{center}

Description

The E3 command establishes the center frequency step size as being the frequency difference between the delta marker and the active marker.

\begin{itemize}
\item \textbf{NOTE} \quad The functions of the E3 command are identical to the MKSS command (page 277).
\end{itemize}
E4 [four]  
Marker to Reference Level

Syntax

```
E4 ;
```

**Description**

The E4 command moves the active marker to the reference level.

**NOTE**  
The functions of the E4 command are identical to the MKRL command (page 275).
EDITDONE
End of Limit Line Edits

Syntax

```
EDITDONE ;
```

Description

The EDITDONE command is used at the completion of limit-line editing within the EDITLIML command (page 168).
EDITLIML
Edit Limit Line

Syntax

EDITLIML
;

Description

The EDITLIML command turns the currently active limit line off, and puts the analyzer into limit-line edit mode.
**ERR**

**Error**

**Syntax**

```
ERR ? ;
```

**Description**

The ERR command returns an integer list of error codes to the controller.
ET
Elapsed Time

Syntax

```
ET ; ?
```

Description

The ET command returns to the controller the elapsed time (in hours) of analyzer operation.
EX
Exchange Trace A and Trace B

Syntax

```
EX ;
```

Description

This command exchanges Trace A and Trace B, point by point.

NOTE

The functions of the EX command are identical to the AXB command (page 124) and to the XCH TRA,TRB command (page 371).
FA
Start Frequency

Syntax

Table 4-5

<table>
<thead>
<tr>
<th>Item</th>
<th>Description/Default</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>REAL</td>
<td>Any real or integer number. Default unit is Hz.</td>
<td>Frequency range of the spectrum analyzer</td>
</tr>
</tbody>
</table>

Step Increment: Frequency span divided by 10

Description

The FA command specifies the start frequency value. The start frequency is equal to the center frequency minus (the span divided by two) \((FA = CF - SP/2)\). Changing the start frequency changes the center frequency and span.

NOTE

The OA parameter only returns the current value to the controller. It does not set the active function to the start frequency.
FB
Stop Frequency

Syntax

Table 4-6

<table>
<thead>
<tr>
<th>Item</th>
<th>Description/Default</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>REAL</td>
<td>Any real or integer number. Default unit is Hz.</td>
<td>Frequency range of the spectrum analyzer</td>
</tr>
</tbody>
</table>

Step Increment: Frequency span divided by 10

Description

The FB command specifies the stop frequency value. The stop frequency is equal to the center frequency plus the span divided by two (FB = CF + SP/2). Changing the stop frequency changes the center frequency and span.

NOTE

The OA parameter only returns the current value to the controller. It does not set the active function to the stop frequency.
FDSP
Frequency Display Off

Syntax

```
FDSP SP OFF ;
```

Description
The FDSP command turns the frequency annotation OFF.

NOTE
It is not possible enable or disable the frequency annotation alone, leaving other annotation unaffected. Thus, the FDSP command behaves in the same way as ANNOT (page 115) If the FDSP command has been used to disable the frequency annotation, sending the ANNOT ON command will not re-enable the display annotation. The display annotation will only be displayed by sending the IP (page 185) command.
**FOFFSET**
Frequency Offset

**Syntax**

```
FOFFSET real
```

**Description**

The FOFFSET command selects a value that offsets the frequency scale for all absolute frequency readouts (for example, center frequency). Relative values such as span and marker delta are not offset.

When an offset is in effect, it is displayed beneath the bottom graticule line on the spectrum analyzer screen.

Execute “FOFFSET 0;” or “IP;” to turn off the offset.

---

**NOTE**

The functions of the FOFFSET command are identical to the KSV command (page 218).

---

**Table 4-7**

<table>
<thead>
<tr>
<th>Item</th>
<th>Description/Default</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>REAL</td>
<td>Any real or integer number. Default unit is Hz.</td>
<td></td>
</tr>
</tbody>
</table>
FPKA
Fast Preselector Peak

Syntax

```
FPKA
```

Description

The FPKA command automatically adjusts the preselector frequency to yield the greatest signal level at the active marker. It returns the amplitude of the active marker.

---

**NOTE**

The FPKA command is only available when the analyzer’s upper frequency limit is greater than 3 GHz. The command is not supported in analyzers with an upper frequency limit of 3 GHz or less, and will return an error message when used.
FREF
Frequency Reference

Syntax

```
FREF SP INT ;
```

Description

The FREF command specifies whether an external source or an internal source is being used.
FS
Full Span

Syntax

\[ \text{FS} \]

Description

The FS command sets the frequency span of the spectrum analyzer to full span. Resolution bandwidth, video bandwidth, and sweep time are all set to auto-coupled.

NOTE
The functions of the FS command are identical to the LF command (page 223).

NOTE
Whenever the frequency range of the analyzer you are using does not match the remote language’s own range, the span will be limited by the capabilities of the analyzer. The tables on the following pages list the frequency ranges for all the supported remote languages when running on any of Agilent’s PSA Series of analyzers.
Table 4-8  PSA Series - Frequency Ranges Set by the FS Command

<table>
<thead>
<tr>
<th>Remote Language</th>
<th>Frequency Range</th>
<th>Frequency Range</th>
<th>Frequency Range</th>
<th>Frequency Range</th>
<th>Frequency Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>E4440A</td>
<td>0 Hz - 2.9 GHz</td>
<td>0 Hz - 2.9 GHz</td>
<td>0 Hz - 2.9 GHz</td>
<td>0 Hz - 2.9 GHz</td>
<td>0 Hz - 2.9 GHz</td>
</tr>
<tr>
<td>E4443A</td>
<td>0 Hz - 6.5 GHz</td>
<td>0 Hz - 6.5 GHz</td>
<td>0 Hz - 6.5 GHz</td>
<td>0 Hz - 6.5 GHz</td>
<td>0 Hz - 6.5 GHz</td>
</tr>
<tr>
<td>E4445A</td>
<td>0 Hz - 13.2 GHz</td>
<td>0 Hz - 6.7 GHz</td>
<td>0 Hz - 13.2 GHz</td>
<td>0 Hz - 13.2 GHz</td>
<td>0 Hz - 13.2 GHz</td>
</tr>
<tr>
<td>E4446A</td>
<td>0 Hz - 26.5 GHz</td>
<td>0 Hz - 6.7 GHz</td>
<td>0 Hz - 26.5 GHz</td>
<td>0 Hz - 40.0 GHz</td>
<td>0 Hz - 40.0 GHz</td>
</tr>
<tr>
<td>E4447A</td>
<td>0 Hz - 26.5 GHz</td>
<td>0 Hz - 6.7 GHz</td>
<td>0 Hz - 26.5 GHz</td>
<td>0 Hz - 40.0 GHz</td>
<td>0 Hz - 40.0 GHz</td>
</tr>
<tr>
<td>E4448A</td>
<td>0 Hz - 26.5 GHz</td>
<td>0 Hz - 6.7 GHz</td>
<td>0 Hz - 26.5 GHz</td>
<td>0 Hz - 40.0 GHz</td>
<td>0 Hz - 40.0 GHz</td>
</tr>
<tr>
<td>8560E</td>
<td>0 Hz - 2.5 GHz</td>
<td>0 Hz - 2.5 GHz</td>
<td>0 Hz - 2.5 GHz</td>
<td>0 Hz - 2.5 GHz</td>
<td>0 Hz - 2.5 GHz</td>
</tr>
<tr>
<td>8561E</td>
<td>0 Hz - 2.5 GHz</td>
<td>0 Hz - 2.5 GHz</td>
<td>0 Hz - 2.5 GHz</td>
<td>0 Hz - 2.5 GHz</td>
<td>0 Hz - 2.5 GHz</td>
</tr>
<tr>
<td>8562E</td>
<td>0 Hz - 1.5 GHz</td>
<td>0 Hz - 1.5 GHz</td>
<td>0 Hz - 1.5 GHz</td>
<td>0 Hz - 1.5 GHz</td>
<td>0 Hz - 1.5 GHz</td>
</tr>
<tr>
<td>8563E</td>
<td>0 Hz - 1.5 GHz</td>
<td>0 Hz - 1.5 GHz</td>
<td>0 Hz - 1.5 GHz</td>
<td>0 Hz - 1.5 GHz</td>
<td>0 Hz - 1.5 GHz</td>
</tr>
<tr>
<td>8564E</td>
<td>0 Hz - 1.5 GHz</td>
<td>0 Hz - 1.5 GHz</td>
<td>0 Hz - 1.5 GHz</td>
<td>0 Hz - 1.5 GHz</td>
<td>0 Hz - 1.5 GHz</td>
</tr>
<tr>
<td>8565E</td>
<td>0 Hz - 1.5 GHz</td>
<td>0 Hz - 1.5 GHz</td>
<td>0 Hz - 1.5 GHz</td>
<td>0 Hz - 1.5 GHz</td>
<td>0 Hz - 1.5 GHz</td>
</tr>
<tr>
<td>8566A</td>
<td>0 Hz - 1.8 GHz</td>
<td>0 Hz - 1.8 GHz</td>
<td>0 Hz - 1.8 GHz</td>
<td>0 Hz - 1.8 GHz</td>
<td>0 Hz - 1.8 GHz</td>
</tr>
<tr>
<td>8568B</td>
<td>0 Hz - 1.8 GHz</td>
<td>0 Hz - 1.8 GHz</td>
<td>0 Hz - 1.8 GHz</td>
<td>0 Hz - 1.8 GHz</td>
<td>0 Hz - 1.8 GHz</td>
</tr>
<tr>
<td>892La</td>
<td>2.75 GHz - 22.0 GHz</td>
<td>2.75 GHz - 6.7 GHz</td>
<td>2.75 GHz - 13.2 GHz</td>
<td>2.75 GHz - 22.0 GHz</td>
<td>2.75 GHz - 22.0 GHz</td>
</tr>
<tr>
<td>893Ea</td>
<td>2.75 GHz - 22.0 GHz</td>
<td>2.75 GHz - 6.7 GHz</td>
<td>2.75 GHz - 13.2 GHz</td>
<td>2.75 GHz - 22.0 GHz</td>
<td>2.75 GHz - 22.0 GHz</td>
</tr>
<tr>
<td>8594E</td>
<td>0 Hz - 1.5 GHz</td>
<td>0 Hz - 2.9 GHz</td>
<td>0 Hz - 2.9 GHz</td>
<td>0 Hz - 2.9 GHz</td>
<td>0 Hz - 2.9 GHz</td>
</tr>
<tr>
<td>8595E</td>
<td>0 Hz - 1.5 GHz</td>
<td>0 Hz - 6.5 GHz</td>
<td>0 Hz - 6.5 GHz</td>
<td>0 Hz - 6.5 GHz</td>
<td>0 Hz - 6.5 GHz</td>
</tr>
<tr>
<td>8596Ea</td>
<td>0 Hz - 1.5 GHz</td>
<td>0 Hz - 6.7 GHz</td>
<td>0 Hz - 12.8 GHz</td>
<td>0 Hz - 12.8 GHz</td>
<td>0 Hz - 12.8 GHz</td>
</tr>
</tbody>
</table>

a. The command HNLOCK (Harmonic Lock) is not supported in Option 266. Thus, the different frequency spans associated with the various harmonic bands are also not supported.
GRAT Graticule

Syntax

Preset State: GRAT ON

Description

Turns the graticule on or off.

NOTE

The functions of the GRAT command are identical to the KSm command (page 211) and the KSn command (page 213).

NOTE

The query command GRAT? returns different responses depending on the language being used.

- 8560 Series: Query response is either 1 or 0, indicating ON or OFF state.
- 8566A: Query response is either ON or OFF.
- 8566B: Query response is either ON or OFF.
- 8568A: Query response is either ON or OFF.
- 8568B: Query response is either ON or OFF.
- 8590 Series: Query response is either ON or OFF.
HD
Hold Data Entry

Syntax

HD \rightarrow AUTO \rightarrow ;

Description

Disables data entry via the spectrum analyzer numeric keypad, knob, or step keys. The active function readout is blanked, and any active function is deactivated.

NOTE

This command will only be supported when followed by the parameter AUTO (page 121). All functions will then be auto-coupled.
I1 [one]
Set RF Coupling to DC

Syntax

```
I1 ;
```

Description

The I1 [one] command sets the RF coupling to DC if your analyzer is capable of being switched. If your analyzer cannot be switched to DC coupling, the command will have no effect but an error message will not be generated.

Whether or not your analyzer can be AC coupled, DC coupled, or both depends on both the analyzer's model number, and on whether or not Option UKB (Low Frequency Extension) has been installed. The tables below list the frequency specifications for all PSA analyzers for both DC and AC coupling.

Table 4-9 8568A/B Analyzer Frequency Coupling Specifications

<table>
<thead>
<tr>
<th>Analyzer Model</th>
<th>DC Coupled Range</th>
<th>AC Coupled Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>8568A/B</td>
<td>100 Hz</td>
<td>1.5 GHz</td>
</tr>
</tbody>
</table>

Table 4-10 PSA Series Analyzer Frequency Coupling Specifications

<table>
<thead>
<tr>
<th>Analyzer Model (PSA series)</th>
<th>DC Coupled Range</th>
<th>AC Coupled Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>E4440A</td>
<td>3 Hz</td>
<td>26.5 GHz</td>
</tr>
<tr>
<td>E4443A</td>
<td>3 Hz</td>
<td>6.7 GHz</td>
</tr>
<tr>
<td>E4445A</td>
<td>3 Hz</td>
<td>13.2 GHz</td>
</tr>
<tr>
<td>E4446A</td>
<td>3 Hz</td>
<td>44 GHz</td>
</tr>
<tr>
<td>E4447A</td>
<td>3 Hz</td>
<td>42.98 GHz</td>
</tr>
<tr>
<td>E4448A</td>
<td>3 Hz</td>
<td>50 GHz</td>
</tr>
</tbody>
</table>

NOTE The PSA Series analyzers only have a single RF input port.
I2 [two]
Set RF Coupling to AC

Syntax

```
I2 ;
```

Description

The I2 [two] command sets the RF coupling to AC if your analyzer is capable of being switched. If your analyzer cannot be switched to AC coupling, the command will have no effect but an error message will not be generated.

Whether or not your analyzer can be AC coupled, DC coupled, or both depends on both the analyzer's model number, and on whether or not Option UKB (Low Frequency Extension) has been installed. The tables below list the frequency specifications for both DC and AC coupling.

Table 4-11 8568A/B Analyzer Frequency Coupling Specifications

<table>
<thead>
<tr>
<th>Analyzer Model</th>
<th>DC Coupled Range</th>
<th>AC Coupled Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>8568A/B</td>
<td>100 Hz</td>
<td>1.5 GHz</td>
</tr>
</tbody>
</table>

Table 4-12 PSA Series Analyzer Frequency Coupling Specifications

<table>
<thead>
<tr>
<th>Analyzer Model (PSA series)</th>
<th>DC Coupled Range</th>
<th>AC Coupled Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>E4440A</td>
<td>3 Hz</td>
<td>26.5 GHz</td>
</tr>
<tr>
<td>E4443A</td>
<td>3 Hz</td>
<td>6.7 GHz</td>
</tr>
<tr>
<td>E4445A</td>
<td>3 Hz</td>
<td>13.2 GHz</td>
</tr>
<tr>
<td>E4446A</td>
<td>3 Hz</td>
<td>44 GHz</td>
</tr>
<tr>
<td>E4447A</td>
<td>3 Hz</td>
<td>42.98 GHz</td>
</tr>
<tr>
<td>E4448A</td>
<td>3 Hz</td>
<td>50 GHz</td>
</tr>
</tbody>
</table>

NOTE The PSA Series analyzers only have a single RF input port.
ID Identify

Syntax

```
ID ? ;
```

Description

The ID command returns the current model number of the spectrum analyzer to the controller.

If you are in SA mode, the response value is determined by your remote language selection. If you have a legacy language selected, the model number of the emulated instrument will be returned (for example, “HP8563E”). If you have SCPI selected, the model number of you PSA will be returned (for example, “E4440”).

If you are in any other mode, the response value will be the model number of your PSA regardless of the remote language selection.

The remote language is configured using the front-panel menu selection (System, Config I/O, Configure Remote Lang) and can also be set using the SCPI command SYSTem:LANGuage.

For more information see:

“Configuring Option 266 on PSA Analyzers” on page 37

“Running Software that Requires SCPI Commands” on page 45
IP
Instrument Preset

Syntax

```
IP;
```

Description

Performs an instrument preset, setting the analyzer back to its factory settings.

Instrument preset automatically occurs when you turn on the spectrum analyzer. IP is a good starting point for many measurement processes. When IP is executed remotely, the spectrum analyzer does not necessarily execute a complete sweep, however. You should execute a take sweep (TS) to ensure that the trace data is valid after an IP.

**NOTE**

The functions of the IP command are identical to the KST command (page 217).

**NOTE**

If the external amplifier gain has been set, executing an IP command will not reset this value. This is to protect the analyzer.
KS, Mixer Level

Syntax

Description

The KS, command specifies the maximum signal level that is applied to the input mixer for a signal that is equal to or below the reference level.

The effective mixer level is equal to the reference level minus the input attenuator setting. When KS, is activated, the effective mixer level can be set from -10 dBm to -70 dBm in 10 dB steps.

As the reference level is changed, the coupled input attenuator automatically changes to limit the maximum signal at the mixer input to your specified setting for signals less than or equal to the reference level.

---

**NOTE**

If the external amplifier gain has been set, executing an IP command will not reset this value. This is to protect the analyzer.

---

**NOTE**

The functions of the KS, command are identical to the ML command (page 283).
**KS=**

**Marker Counter Resolution**

**Syntax**

```
KS= SP real HZ ;
```

**NOTE**

The marker counter can be specified in time units when operating in the time domain.

**Description**

Specifies the resolution of the marker frequency counter.

**NOTE**

The functions of the KS= command are identical to the MKFCR command (page 263).

**NOTE**

On PSA analyzers, setting the marker frequency resolution will cause the Gate Time to change. The Gate Time is calculated using the following formula:

\[
\text{Gate Time} = \frac{1}{\text{Resolution Value}}
\]

For restrictions on the Gate Time, refer to the PSA *User’s and Programmer’s Reference, Volume 1*.

**NOTE**

This command is only supported in the 8568 remote language. The same KS= command has a different function (selects the factory preselector setting) in the 8566 language, and is not supported.
KSA
Amplitude in dBm

Syntax

```
KSA ;
```

Description
The KSA command sets the amplitude readout (reference level, marker, display line and threshold) to dBm units.

NOTE
The functions of the KSA command are identical to the AUNITS DBM command (page 119).
KSa
Normal Detection

Syntax

KSa

Description
The KSa command selects normal input detection. That is, it enables the ‘rosenfell’ detection algorithm that selectively chooses between positive and negative values.

NOTE
The functions of the KSa command are identical to the DET NRM command (page 156).
KSB
Amplitude in dBmV

Syntax

KSB ;

Description
The KSB command sets the amplitude readout (reference level, marker, display line and threshold) to dBmV units.

NOTE
The functions of the KSB command are identical to the AUNITS DBMV command (page 119).
KSB
Positive Peak Detection

Syntax

```
KSB
```

Description

The KSB command enables positive peak input detection for displaying trace information. Trace elements are only updated when the detected signal level is greater than the previous signal level.

NOTE

The functions of the KSB command are identical to the DET POS command (page 156).
**KSC Amplitude in dBuV**

**Syntax**

```
KSC
```

**Description**

The KSC command sets the amplitude readout (reference level, marker, display line and threshold) to dBuV units.

**NOTE**

The functions of the KSC command are identical to the AUNITS DBUV command (page 119).
KSc
A Plus B to A

Syntax

\[ \text{KSc} \to ; \]

Description

The KSc command does a point-by-point addition of Trace A and Trace B, and sends the results to Trace A. Thus, if your input signal remains unchanged, KSc can restore the original trace after an AMB or a C2 command has been executed.

NOTE

The functions of the command KSc are identical to the APB command (page 116).
KSD
Amplitude in Volts

Syntax

KSD

Description

The KSD command sets the amplitude readout (reference level, marker, display line and threshold) to voltage units.

NOTE
The functions of the KSD command are identical to the AUNITS V command (page 119).
KSk
Negative Peak Detection

Syntax

```
KSk
```

Description

The KSk command selects negative-peak input detection for displaying trace information. Each trace element is updated with the minimum value detected during the sweep.

NOTE

The functions of the command KSk are identical to the DET NEG command (page 156).
KSE Title Mode

Syntax

```
KSE <char> <real> <terminator>
```

Description

The KSE command activates the title mode, writing a message to the top line of the display.

NOTE

The only characters that Option 266 will accept as a terminator are the ‘@’ character and the carriage return.
KSe Sample Detection

Syntax

![KSe;]

Description

The KSe command selects sample input detection for displaying trace information.

NOTE

The functions of the command KSe are identical to the DET SMP command (page 156).
KSG
Video Averaging On

Syntax

Description
The KSG command enables video averaging. The averaged trace is displayed in Trace A.

If video averaging is off when either KSG? or KSG OA is sent to the instrument, video averaging is turned on and the current average count is returned to the controller.

NOTE
The functions of the KSG command are identical to the VAVG ON command (page 363).
KSg
Display Off

Syntax

```
KSg ;
```

Description

The KSg command turns the analyzer’s display Off.

NOTE

On the legacy spectrum analyzers, this command turned the CRT beam power off to avoid unnecessary wear on the CRT. Although this command is supported, displays used on the PSA Series analyzers have a much longer life than the CRTs used in the legacy spectrum analyzers.
KSH Video Averaging Off

Syntax

```
KSH
```

Description

The KSH command switches video averaging Off.

**NOTE**

The functions of the KSH command are identical to the VAVG OFF command (page 363).
KSh Display On

Syntax

![KSh command](image)

Description

The KSh command turns the analyzer’s display On.

**NOTE**

On the early models of spectrum analyzers, CRT beam power was often switched Off to prevent wear of the CRT. This command (KSh) was used to turn the CRT beam power on again. Although this command is supported, displays used on the PSA Series analyzers have a much longer life than the CRTs used in the legacy spectrum analyzers.
KSI
Extend Analyzer Reference Level

Syntax

```
KSi →
```

Description

The KSI command was used in the legacy analyzers to extend the analyzer reference level range. As the PSA analyzer already has a minimum reference level of −170 dBm and a maximum reference level of +30 dBm, this command has no effect in Option 266 Programming Code Compatibility Suite. Issuing this command will not generate an error in Option 266 Programming Code Compatibility Suite.
KSi
Exchange Trace B and Trace C

Syntax

KSi

Description

The KSi command exchanges Trace B data with Trace C data.

NOTE

Trace C cannot be an active trace. This means that the data in Trace C cannot be updated as the analyzer sweeps. To ensure that the current settings of the analyzer are reflected in the data exchanged between Trace B and Trace C, you must follow the four step process below.

- Select single sweep mode (S2 (page 321) or SNGLS command (page 332))
- Select the desired analyzer settings
- Take one complete sweep using the TS command (page 362)
- Exchange the data

NOTE

The functions of the command KSi are identical to the BXC command (page 133) and the XCH TRB,TRC command (page 371).
KSj
View Trace C

Syntax

```
KSj ;
```

Description

The KSj command displays Trace C.

---

**NOTE**

The functions of the command KSj are identical to the VIEW TRC command (page 369).
KSK
Marker to Next Peak

Syntax

KSK ;

Description

If there is a marker on the screen, the KSK command moves this marker to the next signal peak of lower amplitude.

NOTE

The functions of the KSK command are similar to the MKPK NH command (page 270), except that KSK does not take into account the marker peak threshold value or the marker peak excursion value. For more details on marker peak threshold, see the MKPT command (page 271) and the TH command (page 351). For more details on marker peak excursion, see the MKPX command (page 272).
Programming Commands

KSk Blank Trace C

Syntax

```
KSk ;
```

Description

The KSk command blanks Trace C.

NOTE

The functions of the command KSk are identical to the BLANK TRC command (page 130)
KSL
Marker Noise Off

Syntax

```
KSL
```

Description

The KSL command disables the noise density function which displays the RMS noise density at the marker. KSL does not blank the marker.

NOTE

The functions of the KSL command are identical to the MKNOISE OFF command (page 266).
Programming Commands

KSI Transfer Trace B to Trace C

Syntax

KSI

Description

The KSI command transfers Trace B data to Trace C

NOTE

Trace C cannot be an active trace. This means that the data in Trace C cannot be updated as the analyzer sweeps. To ensure that the current settings of the analyzer are reflected in the data transferred from Trace B to Trace C, you must follow the four step process below.

• Select single sweep mode (S2 (page 321) or SNGLS command (page 332))
• Select the desired analyzer settings
• Take one complete sweep using the TS command (page 362)
• Transfer the data

NOTE

The functions of the command KSI are identical to the BTC command (page 132).
KSM
Marker Noise On

Syntax

```
KSM
```

Description

The KSM command displays the noise density at the marker. The noise density is normalized to a 1Hz bandwidth.

**NOTE**
The functions of the KSM command are identical to the MKNOISE ON command (page 266).

**NOTE**
Some differences in marker noise may be seen between the legacy analyzers and the PSA Series analyzers due to the greater dynamic range of the PSA Series.

**NOTE**
*All legacy analyzer languages:* If either the M3 command or the MKD command is executed with the marker noise function active (MKNOISE ON or KSM), the marker amplitude displayed and returned by the MKA? command (page 255) or the MA command (page 245) is the difference between the noise densities at the reference marker and at the delta marker position.

*8566, 8568 and 8590 Series only:* If either the M3 command or the MKD command is executed before marker noise has been activated (using the MKNOISE ON or KSM commands), the marker noise amplitude that is displayed on the screen is the difference between the carrier wave power and the noise density at the delta marker position. Regardless of the order in which Marker Noise and Delta Marker are activated, the marker amplitude displayed and returned by the MKA? command (page 255) or the MA command (page 245) is the difference between the noise densities at the reference marker and at the delta marker. That is, the value returned by MKA? and MA does not always agree with that displayed on the screen of the PSA Series analyzer. These returned values will only be correct as long as there has been no change in either the delta marker state or the marker noise state from the front panel.

*8560 Series only:* If either the M3 command or the MKD command is
executed before marker noise has been activated (using the MKNOISE ON or KSM commands), the marker noise amplitude that is displayed on the screen is the difference between the carrier wave power and the noise density at the delta marker position. The value returned by the MKA? or MA command is the difference between the carrier wave power and the noise density at the delta marker position. That is, the value returned by MKA? and MA will agree with that displayed on the screen of the PSA Series analyzer.

NOTE The nominal noise bandwidth to RBW ratio for PSA analyzers is 1.055 for all RBWs. The nominal ratio for the 8566 family of analyzers is 1.128 for RBWs 100 kHz and higher, and 1.114 for RBWs of 30kHz and lower.
**KSm**  
**Graticule Off**

**Syntax**

```
KSm
```

**Description**

The KSm command blanks the graticule on the analyzer display.

---

**NOTE**

The functions of the command KSm are identical to the GRAT OFF command (page 180).
KSN
Marker Minimum

Syntax

![KSN Syntax Diagram]

Description

The KSN command moves the marker to the minimum value detected.

NOTE

The functions of the KSN command are identical to the MKMIN command (page 264).
KSn
Graticule On

Syntax

KSn ;

Description

The KSn command turns on the graticule on the analyzer display.

NOTE

The functions of the command KSn are identical to the GRAT ON command (page 180).
Programming Commands
KSO Marker Span

KSO Marker Span

Syntax

```
KSO ;
```

Description

The KSO command operates only when the delta marker is On (see MKD (page 259) or M3 (page 242)). When the delta marker is on and the KSO command is executed, the left marker specifies the start frequency, and the right marker specifies the stop frequency. If the delta marker is off, the command does nothing.

NOTE

If the active marker is not a delta marker, there is no change in its position.

NOTE

The functions of the KSO command are identical to the MKSP command (page 276).
KSo
Annotation Off

Syntax

KSo

Description

The KSo command blanks the annotation on the analyzer display.

NOTE

The functions of the command KSo are identical to the ANNOT OFF command (page 115).
KSp
Annotation On

Syntax

```
KSp ;
```

Description

The KSp command activates the annotation on the analyzer display.

NOTE

The functions of the command KSp are identical to the ANNOT ON command (page 115).
KST Fast Preset

Syntax

```
KST ;
```

Description

Performs an instrument preset, setting the analyzer back to its factory settings.

---

**NOTE**

There is no fast preset for the PSA series analyzers. Instead, the Code Compatibility software performs an instrument preset (IP) when the KST command is issued. The functions of the command KST are therefore identical to the IP command (page 185).
KSV Frequency Offset

Syntax

Description

The KSV command allows you to specify a value that offsets the frequency scale for all absolute frequency readouts, for example, center frequency. Relative values, for example, span and delta marker, are not offset.

NOTE

The functions of the KSV command are identical to the FOFFSET command (page 175).
KSx
External Trigger

Syntax

KSx → ;

Description
The KSx command activates the normal external trigger mode. When the KSx command is executed, the RF input signal is only displayed when the external trigger level exceeds the trigger threshold level.

NOTE
If an 8566A/B or an 8568A/B analyzer is in zero span and the sweep time is less than 20 msec, the display only gets refreshed when a fresh trace has been taken. This can cause the displayed trace to flicker.

Equally, if any of the 8560-E Series of analyzers, that is the 8560E, 8561E, 8563E, 8564E and the 8565E, are in zero span and with a sweep time of less than 50 msec, and they do not have Option 007 - Fast Digitized Time Domain installed, the display only gets refreshed when a fresh trace has been taken. This can cause the displayed trace to flicker.

In Option 266, all traces are displayed continuously, so all traces are therefore free of flicker.

NOTE
The functions of the command KSx are identical to the TM EXT command (page 354).
KSy Video Trigger

Syntax

```
KSy
```

Description

The KSy command activates the normal video trigger mode. When the KSy command is executed, the RF input signal is only displayed when the video trigger signal, which is internally triggered off the input signal, exceeds the trigger threshold level.

NOTE

If an 8566A/B or an 8568A/B analyzer is in zero span and the sweep time is less than 20 msec, the display only gets refreshed when a fresh trace has been taken. This can cause the displayed trace to flicker.

Equally, if any of the 8560-E Series of analyzers, that is the 8560E, 8561E, 8563E, 8564E and the 8565E, are in zero span and with a sweep time of less than 50 msec, and they do not have Option 007 - Fast Digitized Time Domain installed, the display only gets refreshed when a fresh trace has been taken. This can cause the displayed trace to flicker.

In Option 266, all traces are displayed continuously, so all traces are therefore free of flicker.

NOTE

The functions of the command KSy are identical to the TM VID command (page 354) and to the T4 command (page 347).
KSZ
Reference Level Offset

Syntax

```
KSZ [SP] real DM ;
```

Description

The KSZ command offsets all amplitude readouts on the display but without affecting the trace.

Once activated, the KSZ command displays the amplitude offset on the left side of the screen.

Entering KSZ 0 or presetting the spectrum analyzer eliminates an amplitude offset.

**NOTE**

The functions of the KSZ command are identical to the ROFFSET command (page 318).
L0 [zero]
Display Line Off

Syntax

```
L0
```

Description
The L0 [zero] command disables the display line.

NOTE
The functions of the L0 [zero] command are identical to the DLE OFF command (page 160).
LF
Low Frequency Preset

Syntax

LF
;

Description

Performs a low frequency preset. That is, it selects a Start Frequency of 0 Hz and a Stop Frequency of 2.5 GHz, a Reference Level of 0dBm, and sets all coupled functions to automatic.

Note

If you are using an E4401B or E4411B analyzer, the Stop Frequency will be clipped to the limits of the analyzer, that is 1.5 GHz.
LG Logarithmic Scale

Syntax

```
LG SP number DB DM;
LG UP DN OA;
LG ?
```

Description

Specifies the amplitude (vertical graticule divisions) as logarithmic units, without changing the reference level. The integer ranges vary between the different remote languages. The following table lists the ranges for each remote language.

**Table 4-13**

<table>
<thead>
<tr>
<th>Remote Language</th>
<th>Integer Range using the LG Command</th>
</tr>
</thead>
<tbody>
<tr>
<td>8560E/EC</td>
<td>1, 2, 5, and 10</td>
</tr>
<tr>
<td>8561E/EC</td>
<td>1, 2, 5, and 10</td>
</tr>
<tr>
<td>8562E/EC</td>
<td>1, 2, 5, and 10</td>
</tr>
<tr>
<td>8563E/EC</td>
<td>1, 2, 5, and 10</td>
</tr>
<tr>
<td>8564E/EC</td>
<td>1, 2, 5, and 10</td>
</tr>
<tr>
<td>8565E/EC</td>
<td>1, 2, 5, and 10</td>
</tr>
<tr>
<td>8566A</td>
<td>1, 2, 5, and 10</td>
</tr>
<tr>
<td>8566B</td>
<td>1, 2, 5, and 10</td>
</tr>
<tr>
<td>8568A</td>
<td>1, 2, 5, and 10</td>
</tr>
<tr>
<td>8568B</td>
<td>1, 2, 5, and 10</td>
</tr>
<tr>
<td>8590L</td>
<td>0.1 dB to 20.0 dB</td>
</tr>
<tr>
<td>8591E</td>
<td>0.1 dB to 20.0 dB</td>
</tr>
</tbody>
</table>
### Table 4-13

<table>
<thead>
<tr>
<th>Remote Language</th>
<th>Integer Range using the LG Command</th>
</tr>
</thead>
<tbody>
<tr>
<td>8592L</td>
<td>0.1 dB to 20.0 dB</td>
</tr>
<tr>
<td>8593E</td>
<td>0.1 dB to 20.0 dB</td>
</tr>
<tr>
<td>8594E</td>
<td>0.1 dB to 20.0 dB</td>
</tr>
<tr>
<td>8594L</td>
<td>0.1 dB to 20.0 dB</td>
</tr>
<tr>
<td>8595E</td>
<td>0.1 dB to 20.0 dB</td>
</tr>
<tr>
<td>8596E</td>
<td>0.1 dB to 20.0 dB</td>
</tr>
</tbody>
</table>
LIMD
Limit Line Delta Value

Syntax

![Syntax Diagram]

Description

The LIMD command is used to enter the delta value for the amplitude of a limit line segment.

NOTE

The response to the query command LIMD? is the delta value for the segment currently selected with the SEDI command (page 326).
LIMF
Limit Line Frequency Value

Syntax

\[
\text{LIMF} \rightarrow \text{Sr} \rightarrow \text{number} \rightarrow \text{Hz} \rightarrow \ldots
\]

Description

The LIMF command is used to enter a frequency value for a limit-line segment.

NOTE

The response to the query command LIMF? is the delta value for the segment currently selected with the SEDI command (page 326).
LIMIDEL  
Delete Limit Line Table

Syntax

```
LIMIDEL
```

Description

The LIMIDEL command deletes all upper and lower segments in the current limit-line table.
LIMIDISP
Limit Line Display

Syntax

![Diagram of LIMIDISP syntax]

Description
Controls the display of the limit line (or limit lines).
LIMIFAIL
Limits Failed

Syntax

```
LIMIFAIL ? ;
```

Description

The LIMIFAIL command returns a number between 0 and 3 which specifies whether the active trace passed or failed the upper and lower limit line tests. The meanings of the returned numbers are shown below.

Table 4-14 Results of the LIMIFAIL Command

<table>
<thead>
<tr>
<th>Result</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>The active trace passed both the upper and the lower limit tests.</td>
</tr>
<tr>
<td>1</td>
<td>The active trace failed the lower limit test.</td>
</tr>
<tr>
<td>2</td>
<td>The active trace failed the upper limit test.</td>
</tr>
<tr>
<td>3</td>
<td>The active trace failed both the upper and the lower limit tests.</td>
</tr>
</tbody>
</table>
LIMIFT
Select Frequency or Time Limit Line

Syntax

![Diagram showing LIMIFT command syntax]

Description
The LIMIFT command determines how the limit-line segments are defined. They can be defined according to frequency, or according to the sweep time setting of the spectrum analyzer.
LIMIPURGE
Delete Current Limit Line

Syntax

LIMIPURGE
;

Description

The LIMIPURGE command deletes the current limit line.
LIMIREL
Relative Limit Lines

Syntax

```
LIMIREL SP ON ;
```

Description

Specifies whether the current limit lines are fixed or relative.
LIMITEST
Enable Limit Line Testing

Syntax

```
LIMITEST
```

Description

The LIMITEST command compares trace A with the current limit line data.
LIML
Lower-Limit Amplitude

Syntax

The LIML command is used within the SEDI command (page 326) to assign the lower-limit amplitude value to a limit-line segment.
**LIMM**

Limit Middle-Amplitude

**Syntax**

```
LIMM Sp number DB DBM
```

**Description**

The LIMM command is used within the SEDI command (page 326) to assign the middle amplitude value to a limit-line segment.
**LIMU**

**Upper-Limit Amplitude**

**Syntax**

```
LIMU Sp number DB DBM ;
```

**Description**

The LIMU command is used within the SEDI command (page 326) to assign the upper-limit amplitude value to a limit-line segment.
LN
Linear Scale

Syntax

Description
Scales the amplitude (vertical graticule divisions) proportional to the input voltage, without changing the reference level. The bottom line of the graticule represents 0 volts.
LSPAN
Previous Span

Syntax

LSPAN ;

Description
The LSPAN command changes the spectrum analyzer's span to the previous span setting.
M1 [one] Marker Off

Syntax

```
M1 ;
```

Description

The M1 [one] command blanks any markers showing on the display.

NOTE

The functions of the M1 [one] command are identical to the MKOFF ALL command (page 268).
M2 [two]
Marker Normal

Syntax

M2 [two] SP HZ KHZ MHZ GHZ UP DN ? SP KZ MZ GZ S MS US SC OA

Description

The M2 [two] command moves the active marker to the marker frequency. If the active marker type is not currently normal (for example, it is delta or peak), the M2 command will change it to a normal marker.

NOTE

The functions of the M2 command are identical to the MKN command (page 265).

NOTE

Model numbers 8566, 8588, and the 8590 Series only: If the active marker has not been declared with MKACT, a normal marker is turned on and this active marker is assumed to be marker number 1 [one].
**M3 [three] Delta Marker**

**Syntax**

```
M3 [SP] [real] [HZ] [SP] [KHZ] [MHZ] [GHZ] [SP] [UP|DN|OA] [SP] [S|MS|US|SC]
```

**Description**

The M3 [three] command computes the frequency and amplitude difference between the active marker and the delta (or difference) marker.

If a delta marker is not displayed on the screen, the M3 command places one at the specified frequency or on the right hand edge of the display. If an active marker is not displayed on the screen, the M3 command places an active marker at the center of the screen.

**NOTE**

The active marker is the number 1 marker unless otherwise specified by the MKACT command (page 256).
NOTE

All legacy analyzer languages: If the M3 command is executed with the marker noise function active (MKNOISE ON or KSM), the marker amplitude displayed and returned by the MKA? command (page 255) or the MA command (page 245) is the difference between the noise densities at the reference marker and at the delta marker position.

8566, 8568 and 8590 Series only: If the M3 command is executed before marker noise has been activated (using the MKNOISE ON or KSM commands), the marker noise amplitude that is displayed on the screen is the difference between the carrier wave power and the noise density at the delta marker position. Regardless of the order in which Marker Noise and Delta Marker are activated, the marker amplitude displayed and returned by the MKA? command (page 255) or the MA command (page 245) is the difference between the noise densities at the reference marker and at the delta marker. That is, the value returned by MKA? and MA does not always agree with that displayed on the screen of the PSA Series analyzer. These returned values will only be correct as long as there has been no change in either the delta marker state or the marker noise state from the front panel.

8560 Series only: If the M3 command is executed before marker noise has been activated (using the MKNOISE ON or KSM commands), the marker noise amplitude that is displayed on the screen is the difference between the carrier wave power and the noise density at the delta marker position. The value returned by the MKA? or MA command is the difference between the carrier wave power and the noise density at the delta marker position. That is, the value returned by MKA? and MA will agree with that displayed on the screen of the PSA Series analyzer.

NOTE

The nominal ratio for PSA analyzers is 1.055 for all RBWs. The nominal ratio for the 8566 family of analyzers is 1.128 for RBWs 100 kHz and higher, and 1.114 for RBWs of 30kHz and lower.

NOTE

The functions of the M3 command are identical to the MKD command (page 259).
M4 [four]
Marker Zoom

Syntax

```
M4 SP HZ;
```

Description

The M4 [four] command, when specifying either the UP or DN parameter, increases or decreases the frequency span by one step. When specifying a numeric value, the M4 command moves the markers horizontal (X) position to the specified position in frequency or time.

**NOTE**

The OA option only returns the current value to the controller; it does not set the active function to the active marker.
MA
Marker Amplitude Output

Syntax

```
MA ;
```

Description

The MA command returns the amplitude level of the active marker if the marker is on the screen. If both the active marker and the delta marker are displayed, the MA command returns the amplitude difference between the two markers.

NOTE

The format of the returned data when using the MKA command is dependent on the currently set trace data format (refer to TDF, MDS, O1, O2, O3, or O4) when the selected remote language is either 8566 or 8590. When the selected remote language is 8560, the marker amplitude is always returned as an ASCII value (TDF P).

NOTE

The functions of the MA command are identical to the MKA command (page 255).
Programming Commands

MC0 [zero] Marker Frequency Counter Off

Syntax

```
MC0 ;
```

Description

The MC0 [zero] command turns the marker frequency counter off.

NOTE

The functions of the MC0 [zero] command are identical to the MKFC OFF command (page 262).
**MC1 \[one\] Marker Frequency Counter On**

**Syntax**

```
MC1 \[one\];
```

**Description**

The MC1 \[one\] command turns the marker frequency counter on.

**NOTE**

The functions of the MC1 \[one\] command are identical to the MKFC ON command (page 262).
MDS Measurement Data Size

Syntax

The MDS command formats binary data in one of the following formats:

- **B** selects a data size of one 8-bit byte.
- **W** selects a data size of one word, which is two 8-bit bytes.

If no keyword is specified in the command, the default value of **W** is assumed.
MEAN Trace Mean

Syntax

```
MEAN SP TRA ;
```

Description

Returns the mean value of the specified trace in display units.

NOTE

TRA corresponds to Trace 1, TRB corresponds to Trace 2, and TRC corresponds to Trace 3.
MEANPWR
Mean Power measurement

Syntax

![Syntax Diagram]

Description

The MEANPWR command measures the average power of the carrier during that portion of the time when it is on. The on state is defined as the time when the signal is within a selected number of dB of its peak level. The range of amplitudes that is defined as the on state can be set with the command. The amplitude range is set relative to the peak value of the signal.

NOTE

The MEANPWR command is similar to the CARRON command (page 138), except that the CARRON command defines ‘on’ as that time when the signal is within 20dB of its peak level.
MEASOFF
Measurement Off

Syntax

```
MEASOFF
```

Description

Turns the current measurement off if the current measurement is ACP (page 93) or CHP (page 142).

**NOTE**

If ACPPAR (page 105) is set to automatic, the MEASOFF command returns the following settings back to their pre-measurement states:

- Frequency span
- Resolution bandwidth
- Video bandwidth
- Center frequency step size
- Sweep time
- Detector mode
- Amplitude scale

It does not do any of the following:

- Change the values of ACPSP or ACPBW
- Restore trace elements
- Restore trigger mode
- Restore Amplitude units
- Restore any trace math functions
**MF Marker Frequency Output**

**Syntax**

**8566 and 8568 Remote Language**

```
MF ;
```

**8560 Series and 8590 Series Remote Language**

```
MF ? ;
```

**Description**

Returns the frequency (or time) of the on-screen active marker. If both an active marker and the delta marker are on the screen, the frequency difference is returned.

---

**NOTE**

8566 and 8568 only: If the active marker has marker frequency count set to *On* when using the MF? command, the marker frequency count value is returned to the controller.
MINH
Minimum Hold

Syntax

8560 Series Remote Language

```
8560 Series Remote Language

MINH $P$ TRA ;
MINH $P$ TRA TRB ;
```

8590 Series Remote Language

```
8590 Series Remote Language

MINH $P$ TRC ;
```

Description

The MINH command updates the chosen trace with the minimum signal level detected at each trace-data point from subsequent sweeps.
MINPOS
Minimum X Position

Syntax

```
MINPOS  Sp  TRA  TRB  TRC ;
```

Description

The MINPOS command returns the X co-ordinate value that corresponds to the minimum amplitude of the specified trace.
MKA
Marker Amplitude

Syntax

8566 and 8568 Remote Language

```
MKA Sp number DM 
```

8560 Series and 8590 Series Remote Language

```
MKA ? ;
```

Description

**8566 and 8568:** Specifies the amplitude of the active marker in dBm when the active marker is the fixed or amplitude type (refer to the MKTYPE command).

**8560 and 8590:** Returns the amplitude of the active marker. For further details, refer to the MA command.

---

**NOTE**

The format of the returned data when using the MKA command is dependent on the currently set trace data format (refer to TDF, MDS, O1, O2, O3, or O4) when the selected remote language is either 8566 or 8590. When the selected remote language is 8560, the marker amplitude is always returned as an ASCII value (TDF P).

---

**NOTE**

The functions of the MKA command are identical to the MA command (page 245).

---

**NOTE**

In the 8566, 8568, and in the 8590 Series analyzers, the MKA command can be used with a numeric argument that places the marker at the specified amplitude on the screen. For the 8566 and 8568, the MKA command will only accept a value in PSA Series analyzers with firmware Rev. A.08.08 or later. In Option 266 Programming Code Compatibility, MKA is a query only command. That is, the command will not accept arguments of any type, and can only be used in the form MKA?.
MKACT
Activate Marker

Syntax

```
MKACT Sp marker number ;
```

Table 4-15

<table>
<thead>
<tr>
<th>Item</th>
<th>Description/Default</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Marker Number</td>
<td>Any valid integer. Default value is 1.</td>
<td>1 to 4</td>
</tr>
</tbody>
</table>

Description

MKACT specifies the active marker. There can be four different markers, but only one marker can be active at any time.
MKBW
Marker Bandwidth

Syntax

Description
Returns the bandwidth at the specified power level relative to an on-screen marker (if present) or the signal peak (if no on-screen marker is present).
MKCF
Marker to Center Frequency

Syntax

```
MKCF
```

**Description**

Sets the center frequency equal to the marker frequency and moves the marker to the center of the screen.

**NOTE**

The functions of the MKCF command are identical to the E2 command (page 164).
MKD
Marker Delta

Syntax

Step Increment: by 1/10 of the frequency span

Description

The MKD command computes the frequency and amplitude difference of the active marker and the delta marker. These values are displayed in the screen.

If a delta marker is not displayed on the screen, the MKD command places one at the specified frequency or on the right hand edge of the display. If an active marker is not displayed on the screen, the MKD command places an active marker at the center of the screen.

NOTE

The active marker is the number 1 marker unless otherwise specified by the MKACT command (page 256).
NOTE

All legacy analyzer languages: If the MKD command is executed with the marker noise function active (MKNOISE ON or KSM), the marker amplitude displayed and returned by the MKA? command (page 255) or the MA command (page 245) is the difference between the noise densities at the reference marker and at the delta marker position.

8566, 8568 and 8590 Series only: If the MKD command is executed before marker noise has been activated (using the MKNOISE ON or KSM commands), the marker noise amplitude that is displayed on the screen is the difference between the carrier wave power and the noise density at the delta marker position. Regardless of the order in which Marker Noise and Delta Marker are activated, the marker amplitude displayed and returned by the MKA? command (page 255) or the MA command (page 245) is the difference between the noise densities at the reference marker and at the delta marker. That is, the value returned by MKA? and MA does not always agree with that displayed on the screen of the PSA Series analyzer. These returned values will only be correct as long as there has been no change in either the delta marker state or the marker noise state from the front panel.

8560 Series only: If the MKD command is executed before marker noise has been activated (using the MKNOISE ON or KSM commands), the marker noise amplitude that is displayed on the screen is the difference between the carrier wave power and the noise density at the delta marker position. The value returned by the MKA? or MA command is the difference between the carrier wave power and the noise density at the delta marker position. That is, the value returned by MKA? and MA will agree with that displayed on the screen of the PSA Series analyzer.

NOTE

The nominal ratio for PSA analyzers is 1.055 for all RBWs. The nominal ratio for the 8566 family of analyzers is 1.128 for RBWs 100 kHz and higher, and 1.114 for RBWs of 30kHz and lower.

NOTE

The functions of the MKD command are identical to the M3 command (page 242).
MKF
Marker Frequency

Syntax

```
MKF SP real HZ
```

Description

Specifies the frequency value of the active marker.

**NOTE**

With the 8560 Series languages, the data is always returned in ASCII format.

With all other languages, the format of the returned data is determined by the TDF (Trace Data Format) (page 350) command and, if TDF B (binary data format) has been selected, by the MDS command (page 248).

8566 and 8568 only: If the active marker has marker frequency count set to *On* when using the MKF? command, the marker frequency count value is returned to the controller.
MKFC Marker Counter

Syntax

```
MKFC
```

Description

Turns on or off the marker frequency counter. The resolution of the frequency marker counter is determined by the MKFCR command (page 263).

**NOTE**

The functions of the MKFC command are identical to the MC0 [zero] command (page 246) and MC1 [one] command (page 247).
MKFCR
Marker Counter Resolution

Syntax

```plaintext
MKFCR  Sp  real  [HZ | KHZ | MHZ | GHZ | KZ | MZ | GZ] ;
```

NOTE

The marker counter can be specified in time units when operating in the time domain.

Description

Sets the resolution of the marker frequency counter. The marker counter value is always given either in Hertz or in seconds depending on whether the analyzer is operating in the frequency domain or the time domain.

NOTE

On PSA analyzers, setting the marker frequency resolution will cause the Gate Time to change. The Gate Time is calculated using the following formula:

\[
\text{Gate Time} = \frac{1}{\text{Resolution Value}}
\]

For restrictions on the Gate Time, refer to the PSA User’s and Programmer’s Reference, Volume 1.

NOTE

The functions of the MKFCR command are identical to the KS= command (page 187).
MKMIN
Marker Minimum

Syntax

```
MKMIN ;
```

Description
Moves the active marker to the minimum value detected.

**NOTE**
The functions of the MKMIN command are identical to the KSN command (page 212).
MKN
Marker Normal

Syntax

Step Increment: by 1/10 of the frequency span.

Description

The MKN command moves the active marker to the specified frequency. If the active marker has not been declared with MKACT, a normal marker is turned on and this active marker is assumed to be 1. If the active marker type is not currently normal (for example, it is delta or peak), the MKN command will change it to a normal marker.

NOTE

The functions of the MKN command are identical to the M2 [two] command (page 241).
MKNOISE
Marker Noise

Syntax

Description
Displays the average RMS noise density at the marker.

NOTE
The functions of the MKNOISE command are identical to the KSM command (page 209) and the KSL command (page 207).

NOTE
Some differences in marker noise may be seen between the legacy analyzers and the PSA Series analyzers due to the greater dynamic range of the PSA Series.

NOTE
All legacy analyzer languages: If either the M3 command or the MKD command is executed with the marker noise function active (MKNOISE ON or KSM), the marker amplitude displayed and returned by the MKA? command (page 255) or the MA command (page 245) is the difference between the noise densities at the reference marker and at the delta marker position.

8566, 8568 and 8590 Series only: If either the M3 command or the MKD command is executed before marker noise has been activated (using the MKNOISE ON or KSM commands), the marker noise amplitude that is displayed on the screen is the difference between the carrier wave power and the noise density at the delta marker position. Regardless of the order in which Marker Noise and Delta Marker are activated, the marker amplitude displayed and returned by the MKA? command (page 255) or the MA command (page 245) is the difference between the noise densities at the reference marker and at the delta marker. That is, the value returned by MKA? and MA does not always agree with those displayed on the screen of the PSA Series analyzer. These returned values will only be correct as long as there has been no change.
in either the delta marker state or the marker noise state from the front panel.

8560 Series only: If either the M3 command or the MKD command is executed before marker noise has been activated (using the MKNOISE ON or KSM commands), the marker noise amplitude that is displayed on the screen is the difference between the carrier wave power and the noise density at the delta marker position. The value returned by the MKA? or MA command is the difference between the carrier wave power and the noise density at the delta marker position. That is, the value returned by MKA? and MA will agree with that displayed on the screen of the PSA Series analyzer.

NOTE

The nominal ratio for PSA analyzers is 1.055 for all RBWs. The nominal ratio for the 8566 family of analyzers is 1.128 for RBWs 100 kHz and higher, and 1.114 for RBWs of 30kHz and lower.
MKOFF
Marker Off

Syntax

Description

Turns off either the active marker or all the markers. If the ALL parameter is omitted, only the active marker is turned off.
**MKP Marker Position**

**Syntax**

```
MKP [SP integer] ;
```

**Description**

Places the active marker at the specified X co-ordinate.
MKPK Marker Peak

Syntax

```
MKPK Specify NH NR NL
```

Description

Executing MKPK HI, or simply MKPK (no secondary keyword), positions the active marker at the highest signal detected. If an active marker is on the screen, the MKPK parameters move the marker as follows:

- **HI** (highest) moves the active marker to the highest peak.
- **NH** (next highest) moves the active marker to the next signal peak of lower amplitude.
- **NR** (next right) moves the active marker to the next signal peak to the right of the current marker.
- **NL** (next left) moves the active marker to the next signal peak to the left of the current marker.

**NOTE**
The functions of the MKPK command (no secondary keyword) and the MKPK HI command are identical to the E1 commands: (page 163).

**NOTE**
The functions of the MKPK NH command are similar to the KSK command (page 205), except that KSK does not take into account the marker peak excursion or marker peak threshold values. For more details on marker peak excursion, see the MKPX command (page 272).
MKPT
Marker Threshold

Syntax

The MKPT command sets the minimum amplitude level from which a peak on the trace can be detected.

NOTE
The default values and the range settings on Option 266 Programming Code Compatibility are different than on the legacy analyzers. The following table shows the differences.

### Table 4-16 Range Settings and Default Values with the MKPT Command

<table>
<thead>
<tr>
<th>Remote Language</th>
<th>Default Setting on Original Analyzer</th>
<th>Default Setting on PSA analyzers</th>
<th>Valid Range on Legacy Analyzer</th>
<th>Valid Range on PSA analyzers</th>
</tr>
</thead>
<tbody>
<tr>
<td>8560E/EC Series analyzers</td>
<td>−130 dBm</td>
<td>−100 dBm</td>
<td>−200 dBm to 30 dBm</td>
<td>Ref Level to (Ref Level - (10 × Scale per Division))</td>
</tr>
</tbody>
</table>
MKPX Marker Peak Excursion

Syntax

Preset State: 6 dB.
Step Increment: by 1 dB.

Description

Specifies the minimum signal excursion for the spectrum analyzer’s internal peak identification routine.

The default value is 6 dB. In this case, any signal with an excursion of less than 6 dB on either side of the marker would not be identified. Thus, if an MKPK NH command were to be executed on such a signal, the analyzer would not place a marker on this signal peak.
**MKREAD Marker Readout**

**Syntax**

```
MKREAD SP FRQ ;
```

**Description**

Selects the type of active trace information displayed by the spectrum analyzer marker readout.

The MKREAD command can select the following types of active trace information:

- **FRQ** frequency
- **SWT** sweep time
- **IST** inverse sweep time
- **PER** period

**NOTE** The Inverse Sweep Time (IST) readout is only available when using a delta marker in zero span.

The results of the data depend on the MKREAD parameter and the frequency span, and whether the marker delta function is used.

**Table 4-17**

<table>
<thead>
<tr>
<th>MKREAD Type</th>
<th>Non-Zero Span</th>
<th>Non-Zero Span Delta</th>
<th>Zero Span</th>
<th>Zero Span Delta</th>
</tr>
</thead>
<tbody>
<tr>
<td>FRQ</td>
<td>Reads frequency</td>
<td>Reads delta frequency</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>SWT</td>
<td>Reads time since the start of sweep</td>
<td>Reads delta time between end points</td>
<td>Waveform measurements of detected modulation</td>
<td>Waveform measurements of detected modulation</td>
</tr>
</tbody>
</table>
### Table 4-17

<table>
<thead>
<tr>
<th>MKREAD Type</th>
<th>Non-Zero Span</th>
<th>Non-Zero Span Delta</th>
<th>Zero Span</th>
<th>Zero Span Delta</th>
</tr>
</thead>
<tbody>
<tr>
<td>IST</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>Computes frequency corresponding to delta of markers. Performs $1/(T_1 - T_2)$</td>
</tr>
<tr>
<td>PER</td>
<td>Period of frequency</td>
<td>(Pulse measurement) delta time</td>
<td>N/A</td>
<td>N/A</td>
</tr>
</tbody>
</table>

**NOTE**

FFT (Fast Fourier Transform) is not available in the Programming Code Compatibility Suite option.
MKRL
Marker to Reference Level

Syntax

```markdown
MKRL
```

Description

The MKRL command moves the active marker to the reference level.

NOTE

The functions of the MKRL command are identical to the E4 command (page 166).
MKSP
Marker to Span

Syntax

MKSP

Description

The MKSP command operates only when the delta marker is On (see MKD (page 259) or M3 (page 242)). When the delta marker is On and MKSP is executed, the delta marker and active marker determine the start and stop frequencies. The left marker specifies the start frequency, and the right marker specifies the stop frequency. If marker delta is Off, there is no operation.

NOTE
If the active marker is not a delta marker, there is no change in its position.

NOTE
The functions of the MKSP command are identical to the KSO command (page 214).
MKSS
Marker to Step Size

Syntax

\[ \text{MKSS} \rightarrow ; \]

Description
Sets the center-frequency step-size equal to the marker frequency. If the analyzer is in the delta mode, the step size is set to the frequency difference between the active and the delta marker.

NOTE
When the marker is a delta marker, the functions of the MKSS command are identical to the E3 command (page 165).
MKT
Marker Time

Syntax

```
MKT Sp real S ;
```

Description

Places a marker at a position that corresponds to a specified point in time during the sweep.

**NOTE**

The default unit of time is seconds (‘S’ or ‘SC’).
MKTBL
Marker Table

Syntax

Description
The MKTBL command turns the display of the marker table on or off.
MKTRACE
Marker Trace

Syntax


NOTE

TRA corresponds to Trace 1, TRB corresponds to Trace 2, and TRC corresponds to Trace 3.

Description

Moves the active marker to the corresponding position in Trace 1, Trace 2, or Trace 3.

NOTE

If the marker is moved to an inactive trace, the marker will move to the top of the screen on a PSA analyzer.
MKTRACK
Marker Track

Syntax

Description

Moves the signal on which the active marker is located to the center of the spectrum analyzer display and keeps the signal peak at center screen.

To keep a drifting signal at center screen, place the active marker on the desired signal before turning on MKTRACK.

NOTE

The functions of the MKTRACK command are identical to the MT0 [zero] command (page 285) and the MT1 [one] command (page 286).
MKTYPE Marker Type

Syntax

8566 and 8568 Remote Language only

```
MKTYPE <SP> PSN --> ;
MKTYPE <SP> AMP --> ;
MKTYPE <SP> FIXED --> ;
```

Description

Specifies the type of marker.

MKTYPE PSN allows the marker to be positioned horizontally in display units (default). Use the MKP and MKF commands to position the marker.

MKTYPE AMP allows the marker to be positioned according to amplitude. Use the MKA command to position the marker.

MKTYPE FIXED allows a marker to be placed at any fixed point on the display. Use the MKP, MKF, and MKA commands to position the marker.

NOTE

Marker type can only be set for an active marker. The marker type is reset to PSN when the marker is turned off (using the MKOFF command) or the instrument is preset.
ML Mixer Level

Syntax

8560 Series Remote Language

8566 and 8568 Remote Language

8590 Series Remote Language

Description

The ML command specifies the maximum signal level that is applied to the input mixer for a signal that is equal to or below the reference level. The effective mixer level is equal to the reference level minus the input attenuator setting.
NOTE

If an external amplifier gain value is set, the mixer level is determined using the following equation:

\[
\text{Mixer Level} = \text{Ref. Level} - \text{Attenuation} + \text{Ext. Amplifier Gain}
\]

The external amplifier gain is not preset by doing an IP command in case the analyzer is measuring a large signal. This is to protect the analyzer from damage from a large signal. For a helpful suggestion, see Chapter 3, “Hints and Tips,” on page 81.

NOTE

The functions of the ML command are identical to the KS, command (page 186).
MT0 [zero]
Marker Track Off

Syntax

MT0 ;

Description

The MT0 [zero] command disables the marker tracking mode.

NOTE

The functions of the MT0 [zero] command are identical to the MKTRACK OFF command (page 281).
**MT1 [one]**
**Marker Track On**

**Syntax**

```
MT1 ;
```

**Description**

Moves the signal on which the active marker is located to the center of the spectrum analyzer display and keeps the signal peak at center screen.

To keep a drifting signal at center screen, place the active marker on the desired signal before issuing an MT1 [one] command.

**NOTE**

The functions of the MT1 command are identical to the MKTRACK ON command (page 281).
MXMH
Maximum Hold

Syntax

```
MXMH TRA $p ; TRB
```

**NOTE**
TRA corresponds to Trace 1 and TRB corresponds to Trace 2.

**Description**

Updates each trace element with the maximum level detected.

MXMH updates the specified trace (either Trace A or Trace B) with a new value from a detector only if the new value is larger than the previous trace data value.

**NOTE**
The functions of the MXMH command are identical to the A2 command (page 90) and B2 command (page 126).
### O1 [one] Format - Display Units

**Syntax**

```
O1 ;
```

**Description**

The O1 [one] command transmits trace amplitude and position information as decimal values in display units.
O2 [two]
Format - Two 8-Bit Bytes

Syntax

Description

The O2 [two] command transmits trace amplitude and position information as two 8-bit binary numbers, or one instruction word.
O3 [three] Format - Real Amplitude Units

Syntax

```
O3 [three] ;
```

Description

The O3 [three] command transmits trace vertical axis information only, in measurement units of Hz, dBm, dB, volts or seconds.
O4 [four]
Format - One 8-Bit Byte

Syntax

```
O4 0x0 ;
```

Description

The O4 [four] command transmits trace amplitude information only as a binary number.
OCCUP
Percent Occupied Power Bandwidth

Syntax

```
OCCUP SP number ;
```

Description

The OCCUP command is used to query the current value of the percent occupied power. This value is set by the DELMKBW (page 155) and the PWRBW command (page 301) command. The OCCUP command can also be used to set the percent occupied power.
OL
Output Learn String

Syntax

```
OL
```

80 byte binary string

;?

Description

The OL command transmits information to the controller that describes the state of the analyzer when the OL command is executed. This information is called the “learn string.” The learn string can be sent from the controller memory back to the analyzer to restore the analyzer to its original state.

NOTE

The OL command is not completely supported, due to differences between the PSA series, ESA series, and 8566/8568. This command is only supported on the PSA series of analyzers with firmware Rev. A.08.02 or later.
OT
Output Trace Annotations

Syntax

```
OT
```

Description

The OT command sends 32 character-strings to the controller. Each character-string can be up to 64 characters long.

NOTE

The 'data invalid indicator' status report given in string 27 of the returned text is only supported on PSA.
PEAKS
Peaks

Syntax

8560 Series Remote Language

8566 and 8568 Remote Language

8590 Series Remote Language

Prerequisite Commands: TS when using trace data

Description

The PEAKS command sorts the signal peaks in the source trace by frequency or amplitude, and sends the sorted results to the destination trace.
PKPOS
Peak Position

Syntax

```
PKPOS SP TRA SP TRB SP TRC ;
```

NOTE

TRA corresponds to Trace 1, TRB corresponds to Trace 2, and TRC corresponds to Trace 3.

Description

The PKPOS command returns the X co-ordinate value of the maximum peak in the specified trace.
PLOT
Plot

Syntax

PLOT SP, value, value, value, value;

Description

The PLOT command allows you to transfer trace data, graticule and annotation information to a printer using a parallel port.

NOTE

The legacy analyzers transferred data directly to a plotter via the GPIB connection. The PLOT command now transfers data to a printer, and prints the entire screen. For instructions on connecting your analyzer to a printer, see the PSA User’s and Programmer’s Reference, Volume 1.

Although the PLOT command will read in plotter dimension values, these will be ignored.
PP Preselector Peak

Syntax

```
PP
```

Description

The PP command optimizes preselector tracking to peak the amplitude of a signal at the active marker. If a marker is not on the screen, PP places a marker at the highest signal level, and optimizes preselector tracking at that frequency.

NOTE

This command is only supported when the analyzer’s maximum frequency limit is greater than 3 GHz. If the command is issued on an analyzer with a maximum frequency limit of 3 GHz or less, an error message will be generated stating that the command is not supported.
PREAMPG
External Preamplifier Gain

Syntax

```
PREAMPG SP number DB ;
```

Description

Subtracts a positive or negative preamplifier gain value from the displayed signal. The preamplifier gain is removed by entering a value of 0.

**NOTE**
An Instrument Preset (using the IP command (page 185)) does not reset the preamplifier gain to 0.
PRINT
Print

Syntax

PRINT
;

Description

Transfers trace data, graticule and annotation of the analyzer screen directly to a printer via a parallel port.
PWRBW
Power Bandwidth

Syntax

8560 Series Remote Language

```
PWRBW $p$ TRA number ;
```

8566 and 8568 Remote Language

```
PWRBW $p$ TRA number ? ;
```

8590 Series Remote Language

```
PWRBW $p$ TRA number ? ;
```

Description

Computes the combined power of all signal responses in the specified trace, and returns the bandwidth of the specified percentage of total power. The number in the command is a percentage value, that is, it has a range of 0 to 100.

**NOTE**

If the percent total power is 100%, the power bandwidth equals the frequency span.

**NOTE**

On the 8566A/B analyzer, this command stops the trace. That is not the case with this Option 266 Programming Code Compatibility.
PWRUPTIME
Power Up Time

Syntax

```
PWRUPTIME;
```

Description

Returns the number of milliseconds that have elapsed since the spectrum analyzer was turned on.
Q0 [zero]
EMI Peak Detection

Syntax

Description
Sets the detector function to EMI detection. This is the same as Peak detection but uses CISPR related bandwidths.

NOTE DET? will return EPK after execution of the Q0 command.
Q1 [one] Quasi-Peak Detection

Syntax

Q1 \[;\]

Description

Sets the detector function to Quasi-Peak detection. This is a fast-rise, slow-fall detector used to make CISPR compliant EMI measurements.

NOTE DET? will return QPD after execution of the Q1 command.
R1 [one]
Illegal Command SRQ

Syntax

R1 ;

Description

The R1 [one] command deactivates all analyzer service requests (SRQs) except SRQ140, the illegal-command service request.
R2 [two]
End-of-Sweep SRQ

Syntax

![Diagram of R2 command]

Description

The R2 [two] command activates the end-of-sweep and illegal-command service requests.
R3 \textit{[three]}

Hardware Broken SRQ

Syntax

\begin{verbatim}
R3 ;
\end{verbatim}

Description

The R3 \textit{[three]} command activates the hardware-broken and illegal-command service requests.
R4 [four] Units-Key-Pressed SRQ

Syntax

Description
The R4 [four] command activate the units-key-pressed and illegal-command SRQs.

NOTE
PSA analyzers cannot replicate the units-key-pressed service request since no front panel interaction is supported.
RB
Resolution Bandwidth

Syntax

8560 Series Remote Language

8566 and 8568 Remote Language

Preset State for all languages: 3 MHz, auto coupled.
Step Increment for all languages: In a 1, 3, 10 series.
8590 Series Remote Language

Preset State for all languages: 3 MHz, auto coupled.
Step Increment for all languages: In a 1, 3, 10 series.

Description
The RB command specifies the resolution bandwidth. Available bandwidths are 10 Hz, 30 Hz, 300 Hz, 1 kHz, 3 kHz, 30 kHz, 100 kHz, 300 kHz, 1 MHz, and 3 MHz. The resolution bandwidths, video bandwidths, and sweep time are normally coupled. Executing RB decouples them. Execute CR (page 150) to reestablish coupling.

NOTE
Default values on PSA analyzers may vary from the legacy analyzers. Refer to the PSA User’s and Programmer’s Reference, Volume 1 to find out any restrictions that may apply.
**RBR**  
Resolution Bandwidth Ratio

**Syntax**

```
RBR SP real UP DN OA ;
```

**Description**

This command is only supported in PSA Series analyzers. It sets the span to resolution bandwidth ratio. Allows you to set the Span/RBW ratio to \(1/<\text{value}>\), where \(<\text{value}>\) is sent by the user.
RC Recall State

Syntax

\[
\text{RC} \quad \text{Sp} \quad \text{digit} \quad ;
\]

Description

Recalls analyzer state data from the specified state register in the analyzer’s memory.

Registers one through six are reserved for the user, and contain instrument states (such as front panel configuration) saved with the SAVES command (page 323) or the SV command (page 343).

NOTE

Recalling the Preset state (RC 7) is only supported in Option 266 Programming Code Compatibility Suite if Save Reg 7 (Preset only) is switched On in the Preferences menu (see page 1-39). Only the Preset state can be recalled. The previous state can not be recalled. With the Save Reg 7 (Preset only) turned Off, the measurement performance of the analyzer will be faster than when it is turned On.

NOTE

The functions of the RC command are identical to the RCLS command (page 313).
RCLS
Recall State

Syntax

```
RCLS \sp\ digit ;
```

Description

Recalls analyzer state data from the specified state register in the analyzer’s memory.

Registers one through six are reserved for the user, and contain instrument states (such as front panel configuration) saved with the SAVES command (page 323) or the SV command (page 343).

---

**NOTE**

The functions of the RCLS command are identical to the RC command (page 312).

---

**NOTE**

Recalling the Preset state (RCLS 7) is only supported in Option 266 Programming Code Compatibility Suite if **Save Reg 7 (Preset only)** is switched **On** in the Preferences menu (see page 1-39). Only the Preset state can be recalled. The previous state can not be recalled.
REV
Revision

Syntax

```
REV ;
```

Description

The REV command returns the firmware revision number.

NOTE

In PSA analyzers, this command returns the build date of Option 266 that you have installed in your analyzer. The date is returned in YYWW format where YY is the number of years since 1950, and WW is week number within that year (often referred to as “Work Week”).

As an example, if your Option 266 Programming Code Compatibility firmware was built on May 23 2004, the number 5421 would be returned. The year 2004 is 54 years after 1950, and May 23 is the 21st week of the year, hence 5421.
RL Reference Level

Syntax

8560 Series Remote Language

8566, 8568, and 8590 Series Remote Language

Description

Specifies the amplitude level of the top graticule line on the display. This represents the reference level.

CAUTION

Signal levels above +30 dBm will damage the spectrum analyzer. For a helpful suggestion on this subject, see Chapter 3, “Hints and Tips,” on page 81.
NOTE

The 8590 Series of analyzers have a maximum value of 60 dBm for the reference level. The range of reference levels for the PSA Series of analyzers depends on the other settings shown below:

- –170 dBm to +30 dBm with 0 dB reference level offset.
- –160 dBm to +40 dBm with 10 dB reference level offset.
- –180 dBm to +20 dBm with 10 dB external amplifier gain.
- –170 dBm to 0 dBm with preamp on (Option 1DS).

NOTE

If the display line is on, changing the reference level does not adjust the position of the display line.
RMS
Root Mean Square Value

Returns the root mean square value of the trace in measurement units.

Syntax

Prerequisite Commands: TS when using trace data.

NOTE
TRA corresponds to Trace 1, TRB corresponds to Trace 2, and TRC corresponds to Trace 3.

Description

Returns the RMS value of the trace in display units.
ROFFSET
Reference Level Offset

Syntax

8560 Series and 8590 Series Remote Language

8566 Remote Language

Description

Offsets all amplitude readouts without affecting the trace.

Once activated, the ROFFSET command displays the amplitude offset on the left side of the screen.

Entering ROFFSET 0 or resetting the spectrum analyzer eliminates an amplitude offset.

NOTE

The functions of the ROFFSET command are identical to the KSZ command (page 221).
RQS
Service Request Mask

Syntax

![Diagram of RQS syntax]

Description

Sets a bit mask for service requests.

**NOTE**

Some differences may be noticed in the value returned by the RQS query when compared with the value set. This is because Option 266 on PSA analyzers does not support the use of bit-1 of the status byte. Bit-1 of the status byte is always set to Off.
S1\[one\] Continuous Sweep

Syntax

```
S1 ;
```

Description

The S1 command sets the spectrum analyzer to continuous sweep mode. In the continuous sweep mode, the spectrum analyzer takes its next sweep as soon as possible after the current sweep (as long as the trigger conditions are met). A sweep may temporarily be interrupted by data entries made over the remote interface.

NOTE

The functions of the command S1 are identical to the CONTS command (page 147).
S2 [two]  
Single Sweep

Syntax

Description
The S2 command sets the analyzer to single sweep mode. Each subsequent time that the command S2 is sent, one sweep is started if the trigger conditions are met.

NOTE  The functions of the S2 command are similar to the SNGLS command (page 332).
SADD
Add Limit Line Segment

Syntax

SADD

Description
The SADD command is used to add a limit-line segment to the current limit line.
SAVES
Save State

Syntax

![Diagram of SAVES command]

Description

Saves the current state of the spectrum analyzer in any of the registers one through six.

NOTE

The functions of the SAVES command are identical to the SV command (page 343).
SDEL
Delete Limit Line Segment

Syntax

```
SDEL
```

Description

The SDEL command deletes the limit-line segment specified with the SEDI command (page 326).
SDON
Terminate Limit Line Segment

Syntax

```
SDON ;
```

Description

The SDON command is used to terminate the SEDI command (page 326).
SEDI
Activate Limit Line Segment

Syntax

```
SEDI
SP integer ;
```

Description

The SEDI command activates the limit-line segment you identify by its segment number in the limit-line table.

NOTE

The maximum number of limit line points that can be specified on a PSA Series analyzer is 200.
**SENTER**
Segment Entry for Frequency Limit Lines

**Syntax**

```plaintext
SENTER number, SP number, number, SLOPE number, FLAT
```

**Description**

The SENTER command is used to create a complete limit-line segment.

**NOTE**

Although the parameters SLOPE and FLAT are accepted in the command, they are ignored and have no effect.
SER
Serial Number

Syntax

![SER Diagram]

Description
The SER command returns the analyzer serial number to the controller.
SETDATE
Set Date

Syntax

Syntax diagram:

```
SETDATE $p number ;
```

Description

The SETDATE command sets the date of the real-time clock of the spectrum analyzer. The date takes the form YYMMDD (Year, Month, Day)
SETTIME
Set Time

Syntax

```
SETTIME SP number ;
```

Description

The SETTIME command sets the date of the real-time clock of the spectrum analyzer. The time takes the form HHMMSS (Hour, Minute, Second)
SMOOTH Smooth Trace

Syntax

Prerequisite Commands: TS when using trace data.

NOTE TRA corresponds to Trace 1, TRB corresponds to Trace 2, and TRC corresponds to Trace 3.

Description

Smooths the trace according to the number of points specified for the running average.

Each point value is replaced with the average of the values (in measurement units) of the given number of points centered on it. Increasing the number of points increases smoothing at the cost of decreasing resolution. If the number of points is an even number, then the number of points is increased by one.

Smoothing decreases at the endpoints.

NOTE Some differences may be noticed between the smoothed trace in the legacy analyzers and the smoothed trace using the same signal in PSA analyzers.
SNGLS
Single Sweep

Syntax

```
SNGLS ;
```

Description

Sets the spectrum analyzer to single-sweep mode. Each time TS (take sweep) is sent, one sweep taken as long as the trigger conditions are met.

NOTE

The functions of the SNGLS command are identical to the S2 command (page 321).
SP
Frequency Span

Syntax

8560 Series Remote Language

Step Increment: 1, 2, 5, 10 sequence (up to the stop frequency of the spectrum analyzer)
8566, 8568, and 8590 Series Remote Language

Step Increment: 1, 2, 5, 10 sequence (up to the stop frequency of the spectrum analyzer)

Description

Changes the total displayed frequency range symmetrically about the center frequency.

If resolution and video bandwidths are coupled to the span width, the bandwidths change with the span width to provide a predetermined level of resolution and noise averaging. Likewise, the sweep time changes to maintain a calibrated display, if coupled. All of these functions are normally coupled, unless RB (page 309), VB (page 365), or ST (page 338) have been executed.

NOTE

Option 266 Programming Code Compatibility does not mimic the exact coupling behavior of the legacy analyzers. Refer to your PSA User’s and Programmer’s Reference, Volume 1 for the values used.
SRQ
User-Defined SRQ

Syntax

```
SRQ s_p digit ;
```

Description

The SRQ command sends a service request to the controller when the SRQ operand fits the mask supplied with the RQS command.

---

**NOTE**

Option 266 Programming Code Compatibility does not support the setting of bit 1 (units-key-pressed) of the status byte. Bit-1 of the status byte is always set to Off.
SS
Center Frequency Step Size

Syntax

8560 Series Remote Language

8566 and 8568 Remote Language
**Description**

The SS command specifies center frequency step size.
ST Sweep Time

Syntax

8560 Series Remote Language

8566 and 8568 Remote Language
8590 Series Remote Language

**Description**

The ST command specifies the time in which the analyzer sweeps the displayed frequency or time span.

**NOTE**

The OA option in the ST command behaves in the same manner as the ST? command in that it returns the current value to the controller. However, the OA option does not set the active function to Sweep Time.
The STB command returns to the controller the decimal equivalent of the bits set in the status byte (see the RQS (page 319) and SRQ (page 335) commands). STB is equivalent to a serial poll. The RQS and associated bits are cleared in the same way that a serial poll would clear them.
STDEV
Standard Deviation of Trace Amplitudes

Syntax

Prerequisite Commands: TS when using trace data

NOTE

TRA corresponds to Trace 1, TRB corresponds to Trace 2, and TRC corresponds to Trace 3.

Description

Returns the standard deviation of the trace amplitude in display units.
SUM

Syntax

![Diagram of SUM command with variables SUM, TRA, TRB, and SP]

Description

Returns the sum of all the trace values to the controller.

NOTE

The 856x series of analyzers returns display units, range (0-610) * 601 points or if Trace Data Format (TDF) is set to M, it returns ASCII.
SV
Save State

Syntax

```
SV sp digit ;
```

Description
Saves the current state of the spectrum analyzer in any of the registers one through six.

NOTE
The functions of the SV command are identical to the SAVES command (page 323).
T1 [one] Free Run Trigger

Syntax

T1 ;

Description

The T1 [one] command sets the analyzer sweep to free run trigger mode.

NOTE

The functions of the T1 [one] command are identical to the TM FREE command (page 354).
T2 [two] Line Trigger

Syntax

```
T2 ;
```

Description

The T2 [two] command sets the analyzer sweep to line trigger mode.

NOTE

The functions of the T2 [two] command are identical to the TM LINE command (page 354).
T3 [three] External Trigger

Syntax

![Syntax Diagram]

Description

The T3 [three] command sets the analyzer sweep to external trigger mode.

**NOTE**

The functions of the T3 [three] command are identical to the TM EXT command (page 354).
T4 [four] Video Trigger

Syntax

```
T4 ;
```

Description

The T4 [four] command sets the analyzer sweep to video trigger mode.

NOTE

The functions of the T4 [four] command are identical to the TM VID command (page 354).
Programming Commands

TA Trace A

Syntax

```
TA ;
```

Description

Returns trace A amplitude values from the analyzer to the controller.

The display unit values are transferred in sequential order (from left to right) as seen on the screen. Display unit values can be transferred to the controller in any one of the four output formats as determined by the O1 [one] (page 288), O2 [two] (page 289), O3 [three] (page 290) and O4 [four] commands (page 291). The format of the returned data is also affected by the TDF (Trace Data Format) (page 350) command and, if TDF B (binary data format) has been selected, by the MDS command (page 248).
TB Trace B

Syntax

\[ \text{T8} ; \]

Description

Returns trace B amplitude values from the analyzer to the controller. The display unit values are transferred in sequential order (from left to right) as seen on the screen. Display unit values can be transferred to the controller in any one of the four output formats as determined by the O1 [one] (page 288), O2 [two] (page 289), O3 [three] (page 290) and O4 [four] commands (page 291). The format of the returned data is also affected by the TDF (Trace Data Format) (page 350) command and, if TDF B (binary data format) has been selected, by the MDS command (page 248).
TDF Trace Data Format

Syntax

TDF

Description

Formats trace information for return to the controller.

The different trace data formats are as follows:

- Specifying M enables the 01 format and returns values in display units, from 0 to 1001.
- Specifying P enables the 03 format and returns absolute measurement values, such as dBm or Hz.
- Specifying A returns data as an A-block data field. The MDS command determines whether data comprises one or two 8-bit bytes. (See MDS (page 248))
- Specifying I returns data as an I-block data field. The MDS command determines whether data comprises one or two 8-bit bytes. (See MDS (page 248))
- Specifying B enables the 02 or 04 format. The MDS command determines whether data comprises one or two 8-bit bytes.
TH Threshold

Syntax

8566 and 8568 Remote Language

8560 Series and 8590 Series Remote Language

Description

The TH command blanks signal responses below the threshold level, similar to a base line clipper. The threshold level is nine major divisions below the reference level, unless otherwise specified. The UP and DN commands move the threshold 10 dB.

NOTE

The legacy analyzers all blank the display of everything below the threshold level, but this is not the case with PSA analyzers. Using the PEAKS (page 295) and MKPK (page 270) commands causes any values below the threshold level to be disregarded, even though the full trace will still be displayed. The 8560 Series supported the MKPT command in addition to the TH command. In PSA analyzers, both the TH and the MKPT commands will set the Marker Peak Threshold level; so if both commands are used in a single program, incompatibility issues may be experienced.

Chapter 4
TIMEDATE
Time Date

Syntax

```
TIMEDATE number SP ;
```

Description
Sets the date and time of the real-time clock of the spectrum analyzer. The number takes the form YYMMDDHHMMSS (Year, Month, Day, Hour, Minute, Second).
TITLE
Title

Syntax

Description
The TITLE command activates the screen title mode, enabling you to enter your own title for the screen. Valid string delimiters which must be used to start and terminate the title are shown below.

- !
- “
- $
- %
- &
- ‘
- ‘
- /
- :
- =
- \n- ~
- @
**TM Trigger Mode**

**Syntax**

```
TM SE FREE; VID LINE EXT?
```

**Description**

Selects a trigger mode: free, line, video, or external.

**NOTE**

The functions of the TM command are identical to the T1 (page 344), T2 (page 345), T3 (page 346) and T4 (page 347) commands.
TRA
Trace Data Input and Output

Syntax

\[ \text{TRA} \rightarrow ? \rightarrow ; \]

Description

The TRA command transfers Trace A amplitude values from the analyzer to the controller. The format depends on the trace data format selected. See the TDF command (page 350) for details on formatting.
TRB
Trace Data Input and Output

Syntax

```
TRB  ?  ;
```

Description

The TRB command transfers Trace B amplitude values from the analyzer to the controller. The format depends on the trace data format selected. See the TDF command (page 350) for details on formatting.
TRC
Trace Data Input and Output

Syntax

```
TRC ? ;
```

Description

The TRC command transfers Trace Amplitude values from the analyzer to the controller. The format depends on the trace data format selected. See the TDF command (page 350) for details on formatting.
**TRDSP**
Trace Display

**Syntax**

```
TRDSP SP 
TRB SP
TRC SP
ON
OFF 1
0
?
```

**Description**

The TRDSP command turns the display of the specified trace on or off.
**TRIGPOL Trigger Polarity**

**Syntax**

```
TRIGPOL SP POS ;
```

**Description**

Selects the edge (positive or negative) of the trigger input that causes the trigger event. TRIGPOL is available in all trigger modes.
Programming Commands

TRPRST Trace Preset

Syntax

```
TRPRST
```

Description

Sets the trace operations to their preset values.

NOTE

Option 266 Language Code Compatibility does not do the following stages of TRPRST as they are not supported:

- ANLGPLUS OFF
- DISPOSE ONEOS
- DISPOSE ONSWP
- DISPOSE TRMATH
- EM
TRSTAT
Trace State

Syntax

```
TRSTAT ? ;
```

Description

The TRSTAT command returns trace states to the controller. Valid trace states are Clear-write, Off, View, Maximum Hold, and Blank.

Table 4-18 Possible Trace States

<table>
<thead>
<tr>
<th>Trace State Description</th>
<th>Trace State Data Returned</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clear-write</td>
<td>CLRW</td>
</tr>
<tr>
<td>View</td>
<td>VIEW</td>
</tr>
<tr>
<td>Blank</td>
<td>BLANK</td>
</tr>
<tr>
<td>Off</td>
<td>No data is returned</td>
</tr>
<tr>
<td>Maximum Hold</td>
<td>MXMH</td>
</tr>
</tbody>
</table>
TS
Take Sweep

Syntax

TS

Description

Starts and completes one full sweep before the next command is executed.

A take sweep is required for each sweep in the single-sweep mode. TS prevents further input from the interface bus until the sweep is completed to allow synchronization with other instruments.
VAVG
Video Average

Syntax

8560 Series Remote Language

VAVG Sr average length ;
Sr UP DN ON OFF ;

8566 and 8568 Remote Language

VAVG Sr average length ;
Sr ON OFF ;

Description

Enables the video-averaging function, which averages trace points to smooth the displayed trace. When queried, the VAVG command returns the average length.

NOTE
The functions of the VAVG command are identical to the KSG command (page 198) and KSH command (page 200).

NOTE
There are a few differences in the way video averaging works in Option 266 Programming Code Compatibility Suite compared to the legacy spectrum analyzers. See the following table for a summary of these differences.
## Table 4-19  Legacy Analyzers - Video Averaging Behavioral Differences

<table>
<thead>
<tr>
<th>Condition</th>
<th>Legacy Spectrum Analyzers</th>
<th>Option 266 - Programming Code Compatibility Suite</th>
</tr>
</thead>
<tbody>
<tr>
<td>All conditions.</td>
<td><em>8566 and 8568 only</em> - Original trace is displayed in Trace C.</td>
<td>Only displays the averaged trace. The averaged trace is displayed in Trace A.</td>
</tr>
<tr>
<td>Average Count value set to 0.</td>
<td>Cannot be set to 0.</td>
<td>Video averaging is turned off if the Averaging Count is set to 0.</td>
</tr>
<tr>
<td>Change in Average Count setting to a higher value.</td>
<td><em>8566 and 8568 only</em> - Continues counting from where the previous value left off.</td>
<td>Resets the counter to zero and starts the measurement again.</td>
</tr>
<tr>
<td>Change in average counter setting to a lower value.</td>
<td><em>8566 and 8568 only</em> - Updates the screen annotation with the lower averaging value.</td>
<td>If the new count value has not been reached, continues until the new lower count has been reached. If the new, lower count value has already been reached, the analyzer will stop and wait until you take a new sweep.</td>
</tr>
<tr>
<td>Averaging turned on.</td>
<td>Sweep time remains unchanged.</td>
<td>Sweep time changes due to the selection of the sample detector.</td>
</tr>
<tr>
<td>Change in resolution bandwidth, video bandwidth, sweep time, reference level or attenuation.</td>
<td><em>8566 and 8568 only</em> - In single sweep mode, resets counter to zero and starts the averaging again.</td>
<td>Continues the measurement without resetting the counter.</td>
</tr>
<tr>
<td>Change in center frequency or span.</td>
<td>In single sweep mode, resets counter to zero and starts the averaging again. <em>8566 and 8568 only</em> - Also reset the counter after changes in RBW, VBW, Sweep Time, Ref. Level and Attenuation.</td>
<td>In single sweep mode, resets counter to zero and starts the averaging again. Does not reset the counter after changes in RBW, VBW, Sweep Time, Ref. Level and Attenuation.</td>
</tr>
</tbody>
</table>
VB Video Bandwidth

Syntax

8560 Series Remote Language

8566 and 8568 Remote Language
8590 Series Remote Language

**Description**

Specifies the video bandwidth, which is a post-detection, low-pass filter.

---

**NOTE**

Default values on the PSA analyzers may differ from the legacy analyzers. Refer to the PSA *User’s and Programmer’s Reference, Volume 1* for more details on the restrictions on the video bandwidth range.

When auto coupled, the video bandwidth is calculated as Resolution Bandwidth x Video Resolution Bandwidth Ratio. See the VBO command (page 367) for more details.
VBO

Video Bandwidth Coupling Offset

Syntax

Description

The VBO command specifies the relationship between the video and resolution bandwidths which is maintained when these bandwidths are coupled. The bandwidths are usually coupled unless the RB command (page 309) or VB command (page 365) have been executed.

- When 0 is selected, the ratio remains fixed at 1. That is, the resolution bandwidth and the video bandwidth are always equal.

- When 1 is selected, the video bandwidth is one step higher than the resolution bandwidth. That is, the video bandwidth:resolution bandwidth ratio is three.

- When -1 is selected, the video bandwidth is one step lower than the resolution bandwidth. That is, the video bandwidth:resolution bandwidth ratio is 0.3.
VBR Video Bandwidth to Resolution Bandwidth Ratio

Syntax

```
VBR [SP | UP | DN | OA] number ;
```

Description

The VBR command specifies the relationship between the video and resolution bandwidths that is maintained when these bandwidths are coupled.

**NOTE**

Some differences may be seen between the resolution bandwidth and video bandwidth settings when auto coupled on a PSA Series analyzer.

```
VIEW
View Trace

Syntax

Description
Displays Trace A, trace B, or trace C, and stops taking new data into the viewed trace.

NOTE
The functions of the VIEW command are identical to the A3 (page 91), B3 (page 127) and KSj (page 204) commands.

NOTE
TRA corresponds to Trace 1, TRB corresponds to Trace 2, and TRC corresponds to Trace 3.
Programming Commands

VTL Video Trigger Level

Syntax

The VTL command sets the signal level that triggers a sweep.

Description

The VTL command sets the signal level that triggers a sweep.
XCH
Exchange

Syntax

Description
The XCH command exchanges the contents of the source and
destination traces. The traces are analyzed and adjusted to fit the
number of display points on the screen.

NOTE
The functions of the XCH TRA,TRB command are identical to the AXB
(page 124) and EX (page 171) commands.
The functions of the XCH TRB,TRC command are identical to the BXC
(page 133) and KSi (page 203) commands.
Programming Commands
XCH Exchange
5 A Brief Introduction to the SCPI Language
SCPI Language Basics

This section is not intended to teach you everything about the SCPI (Standard Commands for Programmable Instruments) programming language. The SCPI Consortium or IEEE can provide that level of detailed information.

Topics covered in this chapter include:

- “Creating Valid Commands” on page 374
- “Command Keywords and Syntax” on page 374
- “Special Characters in Commands” on page 375
- “Parameters in Commands” on page 377
- “Putting Multiple Commands on the Same Line” on page 379

For more information refer to:


Command Keywords and Syntax

A typical command is made up of keywords set off by colons. The keywords are followed by parameters that can be followed by optional units.

Example: `SENSe:FREQuency:STARt 1.5 MHZ`

The instrument does not distinguish between upper and lower case letters. In the documentation, upper case letters indicate the short form of the keyword. The lower case letters, indicate the long form of the keyword. Either form may be used in the command.

Example: `Sens:Freq:Star 1.5 mhz`

is the same as `SENSE:FREQ:start 1.5 MHz`

---

**NOTE**

The command `SENS:FREQU:STAR` is not valid because `FREQU` is neither the short, nor the long form of the command. Only the short and long forms of the keywords are allowed in valid commands.

Creating Valid Commands

Commands are not case sensitive and there are often many different ways of writing a particular command. These are examples of valid
commands for a given command syntax:

<table>
<thead>
<tr>
<th>Command Syntax</th>
<th>Sample Valid Commands</th>
</tr>
</thead>
<tbody>
<tr>
<td>[SENSe:]BANDwidth[:RESolution] &lt;freq&gt;</td>
<td>The following sample commands are all identical. They will all cause the same result.</td>
</tr>
<tr>
<td></td>
<td>• Sense:Band:Res 1700</td>
</tr>
<tr>
<td></td>
<td>• BANDWIDTH:RESOLUTION 1.7e3</td>
</tr>
<tr>
<td></td>
<td>• sens:band 1.7KHZ</td>
</tr>
<tr>
<td></td>
<td>• SENS:band 1.7E3Hz</td>
</tr>
<tr>
<td></td>
<td>• band 1.7kHz</td>
</tr>
<tr>
<td></td>
<td>• bandwidth:RES 1.7e3Hz</td>
</tr>
<tr>
<td>MEASure:SPECTrum[n]?</td>
<td>• MEAS:SPEC?</td>
</tr>
<tr>
<td></td>
<td>• Meas:spec?</td>
</tr>
<tr>
<td></td>
<td>• meas:spec3?</td>
</tr>
<tr>
<td></td>
<td>The number 3 in the last meas example causes it to return different results then the commands above it. See the command description for more information.</td>
</tr>
<tr>
<td>[:SENSe]:DETector[:FUNCtion] NEGative</td>
<td>POSitive</td>
</tr>
<tr>
<td></td>
<td>• Detector:Func Pos</td>
</tr>
<tr>
<td>INITiate:CONTinuous ON</td>
<td>OFF</td>
</tr>
<tr>
<td></td>
<td>• INIT:CONT ON</td>
</tr>
<tr>
<td></td>
<td>• init:continuous 1</td>
</tr>
</tbody>
</table>

**Special Characters in Commands**

<table>
<thead>
<tr>
<th>Special Character</th>
<th>Meaning</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>\</td>
<td>A vertical stroke between <strong>parameters</strong> indicates alternative choices. The effect of the command is different depending on which parameter is selected.</td>
<td>Command: TRIGger:SOURce EXTernal</td>
</tr>
</tbody>
</table>
### Special Character

<table>
<thead>
<tr>
<th>Special Character</th>
<th>Meaning</th>
<th>Example</th>
</tr>
</thead>
</table>
| ![vertical stroke] | A vertical stroke between **keywords** indicates identical effects exist for both keywords. The command functions the same for either keyword. Only one of these keywords is used at a time. | Command: `SENSe:BANDwidth|BWIDth:OFFSET`  
Two identical commands are:  
Ex1: `SENSe:BWIDTH:OFFSET`  
Ex2: `SENSe:BAND:OFFSET` |
| ![square brackets] | Keywords in square brackets are optional when composing the command. These implied keywords will be executed even if they are omitted. | Command: `[SENSe:]BANDwidth[:RESolution]:AUTO`  
The following commands are all valid and have identical effects:  
Ex1: `bandwidth:auto`  
Ex2: `band:resolution:auto`  
Ex3: `sense:bandwidth:auto` |
| ![angle brackets] | Angle brackets around a word, or words, indicates they are not to be used literally in the command. They represent the needed item. | Command: `SENS:FREQ <freq>`  
In this command example the word `<freq>` should be replaced by an actual frequency.  
Ex: `SENS:FREQ 9.7MHz`. |
| ![braces] | Parameters in braces can optionally be used in the command either not at all, once, or several times. | Command: `MEASure:BW <freq>{,level}`  
A valid command is: `meas:BW 6 MHz, 3dB, 60dB`. |
Parameters in Commands

There are four basic types of parameters: booleans, keywords, variables and arbitrary block program data.

OFF | ON | 0 | 1
(Boolean) This is a two state boolean-type parameter. The numeric value 0 is equivalent to OFF. Any numeric value other than 0 is equivalent to ON. The numeric values of 0 or 1 are commonly used in the command instead of OFF or ON. Queries of the parameter always return a numeric value of 0 or 1.

keyword The keywords that are allowed for a particular command are defined in the command syntax description.

Units Numeric variables may include units. The valid units for a command depend on the variable type being used. See the following variable descriptions. The indicated default units will be used if no units are sent. Units can follow the numerical value with, or without, a space.

Variable A variable can be entered in exponential format as well as standard numeric format. The appropriate range of the variable and its optional units are defined in the command description.

The following keywords may also be used in commands, but not all commands allow keyword variables.

- DEFault - resets the parameter to its default value.
- UP - increments the parameter.
- DOWN - decrements the parameter.
- MINimum - sets the parameter to the smallest possible value.
- MAXimum - sets the parameter to the largest possible value.

The numeric value for the function’s MINimum, MAXimum, or DEFault can be queried by adding the keyword to the command in its query form. The keyword must be entered following the question mark.

Example query: SENSE:FREQ:CENTEr? MAX

Variable Parameters

<integer> is an integer value with no units.

<real> Is a floating point number with no units.
<bandwidth> Is a positive rational number followed by optional units. The default unit is Hertz. Acceptable units include: Hz, kHz, MHz, GHz.

<time> <seconds> Is a rational number followed by optional units. The default units are seconds. Acceptable units include: ks, s, ms, us, ns.

<voltage> Is a rational number followed by optional units. The default units are Volts. Acceptable units include: V, mV, uV, nV

<current> Is a rational number followed by optional units. The default units are Amperes. Acceptable units include: A, mA, uA, nA.

<power> Is a rational number followed by optional units. The default units are W. Acceptable units include: mAW, kW, W, mW, uW, nW, pW.

<ampl> Is a rational number followed by optional units. The default units are dBM. Acceptable units include: dBM, dBmV, dBuV.

<rel_power> <rel_ampl> Is a positive rational number followed by optional units. The default units are dB. Acceptable units include: dB.

<percent> Is a rational number between 0 and 100. You can either use no units or use PCT.

<angle> <degrees> Is a rational number followed by optional units. The default units are degrees. Acceptable units include: DEG, RAD.

<string> Is a series of alpha numeric characters.

/bit_pattern> Specifies a series of bits rather than a numeric value. The bit series is the binary representation of a numeric value. There are no units.

Bit patterns are most often specified as hexadecimal numbers, though octal, binary or decimal numbers may also be used. In the SCPI language these numbers are specified as:

- Hexadecimal, #Hdddd or #hdddd where ‘d’ represents a hexadecimal digit 0 to 9 and ‘a’ to ‘f’. So #h14 can be used instead of the decimal number 20.
- Octal, #Odddd or #oddddd where ‘d’ represents an octal digit 0 to 7. So #o24 can be used instead of the decimal number 20.
- Binary, #Bdddddddddddddddd or #bdddddddddddddddd where ‘d’ represents a 1 or 0.
So \#b10100 can be used instead of the decimal number 20.

**Block Program Data**

Some parameters consist of a block of data. There are a few standard types of block data. Arbitrary blocks of program data can also be used.

<trace> Is an array of rational numbers corresponding to displayed trace data. See FORMat:DATA for information about available data formats.

A SCPI command often refers to a block of current trace data with a variable name such as: Trace1, TRACE2, or trace3, depending on which trace is being accessed.

<arbitrary block data> Consists of a block of data bytes. The first information sent in the block is an ASCII header beginning with #. The block is terminated with a semi-colon. The header can be used to determine how many bytes are in the data block. There are no units. (You will not get block data if your data type is ASCII, using FORMat:DATA ASCII command. Your data will be comma separated ASCII values.

Block data example: suppose the header is \#512320.

- The first digit in the header (5) tells you how many additional digits/bytes there are in the header.
- The 12320 means 12 thousand, 3 hundred, 20 data bytes follow the header.
- Divide this number of bytes by your current data format (bytes/data point), either 8 (for real,64), or 4 (for real,32). For this example, if you’re using real64 then there are 1540 points in the block.

**Putting Multiple Commands on the Same Line**

Multiple commands can be written on the same line, reducing your code space requirement. To do this:

- Commands must be separated with a semicolon (;).
- If the commands are in different subsystems, the key word for the new subsystem must be preceded by a colon (:).
- If the commands are in the same subsystem, the full hierarchy of the command key words need not be included. The second command can start at the same key word level as the command that was just executed.

**SCPI Termination and Separator Syntax**

All binary trace and response data is terminated with <NL><END>, as

The following are some examples of good and bad commands. The examples are created from a theoretical instrument with the simple set of commands indicated below:

```
[:SENSe]
  :POWer
  [:RF]
  :ATTenuation 40dB

:TRIGger
  [:SEQuence]
  :EXTernal [1]
  :SLOPe
  POSitive

[:SENSe]
  :FREQuency
  :STARt
  :POWer
  [:RF]
  :MIXer
  :RANGe
  [:UPPer]
```

<table>
<thead>
<tr>
<th>Bad Command</th>
<th>Good Command</th>
</tr>
</thead>
<tbody>
<tr>
<td>PWR:ATT 40dB</td>
<td>POW:ATT 40dB</td>
</tr>
</tbody>
</table>

The short form of POWER is POW, not PWR.

<table>
<thead>
<tr>
<th>FREQ:STAR 30MHz;MIX:RANG -20dBm</th>
<th>FREQ:STAR 30MHz;POW:MIX:RANG -20dBm</th>
</tr>
</thead>
</table>

The MIX:RANG command is in the :SENSe subsystem as FREQ, but executing the FREQ command puts you back at the SENSE level. You must specify POW to get to the MIX:RANG command.

<table>
<thead>
<tr>
<th>FREQ:STAR 30MHz;POW:MIX RANG -20dBm</th>
<th>FREQ:STAR 30MHz;POW:MIX:RANG -20dBm</th>
</tr>
</thead>
</table>

MIX and RANG require a colon to separate them.

<table>
<thead>
<tr>
<th>:POW:ATT 40dB;TRIG:FREQ:STAR 2.3GHz</th>
<th>:POW:ATT 40dB;:FREQ:STAR 2.3GHz</th>
</tr>
</thead>
</table>

:TRIG:FREQ:STAR is in the :SENSe subsystem, not the :TRIGGER subsystem.

|----------------------|-----------------------|
A Brief Introduction to the SCPI Language

SCPI Language Basics

<table>
<thead>
<tr>
<th>Bad Command</th>
<th>Good Command</th>
</tr>
</thead>
<tbody>
<tr>
<td>:POW and FREQ are within the same :SENSE subsystem, but they are two separate commands, so they should be separated with a semicolon, not a colon.</td>
<td>:POW:ATT -5dB; :FREQ:STAR 10MHz; :POW:ATT 5dB; :FREQ:STAR 10MHz</td>
</tr>
</tbody>
</table>

Attenuation cannot be a negative value.
Index

Numerics
8-bit bytes, 289, 291

A
A minus B
  into A, 112, 135
  off, 134
  plus display line, 113
A plus B
  to A, 116, 193
A1, 89
A2, 90
A3, 91
A4, 92
absolute amplitude units, 119
AC coupling, 183
AC/DC, 182, 183
ACP, 93
ACALPHA, 94
ACALTC, 95
ACPBRPER, 96
ACPBRWID, 97
ACPBMW, 98
ACPULSE, 99
ACPFRQWT, 100
ACPLower, 101
ACPMAX, 102
ACPMAX, 103
ACPMSTATE, 104
ACPPAR, 105
ACPWPRTX, 106
ACPSLTS, 107
ACPS, 108
ACPT, 109
ACPUPPER, 110
activate limit line segment, 326
activate marker, 256
active license key, 35
how to locate, 35
add limit line segment, 322
address
display, 154
adjacent channel power, 93
alpha weighting, 94
alternate channels, 95
auto, 105
bandwidth, 98
burst period, 96
burst width, 97
channel spacing, 108
compute, 99
frequency weighting, 100
lower, 101
manual, 105
maximum, 102
measure, 103
measurement results, 107
measurement state, 104
T weighting, 109
total power transmitted, 106
upper, 110
ADJALL, 111
Agilent Technologies URL, 2
alpha weighting, 94
AMB, 112
AMBPL, 113
amplitude
  in dBM, 188
  in dBMV, 190
  in dBUV, 192
  in volts, 194
amplitude marker, 255
amplitude units, 87, 119
analyzer command, 87
angle parameter (variables), 378
ANOT, 115
annotation, 115
  off, 215
  on, 216
  output trace, 294
APB, 116
arbitrary block data, 379
AT, 117
attenuation, 117
  coupling, 136
AUNITS, 119
AUTO, 121
auto couple, 121, 123
AUTOCMP, 123
average
  video, 363
AXB, 124

B
B minus display line, 129
B1, 125
B2, 126
B3, 127
B4, 128
bandwidth
cchannel power, 143
marker, 257
occupied power, 292
power, 301
resolution, 309
video, 365
bit coupling offset, 367
bit_pattern parameter (variables), 378
BL, 129
BLANK, 130
blank
  trace C, 206
  blank trace, 92, 128, 130
block data
  arbitrary, 379
  identifying block size, 379
  parsing output, 379
BML, 131
boolean parameter (commands), 377
BTC, 132
BXC, 135
bytes, 289, 291, 340

C
C1, 134
C2, 135
CA, 136
CAL, 137
calibration, 137
carrier on power, 138
CARRON, 138
center frequency, 139
marker, 164, 258
step size, 336
CF, 139
CHANNEL, 140
channel power, 141, 142
bandwidth, 143
channel selection, 140
CHANPW, 141
Chapter 5, “A Brief Introduction to the SCPI Language,” on page 373, 45
Chapter 5, A Brief Introduction to the SCPI Language,” on page 371, 45
Chapter 6, “A Brief Introduction to the SCPI Language,” on page 247, 45
caracter EOI, 87
caracters, 86
Choose Option key, 35
CHP, 142
CHPWRBW, 142
CISPR, 303, 304
clear
  average, 144
  status byte, 146
write, 89, 125, 145
Clear Command Error Log, 44
CLAVG, 144
CLRW, 145
CLS, 146
Cmd Error Log, 44
command
  mnemonic, 86
terminators, 86
Command Err, 43
commands

383
boolean parameter, 377
keyword parameter, 377
multiple on a line, 379
parameters, 377
syntax, 374
termination, IEEE, 380
units parameter, 377
valid commands, 374
variable parameter, 377
variable parameter keywords, 377
configure remote language, 40
continuous sweep, 147, 320
CONTS, 147
correction factors on, 148
CORREK, 148
counter
marker, 262
COUPLE, 149
couple
attenuation, 136
auto, 121, 123
frequency
step size, 151
input, 149
resolution bandwidth, 150
sweep time, 152
video bandwidth, 153
coupling
AC/DC, 182, 183
video bandwidth
offset, 367
CR, 150
CS, 151
CT, 152
current units, 87
CV, 153
sweep, 161
delete
current limit line, 232
limit line segment, 324
limit line table, 228
deleting an
application/personality, 30
delimiter, 87
DELMKBW, 155
delta marker, 242, 259
occupied power bandwidth, 155
step size, 165
delta value
limit line, 226
DE, 156
detection, 303, 304
mode, 156
negative peak, 195
normal, 189
positive peak, 191
sample, 197
digit, 87
display
address, 154
frequency, 174
limit line, 229
line, 158
line enable, 160
line off, 222
off, 199
on, 201
display trace, 358
DL, 158
DLE, 160
DLYSWP, 161
documentation, 48
DONE, 162
dotted lines
optional path, 86
clearing, 44
displaying, 43
storing, 44
ET, 170
EX, 171
exchange traces, 371
A and B, 124, 171
B and C, 133, 203
excursion
marker peak, 272
extend analyzer reference level, 202
external
preamplifier gain, 299
trigger, 219, 346
trigger mode, 354
F
FA, 172
fast preselector peak, 176
fast preset, 217
FB, 173
FDS, 174
FOFFSET, 175
format
display units, 288
one 8-bit byte, 291
real amplitude units, 290
trace data, 350
two 8-bit bytes, 289
FPKA, 176
free run trigger, 344
free trigger mode, 354
FREF, 177
frequency
center, 139
display off, 174
limit line, 227
limit line segment entry, 327
marker, 261
marker readout, 273
offset, 175, 218
reference, 177
segment entry, 327
span, 333
start, 172
stop, 173
units, 87
frequency parameter (variables), 378
FS, 178
full span, 178
G
gain
external preamplifier, 299
getting started, 26
Index

GRAT, 180
graticule, 180
off, 211
on, 213

H
hardware broken SRQ, 307
hardware requirements, 28
HD, 181
hinds, 82
compatibility, 82
instrument presets, 83
overloading, 83
SCPI language, 83
speed, 82
sweep times, 82
synchronization, 82, 83
time out, 82
hold
data entry, 181
maximum, 287
minimum, 253
HP8560E/EC remote language, 40
HP8561E/EC remote language, 40
HP8562E/EC remote language, 40
HP8563E/EC remote language, 40
HP8564E/EC remote language, 40
HP8565E/EC remote language, 40
HP8566B remote language, 41
HP8568B remote language, 41
HP8590L remote language, 41
HP8591E remote language, 41
HP8592L remote language, 41
HP8593E remote language, 41
HP8594E remote language, 42
HP8594EL remote language, 42
HP8595E remote language, 42
HP8596E remote language, 42

I
I1, 182
I2, 183
ID, 184
identify, 184
IEEE command termination, 380
IP adjustment, 111
illegal command SRQ, 305
impedance
units, 87
input attenuation, 117
coupling, 149
input attenuation, 44
Install Now key, 35
Installing and Obtaining a license key, 34
installing measurement
personalities, 30
instrument preset, 185
integer variable (variables), 377
IP, 185

K
keyword parameter (commands), 377
KS, 186
KSa, 187
KSB, 190
KSh, 191
KSc, 192
KSc, 193
KSD, 194
KSe, 195
KSE, 196
KSG, 198
KSh, 199
KSH, 200
KSI, 202
KSi, 203
KSk, 204
KSk, 205
KSk, 206
KSL, 207
KSL, 208
KSM, 209
KSm, 211
KSN, 212
KSn, 213
KSO, 214
KSO, 215
KSp, 216
KST, 217
KSV, 218
KSw, 219
KSy, 220
KSZ, 221

L
L0, 222
level
mixer, 283
reference, 315
reference offset, 318
video trigger, 370
LG, 224
license key
obtaining and installing, 34
LIMD, 226
LIMF, 227
LIMDEL, 228
LIMIDESP, 229
LIMFAIL, 230
LIMFT, 231
LIMPURGE, 232
LIMIREL, 233
limit
lower amplitude, 235
middle amplitude, 236
upper amplitude, 237
limit line
activate segment, 326
add segment, 322
delete current, 323
delete segment, 324
delete table, 228
delta value, 226
display, 229edit, 168
enable testing, 234
def of edit, 167
frequency, 231
frequency value, 227
relative, 233
segment activate, 326
segment entry for frequency limit line, 327
segment terminate, 325
terminate segment, 325
testing, 234
time, 231
limitations, 26
commands supported, 27
predefined functions, 27
user-defined functions, 27
LIMITEST, 234
limits failed, 230
LIML, 235
LIMM, 236
LIMU, 237
line trigger, 345
line trigger mode, 354
linear scale, 238
LN, 238
LO adjustment, 111
LO and IF adjustment, 111
loading an
application/personality, 30
logarithmic scale, 224
lower adjacent channel power, 101
lower-limit amplitude, 235
lab length, 87
LSPAN, 239

M
M1, 240
M2, 241
M3, 242
M4, 244
MA, 245
marker
activate, 256
amplitude, 255
amplitude output, 245
bandwidth, 257
center frequency, 164, 258
counter, 262
counter resolution, 263
delta, 242, 259
delta step size, 165
frequency, 261
frequency counter off, 246
frequency counter on, 247
frequency output, 252
minimum, 212, 264
next peak, 205
noise, 266
noise off, 207
noise on, 209
normal, 241, 265
occupied power bandwidth, 155
off, 240, 268
peak, 163, 270
peak excursion, 272
position, 269
readout, 273
reference level, 166
span, 214
step size, 165, 277
table, 279
threshold, 271
time, 278
to span, 276
trace, 280
track, 281
track off, 285
track on, 286
type, 282
zoom, 244
marker amplitude, 255
marker amplitude output, 245
marker bandwidth, 257
marker counter, 262
marker counter resolution, 187, 263
marker delta, 259
marker frequency, 261
marker frequency counter off, 246
marker frequency counter on, 247
marker frequency output, 252
marker minimum, 212, 264
marker noise, 266
marker noise off, 207
marker noise on, 209
marker normal, 241, 265
marker off, 240, 268
marker peak, 270
marker peak excursion, 272
marker position, 269
marker readout, 273
marker readout in frequency, 273
marker span, 214
marker step size, 277
marker table, 279
marker threshold, 271
marker time, 278
marker to center frequency, 164, 258
marker to next peak, 205
marker to reference level, 166, 275
marker track, 280
marker track on, 281
marker track off, 285
marker track on, 286
marker type, 282
max mixer level, 44
maximum adjacent channel
power, 102
maximum hold, 90, 126, 287
MC0, 246
MC1, 247
MDS, 248
MEAN, 249
mean
power measurement, 250
trace, 249
mean power measurement, 250
MEANPWR, 250
MEASOFF, 251
measurement
data size, 248
off, 251
MF, 252
middle-amplitude
limit, 236
MINH, 253
minimum
hold, 253
marker, 212, 264
x position, 254
MINPOS, 254
missing options, 30
mixer level, 186, 283
MKA, 255
MKACT, 256
MKBW, 257
MKCF, 258
MKD, 259
MKF, 261
MKFC, 262
MKFCR, 263
MKMIN, 264
MKN, 265
MKNOISE, 266
MKOFF, 268
MKP, 269
MKPK, 270
MKPT, 271
MKPX, 272
MKREAD, 273
MKRL, 275
MKSP, 276
MKSS, 277
MKT, 278
MKTBL, 279
MKTRACE, 280
MKTRACK, 281
MKTYPE, 282
ML, 283
mnemonic
command, 86
msb length, 87
MT0, 285
MT1, 286
MXMH, 287

N
negative peak detection, 195
noise
marker, 266
marker off, 207
marker on, 209
measurement, 266
signal to noise ratio, 266
normal
detection, 189
marker, 241, 265
number, 87

O
O1, 288
O2, 289
O3, 290
O4, 291
OCCUP, 292
occupied power bandwidth, 292
occupied power bandwidth within
delta marker, 155
offset
frequency, 175, 218
## Index

- reference level, 221, 318
- video bandwidth coupling, 367
- OL, 293
- Q1, 304
- options
  - loading/deleting, 30
  - options not in instrument memory, 30
- OT, 294
- output data, identifying block size, 379
- output learn string, 293
- output termination, 87
- output trace annotations, 294

### P
- parameter (variables), 377
- parameters (commands), 377
- parameters, variable, 377
- peak
  - excursion marker, 272
  - fast preselector, 176
  - marker, 163, 270
  - negative peak detection, 195
  - position, 296
  - preselector, 298
- PEAKS, 295
- percent occupied power bandwidth, 292
- percent parameter (variables), 378
- personality options not in instrument, 30
- phase parameter (variables), 378
- PKPOS, 296
- PLOT, 297
- polarity
  - trigger, 359
  - position minimum x, 254
- positive peak detection, 191
- power
  - bandwidth, 301
  - carrier on, 138
  - channel, 141, 142
  - percent occupied bandwidth, 292
  - up time, 302
- power measurement mean, 250
- power parameter (variables), 378
- power up time, 302
- PP, 298
- PREAMPG, 299
- preamplifier
  - external gain, 299
- preselector peak, 176, 298
- preset
  - fast, 217
  - trace, 360
- preset instrument, 185
- previous span, 239
- PRINT, 300
- print, 300
- programming
  - command parameters, 377
  - command syntax, 374
  - SCPI basics, 374
  - valid commands, 374
- PWRBW, 301
- PWRUPTIME, 302

### Q
- quasi-peak detection, 303, 304
- query
  - status byte, 340

### R
- R1, 305
- R2, 306
- R3, 307
- R4, 308
- ratio
  - VBW/RBW, 368
  - RB, 150, 309
  - RBR, 311
  - RBW to span ratio, 311
  - RBW/VBW, 44
  - RC, 312
  - readout
    - marker, 273
    - recall last state, 312
    - recommended path, 86
    - reference
      - frequency, 177
      - reference level, 315
      - marker, 275
      - reference level marker, 166
      - reference level offset, 221, 318
      - register 7, 44
    - saving, 44
    - relative limit lines, 233
    - relative power parameter (variables), 378
- remote language configuring, 40
- HP8560E/EC, 40
- HP8561E/EC, 40
- HP8562E/EC, 40
- HP8563E/EC, 40
- HP8564E/EC, 40
- HP8565E/EC, 40
- HP8566B, 41
- HP8568B, 41
- HP8590L, 41
- HP8591E, 41
- HP8592L, 41
- HP8593E, 41
- HP8594E, 42
- HP8594L, 42
- HP8595E, 42
- HP8596E, 42
- SCPI, 40, 45
- repeating syntax element, 86
- reserved words, 86
- resolution marker counter, 187, 263
- resolution bandwidth, 309, 311
- coupling, 150
- video bandwidth ratio, 368
- resolution bandwidth ratio, 311
- results data, identifying block size, 379
- returning or storing trace values, 355, 356, 357
- REV, 314
- revision, 314
- RL, 315
- RMS, 317
- ROFFSET, 318
- root mean square value, 317
- RQS, 319

### S
- S1, 320
- S2, 321
- SADD, 322
- sample detection, 197
- save state, 343
- saving analyzer state, 293
- saving register 7, 44
- scale
  - linear, 238
  - logarithmic, 224
- SCPI language, 40, 45
  - basic info, 374
  - command parameters, 377
  - command syntax, 374
  - keyword parameters, 377
  - valid commands, 374
- screen title, 353
- display, 353
- SDEL, 324
- SDON, 325
- secondary keywords, 86
- SEDI, 326
- segment entry for frequency limit lines, 327
- select frequency line, 231
- select time limit line, 231
Index

selection
channel, 140
SENTER, 327
SER, 328
serial request mask, 319
set
date, 329
RF coupling to AC, 183
RF coupling to DC, 182
time, 330
SETDATE, 329
SETTIME, 330
setting the marker counter
resolution, 187
shipment
verification list, 48
signal-to-noise ratio, 266
single sweep, 321, 332
SMOOTH, 331
smooth trace, 331
SNGLS, 332
softkeys
Atten Offset, 44
Clear Command Error Log, 44
Cmd Error Log, 44
Command Err, 43
Config Remote Lang, 40
HP8566B/EC, 40
HP8565E/EC, 40
HP8563E/EC, 40
HP8564E/EC, 40
HP8566E/EC, 40
HP8565B, 41
HP8566B, 41
HP8569L, 41
HP8569E, 41
HP8592L, 41
HP8593E, 41
HP8594E, 42
HP8594L, 42
HP8595E, 42
HP8596E, 42
Language, 40
Limit RBW/VBW, 44
Save Reg 7, 44
SCPI, 40
SP, 333
span, 311, 333
frequency, 333
full, 178
marker, 214, 276
previous, 239
span zoom, 244
special, 86
numbers, 86
SPEED|DRANGE|DYNAMIC
marker, 271
time, 352
elapsed, 170
marker, 278
set, 330
units, 87
time date, 352
time parameter (variables), 378
TIMEDATE, 352
tips, 82
compatibility, 82
instrument presets, 83
overloading, 83
SCPI language, 83
speed, 82
sweep times, 82
synchronization, 82, 83
time out, 82
TITLE, 353
title mode, 196
title, 353
TM, 354
TRA, 355
trace
A plus B to A, 193
blank, 92, 130
blank trace C, 206
data input, 355, 356, 357
data output, 355, 356, 357
display, 358
exchange, 371
exchange B and C, 203
mean, 249
output annotations, 294
preset, 360
returning values, 355, 356, 357
smooth, 331
standard deviation of
amplitudes, 341
state, 361
storing values, 355, 356, 357
transfer B to C, 208
view, 91, 127
view trace C, 204
trace B minus display line, 131
trace data format, 350, 379
trace data input, 355, 356, 357
trace data input and output, 355, 356, 357
trace data output, 355, 356, 357
trace marker, 280
trace mean, 249
trace preset, 360
track marker, 281
transfer traces
B to C, 132, 208
TRB, 356
Index

TRC, 357
TRDSP, 358
trigger
  external, 219, 346, 354
  free, 354
  free run, 344
  line, 345, 354
  mode, 354
  polarity, 359
  TV, 354
  video, 220, 347, 354
  video level, 370
triggering the spectrum analyzer, 354
TRIGPOL, 359
TRPRST, 360
TRSTAT, 361
TS, 362
TV trigger mode, 354
type marker, 282

U
Uninstall Now, 35
uninstalling measurement personalities, 30
units, 87
units-key parameter (commands), 377
units-key-pressed SRQ, 308
upper adjacent channel power, 110
upper-limit amplitude, 237
URL
  Agilent Technologies, 2
  firmware, 48
  spectrum analyzer updates, 48
user-defined SRQ, 335

V
variable parameter (commands), 377
variables
  angle parameter, 378
  bit_data parameter, 378
  degree parameter, 378
  frequency parameter, 378
  integer parameter, 377
  parameters, 377
  percent parameter, 378
  phase parameter, 378
  power parameter, 378
  relative power parameter, 378
  string parameter, 378
  time parameter, 378
  voltage parameter, 378
  VAVG, 363
  VB, 365
  VBO, 367
  VBR, 368
  VBW/RBW ratio, 368
  video average, 363
  video averaging
    off, 200
    on, 198
  video bandwidth, 365
    coupling, 153
    coupling offset, 367
  resolution bandwidth ratio, 368
  video bandwidth to resolution bandwidth ratio, 368
  video trigger, 220, 347
    level, 370
  video trigger level, 370
  video trigger mode, 354
VIEW, 369
  view
    mode, 91, 127
    trace, 369
    trace C, 204
  view trace, 91, 127
  view trace, trace view, 369
  voltage parameter (variables), 378
  VTL, 370

W
  website
    firmware updates, 48

X
XCH, 371

Z
Q0, 303
zoom marker, 244
Index