

# Trigger Subsystem

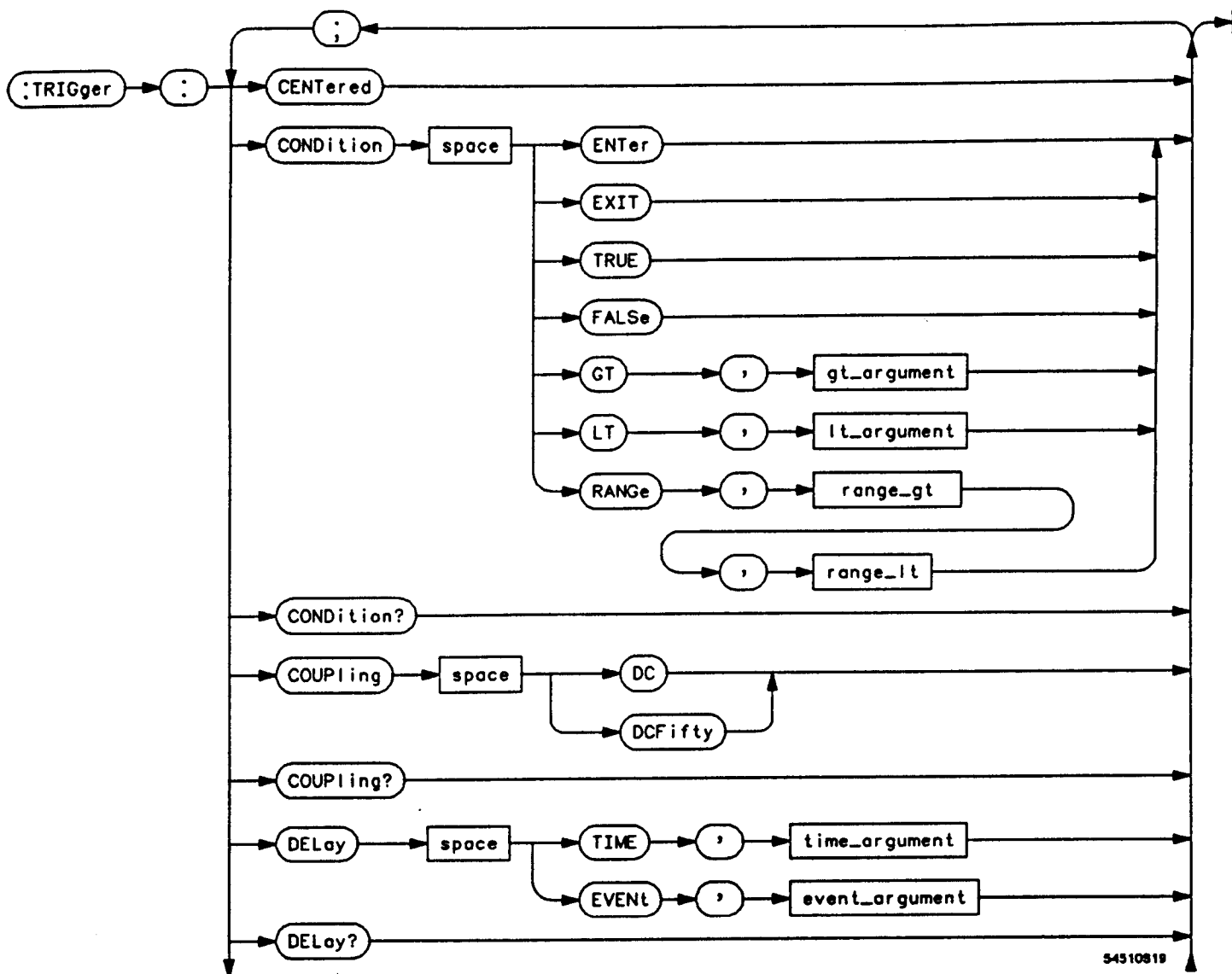
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## Introduction

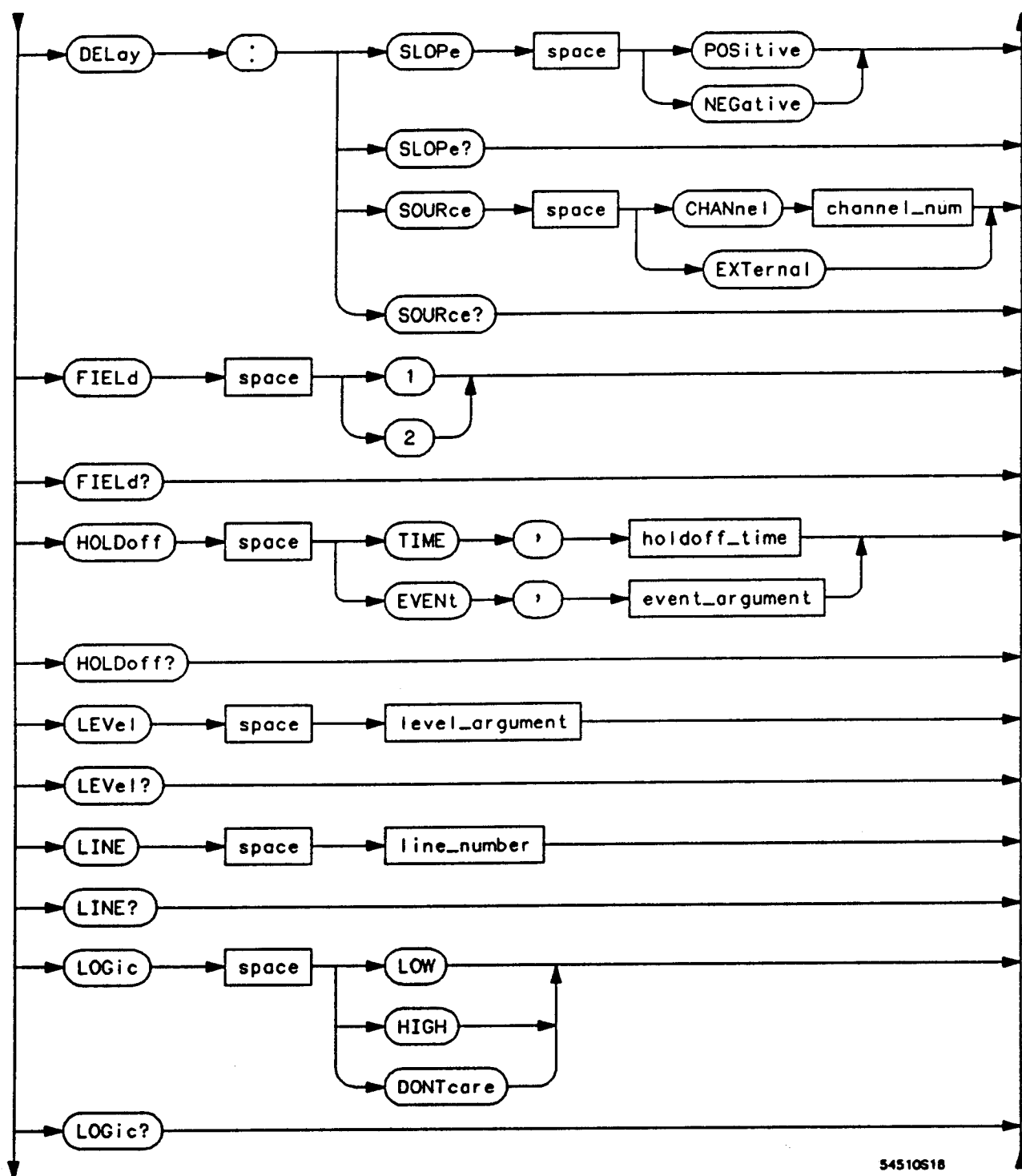
The commands in the TRIGGER subsystem are used to define the conditions for a trigger. Many of the commands in the Trigger subsystem are valid in more than one of the trigger modes. If the command is a valid command for a trigger mode, that setting is accepted. If the command is not valid for a trigger mode, an error is generated. This subsystem contains the following commands:

- CENTERed
- CONDition
- COUPling
- DELay
- DELay:SLOPe
- DELay:SOURce
- FIELD
- HOLDoff
- LEVel
- LINE
- LOGic
- MODE
- OCCurrence
- OCCurrence:SLOPe
- OCCurrence:SOURce
- PATH
- POLarity
- PROBe
- QUALify
- SENSitivity
- SLOPe
- SOURce
- STANdard

Figure 17-1 lists the syntax diagrams for the Trigger subsystem commands.

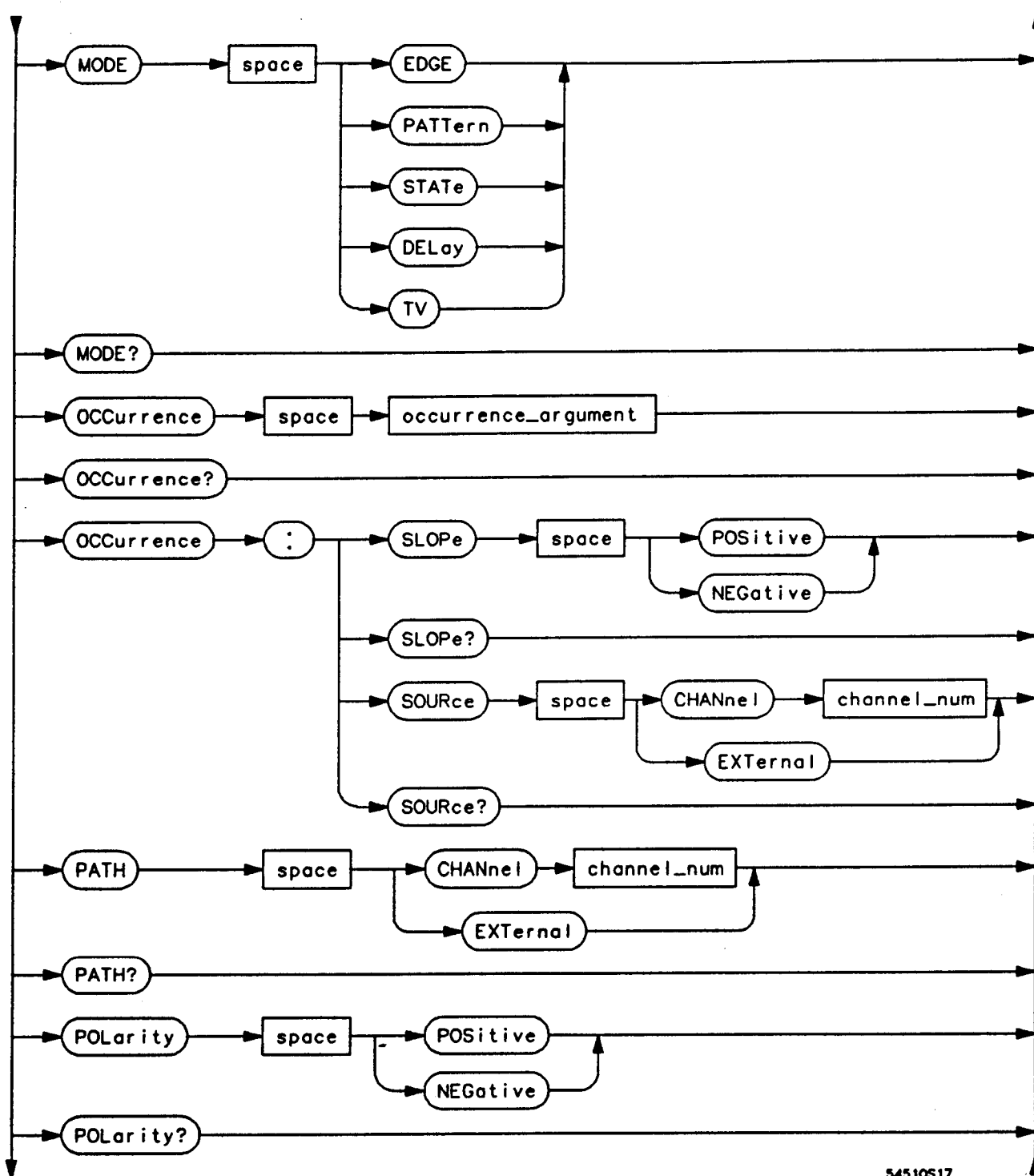


**Figure 17-1. Trigger Subsystem Commands Syntax Diagram**



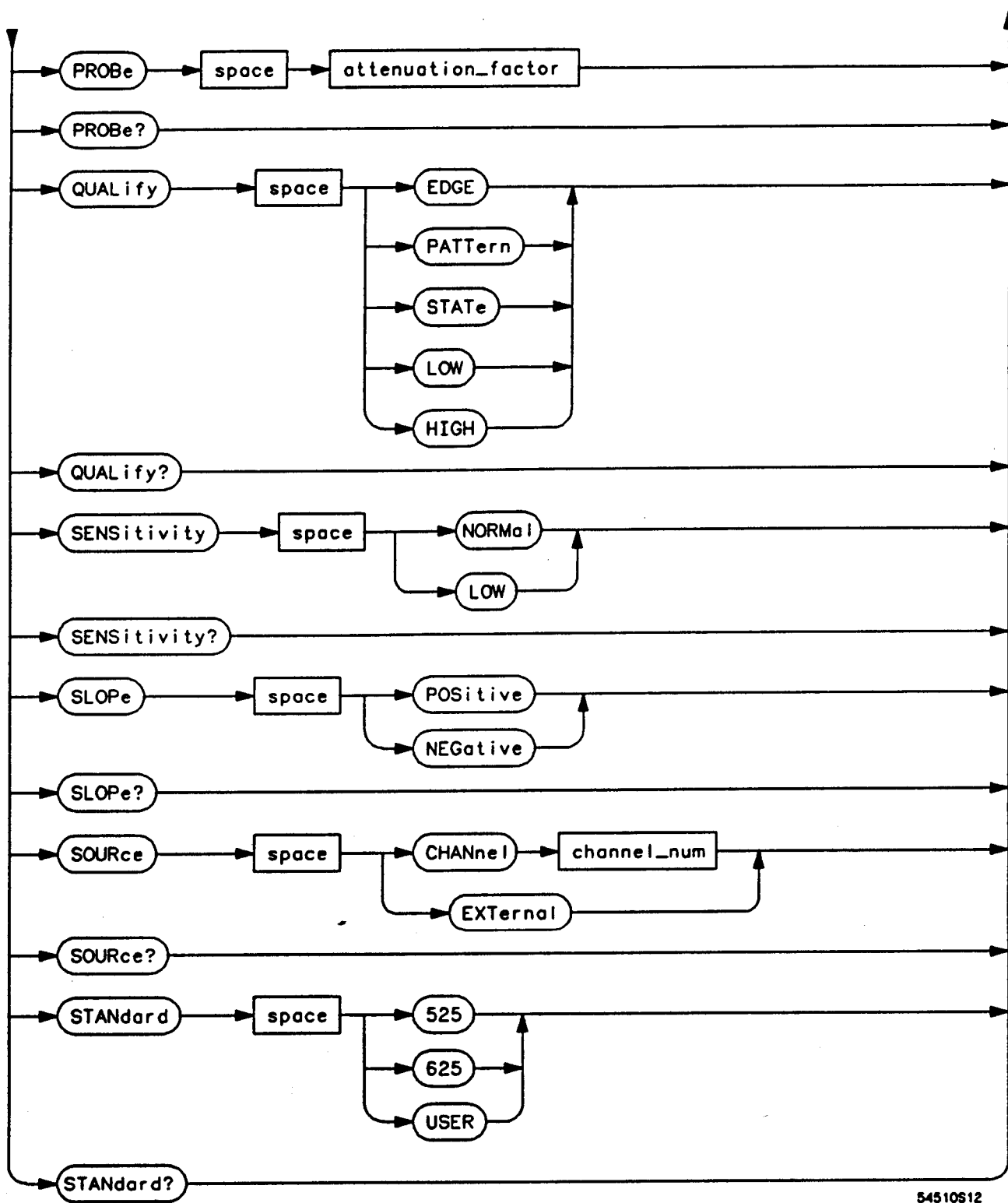
54510S18

**Figure 17-1. Trigger Subsystem Commands Syntax Diagram (continued)**



54510S17

**Figure 17-1. Trigger Subsystem Commands Syntax Diagram (continued)**



54510S12

**Figure 17-1. Trigger Subsystem Commands Syntax Diagram (continued)**

<b>attenuation_factor =</b>	a real number, 0.9 to 1000.
<b>channel_num =</b>	an integer, 1 or 2.
<b>event_argument =</b>	an integer, 1 to 16000000.
<b>gt_argument =</b>	a time value, 20 ns to 160 ms.
<b>holdoff_time =</b>	a time value, 40 ns to 320 ms.
<b>level_argument =</b>	a real number specifying the trigger level in volts.
<b>line_number =</b>	an integer, 1 to 625 (depending on the video STANDARD selected).
<b>lt_argument =</b>	a time value, 20 ns to 160 ms.
<b>range_gt =</b>	a time value, 20 ns to 159.999 ms (the value must be less than range_lt).
<b>range_lt =</b>	a time value, 30 ns to 160 ms (the value must be greater than range_gt).
<b>time_argument =</b>	a time value, 30 ns to 160 ms.
<b>occurrence_argument =</b>	an integer, 1 to 16000000.

**Figure 17-1. Trigger Subsystem Commands Syntax Diagram (continued)**

## Trigger Mode

Make sure the instrument is in the proper trigger mode for the command you want to send. The instrument can be placed in the trigger mode from the front panel or over the HP-IB. One method of insuring the instrument is in the proper trigger mode is to send the :TRIGGER:MODE command in the same program message as the parameter to be set. For example,

```
" :TRIGGER:MODE TV;LEVEL 200 MV"
```

places the instrument in the TV Trigger Mode and sets the trigger level to 200 mV. This process is necessary because the LEVEL command is also valid for the other trigger modes.

The trigger modes are described on the next few pages prior to the descriptions of the individual commands. Table 17-1 lists the different TRIGGER subsystem commands that are available for each trigger mode.



Auto or triggered mode is selected with the TIMEBASE:MODE command. For more information, refer to chapter 16, "Timebase Subsystem."

**Table 17-1. Valid Commands for Specific Trigger Modes**

EDGE	PATTERN	STATE	DELAY	TV
CENTERed COUPling HOLDoff LEVel PROBe SENSitivity SLOPe SOURce	CENTERed CONDition COUPling HOLDoff LEVel LOGic PATH PROBe SENSitivity	CENTERed CONDition COUPling HOLDoff LEVel LOGic PATH PROBe SENSitivity SLOPe SOURce	CENTERed CONDition COUPling DELay DELay:SLOPe DELay:SOURce LEVel LOGic OCCurrence OCCurrence:SLOPe OCCurrence:SOURce PATH PROBe QUALify SENSitivity SLOPe SOURce	CENTERed CONDition COUPling FIELD HOLDoff LEVel LINE OCCurrence OCCurrence:SLOPe POLarity PROBe QUALify SENSitivity SOURce STANDARD

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## The EDGE Trigger Mode

The Edge Trigger Mode is the easiest trigger mode to understand and use from the front panel or over the HP-IB, because it has the least number of parameters to be set. This explanation of the trigger mode commands follow the front-panel keys very closely. Refer to the *HP 54510A Front-Panel Reference* for further explanations of the trigger operation.

In the Edge Trigger Mode you must set the trigger source using the :TRIGGER:SOURCE command. This selects the source that the oscilloscope triggers on. The argument for the :TRIGGER:SOURCE command is channel1, channel2, or external.

After setting the trigger source, you need to set the trigger level. This value is set using the :TRIGGER:LEVEL command and can be set for each trigger source. The trigger level values that are set in the Edge Trigger Mode are used for all modes except the TV Trigger Mode. Conversely, the levels set in the PATTERN, STATE, or DELAY modes set the levels for the EDGE mode.

The actual edge that creates the trigger is set with the :TRIGGER:SLOPE command. This command can be set to POSITIVE or NEGATIVE for each of the sources.

The last setting in the Edge Trigger Mode is the Trigger Holdoff value. This value is used only for the EDGE mode.



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## The Pattern Trigger Mode

This description of the Pattern Trigger Mode follows the front-panel keys very closely. There are additional parameters in this mode that are not used in the Edge Trigger Mode and one parameter that is carried over from the Edge Trigger Mode. The one parameter that carries over is LEVEL. If the level command is used in this mode it also changes the level value for that source in the Edge Trigger Mode. In this trigger mode, the :TRIGGER:LEVEL command defines the voltage that determines if the input voltage is a logic high or logic low for the logic triggers.

The logic pattern for the Pattern Trigger Mode is set using the PATH and LOGIC commands. The PATH command specifies which of the two inputs is selected for the logic pattern. Once the path is selected, the pattern can be set using the LOGIC command. The LOGIC command uses the arguments HIGH, LOW, and DONTCARE to set the "trigger on" bit pattern.

The CONDITION command sets the "when" field on the front panel. This command is used in several of the trigger modes; therefore, it has parameters that are not valid in this mode. The valid parameters for the CONDITION command in the Pattern Trigger Mode are ENTER, EXIT, GT (Greater Than), LT (Less Than), and RANGE.

When the command :TRIGGER:CONDITION ENTER or :TRIGGER:CONDITION EXIT is sent, the Entered or Exited parameter is set on the front panel. When the GT or LT option is used, a time value must be sent to define the limit. When the RANGE option is used, two time values must be sent to define the lower and upper limit. The correct syntax for the RANGE option is :TRIGGER:CONDITION RANGE, <range\_low>, <range\_high>.

The holdoff time is set in the Pattern Trigger Mode with the :TRIGGER:HOLDOFF command.

---

## The State Trigger Mode

When the State Trigger Mode is selected, the `:TRIGGER:SOURCE` command is used to select the clock source. The syntax for selecting channel 2 as the clock source is `:TRIGGER:SOURCE CHANNEL2`.

After the clock source is selected, the correct edge for the clock can be selected using the `:TRIGGER:SLOPE` command, which can be set to `NEGATIVE` or `POSITIVE`.

The `:TRIGGER:PATH` command can be used with the `:TRIGGER:LOGIC` command to set the three bit logic pattern to qualify the clock trigger. These commands can be sent using the syntax `:TRIGGER:PATH CHAN2;;TRIGGER:LOGIC LOW`, or `:TRIGGER:PATH CHAN2; LOGIC LOW`.

In this trigger mode, the `:TRIGGER:LEVEL` command defines the voltage that determines if the input voltage is a logic high or a logic low for the logic triggers.

The `:TRIGGER:CONDITION` command sets the "is/is not present" state using the parameters `TRUE` for "is present" and `FALSE` for "is not present."

In the State Trigger Mode, a holdoff value can be set as in all other modes.

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## The Delay Trigger Mode

In the Delay Trigger Mode, the TRIGGER:QUALIFY command can be used to select the EDGE, PATTERN, or STATE mode as a qualifier. When the EDGE qualifier is selected, all Edge parameters and commands can be used to set the Source and Slope. When the PATTERN qualifier is selected, all Pattern commands can be used to set the pattern mode parameters. When the STATE qualifier is selected, all State commands can be used to set the state mode parameters.

The next settings (in front panel order) are the delay settings. The DELAY command is used to set the Time or Count parameter and the amount of delay. To set the delay to time use the command :TRIGGER:DELAY TIME, <time> . To set the delay to count use the command :TRIGGER:DELAY EVENT <number\_events> .

If the trigger delay is set to Event (count) you can then set the delay source and slope. To set the delay source, use the command :TRIGGER:DELAY:SOURCE CHANNEL2. To set the delay slope, use the command TRIGGER:DELAY:SLOPE POSITIVE.

The values within the front-panel "trigger on" field are set with the OCCURRENCE command. To set the number of occurrences to 3333, use the command syntax TRIGGER:OCCURRENCE 3333. To set the source for the number of occurrences to channel 2, use the command syntax :TRIGGER:OCCURRENCE:SOURCE CHANNEL2. To set the slope of the trigger occurrence to negative, use the command syntax :TRIGGER:OCCURRENCE:SLOPE NEGATIVE.

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## The TV Trigger Mode

The TV Trigger Mode is used for triggering on clamped television signals. This mode allows you to select one of the TV signal frames and one of the lines within that frame.

Once the TV Trigger Mode is selected, the Television Signal Standard can be selected using the `:TRIGGER:STANDARD` command. The three parameters for this command are 525, 625, and USER. Any of these modes allow you to select the trigger level and the source of the trigger signal.

The trigger level is set by sending the command `:TRIGGER:LEVEL <value>`.

The trigger source is set by sending the `:TRIGGER:SOURCE` command. This command allows you to select channel 1 or channel 2 as the trigger source.

With the standard set to 525 or 625, the commands that can be used are POLARITY, FIELD, and LINE. The POLARITY command sets the edge for the trigger. This edge can be set to NEGATIVE or POSITIVE. The FIELD command selects the first or second field of the television signal. The LINE command specifies the horizontal line in which the instrument will trigger on. Refer to the LINE command to determine the correct values.

The HOLDOFF value can also be set in the TV trigger mode, as in all modes.

When the USER (user defined) standard is selected, the source and level are set in the same manner as before.

The QUALIFY command is used to set the "qualify on" field. This command can be set to HIGH or LOW.

The edge defined by the QUALIFY command must occur within the range of time values that are displayed in the front panel field. The TRIGGER:CONDITION RANGE command sets the greater than and less than time values. In order to actually generate a trigger, the qualified conditions must be met within the specified time. To set the time values, send the command :TRIGGER:CONDITION . RANGE, <greater\_than\_value>, <less\_than\_value>.

The field, "trigger on," is set with the OCCURRENCE command and OCCURRENCE:SLOPE command. To set the number of occurrences, send the command :TRIGGER:OCCURRENCE <number>. To set the slope for the occurrences, send the command :TRIGGER:OCCURRENCE:SLOPE <slope>. The slope can be set to POSITIVE or NEGATIVE.

The description for each command tells you in which modes that command is valid.

# CENTered

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## CENTered

## command

The `:TRIGGER:CENTERED` command sets the trigger level to the centered mode (at the center of the graph) when the internal source is selected. This command is not valid when the external source is selected.

### Note



To return to the ADJUST mode, specify a level with the `TRIGGER:LEVEL` command.

**Command Syntax:** `:TRIGger:CENTered`

**Example:** `OUTPUT 707;":TRIGGER:SOURCE CHANNEL1"` !select trigger source  
`OUTPUT 707;":TRIGGER:CENTERED"`

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**CONDition****command/query**

The **:TRIGGER:CONDITION** command is valid in the **PATTERN**, **STATE**, **DELAY**, and **TV** trigger modes. The time values entered using this command are rounded to the nearest 10 ns.

In the **Pattern Trigger Mode**, the valid arguments for the **CONDITION** command are **ENTER**, **EXIT**, **GT**, **LT**, **RANGE**.

In the **Pattern Trigger Mode**, the **CONDITION** command is used to specify whether the trigger is generated upon entering (**ENTER**) or leaving (**EXIT**) the specified logic pattern. Also, the **CONDITION** command specifies whether the pattern must be present for a specified amount of time. The time in the pattern trigger mode can be greater than a value (**GT**), less than a value (**LT**), or between two values (**RANGE**). These settings can also be specified from the front panel using the "when" key in the **Pattern Trigger Mode**.

In the **State Trigger Mode**, the valid parameters for the **CONDITION** command are **TRUE** (is present) and **FALSE** (is not present).

In the **Delay Trigger Mode**, the **CONDITION** command is valid when **PATTERN** or **STATE** is selected as the qualifier. All arguments for this command that are valid in the **Pattern** or **State Trigger Modes** are valid here.

In the **TV Trigger Mode**, the **CONDITION** command is used to set the range of time values on which the trigger occurs. This command is only valid in the "user defined" mode.

The **CONDITION** query returns the currently selected condition for the currently selected mode.

# CONDition

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**Command Syntax:** :TRIGger:CONDition <argument>

Where in **PATTERN** or **DELAY:PATTERN** mode:

<argument> ::= {ENTER | EXIT | GT,<value> | LT,<value> |  
RANGe,<range\_gt>,<range\_lt>}

Where in **STATE** or **DELAY:STATE** mode:

<argument> ::= {TRUE | FALSE}

Where in **TV** mode:

<argument> ::= RANGe,<range\_gt>,<range\_lt>

Where:

<value> ::= 20 ns to 160 ms

<range\_gt> ::= 20 ns to 159.999 ms (must be less than range\_lt)

<range\_lt> ::= 30 ns to 160 ms (must be greater than range\_gt)

**Example:** OUTPUT 707;":TRIGGER:MODE PATTERN" !select trigger mode  
OUTPUT 707;":TRIG:COND RANGE,22ms,33ms"



**Query Syntax:** :TRIGger:CONDition?

**Returned Format:** [:TRIGger:CONDition] <argument><NL>

**Where in PATTERN or DELAY PATTERN mode:**

<argument> ::= {ENTER | EXIT | GT,<value> | LT,<value> |  
RANGe,<range\_gt>,<range\_lt>}

**Where in STATE or DELAY STATE mode:**

<argument> ::= {TRUE | FALSE}

**Where in TV mode:**

<argument> ::= RANGe,<range\_gt>,<range\_lt>

**Where:**

<value> ::= 20 ns to 160 ms

<range\_gt> ::= 20 ns to 159.999 ms (must be less than range\_lt)

<range\_lt> ::= 30 ns to 160 ms (must be greater than range\_gt)

**Example:** DIM Con\$[50]  
OUTPUT 707;":TRIGGER:CONDITION?"  
ENTER 707;Con\$  
PRINT Con\$

# COUPLing

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## COUPLing

## command/query

The :TRIGGER:COUPLING command selects the input coupling for the selected external trigger source. The coupling can be set to DC or DCFifty. The DCFifty parameter places a 50  $\Omega$  load on the trigger input.

The COUPLING query returns the current selection.

**Command Syntax:** :TRIGger:COUPling {DC | DCFifty}

**Example:** OUTPUT 707;":TRIGGER:COUPLING DC"

**Query Syntax:** :TRIGger:COUPling?

**Returned Format:** [:TRIGger:COUPling] {DC | DCFifty}<NL>

**Example:**  
DIM Mode\$[50]  
OUTPUT 707;":TRIG:COUP?"  
ENTER 707;Mode\$  
PRINT Mode\$

## DELaY

## command/query

The :TRIGGER:DELaY command is valid only in the Delay Trigger Mode. This command sets a delay value in either time or number of events. In the time delay mode, this command specifies the delay value in seconds. In the events delay mode, this command specifies the delay value in number of trigger events.

The DELaY query returns the current delay value.

**Command Syntax:** :TRIGger:DELaY {TIME,<time\_value> | EVENT,<event\_value>}

Where:

<time\_value> ::= amount of delay from 30 ns to 160 ms  
<event\_value> ::= number of events from 1 to 16000000

**Example:** OUTPUT 707;":TRIGGER:MODE DELAY" !select trigger mode  
OUTPUT 707;":TRIGGER:DELaY TIME,1.23E-01"

**Query Syntax:** :TRIGger:DELaY?

**Returned Format:** [:TRIGger:DELaY] {TIME,<time\_value> | EVENT,<event\_value>}<NL>

Where:

<time\_value> ::= amount of delay from 30 ns to 160 ms  
<event\_value> ::= number of events from 1 to 16000000

**Example:** DIM Value\$[50]  
OUTPUT 707;":TRIG:DELaY?"  
ENTER 707;Value\$  
PRINT Value\$

# DElay:SLOPe

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## DElay:SLOPe

## command/query

The :TRIGGER:DELAY:SLOPE command selects the edge that will be counted by the delay command. The parameters for this command are NEGATIVE or POSITIVE. This command is only valid in the Delay Trigger Mode.

The DELAY:SLOPE query returns the current delay slope.

**Command Syntax:** :TRIGger:DElay:SLOPe {POSitive | NEGative}

**Example:** OUTPUT 707;":TRIGGER:MODE DELAY" !select trigger mode  
OUTPUT 707;":TRIG:DEL:SLOP POS"

**Query Syntax:** :TRIGger:DElay:SLOPe?

**Returned Format:** [:TRIGger:DElay:SLOPe] {POSitive | NEGative}<NL>

**Example:** DIM Tos\$[50]  
OUTPUT 707;":TRIGGER:DELAY:SLOP?"  
ENTER 707;Tos\$  
PRINT Tos\$

**DElay:SOURce****command/query**

The **:TRIGGER:DELAY:SOURCE** command selects the source that is counted by the delay command. The parameters for this command are **CHANNEL1**, **CHANNEL2**, or **EXTERNAL**. This command is only valid in the **Delay Trigger Mode**.

The **DELAY:SOURCE** query returns the source of the delay in the **Delay Trigger Mode**.

**Command Syntax:** **:TRIGger:DElay:SOURce {CHANne11 | CHANne12 | EXTerna1}**

**Example:** **OUTPUT 707;":TRIGGER:MODE DELAY" !select trigger mode**  
**OUTPUT 707;":TRIG:DEL:SOURCE CHANNEL2"**

**Query Syntax:** **:TRIGger:DElay:SOURce?**

**Returned Format:** **[ :TRIGger:DElay:SOURce ] {CHANne11 | CHANne12 | EXTerna1} <NL>**

**Example:** **DIM Tos\$[50]**  
**OUTPUT 707;":TRIGGER:DELAY:SOUR?"**  
**ENTER 707;Tos\$**  
**PRINT Tos\$**

## FIELD

## FIELD

## command/query

The :TRIGGER:FIELD command is only valid in the TV Trigger Mode. This command selects the field of the TV signal when the STANDARD is set to 525 or 625. The valid parameters for this command are 1 or 2.

If the :TRIGGER:FIELD command is set in any other trigger mode, error -221, "Settings conflict," is placed in the error queue.

The FIELD query returns the current setting of the FIELD command.

**Command Syntax:** :TRIGger:FIELD { 1 | 2 }

**Example:** OUTPUT 707;":TRIGGER:MODE TV" !select trigger mode  
OUTPUT 707;":TRIGGER:FIEL 2"

**Query Syntax:** :TRIGger:FIELD?

**Returned Format:** [:TRIGger:FIELD] { 1 | 2 }<NL>

**Example:** DIM F\$[50]  
OUTPUT 707;":TRIG:FIELD?"  
ENTER 707;F\$  
PRINT F\$

**HOLDoff****command/query**

The **:TRIGGER:HOLDOFF** command is valid in the **Edge, Pattern, State, and TV Trigger Modes**. The **HOLDOFF** command enters a holdoff value in terms of time or events.

The **HOLDOFF** query returns the value of the holdoff for the current mode.

**Command Syntax:** **:TRIGger:HOLDoff {TIME,<holdoff\_value> | EVENT,<event\_argument>}**

**Where:**

**<holdoff\_value> ::= 40 ns to 320 ms rounded to nearest 20 ns increment.**  
**<event\_argument> ::= 1 to 16000000**

**Examples:** **OUTPUT 707;":TRIGGER:HOLDOFF TIME,216 US"**

**OUTPUT 707;":TRIGGER:HOLDOFF EVENT,10"**

**Query Syntax:** **:TRIGger:HOLDoff?**

**Returned Format:** **[ :TRIGger:HOLDoff ] {TIME,<holdoff\_value> | EVENT,<event\_argument>}<NL>**

**Where:**

**<holdoff\_value> ::= 40 ns to 320 ms (exponential - NR3 format)**  
**<event\_argument> ::= 1 to 16000000 (integer - NR1 format)**

**Example:** **DIM Ho\$[50]**  
**OUTPUT 707;":TRIGGER:HOLD?"**  
**ENTER 707;Ho\$**  
**PRINT Ho\$**

# LEVel

## LEVel

## command/query

The :TRIGGER:LEVEL command sets the trigger level voltage of the active trigger. This command can be sent in any mode; however, only two separate levels are stored. One value is kept for the TV Trigger Mode and another value is kept for all other modes. If you are in the Pattern Trigger Mode and set a trigger level value, that level is also used for the Edge, State, and Delay Trigger Modes.

The LEVEL query returns the trigger level of the current trigger mode.

**Command Syntax:** :TRIGger:LEVel <level>

**Where:**

<level> ::= for internal triggers,  $\pm 1.5 \times$  full-scale voltage from center screen.  
for external triggers,  $\pm 2$  volts with probe attenuation at 1:1.

**Examples:** OUTPUT 707;":TRIGGER:LEVEL .30"

OUTPUT 707;":TRIGGER:LEV 300MV"

OUTPUT 707;":TRIG:LEV 3E-1"

Refer to chapter 22, "Message Communication and System Functions" for the syntax of using values with multipliers.

**Query Syntax:** :TRIGger:LEVel?

**Returned Format:** [:TRIGger:LEVel] <level><NL>

**Where:**

<level> ::= trigger level in volts (exponential - NR3 format)

**Example:** DIM Tlevel\$[30]  
OUTPUT 707;":TRIGGER:LEVEL?"  
ENTER 707;Tlevel\$  
PRINT Tlevel\$



## LINE

## command/query

The :TRIGGER:LINE command specifies the horizontal line in which the instrument will trigger on. The LINE command is valid in the TV Trigger Mode when the STANDARD selected is 525 or 625. If one of these standards is selected when the TV Trigger Mode is entered, the line value is set in that standard and selected field.

The LINE query returns the current line of the selected standard.

**Command Syntax:** :TRIGger:LINE <line\_number>

**Where:**

<line\_number> ::= 1 to 625 (depends on STANDARD and FIELD selection).

**Example:**    OUTPUT 707;":TRIGGER:MODE TV"            !select trigger mode  
              OUTPUT 707;":TRIGGER:STANDARD 525"       !select TV signal standard  
              OUTPUT 707;":TRIG:LINE 22"

**Query Syntax:** :TRIGger:LINE?

**Returned Format:** [:TRIGger:LINE] <line\_number><NL>

**Where:**

<line\_number> ::= 1 to 625 (depends on STANDARD and FIELD selection).  
(integer - NR1 format)

**Example:**    DIM Ln\$[50]  
              OUTPUT 707;":TRIGGER:LINE?"  
              ENTER 707;Ln\$  
              PRINT Ln\$

# LOGic

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## LOGic

## command/query

The :TRIGGER:LOGIC command is valid in the **Pattern** and **State Trigger Modes**, as well as the **DELAY Trigger Mode** when qualifying by **PATTERN** or **STATE**. The **LOGIC** command specifies the relationship between the signal and the defined voltage level that must exist before that part of the pattern is considered valid. If the signal on a selected path is greater than the trigger level, that signal is considered **HIGH**. If the signal is less than the trigger level, it is considered **LOW**.

The **LOGIC** query returns the last specified logic level of the currently enabled path.

**Command Syntax:** :TRIGger:LOGic {HIGH | LOW | DONTcare}

**Example:**

```
OUTPUT 707;":TRIGGER:MODE DELAY"      !select trigger mode
OUTPUT 707;":TRIGGER:QUALIFY PATTERN"  !qualify trigger
OUTPUT 707;":TRIG:LOGIC DONT"
```

**Query Syntax:** :TRIGger:LOGic?

**Returned Format:** [:TRIGger:LOGic] {HIGH | LOW | DONTcare}<NL>

**Example:**

```
DIM L$[50]
OUTPUT 707;":TRIGGER:LOGIC?"
ENTER 707;L$
PRINT L$
```

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**MODE****command/query**

The **:TRIGGER:MODE** command selects the trigger mode. This command can be sent from any trigger mode.

The **MODE** query returns the currently selected trigger mode.

**Command Syntax:** **:TRIGger:MODE {EDGE | PATtern | STATE | DELay | TV}**

**Example:** **OUTPUT 707;":TRIGGER:MODE PATT"**

**Query Syntax:** **:TRIGger:MODE?**

**Returned Format:** **[ :TRIGger:MODE ] {EDGE | PATtern | STATE | DELay | TV}<NL>**

**Example:**  
**DIM Mode\$[50]**  
**OUTPUT 707;":TRIGGER:MODE?"**  
**ENTER 707;Mode\$**  
**PRINT Mode\$**

## OCCurrence

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### OCCurrence

### command/query

The **:TRIGGER:OCCURRENCE** command sets the number of trigger events that must occur before the oscilloscope is actually triggered. This command is valid in the **Delay Trigger Mode** and in the **TV Trigger Mode**.

The **OCCURRENCE** query returns the current value of the **OCCURRENCE** command when the oscilloscope is in the **Delay Trigger Mode**, or in the **TV Trigger Mode** with **USER DEFINED** selected.

**Command Syntax:** `:TRIGger:OCCurrence <occ_number>`

**Where:**

`<occ_number> ::= 1 to 16000000`

**Example:** `OUTPUT 707;":TRIGGER:MODE DELAY" !select trigger mode`  
`OUTPUT 707;":TRIGGER:OCC 14"`

**Query Syntax:** `:TRIGger:OCCurrence?`

**Returned Format:** `[ :TRIGger:OCCurrence] <occ_number><NL>`

**Where:**

`<occ_number> ::= 1 to 16000000 (integer - NR1 format)`

**Example:** `DIM 0c$[50]`  
`OUTPUT 707;":TRIGGER:OCCURRENCE?"`  
`ENTER 707;0c$`  
`PRINT 0c$`

**OCCurrence:SLOPe****command/query**

The **:TRIGGER:OCCURRENCE:SLOPE** command selects the edge that will be counted by the occurrence command. The parameters for this command are **NEGATIVE** or **POSITIVE**. This command is valid in the **Delay Trigger Mode** and the **TV Trigger Mode**.

The **OCCURRENCE:SLOPE** query returns the slope of the current mode.

**Command Syntax:** **:TRIGger:OCCurrence:SLOPe** {POSitive | NEGative}

**Example:** **OUTPUT 707;":TRIGGER:MODE DELAY"**    !select trigger mode  
**OUTPUT 707;":TRIG:OCC:SLOP POS"**

**Query Syntax:** **:TRIGger:OCCurrence:SLOPe?**

**Returned Format:** **[ :TRIGger:OCCurrence:SLOPe ] {POSitive | NEGative}<NL>**

**Example:** **DIM Tos\$[50]**  
**OUTPUT 707;":TRIGGER:OCCURRENCE:SLOP?"**  
**ENTER 707;Tos\$**  
**PRINT Tos\$**

## OCCurrence:SOURce

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### OCCurrence:SOURce

### command/query

The :TRIGGER:OCCURRENCE:SOURCE command selects the source that will be counted by the occurrence command. The parameters for this command are CHANNEL1, CHANNEL2, or EXTERNAL. This command is valid only in the Delay Trigger Mode.

The OCCURRENCE:SOURCE query returns the source of the occurrence in the Delay Trigger Mode.

**Command Syntax:** :TRIGger:OCCurrence:SOURce {CHANne11 | CHANne12 | EXTerna1}

**Example:** OUTPUT 707;":TRIGGER:MODE DELAY" !select trigger mode  
OUTPUT 707;":TRIG:OCC:SOURCE CHANNEL2"

**Query Syntax:** :TRIGger:OCCurrence:SOURce?

**Returned Format:** [:TRIGger:OCCurrence:SOURce] {CHANne11 | CHANne12 | EXTerna1}<NL>

**Example:** DIM Tos\$[50]  
OUTPUT 707;":TRIGGER:OCCURRENCE:SOUR?"  
ENTER 707;Tos\$  
PRINT Tos\$

## PATH

## command/query

The :TRIGGER:PATH command is valid in the Pattern Trigger Mode, State Trigger Mode, and Delay Trigger Mode when "qualify on" pattern or state is selected. This command selects a pattern bit as the source for future logic commands.

The PATH query returns the current trigger source of the present mode.

**Command Syntax:** :TRIGger:PATH {CHANne11 | CHANne12 | EXTerna1}

**Example:** OUTPUT 707;":TRIGGER:MODE PATTERN" !select trigger mode  
OUTPUT 707;":TRIGGER:PATH CHANNEL2" !select logic level  
OUTPUT 707;":TRIGGER:LOGIC HIGH"

**Query Syntax:** :TRIGger:PATH?

**Returned Format:** [:TRIGger:PATH] {CHANne11 | CHANne12 | EXTerna1}<NL>

**Example:** DIM Tp\$[50]  
OUTPUT 707;":TRIG:PATH?"  
ENTER 707;Tp\$  
PRINT Tp\$

# POLarity

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## POLarity

## command/query

The **:TRIGGER:POLARITY** command is valid only in the **TV Trigger Mode**. This command sets the polarity for the trigger when the **STANDARD** is set to 525 or 625. The valid parameters for this command are **POSITIVE** and **NEGATIVE**.

The **POLARITY** query returns the current polarity setting.

**Command Syntax:** `:TRIGger:POLarity {POSitive | NEGative}`

**Example:** `OUTPUT 707;":TRIGGER:MODE TV" !select trigger mode  
OUTPUT 707;":TRIGGER:POL NEGATIVE"`

**Query Syntax:** `:TRIGger:POLarity?`

**Returned Format:** `[ :TRIGger:POLarity ] {POSitive | NEGative}<NL>`

**Example:** `DIM Tp$[50]  
OUTPUT 707;":TRIG:POL?"  
ENTER 707;Tp$  
PRINT Tp$`



## PROBe

## command/query

The `:TRIGGER:PROBE` command is valid only for external triggers. It specifies the attenuation factor for the external trigger probe.

The `PROBE` query returns the current setting.

**Command Syntax:** `:TRIGger:PROBe <attenuation_factor>`

Where:

`<attenuation_factor> ::= .9 to 1000 (exponential - NR3 format)`

**Example:** `OUTPUT 707;":TRIGGER:SOURCE EXTERNAL" !select trigger source`  
`OUTPUT 707;":TRIGGER:PROBE 10"`

**Query Syntax:** `:TRIGger:PROBe?`

**Returned Format:** `[ :TRIGger:PROBe] <attenuation_factor><NL>`

Where:

`<attenuation_factor> ::= .9 to 1000 (exponential - NR3 format)`

**Example:** `DIM Af$[50]`  
`OUTPUT 707;":TRIG:PROB?"`  
`ENTER 707;Af$`  
`PRINT Af$`

# QUALify

## QUALify

## command/query

The **:TRIGGER:QUALIFY** command is valid in the Delay and TV Trigger Mode. When you are in the Delay Trigger Mode, the parameters for this command are:

- EDGE
- PATTERN
- STATE

In the TV Trigger Mode, the parameters for this command are:

- LOW
- HIGH

The **QUALIFY** query returns the current setting of the **QUALIFY** command in the currently selected mode.

**Command Syntax:** `:TRIGger:QUALify <qualify_parameter>`

**Where in Delay Trigger Mode:**

`<qualify_parameter> ::= {EDGE | PATtern | STATE}`

**Where in TV Trigger Mode:**

`<qualify_parameter> ::= {LOW | HIGH}`

**Example:** `OUTPUT 707;":TRIGGER:MODE DELAY" !select trigger mode`  
`OUTPUT 707;":TRIGGER:QUALIFY PATT"`

**Query Syntax:** `:TRIGger:QUALify?`

**Returned Format:** `[[:TRIGger:QUALify] {EDGE | PATtern | STATE | LOW | HIGH}<NL>`

**Example:** `DIM Tq$[50]`  
`OUTPUT 707;":TRIG:QUALIFY?"`  
`ENTER 707;Tq$`  
`PRINT Tq$`

## SENSitivity

## command/query

The **:TRIGGER:SENSITIVITY** command sets the trigger sensitivity for the selected source. **NORMAL** corresponds to noise reject off and **LOW** corresponds to noise reject on.

The **SENSITIVITY** query returns the current sensitivity for the selected source.



Trigger sensitivity cannot be set for the **EXTERNAL** trigger source.

**Command Syntax:** `:TRIGger:SENSitivity {NORMa1 | LOW}`

**Example:** `OUTPUT 707;":TRIGGER:SOURCE CHANNEL1" !select trigger source`  
`OUTPUT 707;":TRIGGER:SENSITIVITY LOW"`

**Query Syntax:** `:TRIGger:SENSitivity?`

**Returned Format:** `[ :TRIGger:SENSitivity ] {NORMa1 | LOW}<NL>`

**Example:** `DIM Sens$[50]`  
`OUTPUT 707;":TRIG:SENS?"`  
`ENTER 707;Sens$`  
`PRINT Sens$`

# SLOPe

## SLOPe

## command/query

The :TRIGGER:SLOPE command specifies the slope of the edge for the trigger. The SLOPE command is valid in the **Edge Trigger Mode**, **State Trigger Mode**, and **Delay Trigger Mode** when **EDGE** or **STATE** is selected as the qualifier.

The SLOPE query returns the current slope for the currently selected trigger mode.

**Command Syntax:** :TRIGger:SLOPe {NEGative | POSitive}

**Example:**      OUTPUT 707;":TRIGGER:MODE DELAY"      !select trigger mode  
                 OUTPUT 707;":TRIGGER:QUALIFY EDGE"      !qualify trigger  
                 OUTPUT 707;":TRIGGER:SLOPE POSITIVE"

**Query Syntax:** :TRIGger:SLOPe?

**Returned Format:** [:TRIGger:SLOPe] {POSitive | NEGative}<NL>

**Example:**      DIM Ts\$[50]  
                 OUTPUT 707;":TRIG:SLOP?"  
                 ENTER 707;Ts\$  
                 PRINT Ts\$

**SOURce****command/query**

The **:TRIGGER:SOURCE** command selects the channel that actually produces the trigger. The **SOURCE** command is valid in the **Edge Trigger Mode**, **State Trigger Mode**, **Delay Trigger Mode**, and **TV Trigger Mode**. In the **Delay Trigger Mode** this command is valid when **EDGE** or **STATE** is selected as the qualifier.

The **SOURCE** query returns the current source for the selected trigger mode.

**Command Syntax:** `:TRIGger:SOURce {CHANne11 | CHANne12 | EXTerna1}`

**Example:** `OUTPUT 707;":TRIGGER:SOURCE CHAN2"`

**Query Syntax:** `:TRIGger:SOURce?`

**Returned Format:** `[ :TRIGger:SOURce ] {CHANne11 | CHANne12 | EXTerna1} <NL>`

**Example:**  
`DIM Src$[30]  
OUTPUT 707;":TRIGGER:SOURCE?"  
ENTER 707;Src$  
PRINT Src$`

# STANdard

## STANdard

## command/query

The :TRIGGER:STANDARD command selects the television signal standard to be used in the TV Trigger Mode. The valid parameters for this command 525, 625, and USER (user defined).

The STANDARD query returns the currently selected standard.

**Command Syntax:** :TRIGger:STANdard {525 | 625 | USER}

**Example:** OUTPUT 707;":TRIGGER:MODE TV" !select trigger mode  
OUTPUT 707;":TRIGGER:STAN USER"

**Query Syntax:** :TRIGger:STANdard?

**Returned Format:** [:TRIGger:STANdard] {525 | 625 | USER}<NL>

**Example:** DIM Ts\$[50]  
OUTPUT 707;":TRIG:STANDARD?"  
ENTER 707;Ts\$  
PRINT Ts\$