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**ADVANTEST®**  
ADVANTEST CORPORATION

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**INSTRUCTION  
MANUAL**  
**R3265/3271 SERIES**  
**OPT73**  
**GPIB COMMAND EXPANSION**

MANUAL NUMBER OEA01 9303

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*Applicable Instruments*

R3265

R3365

R3271

R3371

Before reselling to other corporations  
or re-exporting to other countries, you  
are required to obtain permission from  
both the Japanese Government under its  
Export Control Act and the U.S. Govern-  
ment under its Export Control Law.



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## Safety Summary

To ensure thorough understanding of all functions and to ensure efficient use of this instrument, please read the manual carefully before using. Note that Advantest bears absolutely no responsibility for the result of operations caused due to incorrect or inappropriate use of this instrument.

If the equipment is used in a manner not specified by Advantest, the protection provided by the equipment may be impaired.

- **Warning Labels**

Warning labels are applied to Advantest products in locations where specific dangers exist. Pay careful attention to these labels during handling. Do not remove or tear these labels. If you have any questions regarding warning labels, please ask your nearest Advantest dealer. Our address and phone number are listed at the end of this manual.

Symbols of those warning labels are shown below together with their meaning.

**DANGER:** Indicates an imminently hazardous situation which will result in death or serious personal injury.

**WARNING:** Indicates a potentially hazardous situation which will result in death or serious personal injury.

**CAUTION:** Indicates a potentially hazardous situation which will result in personal injury or a damage to property including the product.

- **Basic Precautions**

Please observe the following precautions to prevent fire, burn, electric shock, and personal injury.

- Use a power cable rated for the voltage in question. Be sure however to use a power cable conforming to safety standards of your nation when using a product overseas.
- When inserting the plug into the electrical outlet, first turn the power switch OFF and then insert the plug as far as it will go.
- When removing the plug from the electrical outlet, first turn the power switch OFF and then pull it out by gripping the plug. Do not pull on the power cable itself. Make sure your hands are dry at this time.
- Before turning on the power, be sure to check that the supply voltage matches the voltage requirements of the instrument.
- Be sure to plug the power cable into an electrical outlet which has a safety ground terminal. Grounding will be defeated if you use an extension cord which does not include a safety ground terminal.
- Be sure to use fuses rated for the voltage in question.
- Do not use this instrument with the case open.
- Do not place objects on top of this product. Also, do not place flower pots or other containers containing liquid such as chemicals near this product.

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## Safety Summary

- When the product has ventilation outlets, do not stick or drop metal or easily flammable objects into the ventilation outlets.
- When using the product on a cart, fix it with belts to avoid its drop.
- When connecting the product to peripheral equipment, turn the power off.

- **Caution Symbols Used Within this Manual**

Symbols indicating items requiring caution which are used in this manual are shown below together with their meaning.

**DANGER:** Indicates an item where there is a danger of serious personal injury (death or serious injury).

**WARNING:** Indicates an item relating to personal safety or health.

**CAUTION:** Indicates an item relating to possible damage to the product or instrument or relating to a restriction on operation.

- **Safety Marks on the Product**

The following safety marks can be found on Advantest products.



: ATTENTION - Refer to manual.



: Protective ground (earth) terminal.



: DANGER - High voltage.



: CAUTION - Risk of electric shock.

- **Replacing Parts with Limited Life**

The following parts used in the instrument are main parts with limited life.

Replace the parts listed below before their expected lifespan has expired to maintain the performance and function of the instrument.

Note that the estimated lifespan for the parts listed below may be shortened by factors such as the environment where the instrument is stored or used, and how often the instrument is used.

The parts inside are not user-replaceable. For a part replacement, please contact the Advantest sales office for servicing.

There is a possibility that each product uses different parts with limited life. For more information, refer to Chapter 1.

## Main Parts with Limited Life

Part name	Life
Unit power supply	5 years
Fan motor	5 years
Electrolytic capacitor	5 years
LCD display	6 years
LCD backlight	2.5 years
Floppy disk drive	5 years
Memory backup battery	5 years

- **Hard Disk Mounted Products**

The operational warnings are listed below.

- Do not move, shock and vibrate the product while the power is turned on. Reading or writing data in the hard disk unit is performed with the memory disk turning at a high speed. It is a very delicate process.
- Store and operate the products under the following environmental conditions.
  - An area with no sudden temperature changes.
  - An area away from shock or vibrations.
  - An area free from moisture, dirt, or dust.
  - An area away from magnets or an instrument which generates a magnetic field.
- Make back-ups of important data.
  - The data stored in the disk may become damaged if the product is mishandled. The hard disc has a limited life span which depends on the operational conditions. Note that there is no guarantee for any loss of data.

- **Precautions when Disposing of this Instrument**

When disposing of harmful substances, be sure dispose of them properly with abiding by the state-provided law.

Harmful substances: (1) PCB (polycarbon biphenyl)  
 (2) Mercury  
 (3) Ni-Cd (nickel cadmium)  
 (4) Other  
 Items possessing cyan, organic phosphorous and hexadic chromium and items which may leak cadmium or arsenic (excluding lead in solder).

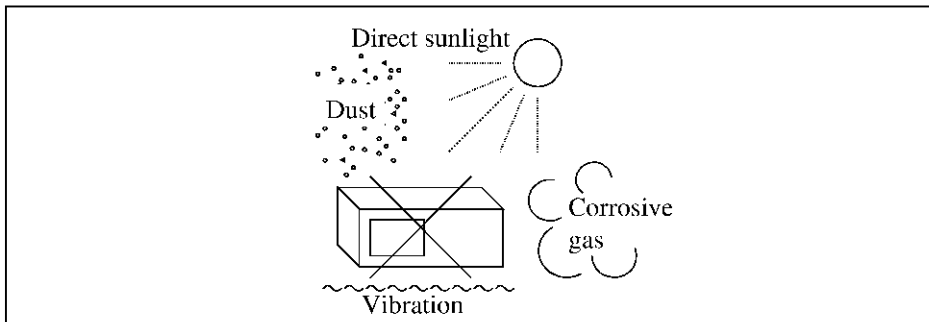
Example: fluorescent tubes, batteries

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# Environmental Conditions

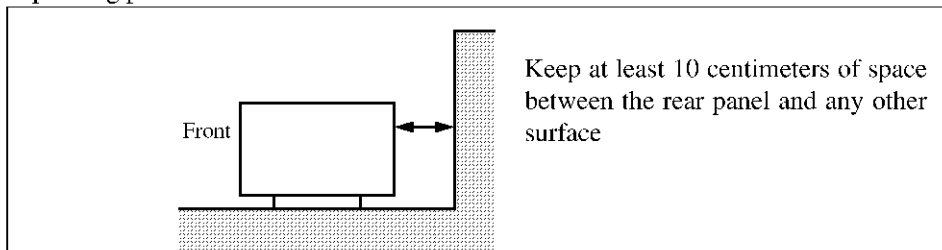
This instrument should be only be used in an area which satisfies the following conditions:

- An area free from corrosive gas
- An area away from direct sunlight
- A dust-free area
- An area free from vibrations



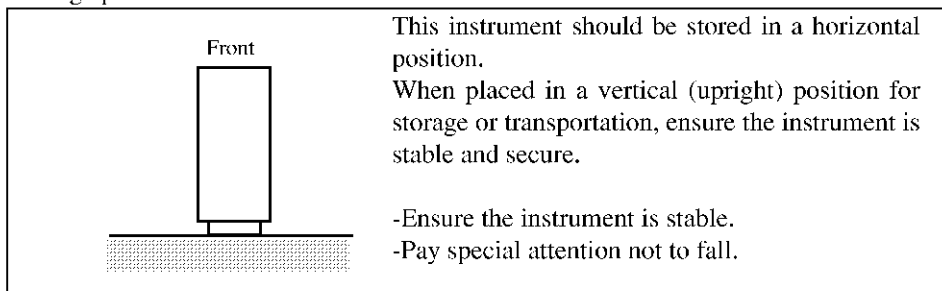
**Figure-1 Environmental Conditions**

- Operating position



**Figure-2 Operating Position**

- Storage position



**Figure-3 Storage Position**

This instrument can be used safely under the following conditions:

- Altitude of up to 2000 m
- Installation Categories II
- Pollution Degree 2

## PREFACE

All descriptions on the R3265/3271 manual are also applicable to the R3365/3371.

1. About R3265/3271-related manuals

Manual name	Contents	Remarks
1 R3265/3271 SERIES SPECTRUM ANALYZER INSTRUCTION MANUAL	Handling of R3265/3271 is explained. { Explanation of accessories, panel, functions, operation, performance, preface, etc. }	This manual is an accessory of the R3265/3271 main unit.
2 R3265/3271 SERIES QUICK GUIDE	Basic to application key operations for R3265/3271 are explained using examples.	This manual is an accessory of the R3265/3271 main unit.
3 R3265/3271 SERIES OPT 15 INSTRUCTION MANUAL	Handling of option 15 for R3265/3271 is explained. { Part 1: Guide Part 2: Reference }	This manual is an accessory of the R3265/3271 option 15.
4 R3265/3271 SERIES OPT 73 INSTRUCTION MANUAL (THIS MANUAL)	Handling of option 73 for R3265/3271 is explained. { Part 1: General - same contents as sections 6.1 and 6.2 in the instruction manual No. 1 shown above. Part 2: GPIB command expansion mode 1, supporting 8562 commands Part 3: GPIB command expansion mode 2, supporting 8566 commands }	This manual is an accessory of R3265/3271 option 73.

2. About R3265/3271 option 73

R3265/3271 option 73 (GPIB command expansion) has modes 1 and 2.

Modes 1 and 2 have compatibility for commands with the 8562 and 8566 spectrum analyzers, respectively.

The mode can be switched by sending the mode switching command at first.





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**Part 1**  
**GPIB General**

Contents of Part 1 are the same as those of sections 6.1 and 6.2 in the R3265/3271 spectrum analyzer instruction manual.





# 1 OUTLINE OF GPIB

## 1.1 Outline

The analyzer is loaded with the measurement bus GPIB (general-purpose interface bus) of IEEE specification 488-1978 and can be controlled at distance fully by the external controller.

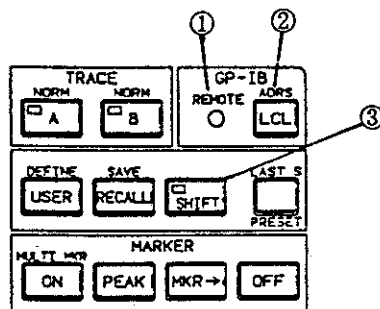
### (1) GPIB extension and compatibility

The GPIB is an interface system connecting the analyzer with the controller and peripheral devices with a cable (bus line). The GPIB is superior to the current interface method in extensibility and compatible electrically, mechanically and functionally with products of other companies. High-grade measuring system can easily be constructed with this GPIB in the same way as a simple system with a single bus cable.

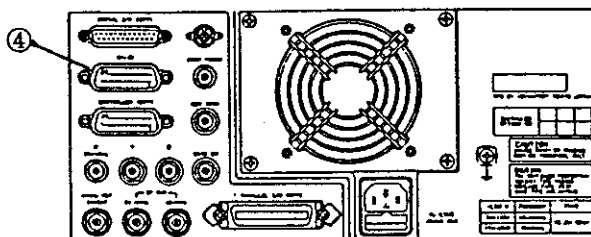
### (2) Talker, Listener, Controller

In the GPIB system, "address" is assigned to the devices connected to the bus line. Each device can play one or two roles selected from Controller, Talker and Listener. During system operation, only one talker can transmit data to the bus line and multiple listeners can receive the data. The controller specifies the talker and listener addresses and transfers data from the talker to the listener, or the controller itself can ply the role of talker and specifies listener measurement conditions.

### (3) GPIB-related panel switches



Front panel



Rear panel

#### ① Remote lamp

This lamp will light when the analyzer is set to External control mode.

#### ② LCL key

This is used to switch between Remote and Local. With this switch, external control can be interrupted to enable input from the panel.

#### ③ Shift key

After pressing this key, press the LCL key so that GPIB address can be specified.

#### ④ GPIB connector

This terminal is used to connect the analyzer to the external controller or plotter with the GPIB cable.

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**1.1 Outline**

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(4) Functions which can be controlled externally

- ① Setting the measurement conditions: Entering the measurement conditions in the same way as the panel key operation.
- ② Output of the setting conditions: The analyzer setting conditions and data call.
- ③ Input and Output of measurement data: Screen trace, Data write and read out.
- ④ Service request to the controller: Interrupt processing request to the controller control and output of status byte.

## 1.2 GPIB Specifications and the Analyzer GPIB Specifications

### (1) Bus line

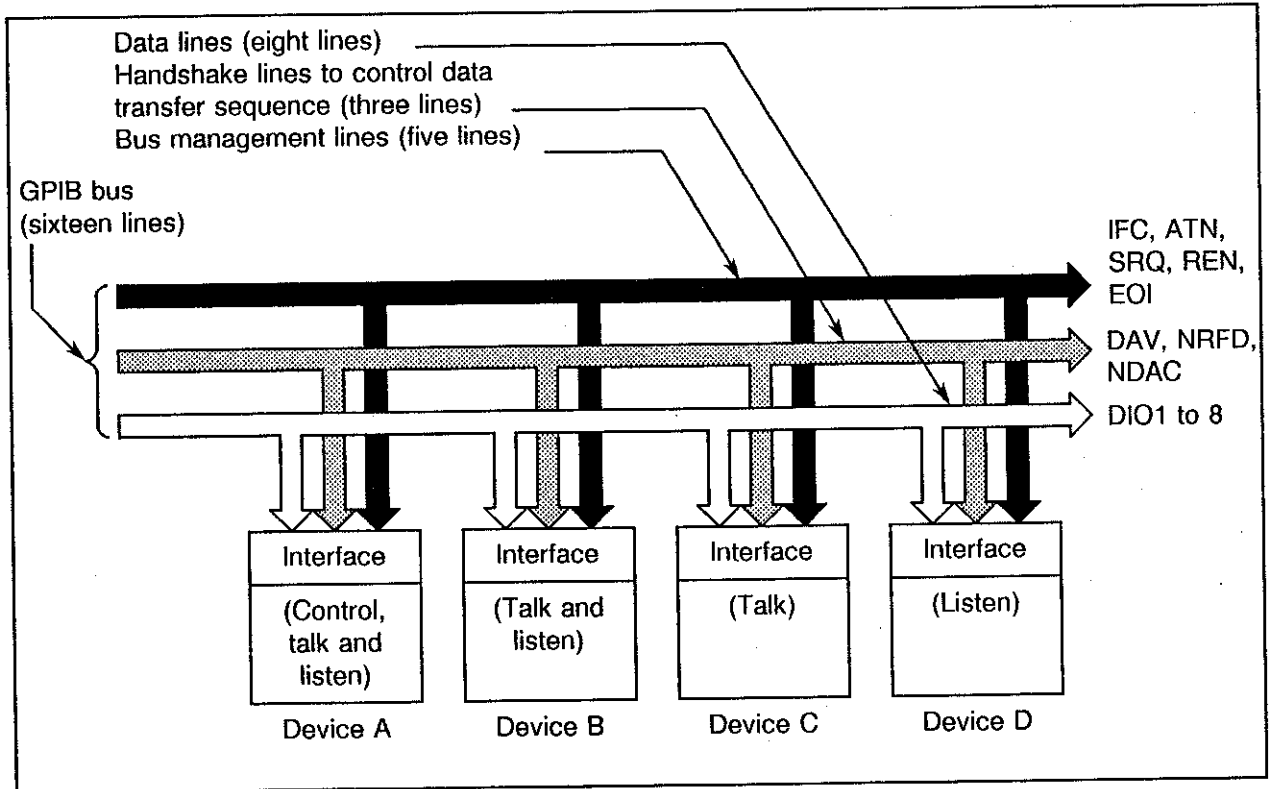


Fig. 1-1 GPIB Bus Line Configuration

The GPIB bus cables include eight data lines, three transfer control lines (handshake lines) to control asynchronous data transfer between devices and five bus management lines (control lines) to control information flow through the bus.

- **Data line:** Eight data lines of bit parallel bite serial type are used for data transfer between devices so that asynchronous bi-directional transfer can be executed. Since it this is an asynchronous system, devices of high speed and low speed can be connected at once. ASCII code is used in the data (messages) transferred between devices, including measurement data, measurement conditions (programs) and various commands.
- **Transfer control lines (Handshake lines) :**  
 The following signals are used:  
 DAV (Data valid): Signal indicating the data valid state  
 NRFD (Not ready for data): Signal indicating that data can be received  
 NDAC (Not data accepted): Signal indicating that data receive is complete

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**1.2 GPIB Specifications and the Analyzer GPIB Specifications**

- Bus control lines : the following signals are used:
  - ATN (Attention) : Signal to determine whether the signal on the data line is a command or other information.
  - IFC (Interface clear) : Signal to clear the interface.
  - EOI (End of identify) : Signal used upon completion of information transfer.
  - SRQ (Service request) : Signal to make service request to the controller from a device.
  - REN (Remote enable) : Used to remote-control a device which can be remote-programmed.

(2) Connector: 24-pin GPIB connector, 557-20240-D35A (Product of Amphenor or its equivalent)

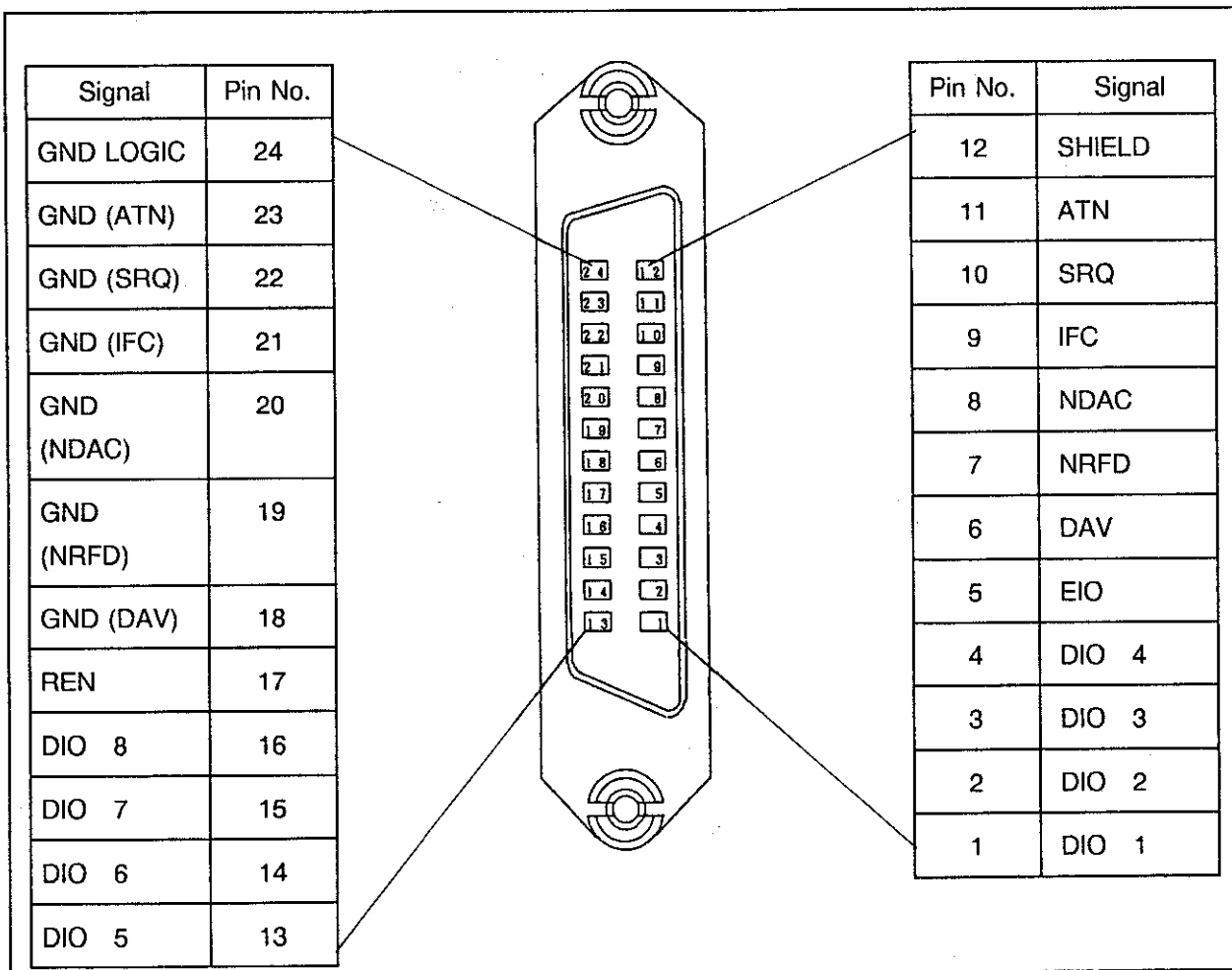


Fig. 1-2 GPIB Connector Pin Assignment

(3) Specifications

- Code : ASCII code, except at packed formatting when binary code is used.
- Logic level : Logical 0 "High" state + 2.4V or above  
Logical 1 "Low" state + 0.4V or below
- Signal line termination : The sixteen bus lines are terminated as shown below. (Fig. 1-3)

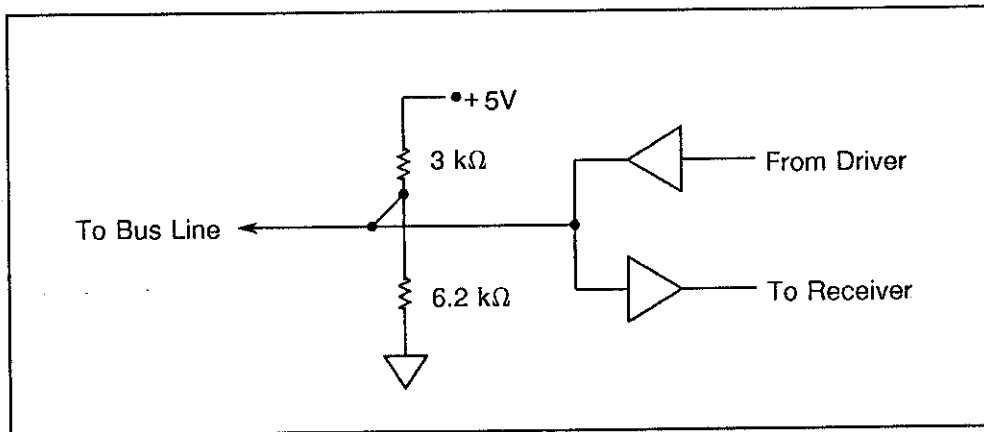


Fig. 1-3 Signal Line Termination

- Driver : Open collector type  
Output voltage at "Low" ... + 0.4V or below, 48mA  
at "High".... + 2.4V or above, -6.2mA
- Receiver : + 6V or below ... "Low" state  
+ 2.0V or above ... "High" state
- Bus cable length : Each cable length should be 4m or less and the total bus cable length, i.e., twice the number of devices connected to the bus, should not exceed 20m.
- Address specification : Up to 31 talk/listen addresses can be entered through panel key operation.

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1.2 GPIB Specifications and the Analyzer GPIB Specifications

(4) Interface Function: See Table 1-1.

Table 1-1 Analyzer GPIB Interface Functions

Code	Description
SH1	Source handshake function
AH1	Acceptor handshake function
T6	Basic talker function, Serial pole function, Talker cancel function by listener specification
L4	Basic listener function, Listener cancel function by talker specification
SR1	Service request function
RL1	Remote function
PP0	No parallel function
DC1	Device clear function provided
DT1	Device trigger function provided
C0	No controller function
E1	Used open collector bus driver. However, EOI and DAV is used a three-state bus driver.

**Part 2**  
**MODE-1 of**  
**GPIB Command Expansion Option**

Many of the commands functions in Part 2 programming language are based on the 8562 command language.

Before use these languages, set the spectrum analyzer to compatible mode by sending the command "HP8562".

It is possible to select the compatible mode through panel key operation.

To select mode-1, press  SHIFT  OPTION 6 and set  GPIB CMND AT/ 1/2 to 1.





## 1 PROGRAMMING

### 1.1 GPIB Setting

#### 1.1.1 GPIB Address Setting

The analyzer GPIB address is set through panel key operation. Addresses from 0 through 30 can be specified.

Example: Setting 1 for the GPIB address

Press  SHIFT LCL 1 GHz

#### 1.1.2 Delimiter

When sending data from an external controller to the analyzer, the delimiter should follow the definitions described below. When sending data from the analyzer to the external controller, outputs LF as a delimiter, also outputs EOI signal together with LF.

Table 1-1 Delimiters

Delimiter	Description
CR and LF <EOI>	Outputs CR and LF, also outputs EOI signal together with LF.
LF	Outputs LF.
<EOI>	Outputs EOI signal together with the data end byte.
CR and LF	Outputs CR and LF.
LF<EOI>	Outputs LF and also EOI signal together with LF.

#### 1.1.3 Input/Output Format

Such input/output commands as GPIB code transmission to connected devices, data reception, bus command execution, and serial polling are programmable in GPIB. Other operational calculations are defined by the active controller.

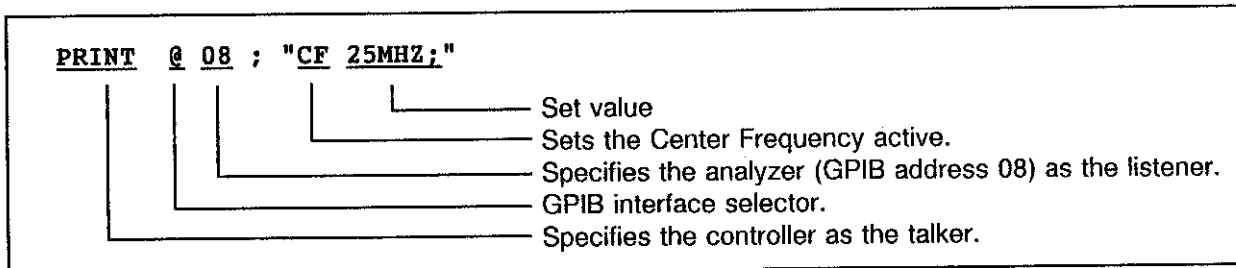
Statement Format

Input/Output statement device address; data

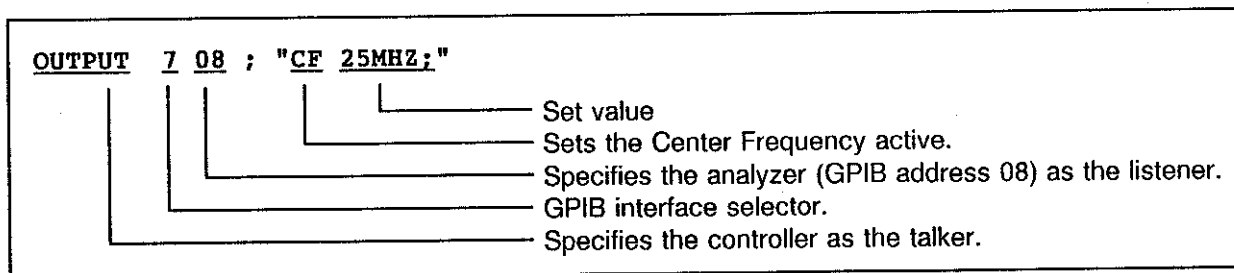
## 1.2 Remote Setting Format (Listener)

The measurement parameter and setting conditions are entered by remote control using the specified GPIB code. When setting the center frequency to 25 MHz, enter as follows:

PC9801 series



HP200, 300 series



"CF", "3", "0" and "MZ" in the programs are GPIB codes used to remote-control the analyzer.

The following are restrictions on the data to be entered:

- Each command should be separated from another with a space, comma (,) or semicolon(;).  
However, this does not apply to numeric data.

Correct) "CF SP"  
"CF 300 MHZ" or "CF 300MHZ"  
"SP100MHZ"  
"CF25MHZ;SP20MHZ;TS;"

Error) "CFSP"

- No binary numeric can be entered. (Excluding the trace binary input)
- The carriage return (CR) and line feed (LF) are recognized as the data delimiters.  
(Excluding the trace binary input)
- Nothing can be entered unless it is defined as a GPIB code. If an undefined data is entered, a syntax error will be caused.

### 1.3 Data Output Format (Talker)

To output the internal data such as setting conditions and measurement data, specify the data to be output with the "command + ?" like as "CF?". Specified data is acceptable only one, it is not allowed to specify the plural data.

The data specified is read in when the analyzer has entered Talker mode. The output formats can be divided as shown 1.3.1. The delimiter LF with EOI signal is used to be the last data (see the Syntax Diagram or 1.1.2 Delimiter section).

PC9801 series

<pre>PRINT @8;"CF?"      'Request the center frequency. INPUT @8;cf\$        'Frequency read-in</pre>
---

HP200, 300 series

<pre>OUTPUT 708;"CF?"  !Request the center frequency. ENTER 708;Cf\$     !Frequency read-in</pre>
---

#### 1.3.1 Output Format

	Output format
Frequency	<div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> <math>\pm</math> DDDDDDDDDDE <math>\pm</math> DDLF&lt;EOI&gt;            </div> <p>17 bytes at max. and the unit is Hz.</p> <hr style="border-top: 1px dashed black;"/> <p>Example: Output the center frequency 00000123.456E + 06</p>
Level	<div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> <math>\pm</math> DDDDDDDDE <math>\pm</math> DDLF&lt;EOI&gt;            </div> <p>12 bytes at max. and the unit is dB, V or W.</p> <hr style="border-top: 1px dashed black;"/> <p>Example: Output the marker level. - 00056.23E + 0</p>

Note \*1: a space if Positive, and minus sign if Negative

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**1.3 Data Output format (Talker)**

	Output format
Time	<p style="text-align: center;"><math>\pm \text{DDDE} \pm \text{DDL F} \langle \text{EOI} \rangle</math></p> <p style="text-align: right;">Delimiter Exponent Mantissa Sign*1</p> <p>9 bytes at max. and the unit is sec.</p> <hr style="border-top: 1px dashed black;"/> <p>Example: Output the sweep time. 0500E-3</p>
Constant	<p style="text-align: center;"><math>\pm \text{DDDL F} \langle \text{EOI} \rangle</math></p> <p style="text-align: right;">Delimiter Data Sign*1</p> <p>5 bytes at maximum.</p> <hr style="border-top: 1px dashed black;"/> <p>Example: Output the averaging time. 128</p>

Note \*1: a space if Positive, and minus sign if Negative

### 1.4 Input and Output of Trace Data

Trace data displayed on the screen comprises 701 points of data on the frequency axis. To input or output the data, data of the 701 points are transferred one after another, starting at the left end (start frequency). The level of each point is expressed by integers from 0 to 400 or from 448 to 3648. (For the waveform out of the uppermost scale, the value exceeds 400 or 3648.)

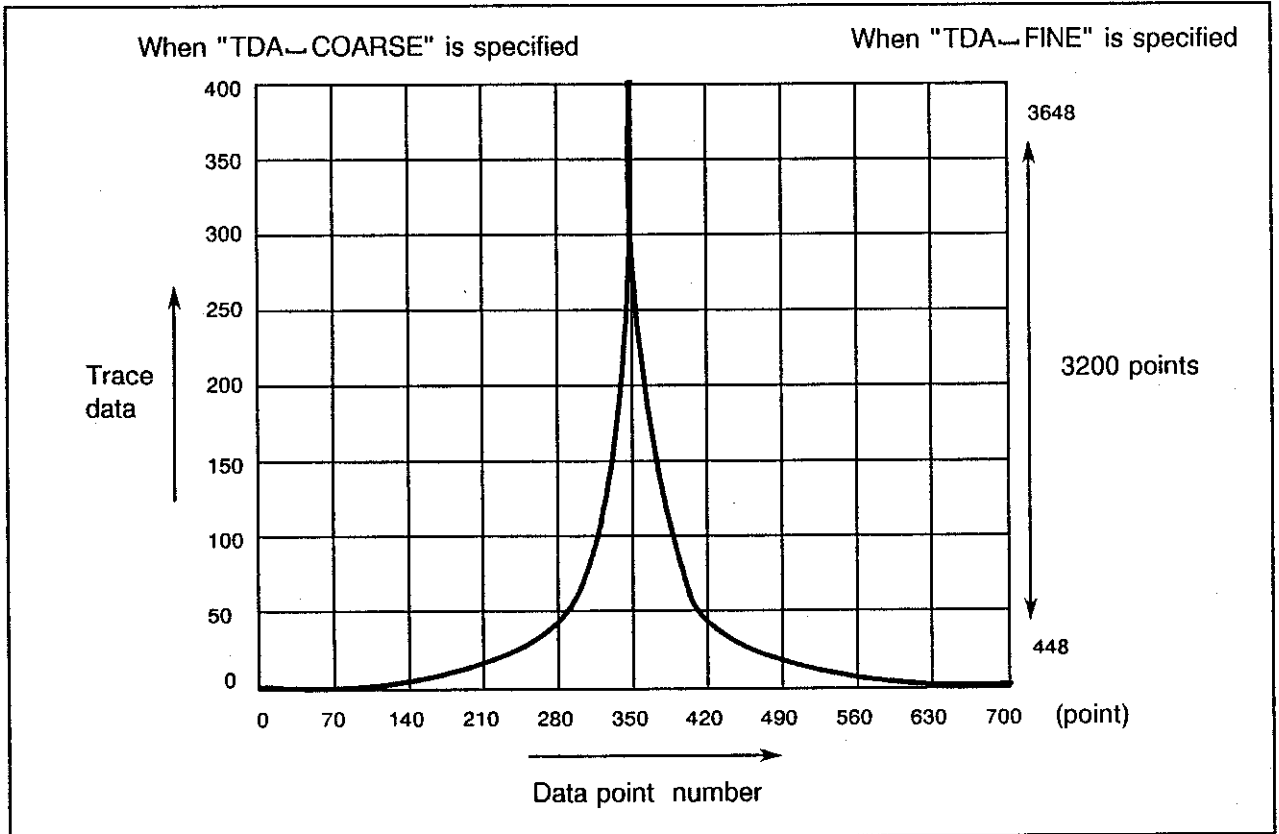


Fig. 1-1 Relation between the Screen Grid and the Number of points

The accuracy of trace data input and output is specified as following table.

Table 1-2 Trace Accuracy Specification Codes

GPIB code	Description
TDA-COARSE	Trace data is input/output at the accuracy 0 to 400.
TDA-FINE	Trace data is input/output at the accuracy 448 to 3648.

### 1.4.1 Input/Output Format

Trace data can be input and output as ASCII data or Binary data.

In ASCII format, each point of the trace data is converted to 4 bytes data as ASCII, and is transferred the data with delimiter. In Binary format, one-point data is converted to 2 bytes data, and its 701-point data is transferred continuously. EOI signal is added to the last byte.

Input/Output format	Description
ASCII format	<p><b>DDDDLFLF&lt;EOI&gt;</b></p> <p>Example: Trace data value is 200.        '0', '2', '0', '0', LF&lt;EOI&gt;</p>
Binary format	<p><b>DD DD.....DD+EOI</b></p> <p>The binary value of one-point data consists of 2 bytes.        The 701-point data is completed with EOI signal at the end.</p> <p>Example: Trace data value is 200.        00c8 .....</p>

### 1.4.2 Trace Output Range Specification

Only the output range of the trace data can be specified. Regarding the lower left corner of the scale as 0, the start position and the number of output items can be specified. However, this should be specified to satisfy  $\text{Start position} + \text{The number of output items} \leq 701$ .

PC9801 series

```
PRINT @8;"TRA 280,140?"      'Output 140-points data from 280th point.
```

HP200, 300 series

```
OUTPUT 708;"TRB,350?"      !Output 350-points data from 0 point.
```

See also Syntax Diagram.

## 1.5 Service Request (SRQ)

Using the service request function, the analyzer state can be detected by external devices. When one of the following conditions has occurred, the corresponding status bit turns ON and the controller can read the status byte by serial polling.

Table 1-3 SRQ ON/OFF Specification codes

GPIB code	Description
SRQ—ON	SRQ signal (interrupt) is transmitted to the controller.
SRQ—OFF	No SRQ signal (interrupt) is transmitted to the controller. (initial setting)
SRQ—CLR	The status byte is cleared.

Table 1-4 Trace Accuracy Specification Codes

Bit	Decimal	Description
0	1	Turns ON when UNCAL has occurred.
1	2	Turns ON when the calibration is complete.
2	4	Turns ON when sweep is complete.
3	8	Turns ON when the specified number of averaging is complete.
4	16	Turns ON when plot output is complete.
5	32	Turns ON when an error is found in the GPIB code or a mode error has occurred (SYNTAX ERR)
6	64	Turns ON simultaneously with bits 0 through 5 or bit 7 when a service request is transmitted (SRQ—ON).
7	128	

When the mode transmitting SRQ signal (interrupt) to the controller is selected, it can be specified to transmit only required SRQ signal. RQS command has the decimal value of status byte as a parameter.

For example, when only the sign of the completion of Averaging is needed, specified as follows:

PC9801 series

```
PRINT @8;"SRQ ON;RQS 8;" 'Transmit SRQ only when complete the Averaging.
```

HP200, 300 series

```
OUTPUT 708;"SRQ ON;RQS 8;" 'Transmit SRQ only when complete the Averaging.
```

*MEMO*



A large rectangular area with rounded corners, enclosed by a dashed border, intended for writing the memo's content.



## 2. LANGUAGE REFERENCE

This chapter contains complete information for GPIB commands which are based on 8562 command language.

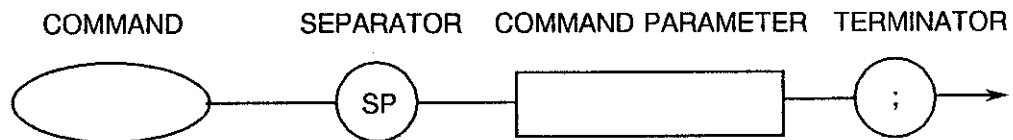
- 2.1 Syntax diagram conventions: This section describes the pictorial notations the proper syntax for each command.
- 2.2 Programming codes: This section lists the programming commands by functional groups.
- 2.3 Programming commands: These are listed in functional order according to their mnemonic, followed by a complete description of their syntax and parameters.

### 2.1 Syntax Diagram Conventions

This chapter contains complete information for the programming commands as a Syntax Diagram available to operate an R3265/3271 Spectrum Analyzers.

The following is a point to notice about Syntax Diagram.

#### 2.1.1 Command Sequence



A typical command sequence is represented above. The order of command sequence items is specified in the syntax diagram for each respective command.

- command Any valid command for the function. "CF", "SP" and so on.
- separator Separators are required to separate command sequences and command sequence items. The separators allowed for the spectrum analyzer are as follows:

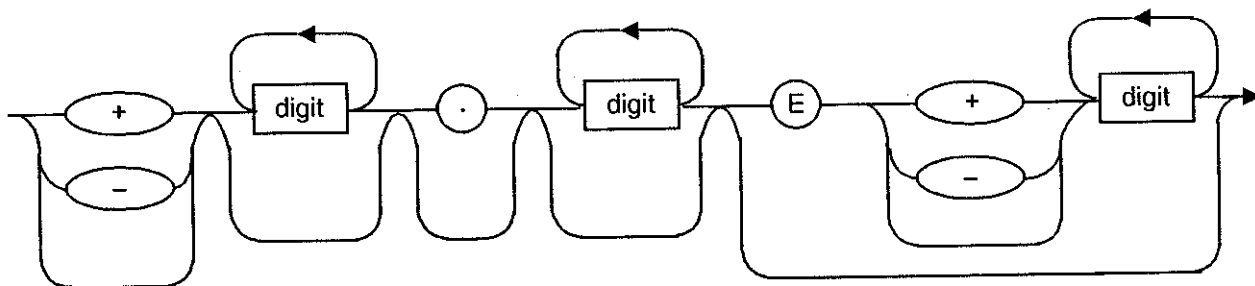
- SP (space)
- , (comma)

2.1 Syntax Diagram Conventions

- command parameter Any secondary key word recognized by the command, data, "ON", "OFF" and so on.
- terminator A terminator is required to end all command sequences. The terminators allowed for the spectrum analyzer are as follows:
  - ; (semicolon)
  - LF (line feed)
  - CR (carriage return)
  - SP (space)
  - ,
  - (comma)

2.1.2 Syntax Element

- data byte 8-bit byte containing numeric data.
- data & EOI 8-bit byte containing numeric data sent with EOI.
- digit 0 1 2 3 4 5 6 7 8 9
- LF with EOI Line feed (LF) with end-or-identify (EOI).
- number Expressed in integer, decimal, or exponential form.



## 2.2 Programming Codes (functional index)

### (1) Frequency Control

ATUN	Activates auto tuning routine.
CF	Specifies center frequency.
FA	Specifies start frequency.
FB	Specifies stop frequency.
FOFFSET	Turns frequency offset on and off, and specifies frequency offset.
FREF	Specifies the frequency reference source.
FS	Specifies full frequency span.
MKCF	Enters marker frequency into center frequency.
MKDCF	Enters marker delta frequency into center frequency.
MKDSS	Moves marker delta frequency to center-frequency step-size.
MKSP	Moves marker delta frequency into span.
MKSS	Moves maker frequency to center-frequency step-size.
SP	Specifies frequency span.
SS	Specifies center-frequency step-size.

### (2) Amplitude Control

AT	Specifies input attenuation.
AUNITS	Specifies amplitude units for input, output, and display.
LG	Selects log scale.
LN	Selects linear scale.
LOWNOISE	Turns low noise mode on.
MINAT	Specifies minimum input attenuation.
MKRL	Moves active marker to reference level.
RL	Specifies reference level.
ROFFSET	Specifies reference-level offset.

(3) Bandwidth Control

RB	Specifies resolution bandwidth.
RBR	Specifies the coupling ratio of RBW and frequency span.
VB	Specifies video bandwidth.
VBR	Specifies the coupling ratio of VBW and RBW.

(4) Coupling Control

AUTOCP	Auto-couple all controls. (RBW, VBW, SWP, ATT)
RBR	Specifies the coupling ratio of RBW and frequency span.
VBR	Specifies the coupling ratio of VBW and RBW.

(5) External Mixing

CNVLOSS	Sets reference-level offset to compensate for external mixer conversion loss.
FULBAND	Sets start and stop frequencies for full waveguide bands.
HNLOCK	Specifies frequency band and locks on.
HNUNLK	Unlocks the specified band number.
LOSSF	Specifies Conversion Loss vs. Frequency Correction, and initiates or edits the external mixer correction.
MBIAS	Specifies the bias level for external mixers.
MXRMODE	Specifies either internal or external mixing.
SIGID	Identifies signals for external mixing frequency bands.

(6) Sweep and Trigger Control

CONTS	Selects continuous sweep mode.
MANS	Selects manual sweep mode.
RSTS	Resets sweep.
SNGLS	Selects single sweep mode.
ST	Specifies sweep time.
TM	Selects trigger mode.
TRIGSLP	Selects trigger slope (+/-).
TS	Take a sweep.
TVH	Specifies line number in TV-H trigger mode.
VTL	Specifies video trigger level.
WDOS	Selects window sweep mode.

(7) Detection and Demodulation

DEMODO	Turns demodulation on and off.
DEMODT	Specifies demodulation time.
DEMODAGC	Turns automatic gain control on and off.
DET	Selects detection mode.
DGTLIF	Selects digital IF and analog IF.
MKPAUSE	Specifies marker pause time.
SQUELCH	Turns squelch control on and off, and specifies squelch level.
VOL	Sets speaker volume.

(8) Input/Output Control

SWPOUT	Selects sweep voltage output mode.
OHM	Selects input impedance.
INPUN	Selects RF connection mode for input signal.

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**2.2 Programming Codes (functional index)**

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- (9) Information and Service Diagnostics and Instrument State Control
- |         |   |
|---------|---|
| ID      | Returns model number of analyzer used and option information.                           |
| IP      | Sets instrument parameters to preset values.  |
| OT      | Outputs annotation of 24 lines on the CRT display.                                      |
| RCLS    | Recalls previously saved state.   |
| REV     | Returns analyzer revision number.   |
| RQS     | Returns decimal weighting of status byte bits which are enabled during service request. |
| SAVES   | Saves current state of the analyzer in the specified register.                          |
| SF      | Selects soft menu number.   |
| SRQ CLR | Clear the status byte.  |
| SRQ OFF | Disables SRQ signal interrupt.  |
| SRQ ON  | Enables SRQ signal interrupt.   |

(10) Trace Functions

AG0	Selects continue mode of averaging A.
AG1	Selects complete mode of averaging A.
AMB	A-B into A.
AML	A-DL into A.
AXB	Exchanges A and B.
BG0	Selects continue mode of averaging B.
BG1	Selects complete mode of averaging B.
BLANK	Stores and blanks specified trace register.
BMA	B-A into A.
BML	B-DL into B.
CLRW	Clear-writes specified trace register.
CWA	Clear A memory.
CWB	Clear B memory.
DGTLIF	Selects digital IF or analog IF mode.
MINH	Holds the minimum trace register values.
MXMH	Max Holds the specified trace register.
NORMLIZE	Selects normalize A and B mode. (ANORM)
SAVENC	Saves normalize correction data.
TDA	Specifies accuracy of trace input/output.
TDF	Selects trace data input/output format.
TRA	Input/output trace A as ASCII or binary data.
TRB	Input/output trace B as ASCII or binary data.
VAVG	Turns video averaging on or off, and specifies averaging time.
VIEW	Views specified trace register.

(11) Marker Control

ATUN	Activates auto tuning routine.
CNTR	Selects counter mode.
CONTPK	Turns continuous peak search mode on or off.
CONTXDB	Turns continuous dB down mode on or off.
DX	Specifies delta X value for peak search.
DY	Specifies delta Y value for peak search.
FXP	Moves fixed delta marker to peak.
MKA	Amplitude of active marker.
MKBW	Selects marker display mode of X dB down execution, and specifies level.
MKCF	Enters marker frequency into center frequency.
MKD	Moves delta marker to specified frequency.
MKDCF	Enters marker delta frequency into center frequency.
MKDMSS	Moves marker delta frequency to marker step-size.
MKDR	Marker delta reciprocal, readout in time.
MKDSPL	Selects marker data display mode.
MKDSS	Moves marker delta frequency to center-frequency step-size.
MKFC	Turns frequency counter mode on or off.
MKFXD	Turns fixed delta marker mode on or off.
MKMIN	Moves marker to minimum signal detected. (MIS)
MKMSS	Moves marker frequency to marker step-size.
MKMULTI	Turns multi marker on or off.
MKN	Moves marker to specified frequency.
MKNOISE	Turns noise level measurement mode on or off, and specifies noise power bandwidth.
MKOFF	Turns the active marker off.
MKPAUSE	Specifies marker pause time.
MKPK	Moves marker to signal peak.
MKRL	Moves active marker to reference level.
MKSP	Moves marker delta frequency into span.
MKSS	Moves marker frequency to center frequency step-size.



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MKTRACK	Turns signal track on or off.
MSS	Specifies marker step-size.
NIC	Selects dBc/Hz measurement mode.
NIM	Selects dBm/Hz measurement mode.
NIU	Selects dB $\mu$ V/ $\sqrt{\text{Hz}}$ measurement mode.
PKLIST	Turns peak list on or off.
PKRNG	Selects next peak range.
XDB	Executes X dB Down.
XDL	Executes X dB Down Left.
XDR	Executes X dB Down Right.
(12) Display Control	
ANNOT	Turns annotation on or off.
DL	Turns display line on or off, and specifies level.
FDSP	Turns frequency display on or off.
GRAT	Turns graticule on or off.
SMENU	Turns soft menu display on or off.
TITLE	Turns label display on or off, and edits the label.
WDO	Turns measurement window on or off. (WN)
WFA	Specifies start frequency of measurement window. (WDOSRT)
WFB	Specifies stop frequency of measurement window. (WDOLOW)
WLL	Specifies lower level of measurement window. (WDOLOW)
WUL	Specifies upper level of measurement window. (WDOUP)
(13) EMC	
ANT	Selects antenna type.
ANTCORR	Turns antenna correction on or off, and initiates or edits correction table.
EMCDET	Selects detection mode of EMC.
LIMLA	Turns limit line A on or off, and initiates or edits limit line A table.
LIMLB	Turns limit line B on or off, and initiates or edits limit line B table.
LVCORR	Turns level correction on or off.
ORB	Specifies resolution bandwidth of detection mode.

(14) OBW/ADJ

ADJ Measure adjacent channel leakage power (ADJ).  
ADJBW Specifies specified bandwidth of ADJ.  
ADJCH Specifies channel spacing of ADJ.  
GONG GO/NG judgment function.  
PWRBW Measure occupied bandwidth.

(15) Internal Preselector Control

PP Activates auto peaking routine.  
PSDAC Specifies preselector setting value.

(16) Calibration

CAL Executes specified calibration item.  
CALCORR Turns calibration correction on or off.  
CL Specifies calibration signal level.  
FREQCORR Turns frequency characteristic correction on or off.

(17) Memory Card Control

MC Operate the memory card.

(18) Plotter Output

PLOT Sends analyzer display to a plotter.  
PLOTFORM Selects plotter form size.  
PLOTPEN Selects the number of pens.  
PLOTPOSN Selects the screen split size and location for plot.  
PLOTSRC Selects plot source.  
PLOTTYPE Selects plotter type.

## 2.3 Programming Commands

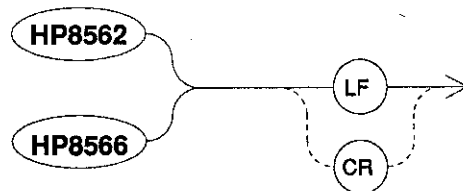
This chapter contains programming commands. For each command, their syntax and parameters are described here.

Before using this part of the manual, you may want to refer to section 1.1 and section 2.1 of this manual (Part 2).

## HP8562 / HP8566

### Selects The HP8562/8566 Compatible Commands

#### Syntax

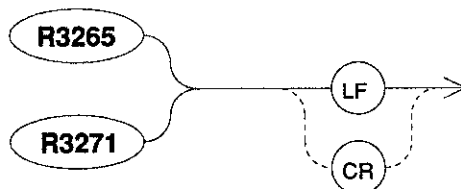


#### Example

```
10 OUTPUT 708,"R3265"  
20 OUTPUT 708,"TS PS MF?"  
30 ENTER 708;Mf  
40 PRINT "PEAK FREQ. = ";Mf  
50 !  
60 OUTPUT 708,"HP8562"  
70 OUTPUT 708,"TS;MKPK;MKN?;"  
80 ENTER 708;Mf  
90 PRINT "PEAK FREQ. = ";Mf  
100 !  
110 OUTPUT 708,"HP8566"  
120 OUTPUT 708,"TS;E1;MF;"  
130 ENTER 708;Mf  
140 PRINT "PEAK FREQ. = ";Mf  
150 END
```

## R3265 / R3271 Selects The Original Commands

### Syntax

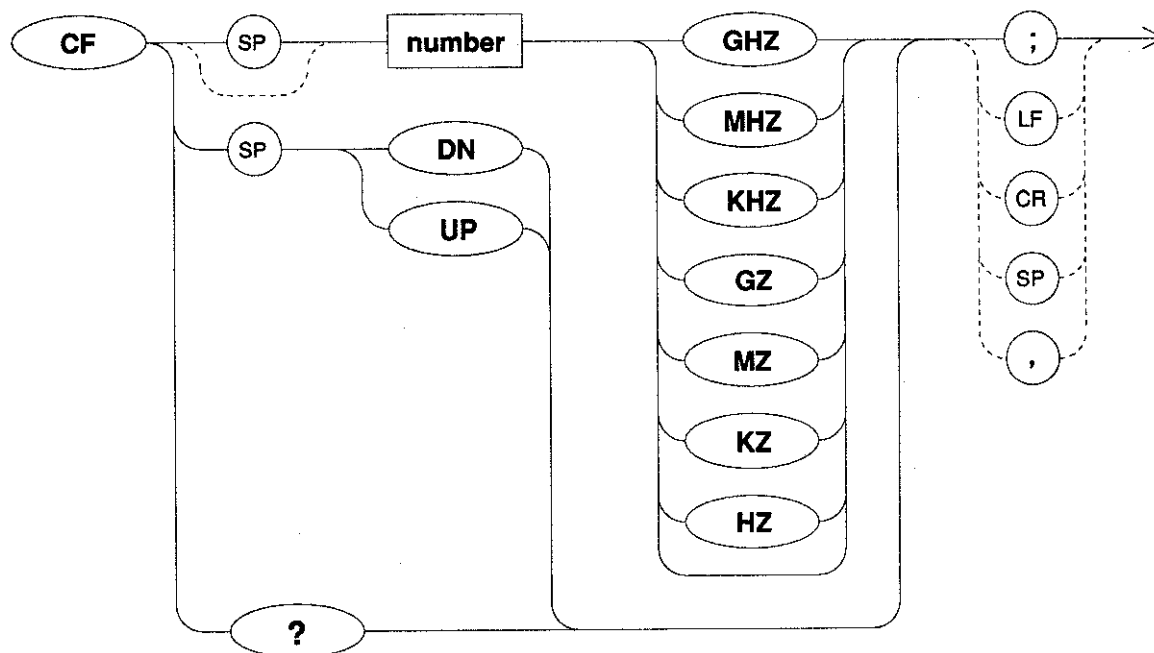


### Example

```
10  OUTPUT 708;"R3265"  
20  OUTPUT 708;"TS PS MF?"  
30  ENTER 708;Mf  
40  PRINT "PEAK FREQ. = ";Mf  
50  !  
60  OUTPUT 708;"HP8562"  
70  OUTPUT 708;"TS;MKPK;MKN?;"  
80  ENTER 708;Mf  
90  PRINT "PEAK FREQ. = ";Mf  
100 !  
110 OUTPUT 708;"HP8566"  
120 OUTPUT 708;"TS;E1;MF;"  
130 ENTER 708;Mf  
140 PRINT "PEAK FREQ. = ";Mf  
150 END
```

## CF Center Frequency

### Syntax



### Query Response

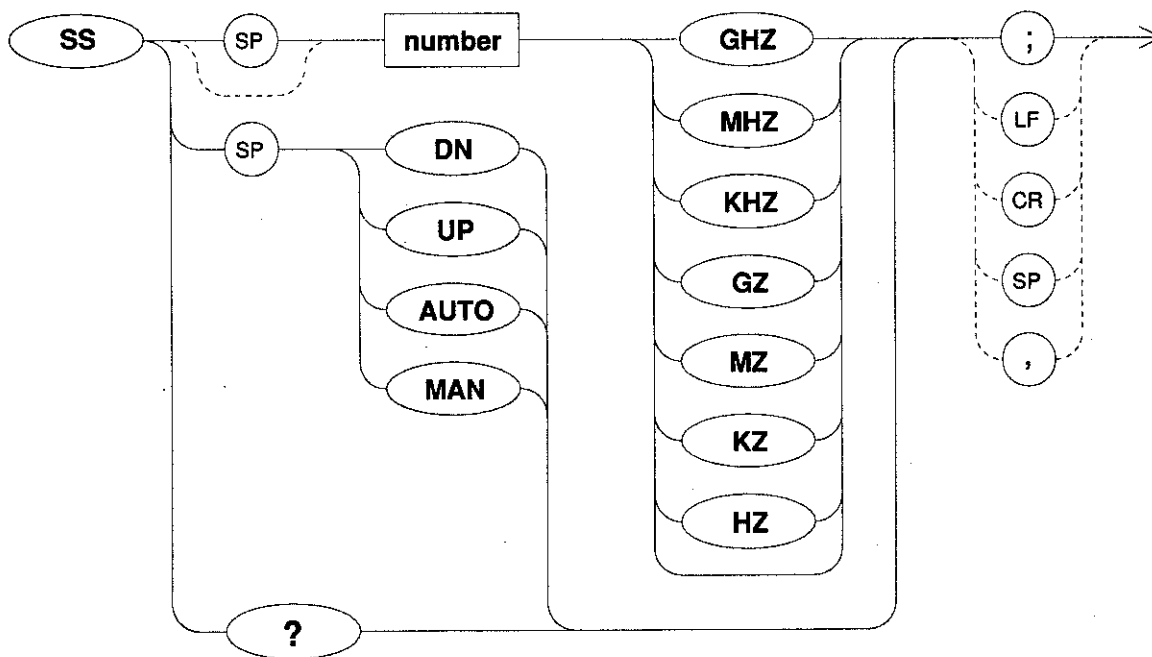


### Example

```
10 OUTPUT 708;"IP;"
20 OUTPUT 708;"CF 200MHZ;SP 30MHZ;TS;"
30 OUTPUT 708;"CF?;"
40 ENTER 708;Cf
50 PRINT Cf
60 END
```

## SS Center Frequency Step Size

### Syntax



### Query Response



### Example

```

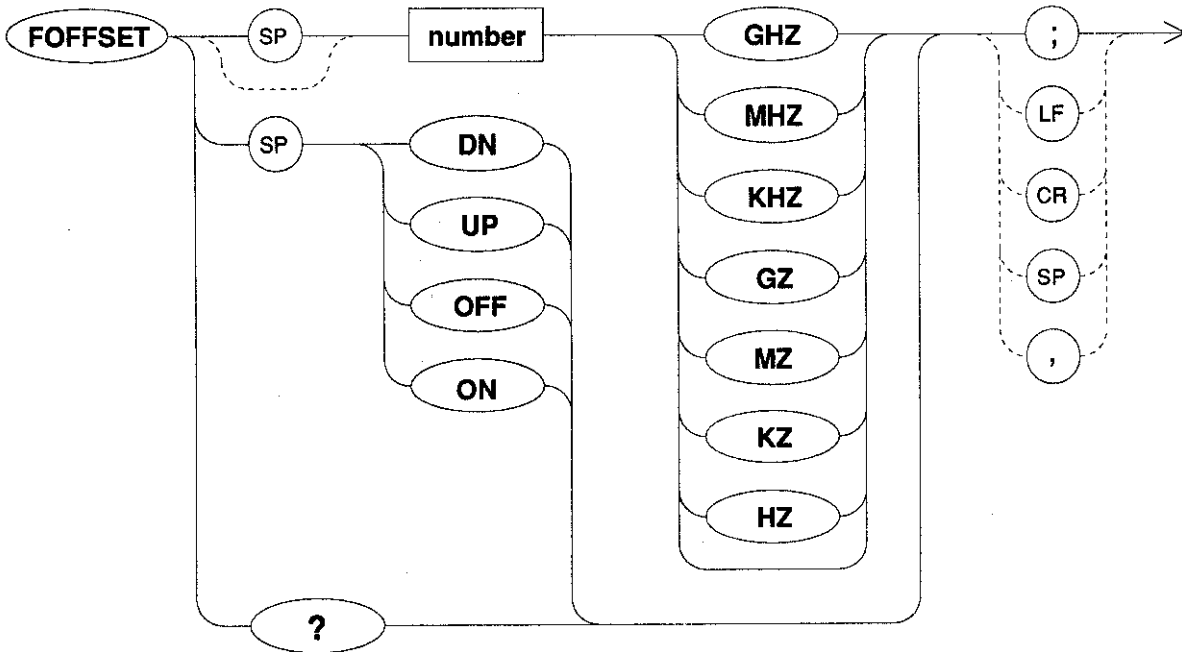
10 CLEAR 708
20 OUTPUT 708,"IP;SNGLS;CF250MHZ;SP 10MZ;TS;"
30 OUTPUT 708,"MKPK HI;MKRL;TS;MKF?;"
40 ENTER 708;M_freq
50 OUTPUT 708,"MKA?;"
60 ENTER 708;M_amp
70 OUTPUT 708,"SS ";M_freq
80 OUTPUT 708,"CF UP;TS;MKPK HI;MKA?;"
90 ENTER 708;M_ampl
100 PRINT M_amp-M_ampl
110 END

```

# FOFFSET

## Frequency Offset

### Syntax



### Query Response



### Example

```

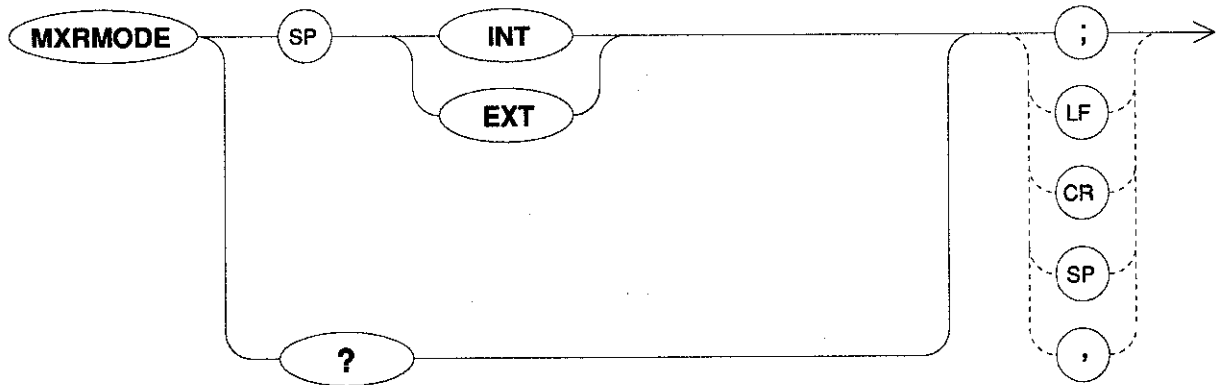
10 INPUT "ENTER DESIRED FREQUENCY OFFSET",Foffset$
20 OUTPUT 708;"FOFFSET ";Foffset$;" "
30 OUTPUT 708;"FOFFSET?"
40 ENTER 708;Foffset
50 PRINT "FREQ. OFFSET IS",Foffset,"HZ"
60 END

```

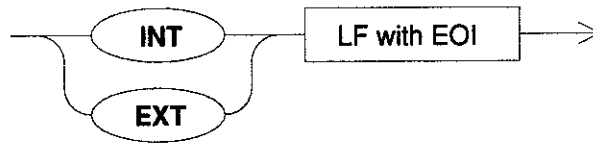


## MXRMODE Mixer Mode

### Syntax

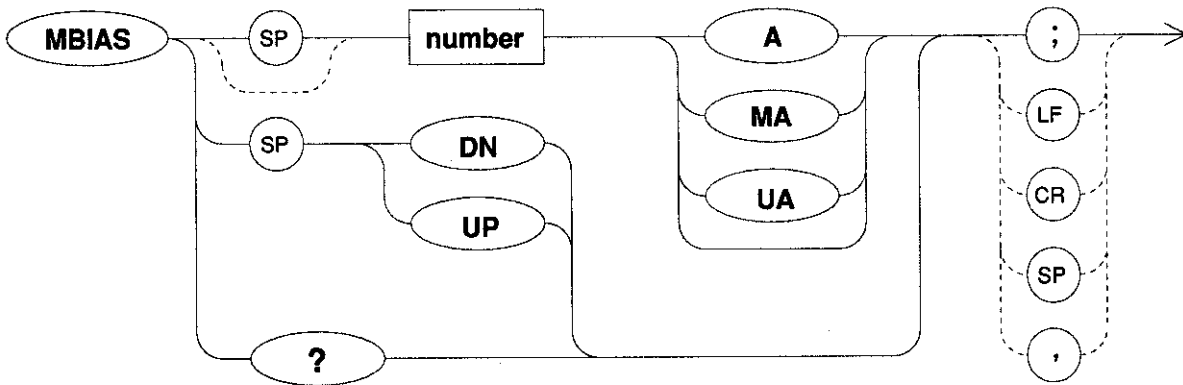


### Query Response



## MBIAS Mixer Bias

### Syntax



### Query Response



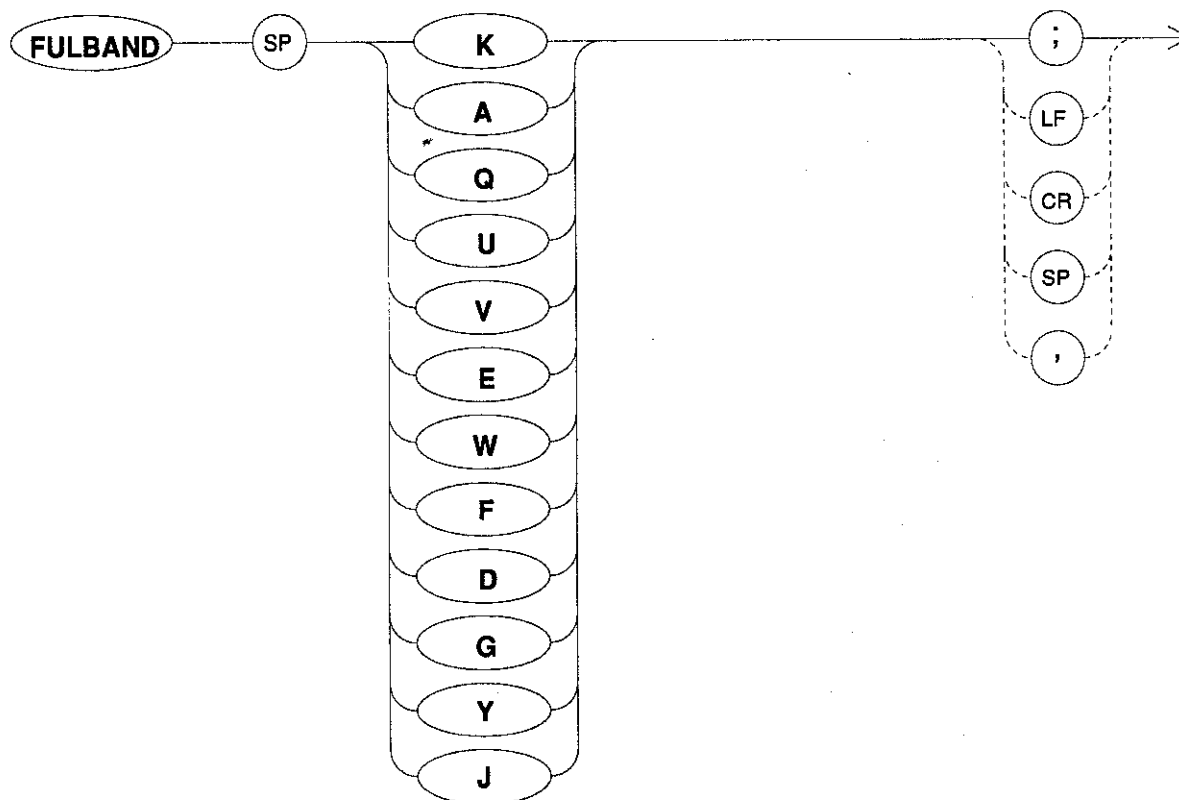
### Example

```
10 OUTPUT 708,"IP;MXRMODE EXT;FULBAND U;"
20 INPUT "ENTER THE BIAS VALUE",Bias$
30 OUTPUT 708,"MBIAS ";Bias$;";"
40 END
```

# FULBAND

## Full Band

### Syntax

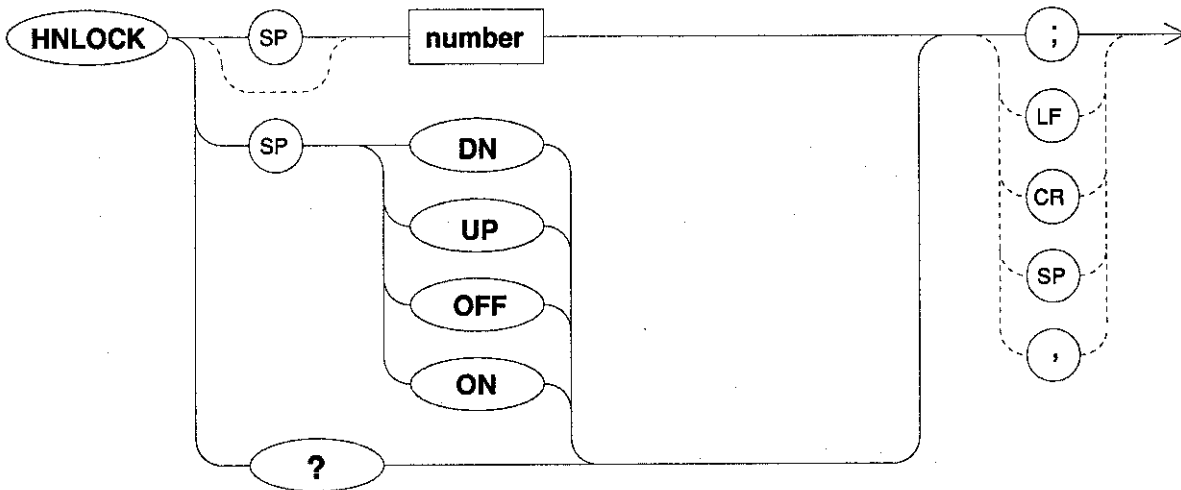


### Parameters

Band No.	Frequency Band	Frequency Range (GHz)	Mixing Degree
0		12.4 - 18.0	3-
1	K	17.0 - 26.5	4-
2		22.0 - 33.0	5-
3	A	26.5 - 40.0	6-
4	Q	33.0 - 50.0	8-
5	U	40.0 - 60.0	8-
6	V	50.0 - 75.0	10-
7	E	60.0 - 90.0	12-
8	W	75.0 - 110.0	14-
9	F	90.0 - 140.0	18-
10	D	110.0 - 170.0	22-
11	G	140.0 - 220.0	28-
12	Y	170.0 - 260.0	34-
13	J	220.0 - 325.0	42-

## HNLOCK Harmonic Number Lock

### Syntax



### Query Response



### Parameters

Band No.	Frequency Band	Frequency Range (GHz)	Mixing Degree
0		12.4 - 18.0	3-
1	K	17.0 - 26.5	4-
2		22.0 - 33.0	5-
3	A	26.5 - 40.0	6-
4	Q	33.0 - 50.0	8-
5	U	40.0 - 60.0	8-
6	V	50.0 - 75.0	10-
7	E	60.0 - 90.0	12-
8	W	75.0 - 110.0	14-
9	F	90.0 - 140.0	18-
10	D	110.0 - 170.0	22-
11	G	140.0 - 220.0	28-
12	Y	170.0 - 260.0	34-
13	J	220.0 - 325.0	42-

### Example

```

10 OUTPUT 708;"IP;MXRMODE EXT;"
20 INPUT "ENTER DESIRED BAND NUMBER FROM 0 TO 13",Band$
30 OUTPUT 708;"HNLOCK ";Band$
  
```

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**2.3 Programming Commands**

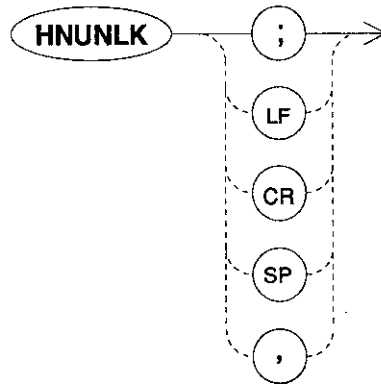
---

**40 END**

# HNUNLK

## Unlock Harmonic Number

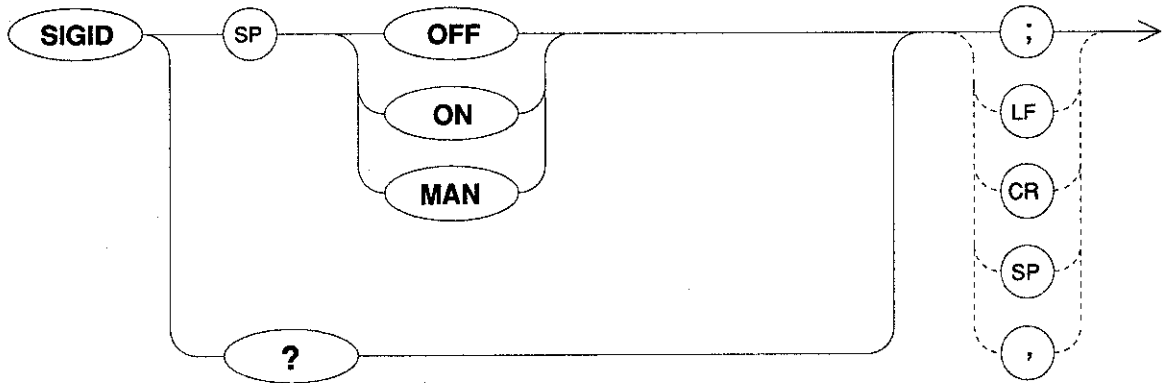
### Syntax



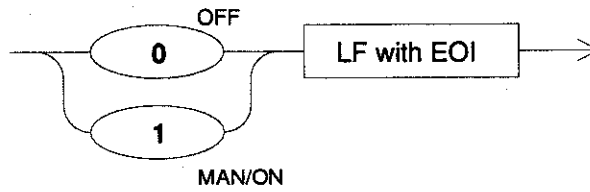
# SIGID

## Signal Identification

### Syntax



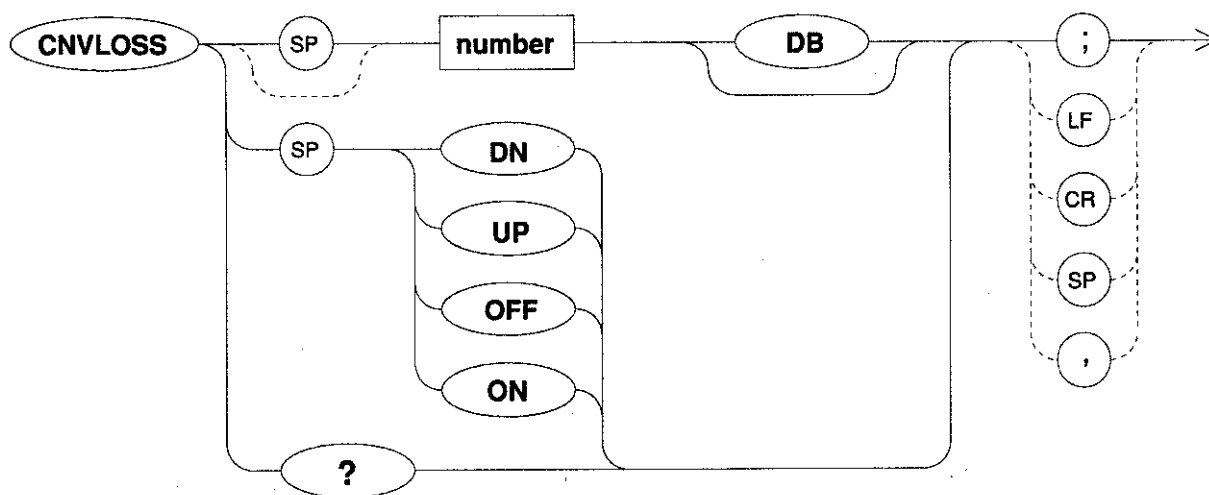
### Query Response



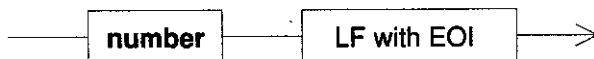
## CNVLOSS

### Conversion Loss

#### Syntax



#### Query Response



#### Example

```

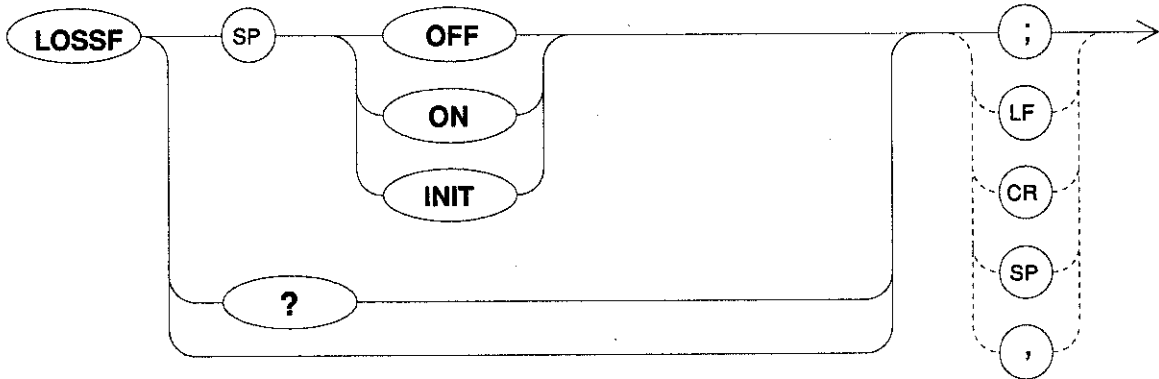
10  OUTPUT 708;"IP;MXRMODE EXT;"
20  INPUT "ENTER THE DESIRED CENTER FREQUENCY",Cf$
30  INPUT "ENTER THE CONVERSION LOSS FOR THAT FREQUENCY",Loss
40  OUTPUT 708;"CF ";Cf$;" ;SP 10MHZ;"
50  OUTPUT 708;"CNVLOSS ";Loss;"DB;"
60  END
  
```



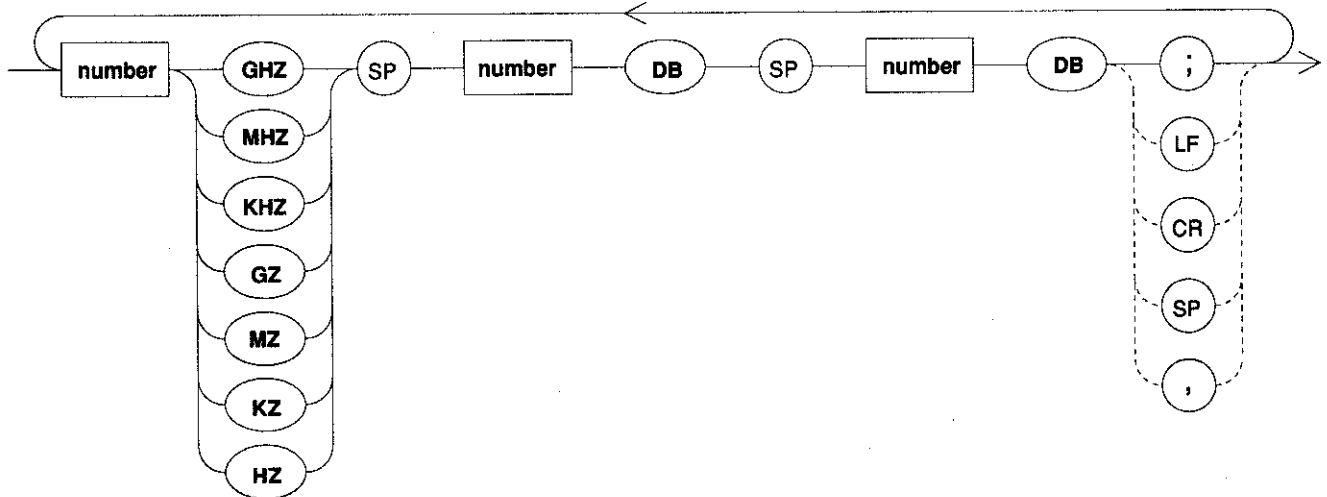
# LOSSF

## Conversion Loss vs Frequency Correction

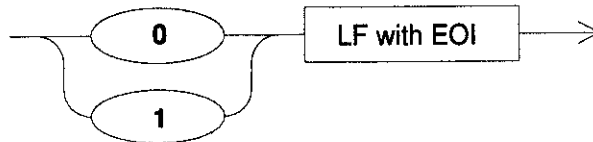
### Syntax



### cf:entry correction data



### Query Response



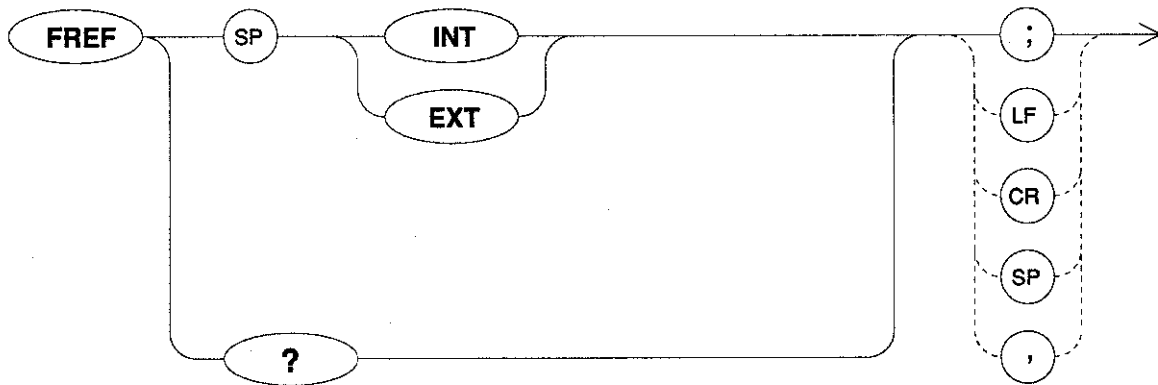
### Example

```

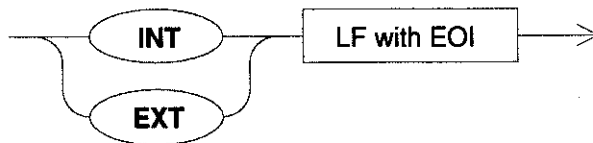
10 OUTPUT 708;"IP;MXRMODE EXT;"
20 OUTPUT 708;"CF 33.25GZ;SP 13.5GZ;"
30 OUTPUT 708;"LOSSF INIT;LOSSF;"
40 OUTPUT 708;"30GZ -22DB 0.1DB;33GZ -23DB 0.12DB;36GZ -24DB 0.14DB;"
50 OUTPUT 708;"LOSSF ON;"
60 END
  
```

## FREF Frequency Reference

### Syntax

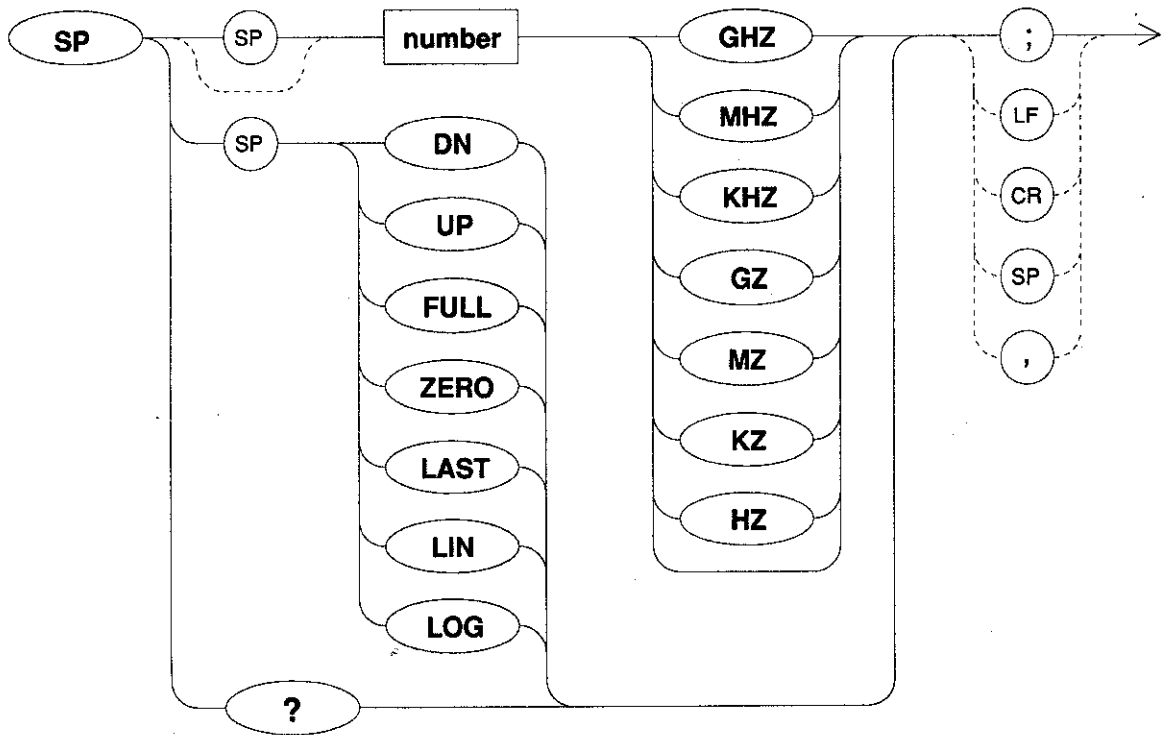


### Query Response



## SP Frequency Span

### Syntax



### Query Response



### Parameters

- LIN**        Sets the linear mode of the frequency span scale.
- LOG**        Sets the logarithmic mode of the frequency span scale.

### Example

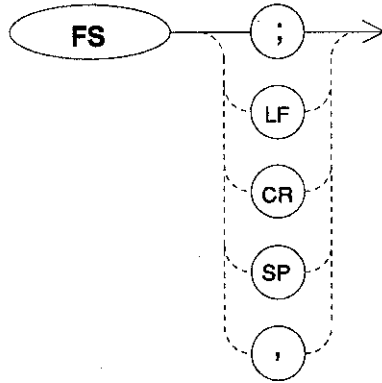
```

10  OUTPUT 708;"IP;CF 200MHZ;SP 30MHZ;"
20  OUTPUT 708;"SP UP;SP?;"
30  ENTER 708;Span
40  PRINT Span
50  END

```

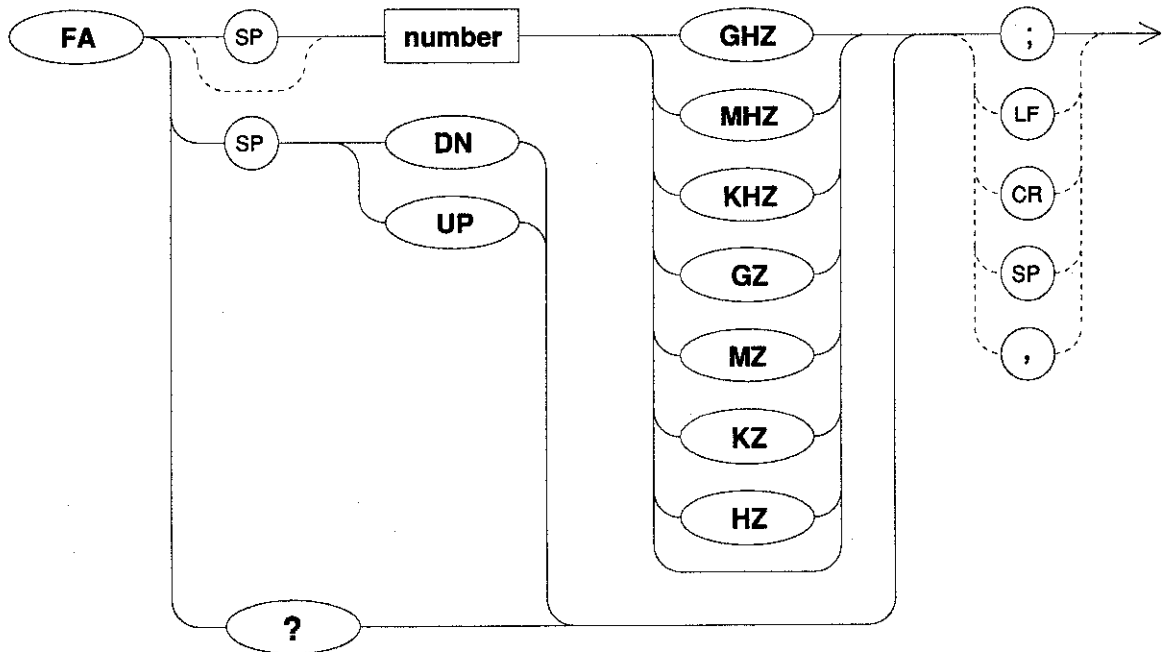
**FS**  
**Full Span**

**Syntax**

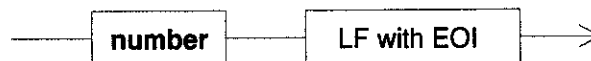


## FA Start Frequency

### Syntax



### Query Response

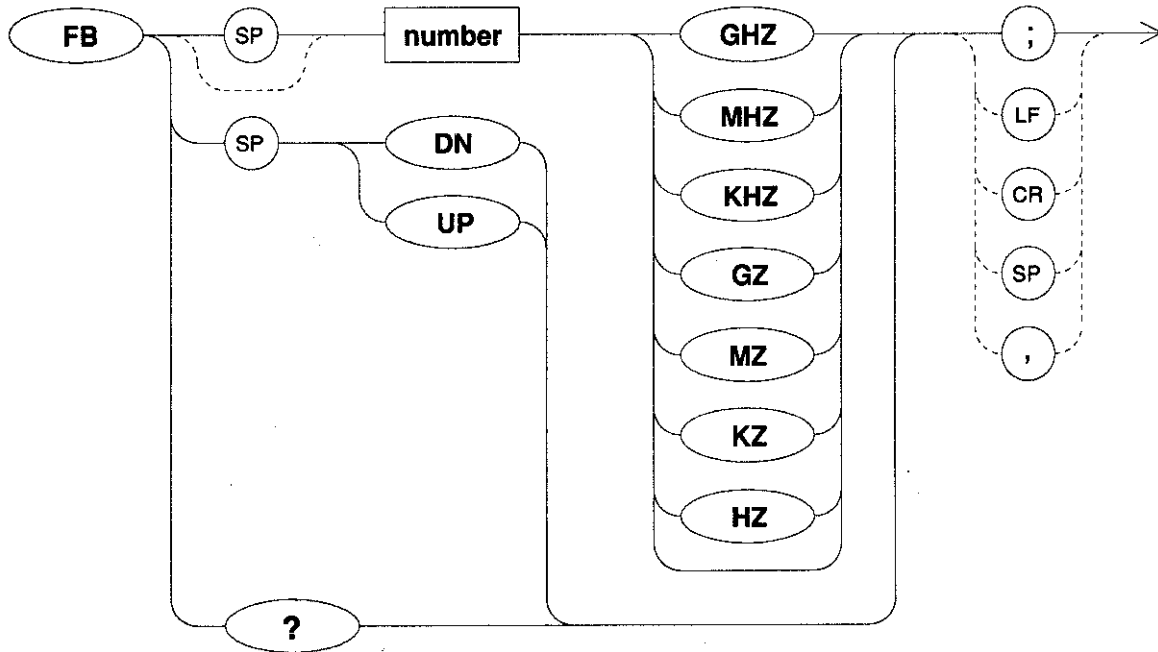


### Example

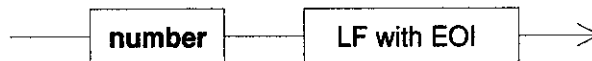
```
10 OUTPUT 708;"CF 164MHZ;SP 122MHZ;"
20 OUTPUT 708;"FA?;"
30 ENTER 708;Start
40 PRINT Start
50 END
```

## FB Stop Frequency

### Syntax



### Query Response



### Example

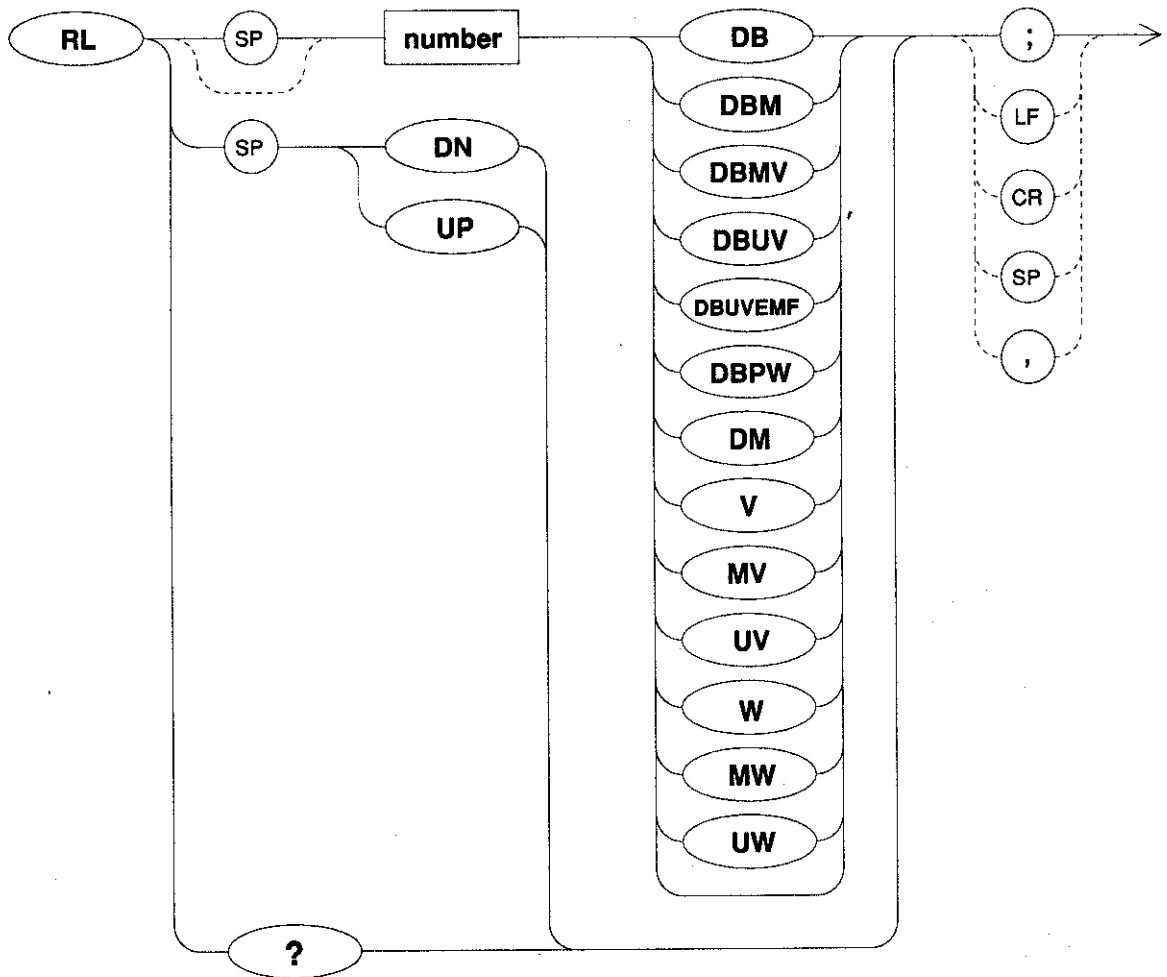
```

10 OUTPUT 708;"CF 164MHZ;SP 122MHZ;"
20 OUTPUT 708;"FB?;"
30 ENTER 708;Stop$
40 PRINT Stop$
50 END

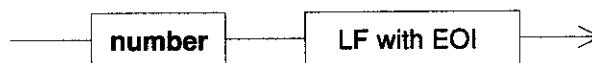
```

# RL Reference Level

## Syntax



## Query Response



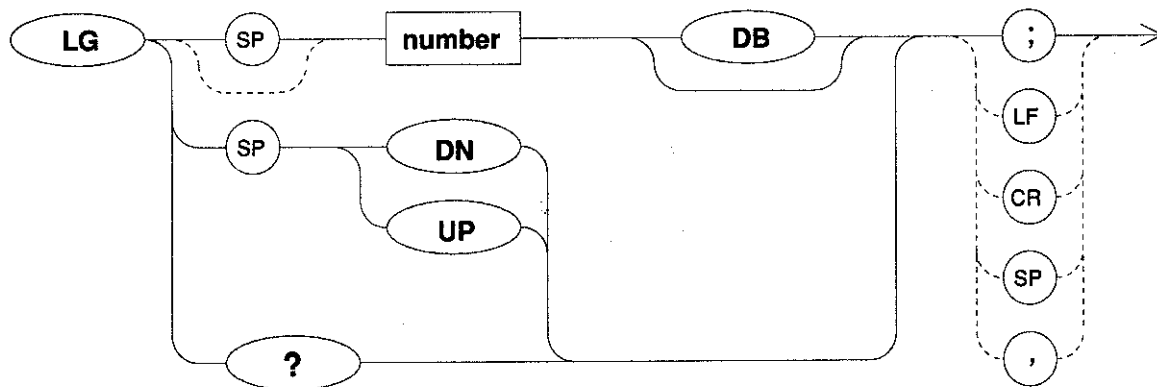
## Example

```

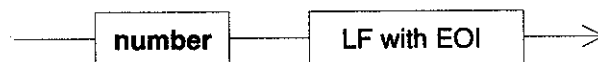
10 OUTPUT 708;"IP;SNGLS;CF 200MHZ;SP 30MHZ;"
20 OUTPUT 708;"TS;MKPK HI;MKRL;TS;"
30 OUTPUT 708;"RL?;"
40 ENTER 708;Ref
50 PRINT "REFERENCE LEVEL IS",Ref,"DB"
60 END
  
```

## LG Logarithmic Scale

### Syntax



### Query Response



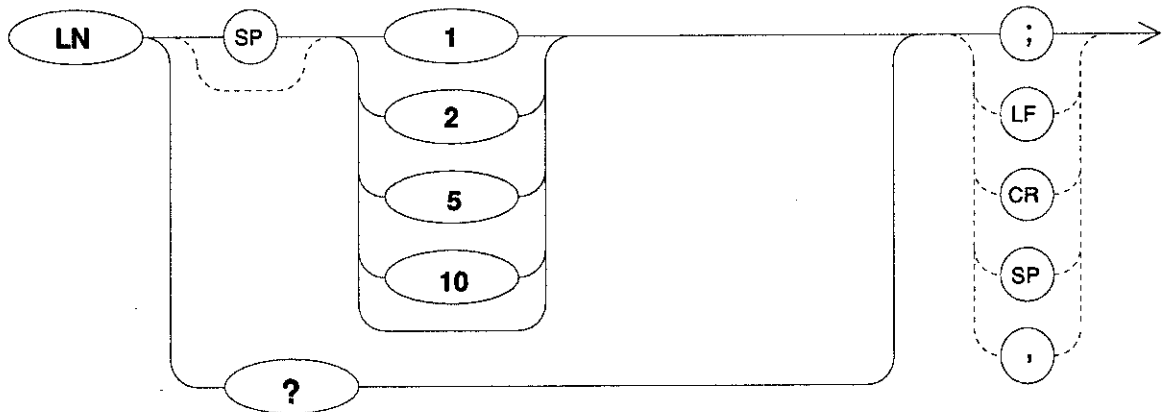
### Example

```
10 OUTPUT 708;"LG 10DB;"  
20 OUTPUT 708;"AUNITS DBUVMF;"  
30 OUTPUT 708;"TS;MKPK HI;MKRL;TS;"  
40 OUTPUT 708;"LG 5DB;"  
50 END
```

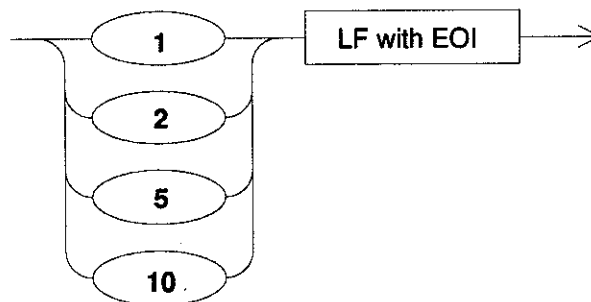


## LN Linear Scale

### Syntax



### Query Response



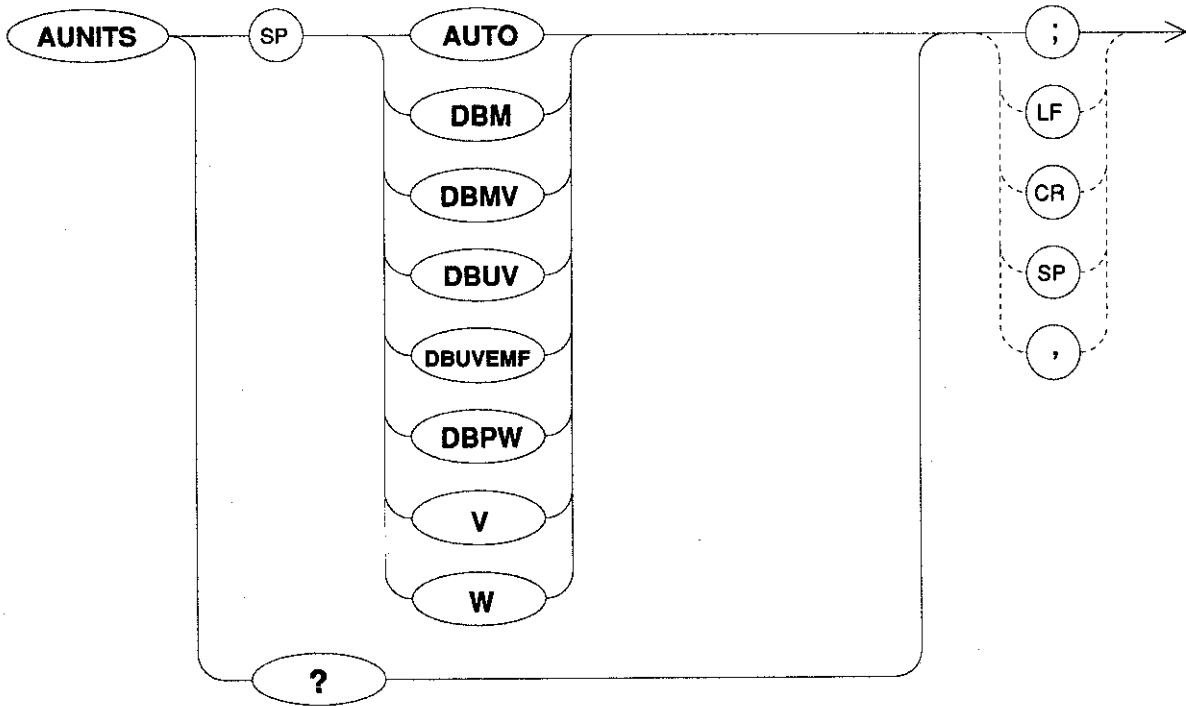
### Parameters

- |    |   |
|----|---|
| 1  | The interval from 0V to reference level is displayed in linear. |
| 2  | Display is multiplied by two according to the reference level.  |
| 5  | Display is multiplied by five according to the reference level. |
| 10 | Display is multiplied by ten according to the reference level.  |

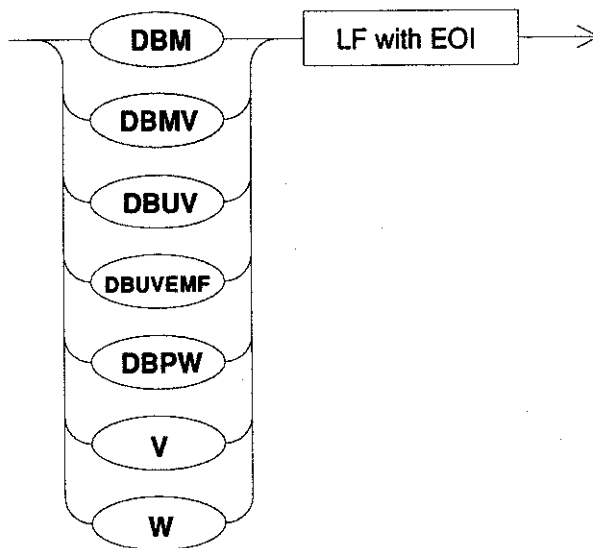
# AUNITS

## Absolute Amplitude Units

### Syntax

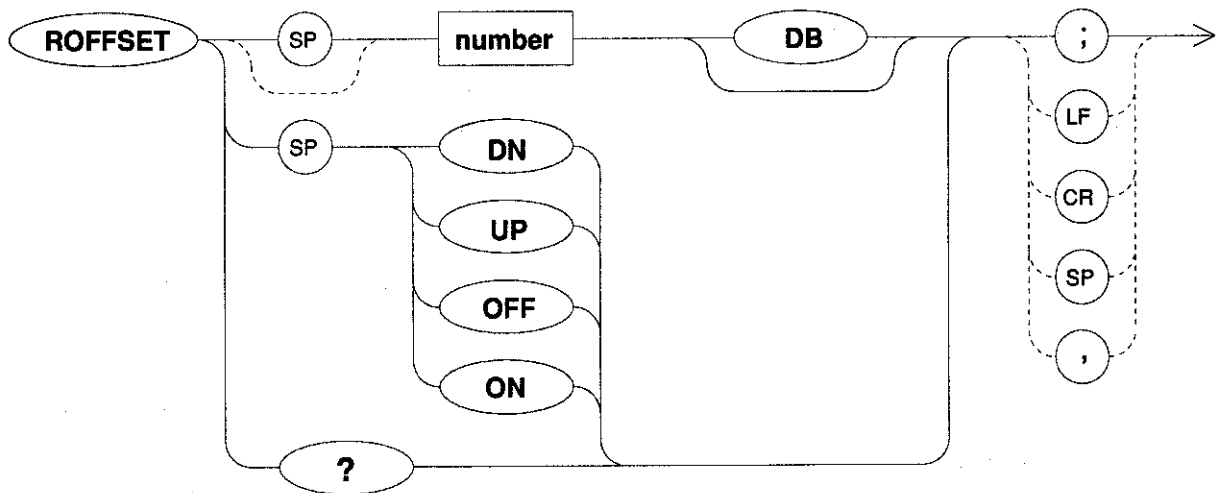


### Query Response



## ROFFSET Amplitude Reference Offset

### Syntax



### Query Response

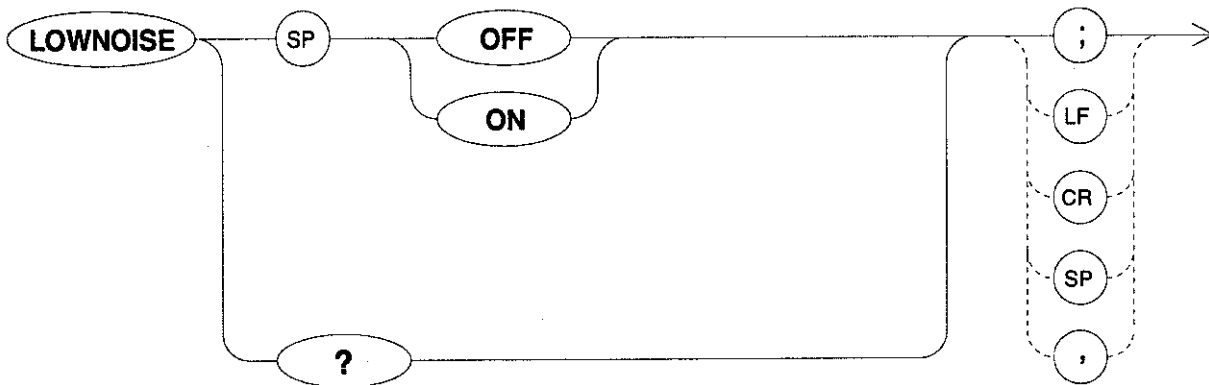


### Example

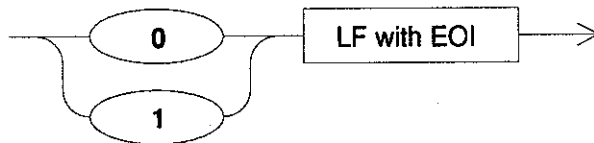
```
10 INPUT "ENTER REFERENCE LEVEL OFFSET",Roffset
20 OUTPUT 708;"ROFFSET ";Roffset;"DB;"
30 OUTPUT 708;"ROFFSET ON;"
40 OUTPUT 708;"ROFFSET?;"
50 ENTER 708;Roffset
60 PRINT "AMPLITUDE OFFSET IS ",Roffset,"DB"
70 END
```

## LOWNOISE Low Noise Mode

### Syntax

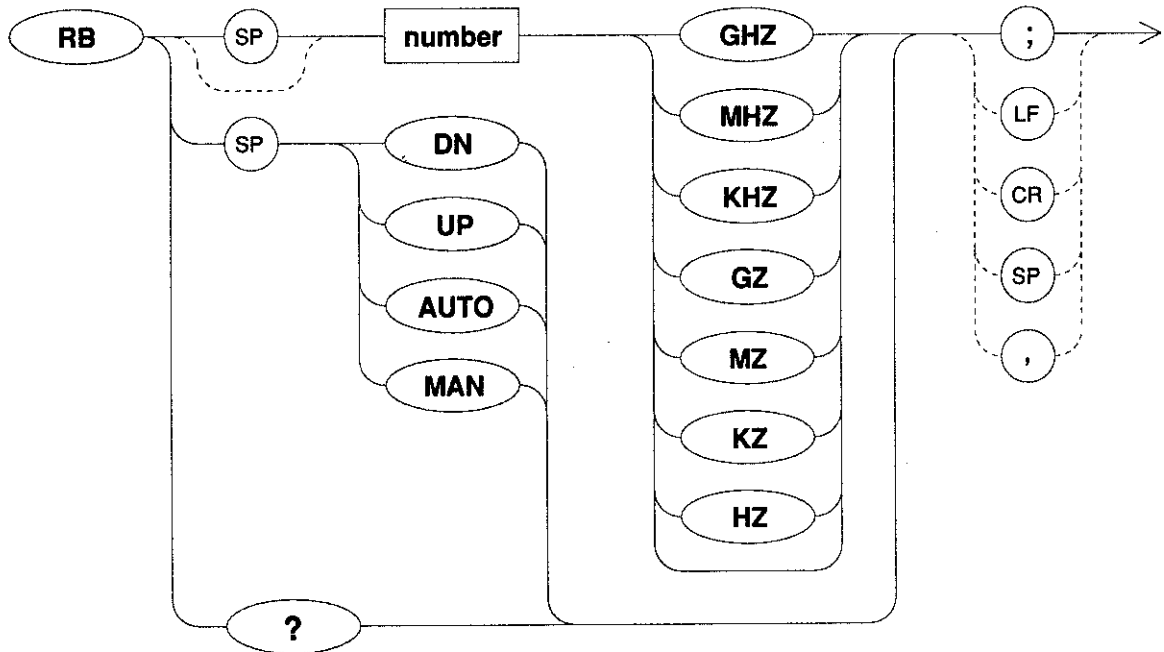


### Query Response



## RB Resolution Bandwidth

### Syntax



### Query Response



### Example

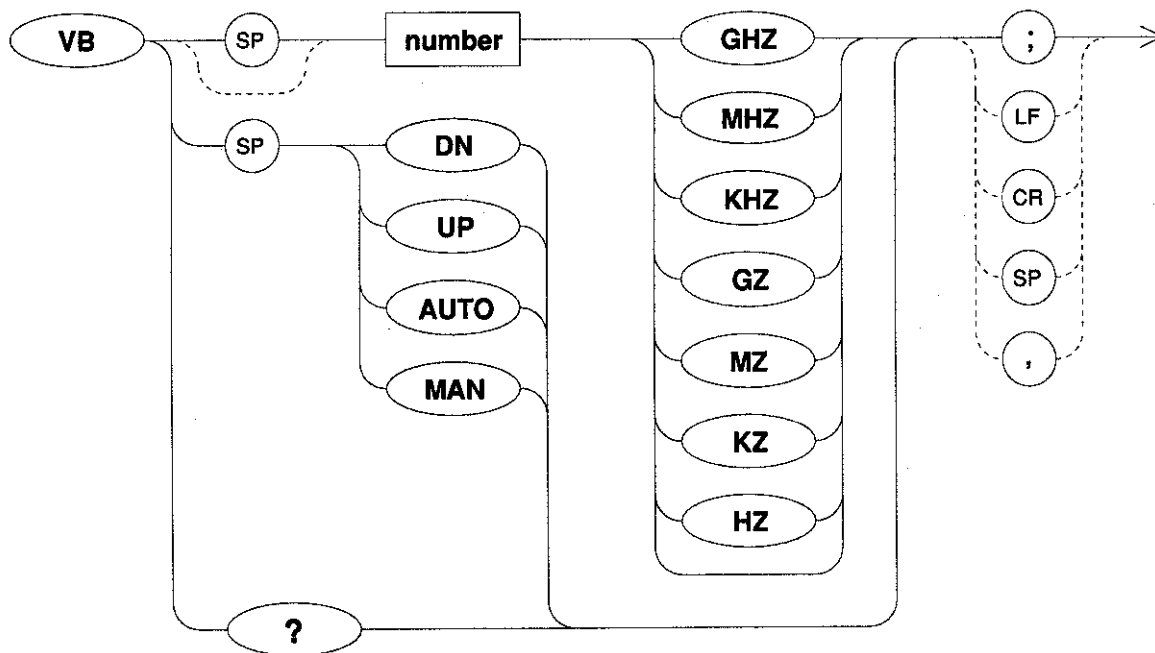
```

10 OUTPUT 708;"IP;"
20 OUTPUT 708;"CF 1.8GHZ;SP 2GHZ;"
30 INPUT "SELECT THE RESOLUTION BANDWIDTH",width$
40 OUTPUT 708;"RB ";width$;" "
50 OUTPUT 708;"RB?;"
60 ENTER 708;width$
70 PRINT "RBW IS ",width$,"HZ"
80 END

```

## VB Video Bandwidth

### Syntax



### Query Response



### Example

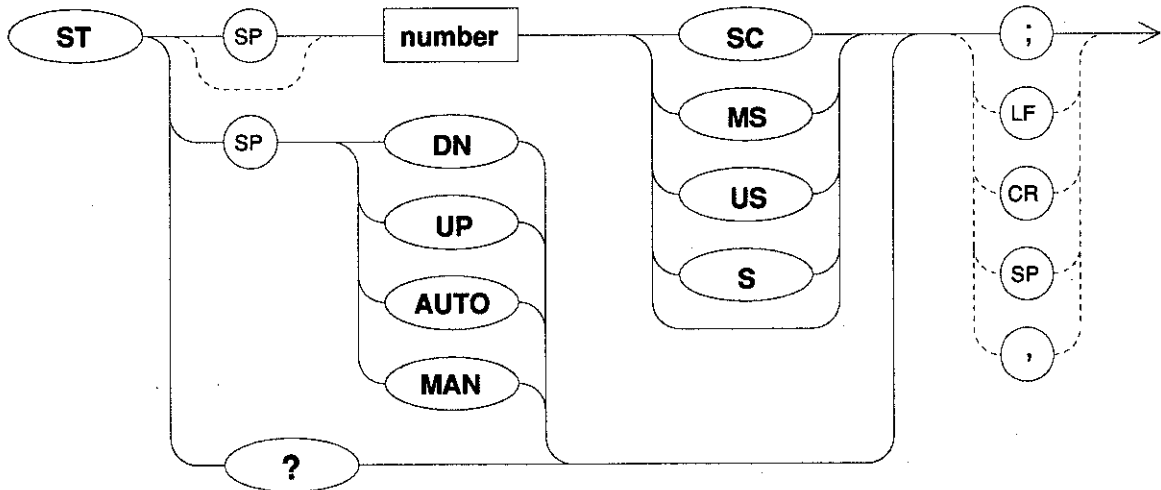
```

10  OUTPUT 708;"IP;"
20  OUTPUT 708;"CF 1.8GHZ;SP 2GHZ;"
30  INPUT "SELECT THE VIDEO BANDWIDTH",width$
40  OUTPUT 708;"VB ";width$;";"
50  OUTPUT 708;"VB?;"
60  ENTER 708;width$
70  PRINT "VBW IS ",width$,"HZ"
80  END

```

# ST Sweep Time

## Syntax



## Query Response

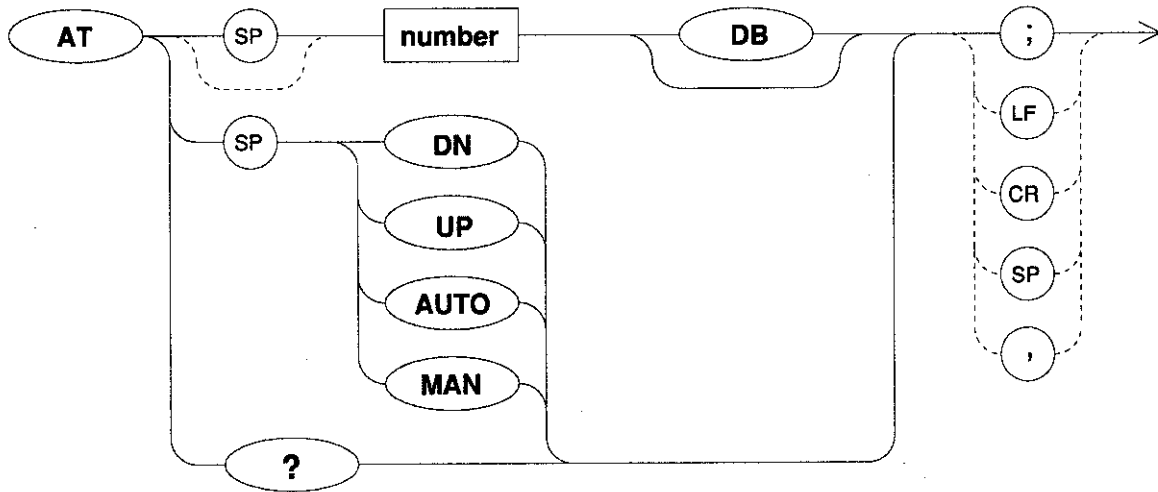


## Example

```
10 OUTPUT 708;"ST 200MS;"
20 OUTPUT 708;"ST DN DN;"
30 OUTPUT 708;"ST?;"
40 ENTER 708;Tim
50 PRINT Tim
60 END
```

## AT Input Attenuation

### Syntax



### Query Response



### Example

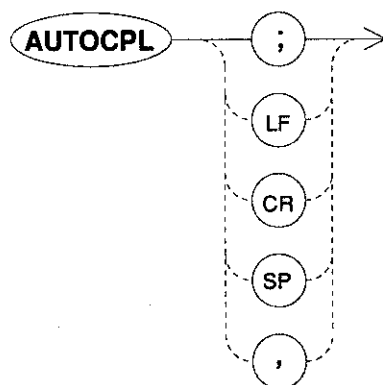
```
10 OUTPUT 708;"AT 25DB;"
20 OUTPUT 708;"AT?;"
30 ENTER 708;Att
40 PRINT "ATTENUATOR SETTING IS ",Att,"DB"
50 END
```



# AUTOPL

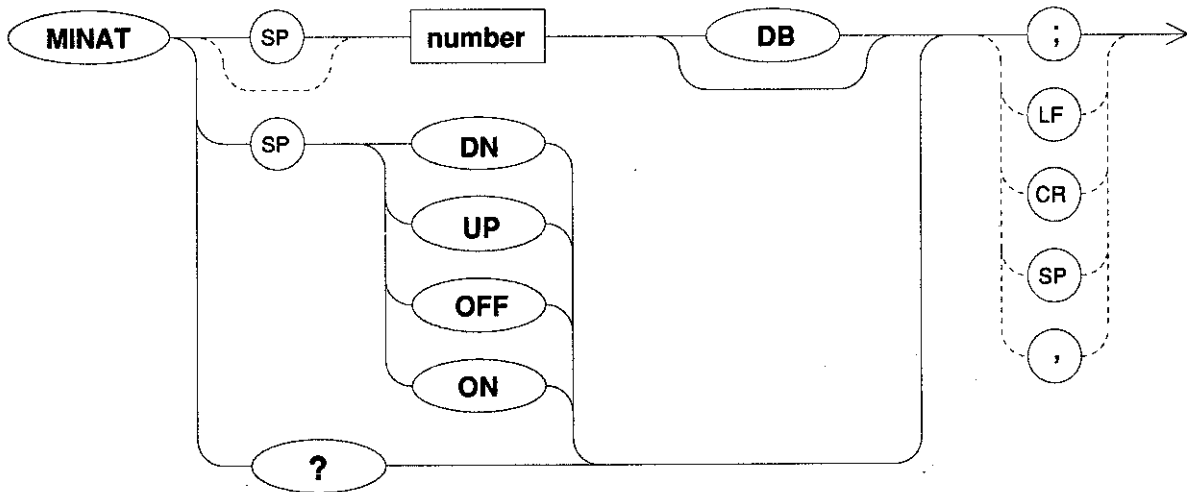
## Auto Coupled

### Syntax



## MINAT Minimum Input Attenuation

### Syntax



### Query Response

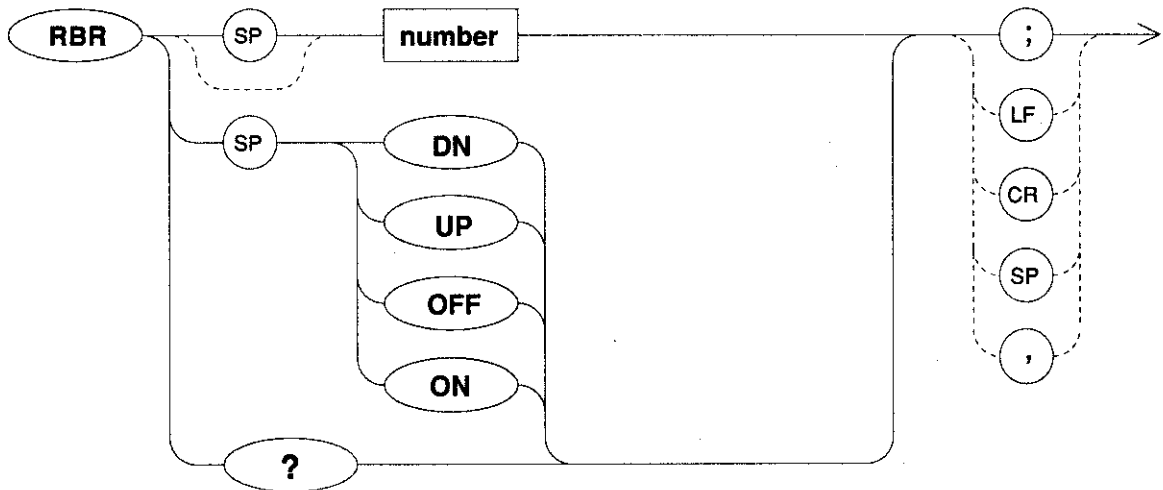


### Example

```
10 OUTPUT 708;"IP;"
20 OUTPUT 708;"MINAT 30DB;"
30 OUTPUT 708;"MINAT?;"
40 ENTER 708;Att
50 PRINT "MINIMUM ATTENUATOR ",Att,"DB"
60 END
```

## RBR Resolution Bandwidth to Span Ratio

### Syntax



### Query Response



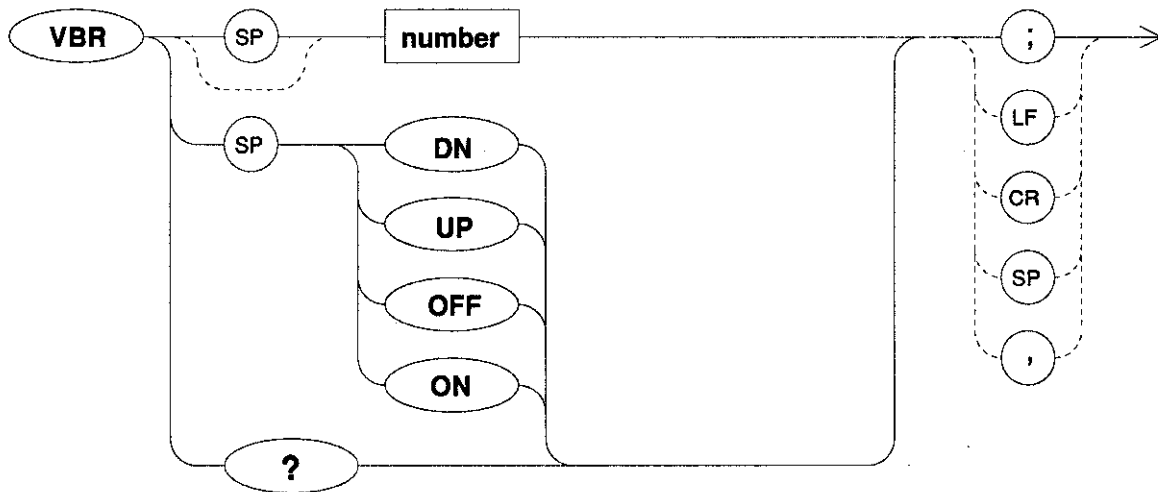
### Example

```
10 OUTPUT 708;"IP;"
20 OUTPUT 708;"CF 1.8GHZ;SP 200MHZ;"
30 INPUT "SELECT THE RESOLUTION BANDWIDTH TO SPAN RATIO",Rat$
40 OUTPUT 708;"RBR ";Rat$;";"
50 OUTPUT 708;"SP 2MHZ;"
60 OUTPUT 708;"RB?;"
70 ENTER 708;width$
80 PRINT "RBW IS ",width$,"HZ"
90 END
```

## VBR

### Video Bandwidth to Resolution Bandwidth Ratio

#### Syntax



#### Query Response

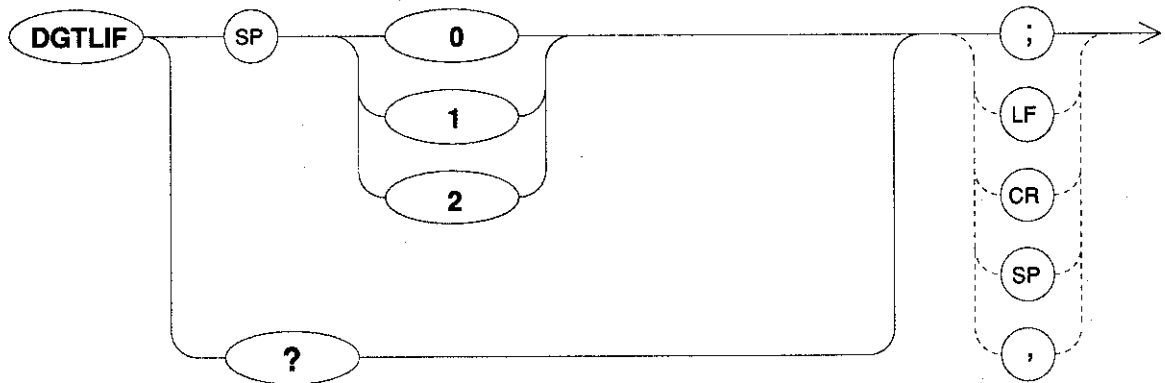


#### Example

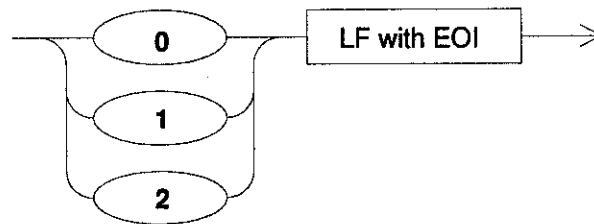
```
10 OUTPUT 708;"IP;"
20 OUTPUT 708;"CF 1.8GHZ;SP 200MHZ;"
30 INPUT "SELECT THE VIDEO BANDWIDTH TO SPAN RATIO",Ratio$
40 OUTPUT 708;"VBR ";Ratio$;"
50 OUTPUT 708;"VB?;"
60 ENTER 708;Width$
70 PRINT "VBW IS ",width$,"HZ"
80 END
```

## DGTLIF Digital IF Mode

### Syntax



### Query Response

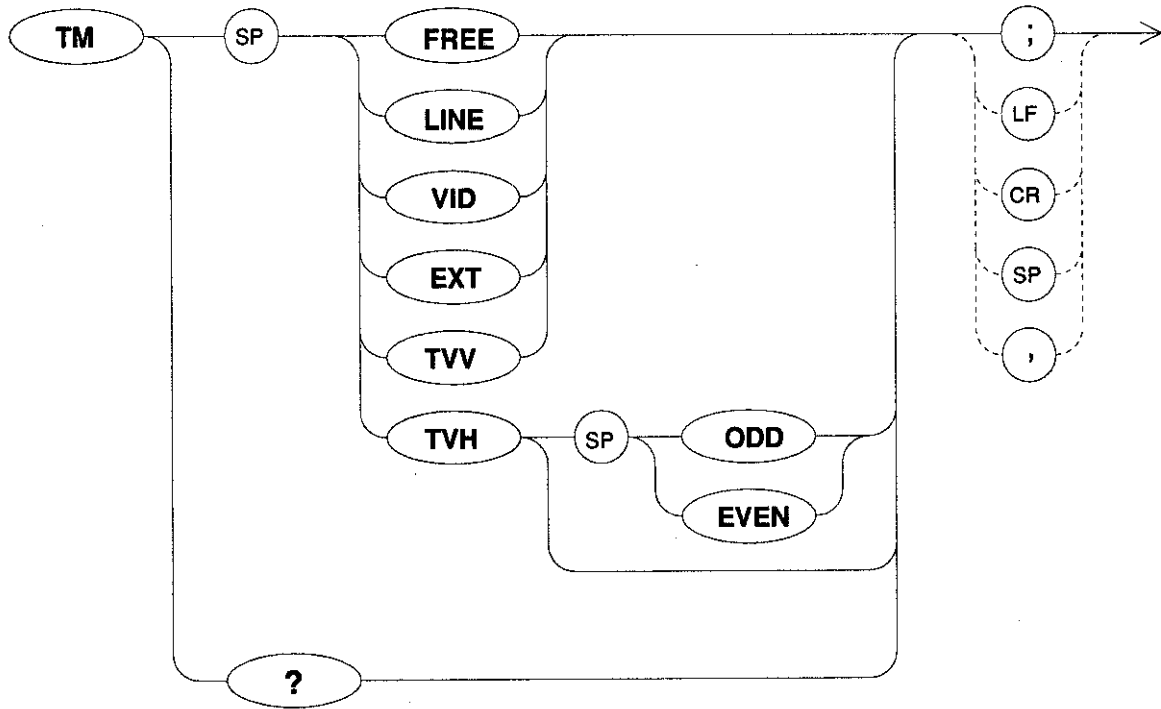


### Parameters

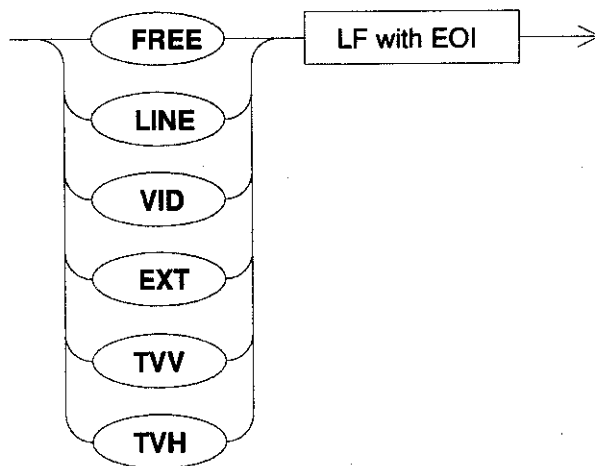
- 0** Sets the analog IF.
- 1** Sets the digital IF when the RBW is 100Hz or below.
- 2** Sets the digital IF when the RBW is 30Hz or below.

# TM Trigger Mode

## Syntax



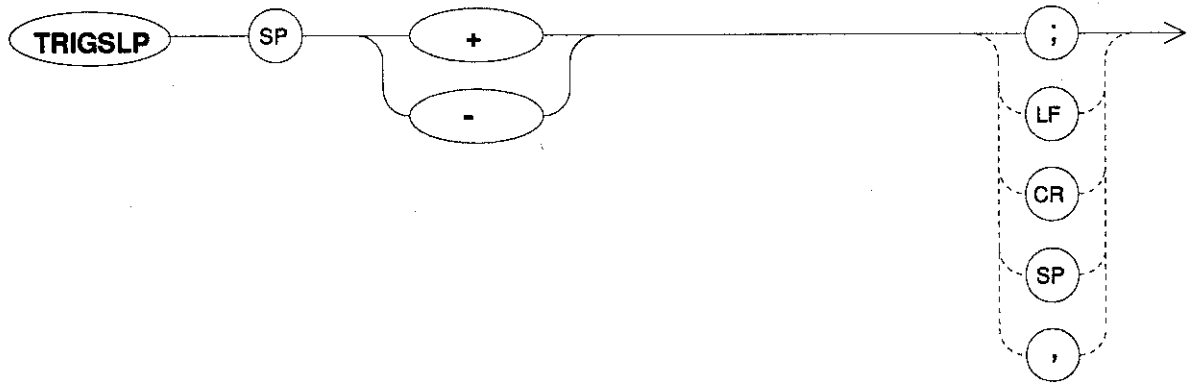
## Query Response



# TRIGSLP

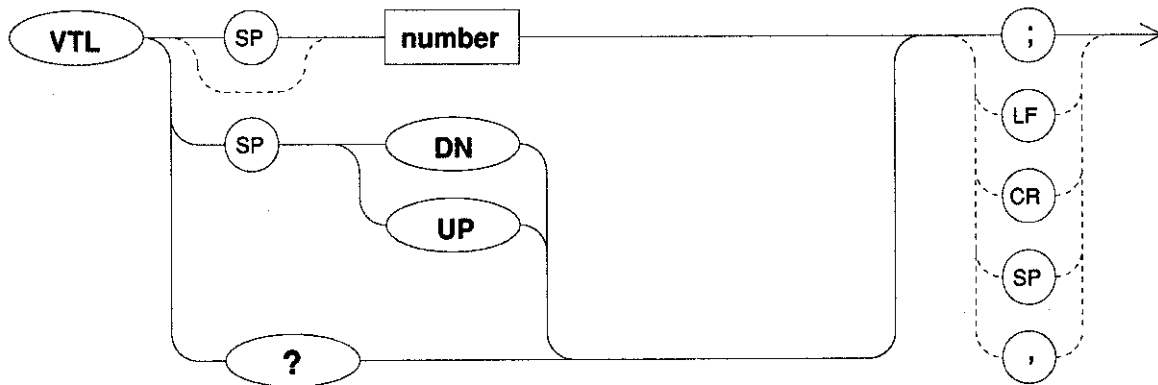
## Trigger Slope

### Syntax



## VTL Video Trigger Level

### Syntax



### Query Response



### Parameter

**number** Sets the position of trigger level at the full scale 100%.

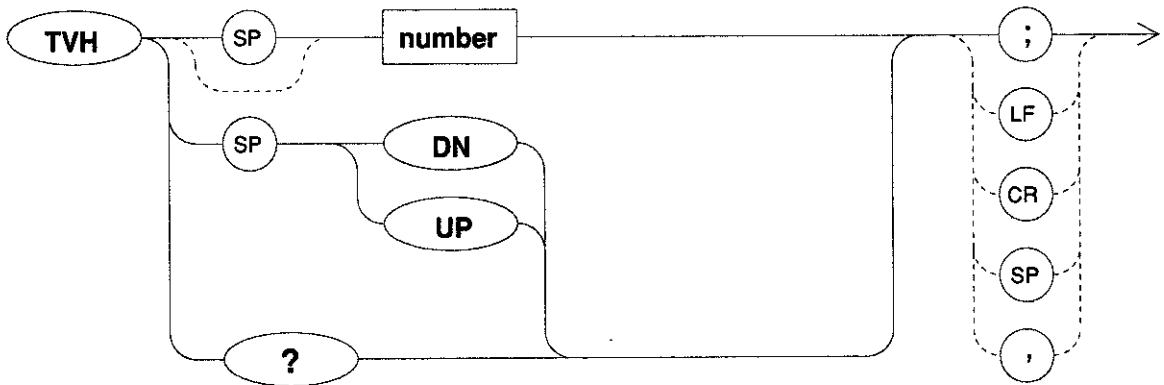
### Example

```
10 OUTPUT 708;"TM VID;"  
20 OUTPUT 708;"VTL 35.0;"  
30 END
```



## TVH Line Number of TV-H Trigger

### Syntax



### Query Response

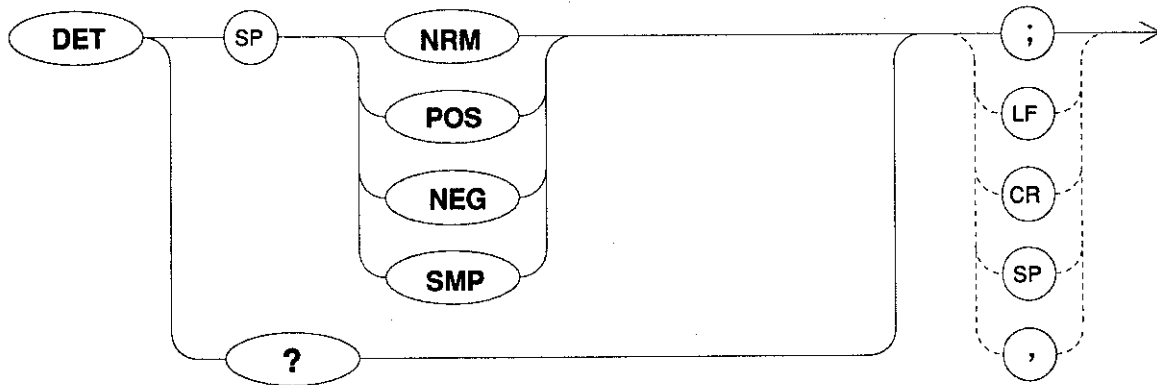


### Example

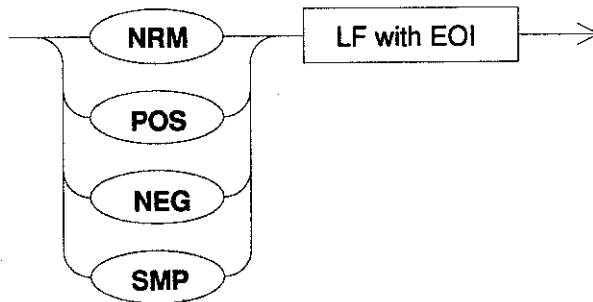
```
10 OUTPUT 708;"TM TVH EVEN;"  
20 OUTPUT 708;"TVH 24;"  
30 END
```

## DET Detection Modes

### Syntax



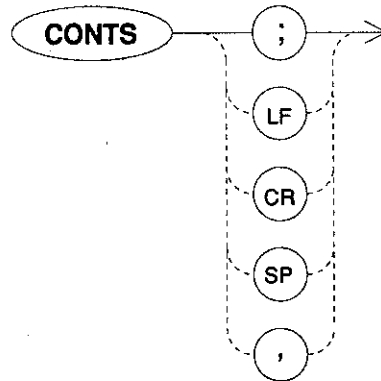
### Query Response



# CONTS

## Continuous Sweep

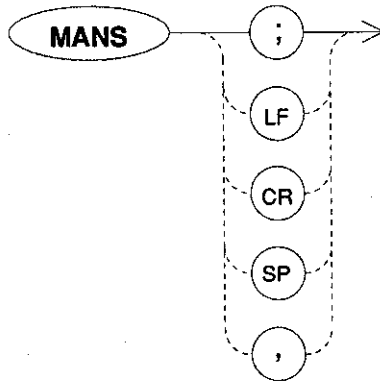
### Syntax



# MANS

## Manual Sweep

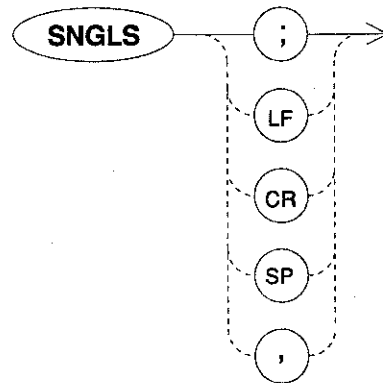
### Syntax



# SNGLS

## Single Sweep

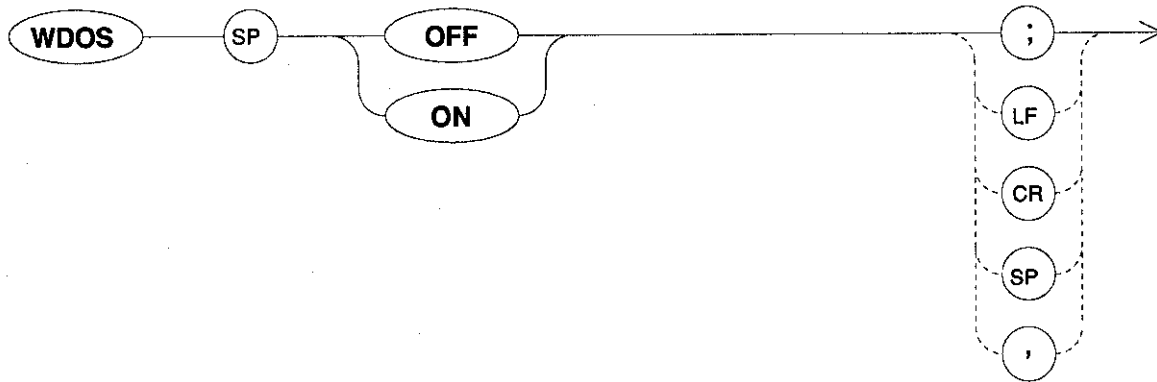
### Syntax



# WDOS

## Window Sweep

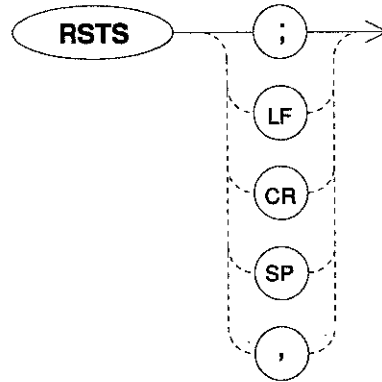
### Syntax



# RSTS

## Reset Sweep

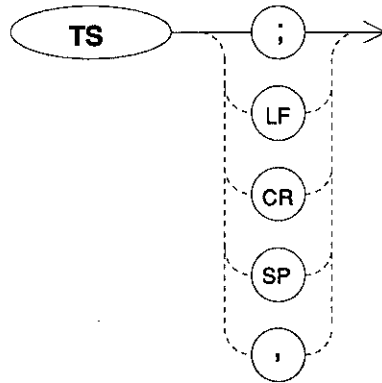
### Syntax



# TS

## Take Sweep

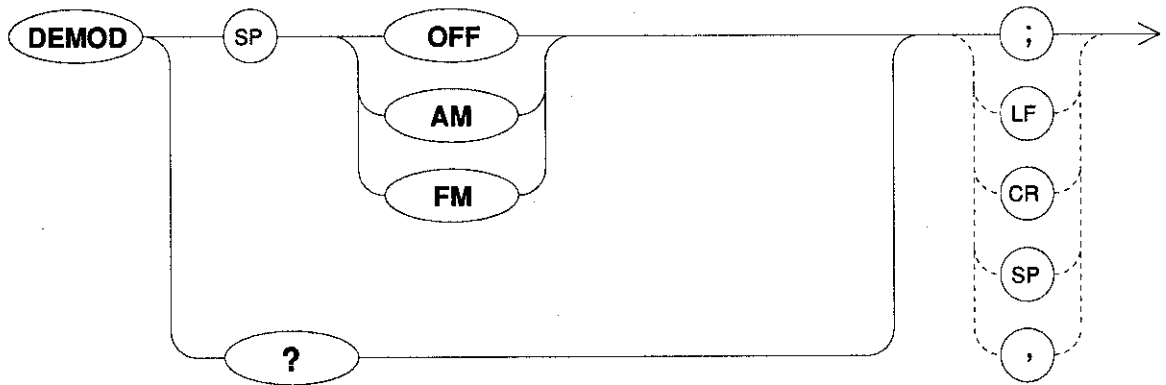
### Syntax



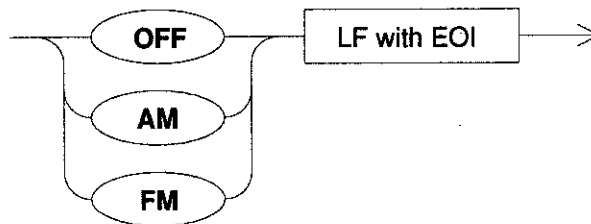


## DEMODO Demodulation

### Syntax

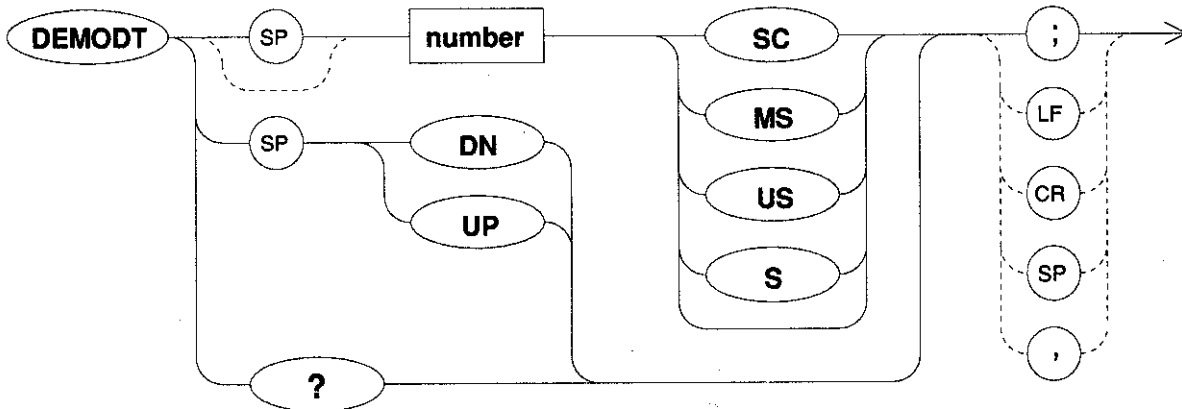


### Query Response



## DEMOTD Demodulation Time

### Syntax



### Query Response



### Example

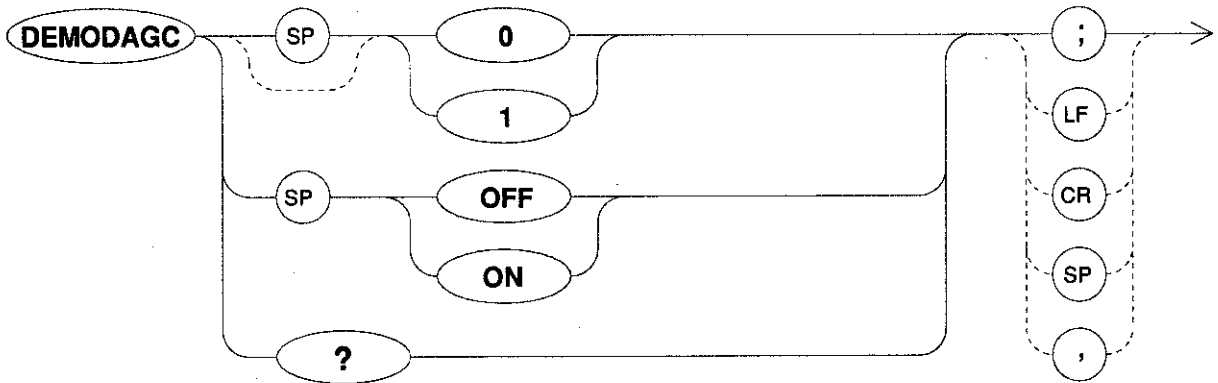
```

10  OUTPUT 708;"IP;"
20  OUTPUT 708;"FA 70MHZ;FB 90MHZ;"
30  OUTPUT 708;"MKN 81.3MHZ;"
40  INPUT "ENTER DEMODULATION TIME",Tim$
50  OUTPUT 708;"DEMOTD ";Tim$;" ";
60  OUTPUT 708;"DEMOTD ";Tim$;" ";
70  END

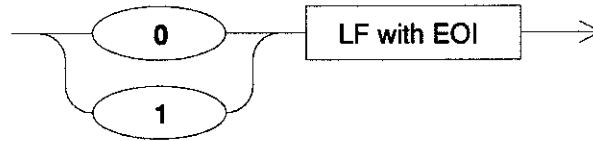
```

## DEMODAGC Demodulation Automatic Gain Control

### Syntax



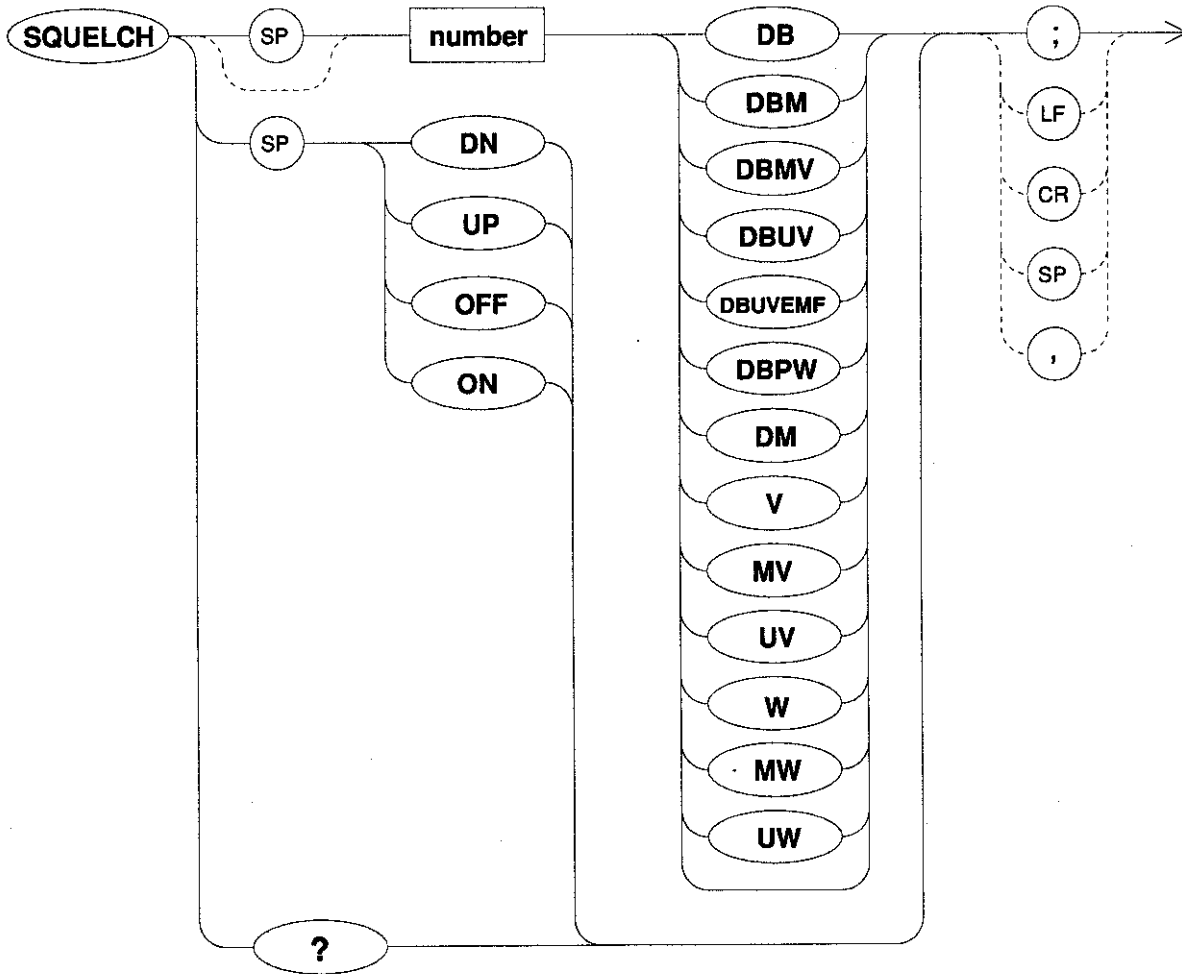
### Query Response



# SQUELCH

## Squelch

### Syntax



### Query Response



### Example

```

10 OUTPUT 708;"IP;"
20 OUTPUT 708;"FA 70MHZ;FB 90MHZ;"
30 OUTPUT 708;"MKN 81.3MHZ;"
40 INPUT "ENTER DEMODULATION TIME",Tim$
50 OUTPUT 708;"DEMOT ";Tim$;"
60 INPUT "ENTER SQUELCH LEVEL",Squelch$
70 OUTPUT 708;"SQUELCH ";Squelch$;"
80 OUTPUT 708;"DEMOT FM;"
  
```

**R3265/3271 OPT73  
GPIB COMMAND EXPANSION  
INSTRUCTION MANUAL**

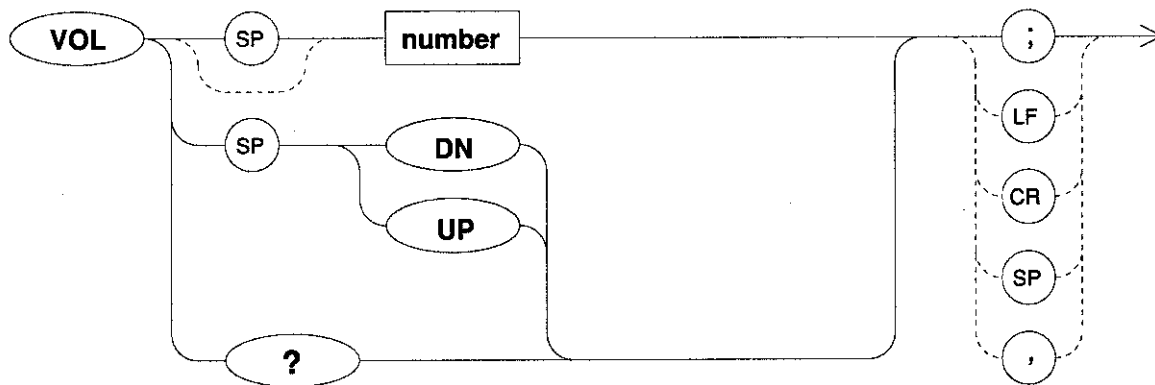
**2.3 Programming Commands**

---

90 END

## VOL Demodulation Volume

### Syntax



### Query Response

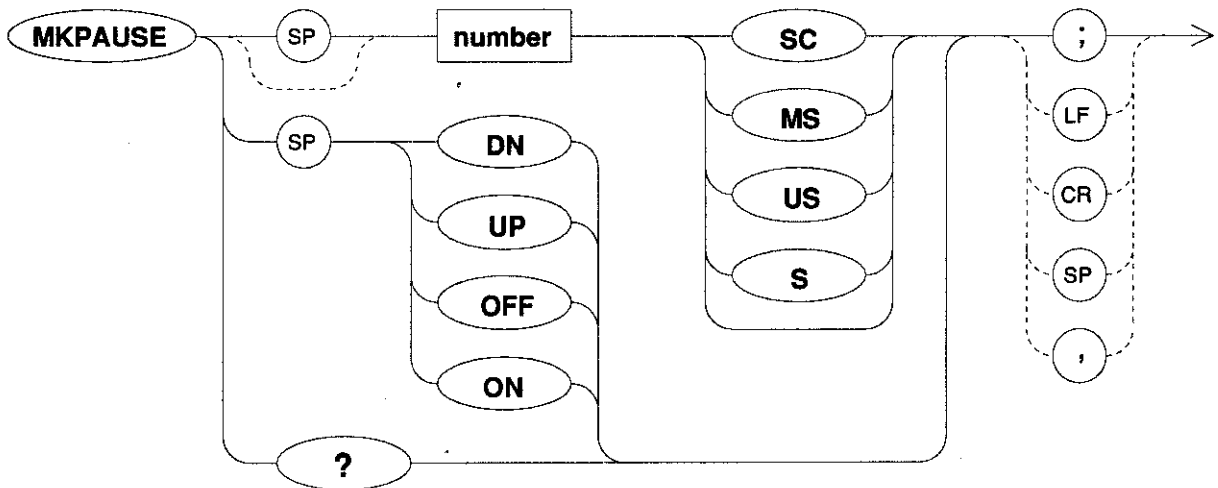


### Example

```
10 OUTPUT 708;"IP;"
20 OUTPUT 708;"FA 70MHZ;FB 90MHZ;"
30 OUTPUT 708;"MKN 81.3MHZ;"
40 INPUT "ENTER DEMODULATION TIME",Tim$
50 OUTPUT 708;"DEMODT ";Tim$;" ";
60 INPUT "ENTER DESIRED VOLUME SETTING(1 - 16)",Vol$
70 OUTPUT 708;"VOL ";Vol$;" ";
80 OUTPUT 708;"DEMOD FM;"
90 END
```

## MKPAUSE Marker Pause

### Syntax



### Query Response

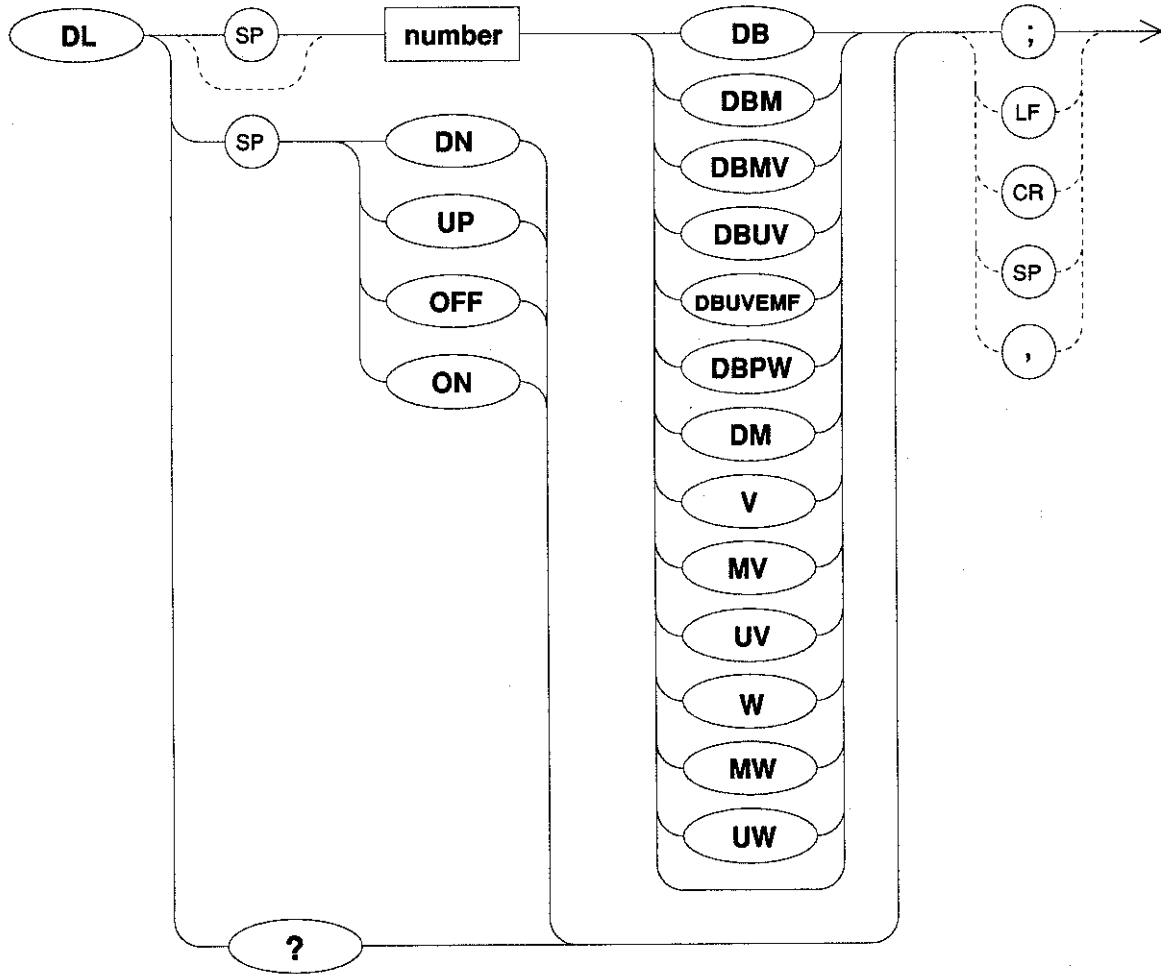


### Example

```
10 OUTPUT 708;"IP;"
20 OUTPUT 708;"FA 70MHZ;FB 90MHZ;"
30 OUTPUT 708;"MKN 81.3MHZ;"
40 INPUT "ENTER PAUSE TIME",Tim$
50 OUTPUT 708;"MKPAUSE ";Tim$;";"
60 END
```

# DL Display Line

## Syntax



## Query Response



## Example

```

10 INPUT "ENTER DESIRED DISPLAY LINE LEVEL",Line$
20 OUTPUT 708;"DL ";Line$;";"
30 OUTPUT 708;"MKPK NH;"
40 OUTPUT 708;"MKDSPL REL;"
50 OUTPUT 708;"MKA?"
60 ENTER 708;Rel_dl
70 PRINT "THE DIFFERENCE IS ",Rel_dl
80 END

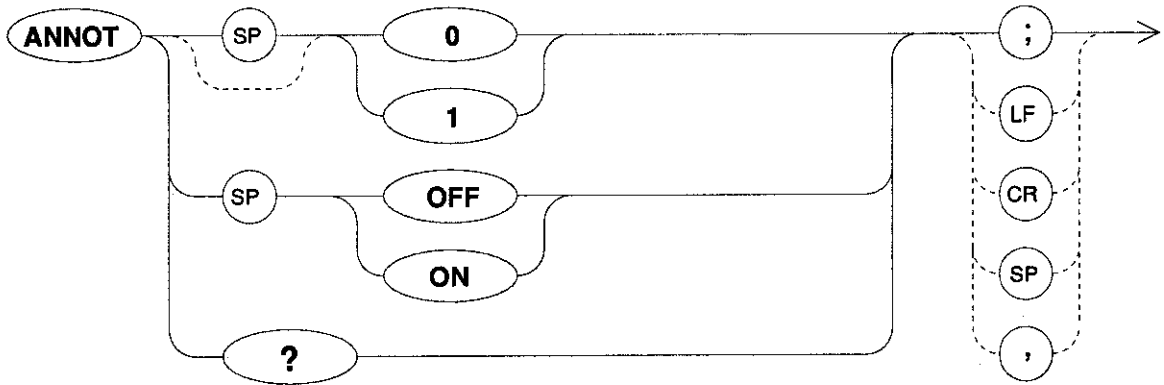
```



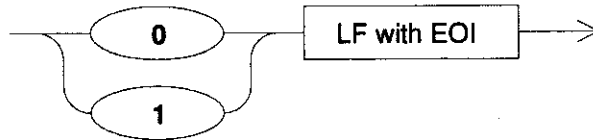
# ANNOT

## Annotation On/Off

### Syntax

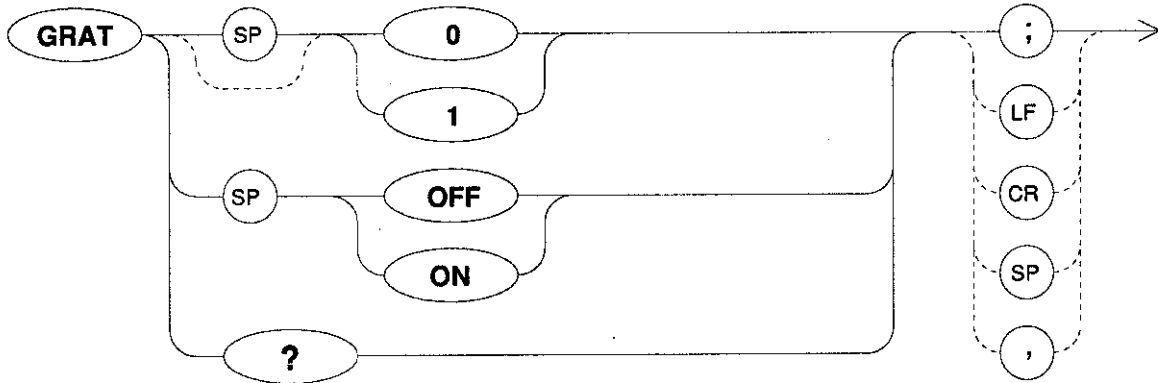


### Query Response

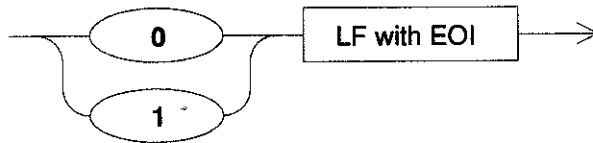


# GRAT Graticule

## Syntax

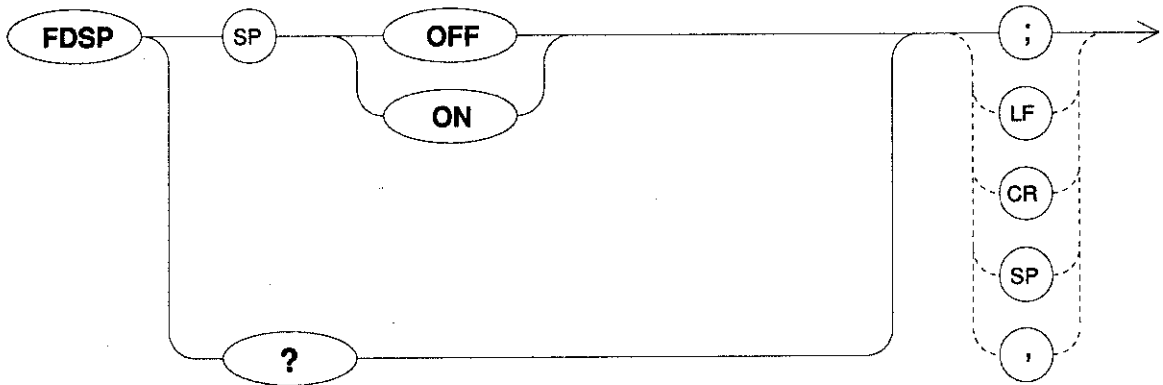


## Query Response

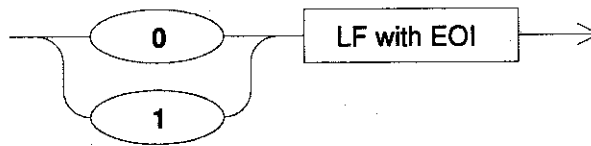


# FDSP Frequency Display On/Off

## Syntax

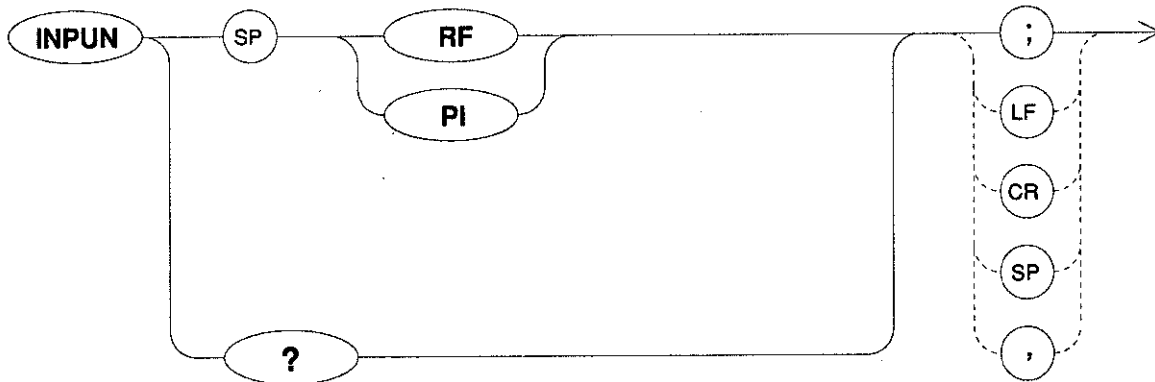


## Query Response

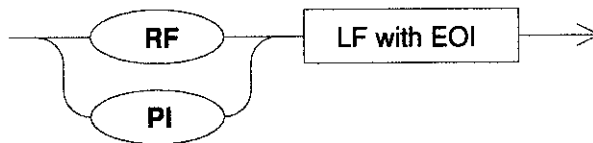


## INPUN Input Unit

### Syntax



### Query Response

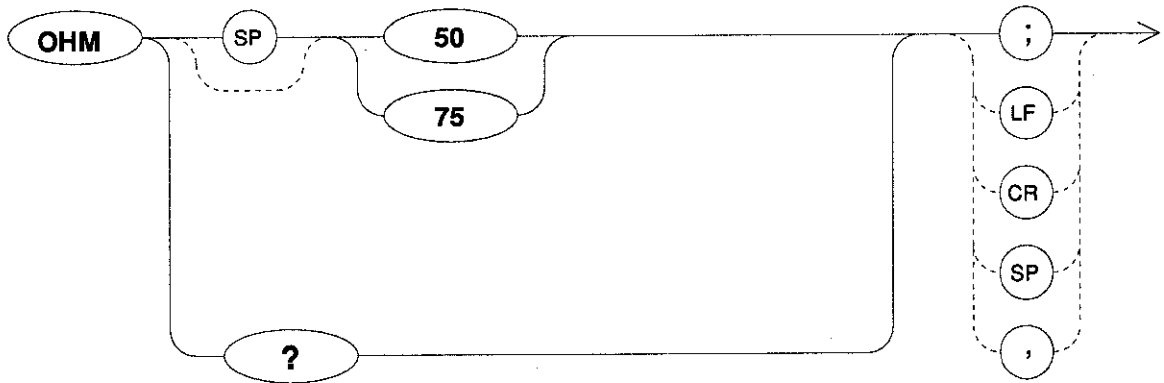


### Parameters

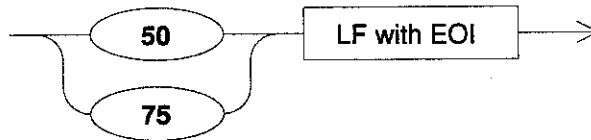
- RF**            The input signal is connected directly to the RF input.
- PI**            The input signal is connected to the RF input through the plug-in unit.

## OHM Input Impedance

### Syntax



### Query Response

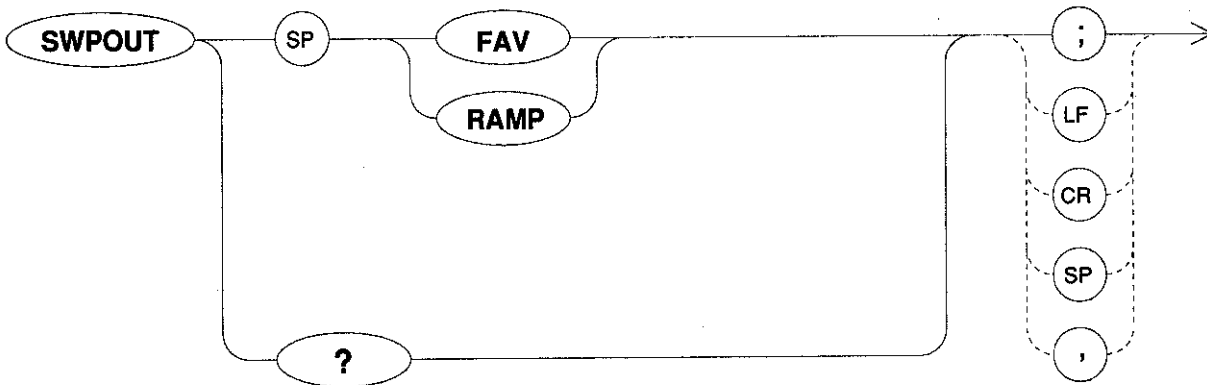


### Parameters

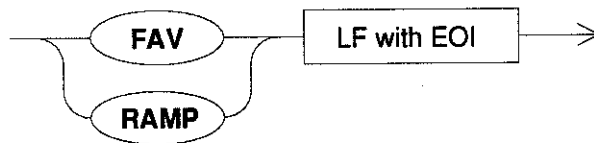
- 50** Selects 50 ohm of input impedance.
- 75** Selects 75 ohm of input impedance.

## SWPOUT Sweep Output

### Syntax



### Query Response

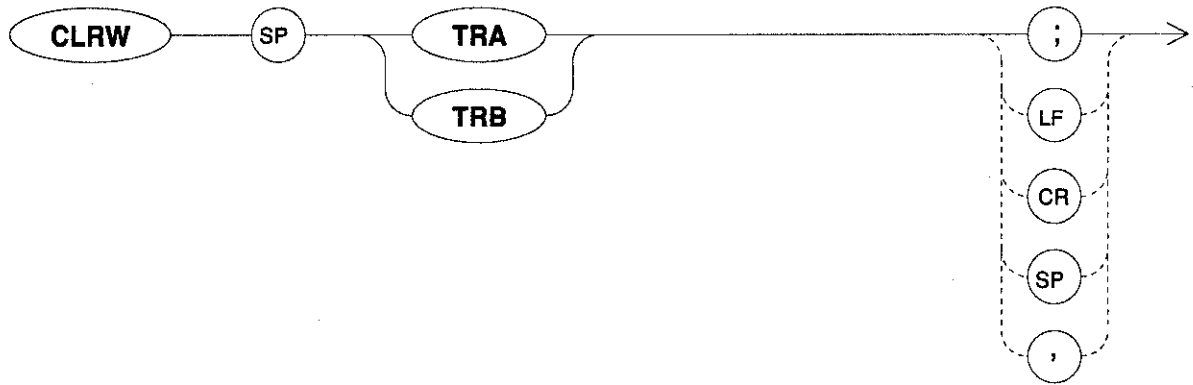


### Parameters

- FAV** Voltage about  $2V/N$  ( $N$ : mixing degree) per 1GHz in proportion to the sweep frequency is output.
- RAMP** Sweep voltage from -5V to +5V is output.

**CLRW**  
**Clear Write**

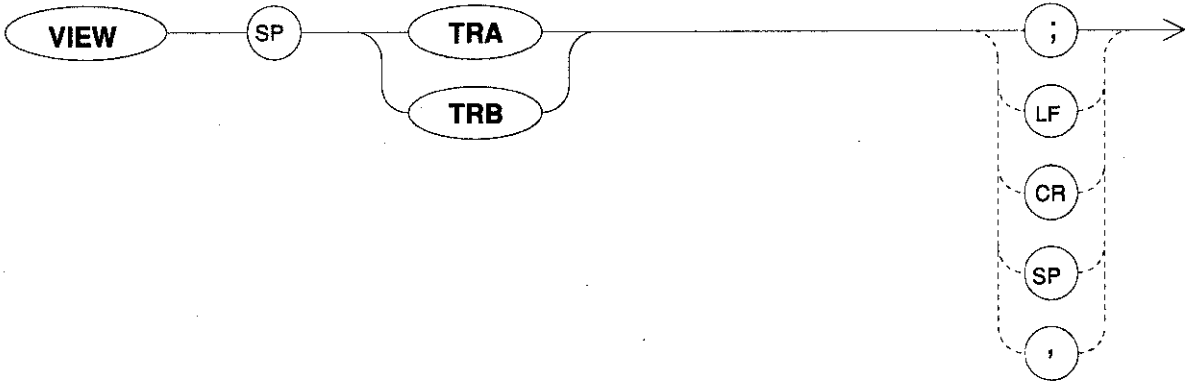
**Syntax**



# VIEW

## View Trace

### Syntax

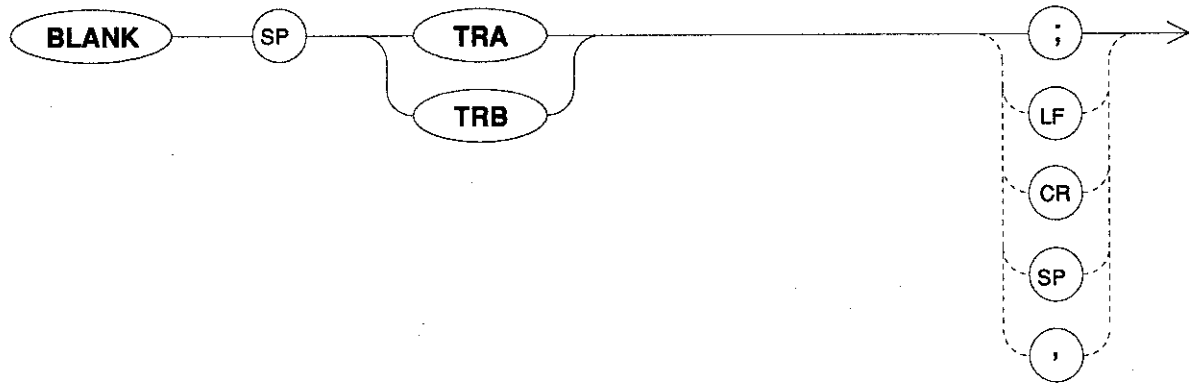




# BLANK

## Blank Trace

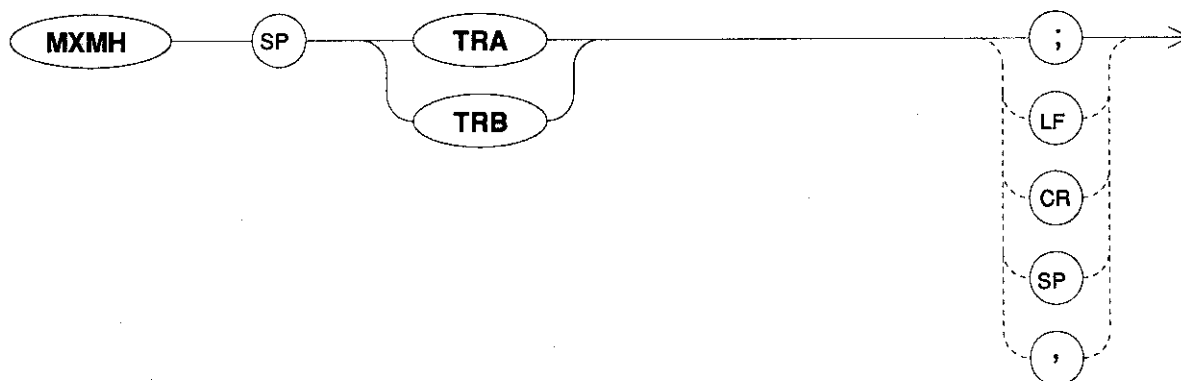
### Syntax



## MXMH

### Maximum Hold

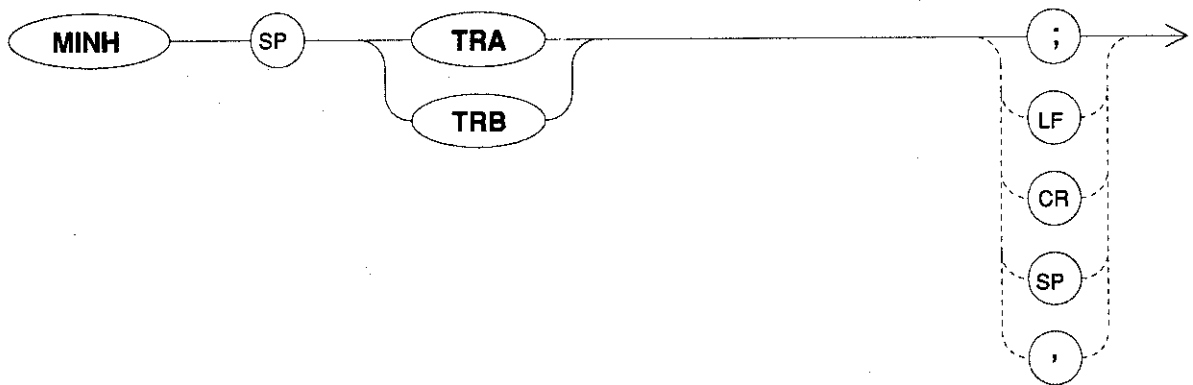
#### Syntax



# MINH

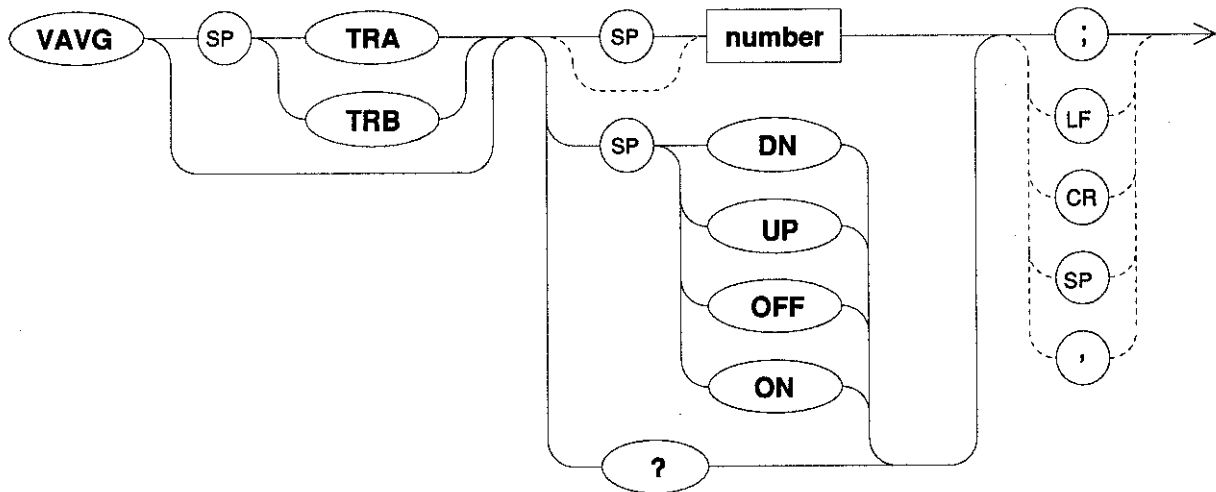
## Minimum Hold

### Syntax



## VAVG Video Averaging

### Syntax



### Query Response



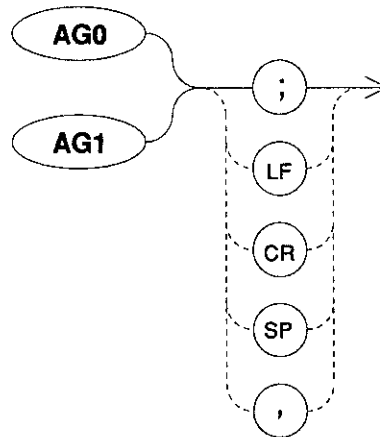
### Example

```
10 INPUT "ENTER DESIRED TRACE (TRA OR TRB)",Trace$
20 INPUT "ENTER DESIRED AVERAGING TIME",Tim
30 OUTPUT 708;"VAVG ";Trace$;Tim,";"
40 END
```

## AG0 / AG1

### Averaging Trace A is Continue Mode / Complete Mode

#### Syntax



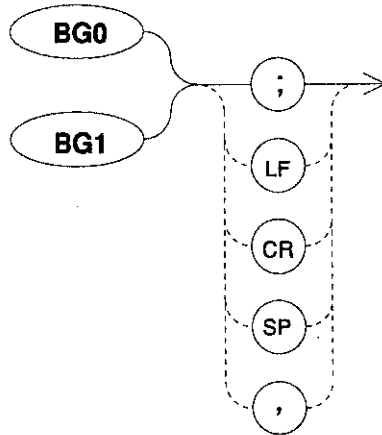
#### Parameters

- AG0** Averaging operation is continued by the calculation mode 2 after the specified number of times are complete.
- AG1** After the specified number of times of averaging is complete, trace is automatically set to view mode and the averaging is canceled.

## BG0 / BG1

### Averaging Trace B is Continue Mode / Complete Mode

#### Syntax



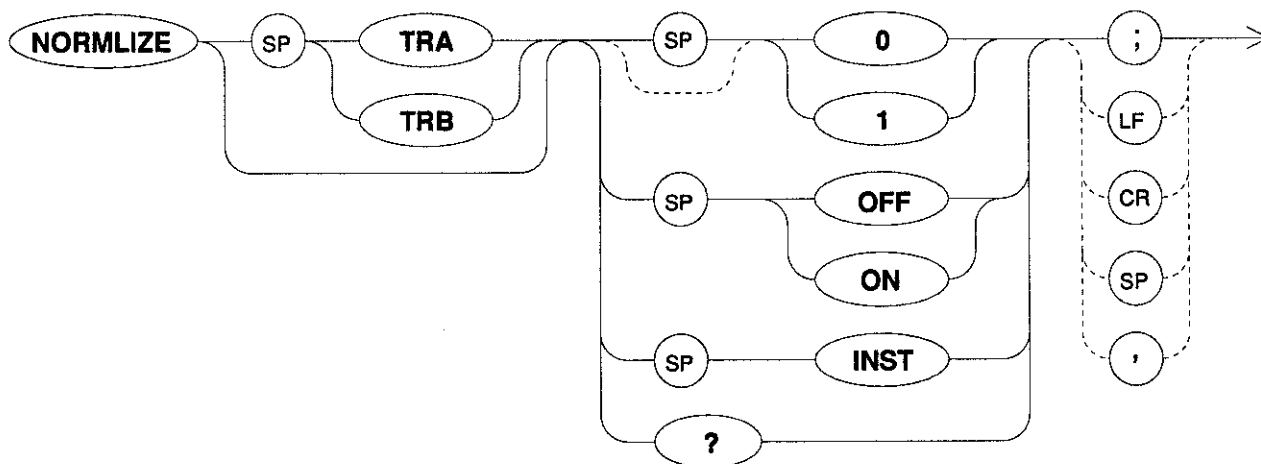
#### Parameters

- BG0** Averaging operation is continued by the calculation mode 2 after the specified number of times are complete.
- BG1** After the specified number of times of averaging is complete, trace is automatically set to view mode and the averaging is canceled.

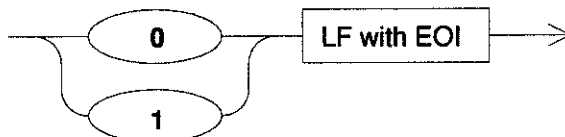
## NORMLIZE

### Normalize Trace Data

#### Syntax



#### Query Response



#### Parameters

- INST** Executes a series of following operations.
- (1) A display line appear almost at the center point between the signal maximum point and minimum point.
  - (2) The current trace A or B is saved as correction data into memory.
  - (3) The normalize function is set to on.

#### Example

```

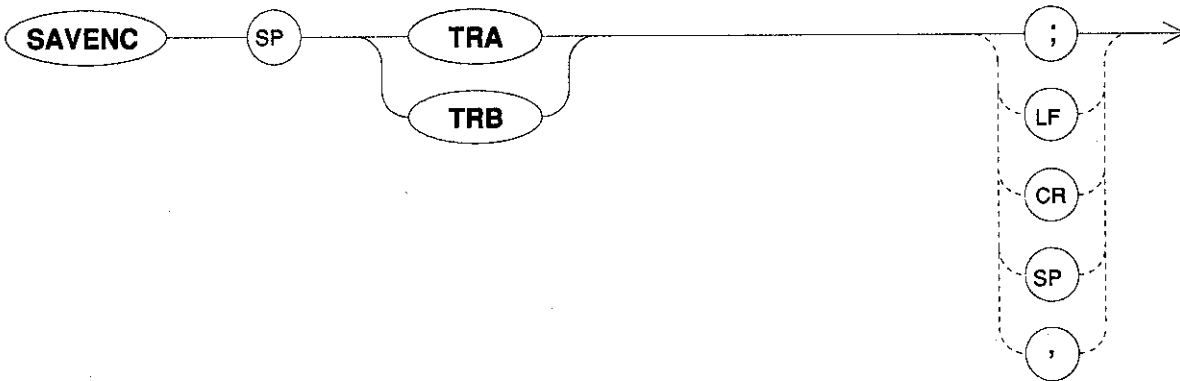
10 OUTPUT 708;"IP;FA 300KHZ;FB 1GHZ;"
20 INPUT "ENTER DESIRED TRACE (TRA OR TRB)?",Trace$
30 OUTPUT 708;"NORMLIZE ";Trace$;" INST;"
40 OUTPUT 708;"DL?;"
50 ENTER 708;D1
60 PRINT "DISPLAY LINE IS ";D1
70 END

```

# SAVENC

## Save Normalize Correction Data

### Syntax

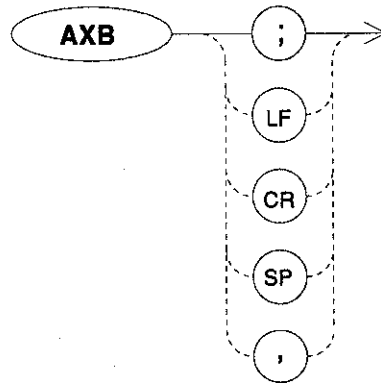




# AXB

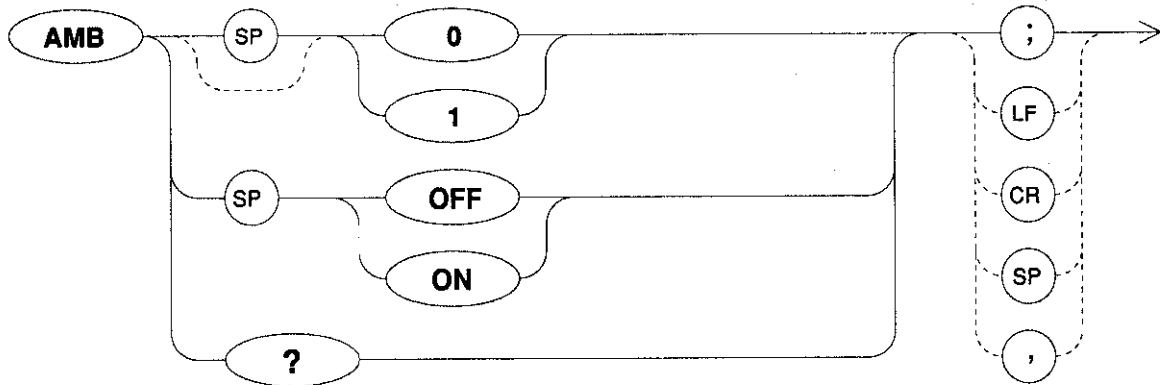
## Trace A Exchange Trace B

### Syntax

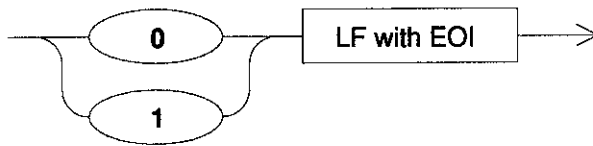


## AMB Trace A Minus Trace B

### Syntax



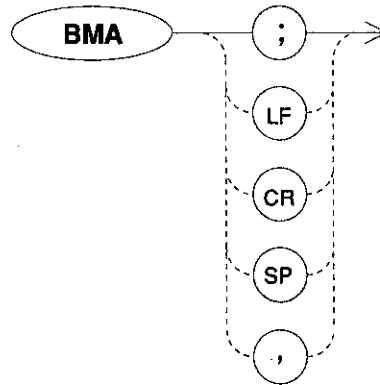
### Query Response



## BMA

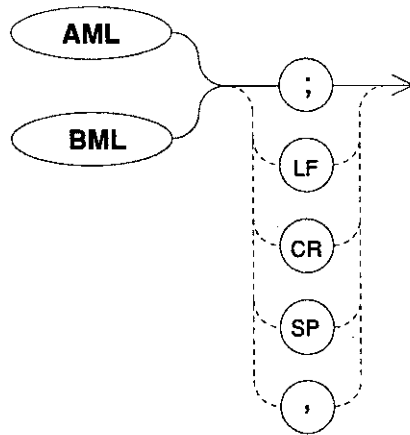
### Trace B Minus Trace A

#### Syntax



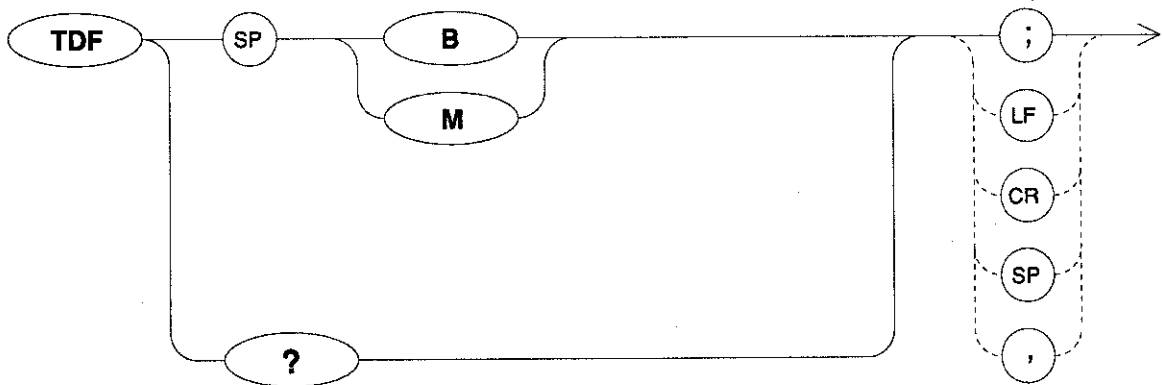
## AML / BML Trace A or Trace B Minus Display line

### Syntax

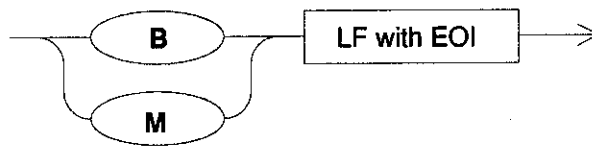


## TDF Trace Data Format

### Syntax



### Query Response

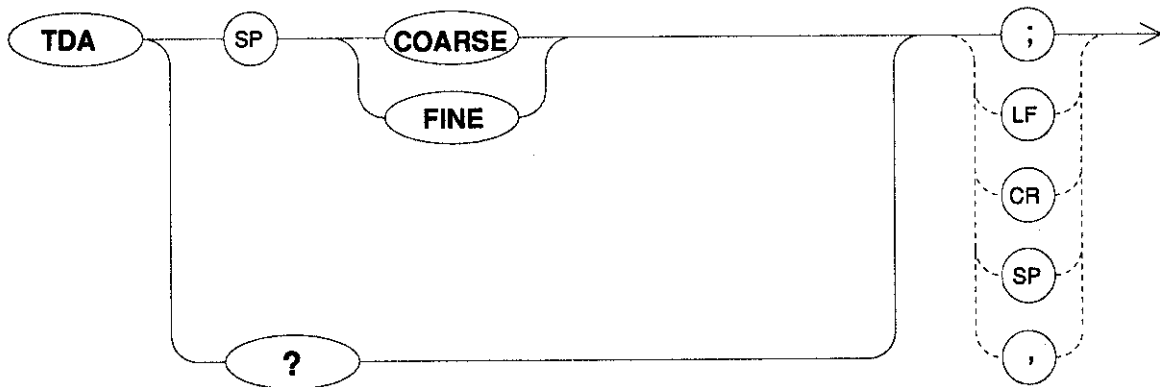


### Parameters

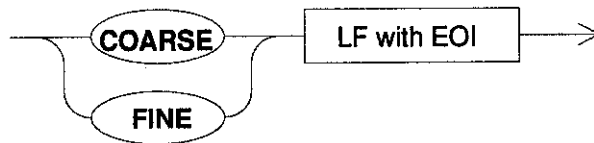
- B** Specified binary data format.
- M** Specified ASCII data format.

## TDA Trace Data Accuracy

### Syntax



### Query Response



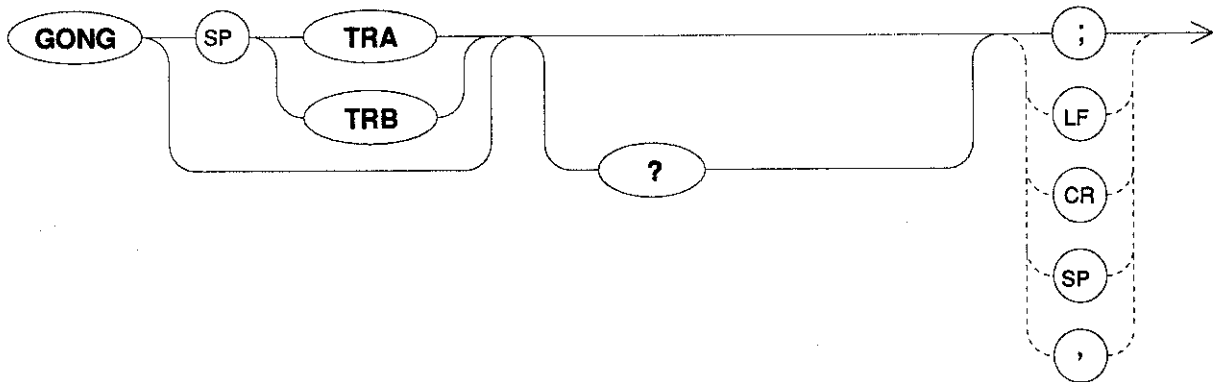
### Parameters

- COARSE** The trace data accuracy is coarse.
- FINE** The trace data accuracy is fine.

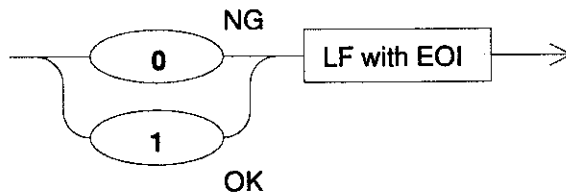
## GONG

### Go/No

#### Syntax



#### Query Response



#### Example

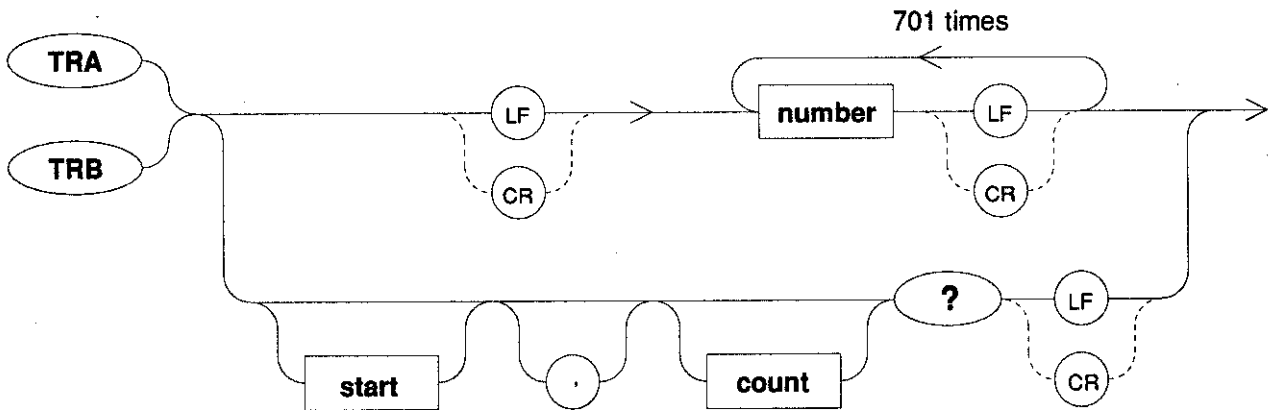
```

10  OUTPUT 708,"FA 30MZ;FB 1GZ;AUNITS DBUV;RL 47DB;"
20  OUTPUT 708,"WFA 100MZ;WFB 500MZ;WUL 42DB;WLL 25DB;"
30  OUTPUT 708,"DET POS;MXMH TRA;"
40  FOR I=0 TO 50
50    OUTPUT 708,"TS;"
60  NEXT I
70  OUTPUT 708,"GONG TRA;GONG?;"
80  ENTER 708;Judge
90  IF Judge=0 THEN
100   PRINT "TRACE JUDGEMENT ... NO GOOD !!"
110  ELSE
120   PRINT "TRACE JUDGEMENT ... GOOD !!"
130  END IF
140  BEEP
150  END

```

**TRA/TRB (ascii format)**  
**Trace Data Input/Output (ascii format)**

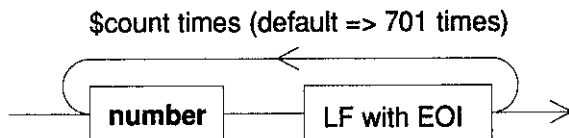
**Syntax**



**Parameters**

- start**            Start position of output trace data (0~700).
- count**            Output trace counter (start + count <= 701).

**Query Response**



**Example**

i) *HP200,300 series (input trace data)*

```

10  A=0
20  St=3.14/100
30  OUTPUT 708;"TDF M;TDA COARSE;BLANK TRA;TRA;"
40  FOR I=0 TO 700
50    N=INT(SIN(A)*200)+200
60    A=A+St
70  OUTPUT 708;N
80  NEXT I
90  OUTPUT 708;"VIEW TRA;"
100 BEEP
110 END

```

ii) *HP200,300 series (output trace data)*

```

10  INTEGER Tr(701)
20  !
30  CONTROL 1,12;1

```



R3265/3271 OPT73  
GPIB COMMAND EXPANSION  
INSTRUCTION MANUAL

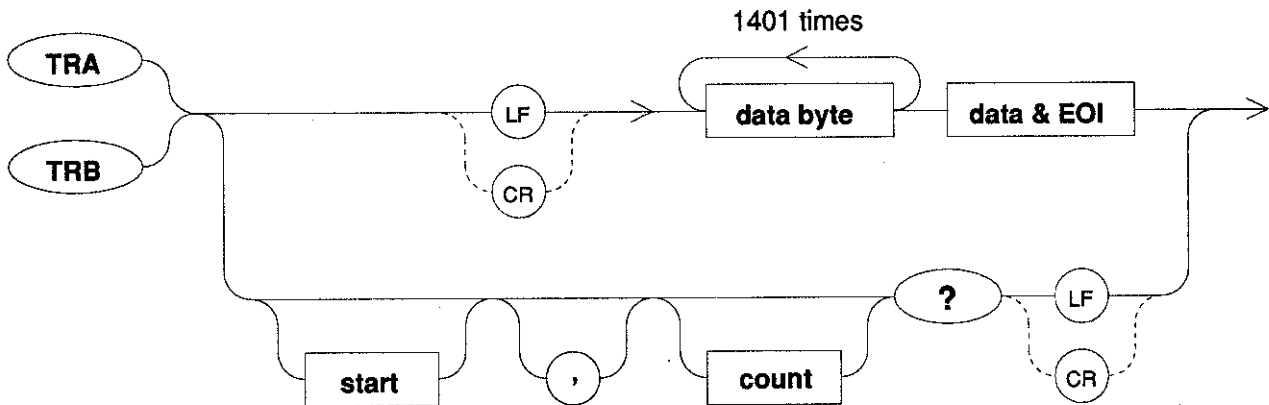
2.3 Programming Commands

---

```
40 GINIT
50 GRAPHICS ON
60 GCLEAR
70 OUTPUT 708;"TDF M;TDA COARSE;TRA?;"
80 FOR I=0 TO 700
90   ENTER 708;Tr(I)
100  NEXT I
110 VIEWPORT 10,120,15,90
120 WINDOW 0,700,0,400
130 GRID 70,40,0,0,10,10,40
140 MOVE 0,Tr(0)
150 FOR I=1 TO 700
160   DRAW I,Tr(I)
170  NEXT I
180 BEEP
190 END
200
```

**TRA/TRB (binary format)**  
**Trace Data Input/Output (binary format)**

**Syntax**

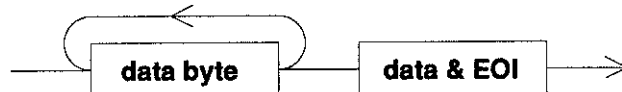


**Parameters**

- start** Start position of output trace data (0~700).
- count** Output trace counter (start+count <= 701).

**Query Response**

(\$count x 2 - 1) times (default => 1401 times)



**Example**

i) HP200,300 series (input trace data)

```

10  INTEGER Tr(701)
20  !
30  A=0
40  St=3.14/100
50  OUTPUT 708;"TDF B;TDA COARSE;BLANK TRB;TRB;"
60  FOR I=0 TO 700
70    Tr(I)=INT(COS(A)*200)+200
80    A=A+St
90  NEXT I
100 OUTPUT 708 USING "#,W";Tr(*),END
110 OUTPUT 708;"VIEW TRB;"
120 BEEP
130 END

```

ii) HP200,300 series (output trace data)

```

10  INTEGER Tr(701)

```

R3265/3271 OPT73  
GPIB COMMAND EXPANSION  
INSTRUCTION MANUAL

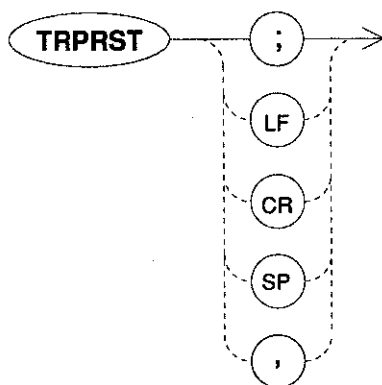
2.3 Programming Commands

---

```
20  !
30  GINIT
40  GRAPHICS ON
50  CONTROL 1,12;1
60  VIEWPORT 10,120,15,90
70  WINDOW 0,700,0,400
80  GRID 70,40,0,0,10,10,40
90  OUTPUT 708;"TDF B;TDA COARSE;TRB210,280?;"
100 ENTER 708 USING "%,W";Tr(*)
110 MOVE 210,Tr(I)
120 FOR I=1 TO 279
130   DRAW I+210,Tr(I)
140 NEXT I
150 BEEP
160 END
```

## TRPRST Trace Preset

### Syntax

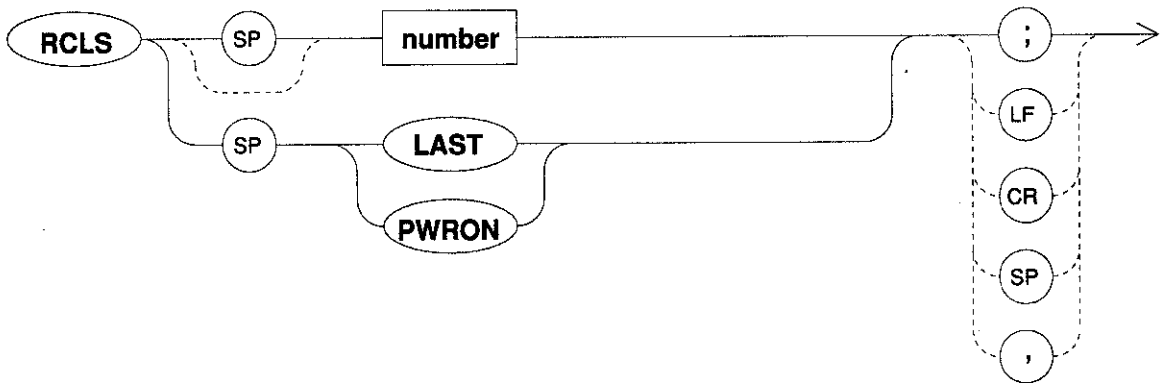


### Comment

CLRW TRA, BLANK TRB, DET NRM, AMB OFF, VAVG OFF

## RCLS Recall States

### Syntax



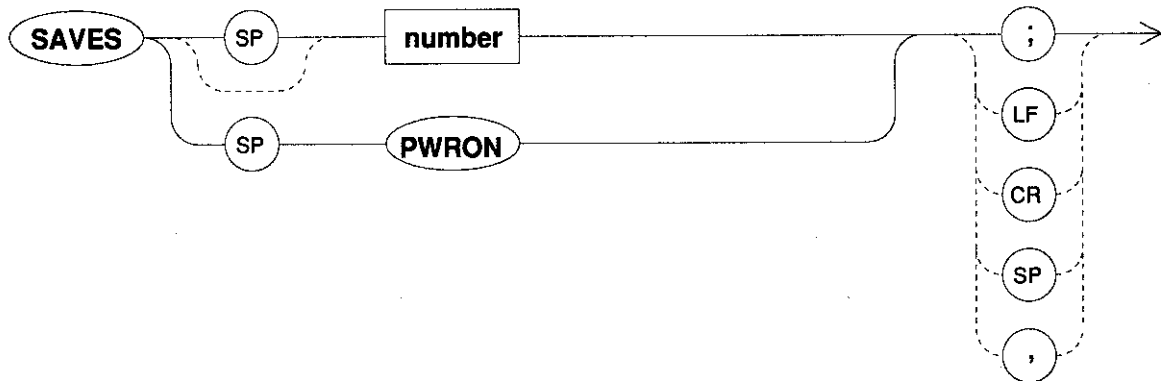
### Example

```
10 OUTPUT 708,"SAVES 3;"  
20 OUTPUT 708;"IP;"  
30 OUTPUT 708;"RCLS 3;"  
40 END
```

## SAVES

### Save States

#### Syntax

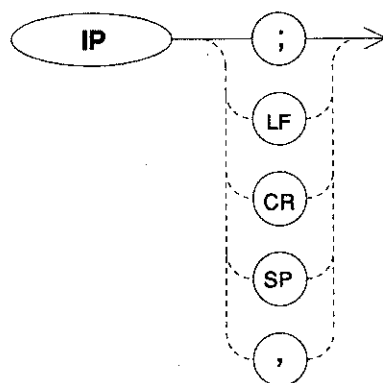


#### Example

```
10 OUTPUT 708;"IP;CF 25MHZ;SP 50MHZ;"  
20 OUTPUT 708;"SAVES 5;"  
30 END
```

# IP Instrument Preset

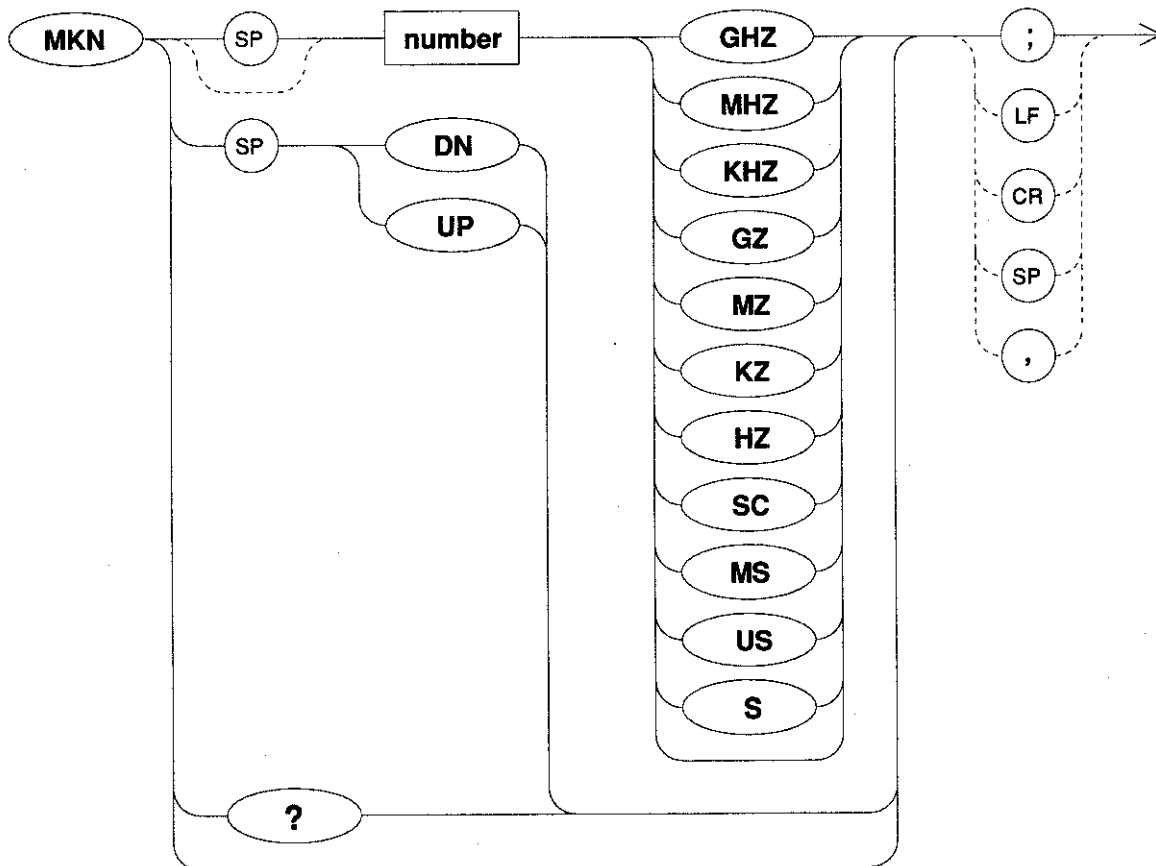
## Syntax



# MKN

## Marker Normal

### Syntax



### Query Response



### Example

```

10 INPUT "ENTER THE START FREQUENCY",Start$
20 INPUT "ENTER THE STOP FREQUENCY",Stop$
30 OUTPUT 708;"IP;FA ";Start$;";"
40 OUTPUT 708;"FB ";Stop$;";"
50 OUTPUT 708;"TS;MKPK HI;"
60 OUTPUT 708;"MKN?;"
70 ENTER 708;Mkr
80 PRINT "MARKER FREQUENCY IS ",Mkr,"HZ"
90 END

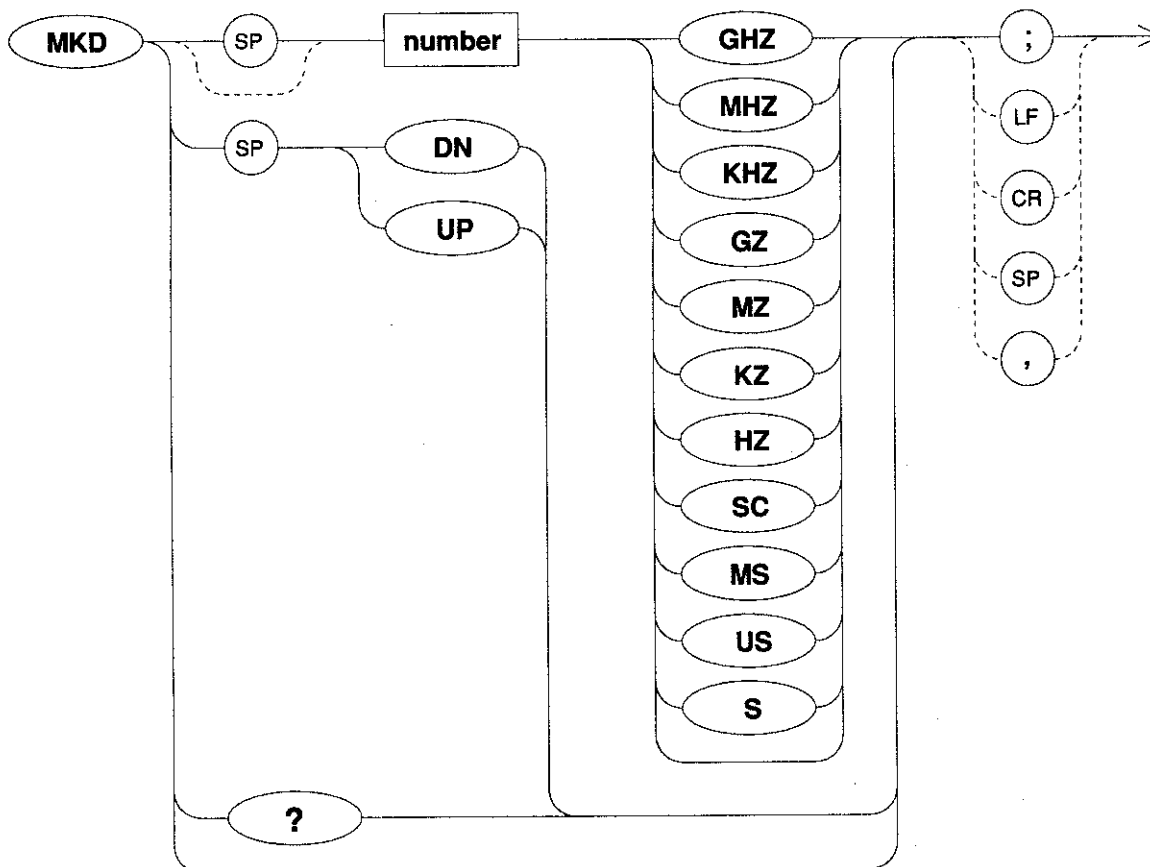
```



# MKD

## Marker Delta

### Syntax



### Query Response



### Example

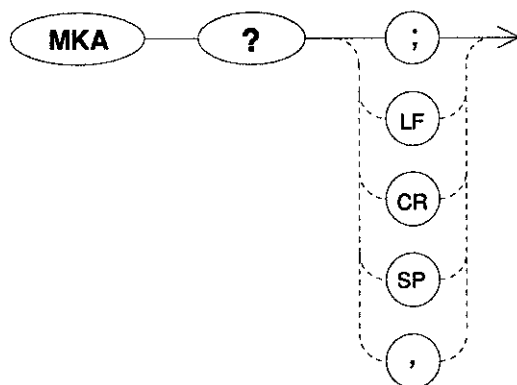
```

10 OUTPUT 708;"IP;CF 300MHZ;SP 200MHZ;"
20 OUTPUT 708;"MKPK HI;MKD;"
30 OUTPUT 708;"MKPK NH;MKD?;"
40 ENTER 708;Delta
50 PRINT Delta
60 END

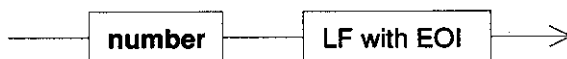
```

## MKA Marker Amplitude

### Syntax



### Query Response



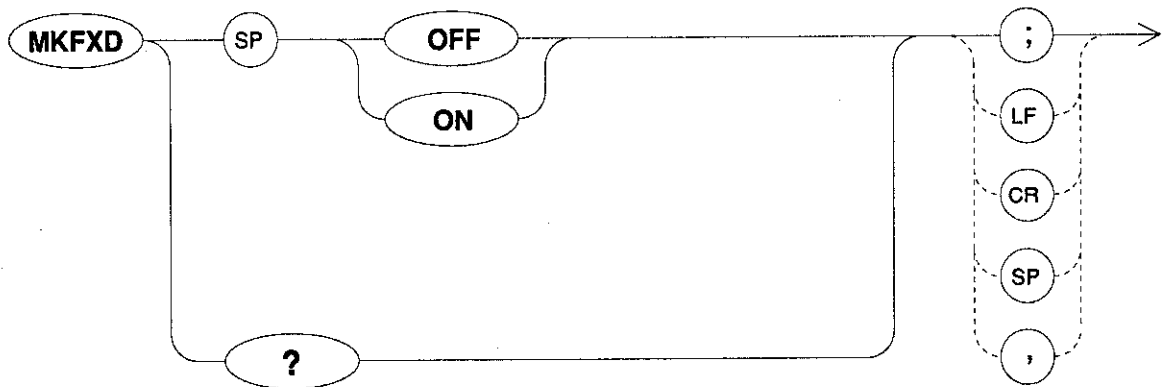
### Example

```
10 OUTPUT 708;"IP;SNGLS;FA 30MHZ;FB 1GHZ"  
20 OUTPUT 708;"TS;MKPK HI;MKA?;"  
30 ENTER 708;Amp  
40 OUTPUT 708;"AUNITS?;"  
50 ENTER 708;Aunits$  
60 PRINT "1ST PEAK POINT IS ";Amp;Aunits$  
70 OUTPUT 708;"TS;MKPK NH;MKA?;"  
80 ENTER 708;Amp  
90 OUTPUT 708;"AUNITS?;"  
100 ENTER 708;Aunits$  
110 PRINT "2ND PEAK POINT IS ";Amp;Aunits$  
120 END
```

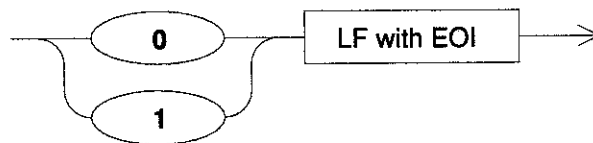
# MKFXD

## Marker Fixed

### Syntax

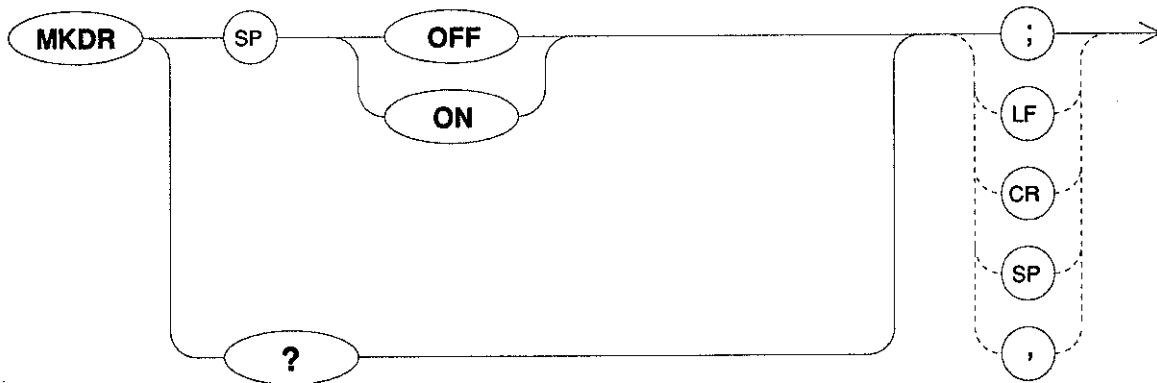


### Query Response

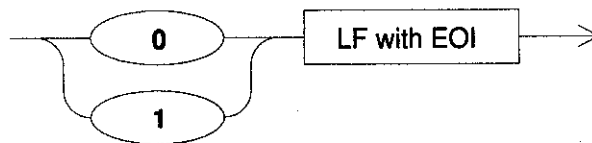


## MKDR Reciprocal of Marker Delta

### Syntax

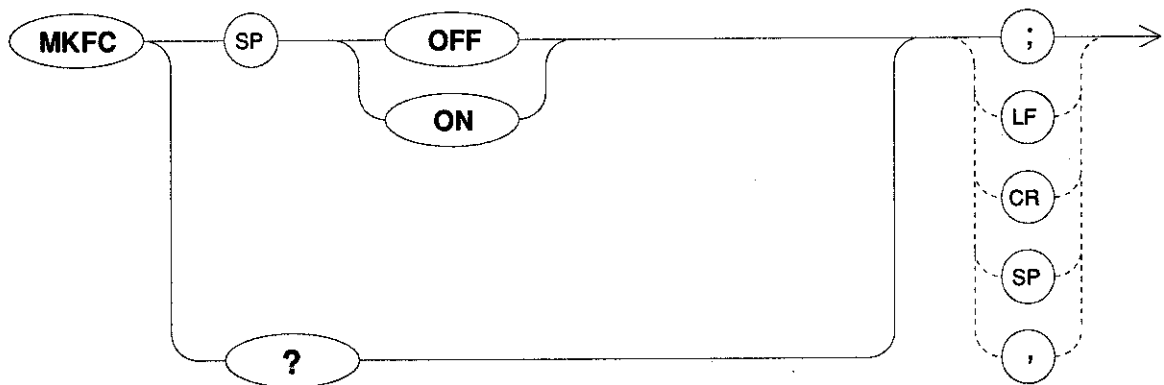


### Query Response

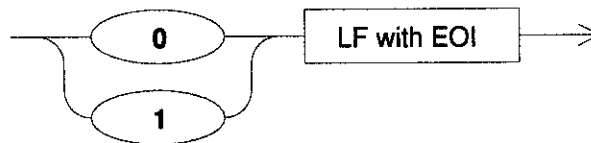


## MKFC Frequency Counter

### Syntax

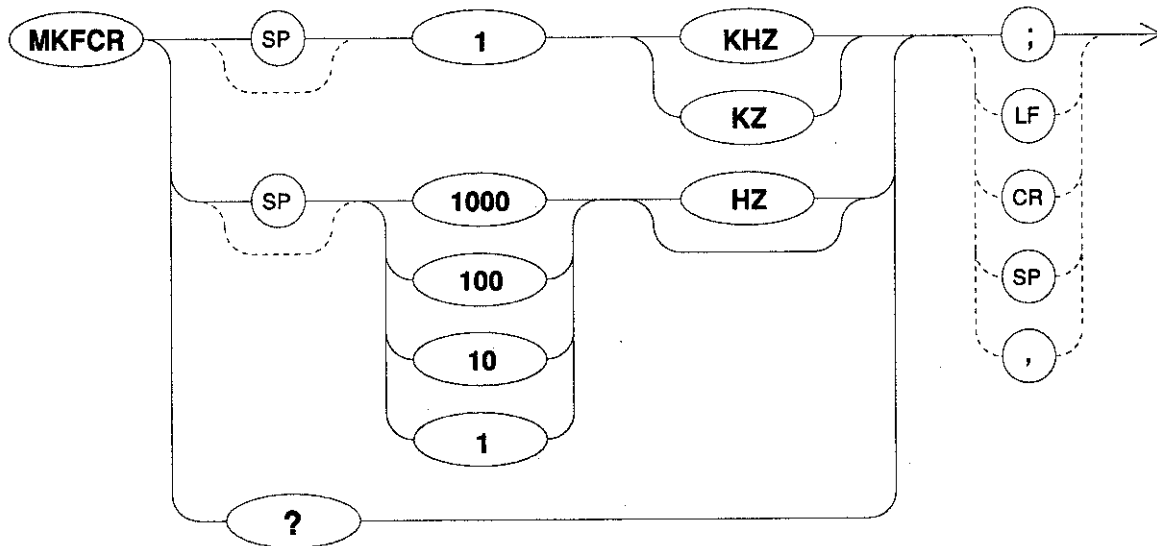


### Query Response



## MKFCR Frequency Counter Resolution

### Syntax



### Query Response



### Example

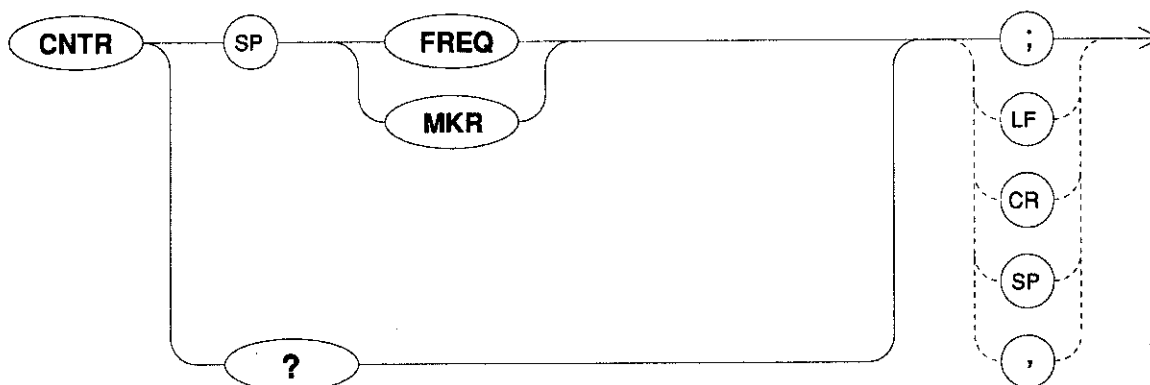
```

10 OUTPUT 708;"IP;SNGLS"
20 INPUT "ENTER THE CENTER FREQUENCY, IN MHZ",Freq
30 INPUT "ENTER THE FREQUENCY SPAN, IN MHZ",Span
40 OUTPUT 708;"CF ";Freq;"MHZ;"
50 OUTPUT 708;"SP ";Span;"MHZ;"
60 OUTPUT 708;"TS;MKPK HI;"
70 INPUT "ENTER THE FREQUENCY COUNTER RESOLUTION, IN HZ",Fcr
80 OUTPUT 708;"MKFCR ";Fcr;"HZ;"
90 OUTPUT 708;"TS;MKF?;"
100 ENTER 708;Freq
110 PRINT "FREQUENCY IS ";Freq
120 END

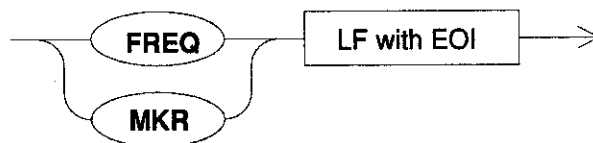
```

## CNTR Counter Mode

### Syntax



### Query Response



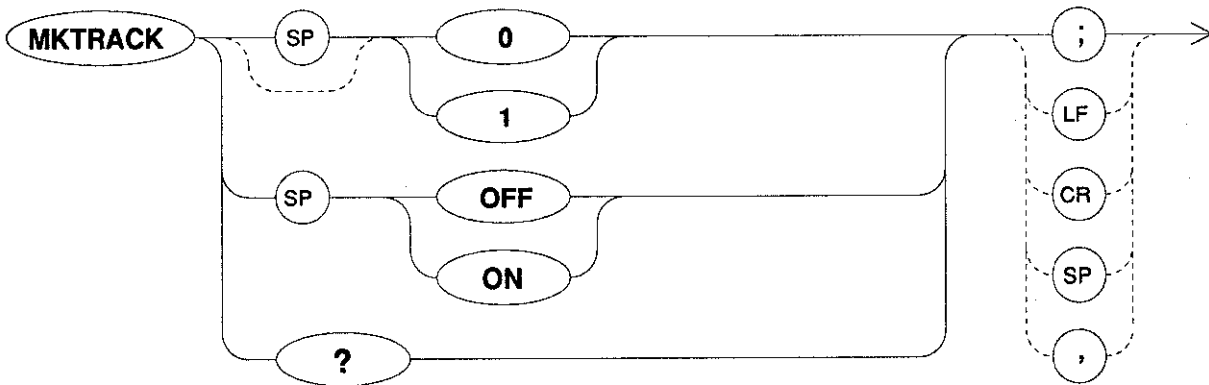
### Parameters

- FREQ**      Selects the frequency counter mode.
- MKR**      Selects the marker counter mode.

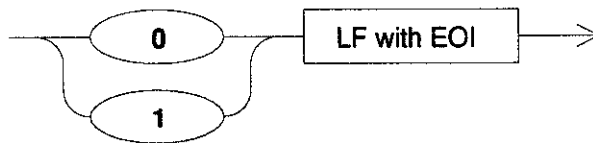
# MKTRACK

## Signal Track

### Syntax



### Query Response

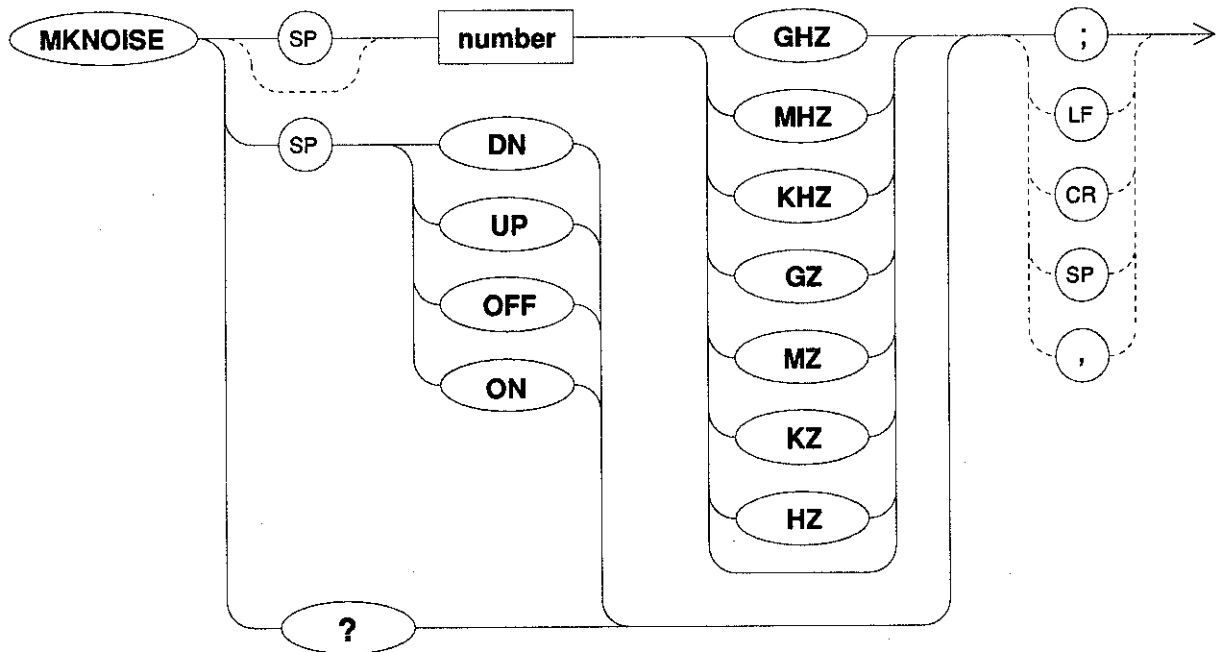




# MKNOISE

## Marker Noise

### Syntax



### Query Response



### Example

```

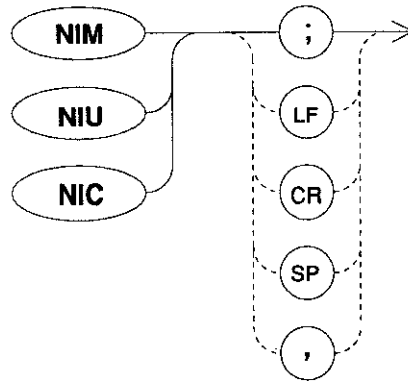
10 OUTPUT 708;"IP;CF1MHZ;SP 200KHZ;RB 1KHZ;"
20 OUTPUT 708;"TS;MKPK HI;"
30 OUTPUT 708;"MKNOISE 1HZ;MKD 50KHZ;"
40 OUTPUT 708;"TS;NIC;"
50 OUTPUT 708;"MKA?;"
60 ENTER 708;Noise
70 PRINT Noise;"DBC/HZ"
80 END

```

## NIM / NIU / NIC

### Marker Noise in dBm/Hz / dBuV/Hz / dBc/Hz

#### Syntax



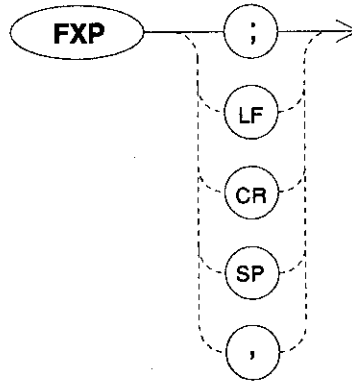
#### Example

```
10 OUTPUT 708;"IP;CF1MHZ;SP 200KHZ;RB 1KHZ;"
20 OUTPUT 708;"TS;MKPK HI;"
30 OUTPUT 708;"MKNOISE 1HZ;MKD 50KHZ;"
40 OUTPUT 708;"TS;NIC;"
50 OUTPUT 708;"MKA?;"
60 ENTER 708;Noise
70 PRINT Noise;"DBC/HZ"
80 END
```

# FXP

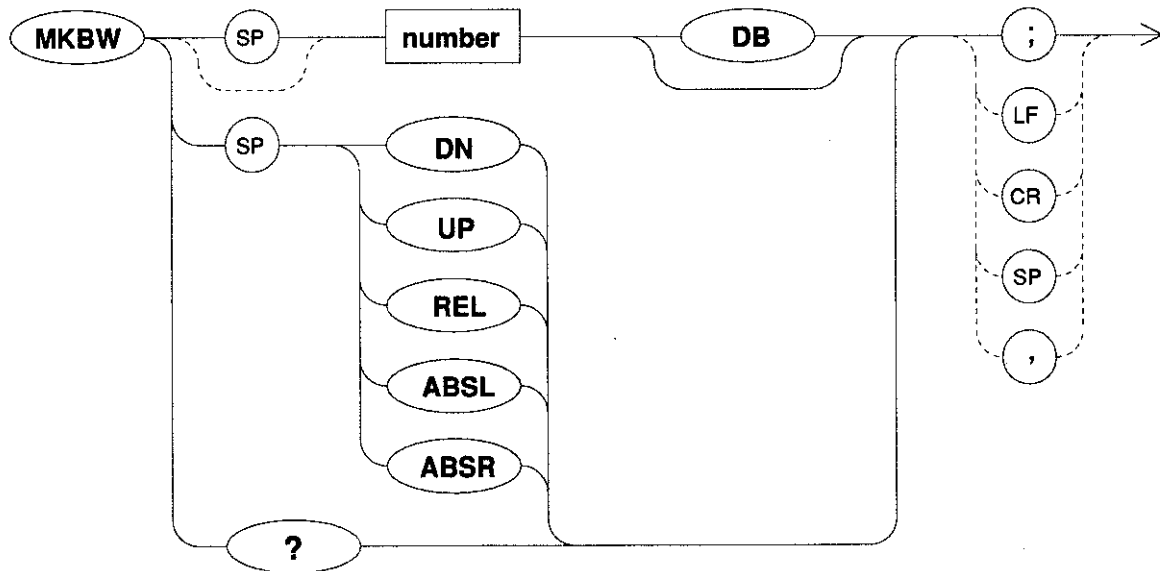
## Fixed Marker Peak

### Syntax



## MKBW X dB Down Bandwidth

### Syntax



### Query Response



### Parameters

- REL Delta marker display mode is set and relative values between the two markers appear.
- ABSL Normal marker display mode is set and the value of the left marker appears.
- ABSR Normal marker display mode is set and the value of the right marker appears.

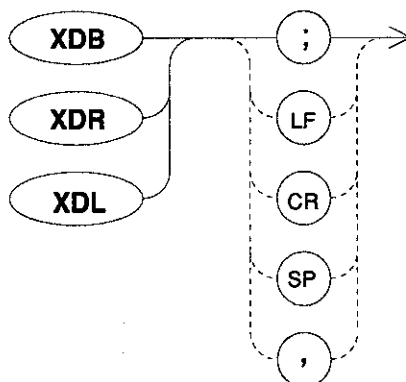
### Example

```
10 OUTPUT 708;"IP;CF 21.5MHZ;SP 1MHZ;RB 300KHZ;VB 100HZ;"
20 OUTPUT 708;"TS;MKPK HI;MKBW 6DB;XDB;"
30 OUTPUT 708;"MKF?"
40 ENTER 708;Freq
50 PRINT Freq
60 END
```

## XDB / XDR / XDL

X dB Down / X dB Down Right / X dB Down Left

### Syntax

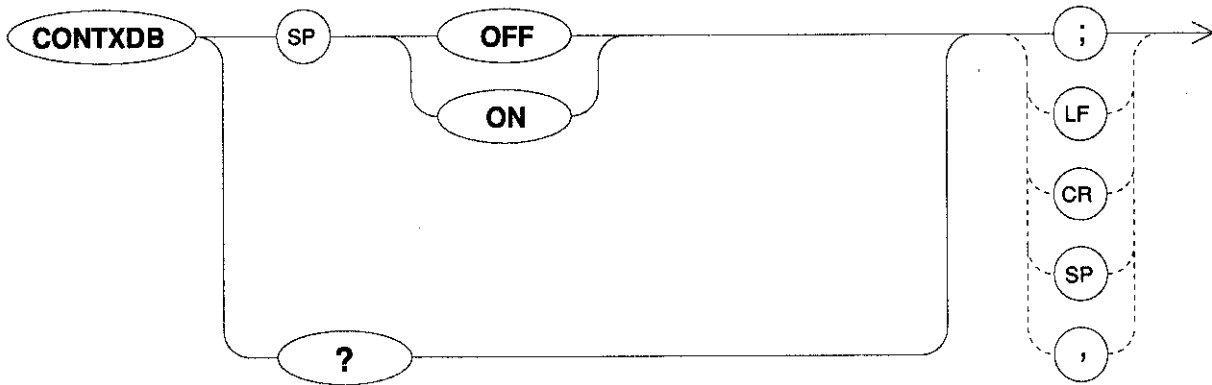


### Example

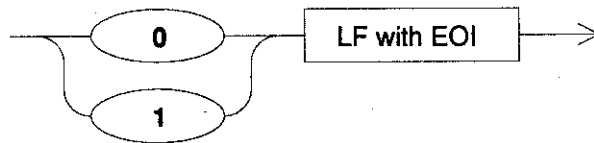
```
10 OUTPUT 708;"IP;CF 21.5MHZ;SP 1MHZ;RB 300KHZ;VB 100HZ;"
20 OUTPUT 708;"TS;MKPK HI;MKBW 6DB;XDB;"
30 OUTPUT 708;"MKF?"
40 ENTER 708;Freq
50 PRINT Freq
60 END
```

## CONTXDB Continuous X dB Down

### Syntax

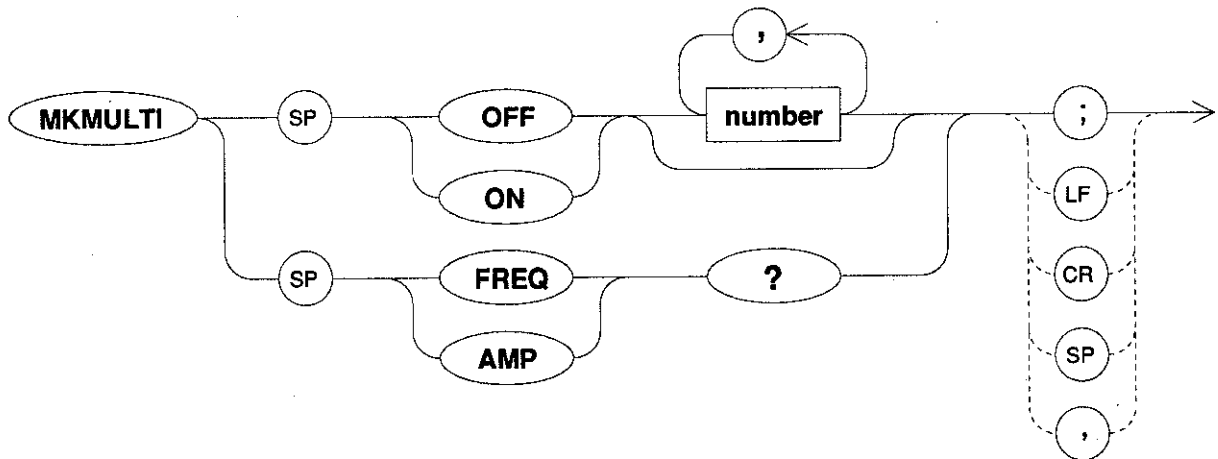


### Query Response

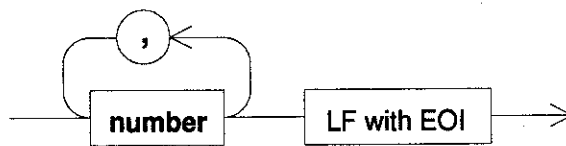


## MKMULTI Marker Multi

### Syntax



### Query Response



### Parameters

- FREQ** Puts out frequency of all the markers.
- AMP** Puts out level of all the markers.

### Example

```

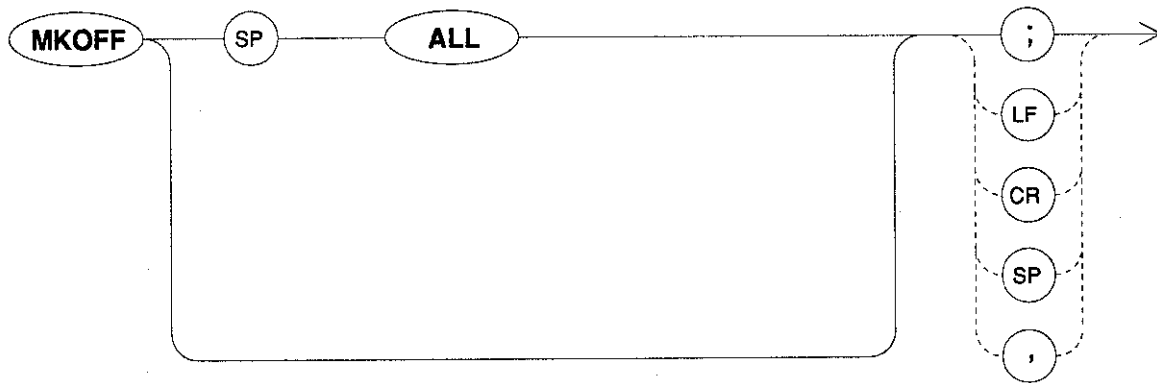
10 OUTPUT 708;"MKMULTI ON1;UP UP UP UP;"
20 OUTPUT 708;"MKMULTI ON2;UP UP UP;"
30 OUTPUT 708;"MKMULTI ON3;UP UP;"
40 OUTPUT 708;"MKMULTI ON4;UP;"
50 OUTPUT 708;"MKMULTI ON5;"
60 OUTPUT 708;"MKMULTI ON6;DN;"
70 OUTPUT 708;"MKMULTI ON7;DN DN;"
80 OUTPUT 708;"MKMULTI ON8;DN DN DN;"
90 OUTPUT 708;"MKMULTI FREQ?;"
100 ENTER 708;A,B,C,D,E,F,G,H,I
110 PRINT A,B,C,D,E,F,G,H,I
120 END

```

# MKOFF

## Marker Off

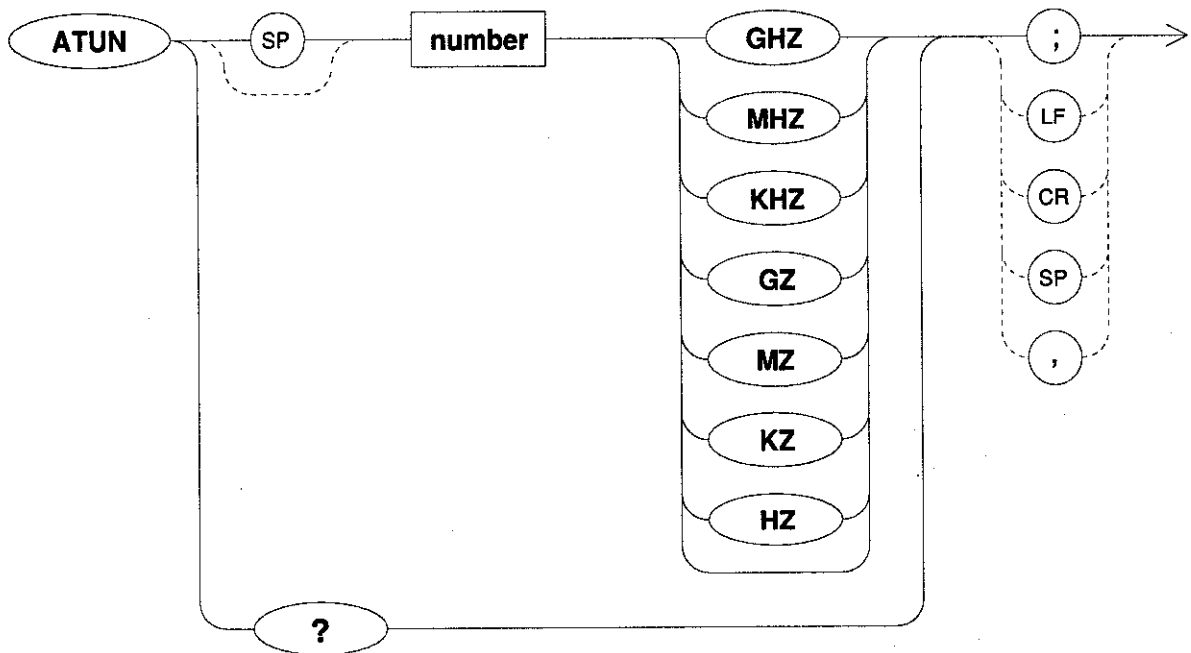
### Syntax



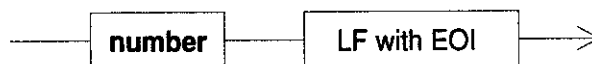


## ATUN Automatic Tuning

### Syntax



### Query Response

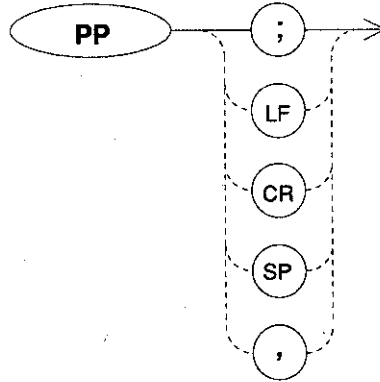


### Example

```
10 OUTPUT 708;"IP;"  
20 OUTPUT 708;"ATUN 200KHZ;"  
30 END
```

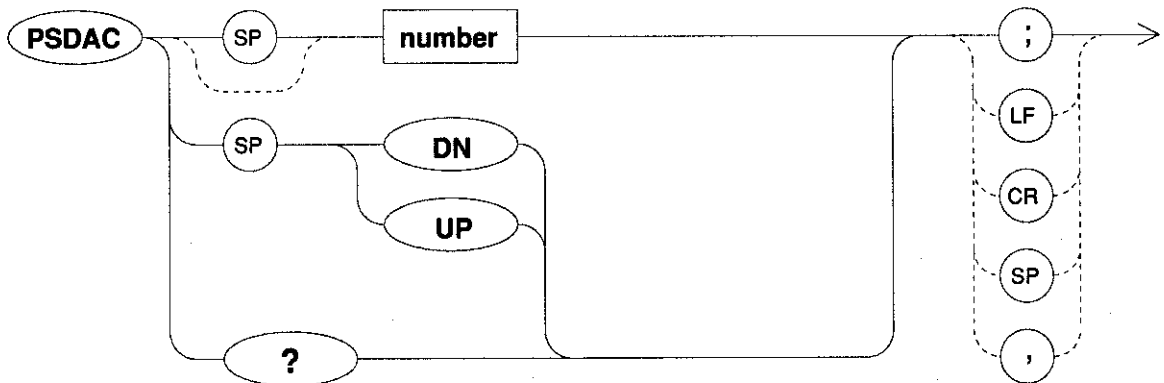
# PP Preselector Peak

## Syntax

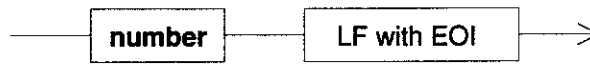


## PSDAC Preselector DAC Number

### Syntax



### Query Response

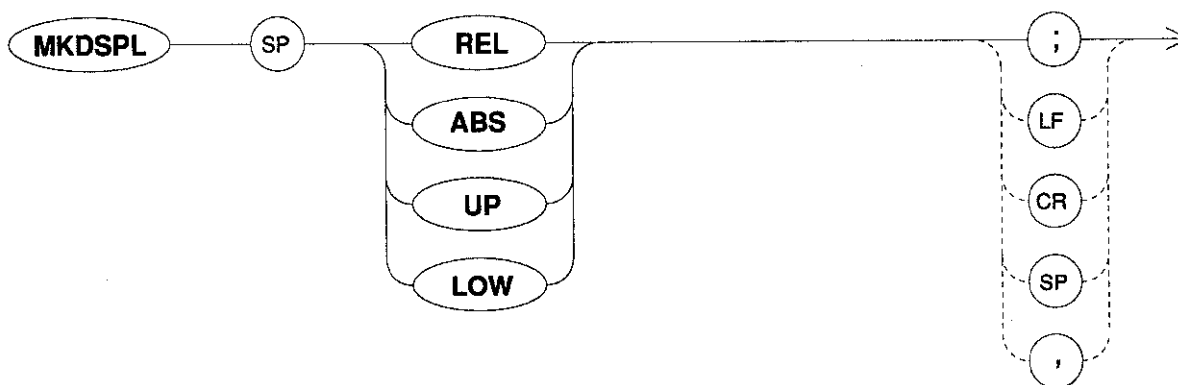


### Example

```
10 OUTPUT 708;"IP;CF 4GHZ;SP 200KHZ;"
20 OUTPUT 708;"TS;MKPK HI;MKCF;TS;PP;"
30 OUTPUT 708;"PSDAC?;"
40 ENTER 708;Pre_peak
50 PRINT "PRESELECTOR PEAK NUMBER IS",Pre_peak
60 END
```

## MKDSPL Marker Display

### Syntax



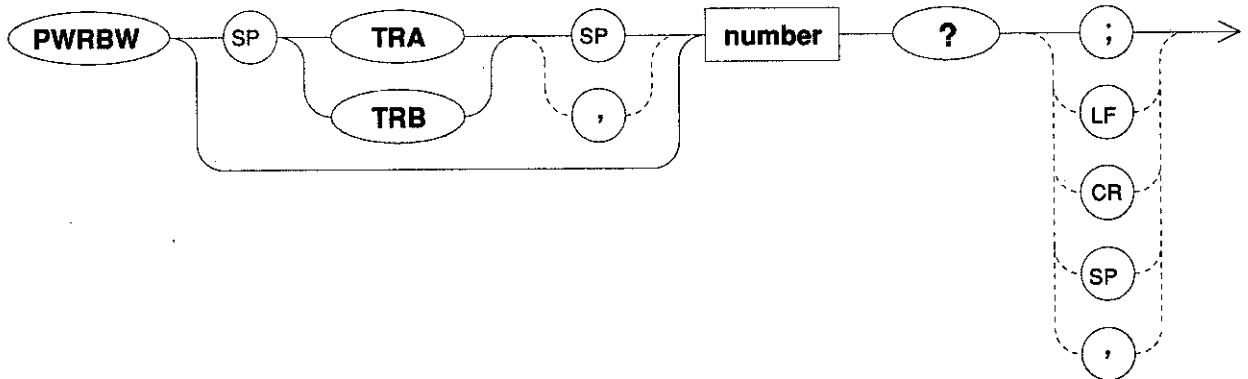
### Parameters

- |            |  |
|------------|--|
| <b>REL</b> | The difference in the level of the display line with the marker is displayed relatively. |
| <b>ABS</b> | The marker level is displayed independently of the display line.                         |
| <b>UP</b>  | Data appear at the upper right.  |
| <b>LOW</b> | Data appear at the lower right.  |

## PWRBW

### Trace Power Bandwidth

#### Syntax



#### Query Response

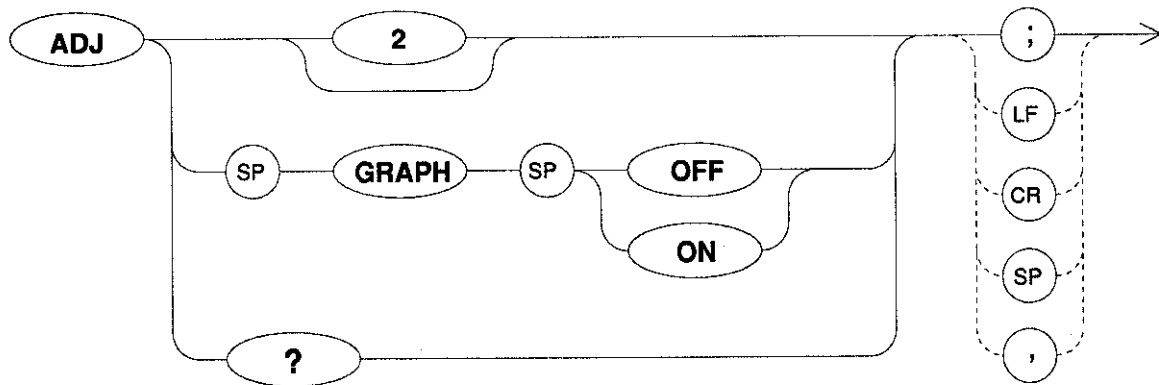


#### Example

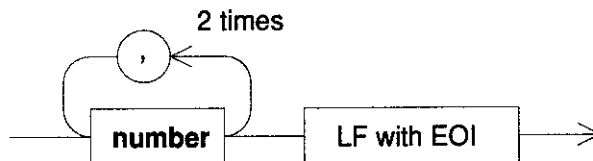
```
10 OUTPUT 708;"IP;CF 902MHZ;SP 50KHZ;RB 300HZ;"
20 OUTPUT 708;"DET SMP;TS;"
30 OUTPUT 708;"PWRBW TRA,99.0?;"
40 ENTER 708;wid
50 PRINT "THE POWER BANDWIDTH AT 99 % IS",wid/1000,"KHZ"
60 END
```

## ADJ Adjacent Channel Leak Power

### Syntax



### Query Response



### Parameters

- GRAPH** The leak power is calculated at the every frequency point on the screen and results appear as a graph.
- 2** The leak power is calculated automatically.

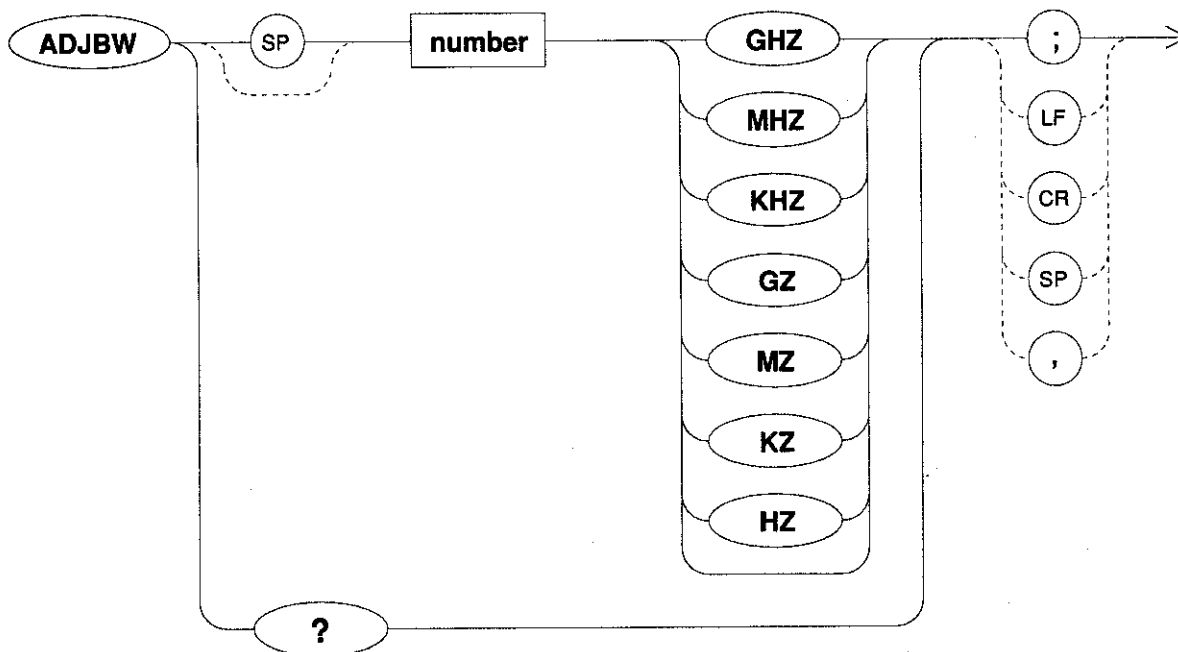
### Example

```

10  OUTPUT 708;"IP;DGT LIF 0;CF 902MHZ;SP 50KHZ;RB 100HZ;"
20  OUTPUT 708;"DET SMP;TS;"
30  OUTPUT 708;"MKN 902MHZ;"
40  OUTPUT 708;"ADJCH 12.5KHZ;ADJBW 8.5KHZ;"
50  OUTPUT 708;"ADJ;"
60  OUTPUT 708;"ADJ?;"
70  ENTER 708;Up,Low
80  PRINT "UPPER ADJ IS ",Up,"DB"
90  PRINT "LOWER ADJ IS ",Low,"DB"
100 END
  
```

## ADJBW Specified Bandwidth of Adjacent Channel Leak Power

### Syntax



### Query Response



### Example

```

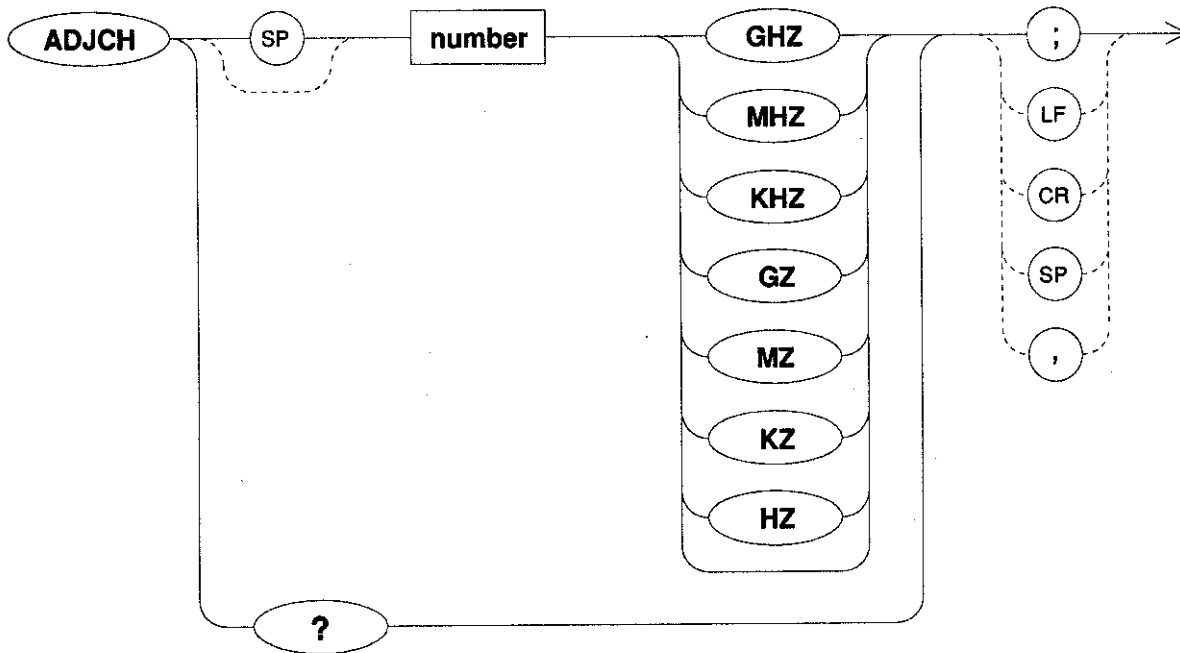
10 OUTPUT 708;"IP;DGT LIF 0;CF 902MHZ;SP 50KHZ;RB 100HZ;"
20 OUTPUT 708;"DET SMP;TS;"
30 OUTPUT 708;"MKN 902MHZ;"
40 OUTPUT 708;"ADJCH 12.5KHZ;ADJBW 8.5KHZ;"
50 OUTPUT 708;"ADJ;"
60 OUTPUT 708;"ADJ?;"
70 ENTER 708;Up,Low
80 PRINT "UPPER ADJ IS ",Up,"DB"
90 PRINT "LOWER ADJ IS ",Low,"DB"
100 END

```

## ADJCH

### Channel Space of Adjacent Channel Leak Power

#### Syntax



#### Query Response



#### Example

```

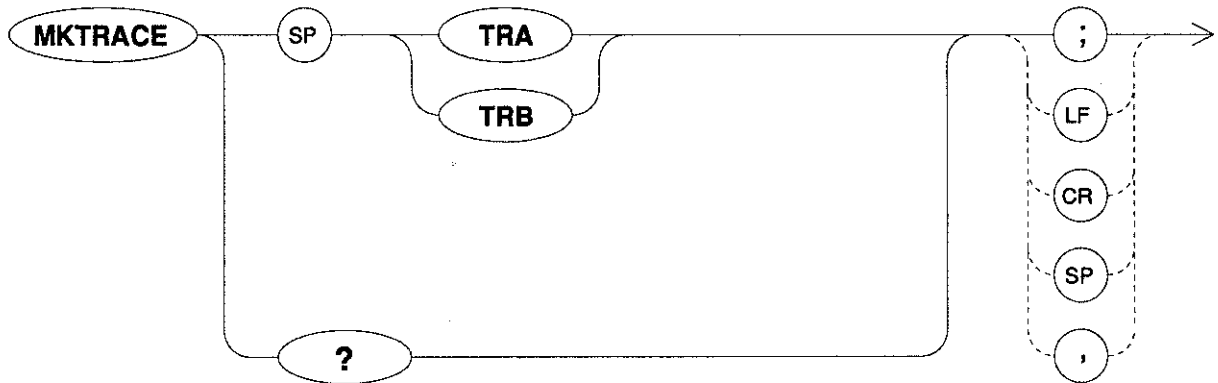
10  OUTPUT 708;"IP;DGT LIF 0;CF 902MHZ;SP 50KHZ;RB 100HZ;"
20  OUTPUT 708;"DEF SMP;TS;"
30  OUTPUT 708;"MKN 902MHZ;"
40  OUTPUT 708;"ADJCH 12.5KHZ;ADJBW 8.5KHZ;"
50  OUTPUT 708;"ADJ;"
60  OUTPUT 708;"ADJ?;"
70  ENTER 708;Up,Low
80  PRINT "UPPER ADJ IS ",Up,"DB"
90  PRINT "LOWER ADJ IS ",Low,"DB"
100 END

```

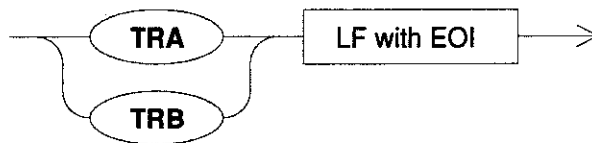


## MKTRACE Marker to Active Trace

### Syntax

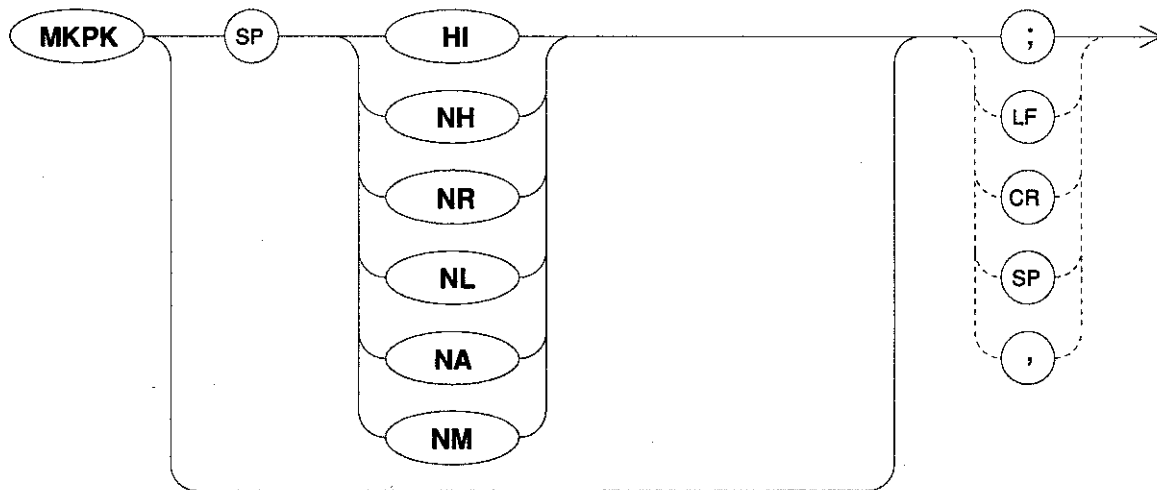


### Query Response



## MKPK Peak Search

### Syntax

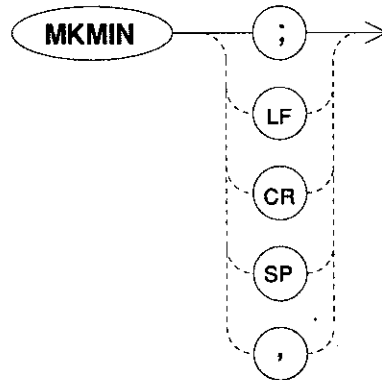


### Parameters

- |           |  |
|-----------|--|
| <b>HI</b> | Finds the highest point on a trace.      |
| <b>NH</b> | Finds the next-highest point on a trace. |
| <b>NR</b> | Finds the next-right peak.               |
| <b>NL</b> | Finds the next-left peak.                |
| <b>NA</b> | Finds the next-maximum/minimum.          |
| <b>NM</b> | Finds the next-lowest point on a trace.  |

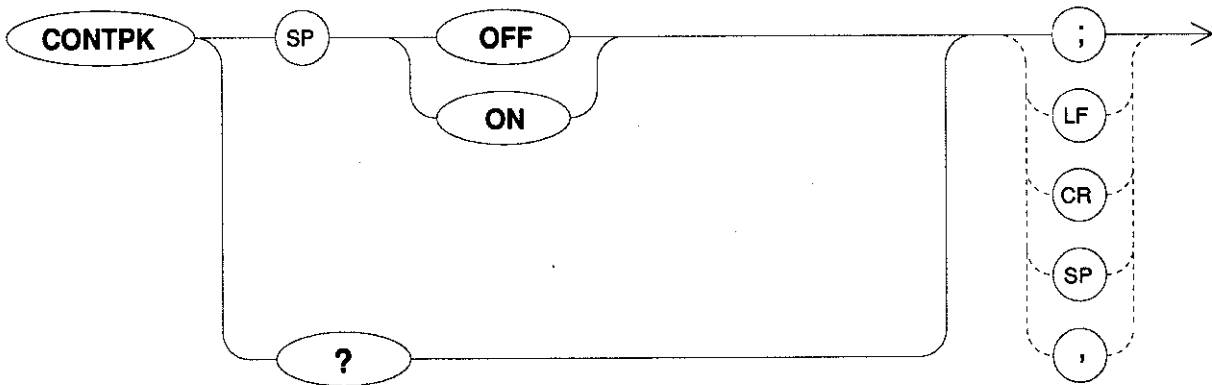
## MKMIN Marker to Minimum

### Syntax

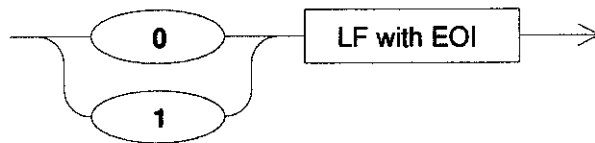


## CONTPK Continuous Peak Search

### Syntax

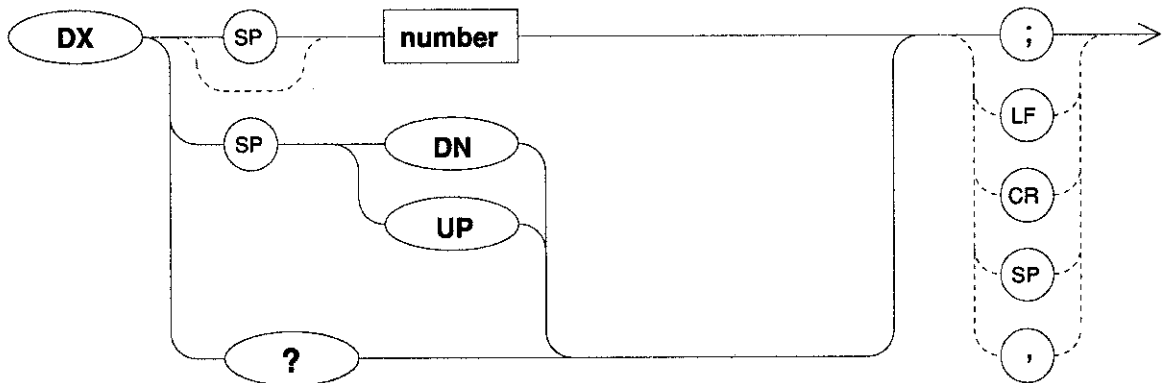


### Query Response



## DX Delta X for Peak Search

### Syntax



### Query Response

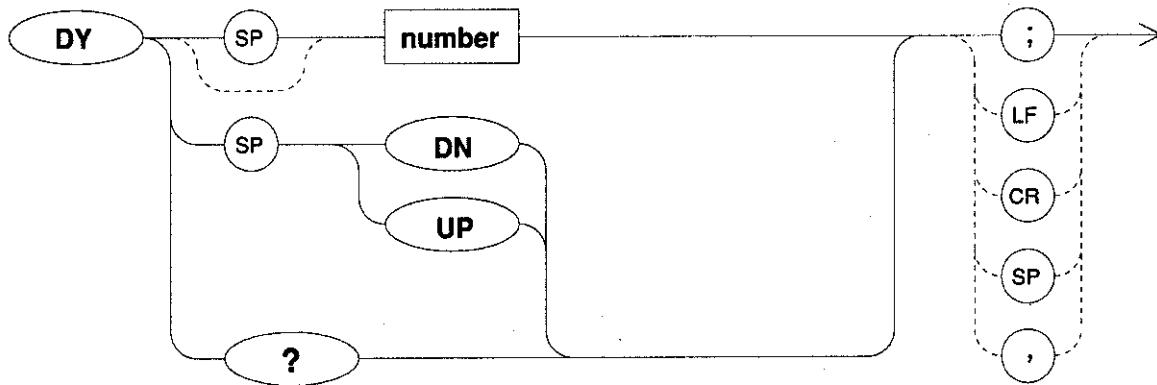


### Example

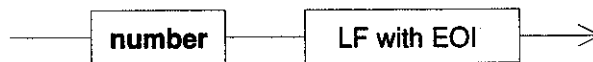
```
10 PRINT "SET THE INCLINATION IN THE X AND Y DIRECTIONS"
20 INPUT "DELTA X (1 - 700)",Dx
30 INPUT "DELTA Y (1 - 400)",Dy
40 OUTPUT 708;"DX ";Dx;" "
50 OUTPUT 708;"DY ";Dy;" "
60 OUTPUT 708;"PKLIST ON;"
70 END
```

## DY Delta Y for Peak Search

### Syntax



### Query Response

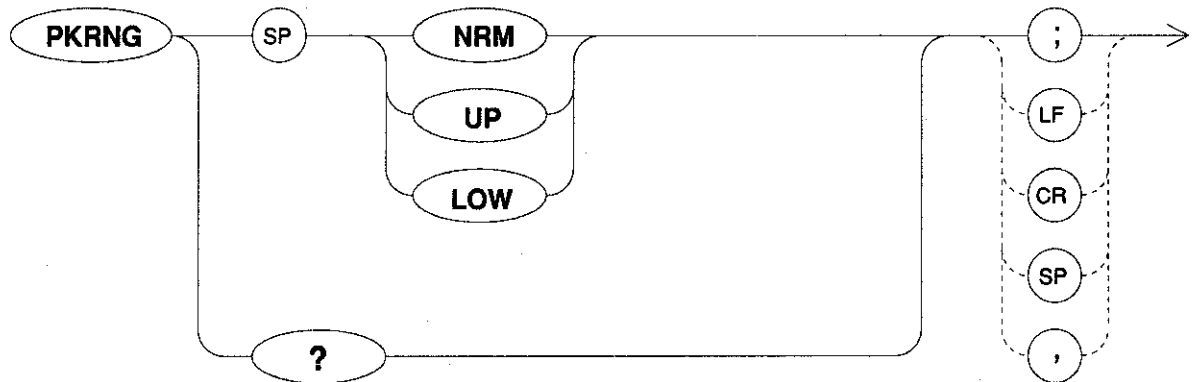


### Example

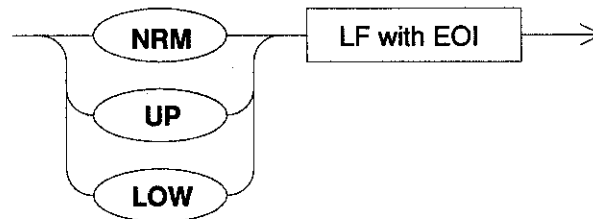
```
10 PRINT "SET THE INCLINATION IN THE X AND Y DIRECTIONS"  
20 INPUT "DELTA X (1 - 700)",Dx  
30 INPUT "DELTA Y (1 - 400)",Dy  
40 OUTPUT 708;"DX ";Dx;" ;"  
50 OUTPUT 708;"DY ";Dy;" ;"  
60 OUTPUT 708;"PKLIST ON;"  
70 END
```

## PKRNG Peak Search Effective Range

### Syntax



### Query Response



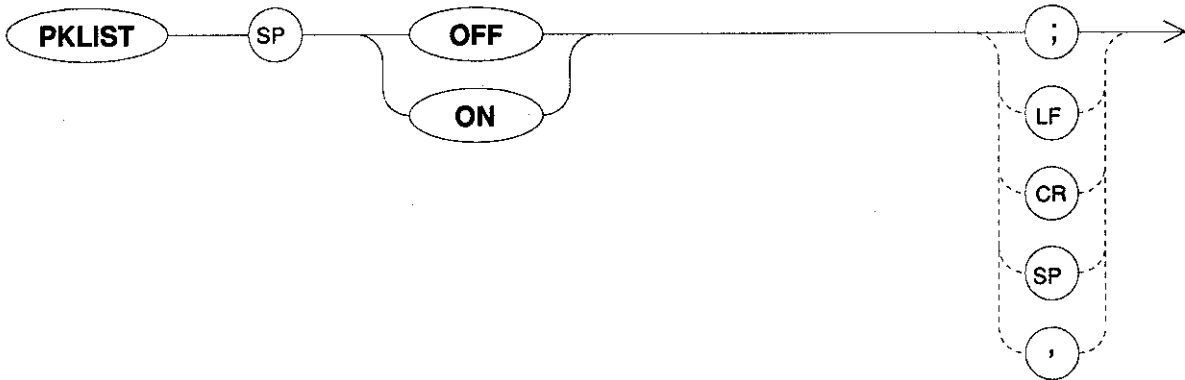
### Parameters

- |            |   |
|------------|---|
| <b>NRM</b> | Search is executed to all the waveforms.  |
| <b>UP</b>  | Level above the display line is searched. |
| <b>LOW</b> | Level below the display line is searched. |

# PKLIST

## Next Peak List On/Off

### Syntax

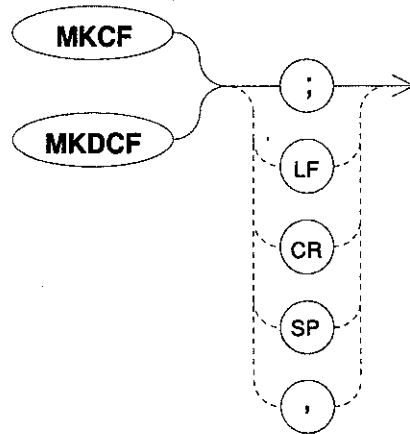




## MKCF / MKDCF

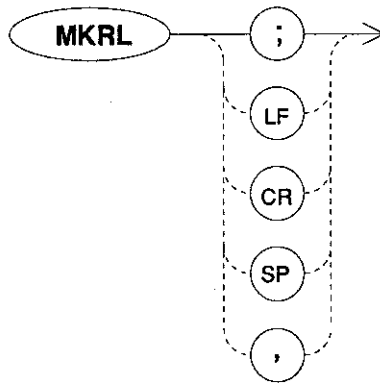
### Marker or Marker Delta to Center Frequency

#### Syntax



## MKRL Marker to Reference Level

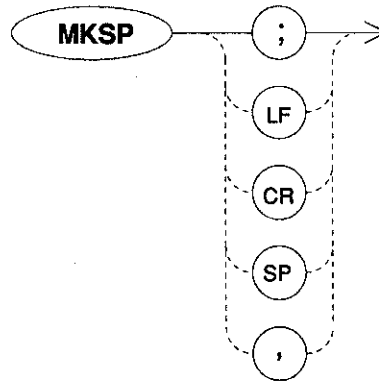
### Syntax



# MKSP

## Marker Delta to Span

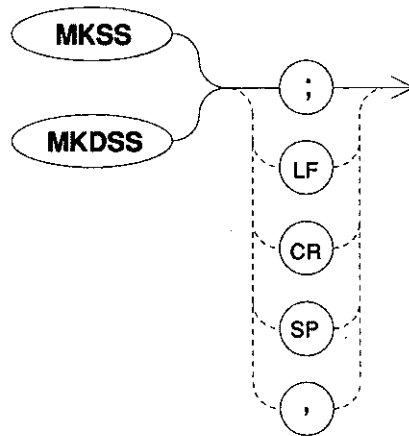
### Syntax



## MKSS / MKDSS

### Marker or Marker Delta to Center Frequency Step Size

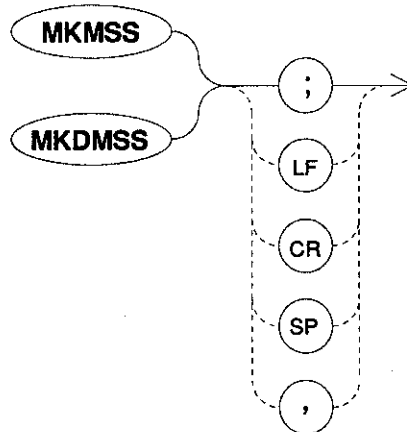
#### Syntax



## MKMSS / MKDMSS

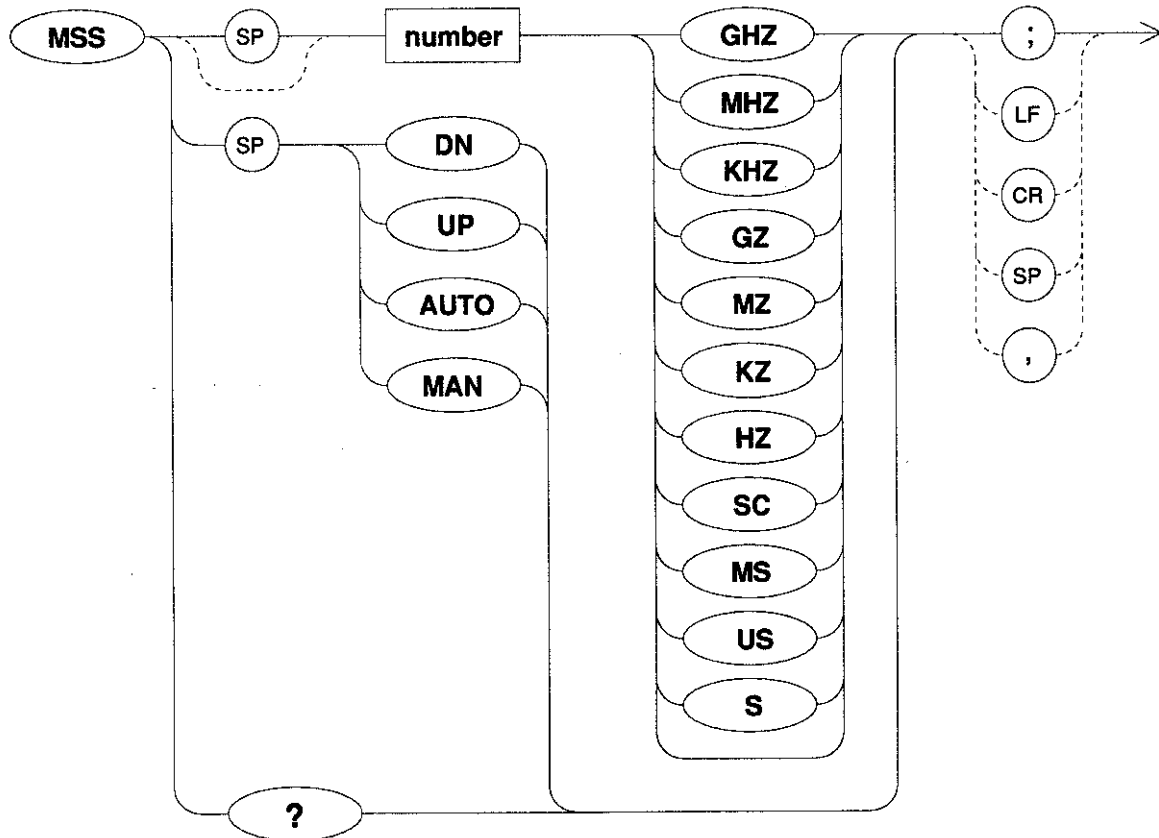
### Marker or Marker Delta to Marker Step Size

#### Syntax



## MSS Marker Step Size

### Syntax



### Query Response



### Example

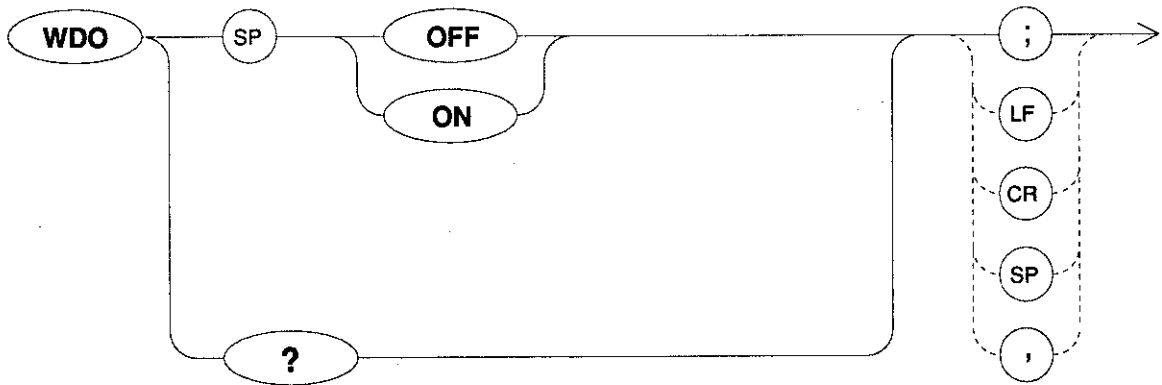
```

10 INPUT "ENTER DESIRED MARKER STEP SIZE",Step$
20 OUTPUT 708;"MSS ";Step$;"
30 OUTPUT 708;"MKN DN DN DN;"
40 OUTPUT 708;"MKA?;"
50 ENTER 708;Level1
60 OUTPUT 708;"MKN UP;"
70 OUTPUT 708;"MKA?;"
80 ENTER 708;Level2
90 OUTPUT 708;"MKN UP;"
100 OUTPUT 708;"MKA?;"
110 ENTER 708;Level3
120 PRINT Level1,Level2,Level3
130 END

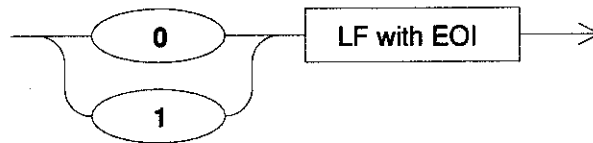
```

## WDO Measurement Window

### Syntax

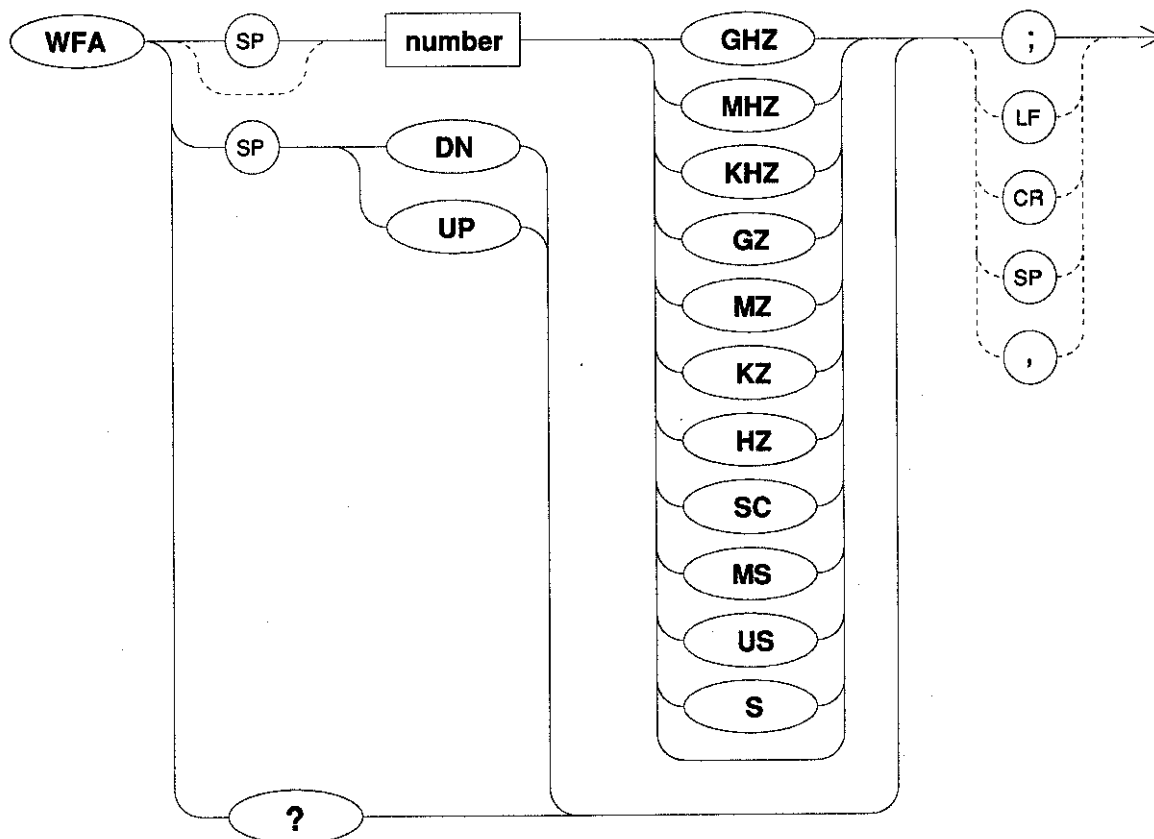


### Query Response

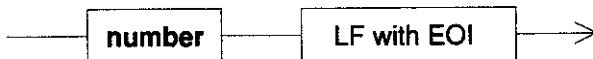


## WFA Measurement Window Start Frequency

### Syntax



### Query Response



### Example

```

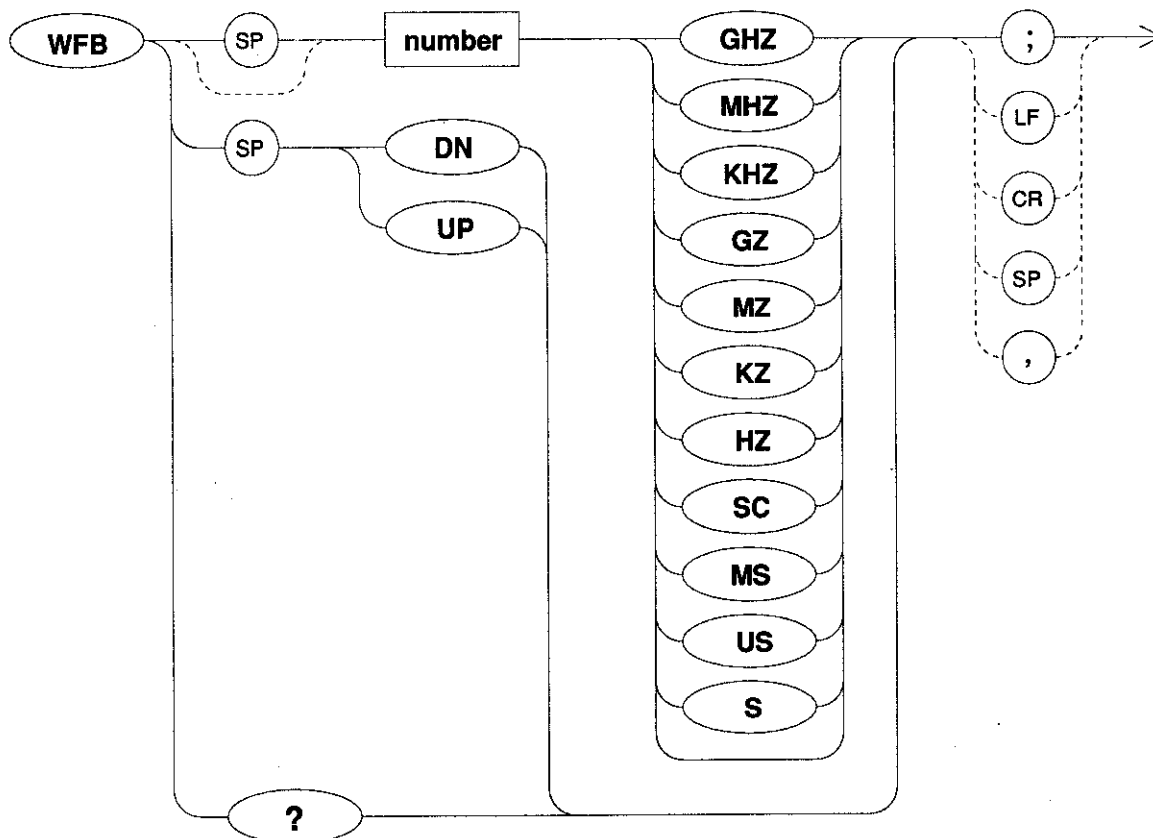
10 OUTPUT 708;"WDO ON;"
20 OUTPUT 708;"WFA 100MHZ;WFB 300MHZ;WUL -10DB;WLL -70DB;"
30 OUTPUT 708;"MKPK NH;"
40 END

```



## WFB Measurement Window Stop Frequency

### Syntax



### Query Response



### Example

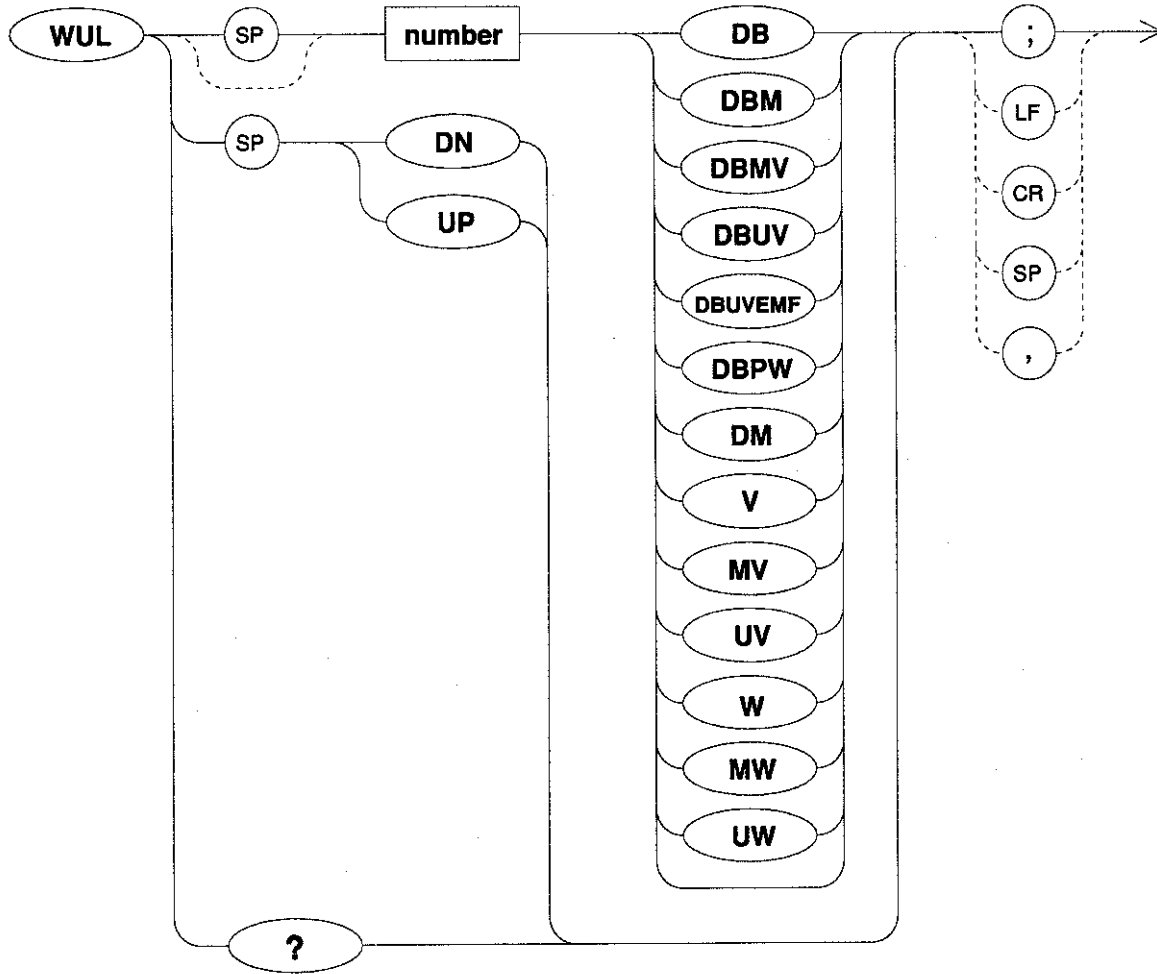
```

10 OUTPUT 708;"WDO ON;"
20 OUTPUT 708;"WFA 100MHZ;WFB 300MHZ;WUL -10DB;WLL -70DB;"
30 OUTPUT 708;"MKPK NH;"
40 END
  
```

# WUL

## Measurement Window Upper Level

### Syntax



### Query Response



### Example

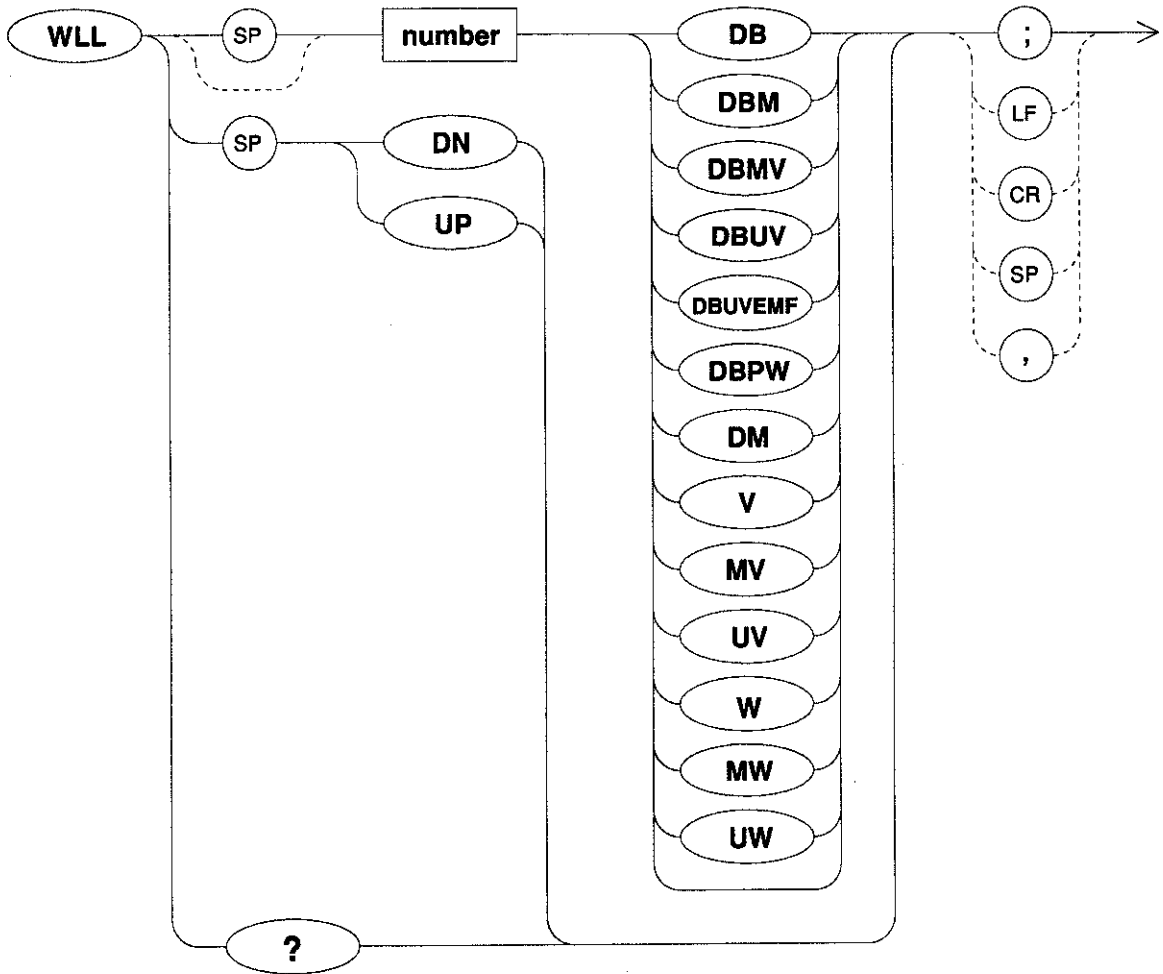
```

10 OUTPUT 708;"WDO ON;"
20 OUTPUT 708;"WFA 100MHZ;WFB 300MHZ;WUL -10DB;WLL -70DB;"
30 OUTPUT 708;"MKPK NH;"
40 END

```

## WLL Measurement Window Lower Level

### Syntax



### Query Response



### Example

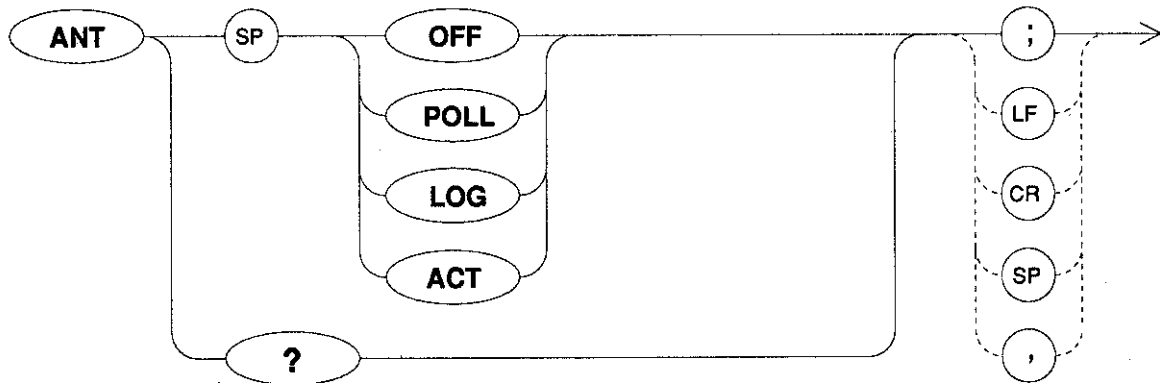
```

10 OUTPUT 708;"WDO ON;"
20 OUTPUT 708;"WFA 100MHZ;WFB 300MHZ;WUL -10DB;WLL -70DB;"
30 OUTPUT 708;"MKPK NH;"
40 END

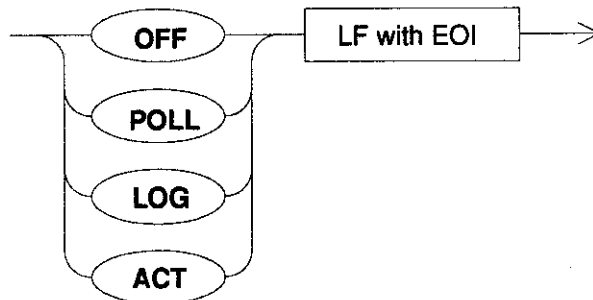
```

## ANT Antenna Type

### Syntax



### Query Response

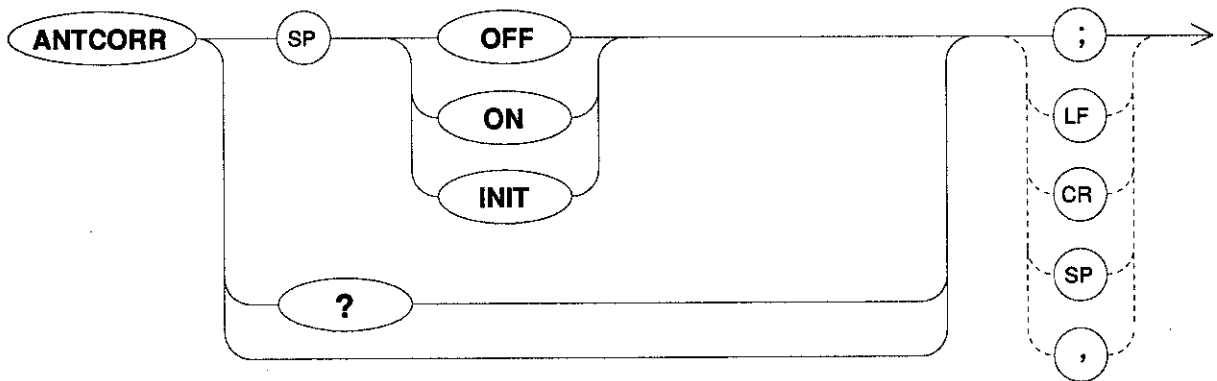


### Parameters

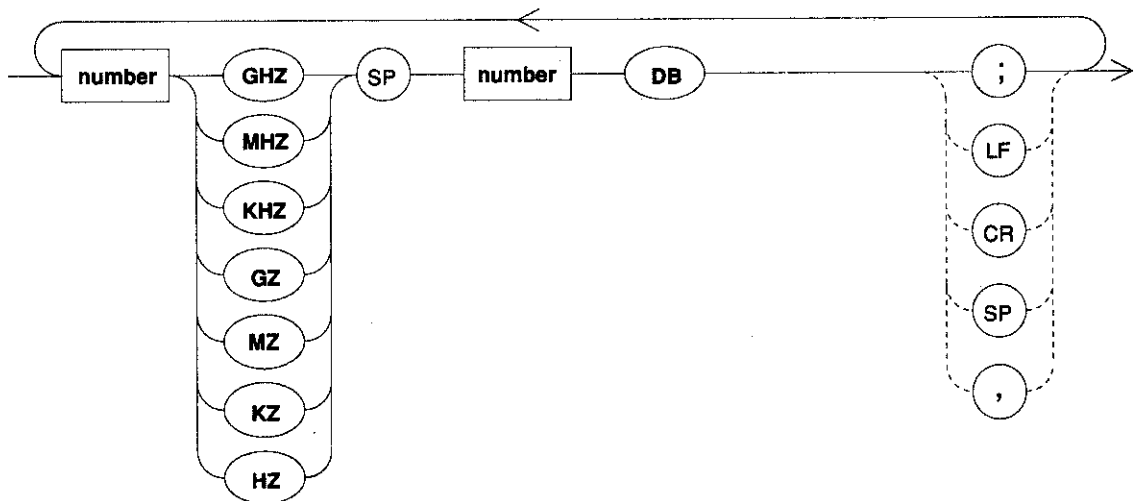
- |             |  |
|-------------|--|
| <b>OFF</b>  | Cancel the antenna corrections.                      |
| <b>POLL</b> | Selects the half-wavelength dipole antenna (TR1722). |
| <b>LOG</b>  | Selects the logarithmic cycle type antenna (TR1711). |
| <b>ACT</b>  | Selects the active antenna (TR17203).                |

## ANTCORR Antenna Correction

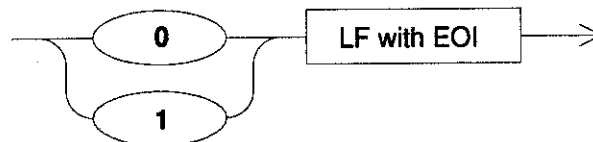
### Syntax



### cf:entry correction data



### Query Response



### Example

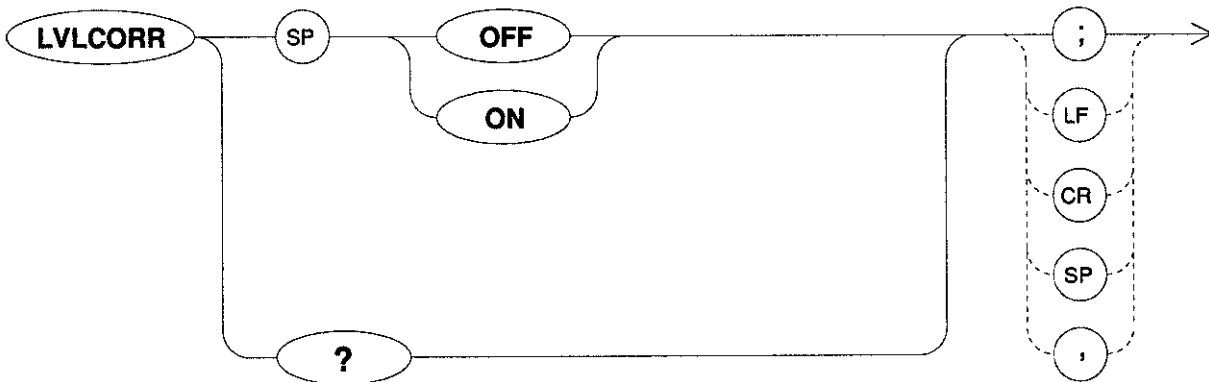
```

10 OUTPUT 708;"FA 30MHZ;FB 1GHZ;VB 3MHZ;"
20 OUTPUT 708;"ANTCORR 80MHZ -5DB;150MHZ -20DB;300MHZ -35DB;"
30 OUTPUT 708;"ANTCORR ON;"
40 END

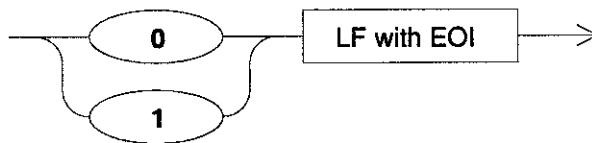
```

## LVLCORR Level Correction On/Off

### Syntax

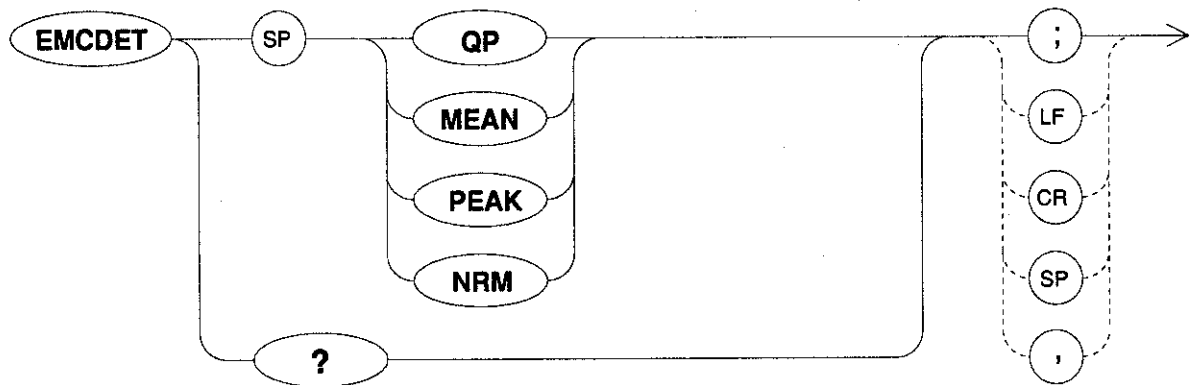


### Query Response

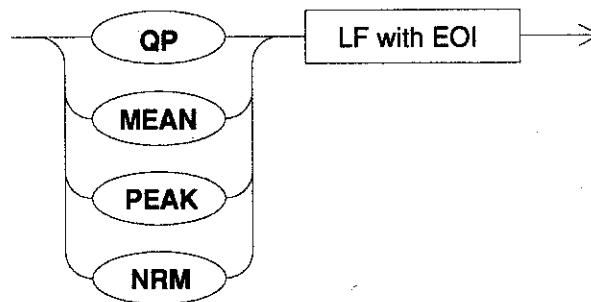


## EMCDET Detection Mode of EMC

### Syntax



### Query Response

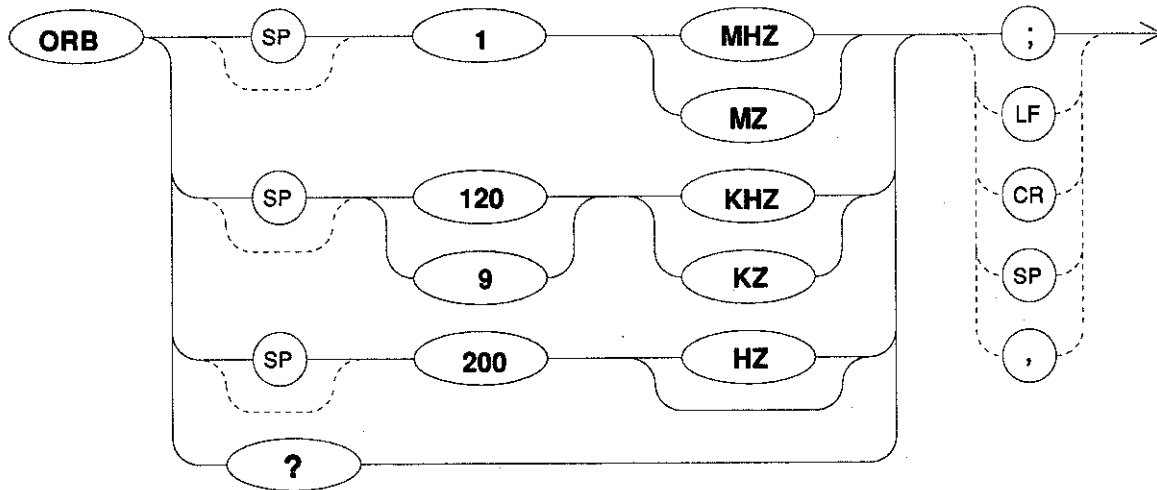


### Parameters

<b>QP</b>	Selects the quasi peak detection.
<b>MEAN</b>	Selects the mean value detection.
<b>PEAK</b>	Selects the peak value detection.
<b>NRM</b>	Selects the normal detection.

## ORB Optimal Resolution Bandwidth

### Syntax



### Query Response



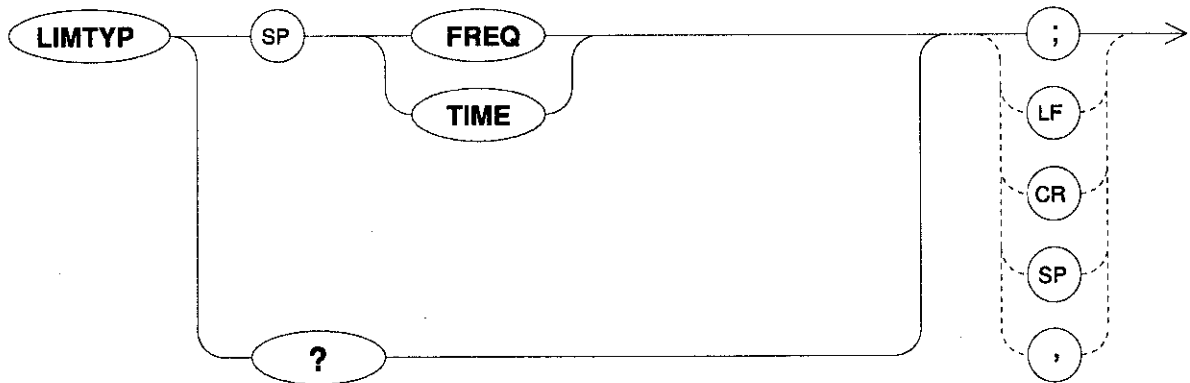
### Example

```
10 OUTPUT 708;"IP;FA30 MHZ;FB 1GHZ;"  
20 OUTPUT 708;"EMCDET PEAK;ORB 1MHZ"  
30 END
```

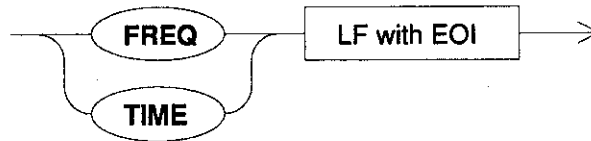


## LIMTYP Selects The Limit Line Type

### Syntax



### Query Response



### Parameters

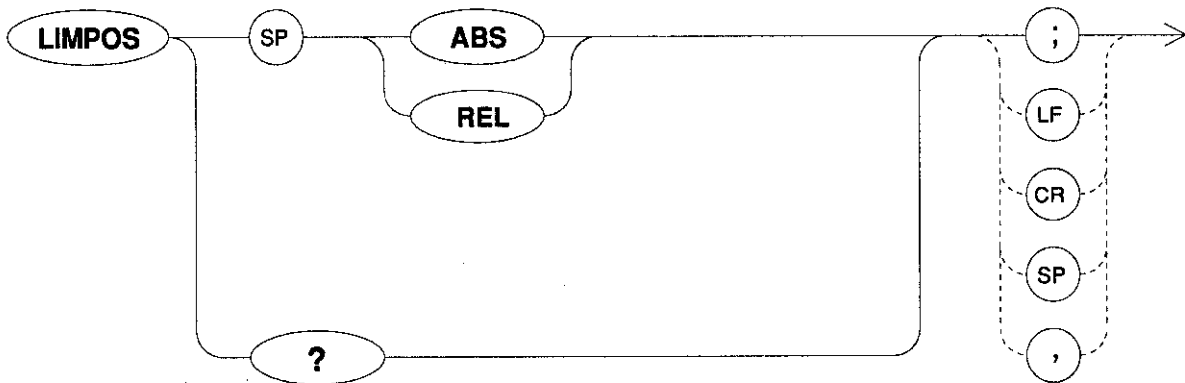
- FREQ** Selects the frequency domain type.
- TIME** Selects the time domain type.

### Example

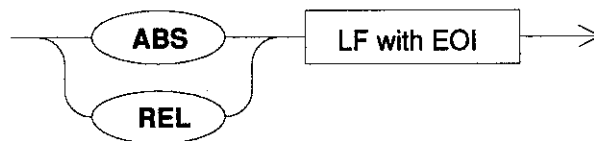
```
10 OUTPUT 708;"FA 0HZ;FB 1GZ;RL 40DBUV;"
20 OUTPUT 708;"LIMTYP FREQ;LIMLA INIT;LIMLA;"
30 OUTPUT 708;"0HZ 30DBUV;500MZ 30DBUV;500MZ 15DBUV;1GZ 15DBUV;"
40 OUTPUT 708;"LIMPOS ABS;LIMAPOS ABS;LIMSFT 50MZ;LIMASFT -40DB;"
50 END
```

## LIMPOS The Horizontal Position of The Limit Line

### Syntax



### Query Response



### Parameters

- ABS** Selects the absolute position of the frequency domain or the time domain.
- REL** Selects the relative position of the frequency domain or the time domain.

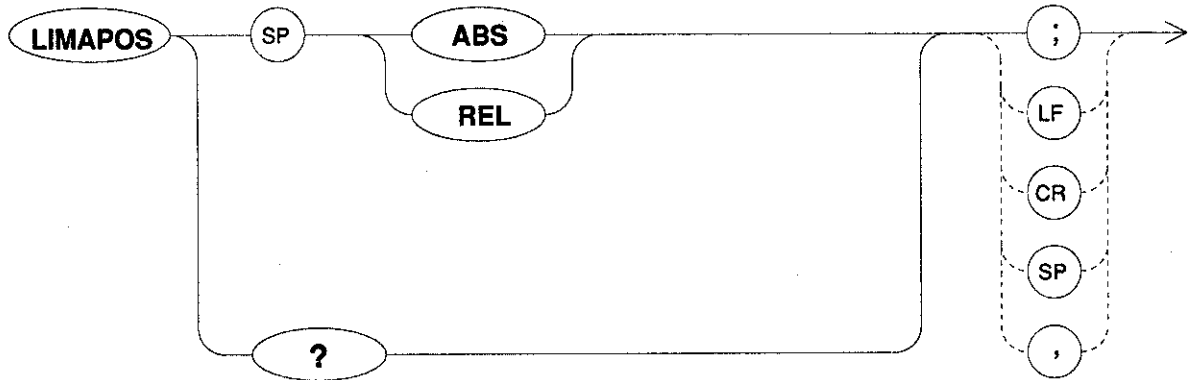
### Example

```
10 OUTPUT 708;"FA 0HZ;FB 1GZ;RL 40DBUV;"  
20 OUTPUT 708;"LIMTYP FREQ;LIMLA INIT;LIMLA;"  
30 OUTPUT 708;"0HZ 30DBUV;500MZ 30DBUV;500MZ 15DBUV;1GZ 15DBUV;"  
40 OUTPUT 708;"LIMPOS ABS;LIMAPOS ABS;LIMSFT 50MZ;LIMASFT -40DB;"  
50 END
```

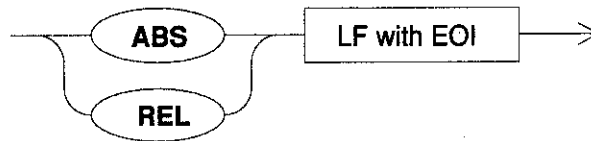
## LIMAPOS

### The Vertical Position of The Limit Line

#### Syntax



#### Query Response



#### Parameters

- ABS** Selects the absolute position of the amplitude.
- REL** Selects the relative position of the amplitude.

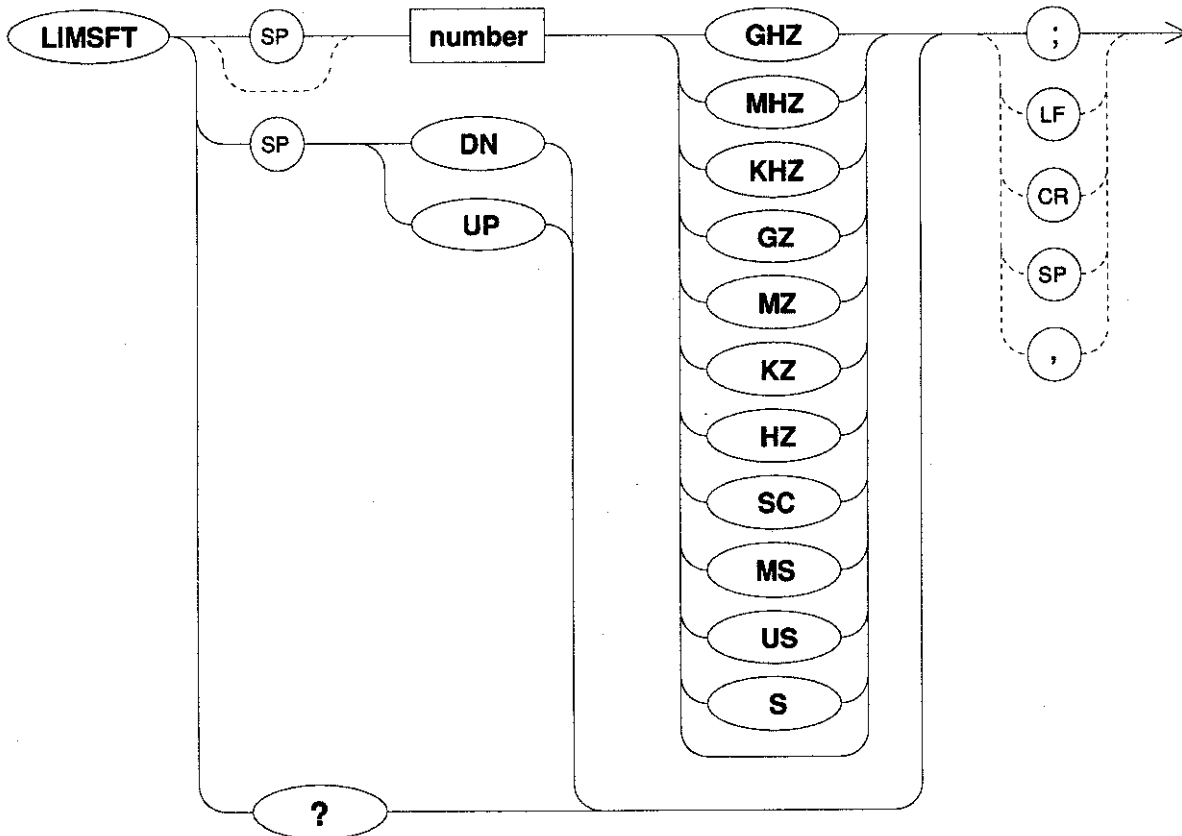
#### Example

```
10 OUTPUT 708;"FA 0HZ;FB 1GZ;RL 40DBUV;"
20 OUTPUT 708;"LIMTYP FREQ;LIMLA INIT;LIMLA;"
30 OUTPUT 708;"0HZ 30DBUV;500MZ 30DBUV;500MZ 15DBUV;1GZ 15DBUV;"
40 OUTPUT 708;"LIMPOS ABS;LIMAPOS ABS;LIMSFT 50MZ;LIMASFT -40DB;"
50 END
```

# LIMSFT

## Shift Frequency or Time

### Syntax



### Query Response



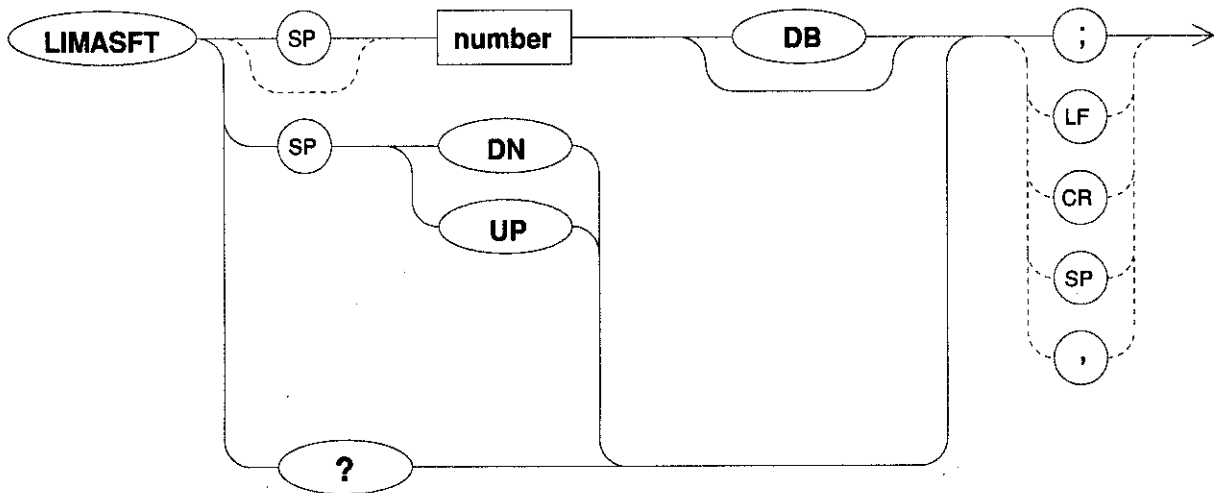
### Example

```

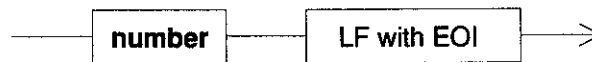
10 OUTPUT 708;"FA 0HZ;FB 1GZ;RL 40DBUV;"
20 OUTPUT 708;"LIMTYP FREQ;LIMLA INIT;LIMLA;"
30 OUTPUT 708;"0HZ 30DBUV;500MZ 30DBUV;500MZ 15DBUV;1GZ 15DBUV;"
40 OUTPUT 708;"LIMPOS ABS;LIMAFOS ABS;LIMSFT 50MZ;LIMASFT -40DB;"
50 END
  
```

## LIMASFT Shift Amplitude

### Syntax



### Query Response



### Example

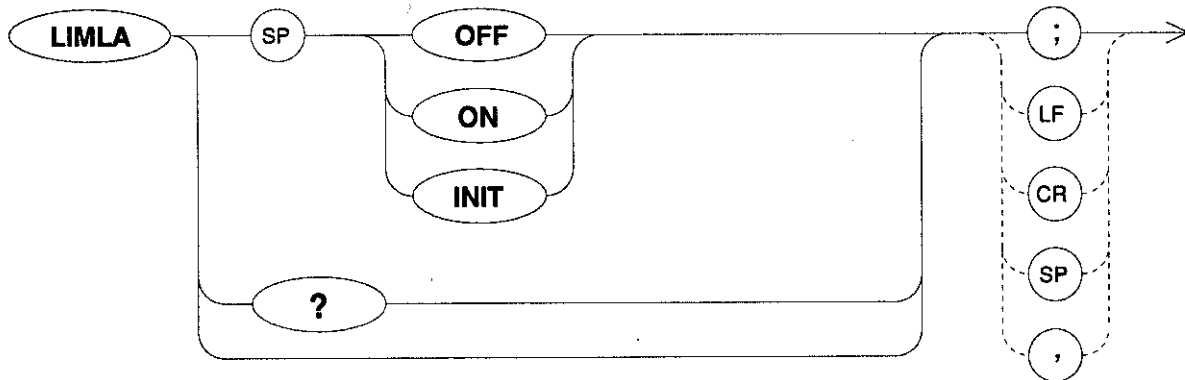
```

10 OUTPUT 708;"FA 0HZ;FB 1GZ;RL 40DBUV;"
20 OUTPUT 708;"LIMTYP FREQ;LIMLA INIT;LIMLA;"
30 OUTPUT 708;"0HZ 30DBUV;500MZ 30DBUV;500MZ 15DBUV;1GZ 15DBUV;"
40 OUTPUT 708;"LIMPOS ABS;LIMAPOS ABS;LIMSFT 50MZ;LIMASFT -40DB;"
50 END
```

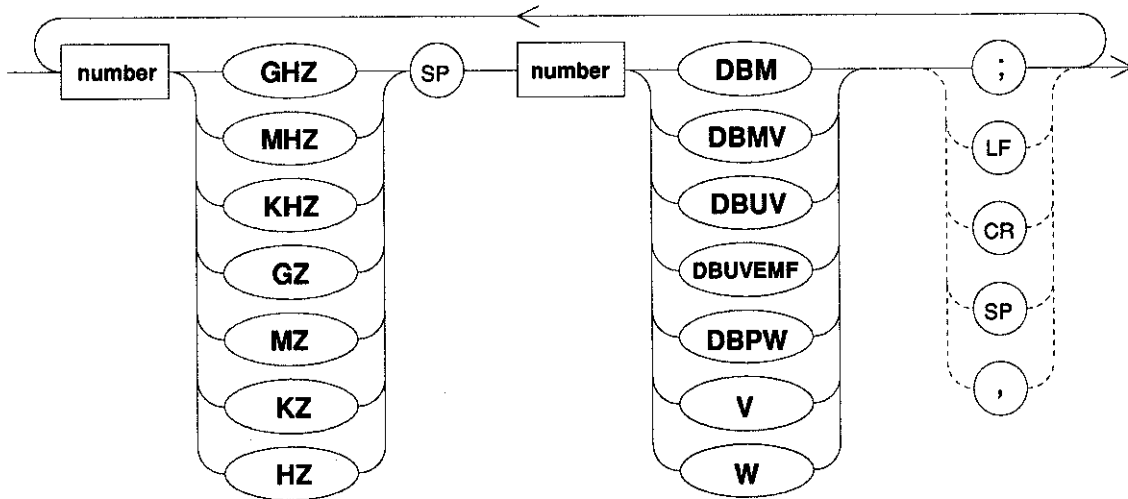
# LIMLA

## Limit Line A

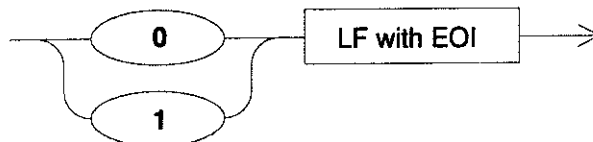
### Syntax



### cf:entry limit line table



### Query Response



### Example

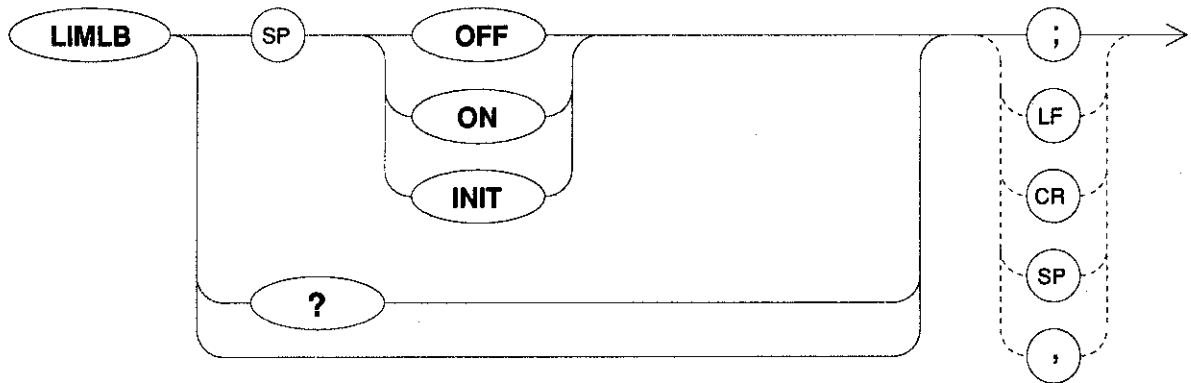
```

10  OUTPUT 708;"FA 30MHZ;FB 1GHZ;VB 3MHZ;RL 47DBUV;"
20  OUTPUT 708;"LIMLA;"
30  OUTPUT 708;"30MHZ 40DBUV;88MHZ 40DBUV;88MHZ 43.5DBUV"
40  OUTPUT 708;"216MHZ 43.5DBUV;216MHZ 46DBUV;1GHZ 46DBUV;"
50  OUTPUT 708;"LIMLA ON;"
60  END

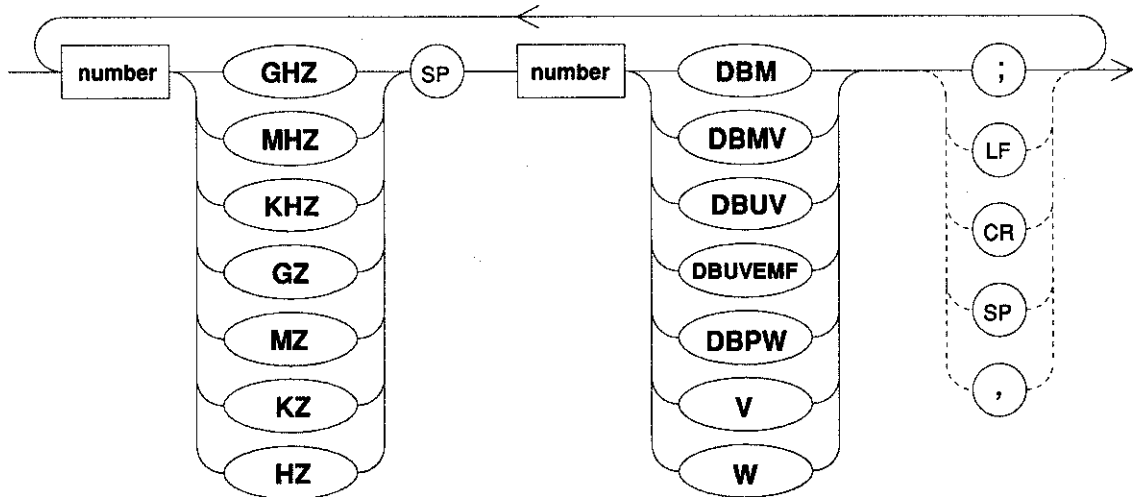
```

## LIMLB Limit Line B

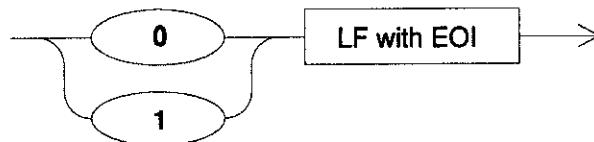
### Syntax



*cf:entry limit line table*



### Query Response



### Example

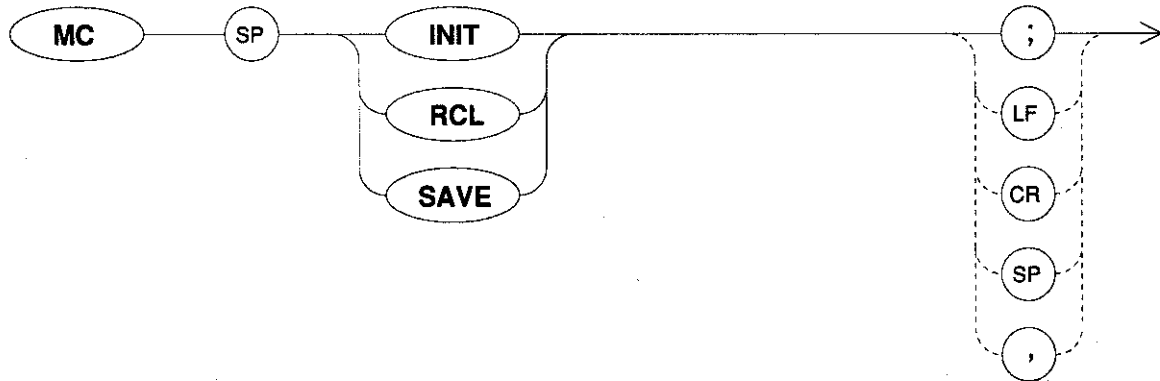
```

10 OUTPUT 708;"FA 30MHZ;FB 1GHZ;VB 3MHZ;RL 47DBUV;"
20 OUTPUT 708;"LIMLB INIT;LIMLB 30MHZ 40DBUV;88MHZ 40DBUV;"
30 OUTPUT 708;"88MHZ 43.5DBUV;216MHZ 43.5DBUV;216MHZ 46DBUV;1GHZ 46DBUV;"
40 OUTPUT 708;"LIMLB ON;"
50 END

```

## MC Memory Card

### Syntax



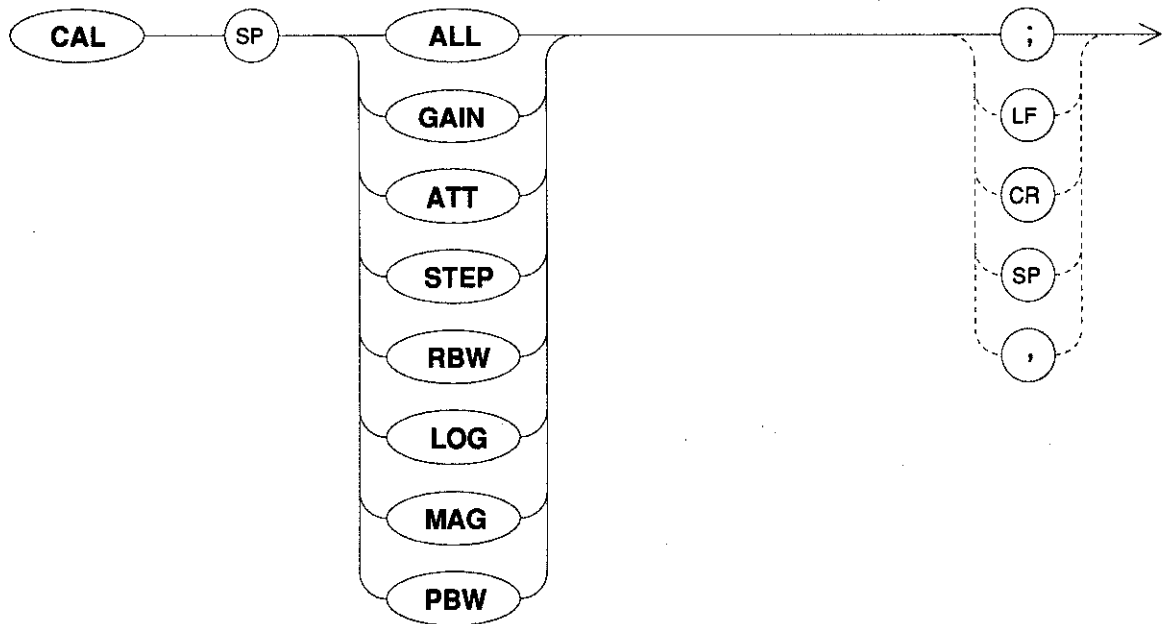
### Parameters

<b>INIT</b>	Initialize the memory card.
<b>RCL</b>	Load the soft menu matrix.
<b>SAVE</b>	Store the soft menu matrix.



## CAL Calibration

### Syntax



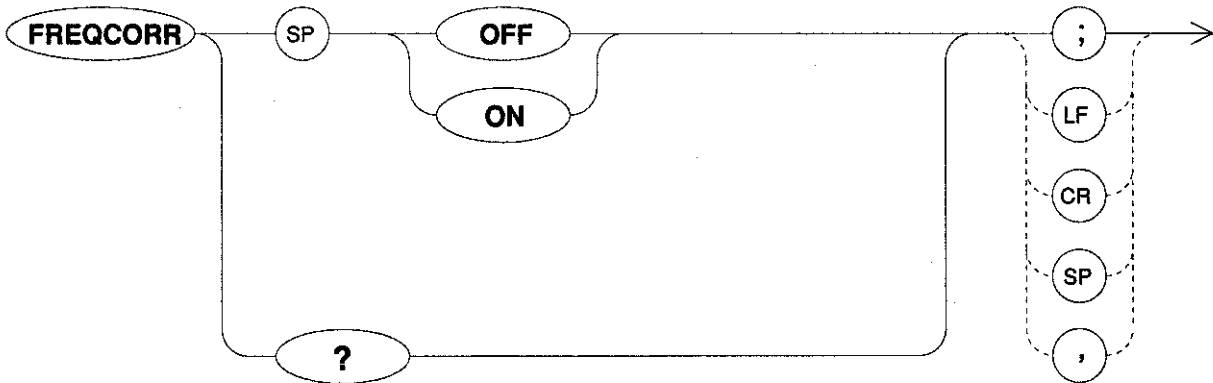
### Parameters

<b>ALL</b>	Calibrates all items excluding PBW are executed.
<b>GAIN</b>	Calibrates only the absolute error.
<b>ATT</b>	Calibrates only the input attenuator switching error.
<b>STEP</b>	Calibrates only the IF step amplifier error.
<b>RBW</b>	Calibrates only the IF filter resolution bandwidth switching level error.
<b>LOG</b>	Calibrates only the screen vertical axis linearity.
<b>MAG</b>	Calibrates only the switching error in LOG 10dB/div to 0.1dB/div.
<b>PBW</b>	Calibrates only the noise power bandwidth.

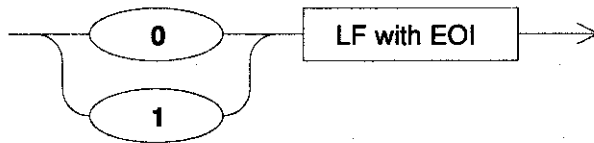
## FREQCORR

### Frequency Characteristic Correction On/Off

#### Syntax

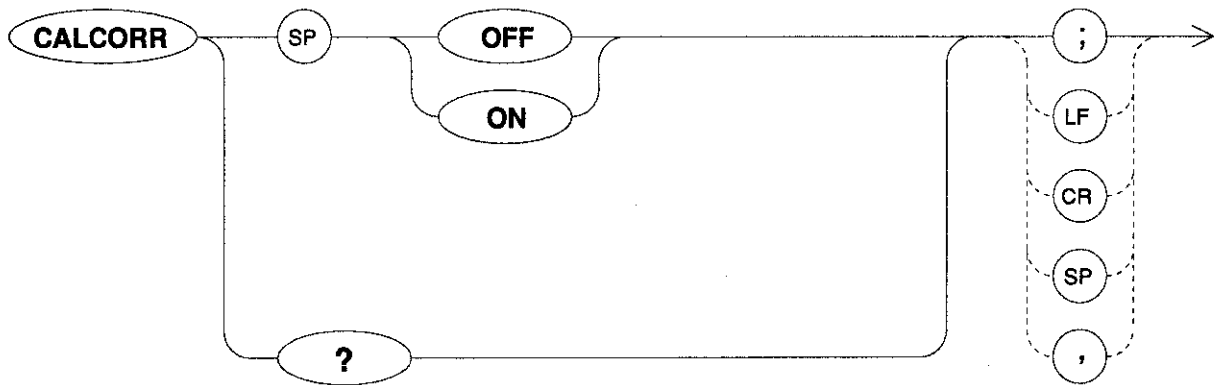


#### Query Response

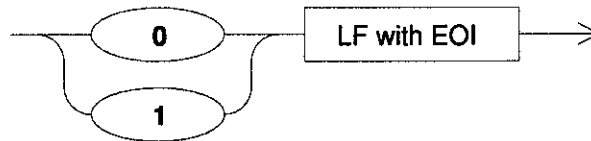


## CALCORR Calibration Correction On/Off

### Syntax

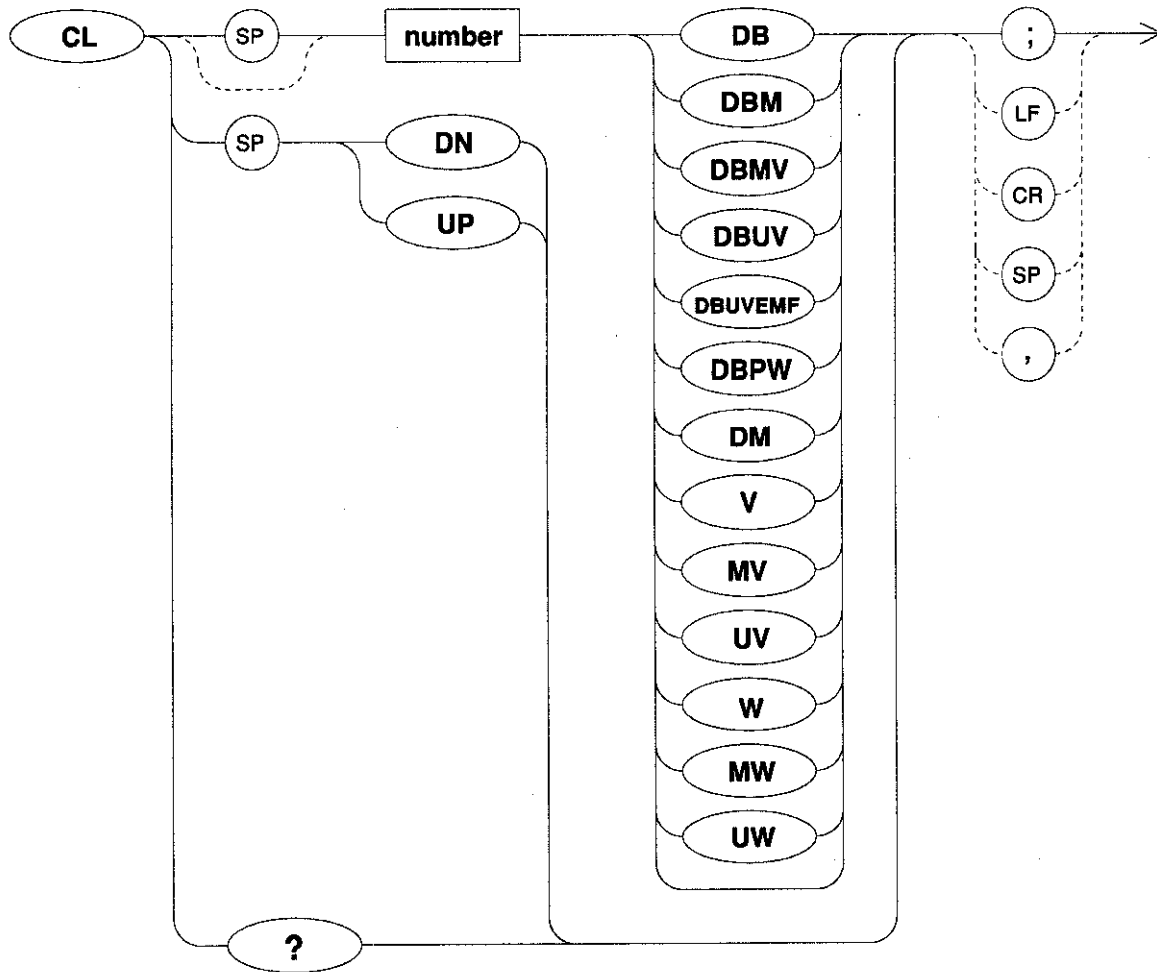


### Query Response



# CL Calibration Signal Level

## Syntax



## Query Response



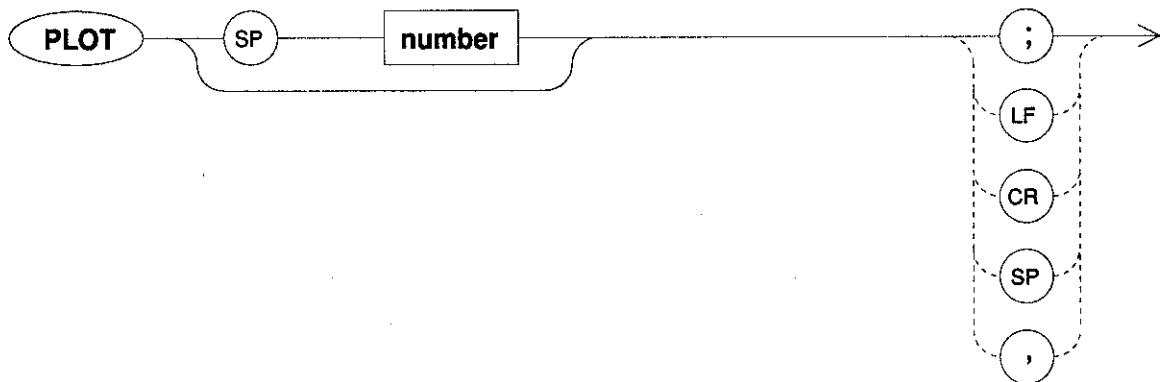
## Example

```
10 OUTPUT 708;"CF 25MHZ;SP 20MHZ;"
20 OUTPUT 708;"CL -15.0DBM;"
30 END
```

## PLOT

### Plot Execute

#### Syntax



#### Parameters

**number** Sets the plotter address when only be controlled by internal controller (OPT15).

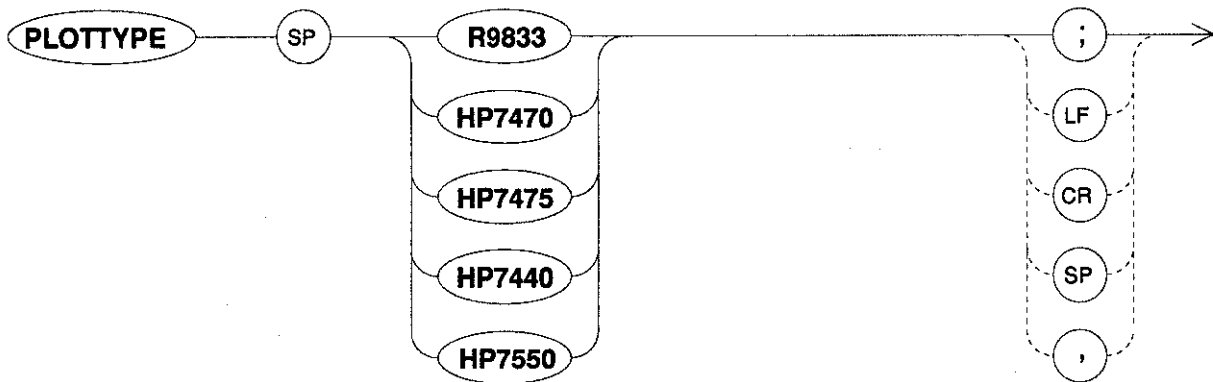
#### Example

```
10 OUTPUT 708;"SRQ ON;RQS 16;"
20 OUTPUT 708;"SRQ CLR;"
30 ON INTR 7 GOTO Done
40 ENABLE INTR 7;2
50 OUTPUT 708;"PLOTTYPE HP7550;PLOTPEN 6;PLOTSRC ALL;"
60 OUTPUT 708;"PLOT;"
70 SEND 7;UNL UNT
80 SEND 7;LISTEN 5 TALK 8
90 SEND 7;DATA
100 Plot_idle: !
110 GOTO Plot_idle
120 Done: !
130 S=SPOLL(708)
140 PRINT "PLOT IS COMPLETE!!"
150 BEEP
160 END
```

# PLOTTYPE

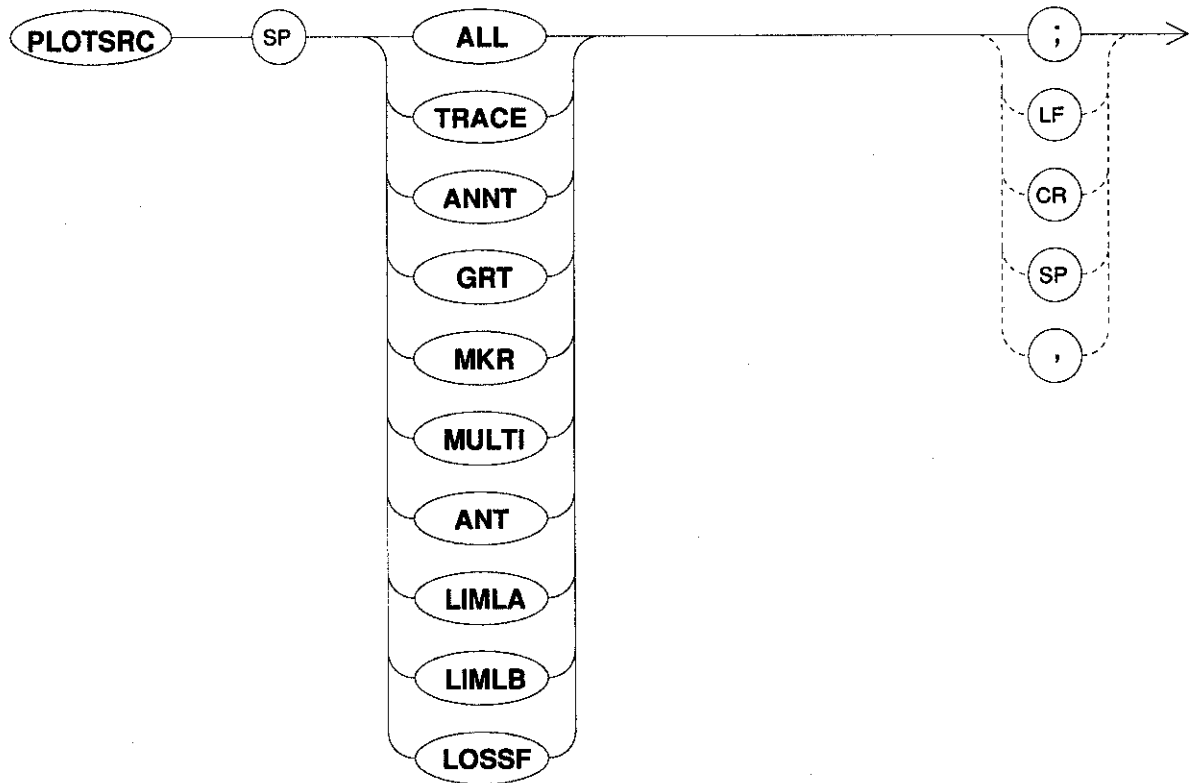
## Plotter Type

### Syntax



## PLOTSRC Plot Source

### Syntax



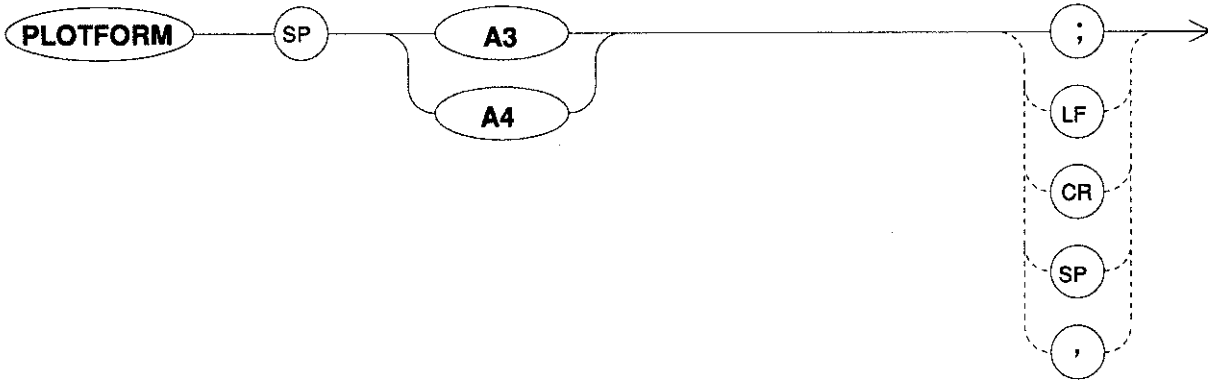
### Parameters

<b>ALL</b>	Plots the entire display.
<b>TRACE</b>	Plots only trace A/B.
<b>ANNT</b>	Plots only the annotation.
<b>GRT</b>	Plots only the graticule.
<b>MKR</b>	Plots the marker and display line and measurement window.
<b>MULTI</b>	Plots only the multi marker data.
<b>ANT</b>	Plots only the antenna correction data.
<b>LIMLA</b>	Plots only the limit line A data.
<b>LIMLB</b>	Plots only the limit line B data.
<b>LOSSF</b>	Plots only the conversion loss vs frequency correction data.

# PLOTFORM

## Plot Form

### Syntax

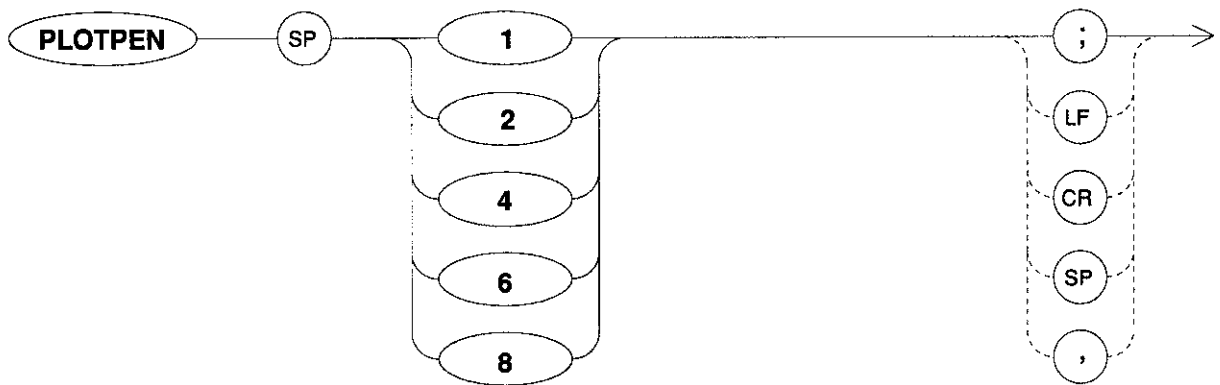




## PLOTPEN

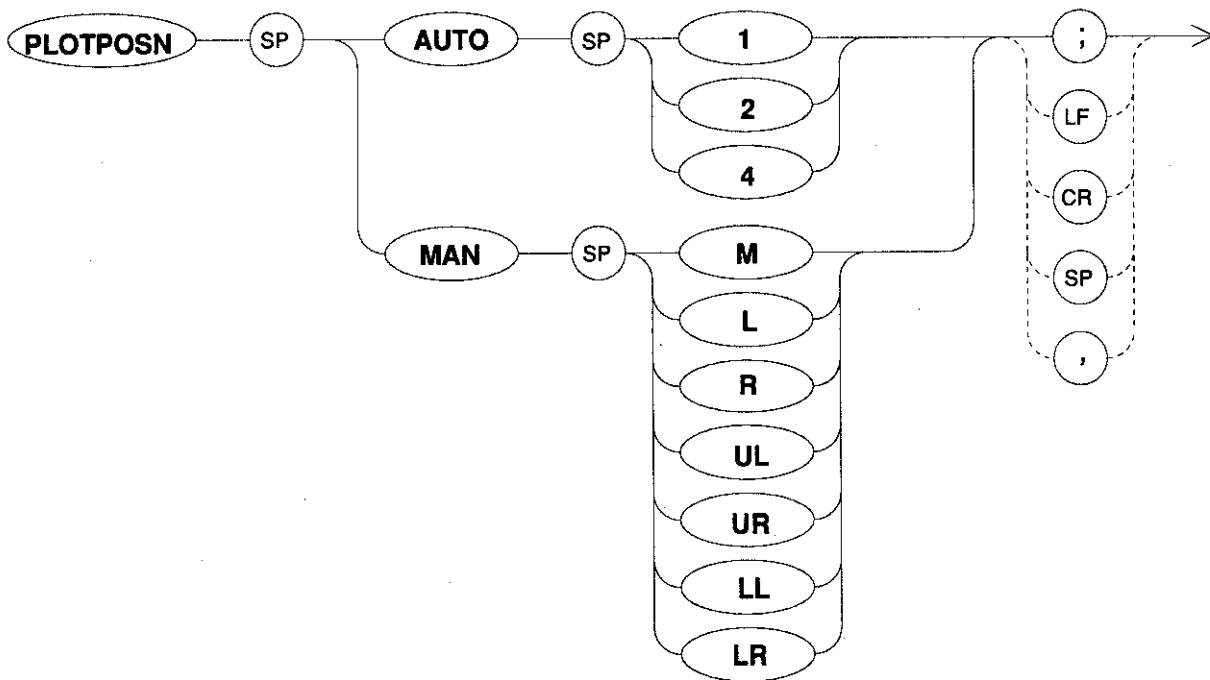
### Plot Pen

#### Syntax



## PLOTPOSN Plot Position

### Syntax



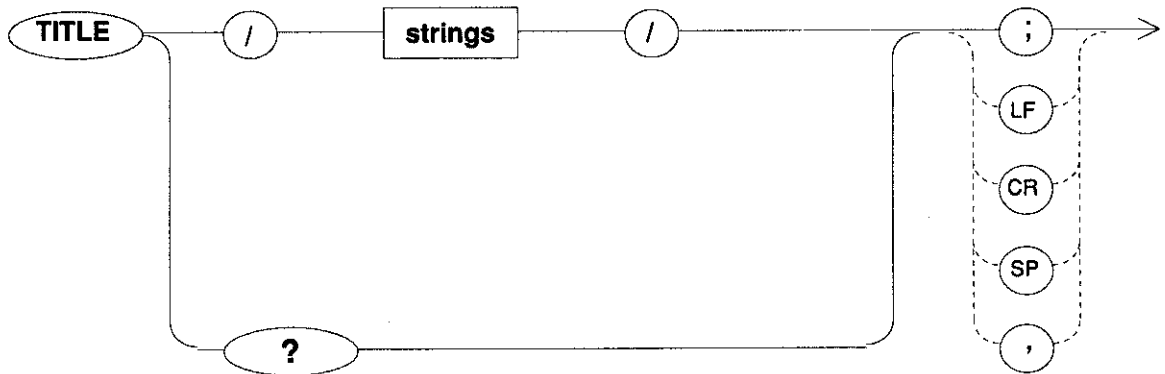
### Parameters

<b>AUTO</b>	Sets the plot location to automatic mode.
<b>MAN</b>	Sets the plot location to manual mode.
<b>1</b>	Selects the one division.
<b>2</b>	Selects the two divisions.
<b>4</b>	Selects the four divisions.
<b>M</b>	Plot position is center(when one division).
<b>L</b>	Plot position is left side(when two divisions).
<b>R</b>	Plot position is right side(when two divisions).
<b>UL</b>	Plot position is up-left side(when four divisions).
<b>UR</b>	Plot position is up-right side(when four divisions).
<b>LL</b>	Plot position is low-left side(when four divisions).
<b>LR</b>	Plot position is low-right side(when four divisions).

## TITLE

### Title Entry

#### Syntax



#### Query Response

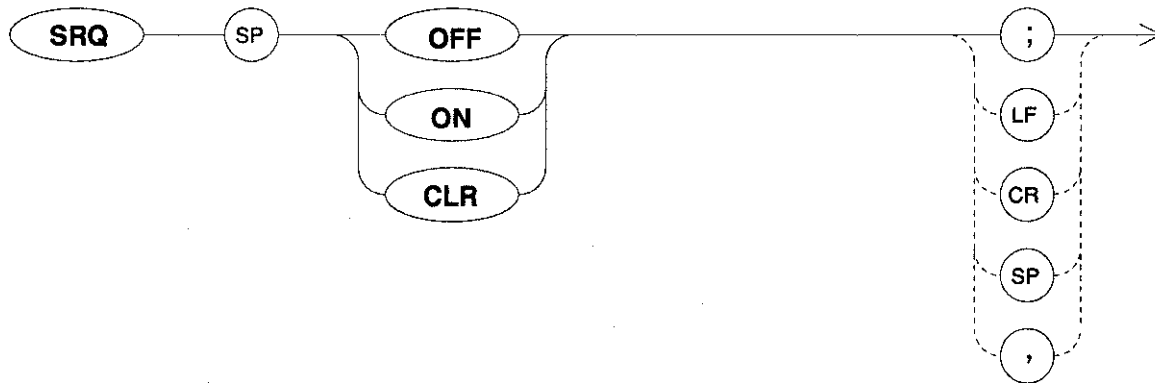


#### Example

```
10 OUTPUT 708;"TITLE/THIS IS THE TITLE COMMAND./;"  
20 END
```

## SRQ Service Request

### Syntax



### Parameters

- OFF**            Disable the service request interrupt.
- ON**             Enable the service request interrupt.
- CLR**            Clear the status byte.

### Example

i) *HP200,300 series (interrupt off)*

```

10     OUTPUT 708;"SRQ OFF;"
20     LOOP
30     OUTPUT 708;"SRQ CLR;"
40     Polling: !
50     S=SPOLL(708)
60     IF BIT(S,2)<>1 THEN Polling
70     BEEP
80     END LOOP
90     END

```

ii) *HP200,300 series (interrupt on)*

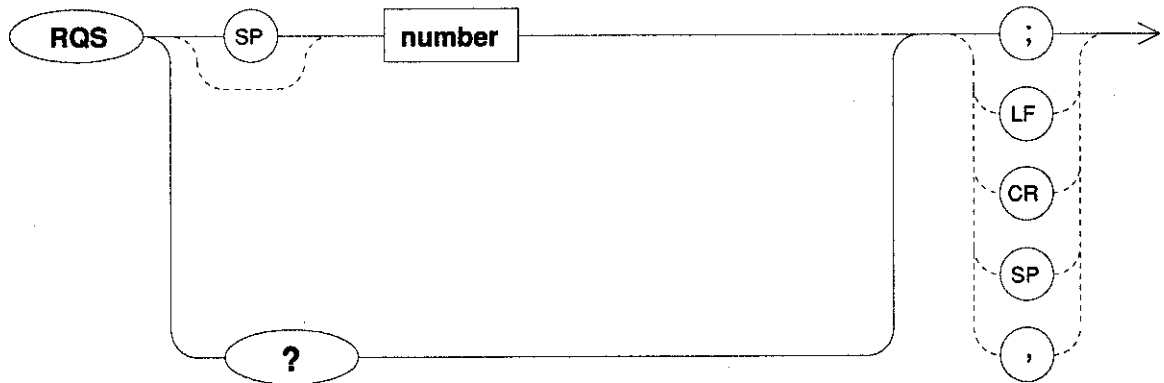
```

10     OUTPUT 708;"SRQ ON;RQS 8;"
20     OUTPUT 708;"VAVG TRA 20;"
30     OUTPUT 708;"SRQ CLR;"
40     ON INTR 7 GOTO Srq
50     ENABLE INTR 7;2
60     Idle: !
70     GOTO Idle
80     Srq: !
90     S=SPOLL(708)
100    PRINT "AVERAGING IS COMPLETE"
110    BEEP
120    END

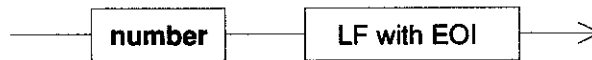
```

## RQS Request Service Conditions

### Syntax



### Query Response



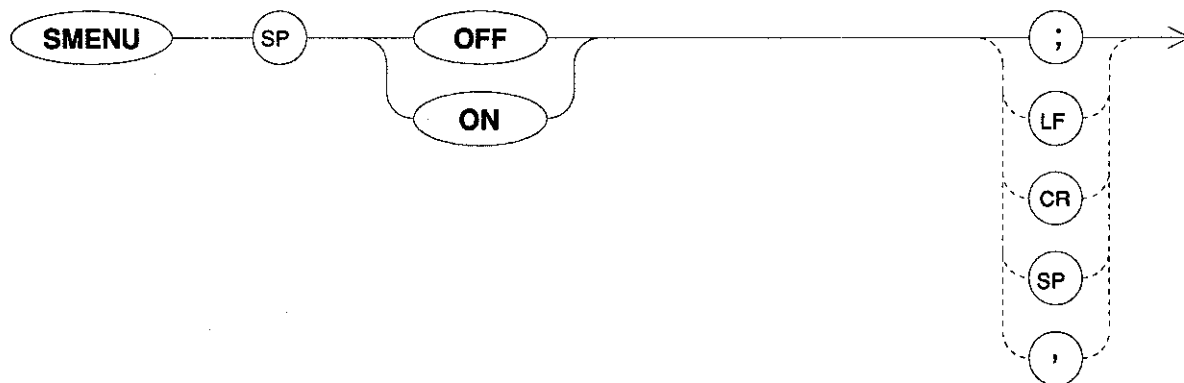
### Example

```
10  OUTPUT 708;"SRQ ON;RQS 8;"
20  OUTPUT 708;"VAVG TRA 20;"
30  OUTPUT 708;"SRQ CLR;"
40  ON INTR 7 GOTO Srq
50  ENABLE INTR 7;2
60  Idle:  !
70  GOTO Idle
80  Srq:   !
90  S=SPOLL(708)
100 PRINT "AVERAGING IS COMPLETE"
110 BEEP
120 END
```

## SMENU

### Soft Menu Display On/Off

#### Syntax



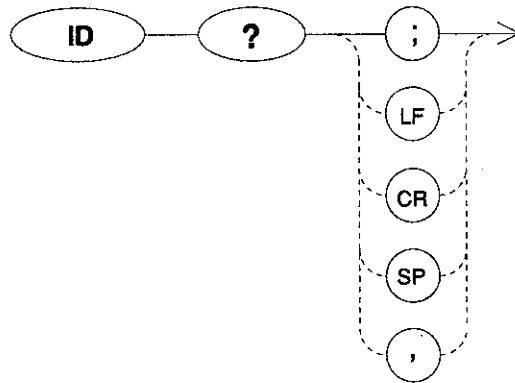
#### Example

```
10 OUTPUT 708;"IP;SMENU OFF"  
20 OUTPUT 708;"SP 20MHZ;MKN;MKA?"  
30 FOR I=0 TO 3600 STEP 10  
40   OUTPUT 708;"CF";I;"MZ"  
50   ENTER 708;M1  
60   PRINT USING "K,DDDD,5X,K,MDDD.DD";"MARKER FREQ = ";I;"MARKER LEVEL = ",M1  
70 NEXT I  
80 END
```

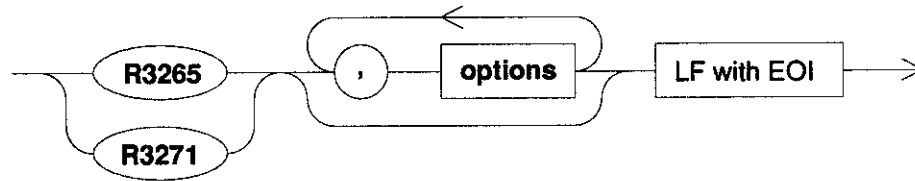
# ID

## Output Identification

### Syntax

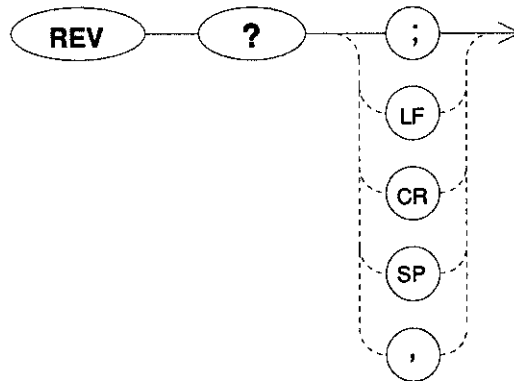


### Query Response

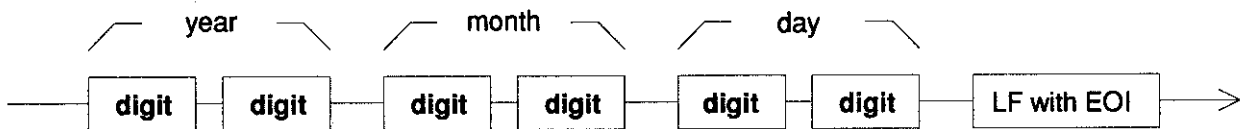


## REV Output Revision Number

### Syntax



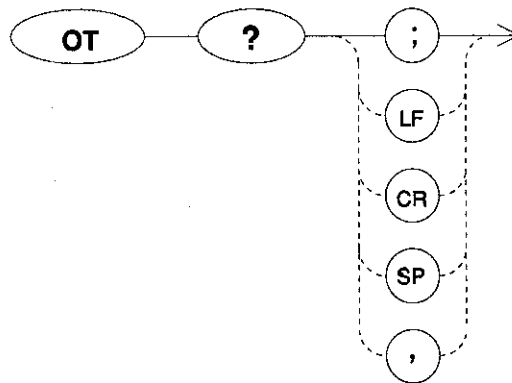
### Query Response



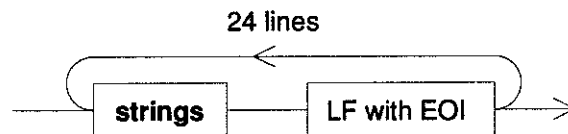


## OT Output All CRT Annotations

### Syntax



### Query Response



### Example

```
10 DIM A$(80)
20 INTEGER Tr(701)
30 !
40 GINIT
50 GRAPHICS ON
60 CONTROL 1,12;1
70 CSIZE 4,.5
80 MOVE 6,95
90 OUTPUT 708;"OT?;"
100 FOR I=1 TO 24
110   ENTER 708;A$
120   LABEL A$
130 NEXT I
140 VIEWPORT 26,114,9,88
150 WINDOW 0,700,0,400
160 GRID 70,40,0,0,10,10,40
170 OUTPUT 708;"TDF B;TDA COARSE;TRA?;"
180 ENTER 708 USING "%,W";Tr(*)
190 MOVE 0,Tr(I)
200 FOR I=1 TO 700
210   DRAW I,Tr(I)
220 NEXT I
230 BEEP
240 END
```

## 2.4 Alphabetical Programming Code Listing

### A

ADJ	Adjacent Channel Leak Power	2-118
ADJBW	Specified Bandwidth of Adjacent Channel Power	2-119
ADJCH	Channel Space of Adjacent Channel Power	2-120
AG0	Continue Mode of Averaging Trace A	2-77
AG1	Complete Mode of Averaging Trace A	2-77
AMB	Trace A Minus Trace B	2-82
AML	Trace A Minus Display Line	2-84
ANNOT	Annotation On/Off	2-65
ANT	Antenna Type	2-140
ANTCORR	Antenna Correction On/Off	2-141
AT	Input Attenuation	2-40
ATUN	Automatic Tuning	2-113
AUNITS	Absolute Amplitude Units	2-34
AUTOCP	Auto Coupled	2-41
AXB	Trace A Exchange Trace B	2-81

### B

BG0	Continue Mode of Averaging Trace B	2-78
BG1	Complete Mode of Averaging Trace B	2-78
BLANK	Blank Trace	2-73
BMA	Trace B Minus Trace A	2-83
BML	Trace B Minus Display Line	2-84

### C

CAL	Calibration	2-153
CALCORR	Calibration Correction On/Off	2-155
CF	Center Frequency	2-14
CL	Calibration Signal Level	2-156
CLRW	Clear Write	2-71
CNTR	Counter Mode	2-103
CNVLOSS	Conversion Loss	2-24
CONTPK	Continuous Peak Search	2-124
CONTS	Continuous Sweep	2-51
CONTXDB	Continuous X dB Down Bandwidth	2-110

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2.4 Alphabetical Programming Code Listing

**D**

DEM0D	Demodulation	2-57
DEM0DAGC	Demodulation Automatic Gain Control	2-59
DEM0DT	Demodulation Time	2-58
DET	Detection Modes	2-50
DGTLIF	Digital IF Mode On/Off	2-45
DL	Display Line	2-64
DX	Delta X for Peak Search	2-125
DY	Delta Y for Peak Search	2-126

**E**

EMCDET	Detection Mode of EMC	2-143
--------	-----------------------	-------

**F**

FA	Start Frequency	2-29
FB	Stop Frequency	2-30
FDSP	Frequency Display On/Off	2-67
FOFFSET	Frequency Offset	2-16
FREF	Frequency Reference	2-26
FREQCORR	Frequency Characteristic Correction On/Off	2-154
FS	Full Span	2-28
FULBAND	Full Band	2-19
FXP	Fixed Marker Peak	2-107

**G**

GONG	GO/NG	2-87
GRAT	Graticule On/Off	2-66

**H**

HNLOCK	Harmonic Number Lock	2-20
HNUNLK	Unlock Harmonic Number	2-22

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2.4 Alphabetical Programming Code Listing

I

ID	Output Identification	2-167
INPUN	Input Unit	2-68
IP	Instrument Preset	2-95

L

LG	Logarithmic Scale	2-32
LIMAPOS	The Vertical Position of The Limit Line	2-147
LIMASFT	Shift Amplitude	2-149
LIMLA	Limit Line A On/Off	2-150
LIMLB	Limit Line B On/Off	2-151
LIMPOS	The Horizontal Position of The Limit Line	2-146
LIMSFT	Shift Frequency or Time	2-148
LIMTYP	Selects The Limit Line Type	2-145
LN	Linear Scale	2-33
LOSSF	Conversion Loss vs. Frequency Correction	2-35
LOWNOISE	Low Noise Mode On/Off	2-36
LVLCORR	Level Correction On/Off	2-142

M

MANS	Manual Sweep	2-52
MBIAS	Mixer Bias	2-18
MC	Memory Card	2-152
MINAT	Minimum Input Attenuation	2-42
MINH	Minimum Hold	2-75
MKA?	Marker Amplitude Output	2-98
MKBW	X dB Down Bandwidth	2-108
MKCF	Marker to Center Frequency	2-129
MKD	Marker Delta	2-97
MKDCF	Marker Delta to Center Frequency	2-129
MKDMSS	Marker Delta to Marker Step-Size	2-133
MKDR	Reciprocal of Marker Delta	2-100
MKDSP	Marker Display	2-116
MKDSS	Marker Delta to Center Frequency Step-Size	2-132
MKFC	Frequency Counter	2-101
MKFCR	Frequency Counter Resolution	2-102
MKFXD	Marker Fixed	2-99
MKMIN	Marker to Minimum	2-123
MKMSS	Marker to Marker Step-Size	2-133
MKMULTI	Marker Multi	2-111

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2.4 Alphabetical Programming Code Listing

MKN	Marker Normal	2-96
MKNOISE	Marker Noise	2-105
MKOFF	Marker Off	2-112
MKPAUSE	Marker Pause	2-63
MKPK	Peak Search	2-122
MKRL	Marker to Reference Level	2-130
MKSP	Delta Marker to Frequency Span	2-131
MKSS	Marker to Center Frequency Step-Size	2-132
MKTRACE	Active Marker to Trace	2-121
MKTRACK	Signal Track	2-104
MSS	Marker Step-Size	2-134
MXMH	Maximum Hold	2-74
MXRMODE	Mixer Mode	2-17
<b>N</b>		
NIC	Marker Noise in dBc/Hz	2-106
NIM	Marker Noise in dBm/Hz	2-106
NIU	Marker Noise in dBuV/Hz	2-106
NORMALIZE	Normalize Trace Data	2-79
<b>O</b>		
OHM	Input Impedance	2-69
ORB	Optimal Resolution Bandwidth	2-144
OT	Output All CRT Annotations	2-169
<b>P</b>		
PKLIST	Next Peak List On/Off	2-128
PKRNG	Peak Search Effective Range	2-127
PLOT	Plot Display	2-157
PLOTFORM	Plot Form	2-160
PLOTPEN	Plot Pen	2-161
PLOTPOSN	Plot Position	2-162
PLOTSRC	Plot Source	2-159
PLOTTYPE	Plotter Type	2-158
PP	Preselector Peak	2-114
PSDAC	Preselector DAC Number	2-115
PWRBW	Trace Power Bandwidth	2-117

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2.4 Alphabetical Programming Code Listing

**R**

RB	Resolution Bandwidth	2-37
RBR	Resolution Bandwidth to Span Ratio	2-43
RCLS	Recall State	2-93
REV	Revision Number	2-168
RL	Reference Level	2-31
ROFFSET	Amplitude Reference Offset	2-35
RQS	Request Service Conditions	2-165
RSTS	Reset Sweep	2-55

**S**

SAVENC	Save Normalize Correction Data	2-80
SAVES	Saves State	2-94
SIGID	Signal Identification	2-23
SMENU	Soft Menu Display On/Off	2-166
SNGLS	Single Sweep	2-53
SP	Frequency Span	2-27
SQUELCH	Squelch	2-60
SRQ	Service Request	2-164
SS	Center Frequency Step-Size	2-15
ST	Sweep Time	2-39
SWPOUT	Sweep Output	2-70

**T**

TDA	Trace Data Accuracy	2-86
TDF	Trace Data Format	2-85
TITLE	Title Entry	2-163
TM	Trigger Mode	2-46
TRA	Trace A Data Input/Output	2-88
TRB	Trace B Data Input/Output	2-88
TRIGSLP	Trigger Slope +/-	2-47
TRPRST	Trace Preset	2-92
TS	Take Sweep	2-56
TVH	Line Number of TV-H Trigger	2-49

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**2.4 Alphabetical Programming Code Listing**

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**V**

VAVG	Video Average	2-76
VB	Video Bandwidth	2-38
VBR	Video Bandwidth to Resolution Bandwidth Ratio	2-44
VIEW	View Trace	2-72
VOL	Demodulation Volume	2-62
VTL	Video Trigger Level	2-48

**W**

WDO	Measurement Window On/Off	2-135
WDOS	Window Sweep On/Off	2-54
WFA	Measurement Window Start Frequency	2-136
WFB	Measurement Window Stop Frequency	2-137
WLL	Measurement Window Lower Level	2-139
WUL	Measurement Window Upper Level	2-138

**X**

XDB	X dB Down Execute	2-109
XDL	X dB Down Left Execute	2-109
XDR	X dB Down Right Execute	2-109

MEMO



A large, empty rectangular area with rounded corners, enclosed by a thin black border, intended for writing the memo's content.



**Part 3**  
**MODE-2 of**  
**GPIB Command Expansion Option**

Many of the commands functions in Part 3 programming language are based on the 8566 command language.

Before use these languages, set the spectrum analyzer to compatible mode by sending the command "HP8566".

It is possible to select the compatible mode through panel key operation.

To select mode-2, press  SHIFT  OPTION 6 and set  GPIB CMND AT/ 1/2 to 2.



# 1 PROGRAMMING

## 1.1 GPIB Setting

### 1.1.1 GPIB Address Setting

The analyzer GPIB address is set through panel key operation. Addresses from 0 through 30 can be specified.

Example: Setting 1 for the GPIB address

Press  SHIFT LCL 1 GHz

### 1.1.2 Delimiter

When sending data from an external controller to the analyzer, the delimiter should follow the definitions described below. When sending data from the analyzer to the external controller, outputs LF as a delimiter, also outputs EOI signal together with LF.

Table 1-1 Delimiters

Delimiter	Description
CR and LF <EOI>	Outputs CR and LF, also outputs EOI signal together with LF.
LF	Outputs LF.
<EOI>	Outputs EOI signal together with the data end byte.
CR and LF	Outputs CR and LF.
LF<EOI>	Outputs LF and also EOI signal together with LF.

### 1.1.3 Input/Output Format

Such input/output commands as GPIB code transmission to connected devices, data reception, bus command execution, and serial polling are programmable in GPIB. Other operational calculations are defined by the active controller.

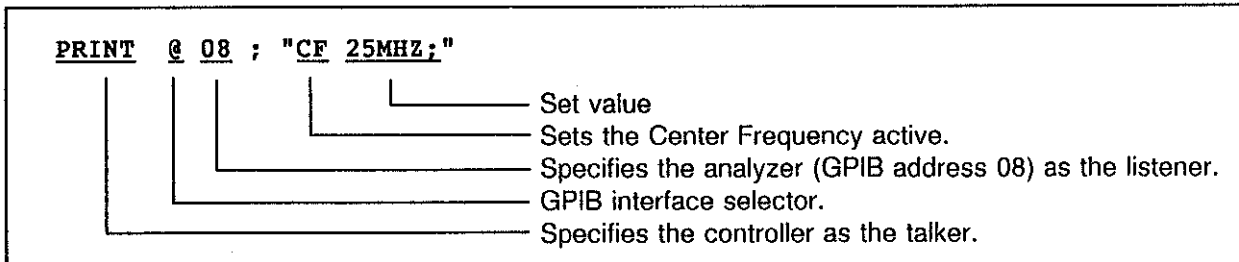
Statement Format

Input/Output statement device address; data

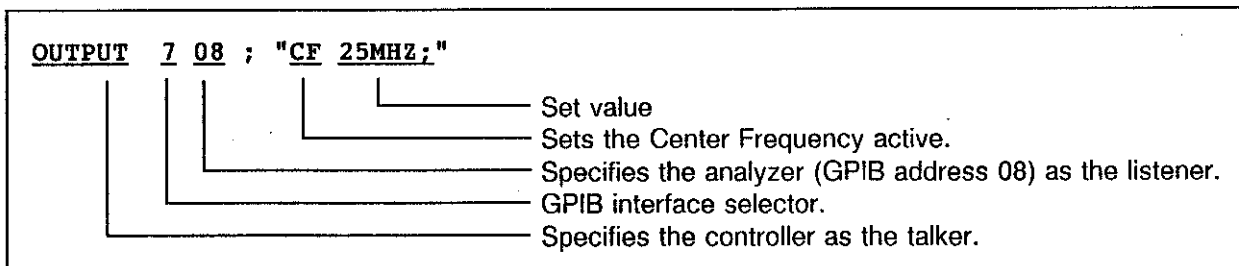
## 1.2 Remote Setting Format (Listener)

The measurement parameter and setting conditions are entered by remote control using the specified GPIB code. When setting the center frequency to 25 MHz, enter as follows:

PC9801 series



HP200, 300 series



"CF", "3", "0" and "MZ" in the programs are GPIB codes used to remote-control the analyzer.

The following are restrictions on the data to be entered:

- Each command should be separated from another with a space, comma (,) or semicolon(;).  
However, this does not apply to numeric data.

Correct) "CF SP"  
"CF 300 MHZ" or "CF 300MHZ"  
"SP100MHZ"  
"CF25MHZ;SP20MHZ;TS;"

Error) "CFSP"

- No binary numeric can be entered. (Excluding the trace binary input)
- The carriage return (CR) and line feed (LF) are recognized as the data delimiters. (Excluding the trace binary input)
- Nothing can be entered unless it is defined as a GPIB code. If an undefined data is entered, a syntax error will be caused.

### 1.3 Data Output Format (Talker)

To output the internal data such as setting conditions and measurement data, specify the data to be output with the "command + ?" like as "CF?". Specified data is acceptable only one, it is not allowed to specify the plural data.

The data specified is read in when the analyzer has entered Talker mode. The output formats can be divided as shown 1.3.1. The delimiter LF with EOI signal is used to be the last data (see the Syntax Diagram or 1.1.2 Delimiter section).

#### PC9801 series

<code>PRINT @8;"CF?"</code>	'Request the center frequency.
<code>INPUT @8;cf\$</code>	'Frequency read-in

#### HP200, 300 series

<code>OUTPUT 708;"CF?"</code>	!Request the center frequency.
<code>ENTER 708;Cf\$</code>	!Frequency read-in

### 1.3.1 Output Format

	Output format
Frequency	$\pm \text{DDDDDDDDDDDE} \pm \text{DDL} \langle \text{E01} \rangle$ <p style="text-align: right; margin-right: 20px;">       Delimiter        Exponent        Mantissa        Sign*1     </p> <p>17 bytes at max. and the unit is Hz.</p> <hr style="border-top: 1px dashed black;"/> <p>Example: Output the center frequency        0000123.456E + 06</p>
Level	$\pm \text{DDDDDDDDDE} \pm \text{DDL} \langle \text{E01} \rangle$ <p style="text-align: right; margin-right: 20px;">       Delimiter        Exponent        Mantissa        Sign*1     </p> <p>12 bytes at max. and the unit is dB, V or W.</p> <hr style="border-top: 1px dashed black;"/> <p>Example: Output the marker level.        - 00056.23E + 0</p>

Note \*1: a space if Positive, and minus sign if Negative

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1.3 Data Output format (Talker)

	Output format
Time	<p style="text-align: center;"><math>\pm \text{DDDE} \pm \text{DDL F} \langle \text{E01} \rangle</math></p> <p style="text-align: right;">       Delimiter        Exponent        Mantissa        Sign*1     </p> <p>9 bytes at max. and the unit is sec.</p> <hr style="border-top: 1px dashed black;"/> <p>Example: Output the sweep time. 0500E-3</p>
Constant	<p style="text-align: center;"><math>\pm \text{DDDL F} \langle \text{E01} \rangle</math></p> <p style="text-align: right;">       Delimiter        Data        Sign*1     </p> <p>5 bytes at maximum.</p> <hr style="border-top: 1px dashed black;"/> <p>Example: Output the averaging time. 128</p>

Note \*1: a space if Positive, and minus sign if Negative

### 1.4 Input and Output of Trace Data

Trace data displayed on the screen comprises 701 points of data on the frequency axis. To input or output the data, data of the 701 points are transferred one after another, starting at the left end (start frequency). The level of each point is expressed by integers from 0 to 400 or from 448 to 3648. (For the waveform out of the uppermost scale, the value exceeds 400 or 3648.)

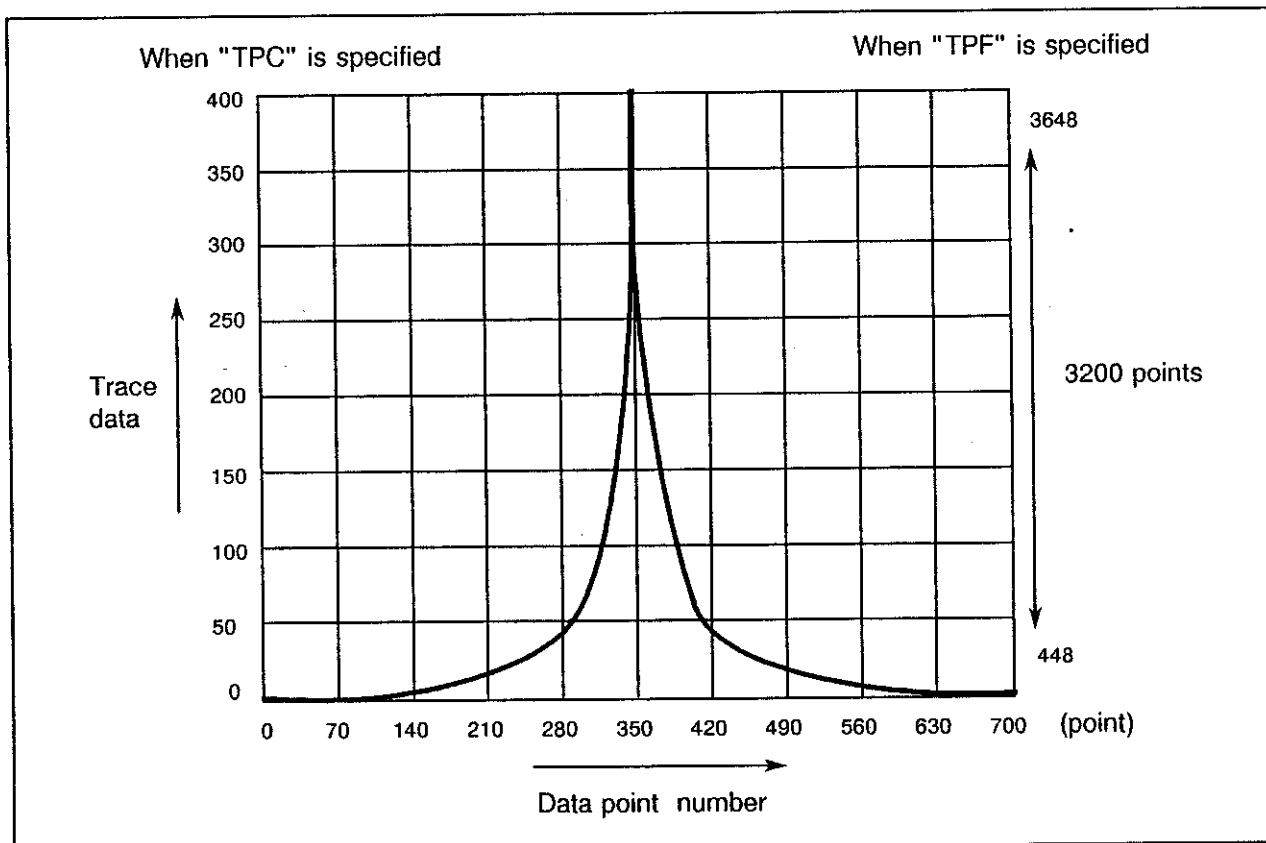


Fig. 1-1 Relation between the Screen Grid and the Number of points

The accuracy of trace data input and output is specified as following table.

Table 1-2 Trace Accuracy Specification Codes

GPIB code	Description
TPC	Trace data is input/output at the accuracy 0 to 400.
TPF	Trace data is input/output at the accuracy 448 to 3648.

### 1.4.1 Input/Output Format

Trace data can be input and output as ASCII data or Binary data.

In ASCII format, each point of the trace data is converted to 4 bytes data as ASCII, and is transferred the data with delimiter. In Binary format, one-point data is converted to 2 bytes data, and its 701-points data is transferred continuously. EOI signal is added to the last byte.

Input/Output format	Description
ASCII format	<p><b>DDDDL<del>F</del>&lt;EOI&gt;</b></p> <p>Example: Trace data value is 200. '0', '2', '0', '0', LF&lt;EOI&gt;</p>
Binary format	<p><b>DD DD.....DD+EOI</b></p> <p>The binary value of one-point data consists of 2 bytes.        The 701-point data is completed with EOI signal at the end.</p> <p>Example: Trace data value is 200. 00c8 .....</p>

### 1.4.2 Trace Output Range Specification

Only the output range of the trace data can be specified. Regarding the lower left corner of the scale as 0, the start position and the number of output items can be specified. However, this should be specified to satisfy  $\text{Start position} + \text{The number of output items} \leq 701$ .

PC9801 series

```
PRINT @8;"TA 280,140?"      'Output 140-points data from 280th point.
```

HP200, 300 series

```
OUTPUT 708;"TB,350?"      !Output 350-points data from 0 point.
```

See also Syntax Diagram.



## 1.5 Service Request (SRQ)

Using the service request function, the analyzer state can be detected by external devices. When one of the following conditions has occurred, the corresponding status bit turns ON and the controller can read the status byte by serial polling.

Table 1-3 SRQ ON/OFF Specification codes

GPIB code	Description
SRQ—ON	SRQ signal (interrupt) is transmitted to the controller.
SRQ—OFF	No SRQ signal (interrupt) is transmitted to the controller. (initial setting)
SRQ—CLR	The status byte is cleared.

Table 1-4 Trace Accuracy Specification Codes

Bit	Decimal	Description
0	1	Turns ON when UNCAL has occurred.
1	2	Turns ON when the calibration is complete.
2	4	Turns ON when sweep is complete.
3	8	Turns ON when the specified number of averaging is complete.
4	16	Turns ON when plot output is complete.
5	32	Turns ON when an error is found in the GPIB code or a mode error has occurred (SYNTAX ERR)
6	64	Turns ON simultaneously with bits 0 through 5 or bit 7 when a service request is transmitted (SO).
7	128	

When the mode transmitting SRQ signal (interrupt) to the controller is selected, it can be specified to transmit only required SRQ signal. RQS command has the decimal value of status byte as a parameter.

For example, when only the sign of the completion of Averaging is needed, specified as follows:

PC9801 series

```
PRINT @8;"SRQ ON;RQS 8;" 'Transmit SRQ only when complete the Averaging.
```

HP200, 300 series

```
OUTPUT 708;"SRQ ON;RQS 8;" 'Transmit SRQ only when complete the Averaging.
```

*MEMO*



A large, empty rectangular area with rounded corners, enclosed by a thin black border. This area is intended for writing the content of the memo.

## 2. LANGUAGE REFERENCE

This chapter contains complete information for GPIB commands which are based on 8566 command language.

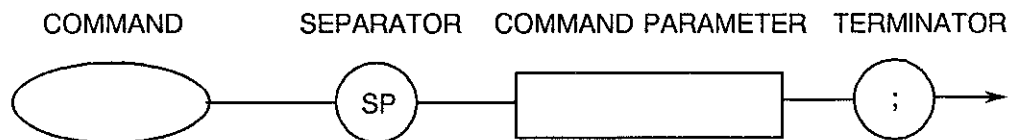
- 2.1 Syntax diagram conventions: This section describes the pictorial notations the proper syntax for each command
- 2.2 Programming codes: This section lists the programming commands by functional groups.
- 2.3 Programming commands: These are listed in functional order according to their mnemonic, followed by a complete description of their syntax and parameters.

### 2.1 Syntax Diagram Conventions

This chapter contains complete information for the programming commands as a Syntax Diagram available to operate an R3265/3271 Spectrum Analyzers.

The following is a point to notice about Syntax Diagram.

#### 2.1.1 Command Sequence



A typical command sequence is represented above. The order of command sequence items is specified in the syntax diagram for each respective command.

- command Any valid command for the function. "CF", "SP" and so on.
- separator Separators are required to separate command sequences and command sequence items. The separators allowed for the spectrum analyzer are as follows:

- SP (space)
- , (comma)

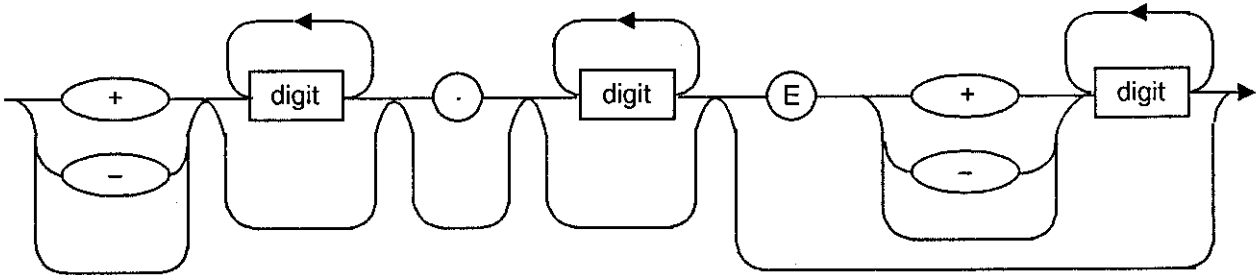
2.1 Syntax Diagram Conventions

- command parameter Any secondary key word recognized by the command, data, "ON", "OFF" and so on.
- terminator A terminator is required to end all command sequences. The terminators allowed for the spectrum analyzer are as follows:

- ; (semicolon)
- LF (line feed)
- CR (carriage return)
- SP (space)
- , (comma)

2.1.2 Syntax Element

- data byte 8-bit byte containing numeric data.
- data & EOI 8-bit byte containing numeric data sent with EOI.
- digit 0 1 2 3 4 5 6 7 8 9
- LF with EOI Line feed (LF) with end-or-identify (EOI).
- number Expressed in integer, decimal, or exponential form.



## 2.2 Programming Codes (functional index)

### (1) Frequency Control

ATUN	Activates auto tuning routine.
CF	Specifies center frequency.
CS	Auto-coupled center frequency step-size.
FA	Specifies start frequency.
FB	Specifies stop frequency.
FRE	Selects external frequency reference source.
FREF?	Returns frequency reference source.
FRI	Selects internal frequency reference source.
FS	Specifies full frequency span.
E2	Enters marker frequency to center frequency.
E3	Moves marker frequency to center-frequency step-size.
KSO	Moves marker delta frequency into span.
KSV	Specifies frequency offset.
LGS	Selects log span mode.
LNS	Selects linear span mode.
LTS	Sets frequency span to the preceding value.
MKDCF	Enters marker delta frequency into center frequency.
MKDSS	Moves marker delta frequency to center-frequency step-size.
SP	Specifies frequency span.
SS	Specifies center-frequency step-size.

### (2) Amplitude Control

AT	Specifies input attenuation.
AUNITS	Specifies amplitude units for input, output, and display.
CA	Auto-coupled input attenuation.
E4	Moves active marker to reference level.
KSA	Amplitude in dBm.
KSB	Amplitude in dBmV.
KSC	Amplitude in dB $\mu$ V.

KSD	Amplitude in V.
KSZ	Specifies amplitude reference offset.
LG	Selects log scale.
LN	Selects linear scale.
LOWNOISE	Turns low noise mode on.
MINAT	Specifies minimum input attenuation.
RL	Specifies reference level.

(3) Bandwidth Control

CR	Auto-coupled resolution bandwidth.
CV	Auto-coupled video bandwidth.
RB	Specifies resolution bandwidth.
RBR	Specifies the coupling ratio of RBW and frequency span.
VB	Specifies video bandwidth.
VBR	Specifies the coupling ratio of VBW and RBW.

(4) Coupling Control

AUTOCP	Auto-coupled all controls. (RBW, VBW, SWP, ATT)
CA	Auto-coupled input attenuation.
CR	Auto-coupled resolution bandwidth.
CS	Auto-coupled center frequency step-size.
CT	Auto-coupled sweep time.
CV	Auto-coupled video bandwidth.
RBR	Specifies the coupling ratio of RBW and frequency span.
VBR	Specifies the coupling ratio of VBW and RBW.

(5) External Mixing

CNVLOSS	Sets reference-level offset to compensate for external mixer conversion loss.
KSt	Specifies frequency band and locks on or off.
LOSSF	Specifies Conversion Loss vs. Frequency Correction, and initializes or edits the external mixer correction.
LVFDEL	Initializes Conversion Loss vs. Frequency Correction table.
LVFIN	Edits Conversion Loss vs. Frequency Correction table.

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*2.2 Programming Codes (functional index)*

---

MBIAS	Specifies the bias level for external mixers.
MXE	Selects external mixer mode.
MXI	Selects internal mixer mode.
MXR?	Returns mixer mode.
SIGID	Identifies signals for external mixing frequency bands.

(6) Sweep and Trigger Control

CT	Auto-coupled sweep time.
S0	Resets sweep.
S1	Selects continuous sweep mode.
S2	Selects single sweep mode.
S3	Selects manual sweep mode.
ST	Specifies sweep time.
T1	Sets the trigger mode to free run.
T2	Sets the trigger mode to line.
T3	Sets the trigger mode to external.
T4	Sets the trigger mode to video.
T5	Sets the trigger mode to TV-V.
T6	Sets the trigger mode to TV-H (Odd-Field).
T7	Sets the trigger mode to TV-H (Even-Field).
TM?	Returns trigger mode.
TRIGSLP	Selects trigger slope (+/-).
TS	Take a sweep.
TVH	Specifies line number in TV-H trigger mode.
VTL	Specifies video trigger level.
WDOS	Selects window sweep mode.

(7) Detection Control

DET?	Returns detection mode.
DGTLIF	Selects digital IF and analog IF.
KSa	Selects normal detection mode.
KSb	Selects positive detection mode.
KSc	Selects negative detection mode.
KSe	Selects sample detection mode.

(8) Demodulation

DEMODO	Turns demodulation on and off.
DEMODO	Specifies demodulation time.
DEMODOAGC	Turns automatic gain control on and off.
MKPAUSE	Specifies marker pause time.
SQL	Specifies squelch level.
SQUELCH	Turns squelch control on and off, and specifies squelch level.
VOL	Sets speaker volume.

(9) Input/Output Control

FAV	Selects the output signal of frequency-analog voltage mode.
INPUN?	Returns the connection of input signal.
OHM	Selects input impedance.
PI	Connects to the RF input through the Plug-in unit.
RAMP	Selects the output signal of ramp voltage.
RF	Connects to the RF input directly.
SWPOUT?	Returns output signal mode.

(10) Information and Service Diagnostics and Instrument State Control

ID?	Returns model number of analyzer used and option information.
IP	Sets instrument parameters to preset values.
KSf	Power on recall.
OT	Outputs annotation of 24 lines on the CRT display.
RC	Recalls previously saved state.
REV?	Returns analyzer revision number.



---

RQS	Returns decimal weighting of status byte bits which are enabled during service request.
SF	Selects soft menu number.
SRQ CLR	Clear the status byte.
SRQ OFF	Disables SRQ signal interrupt.
SRQ ON	Enables SRQ signal interrupt.
SV	Saves current state of the analyzer in the specified register.

(11) Trace Functions

A1	Writes trace A register.
A2	Max Holds the trace A.
A3	Views trace A register.
A4	Stores and blanks trace A register.
A5	Holds the minimum trace A register values.
A6	Selects normalize A.
AG0	Sets averaging A to continue mode.
AG1	Sets averaging A to complete mode.
AINST	Executes instant normalize A mode.
AL	A-DL into A.
ANC	Saves normalize A correction data.
B1	Writes trace B register.
B2	Max Holds the trace B.
B3	Views trace B register.
B4	Stores and blanks trace B register.
B5	Holds the minimum trace B register values.
B6	Selects normalize B.
BG0	Sets averaging B to continue mode.
BG1	Sets averaging B to complete mode.
BINST	Executes instant normalize B mode.
BL	B-DL into B.
BMA	B-A into A.
BNC	Saves normalize B correction data.

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2.2 Programming Codes (functional index)

---

C1	Turns A-B off.
C2	A-B into A.
CWA	Clear A memory.
CWB	Clear B memory.
DGTLIF	Selects digital IF and analog IF.
EX	Exchanges A and B.
KSG	Selects averaging A mode, and specifies averaging time.
KSGB	Selects averaging B mode, and specifies averaging time.
KSH	Turns averaging A off.
KSHB	Turns averaging B off.
TA	Input/output trace A as ASCII or binary data.
TB	Input/output trace B as ASCII or binary data.
TDA?	Returns trace data accuracy.
TPC	Sets trace data accuracy to 400 points mode.
TPF	Sets trace data accuracy to 3200 points mode.

(12) Marker Control

ATUN	Activates auto tuning routine.
CMS	Auto-coupled marker step-size.
CNTR	Selects counter mode.
CONTPK	Turns continuous peak search mode on or off.
CONTXDB	Turns continuous dB down mode on or off.
DX	Specifies delta X parameter for peak search function.
DY	Specifies delta Y parameter for peak search function.
E1	Moves marker to signal peak.
E2	Enters marker frequency into center frequency.
E3	Moves marker frequency to center frequency step-size.
E4	Moves active marker to reference level.
FXP	Activates fixed delta marker peak search function.
KSK	Moves marker to next peak.
KSL	Turns noise level measurement mode off.
KSM	Turns noise level measurement mode on.

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2.2 Programming Codes (functional index)

---

KSN	Moves marker to minimum signal detected.
KSO	Moves marker delta frequency into span.
M1	Turns the active marker off.
M2	Moves marker to specified frequency.
M3	Moves delta marker to specified frequency.
MA	Amplitude of active marker.
MC	Counts marker frequency for greater resolution.
MDA	Displays absolute marker data.
MDL	Displays marker data at lower right of the screen.
MDR	Displays relative marker data.
MDU	Displays marker data at upper right of the screen.
MF	Returns marker frequency.
MKBW	Selects marker display mode of X dB down function, and specifies level.
MKDCF	Enters marker delta frequency into center frequency.
MKDMSS	Moves marker delta frequency to marker step-size.
MKDR	Marker delta reciprocal, readout in time.
MKDSS	Moves marker delta frequency to center-frequency step-size.
MKFCR	Specifies frequency counter resolution.
MKFXD	Turns fixed delta marker mode on or off.
MKMSS	Moves marker frequency to marker step-size.
MKNOISE	Specifies noise power bandwidth.
MKPAUSE	Specifies marker pause time.
MLF	Turns each multi marker off.
MLN	Turns each multi marker on.
MLTA?	Returns multi marker amplitude.
MLTF?	Returns multi marker frequency.
MSS	Specifies marker step-size.
NIC	Selects dBc/Hz measurement mode.
NIM	Selects dBm/Hz measurement mode.
NIU	Selects dB $\mu$ V/ $\sqrt{\text{Hz}}$ measurement mode.
MT	Turns marker signal track on or off.
NXA	Moves marker to next max and min mutually.

NXL	Moves marker to next peak in the left side.
NXM	Moves marker to next minimum.
NXR	Moves marker to next peak in the right side.
PKLIST	Turns peak list display on or off.
PSL	Level below the display line is searched.
PSN	Search is executed to all the waveforms.
PSU	Level above the display line is searched.
XDB	Executes X dB Down.
XDL	Executes X dB Down Left.
XDR	Executes X dB Down Right.
XMT	Selects marker data display mode for X dB down. (relative/absolute)
(13) OBW/ADJ	
ADJ	Measure the adjacent channel leakage power (ADJ).
ADG	Measure the ADJ, and displays as a graph.
ADJBW	Specifies specified bandwidth of ADJ.
ADJCH	Specifies channel spacing of ADJ.
CM?	GO/NG judgment function.
CMA	Executes GO/NG judgment of trace A.
CMB	Executes GO/NG judgment of trace B.
OBW	Measure the occupied bandwidth.
(14) Internal Preselector Control	
PP	Activates auto peaking routine.
PSDAC	Specifies preselector tracking value.
(15) Display Control	
ANNOT	Turns annotation on or off.
DL	Turns display line on or off, and specifies level.
FDSP	Turns frequency data display on or off.
GRAT?	Turns graticule on or off.
KSm	Turns graticule off.
KSn	Turns graticule on.

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2.2 Programming Codes (functional index)

---

KSo	Turns annotation off.
KSp	Turns annotation on.
LB	Edits the label. (KSE)
LO	Turns display line off.
MDL	Displays marker data at lower right of the screen.
MDU	Displays marker data at upper right of the screen.
MND	Turns soft menu display on or off.
WDO	Turns measurement window on or off. (WN)
WFA	Specifies start frequency of measurement window.
WFB	Specifies stop frequency of measurement window.
WLL	Specifies lower level of measurement window.
WUL	Specifies upper level of measurement window.
(16) EMC	
ANT	Selects antenna type.
ANTCORR	Turns antenna correction on or off, and initializes or edits antenna correction table.
CRDEL	Initializes antenna correction table.
CRIN	Edits antenna correction table.
LIMLA	Turns limit line A on or off.
LIMLADEL	Initializes limit line A table.
LIMLAIN	Edits limit line A table.
LIMLB	Turns limit line B on or off.
LIMLBDEL	Initializes limit line B table.
LIMLBIN	Edits limit line B table.
LVLCORR	Turns level correction on or off.
MEAN	Selects the mean value detection.
NRM	Selects the normal detection.
ORB	Specifies resolution bandwidth of detection mode.
PEAK	Selects the peak value detection.
QP	Selects the quasi peak detection.

(17) Calibration

CAL	Executes specified calibration item.
CALCORR	Turns calibration correction on or off.
CL	Specifies calibration signal level.
FREQCORR	Turns frequency correction on or off.

(18) Memory Card Control

MMI	Initializes memory card.
MML	Load the soft menu matrix.
MMS	Store the soft menu matrix.

(19) Plotter Output

PLOT	Sends analyzer display to a plotter.
PLOTFORM	Selects plotter form size.
PLOTPEN	Selects the number of pens.
PLOTPOSN	Selects the screen split size and location for plot.
PLOTSRC	Selects plot source.
PLOTTYPE	Selects plotter type.

## 2.3 Programming Commands

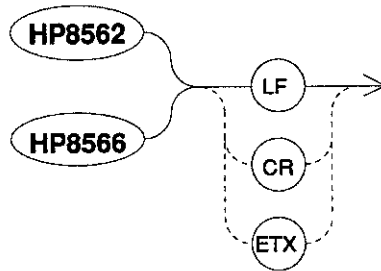
This chapter contains programming commands. For each command, their syntax and parameters are described here.

Before using this part of the manual, you may want to refer to section 1.1 and section 2.1 of this manual (Part 3).

## HP8562 / HP8566

### Selects The HP8562/8566 Compatible Commands

#### Syntax



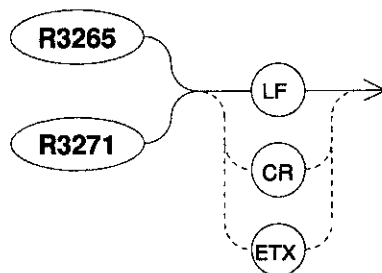
#### Example

```
10  OUTPUT 708;"R3265"  
20  OUTPUT 708;"TS PS MF?"  
30  ENTER 708;Mf  
40  PRINT "PEAK FREQ. = ";Mf  
50  !  
60  OUTPUT 708;"HP8562"  
70  OUTPUT 708;"TS;MKPK;MKN?;"  
80  ENTER 708;Mf  
90  PRINT "PEAK FREQ. = ";Mf  
100 !  
110 OUTPUT 708;"HP8566"  
120 OUTPUT 708;"TS;E1;MF;"  
130 ENTER 708;Mf  
140 PRINT "PEAK FREQ. = ";Mf  
150 END
```



## R3265 / R3271 Selects The Original Commands

### Syntax

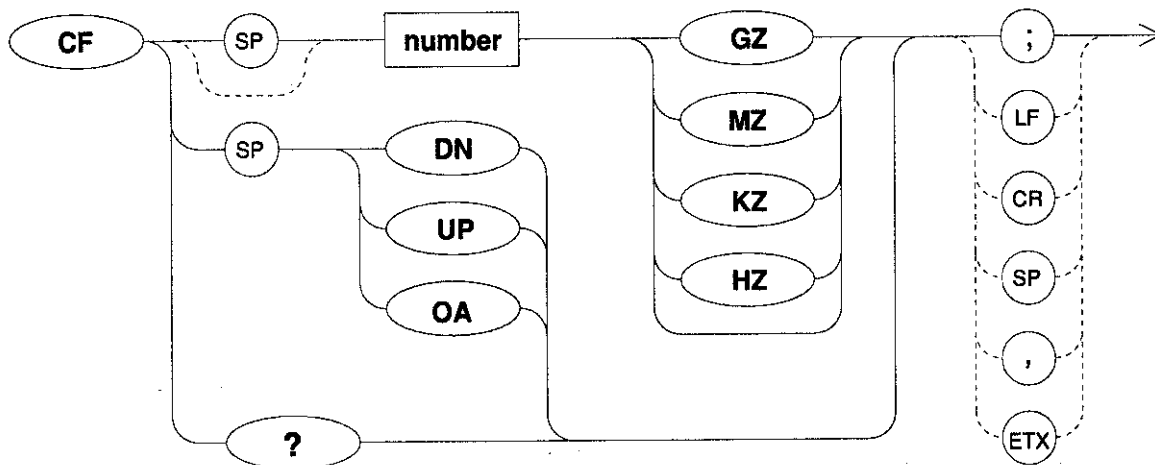


### Example

```
10  OUTPUT 708;"R3265"  
20  OUTPUT 708;"TS PS MF?"  
30  ENTER 708;Mf  
40  PRINT "PEAK FREQ. = ";Mf  
50  !  
60  OUTPUT 708;"HP8562"  
70  OUTPUT 708;"TS;MKPK;MKN?;"  
80  ENTER 708;Mf  
90  PRINT "PEAK FREQ. = ";Mf  
100 !  
110 OUTPUT 708;"HP8566"  
120 OUTPUT 708;"TS;E1;MF;"  
130 ENTER 708;Mf  
140 PRINT "PEAK FREQ. = ";Mf  
150 END
```

## CF Center Frequency

### Syntax



### Query Response

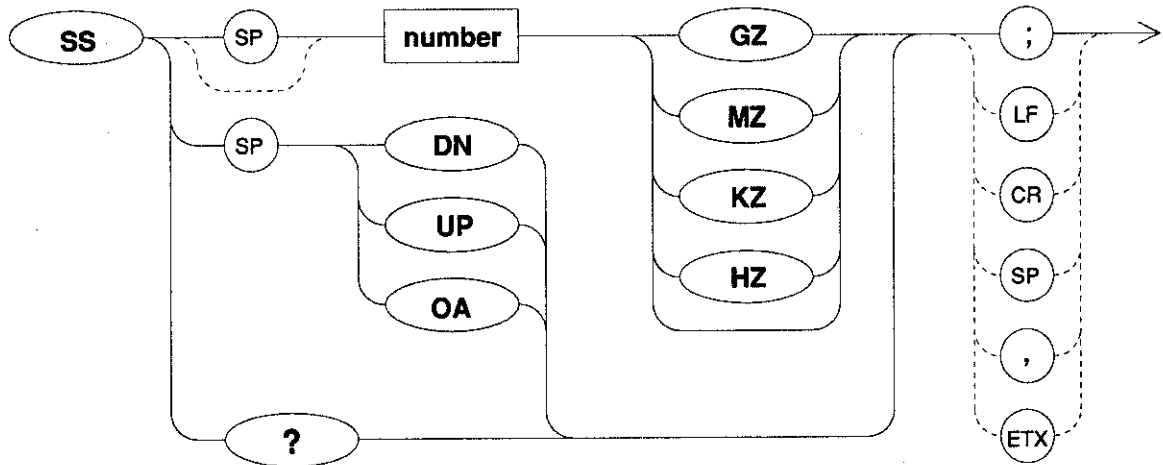


### Example

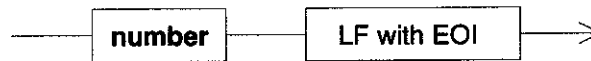
```
10 OUTPUT 708;"IP;"  
20 OUTPUT 708;"CF 200MZ;SP 30MZ;TS;"  
30 OUTPUT 708;"CF OA;"  
40 ENTER 708;Cf  
50 PRINT Cf  
60 END
```

## SS Center Frequency Step Size

### Syntax



### Query Response



### Example

```

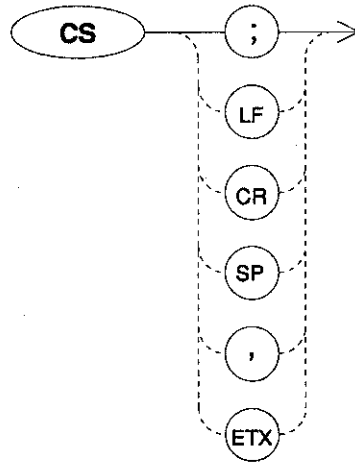
10 CLEAR 708
20 OUTPUT 708;"IP;S2;CF250MZ;SP 10MZ;TS;O3;"
30 OUTPUT 708;"E1;E4;TS;MF;"
40 ENTER 708;M_freq
50 OUTPUT 708;"MA;"
60 ENTER 708;M_amp
70 OUTPUT 708;"SS ";M_freq
80 OUTPUT 708;"CF UP;TS;E1;MA;"
90 ENTER 708;M_ampl
100 PRINT M_amp-M_ampl
110 END

```

# CS

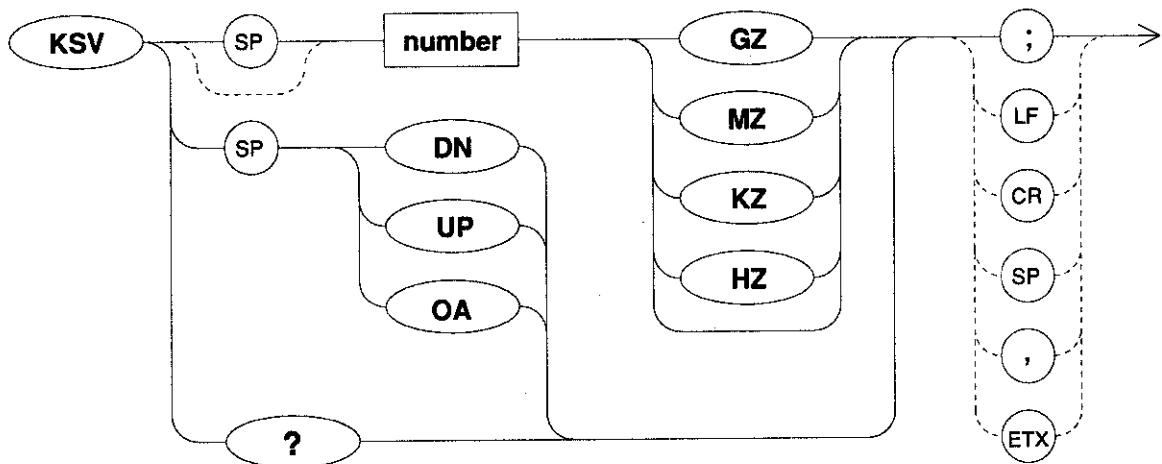
## Coupled Center Frequency Step Size

### Syntax



## KSV Frequency Offset

### Syntax



### Query Response



### Example

```

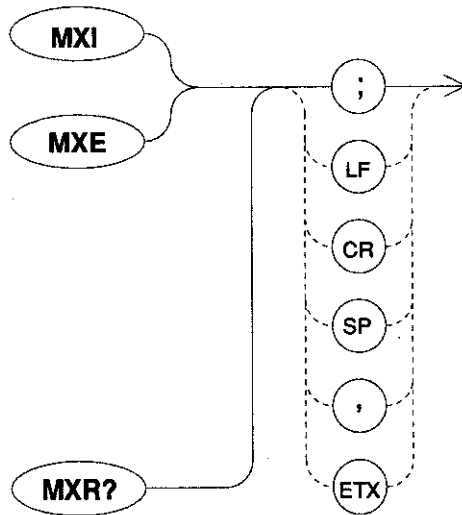
10 INPUT "ENTER DESIRED FREQUENCY OFFSET",Foffset$
20 OUTPUT 708;"KSV ";Foffset$;" "
30 OUTPUT 708;"KSV OA;"
40 ENTER 708;Foffset
50 PRINT "FREQ. OFFSET IS",Foffset,"HZ"
60 END

```

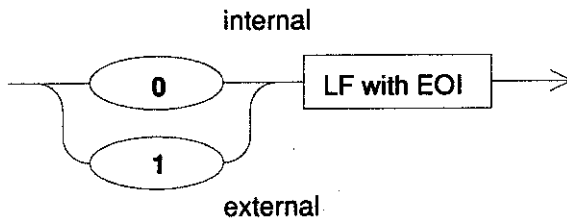
## MXI / MXE / MXR?

### Internal Mixer / External Mixer / Mixer Mode ?

#### Syntax



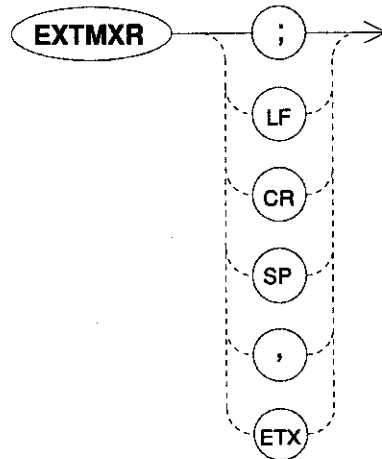
#### Query Response



## EXTMXR

### Selects External Mixer

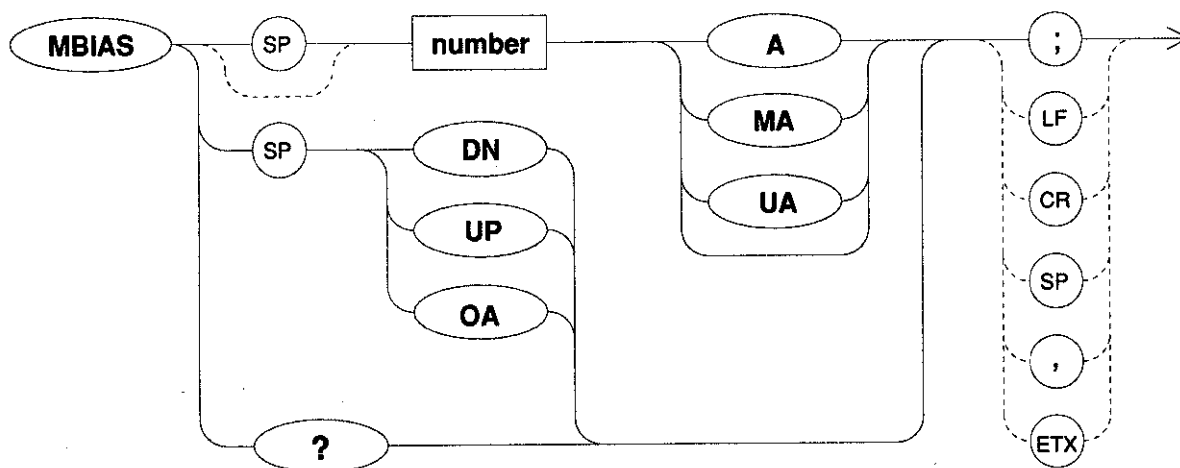
#### Syntax



**See Also**  
MXE

## MBIAS Mixer Bias

### Syntax



### Query Response



### Example

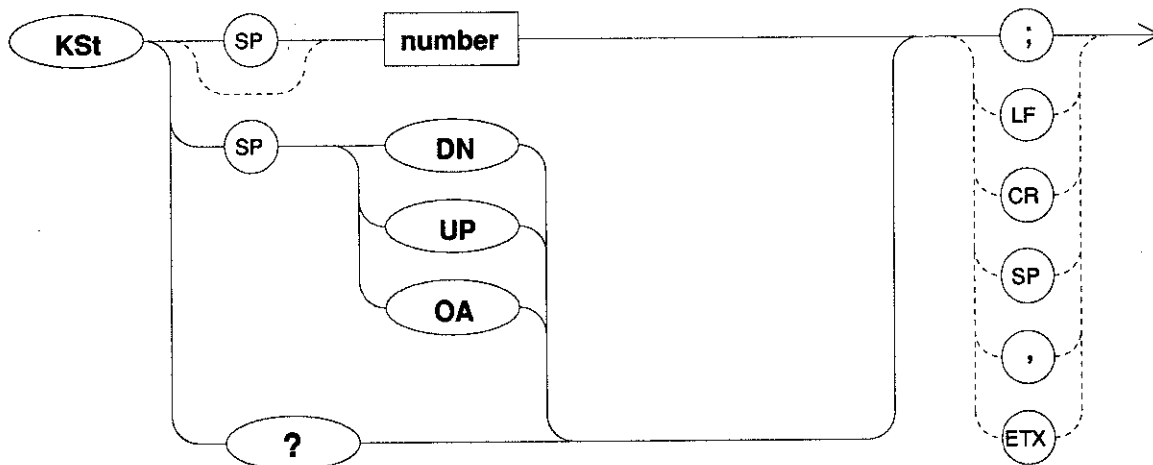
```

10 OUTPUT 708;"IP;MXE;FA 26.5GHZ;FB 40.0GHZ;"
20 INPUT "ENTER THE BIAS VALUE",Bias$
30 OUTPUT 708;"MBIAS ";Bias$
40 END
```

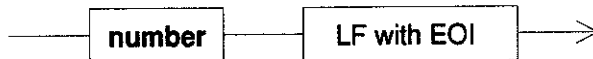


## KSt Band Lock

### Syntax



### Query Response



### Parameters

Band No.	Frequency Band	Frequency Range (GHz)	Mixing Degree
0		12.4 - 18.0	3-
1	K	17.0 - 26.5	4-
2		22.0 - 33.0	5-
3	A	26.5 - 40.0	6-
4	Q	33.0 - 50.0	8-
5	U	40.0 - 60.0	8-
6	V	50.0 - 75.0	10-
7	E	60.0 - 90.0	12-
8	W	75.0 - 110.0	14-
9	F	90.0 - 140.0	18-
10	D	110.0 - 170.0	22-
11	G	140.0 - 220.0	28-
12	Y	170.0 - 260.0	34-
13	J	220.0 - 325.0	42-

### Example

```

10 OUTPUT 708;"IP;MXE;"
20 INPUT "ENTER DESIRED BAND NUMBER FROM 0 TO 13",Band$
30 OUTPUT 708;"KSt ";Band$

```

**R3265/3271 OPT73  
GPIB COMMAND EXPANSION  
INSTRUCTION MANUAL**

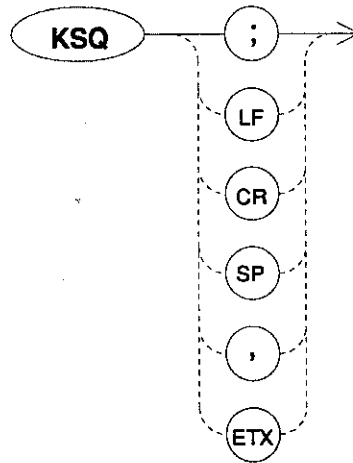
**2.3 Programming Commands**

---

**40 END**

# KSQ Band Unlock

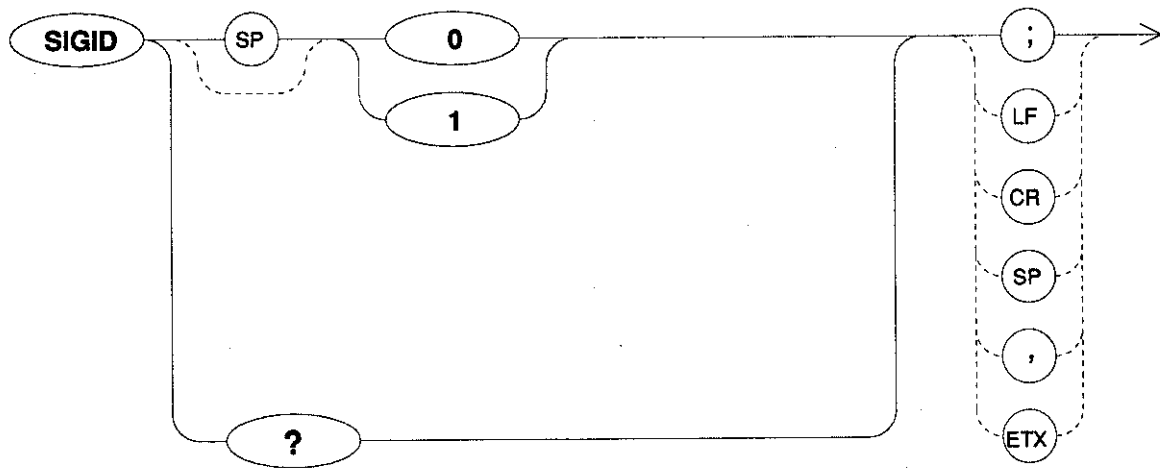
## Syntax



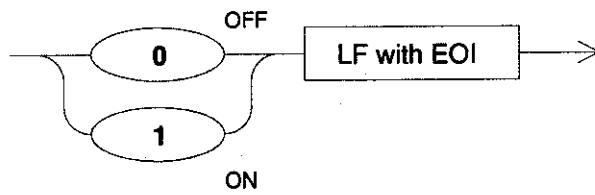
# SIGID

## Signal Identification

### Syntax

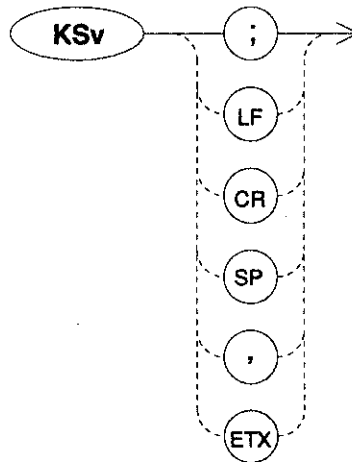


### Query Response



## KSv Signal Identification On

### Syntax

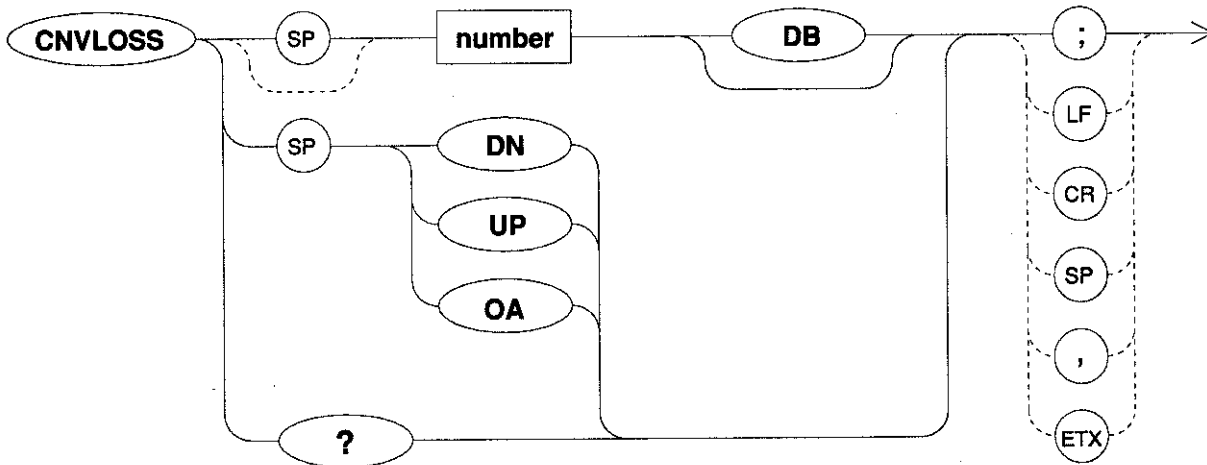


### See Also

SIGID ON

## CNVLOSS Conversion Loss

### Syntax



### Query Response



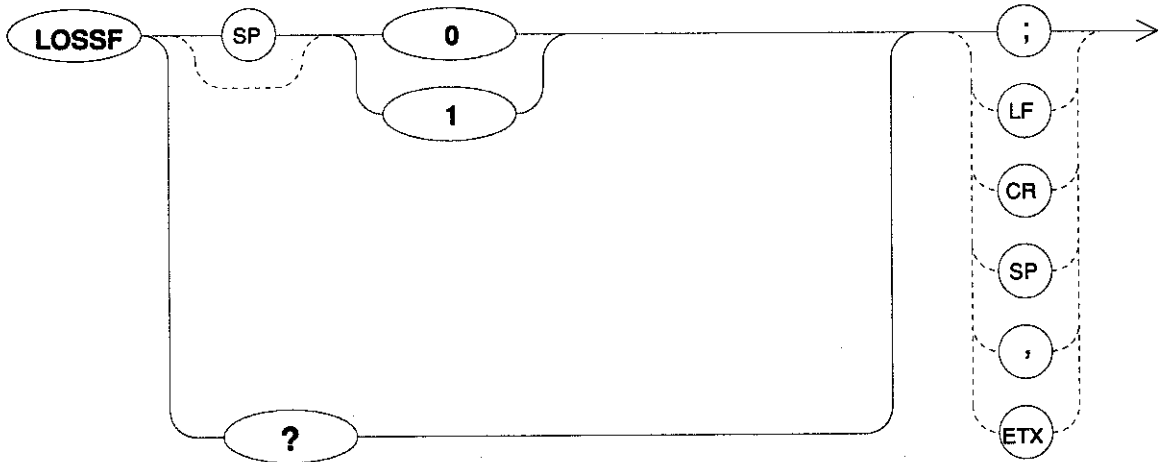
### Example

```
10 OUTPUT 708;"IP;MXE;"
20 INPUT "ENTER THE DESIRED CENTER FREQUENCY",Cf$
30 INPUT "ENTER THE CONVERSION LOSS FOR THAT FREQUENCY",Loss
40 OUTPUT 708;"CF ";Cf$;" ;SP 10MZ;"
50 OUTPUT 708;"CNVLOSS ";Loss;"DB;"
60 END
```

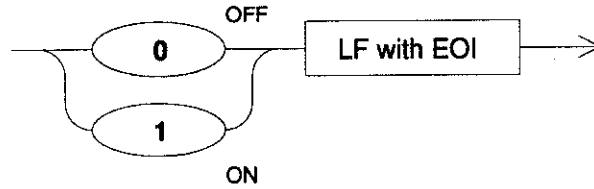
## LOSSF

### Conversion Loss vs Frequency Correction

#### Syntax



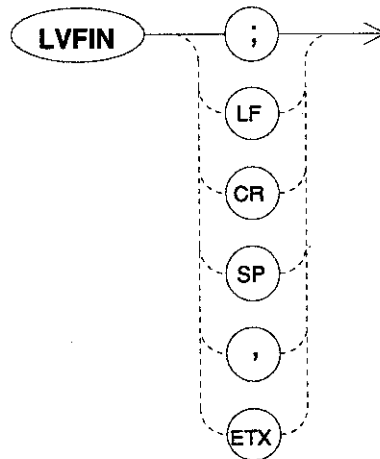
#### Query Response



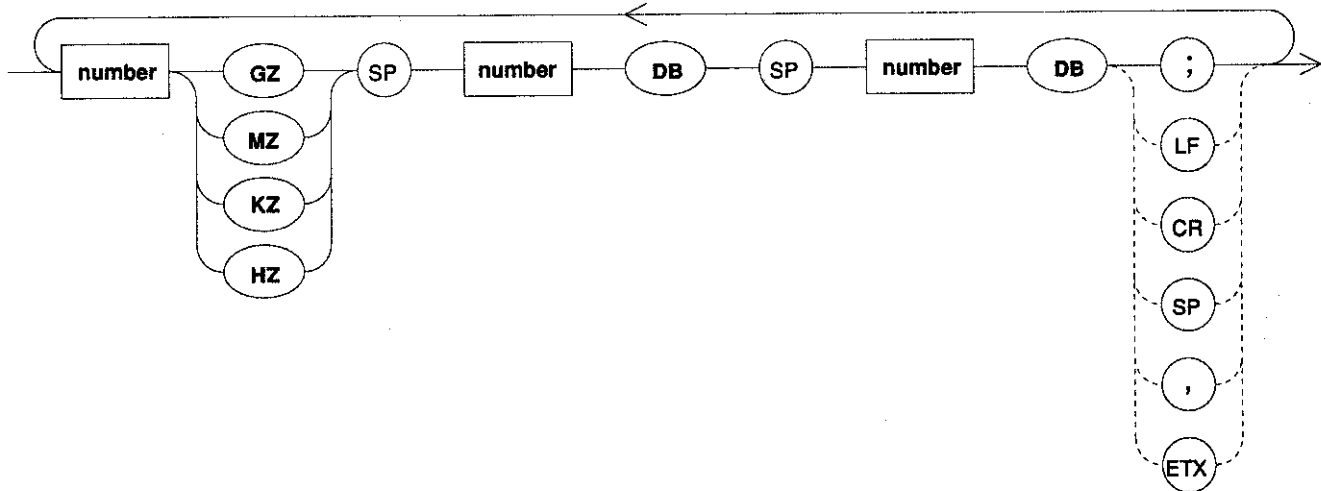
## LVFIN

### Enter Conversion Loss vs Frequency Correction Table

#### Syntax



*cf:entry correction data*



#### Example

```

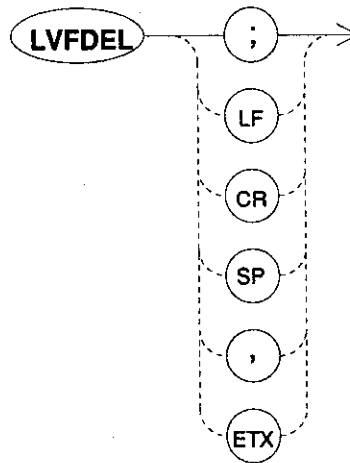
10 OUTPUT 708;"IP;MXE;"
20 OUTPUT 708;"CF 33.25GZ;SP 13.5GZ;"
30 OUTPUT 708;"LVFIN 30GZ -22DB 0.1DB;33GZ -23DB 0.12DB;36GZ -24DB 0.14DB;"
40 OUTPUT 708;"LOSSF 1"
50 END
  
```



## LVFDEL

### Initialize Conversion Loss vs Frequency Correction Table

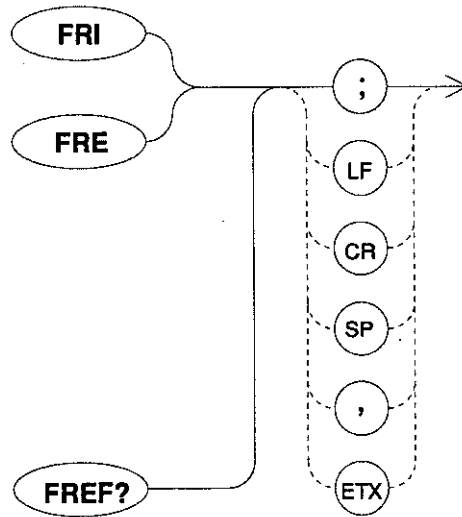
#### Syntax



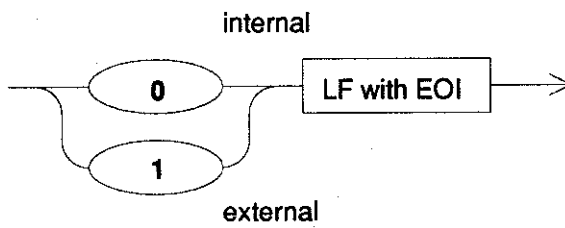
## FRI / FRE / FREF?

### Internal or External Frequency Reference / Frequency Reference ?

#### Syntax

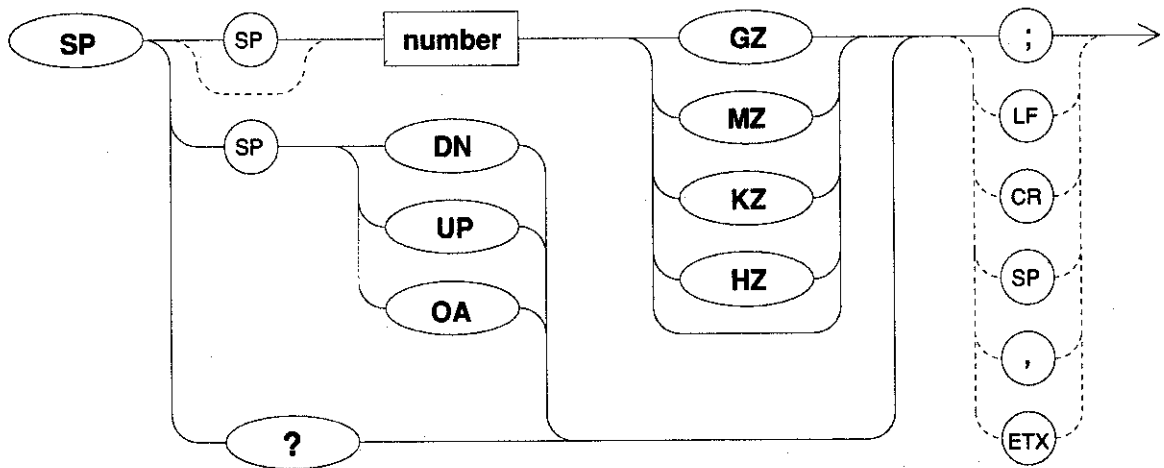


#### Query Response



## SP Frequency Span

### Syntax



### Query Response



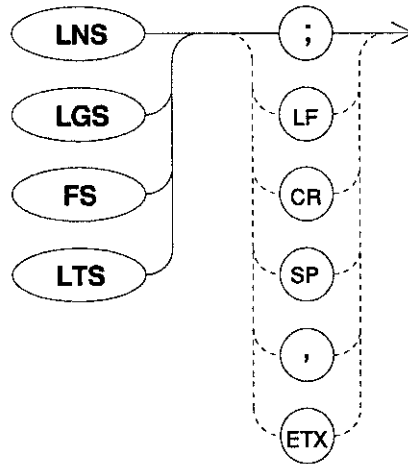
### Example

```
10 OUTPUT 708;"IP;CF 200MZ;SP 30MZ;"
20 OUTPUT 708;"SP UP;SP OA;"
30 ENTER 708;Span
40 PRINT Span
50 END
```

## LNS / LGS / FS / LTS

### Linear / Logarithmic / Full Span / Last Span

#### Syntax

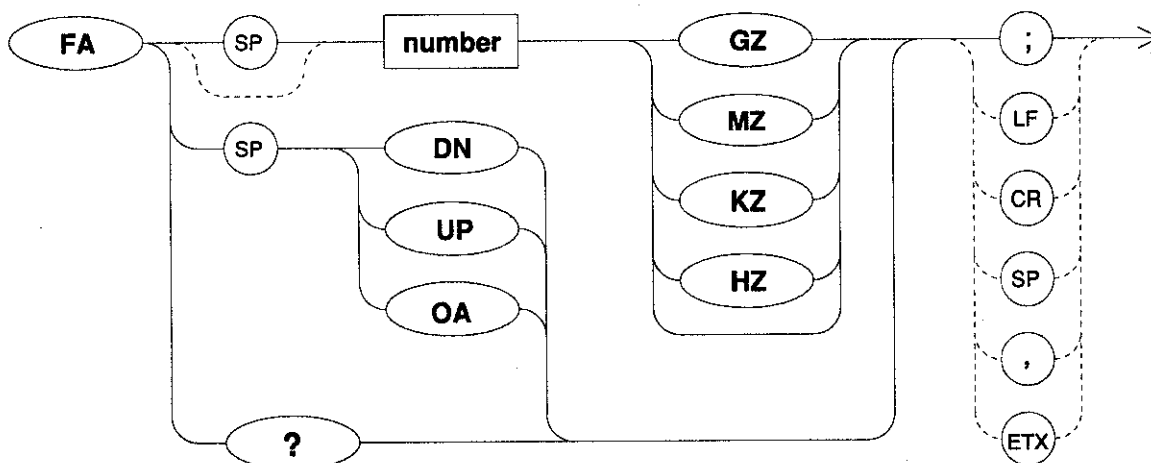


#### Parameters

- |            |  |
|------------|--|
| <b>LNS</b> | Sets the linear mode of the frequency span scale.      |
| <b>LGS</b> | Sets the logarithmic mode of the frequency span scale. |
| <b>LTS</b> | Sets the last frequency span.                          |

## FA Start Frequency

### Syntax



### Query Response

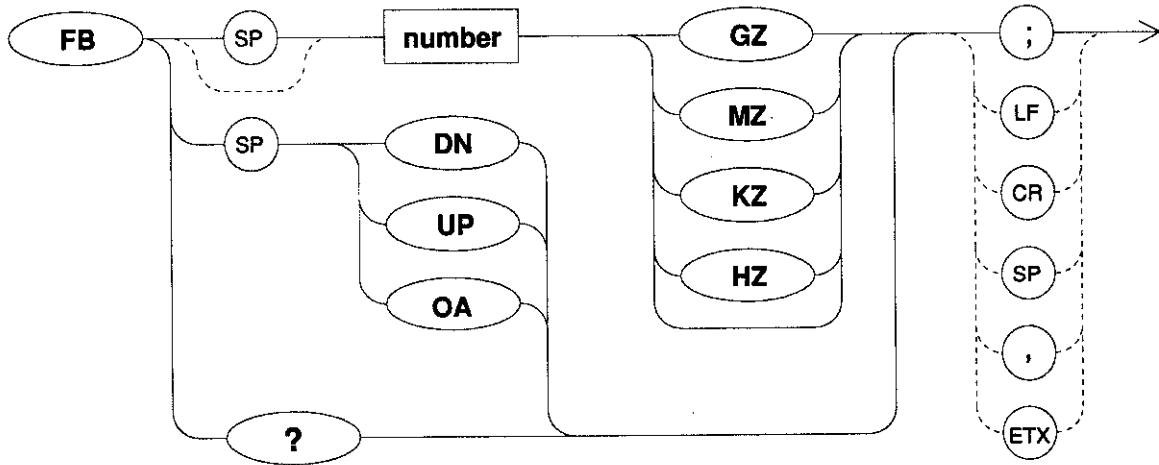


### Example

```
10 OUTPUT 708,"CF 164MZ,SP 122MZ;"
20 OUTPUT 708,"FA OA;"
30 ENTER 708;Start
40 PRINT Start
50 END
```

## FB Stop Frequency

### Syntax



### Query Response

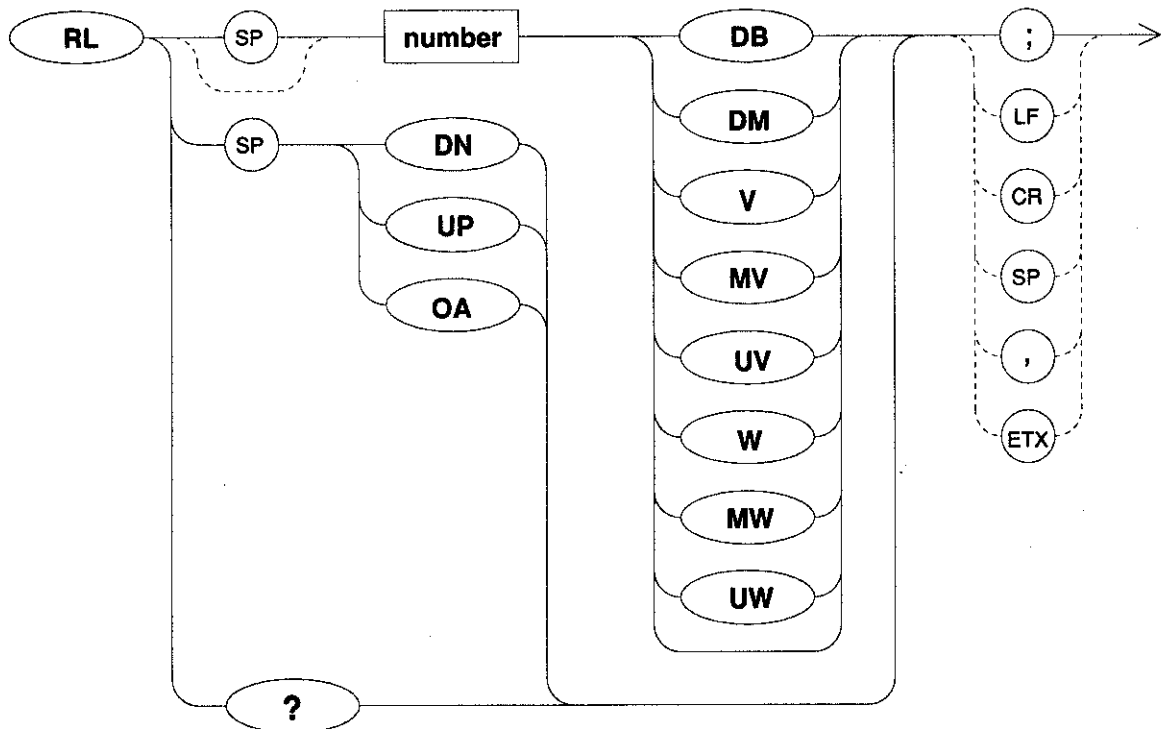


### Example

```
10 OUTPUT 708;"CF 164MZ;SP 122MZ;"
20 OUTPUT 708;"FB OA;"
30 ENTER 708;Stop$
40 PRINT Stop$
50 END
```

## RL Reference Level

### Syntax



### Query Response



### Example

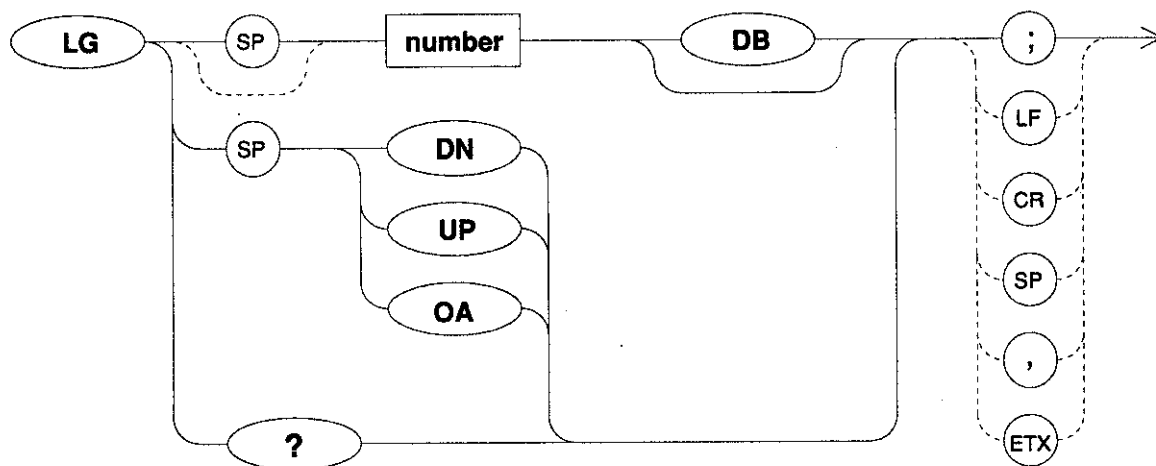
```

10 OUTPUT 708;"IP;S2;CF 200MZ;SP 30MZ;"
20 OUTPUT 708;"TS;E1;E4;TS;"
30 OUTPUT 708;"RL OA;"
40 ENTER 708;Ref
50 PRINT "REFERENCE LEVEL IS",Ref,"DB"
60 END

```

## LG Logarithmic Scale

### Syntax



### Query Response



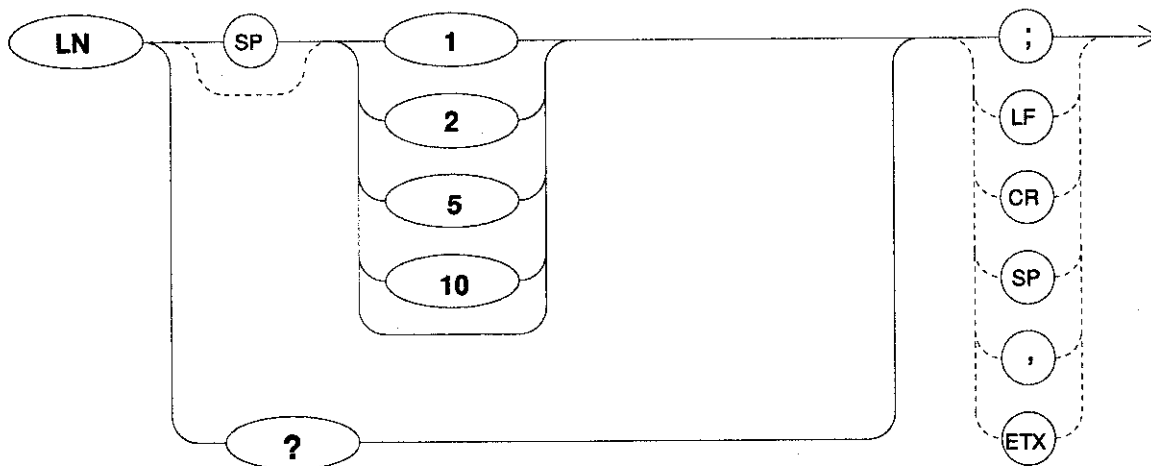
### Example

```
10 OUTPUT 708;"LG 10DB;"
20 OUTPUT 708;"AUNITS 4;"
30 OUTPUT 708;"TS;E1;E4;TS;"
40 OUTPUT 708;"LG 5DB;"
50 END
```

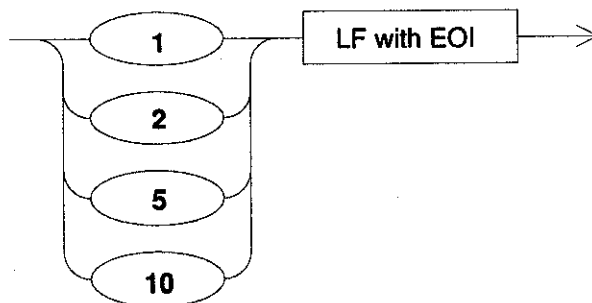


## LN Linear Scale

### Syntax



### Query Response



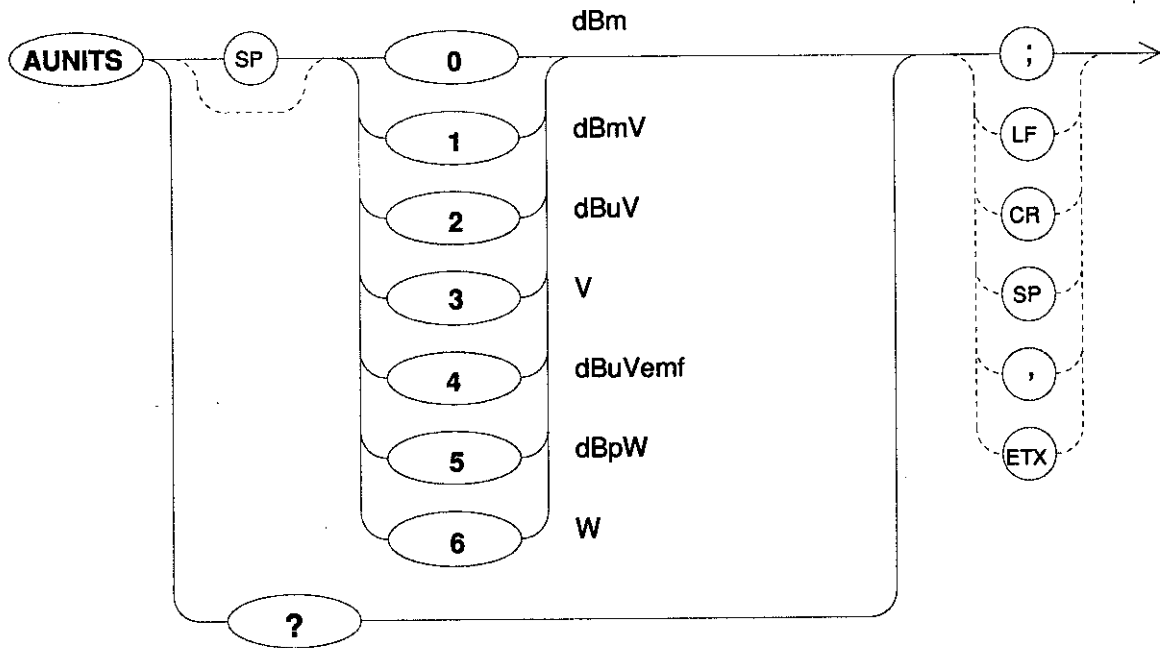
### Parameters

- 1** The interval from 0V to reference level is displayed in linear.
- 2** Display is multiplied by two according to the reference level.
- 5** Display is multiplied by five according to the reference level.
- 10** Display is multiplied by ten according to the reference level.

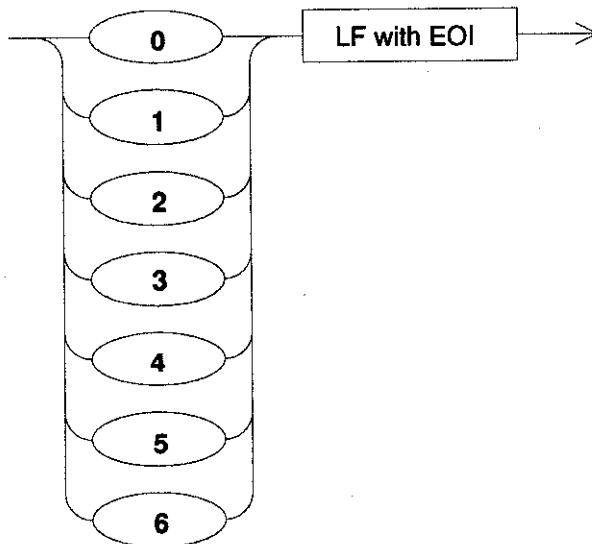
# AUNITS

## Absolute Amplitude Units

### Syntax



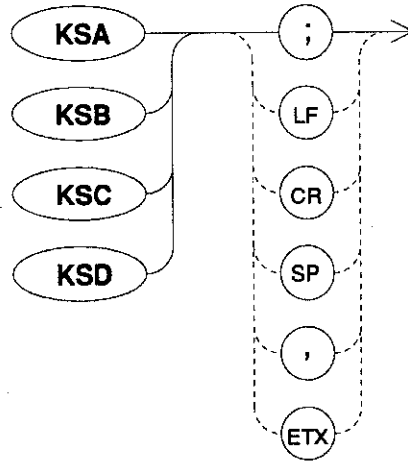
### Query Response



## KSA / KSB / KSC / KSD

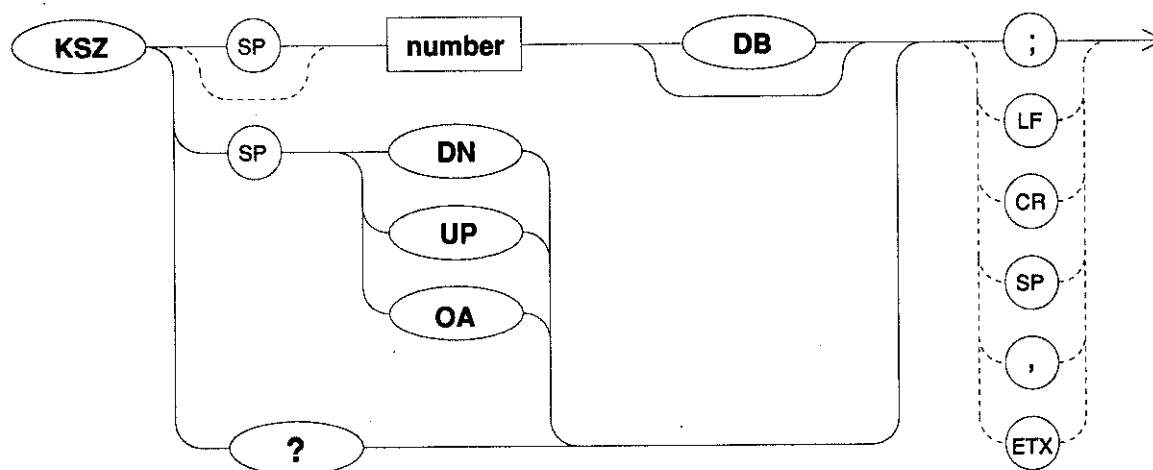
Amplitude in dBm / dBmV / dBuV / Voltage

### Syntax



## KSZ Amplitude Reference Offset

### Syntax



### Query Response



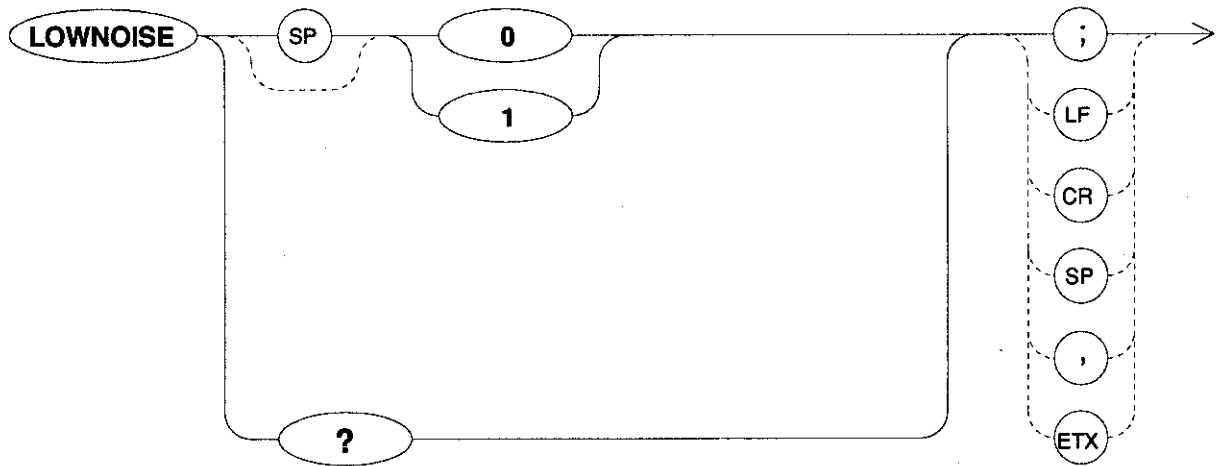
### Example

```
10 INPUT "ENTER REFERENCE LEVEL OFFSET",Roffset
20 OUTPUT 708;"KSZ ";Roffset;"DB;"
30 OUTPUT 708;"KSZ OA;"
40 ENTER 708;Roffset
50 PRINT "AMPLITUDE OFFSET IS ",Roffset,"DB"
60 END
```

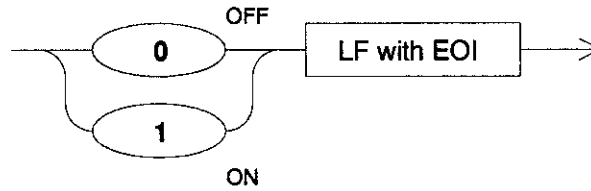
# LOWNOISE

## Low Noise On/Off

### Syntax

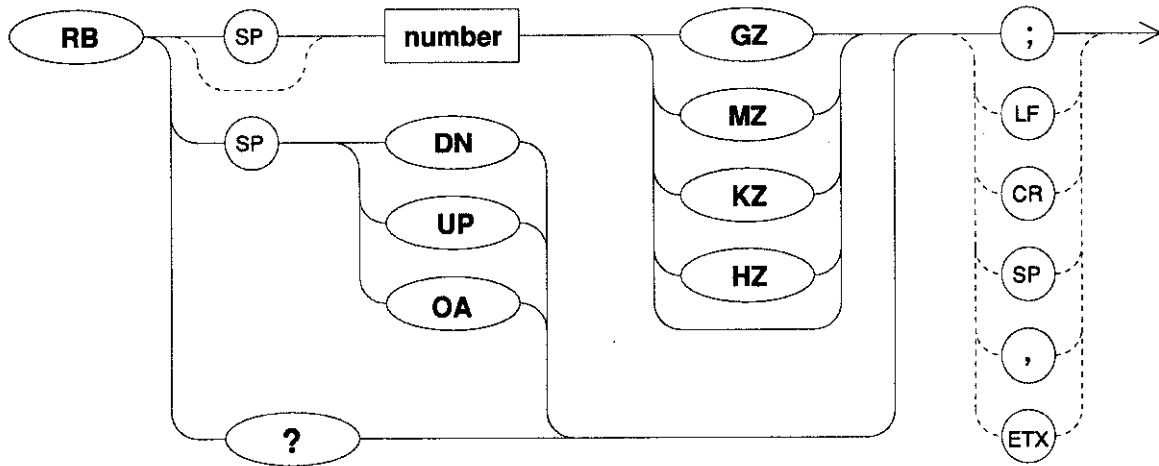


### Query Response

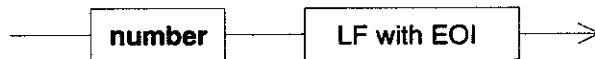


## RB Resolution Bandwidth

### Syntax



### Query Response



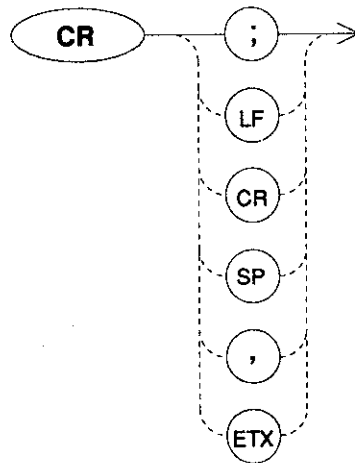
### Example

```
10 OUTPUT 708;"IP;"
20 OUTPUT 708;"CF 1.8GHZ;SP 2GHZ;"
30 INPUT "SELECT THE RESOLUTION BANDWIDTH",width$
40 OUTPUT 708;"RB ";width$;" "
50 OUTPUT 708;"RB OA;"
60 ENTER 708;width$
70 PRINT "RBW IS ",width$,"HZ"
80 END
```

# CR

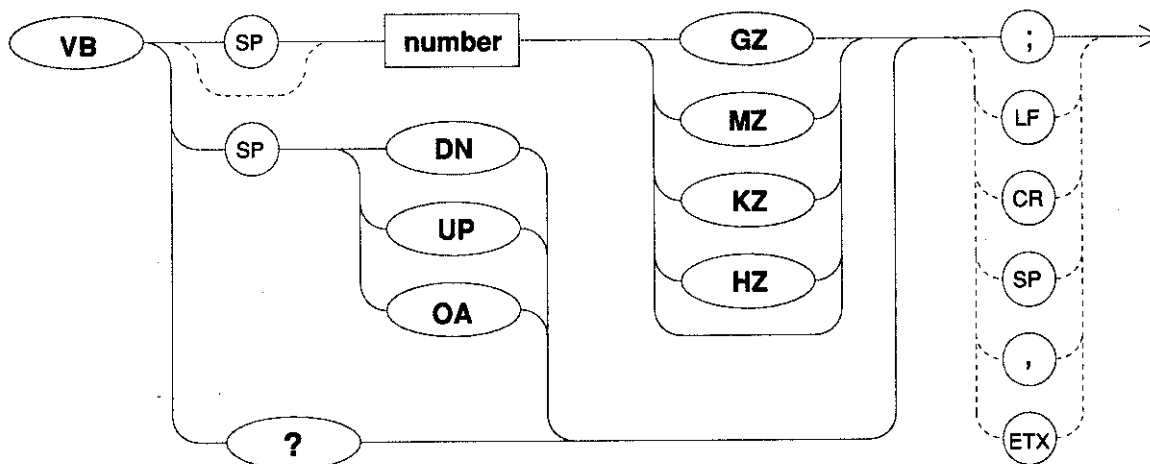
## Coupled Resolution Bandwidth

### Syntax

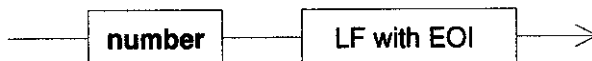


## VB Video Bandwidth

### Syntax



### Query Response



### Example

```

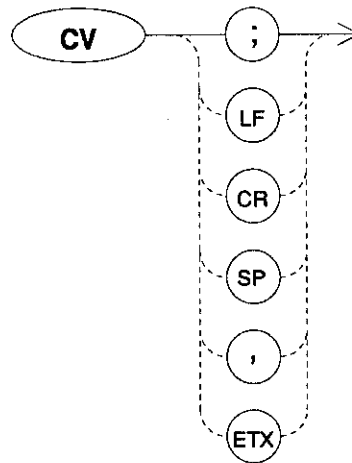
10 OUTPUT 708;"IP;"
20 OUTPUT 708;"CF 1.8GHZ;SP 2GHZ;"
30 INPUT "SELECT THE VIDEO BANDWIDTH",width$
40 OUTPUT 708;"VB ";width$;";"
50 OUTPUT 708;"VB OA;"
60 ENTER 708;width$
70 PRINT "VBW IS ",width$,"HZ"
80 END

```



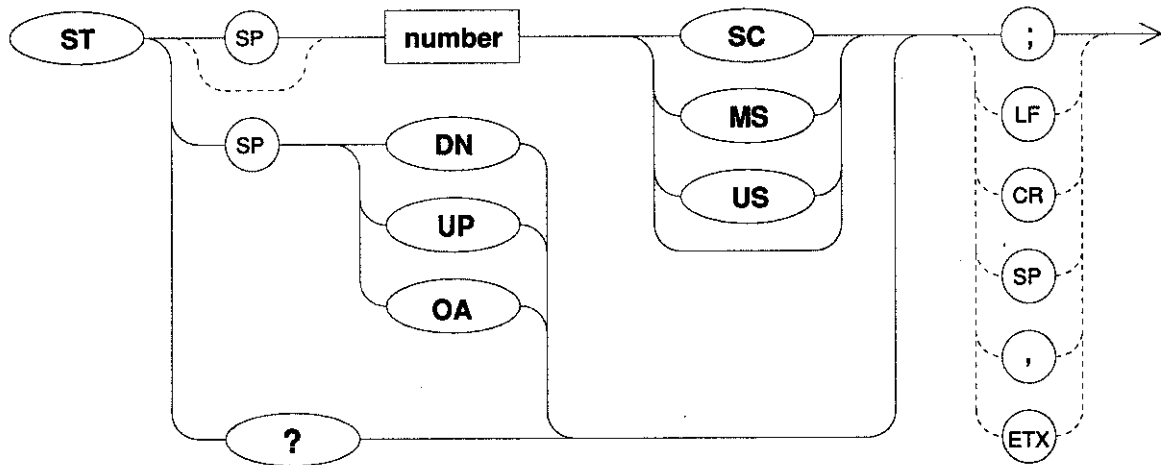
## CV Coupled Video Bandwidth

### Syntax



## ST Sweep Time

### Syntax



### Query Response



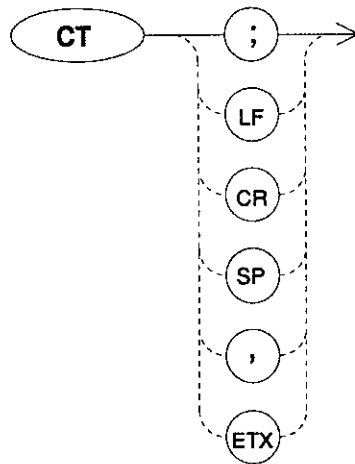
### Example

```
10 OUTPUT 708;"ST 200MS;"
20 OUTPUT 708;"ST DN DN;"
30 OUTPUT 708;"ST OA;"
40 ENTER 708;Tim$
50 PRINT Tim$
60 END
```

# CT

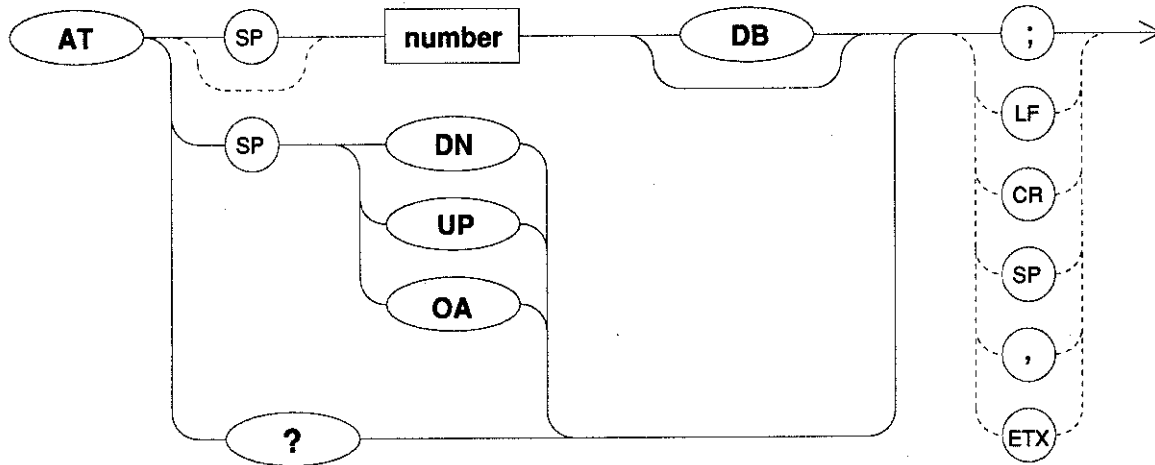
## Coupled Sweep Time

### Syntax



## AT Input Attenuation

### Syntax



### Query Response

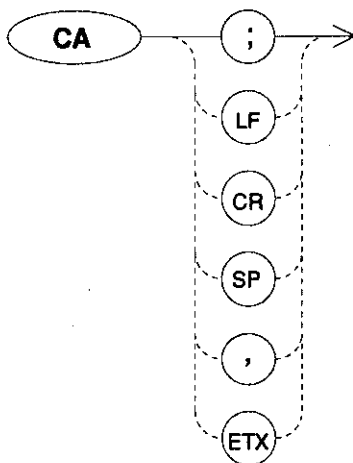


### Example

```
10 OUTPUT 708;"AT 25DB;"
20 OUTPUT 708;"AT OA;"
30 ENTER 708;Att
40 PRINT "ATTENUATOR SETTING IS ",Att,"DB"
50 END
```

## CA Coupled Input Attenuation

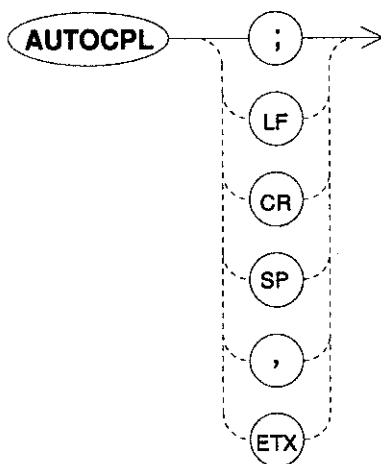
### Syntax



# AUTOPL

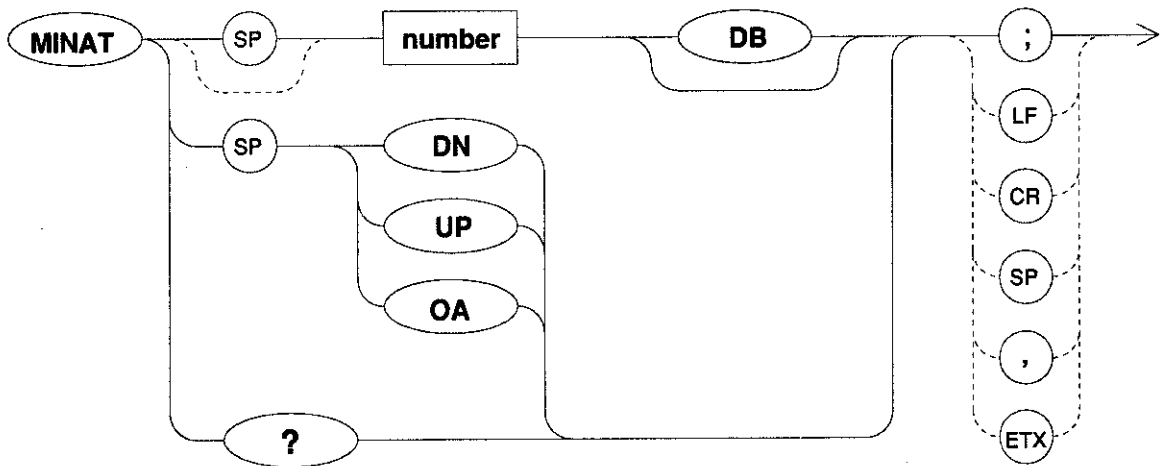
## Auto Coupled

### Syntax



## MINAT Minimum Input Attenuation

### Syntax



### Query Response

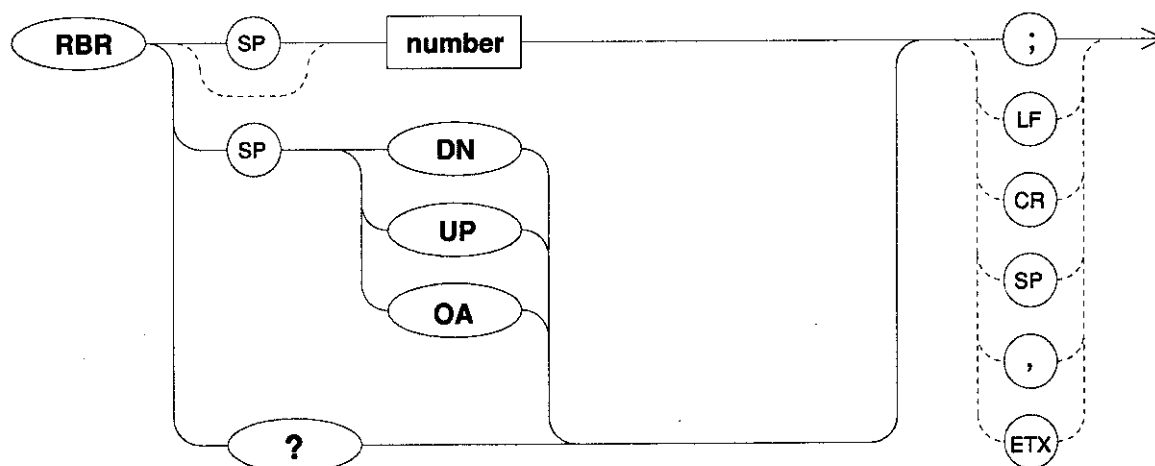


### Example

```
10 OUTPUT 708;"IP;"
20 OUTPUT 708;"MINAT 30DB;"
30 OUTPUT 708;"MINAT OA:"
40 ENTER 708;Att
50 PRINT "MINIMUM ATTENUATOR ",Att,"DB"
60 END
```

## RBR Resolution Bandwidth to Span Ratio

### Syntax



### Query Response



### Example

```

10 OUTPUT 708;"IP;"
20 OUTPUT 708;"CF 1.8GHZ;SP 200MHZ;"
30 INPUT "SELECT THE RESOLUTION BANDWIDTH TO SPAN RATIO",Ratio$
40 OUTPUT 708;"RBR ";Ratio$;" "
50 OUTPUT 708;"SP 2MHZ;"
60 OUTPUT 708;"RB OA;"
70 ENTER 708;Width$
80 PRINT "RBW IS ",Width$,"HZ"
90 END

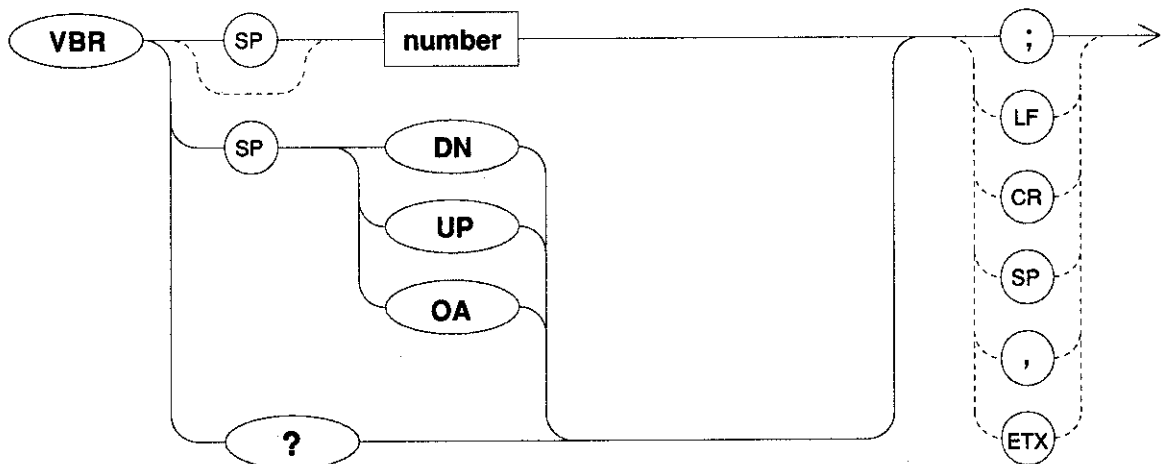
```



## VBR

### Video Bandwidth to Resolution Bandwidth Ratio

#### Syntax



#### Query Response



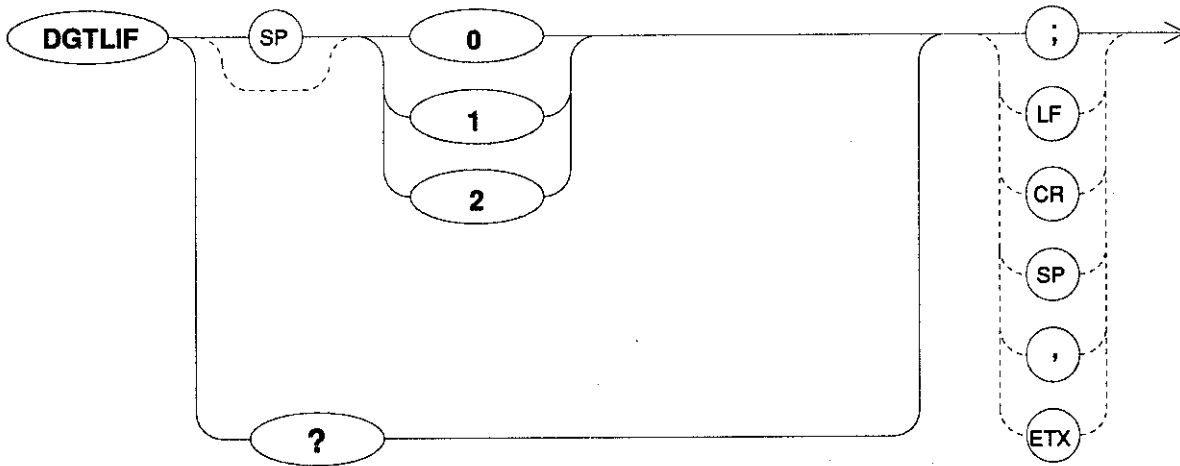
#### Example

```
10 OUTPUT 708;"IP;"
20 OUTPUT 708;"CF 1.8GHZ;SP 2GHZ;"
30 INPUT "SELECT THE VIDEO BANDWIDTH TO SPAN RATIO",Ratio$
40 OUTPUT 708;"VBR ";Ratio$;" "
50 OUTPUT 708;"VB OA;"
60 ENTER 708;width$
70 PRINT "VBW IS ",width$,"HZ"
80 END
```

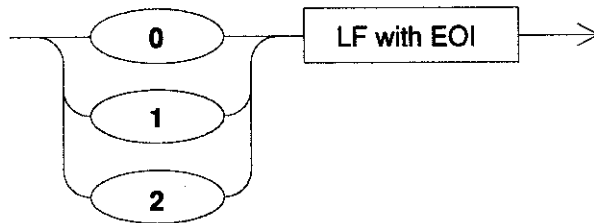
## DGTLIF

### Digital IF Mode On/Off

#### Syntax



#### Query Response



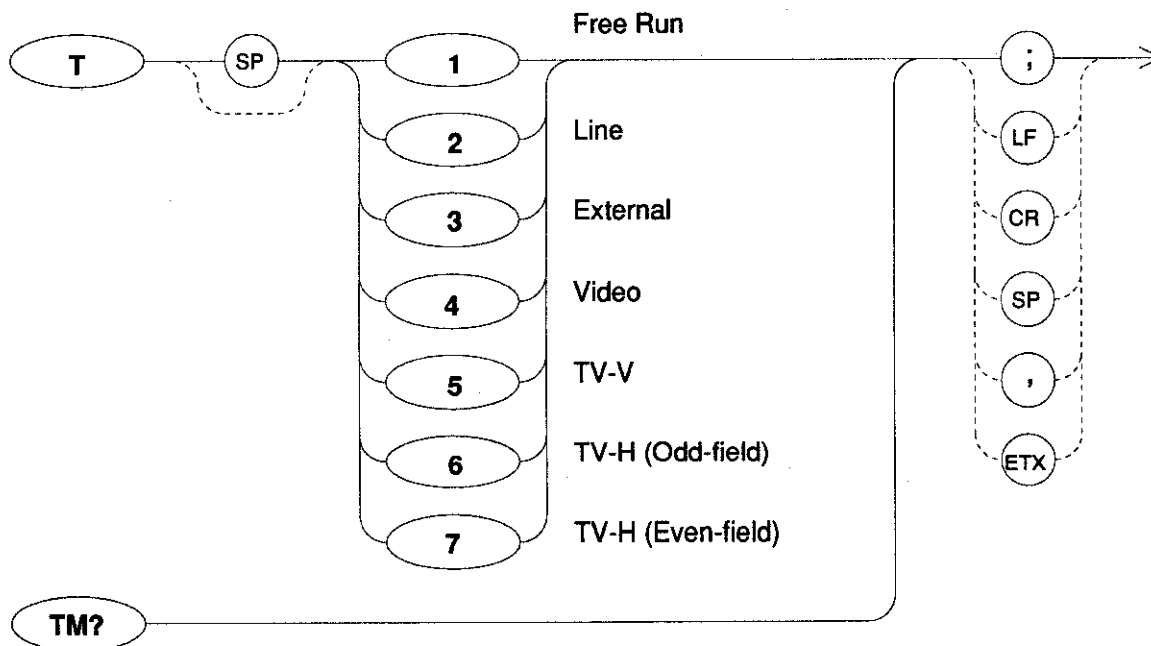
#### Parameters

- 0 Sets the analog IF.
- 1 Sets the digital IF when the RBW is 100Hz or below.
- 2 Sets the digital IF when the RBW is 30Hz or below.

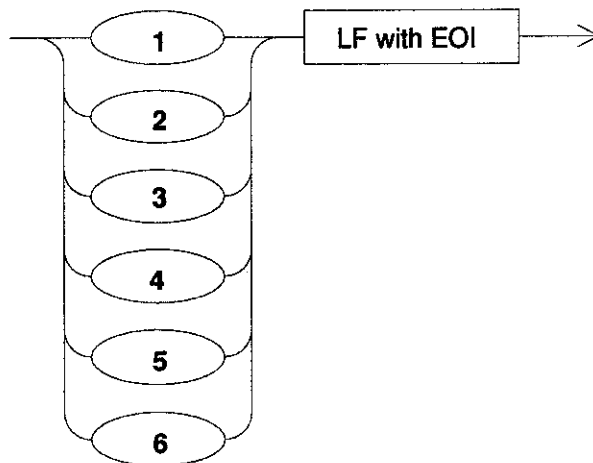
# T1 / T2 / T3 / T4 / T5 / T6 / T7 / TM?

## Trigger Mode

### Syntax

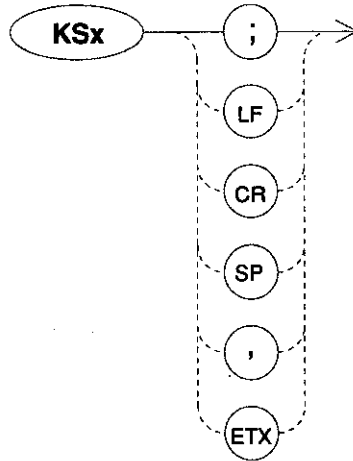


### Query Response



## KSx Selects External Trigger Mode

### Syntax

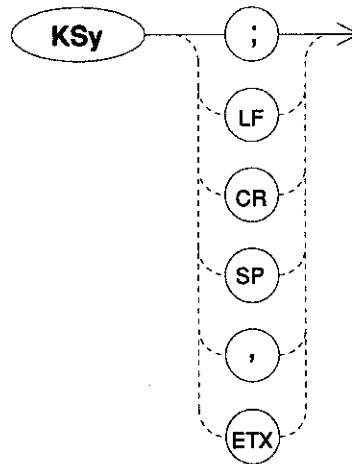


### See Also

T3

## KSy Selects Video Trigger Mode

### Syntax

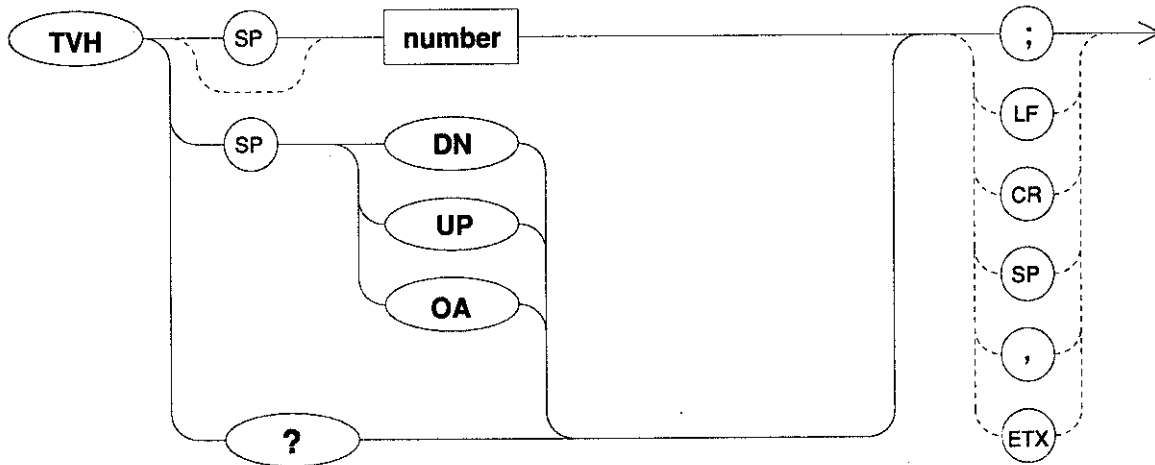


### See Also

T4

## TVH Line Number of TV-H Trigger

### Syntax



### Query Response



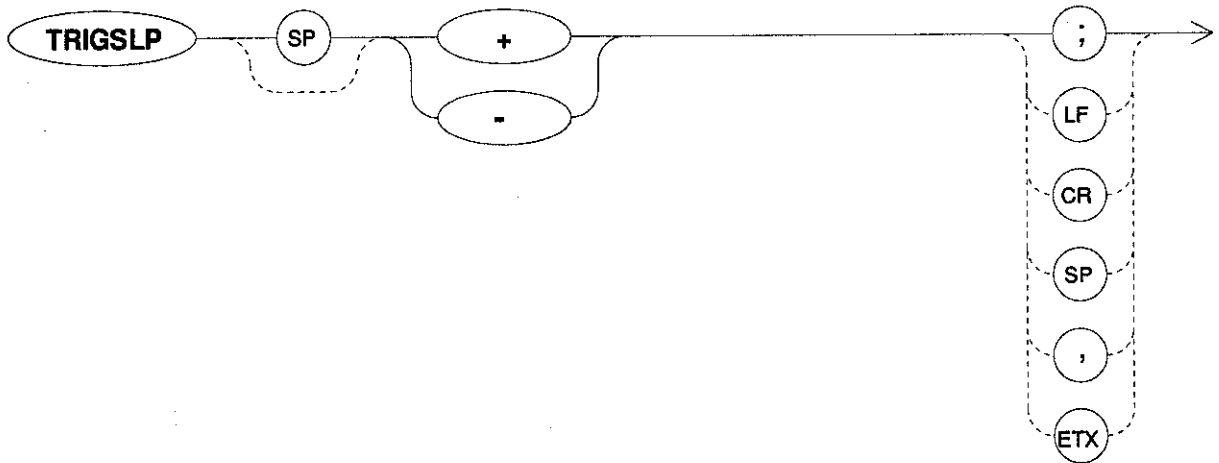
### Example

```
10 OUTPUT 708;"T6;"  
20 OUTPUT 708;"TVH 123;"  
30 END
```

# TRIGSLP

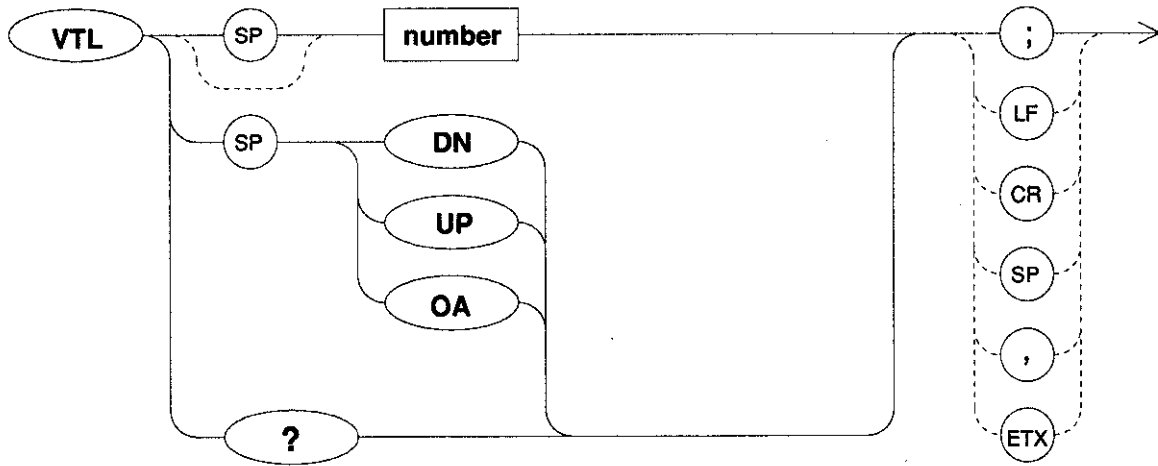
## Trigger Slope

### Syntax



## VTL Video Trigger Level

### Syntax



### Query Response



### Parameters

**number** Sets the position of trigger level at the full scale 100%.

### Example

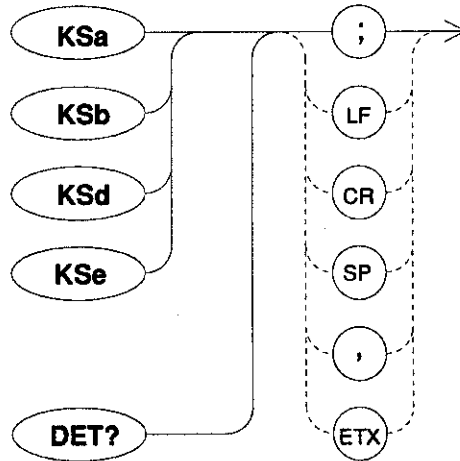
```
10 OUTPUT 708;"T4;"  
20 OUTPUT 708;"VTL 35.0;"  
30 END
```



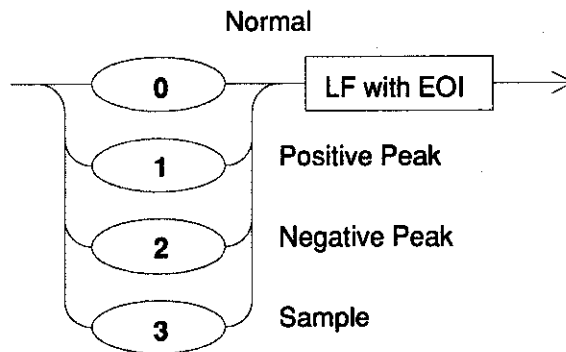
### KSa / K Sb / K Sd / K Se / DET?

Normal / Positive / Negative / Sample Detection / Detection Mode ?

#### Syntax

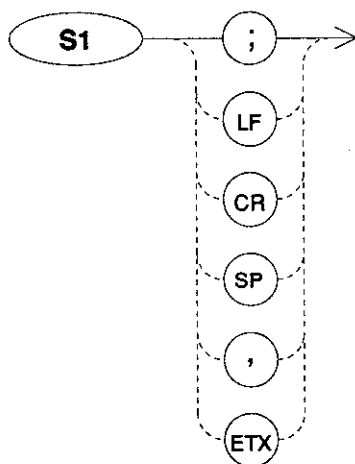


#### Query Response



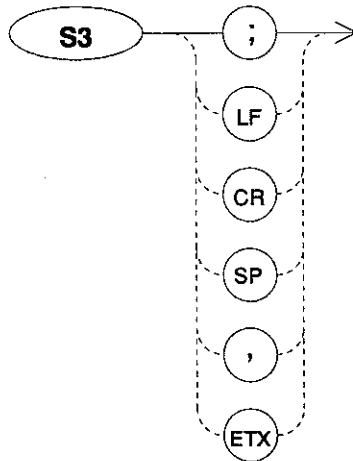
# S1 Continuous Sweep

## Syntax



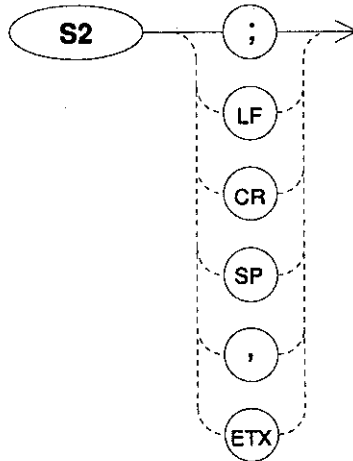
## S3 Manual Sweep

### Syntax



## S2 Single Sweep

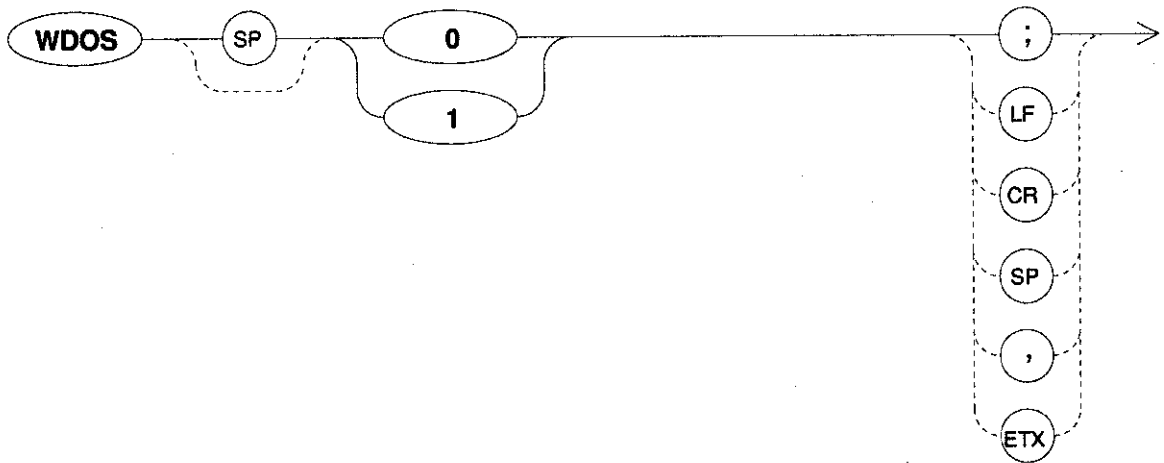
### Syntax



# WDOS

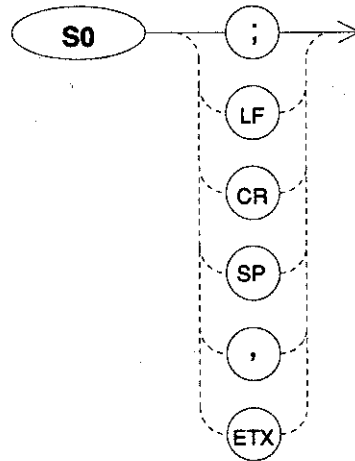
## Window Sweep

### Syntax



## S0 Reset Sweep

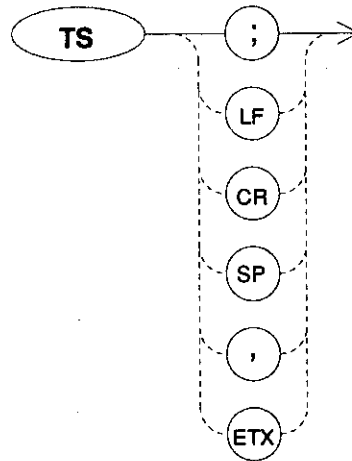
### Syntax



# TS

## Take Sweep

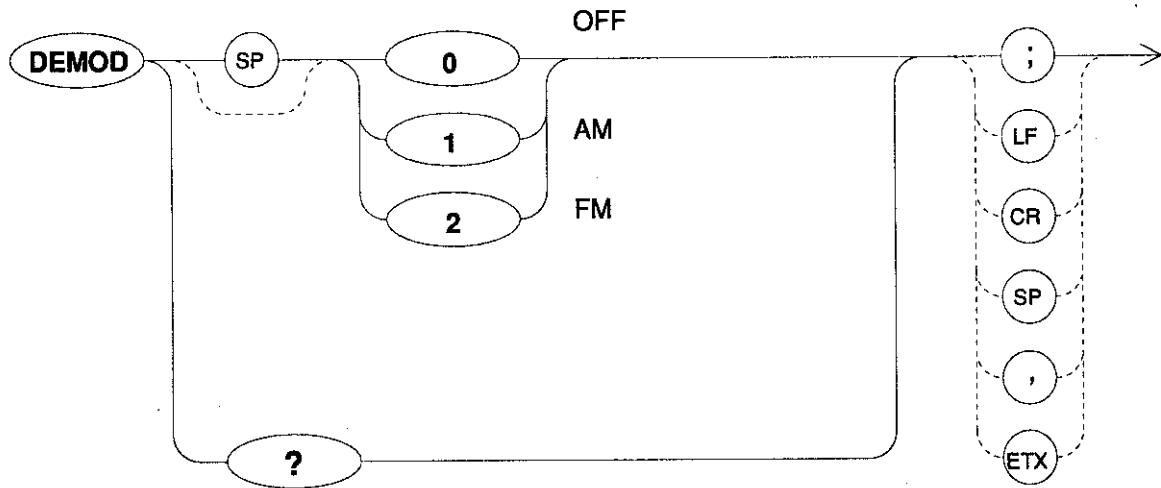
### Syntax



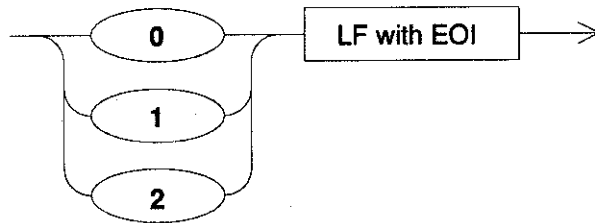
# DEMOD

## Demodulation

### Syntax



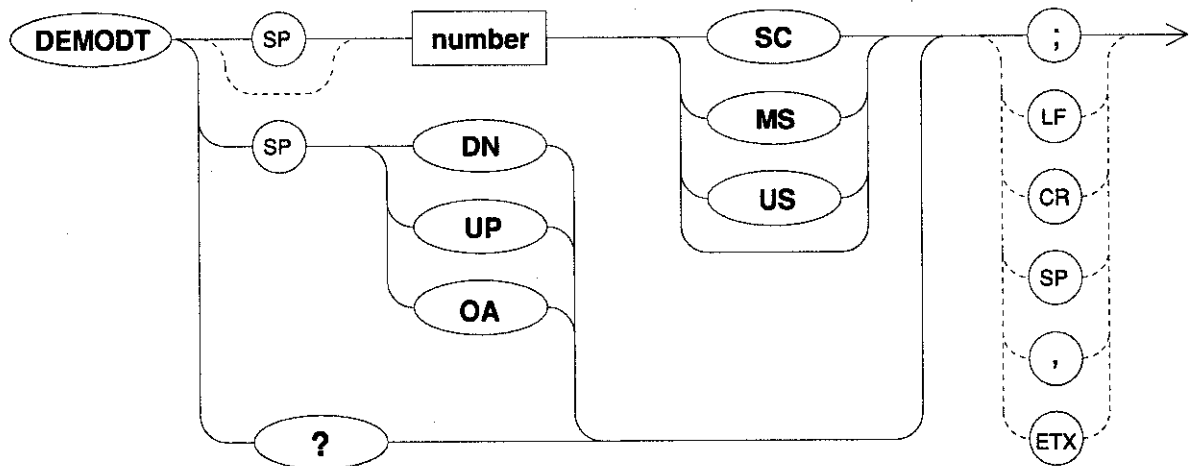
### Query Response





## DEMOTD Demodulation Time

### Syntax



### Query Response



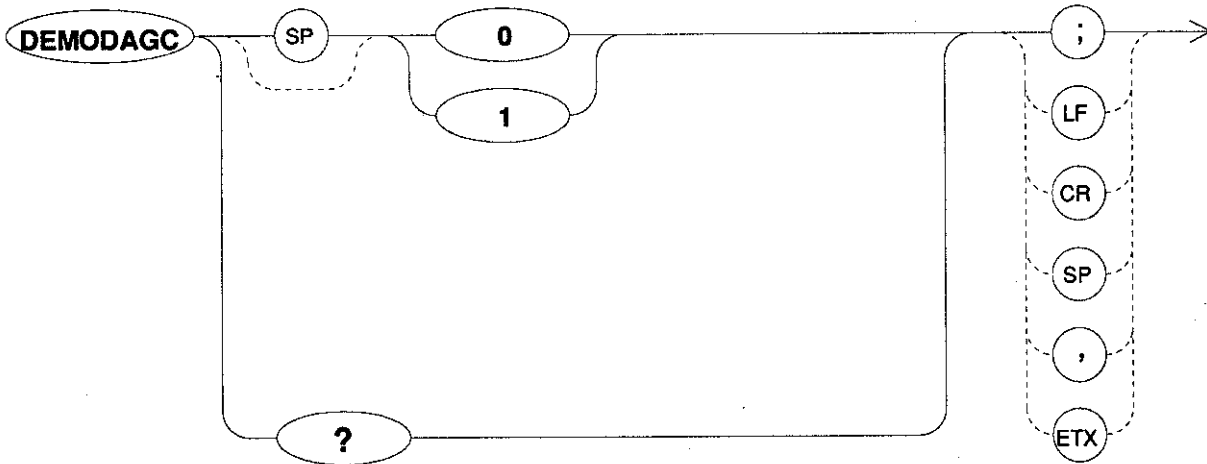
### Example

```
10 OUTPUT 708;"IP;"
20 OUTPUT 708;"FA 70MZ;FB 90MZ;"
30 OUTPUT 708;"M2 81.3MZ;"
40 INPUT "ENTER DEMODULATION TIME",Tim$
50 OUTPUT 708;"DEMOTD ";Tim$;" "
60 OUTPUT 708;"DEMOTD 2;"
70 END
```

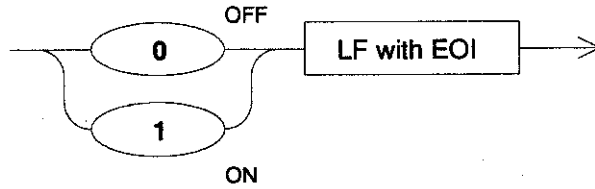
## DEMODAGC

### Demodulation Automatic Gain Control

#### Syntax



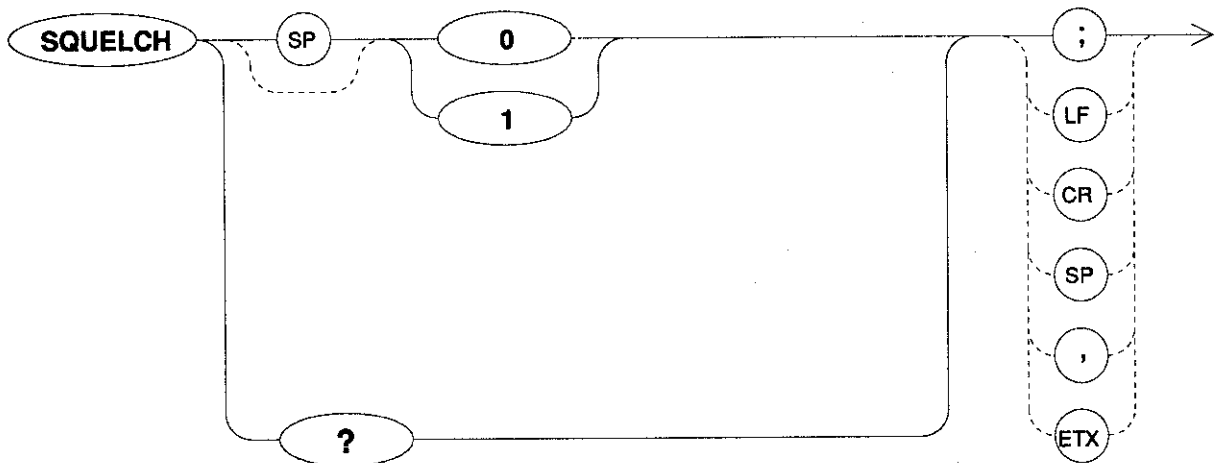
#### Query Response



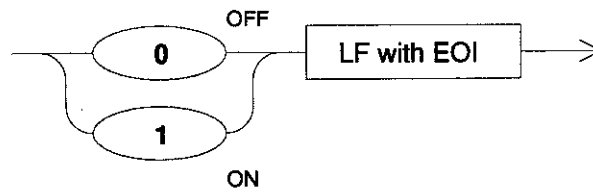
# SQUELCH

## Squelch

### Syntax

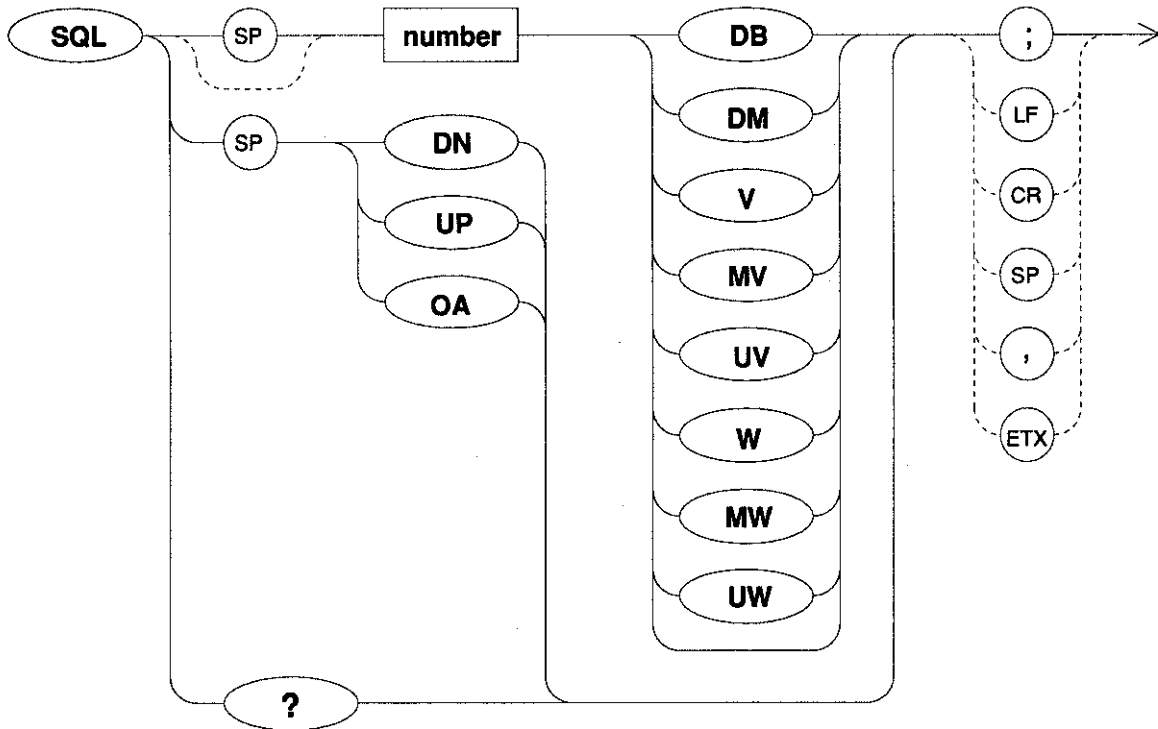


### Query Response



## SQL Squelch Level

### Syntax



### Query Response



### Example

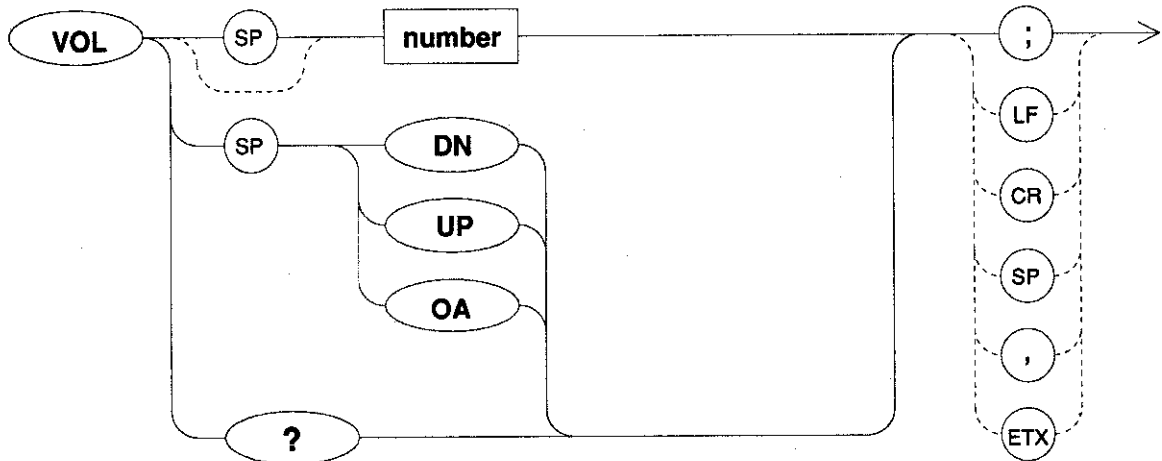
```

10  OUTPUT 708;"IP;"
20  OUTPUT 708;"FA 70MZ;FB 90MZ;"
30  OUTPUT 708;"M2 81.3MZ;"
40  INPUT "ENTER DEMODULATION TIME",Tim$
50  OUTPUT 708;"DEMODT ";Tim$;"
60  INPUT "ENTER SQUELCH LEVEL",Squelch$
70  OUTPUT 708;"SQL ";Squelch$;"
80  OUTPUT 708;"DEMOD 2;"
90  END

```

## VOL Demodulation Volume

### Syntax



### Query Response

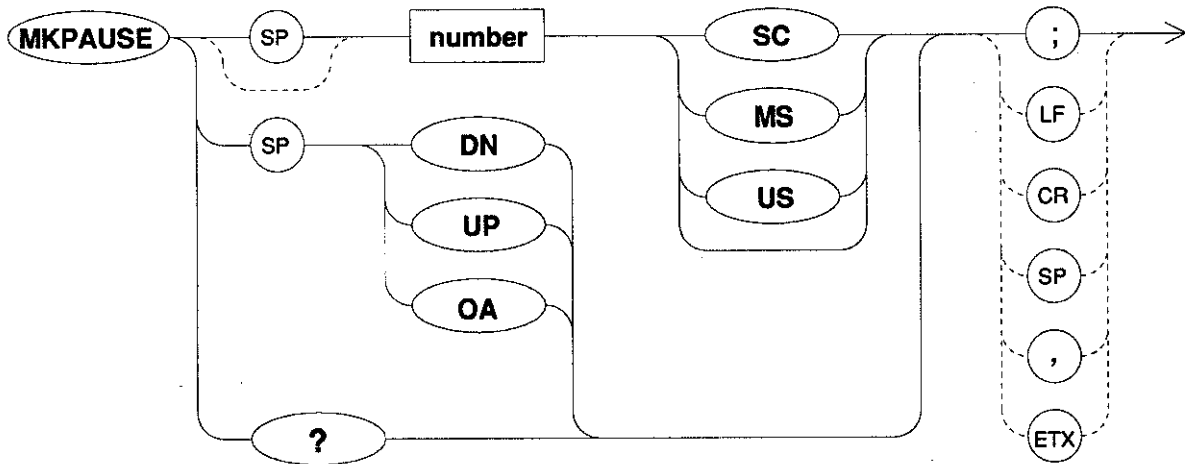


### Example

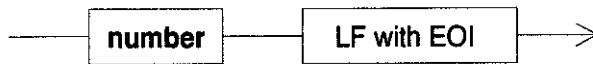
```
10 OUTPUT 708;"IP;"
20 OUTPUT 708;"FA 70MZ;FB 90MZ;"
30 OUTPUT 708;"M2 81.3MZ;"
40 INPUT "ENTER DEMODULATION TIME",Tim$
50 OUTPUT 708;"DEMODT ";Tim$;" "
60 INPUT "ENTER DESIRED VOLUME SETTING(1 - 16)",Vol
70 OUTPUT 708;"VOL ";Vol;" "
80 OUTPUT 708;"DEMOD 2;"
90 END
```

## MKPAUSE Marker Pause

### Syntax



### Query Response

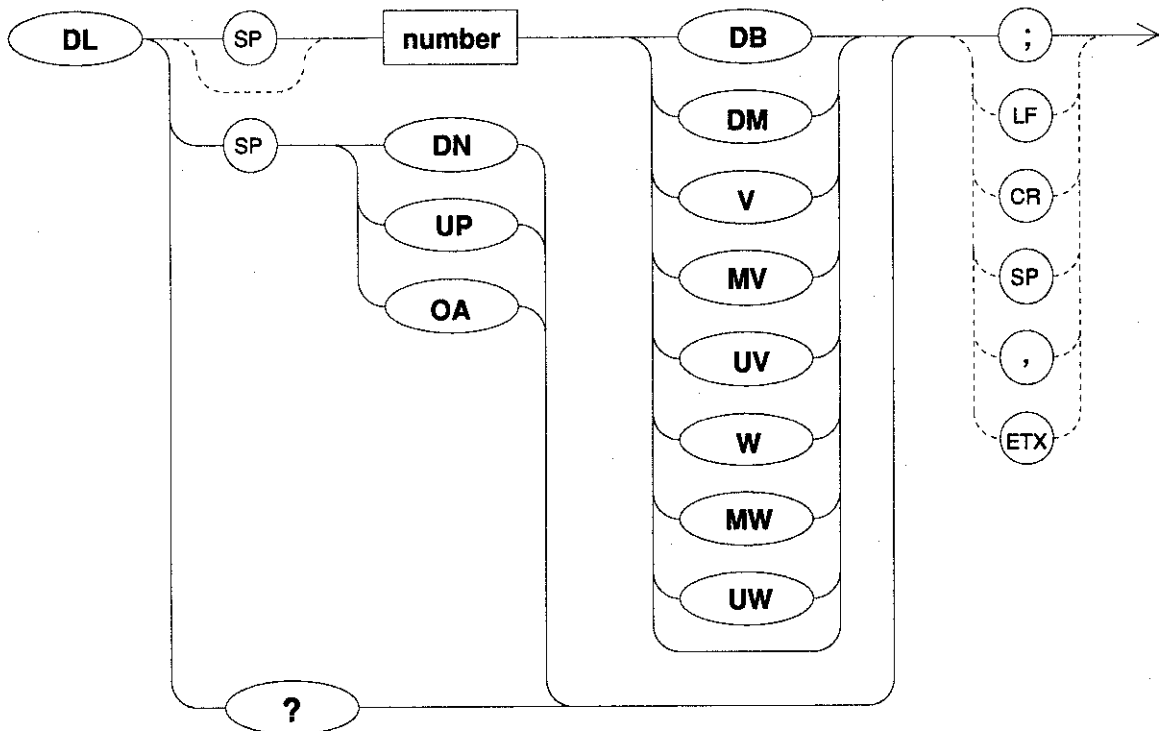


### Example

```
10 OUTPUT 708;"IP;"
20 OUTPUT 708;"FA 70MZ;FB 90MZ;"
30 OUTPUT 708;"M2 81.3MZ;"
40 INPUT "ENTER PAUSE TIME",Tim$
50 OUTPUT 708;"MKPAUSE ";Tim$;";"
60 END
```

## DL Display Line

### Syntax



### Query Response



### Example

```

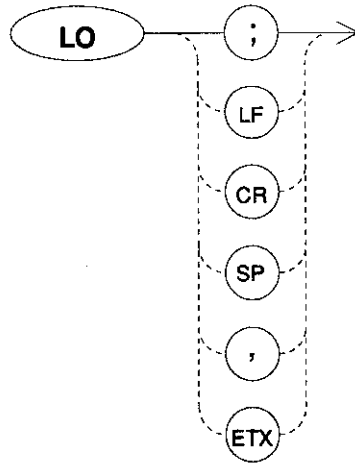
10 INPUT "ENTER DESIRED DISPLAY LINE LEVEL",Line$
20 OUTPUT 708;"DL ";Line$;";"
30 OUTPUT 708;"KSK;"
40 OUTPUT 708;"MDR;"
50 OUTPUT 708;"O3;MA;"
60 ENTER 708;Rel_d1
70 PRINT "THE DIFFERENCE IS ",Rel_d1
80 END

```

# LO

## Display Line Off

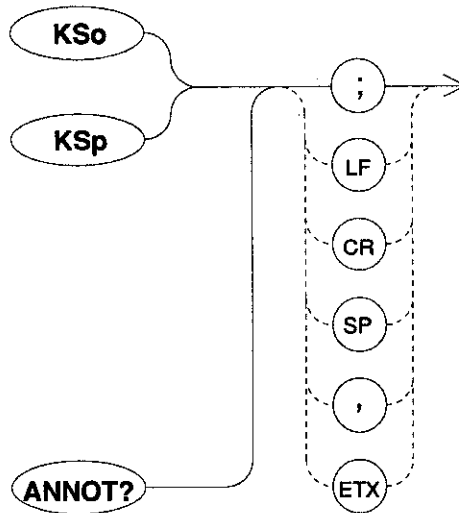
### Syntax



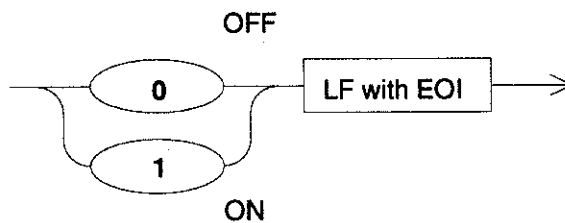


## KSo / KSp / ANNOT? Annotation Off / On / Annotation ?

### Syntax

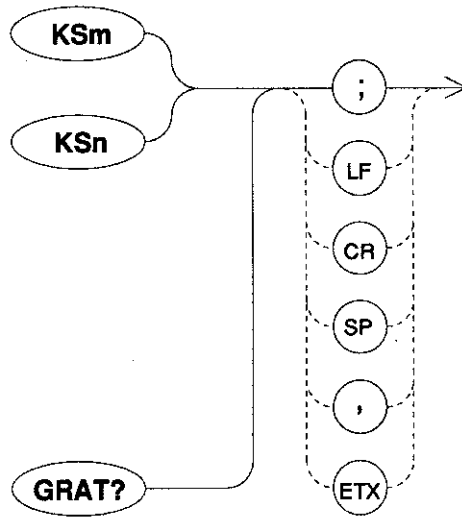


### Query Response

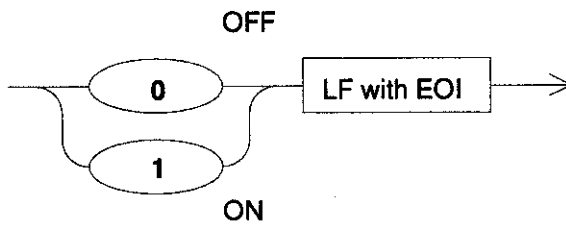


## KSm / KSn / GRAT? Graticule Off / On / Graticule ?

### Syntax

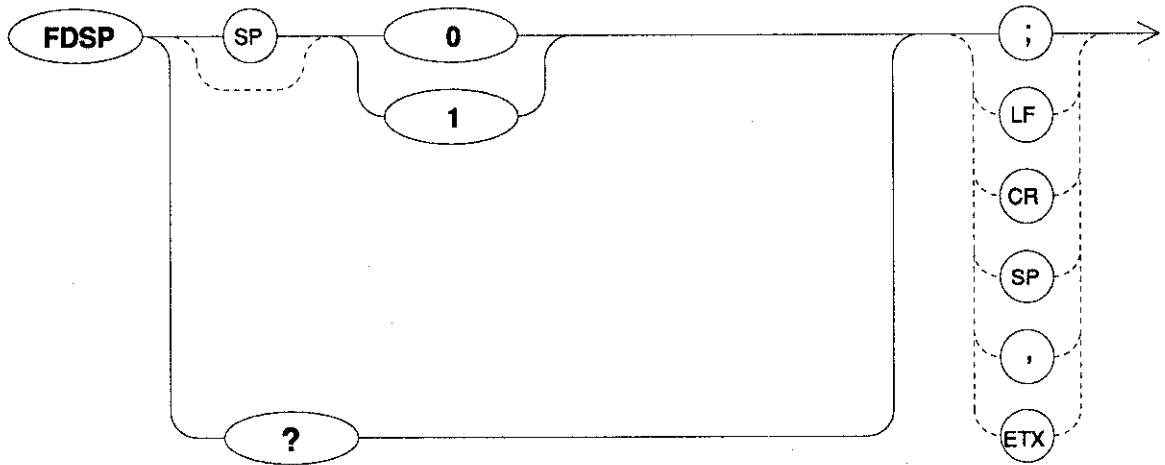


### Query Response

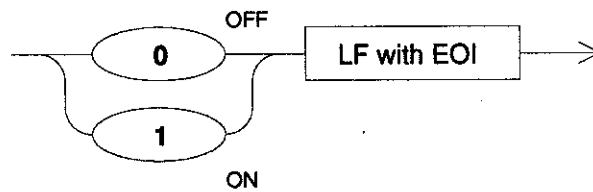


## FDSP Frequency Display On/Off

### Syntax



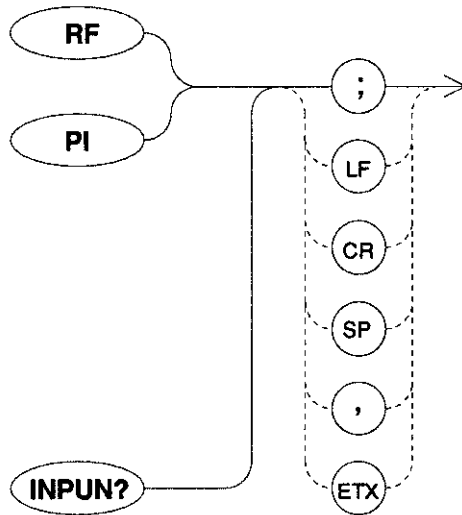
### Query Response



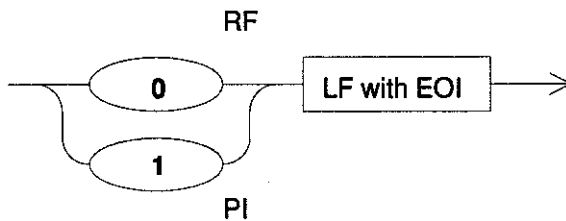
## RF / PI / INPUN?

### RF Input Signal / RF Input Through the Plug-in / Input Unit ?

#### Syntax

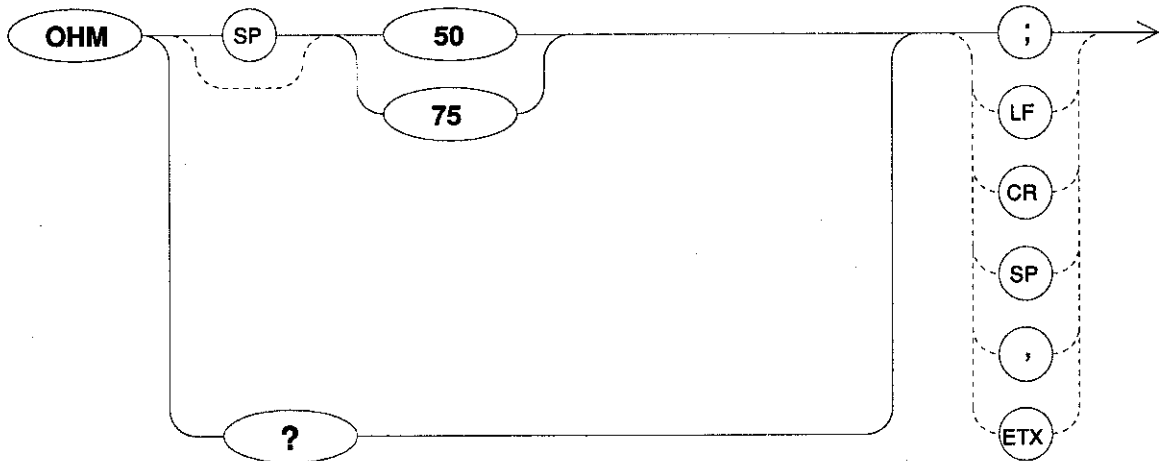


#### Query Response

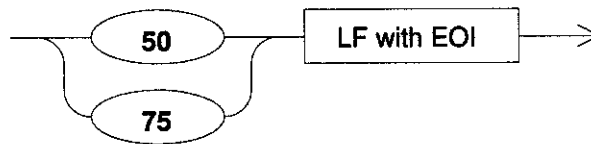


## OHM Input Impedance

### Syntax



### Query Response



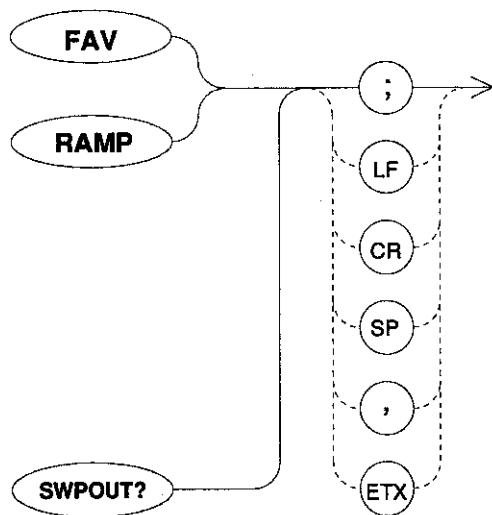
### Parameters

- 50** Selects 50 ohm of input impedance.
- 75** Selects 75 ohm of input impedance.

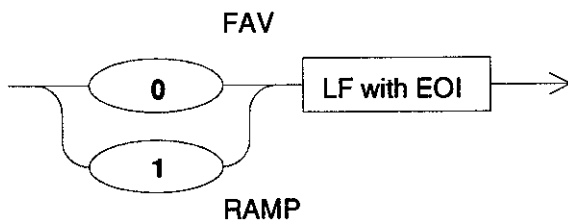
## FAV / RAMP / SWPOUT?

### Sweep Output

#### Syntax



#### Query Response

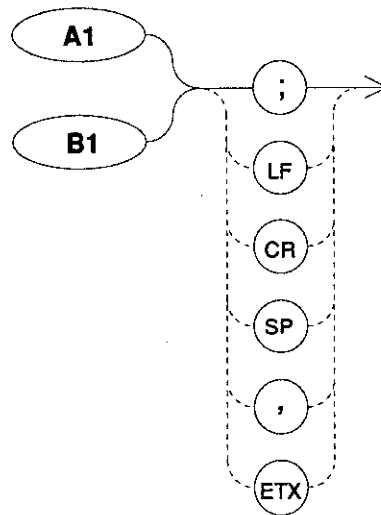


#### Parameters

- FAV** Voltage about  $2V/N$  ( $N$ :mixing degree) per 1GHz in proportion to the sweep frequency is output.
- RAMP** Sweep Voltage from -5V to +5V is output.

## A1 / B1 Clear Write Trace A or Trace B

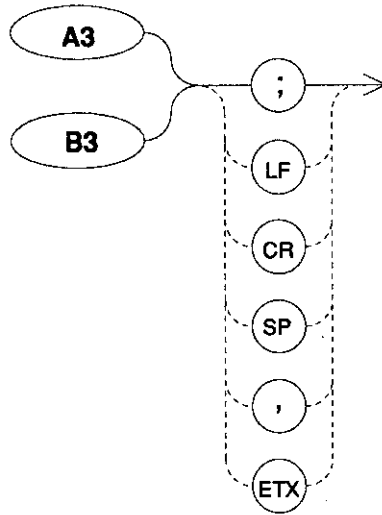
### Syntax



## A3 / B3

### View Trace A or Trace B

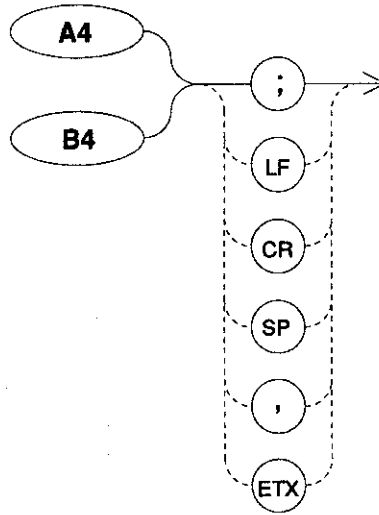
#### Syntax





## A4 / B4 Blank Trace A or Trace B

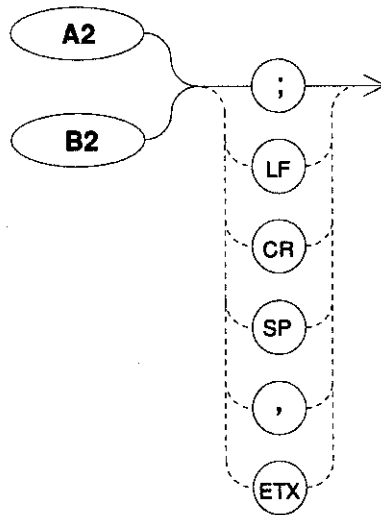
### Syntax



## A2 / B2

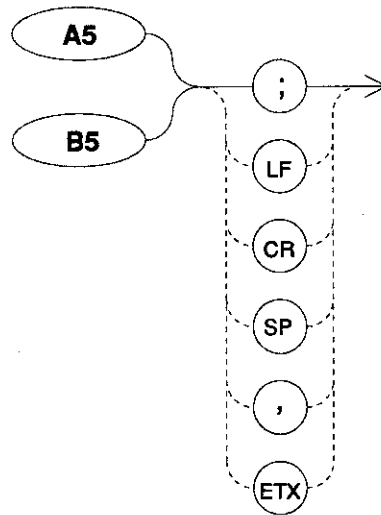
### Maximum Hold Trace A or Trace B

#### Syntax



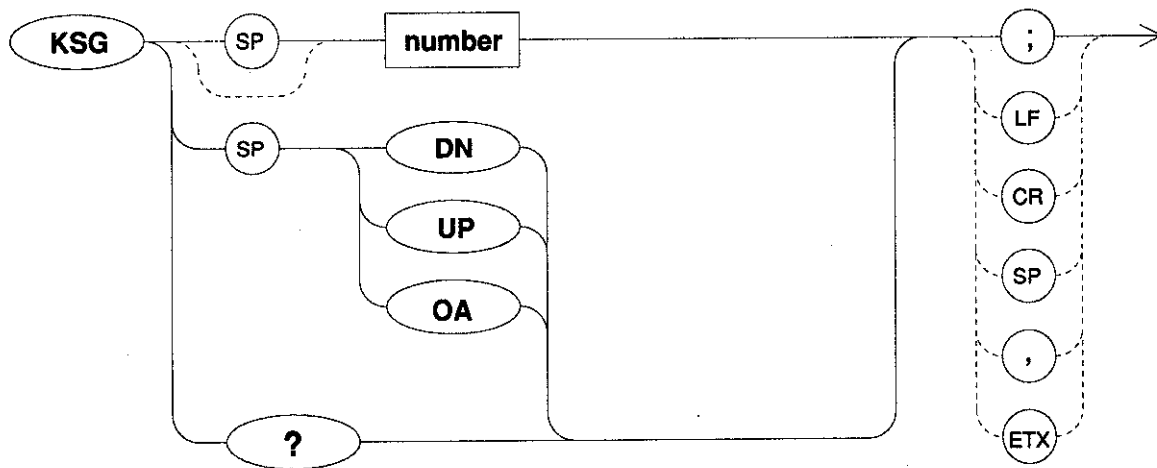
## A5 / B5 Minimum Hold Trace A or Trace B

### Syntax



## KSG Video Averaging On (Trace A)

### Syntax



### Query Response



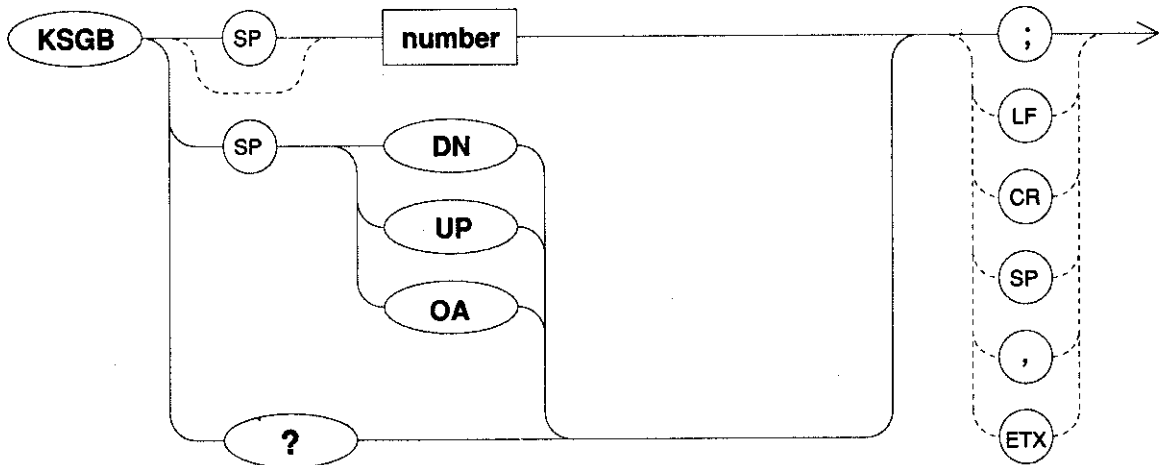
### Example

```
10 INPUT "ENTER DESIRED AVERAGING TIME",Tim$
20 OUTPUT 708;"KSG ";Tim$;" "
30 END
```

## KSGB

### Video Averaging On (Trace B)

#### Syntax



#### Query Response

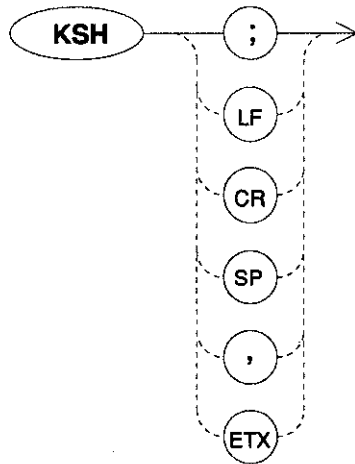


#### Example

```
10 INPUT "ENTER DESIRED AVERAGING TIME",Tim$
20 OUTPUT 708;"KSGB ";Tim$;" ";
30 END
```

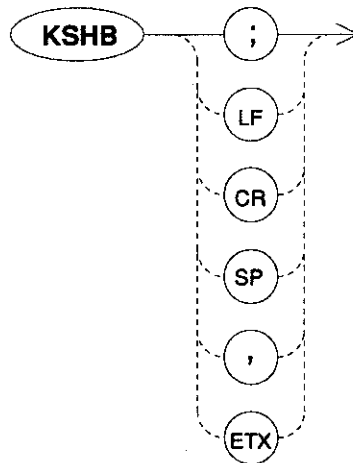
## KSH Video Averaging Off (Trace A)

### Syntax



## KSHB Video Averaging Off (Trace B)

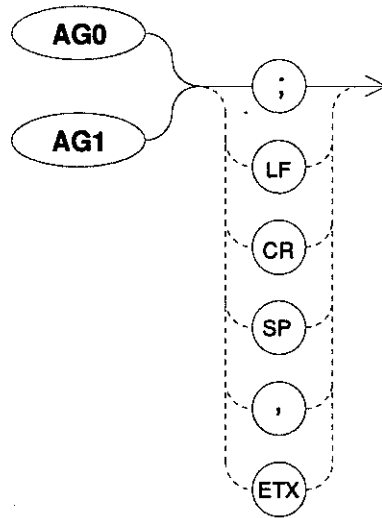
### Syntax



## AG0 / AG1

### Averaging Trace A is Continue Mode / Complete Mode

#### Syntax



#### Parameters

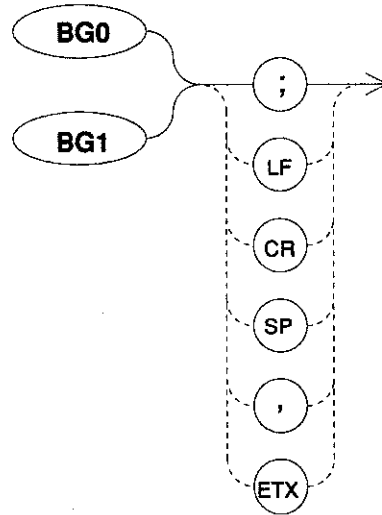
- AG0** Averaging operation is continued by the calculation mode 2 after the specified number of times are complete.
- AG1** After the specified number of times of averaging is complete, trace is automatically set to view mode and the averaging is canceled.



## BG0 / BG1

### Averaging Trace B is Continue Mode / Complete Mode

#### Syntax



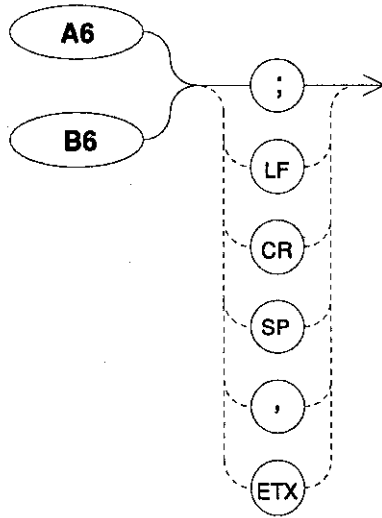
#### Parameters

- BG0** Averaging operation is continued by the calculation mode 2 after the specified number of times are complete.
- BG1** After the specified number of times of averaging is complete, trace is automatically set to view mode and the averaging is canceled.

## A6 / B6

### Normalize Trace A or Trace B

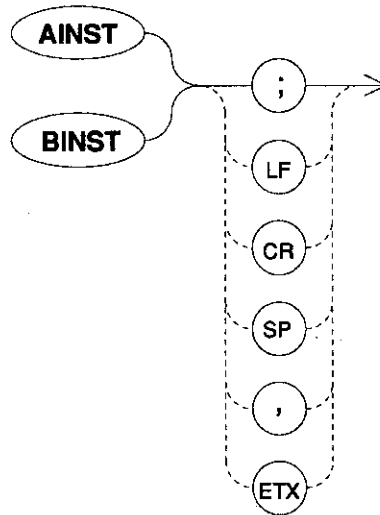
#### Syntax



## AINST / BINST

### Instant Normalize Trace A or Trace B

#### Syntax



#### Comments

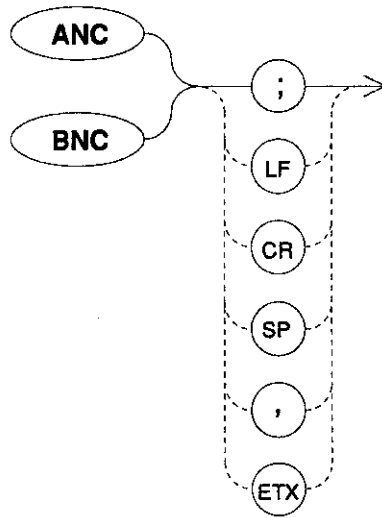
Executes a series of following operations.

- (1) A display line appear almost at the center point between the signal maximum point and minimum point.
- (2) The current trace A or B is saved as correction data into memory.
- (3) The normalize function is set to on.

## ANC / BNC

### Save Normalize Correction Data Trace A or Trace B

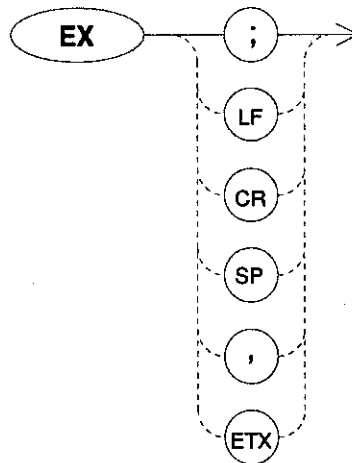
#### Syntax



# EX

## Trace A Exchange Trace B

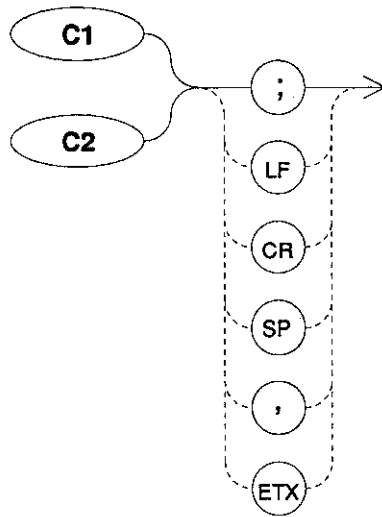
### Syntax



## C1 / C2

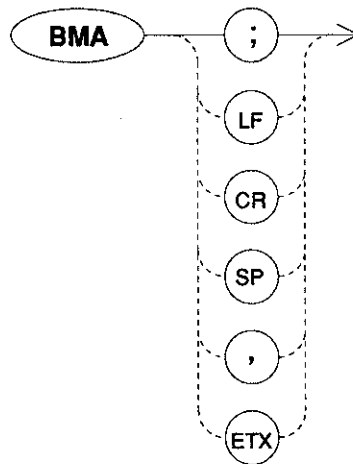
### Trace A Minus Trace B Off / On

#### Syntax



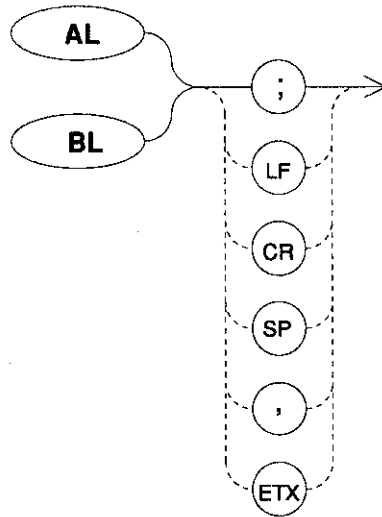
## BMA Trace B Minus Trace A

### Syntax



## AL / BL Trace A or Trace B Minus Display Line

### Syntax

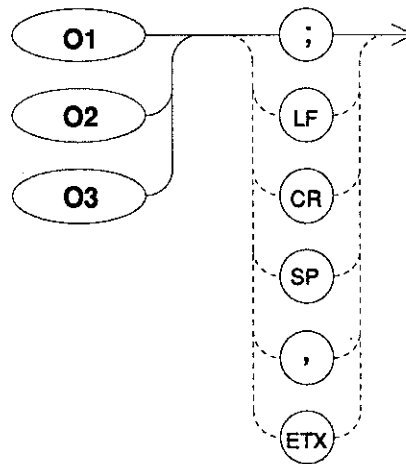




## O1 / O2 / O3

### Output Data Format (Trace and Marker Data)

#### Syntax



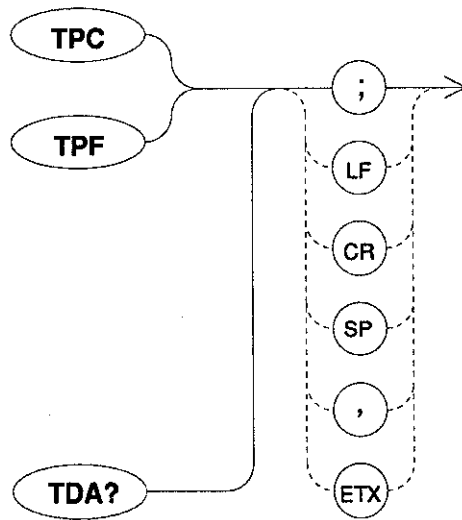
#### Parameters

- O1** Decimal values 0 to 4095. Decimal values for amplitude (y) is referenced from the lower left corner of the graticule (0,0). (only the trace data)
- O2** Binary values in two 8 bit bytes. (only the trace data)
- O3** Decimal value in Hz, dB, volts or seconds. (only the marker data)

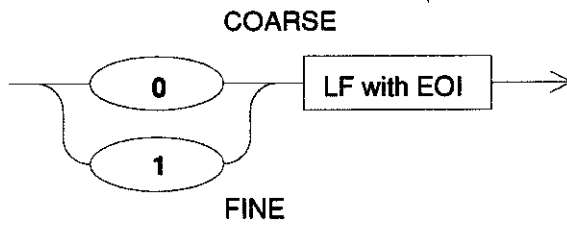
## TPC / TPF / TDA?

### Trace Accuracy Coarse / Fine / Trace Accuracy ?

#### Syntax



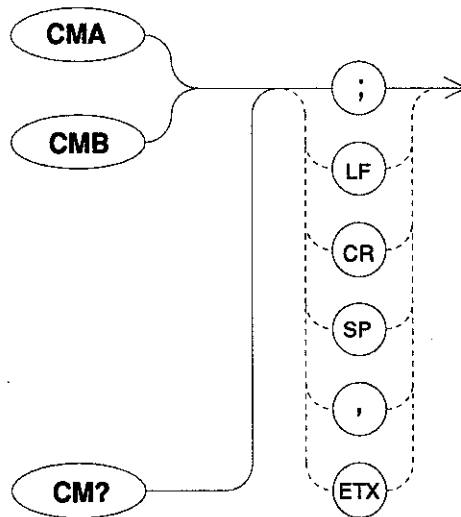
#### Query Response



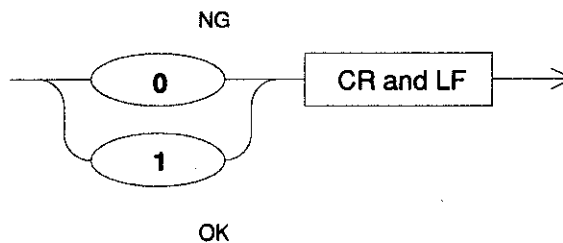
## CMA / CMB / CM?

### GO/NG Decision for Trace A or Trace B / Results?

#### Syntax



#### Query Response

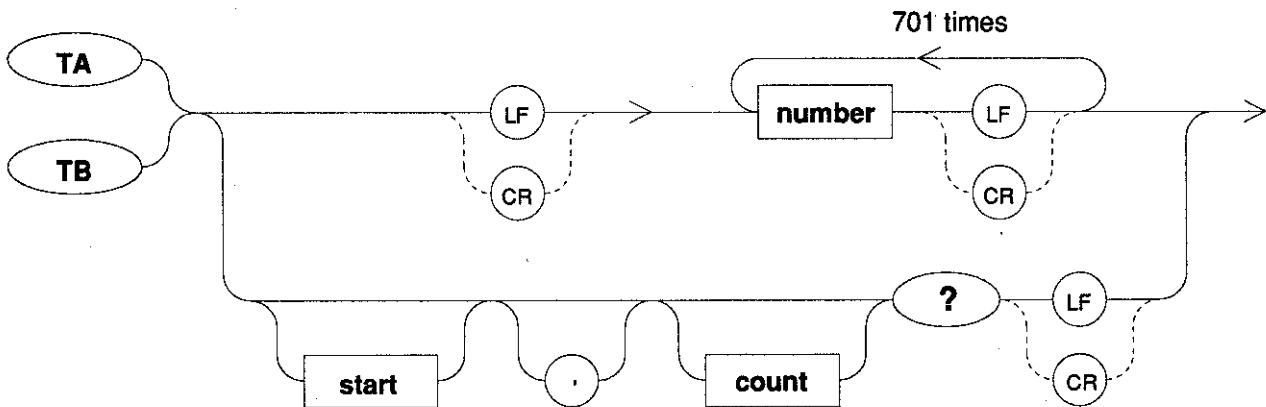


#### Example

```
10 OUTPUT 708,"FA 30MZ;FB 1GZ;KSC;RL 47DB;"
20 OUTPUT 708,"WFA 100MZ;WFB 500MZ;WUL 42DB;WLL 25DB;"
30 OUTPUT 708,"KSa;A2;"
40 FOR I=0 TO 50
50   OUTPUT 708,"TS;"
60 NEXT I
70 OUTPUT 708,"CMA;CM?;"
80 ENTER 708;Judge
90 IF Judge=0 THEN
100   PRINT "TRACE JUDGEMENT ... NO GOOD !!"
110 ELSE
120   PRINT "TRACE JUDGEMENT ... GOOD !!"
130 END IF
140 BEEP
150 END
```

**TA / TB (ascii format)**  
**Trace Data Input/Output (ascii format)**

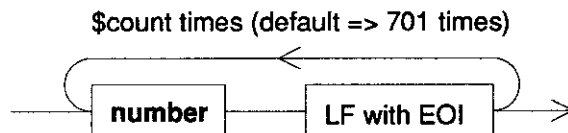
**Syntax**



**Parameters**

- start**            Start position of output trace data (0~700).
- count**            Output trace counter (start + count <= 701).

**Query Response**



**Example**

i) *HP200,300 series (input trace data)*

```

10  A=0
20  St=3.14/100
30  OUTPUT 708;"O1;TPC;A4;TA;"
40  FOR I=0 TO 700
50    N=INT(SIN(A)*200)+200
60    A=A+St
70    OUTPUT 708;N
80  NEXT I
90  OUTPUT 708;"A3"
100 BEEP
110 END

```

ii) *HP200,300 series (output trace data)*

```

10  INTEGER Tr(701)
20  !
30  CONTROL 1,12;1

```

R3265/3271 OPT73  
GPIB COMMAND EXPANSION  
INSTRUCTION MANUAL

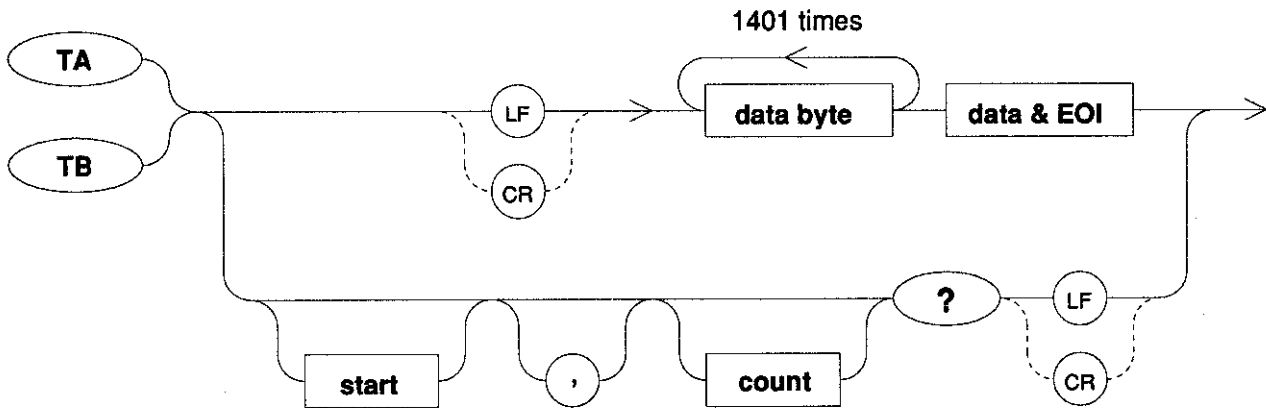
2.3 Programming Commands

---

```
40  GINIT
50  GRAPHICS ON
60  GCLEAR
70  OUTPUT 708;"O1;TPC;TA?;"
80  FOR I=0 TO 700
90    ENTER 708;Tr(I)
100 NEXT I
110 VIEWPORT 10,120,15,90
120 WINDOW 0,700,0,400
130 GRID 70,40,0,0,10,10,40
140 MOVE 0,Tr(0)
150 FOR I=1 TO 700
160   DRAW I,Tr(I)
170 NEXT I
180 BEEP
190 END
```

**TA / TB** (binary format)  
**Trace Data Input/Output** (binary format)

**Syntax**



**Parameters**

- start** Start position of output trace data (0~700).
- count** Output trace counter (start+count <= 701).

**Query Response**

(\$count x 2 - 1) times (default => 1401 times)



**Example**

i) HP200,300 series (input trace data)

```

10  INTEGER Tr(701)
20  !
30  A=0
40  St=3.14/100
50  OUTPUT 708;"O2;TPC;B4;TB;"
60  FOR I=0 TO 700
70    Tr(I)=INT(COS(A)*200)+200
80    A=A+St
90  NEXT I
100 OUTPUT 708 USING "#,W";Tr(*),END
110 OUTPUT 708;"B3;"
120 BEEP
130 END

```

ii) HP200,300 series (input trace data)

```

10  INTEGER Tr(701)

```

R3265/3271 OPT73  
GPIB COMMAND EXPANSION  
INSTRUCTION MANUAL

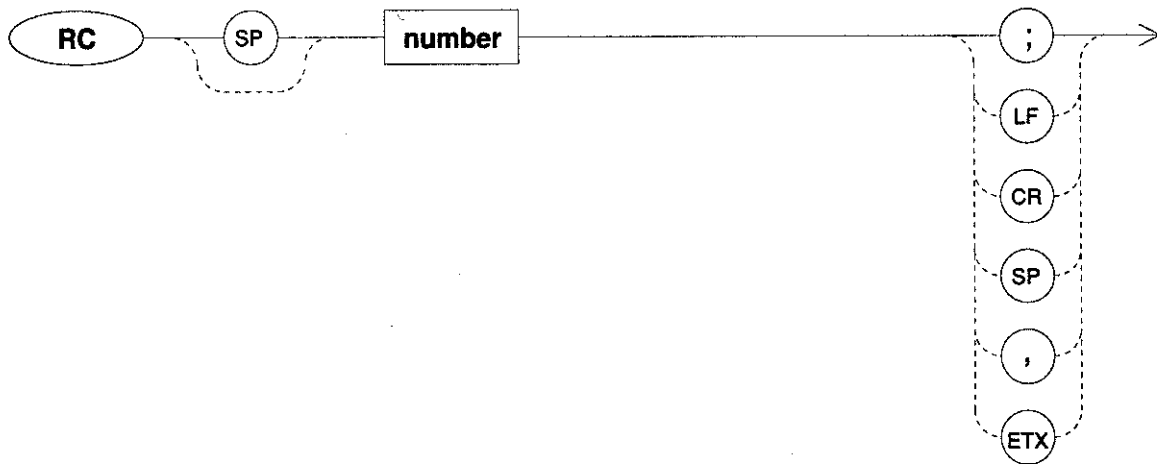
2.3 Programming Commands

---

```
20  !
30  GINIT
40  GRAPHICS ON
50  CONTROL 1,12;1
60  VIEWPORT 10,120,15,90
70  WINDOW 0,700,0,400
80  GRID 70,40,0,0,10,10,40
90  OUTPUT 708;"O2;TPC;TB210,280?;"
100 ENTER 708 USING "%,W";Tr(*)
110 MOVE 210,Tr(I)
120 FOR I=1 TO 279
130 DRAW I+210,Tr(I)
140 NEXT I
150 BEEP
160 END
```

## RC Recall Instrument States

### Syntax



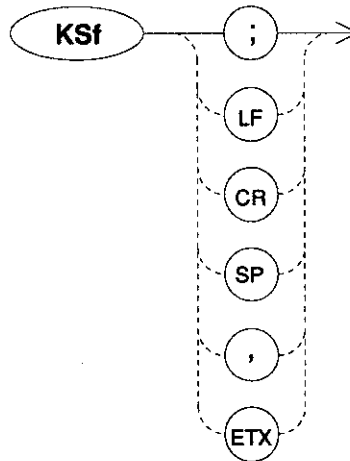
### Example

```
10 OUTPUT 708;"SV 3;"  
20 OUTPUT 708;"IP;"  
30 OUTPUT 708;"RC 3;"  
40 END
```



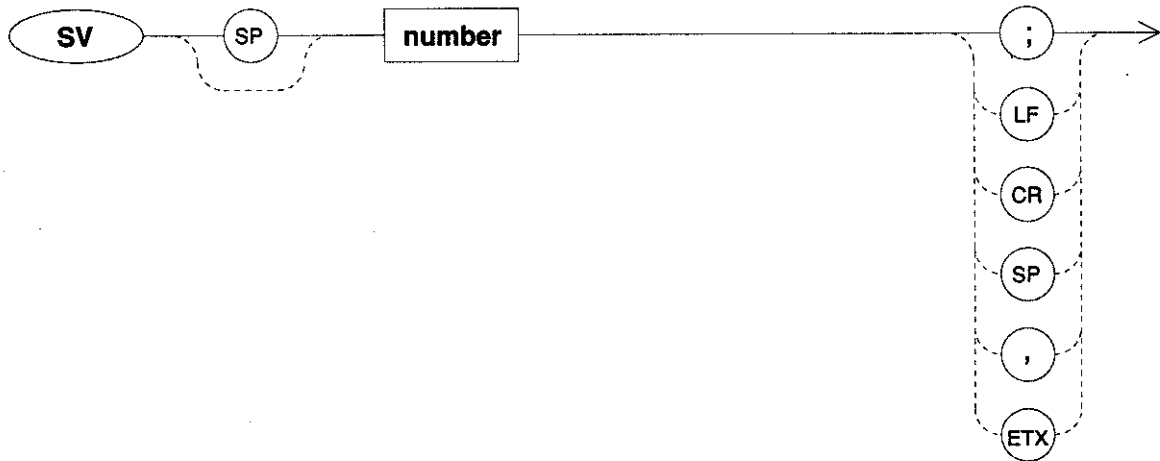
## KSf Power On in Last State

### Syntax



## SV Save Instrument States

### Syntax



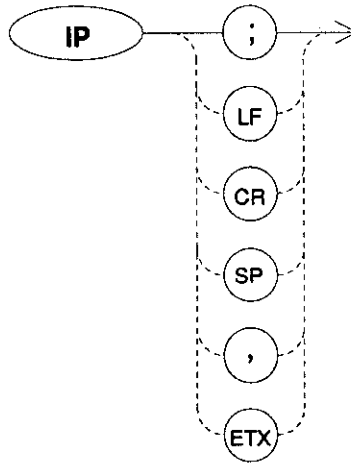
### Example

```
10 OUTPUT 708;"IP;CF 25MZ;SP 50MZ;"  
20 OUTPUT 708;"SV 5;"  
30 END
```

# IP

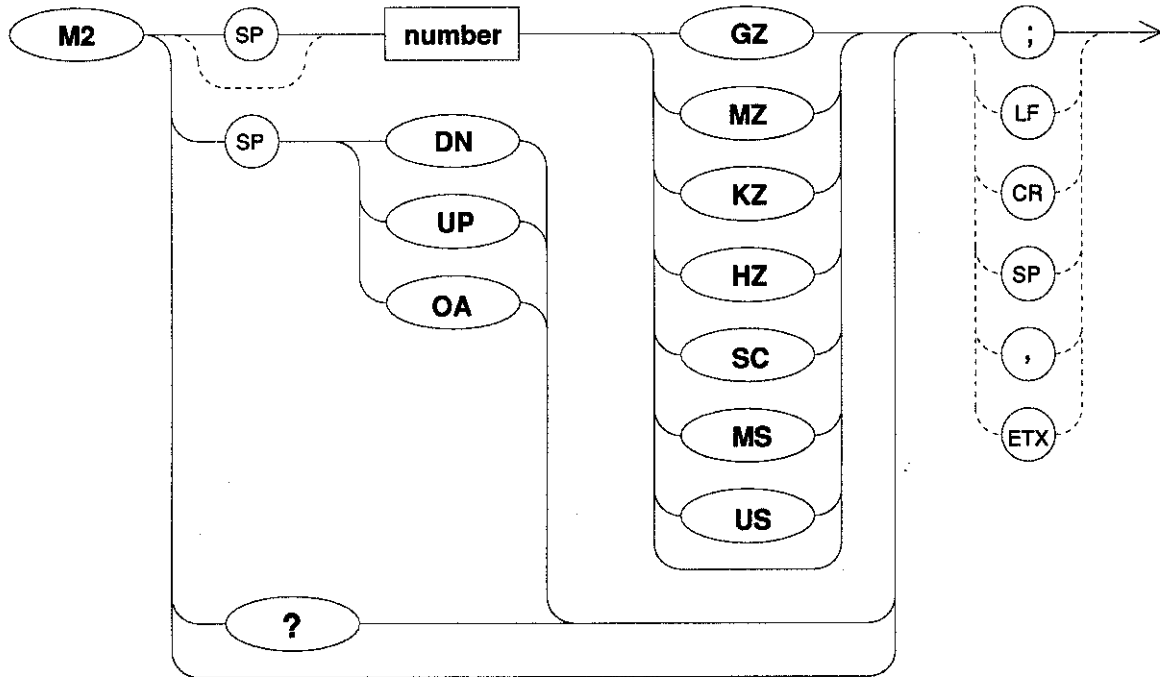
## Instrument Preset

### Syntax

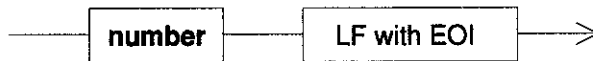


## M2 Marker Normal

### Syntax



### Query Response



### Example

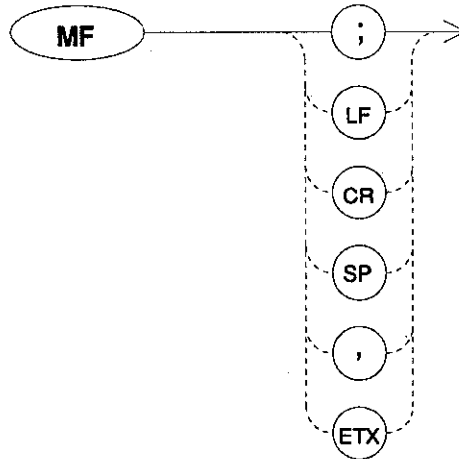
```

10 INPUT "ENTER THE START FREQUENCY",Start$
20 INPUT "ENTER THE STOP FREQUENCY",Stop$
30 OUTPUT 708;"IP;FA ";Start$;";"
40 OUTPUT 708;"FB ";Stop$;";"
50 OUTPUT 708;"TS;E1;"
60 OUTPUT 708;"M2 OA;"
70 ENTER 708;Mkr
80 PRINT "MARKER FREQUENCY IS ",Mkr,"HZ"
90 END

```

## MF Marker Frequency Output

### Syntax



### Query Response

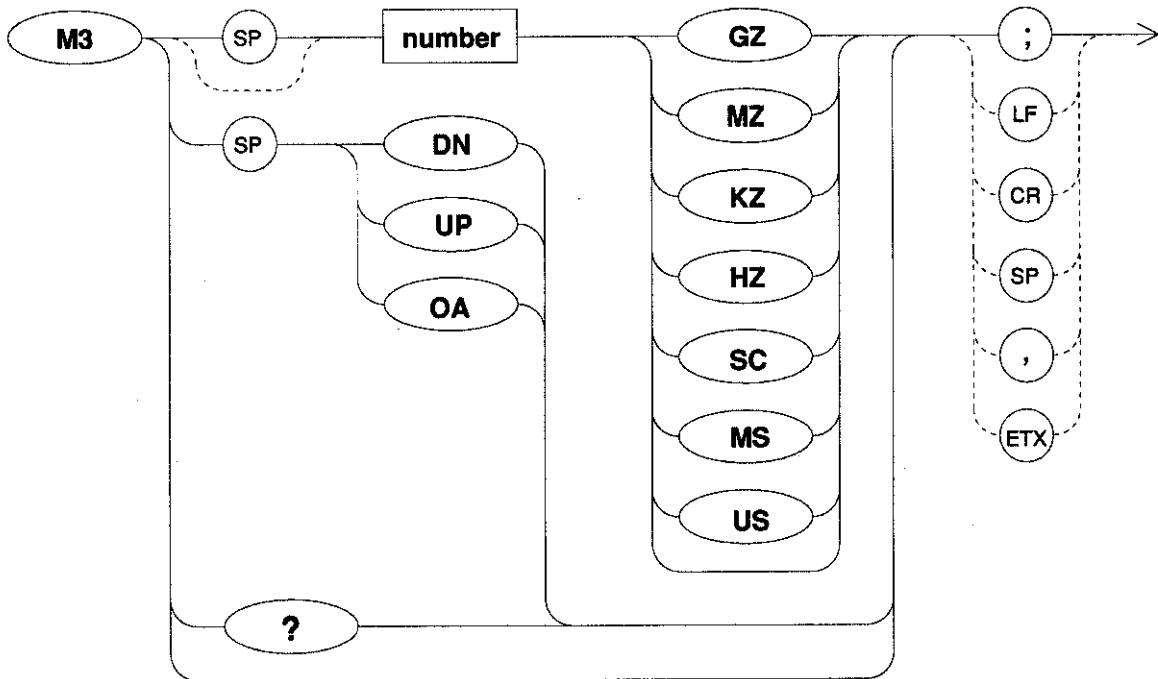


### Example

```
10 OUTPUT 708;"CF 80MZ;SP 10MZ;O3;"
20 OUTPUT 708;"TS;E1;"
30 OUTPUT 708;"O3;MF;"
40 ENTER 708;Freq
50 PRINT Freq,"HZ"
60 END
```

## M3 Marker Delta

### Syntax



### Query Response

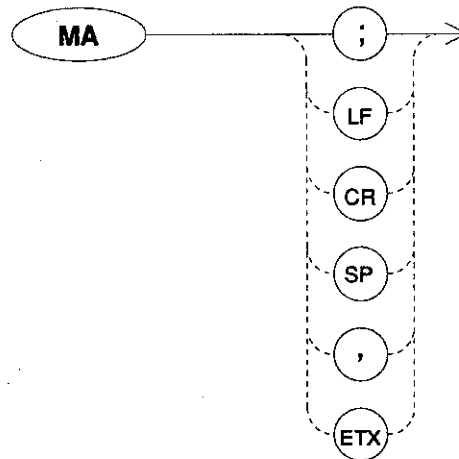


### Example

```
10 OUTPUT 708;"IP;CF 300MZ;SP 200MZ;"
20 OUTPUT 708;"E1;M3;"
30 OUTPUT 708;"KSK;OA;"
40 ENTER 708;Delta
50 PRINT Delta
60 END
```

## MA Marker Amplitude Output

### Syntax



### Query Response

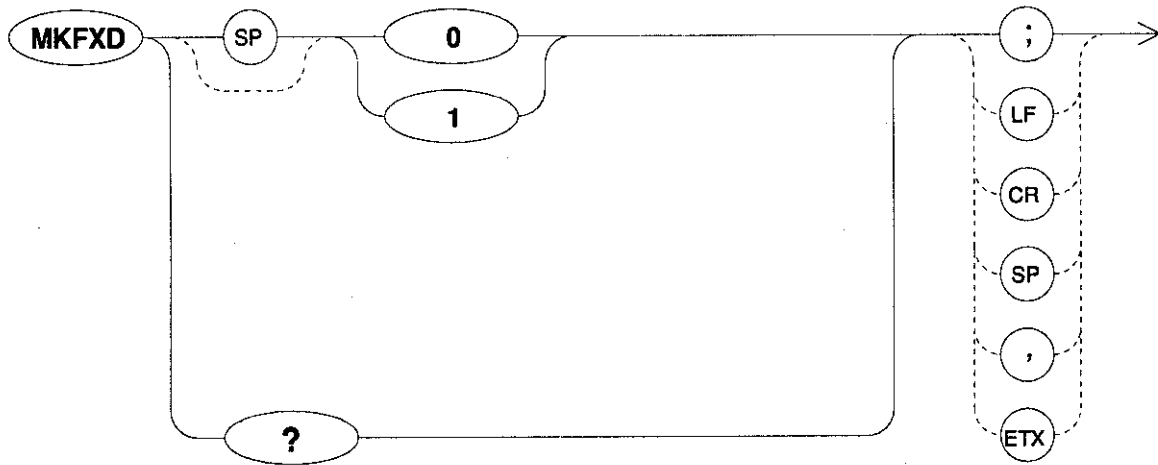


### Example

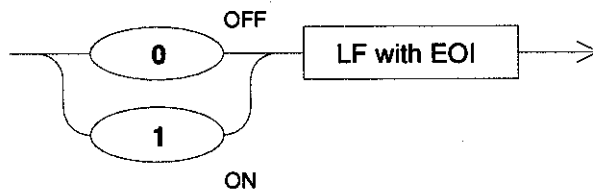
```
10 OUTPUT 708;"CF 80MZ;SP 10MZ;O3;"
20 OUTPUT 708;"TS;E1;"
30 OUTPUT 708;"MA;"
40 ENTER 708;Level
50 PRINT Level,"DB"
60 END
```

# MKFXD Marker Fixed

## Syntax



## Query Response

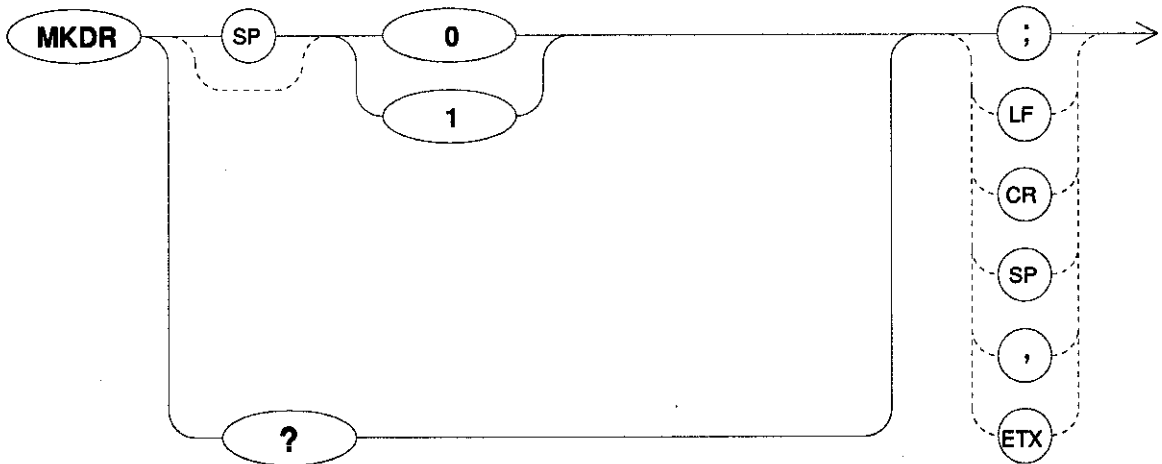




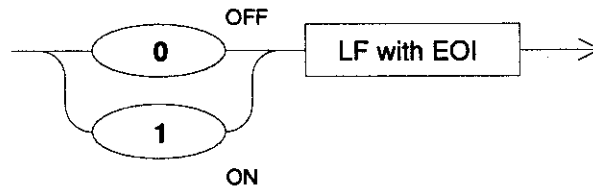
# MKDR

## Reciprocal of Marker Delta

### Syntax

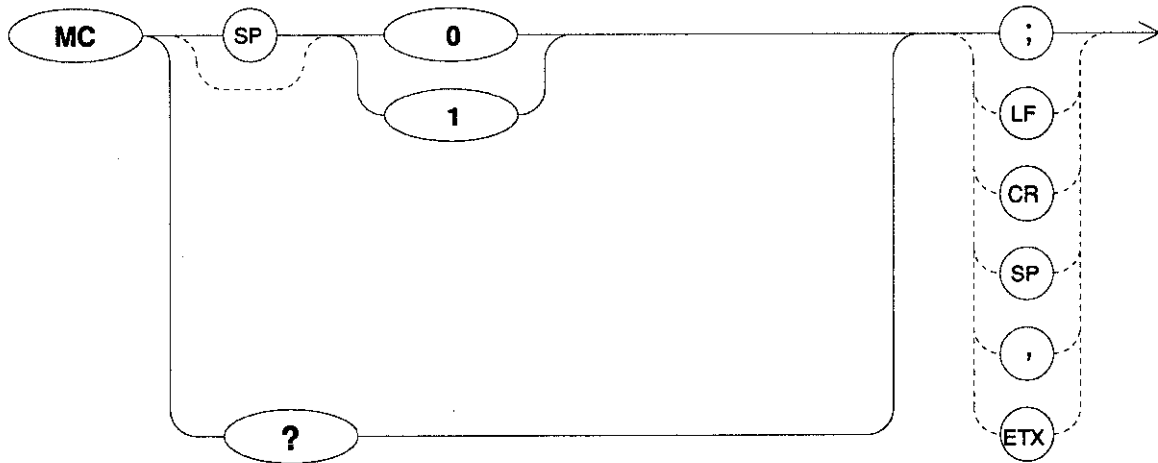


### Query Response

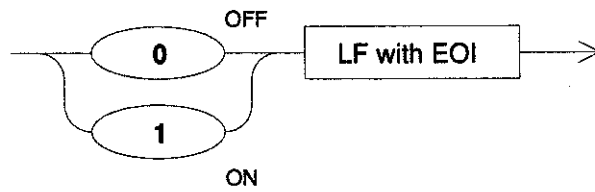


## MC Frequency Counter

### Syntax

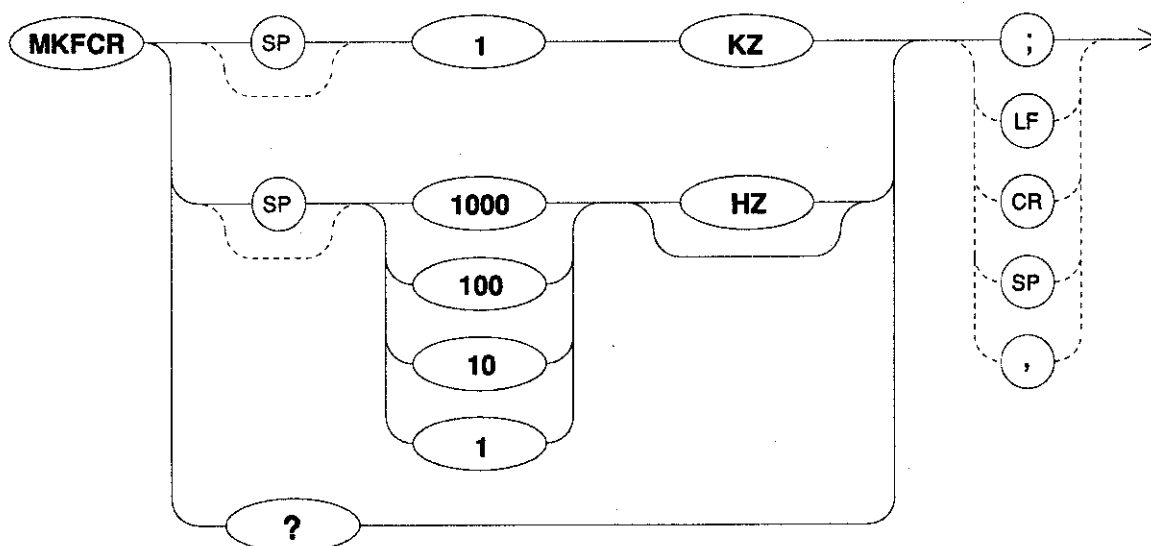


### Query Response



## MKFCR Frequency Counter Resolution

### Syntax



### Query Response



### Example

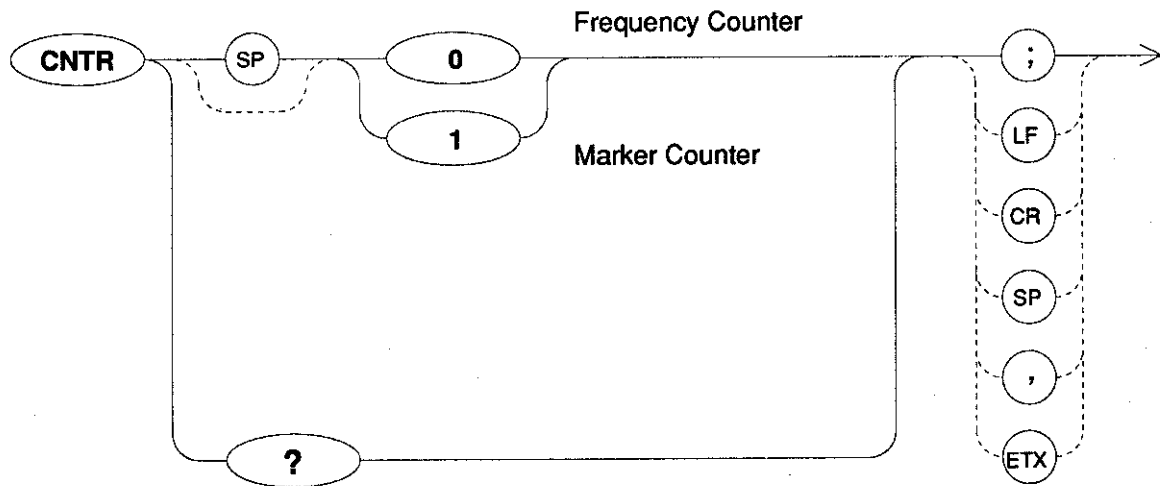
```

10 OUTPUT 708,"IP;S2;"
20 INPUT "ENTER THE CENTER FREQUENCY, IN MHZ",Freq
30 INPUT "ENTER THE FREQUENCY SPAN, IN MHZ",Span
40 OUTPUT 708,"CF ";Freq;"MZ;"
50 OUTPUT 708,"SP ";Span;"MZ;"
60 OUTPUT 708,"TS;E1;"
70 INPUT "ENTER THE FREQUENCY COUNTER RESOLUTION, IN HZ",Fcr
80 OUTPUT 708,"MKFCR ";Fcr;"HZ;"
90 OUTPUT 708,"TS;MKF?;"
100 ENTER 708;Freq
110 PRINT "FREQUENCY IS ";Freq
120 END

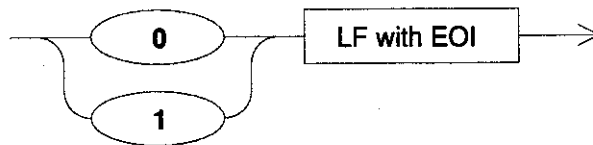
```

## CNTR Counter Mode

### Syntax

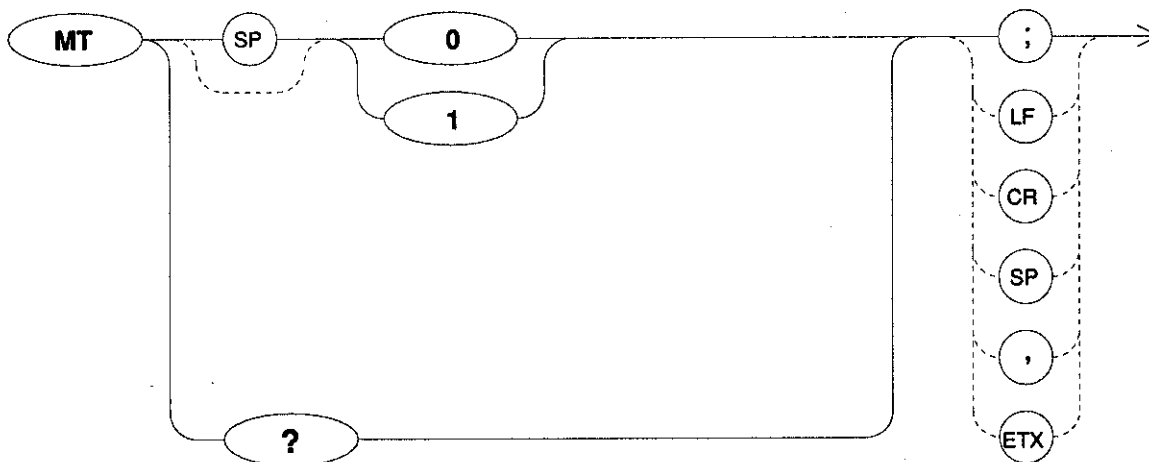


### Query Response

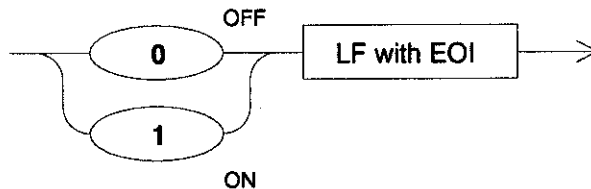


# MT Signal Track

## Syntax

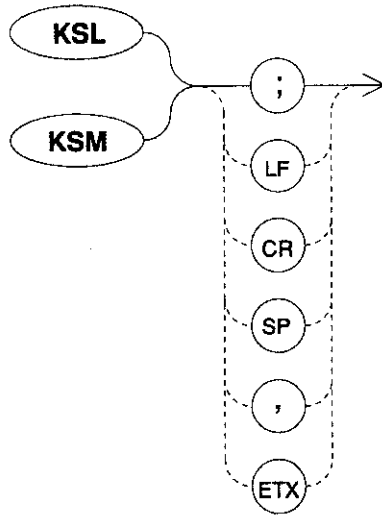


## Query Response



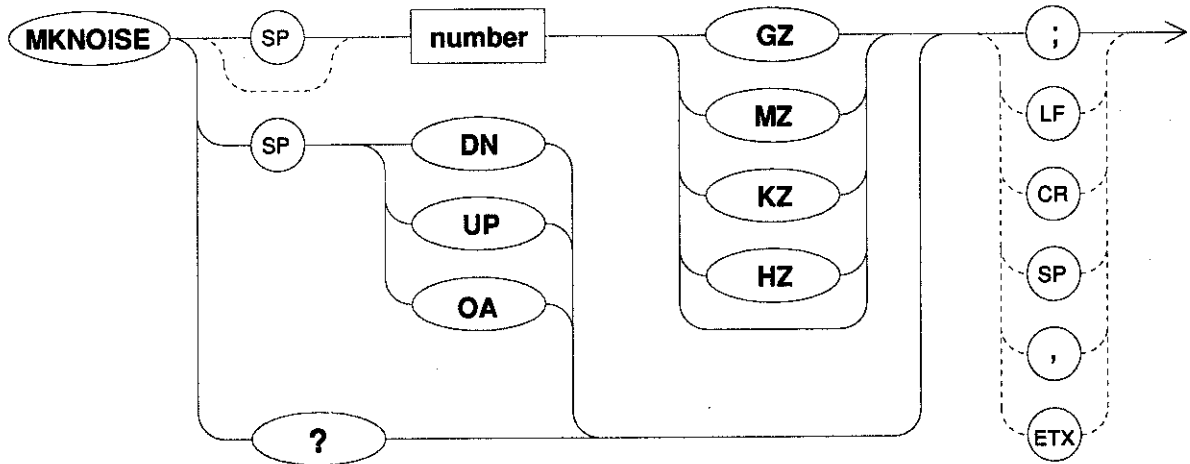
## KSL / KSM Marker Noise Off / On

### Syntax



## MKNOISE Marker Noise Bandwidth

### Syntax



### Query Response



### Example

```

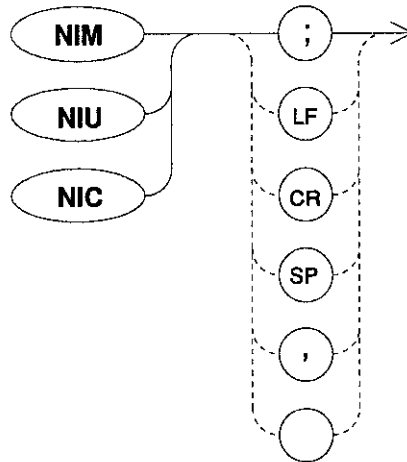
10 OUTPUT 708;"IP;CF 1MZ;SP 200KZ;RB 1KZ;"
20 OUTPUT 708;"TS;E1;"
30 OUTPUT 708;"MKNOISE 1HZ;NIM;"
40 OUTPUT 708;"M3 50KZ;TS;"
50 OUTPUT 708;"O3;MA;"
60 ENTER 708;Noise
70 PRINT Noise,"DBM/HZ"
80 END

```

## NIM / NIU / NIC

### Marker Noise in dBm/Hz / dBuV/Hz / dBc/Hz

#### Syntax



#### Example

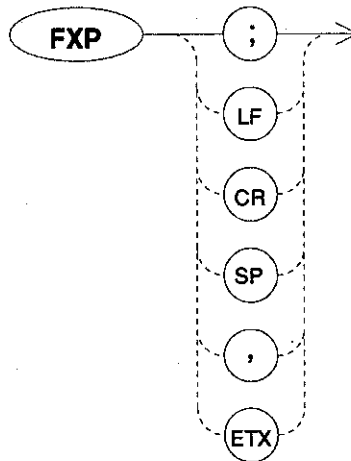
```
10 OUTPUT 708;"IP;CF 1MZ;SP 200KZ;RB 1KZ;"
20 OUTPUT 708;"TS;E1;"
30 OUTPUT 708;"MKNOISE 1HZ;NIM;"
40 OUTPUT 708;"M3 50KZ;TS;"
50 OUTPUT 708;"O3;MA;"
60 ENTER 708;Noise
70 PRINT Noise,"DBM/HZ"
80 END
```



# FXP

## Fixed Marker Peak

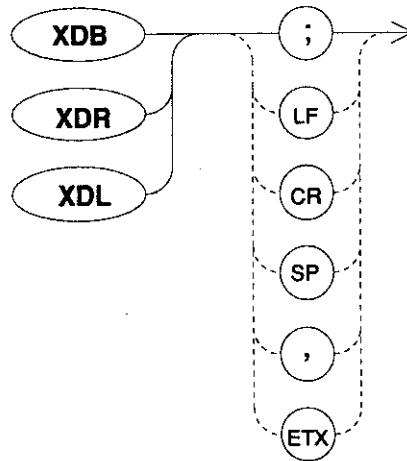
### Syntax



## XDB / XDR / XDL

X dB Down / X dB Down Right / X dB Down Left

### Syntax

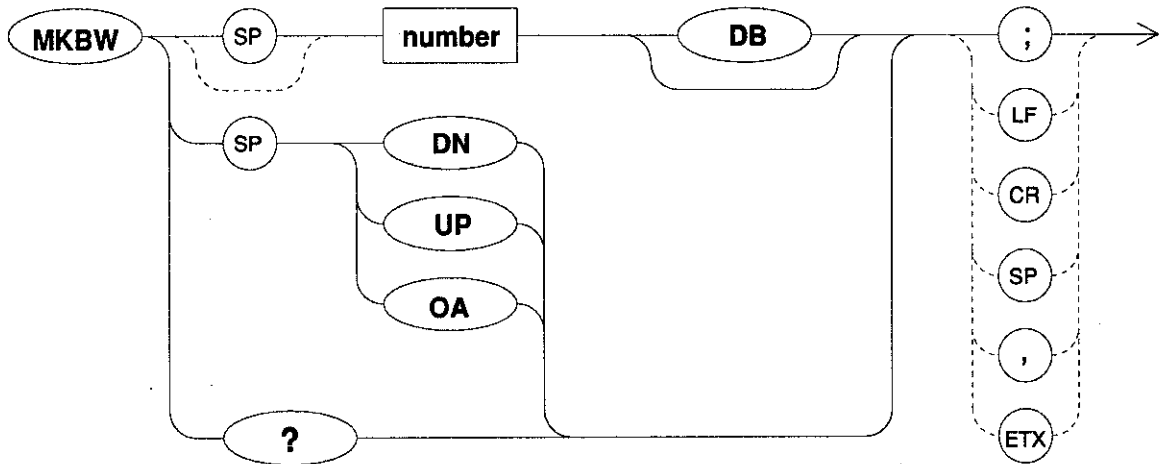


### Example

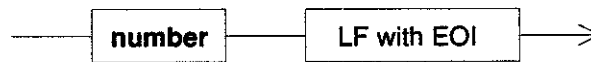
```
10 OUTPUT 708;"IP;CF 21.5MZ;SP 1MZ;RB 300KZ;VB 100HZ;"
20 OUTPUT 708;"TS;E1;MKBW 6DB;XDB;"
30 OUTPUT 708;"O3;MF;"
40 ENTER 708;Freq
50 PRINT Freq
60 END
```

## MKBW X dB Down Bandwidth

### Syntax



### Query Response



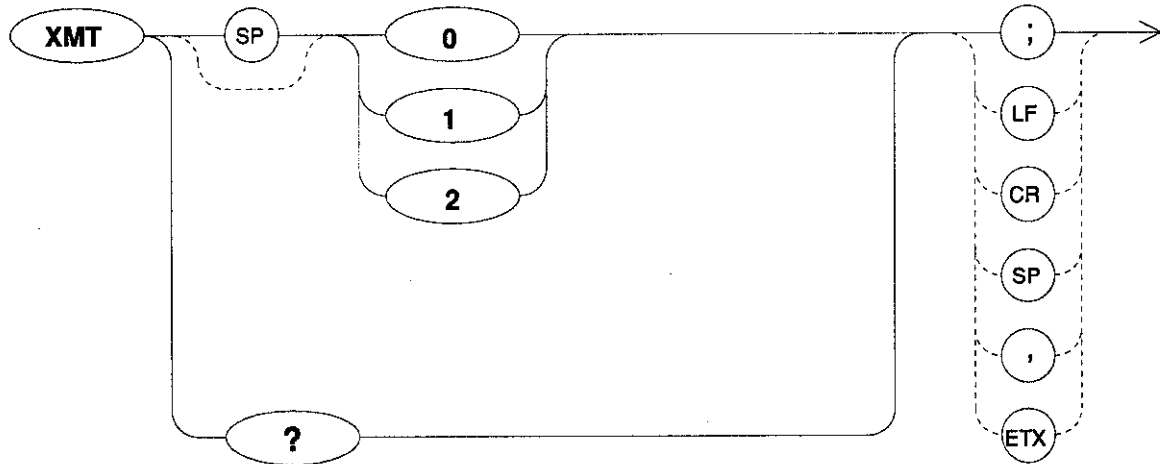
### Example

```
10 OUTPUT 708;"IP;CF 21.5MZ;SP 1MZ;RB 300KZ;VB 100HZ;"
20 OUTPUT 708;"TS;E1;MKBW 6DB;XDB;"
30 OUTPUT 708;"O3;MF;"
40 ENTER 708;Freq
50 PRINT Freq
60 END
```

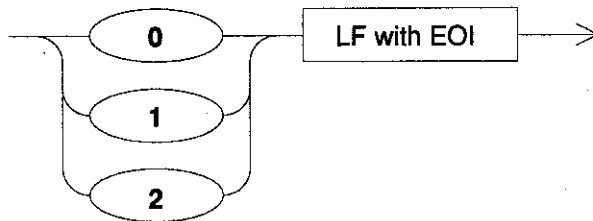
## XMT

### Marker Type of X dB Down

#### Syntax



#### Query Response

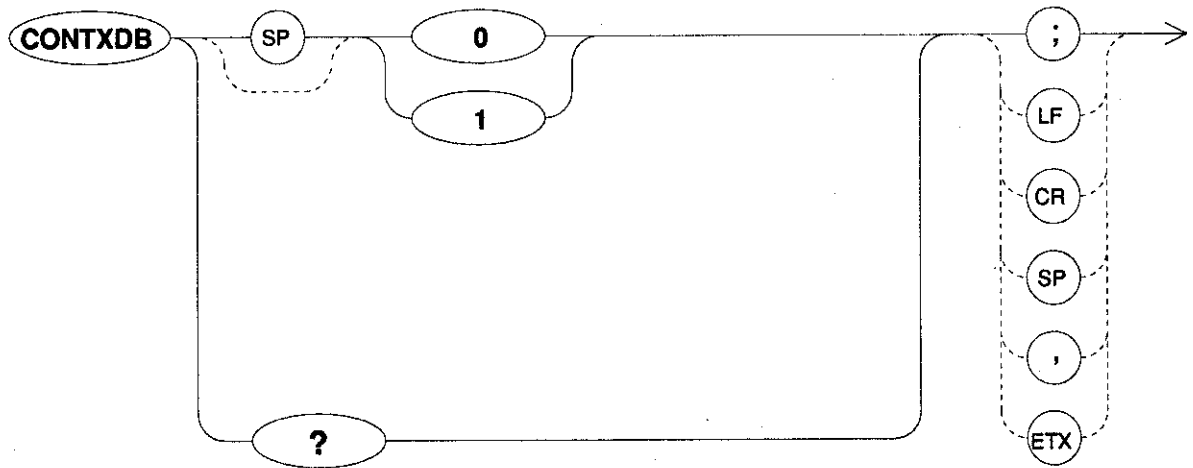


#### Parameters

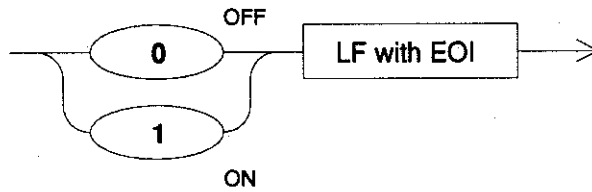
- 0 Delta marker display mode is set and relative value between the two markers.
- 1 Normal marker display mode is set and the value of the left marker.
- 2 Normal marker display mode is set and the value of the right marker.

## CONTXDB Continuous X dB Down

### Syntax

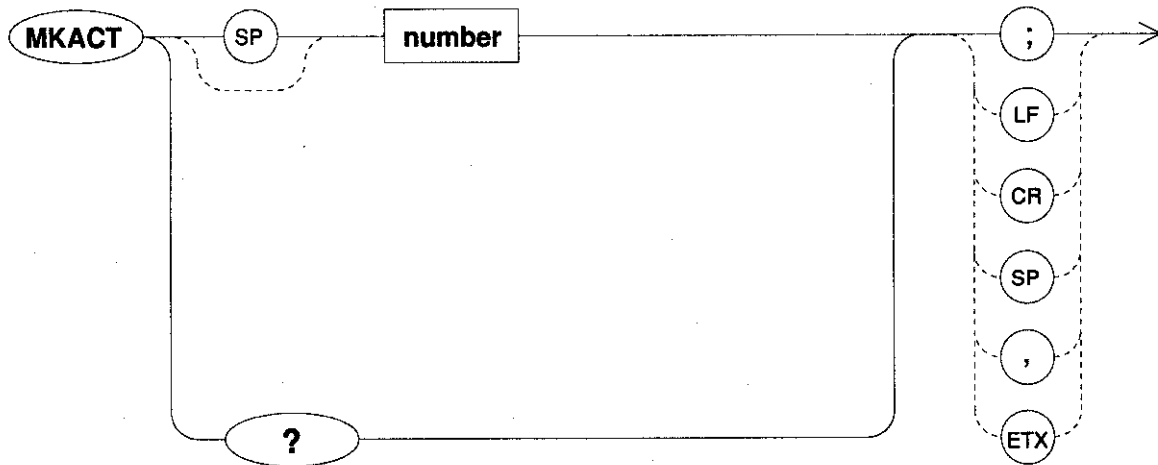


### Query Response



## MKACT Selects Active Marker

### Syntax



### Query Response



### Parameter

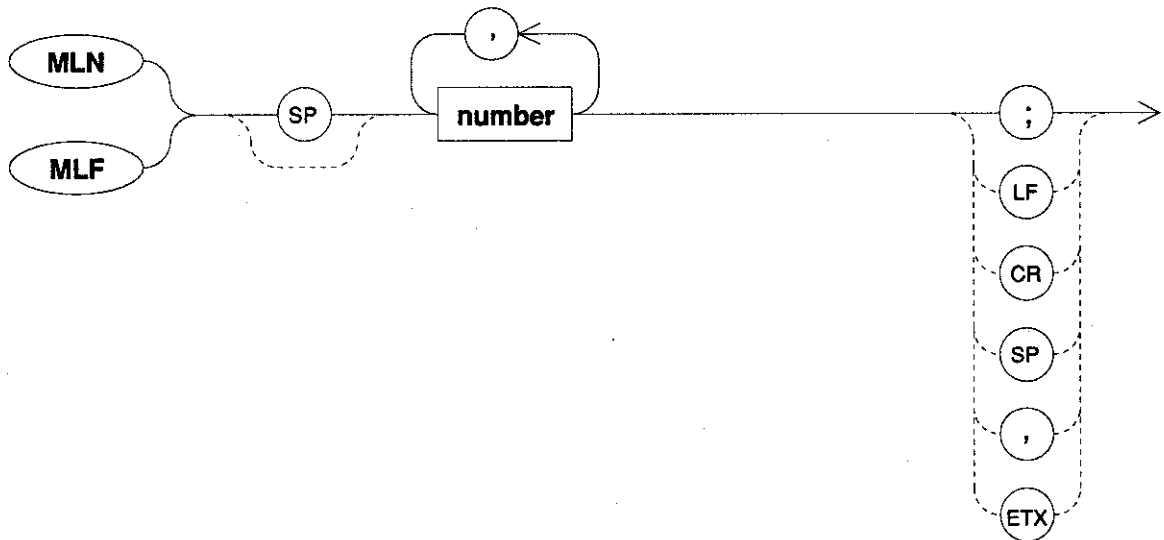
**number** Sets the marker active value from 1 to 8.

### Example

```
10 OUTPUT 708;"CF 1GZ;SP 1GZ;PKLIST1;"
20 OUTPUT 708;"MKACT3;M2?;"
30 ENTER 708;Mf$
40 PRINT "3RD PEAK FREQ = ";Mf$
50 END
```

## MLN / MLF Marker Multi On/Off

### Syntax

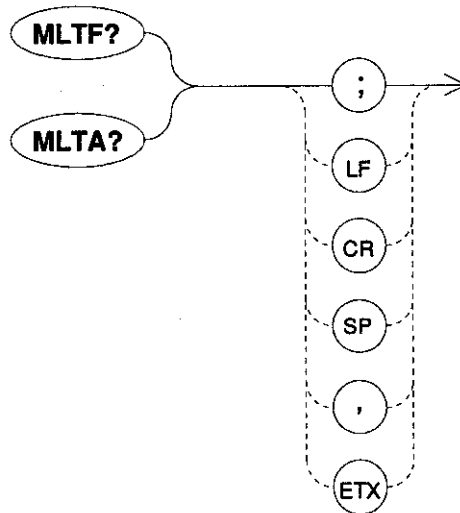


### Example

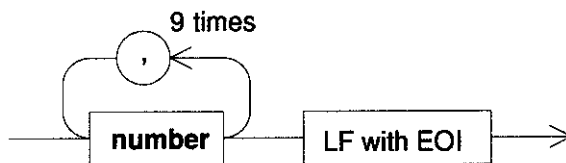
```
10 OUTPUT 708;"MLN1;UP UP UP UP;"
20 OUTPUT 708;"MLN2;UP UP UP;"
30 OUTPUT 708;"MLN3;UP UP;"
40 OUTPUT 708;"MLN4;UP;"
50 OUTPUT 708;"MLN5;"
60 OUTPUT 708;"MLN6;DN;"
70 OUTPUT 708;"MLN7;DN DN;"
80 OUTPUT 708;"MLN8;DN DN DN;"
90 OUTPUT 708;"MLTF?;"
100 ENTER 708;A,B,C,D,E,F,G,H,I
110 PRINT A,B,C,D,E,F,G,H,I
120 END
```

## MLTF? / MLTA? Marker Multi Output

### Syntax



### Query Response



### Parameters

- MLTF** Puts out frequency of all the markers (nine markers).
- MLTA** Puts out level of all the markers (nine markers).

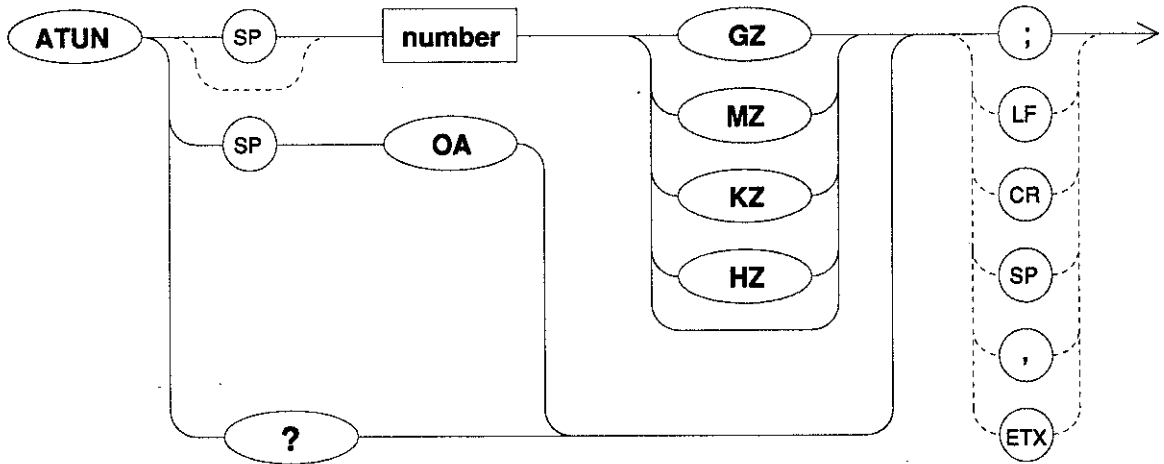
### Example

```
10 OUTPUT 708;"MLN1;UP UP UP UP;"
20 OUTPUT 708;"MLN2;UP UP UP;"
30 OUTPUT 708;"MLN3;UP UP;"
40 OUTPUT 708;"MLN4;UP;"
50 OUTPUT 708;"MLN5;"
60 OUTPUT 708;"MLN6;DN;"
70 OUTPUT 708;"MLN7;DN DN;"
80 OUTPUT 708;"MLN8;DN DN DN;"
90 OUTPUT 708;"MLTF?;"
100 ENTER 708;A,B,C,D,E,F,G,H,I
110 PRINT A,B,C,D,E,F,G,H,I
120 END
```



## ATUN Automatic Tuning

### Syntax



### Query Response

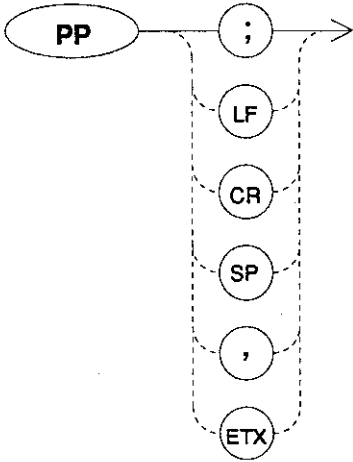


### Example

```
10 OUTPUT 708;"IP;"  
20 OUTPUT 708;"ATUN 200KZ;"  
30 END
```

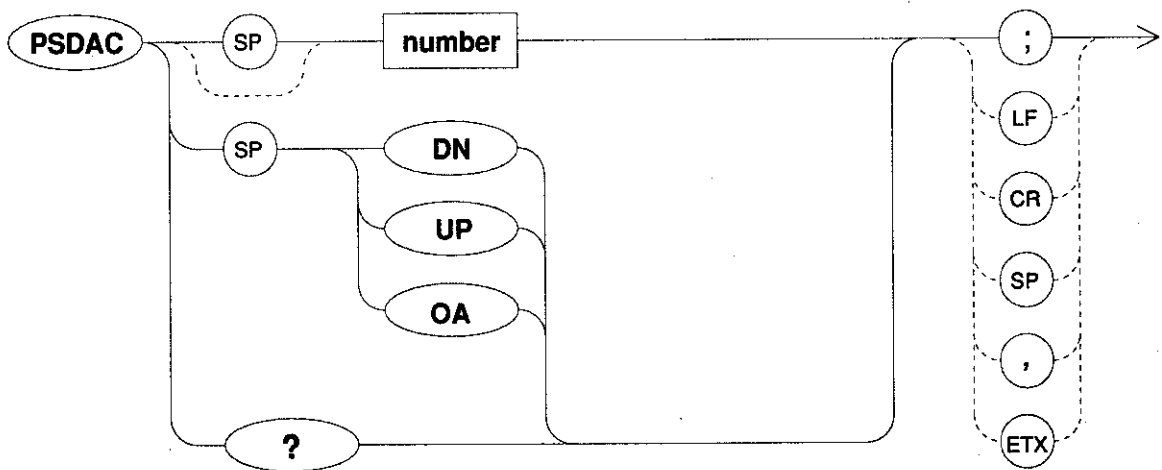
**PP**  
**Preselector Peak**

**Syntax**



## PSDAC Preselector DAC Number

### Syntax



### Query Response

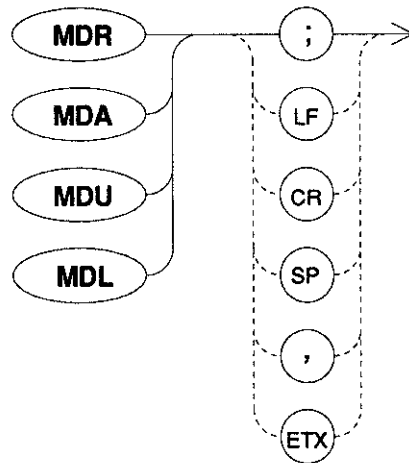


### Example

```
10 OUTPUT 708,"IP;"
20 OUTPUT 708,"CF 4GHZ;SP 200KZ;"
30 OUTPUT 708,"TS;E1;E2;TS;PP;"
40 OUTPUT 708,"PSDAC OA;"
50 ENTER 708;Pre_peak
60 PRINT "PRESELECTOR PEAK NUMBER IS",Pre_peak
70 END
```

## MDR / MDA / MDU / MDL Marker Display

### Syntax

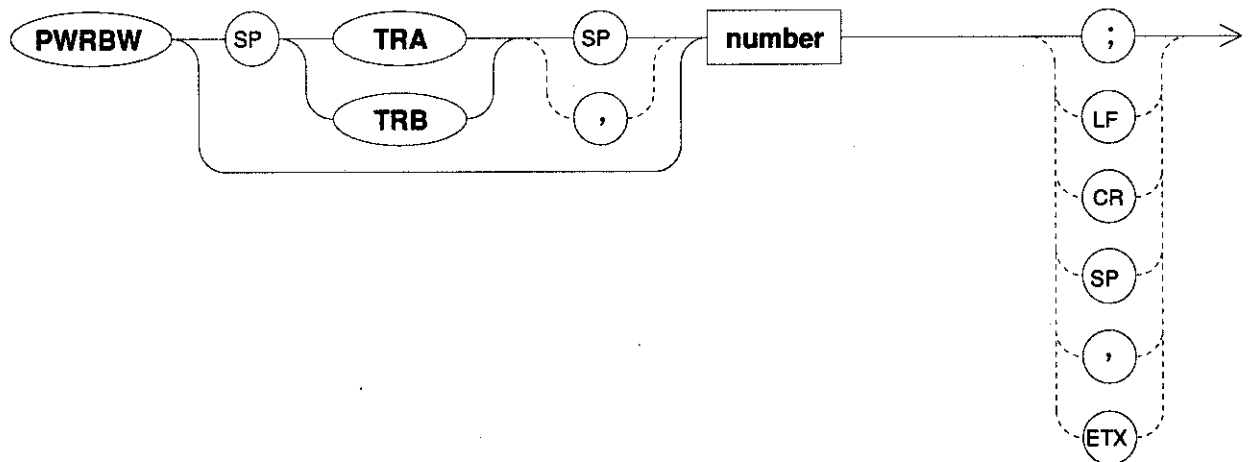


### Parameters

- |            |  |
|------------|--|
| <b>MDR</b> | The difference in the level of the display line with the marker is displayed relatively. |
| <b>MDA</b> | The Marker level is displayed independently of the display line.                         |
| <b>MDU</b> | Data appear at the upper right.  |
| <b>MDL</b> | Data appear at the lower right.  |

## PWRBW Trace Power Bandwidth

### Syntax



### Query Response

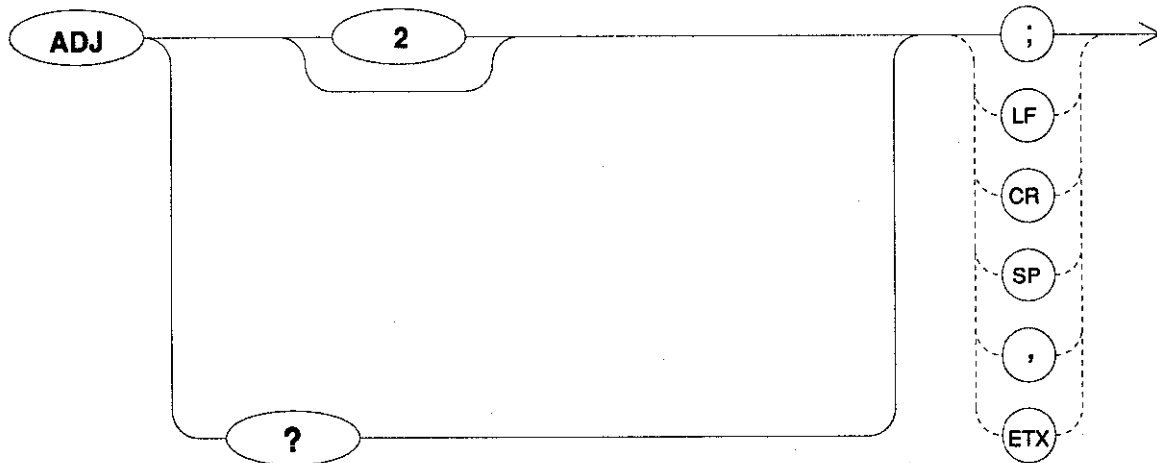


### Example

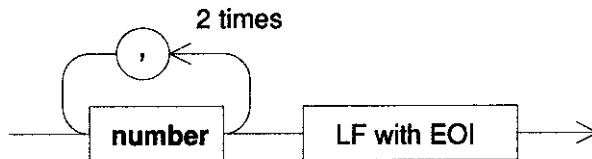
```
10 OUTPUT 708;"IP;CF 902MZ;SP 50KZ;RB 300HZ;"
20 OUTPUT 708;"KSE;TS;"
30 OUTPUT 708;"PWRBW 99.0?;"
40 ENTER 708;wid
50 PRINT "THE POWER BANDWIDTH AT 99 % IS",wid/1000,"KZ"
60 END
```

## ADJ Adjacent Channel Leak Power

### Syntax



### Query Response



### Parameter

- 2 The leak power is calculated automatically.

### Example

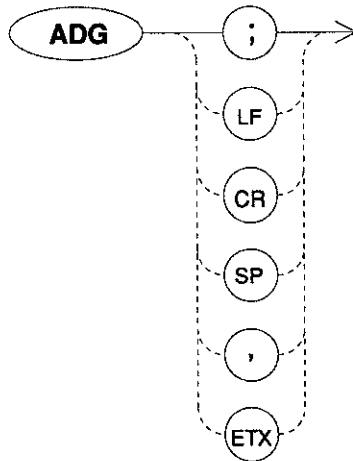
```

10 OUTPUT 708;"IP;DGTLIF 0;CF 902MZ;SP 50KZ;RB 100HZ;"
20 OUTPUT 708;"KSE;TS;"
30 OUTPUT 708;"M2 902MZ;"
40 OUTPUT 708;"ADJCH 12.5KZ;ADJBW 8.5KZ;"
50 OUTPUT 708;"ADJ;"
60 OUTPUT 708;"ADJ?;"
70 ENTER 708;Up,Low
80 PRINT "UPPER ADJ IS ",Up,"DB"
90 PRINT "LOWER ADJ IS ",Low,"DB"
100 END

```

## ADG Adjacent Channel Leak Power Graph

### Syntax



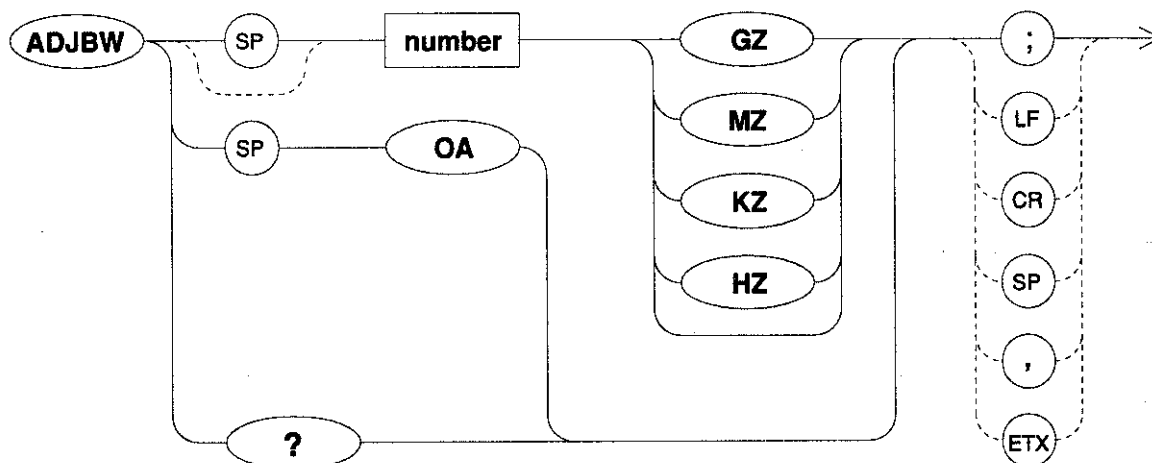
### Comment

The leak power is calculated at the every frequency point on the screen and results appear as a graph.

## ADJBW

### Specified Bandwidth of Adjacent Channel Leak power

#### Syntax



#### Query Response



#### Example

```

10 OUTPUT 708;"IP;DGTLIF 0;CF 902MZ;SP 50KZ;RB 100HZ;"
20 OUTPUT 708;"KSE;TS;"
30 OUTPUT 708;"M2 902MZ;"
40 OUTPUT 708;"ADJCH 12.5KZ;ADJBW 8.5KZ;"
50 OUTPUT 708;"ADJ;"
60 OUTPUT 708;"ADJ?;"
70 ENTER 708;Up,Low
80 PRINT "UPPER ADJ IS ",Up,"DB"
90 PRINT "LOWER ADJ IS ",Low,"DB"
100 END

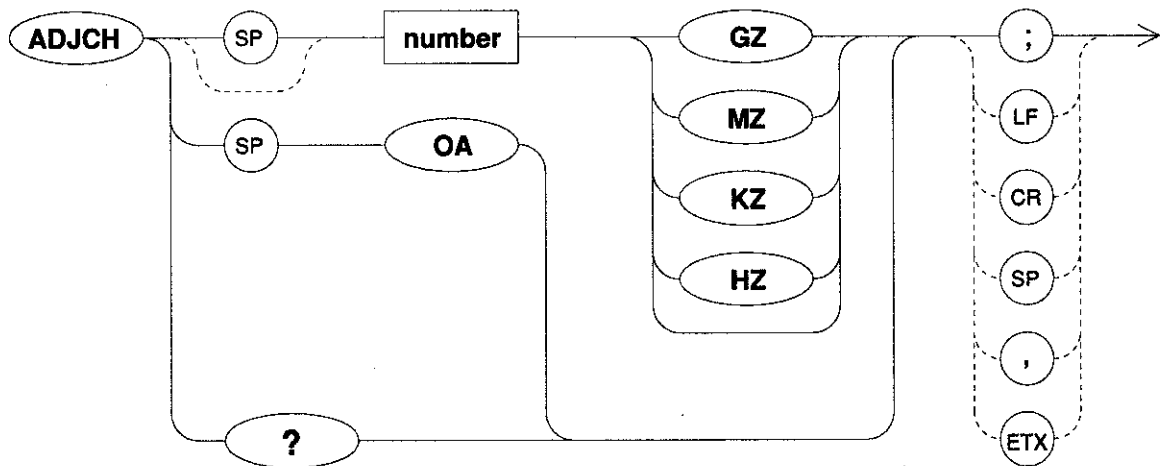
```



## ADJCH

### Channel Space of Adjacent Channel Leak Power

#### Syntax



#### Query Response



#### Example

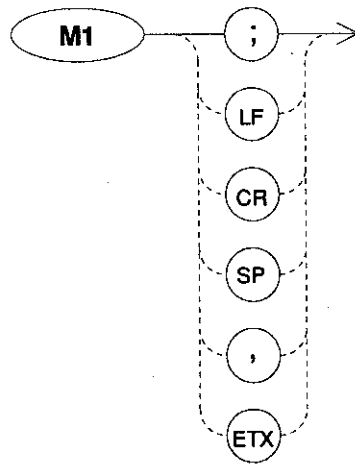
```

10  OUTPUT 708;"IP;DGTLIF 0;CF 902MZ;SP 50KZ;RB 100HZ;"
20  OUTPUT 708;"KSE;TS;"
30  OUTPUT 708;"M2 902MZ;"
40  OUTPUT 708;"ADJCH 12.5KZ;ADJBW 8.5KZ;"
50  OUTPUT 708;"ADJ;"
60  OUTPUT 708;"ADJ?;"
70  ENTER 708;Up,Low
80  PRINT "UPPER ADJ IS ",Up,"DB"
90  PRINT "LOWER ADJ IS ",Low,"DB"
100  END

```

**M1**  
**Marker Off**

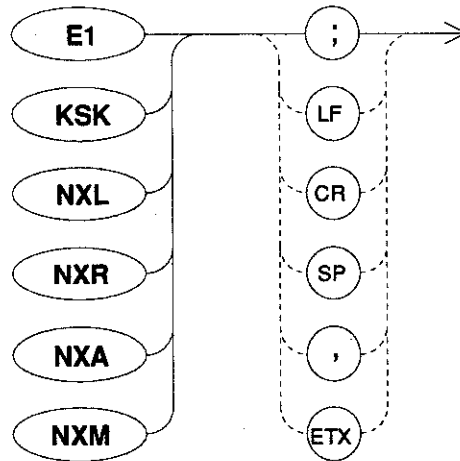
**Syntax**



## E1 / KSK / NXL / NXR / NXA / NXM

### Peak Search

#### Syntax



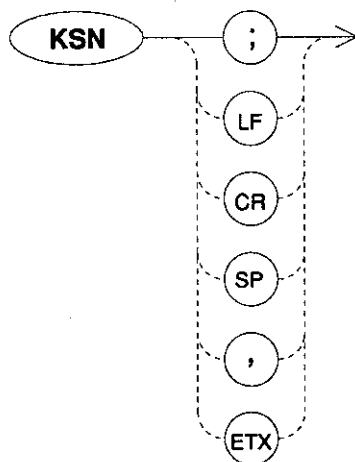
#### Parameters

<b>E1</b>	Finds the highest point on a trace.
<b>KSK</b>	Finds the next-highest point on a trace.
<b>NXL</b>	Finds the next-left peak.
<b>NXR</b>	Finds the next-right peak.
<b>NXA</b>	Finds the next-maximum/minimum.
<b>NXM</b>	Finds the next-lowest point on a trace.

# KSN

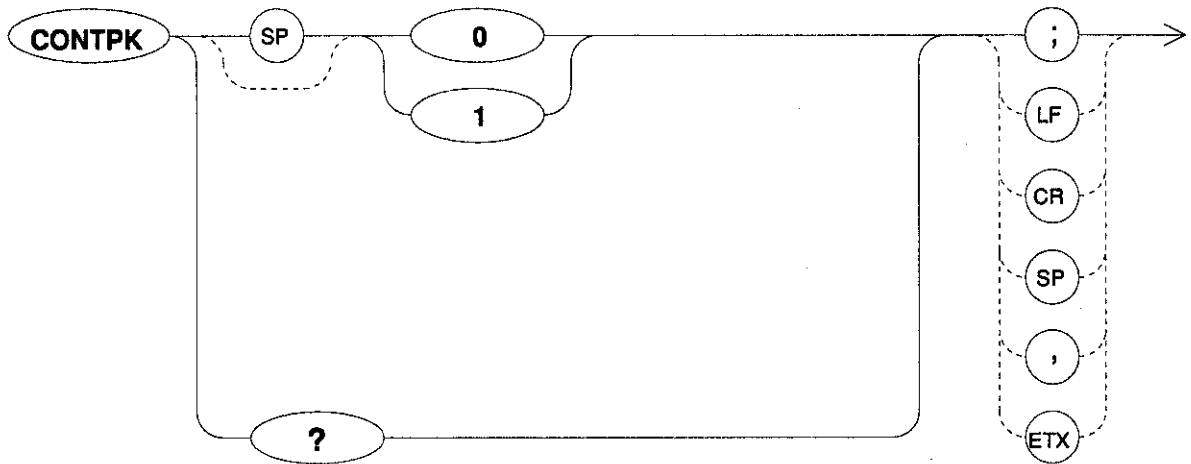
## Marker to Minimum

### Syntax

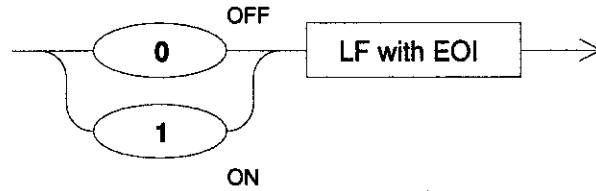


## CONTPK Continuous Peak Search

### Syntax

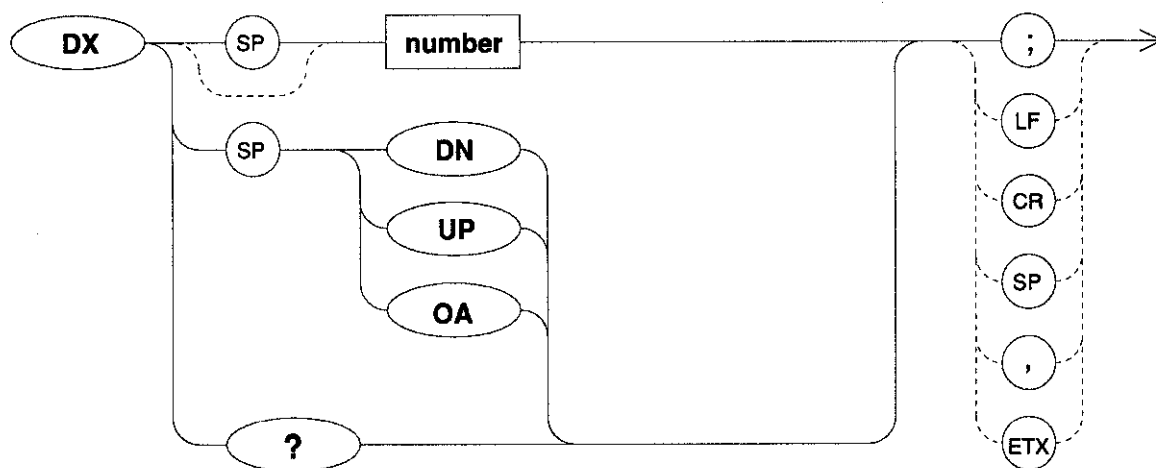


### Query Response

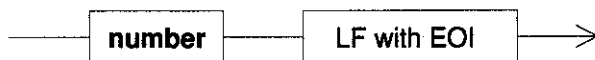


## DX Delta X for Peak Search

### Syntax



### Query Response



### Example

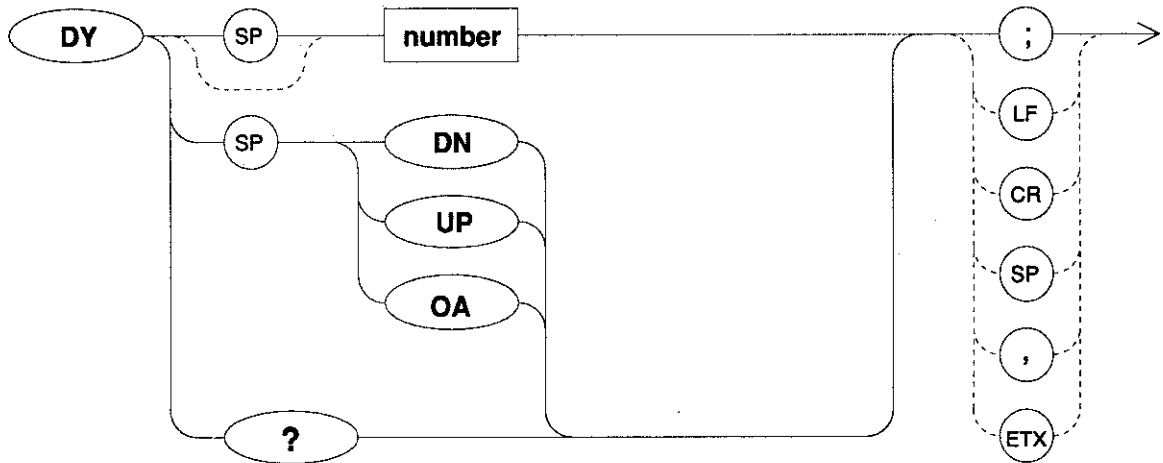
```

10 PRINT "SET THE INCLINATION IN THE X AND Y DIRECTIONS"
20 INPUT "DELTA X (1 - 700)", Dx
30 INPUT "DELTA Y (1 - 400)", Dy
40 OUTPUT 708; "DX "; Dx; "; "
50 OUTPUT 708; "DY "; Dy; "; "
60 OUTPUT 708; "PKLIST 1;"
70 END

```

## DY Delta Y for Peak Search

### Syntax



### Query Response

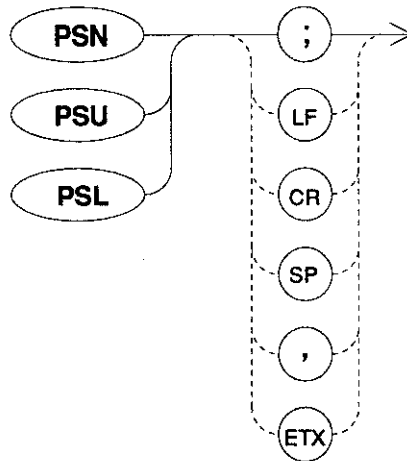


### Example

```
10 PRINT "SET THE INCLINATION IN THE X AND Y DIRECTIONS"  
20 INPUT "DELTA X (1 - 700)",Dx  
30 INPUT "DELTA Y (1 - 400)",Dy  
40 OUTPUT 708;"DX ";Dx;" ;"  
50 OUTPUT 708;"DY ";Dy;" ;"  
60 OUTPUT 708;"PKLIST 1;"  
70 END
```

## PSN / PSU / PSL Peak Search Effective Range

### Syntax



### Parameters

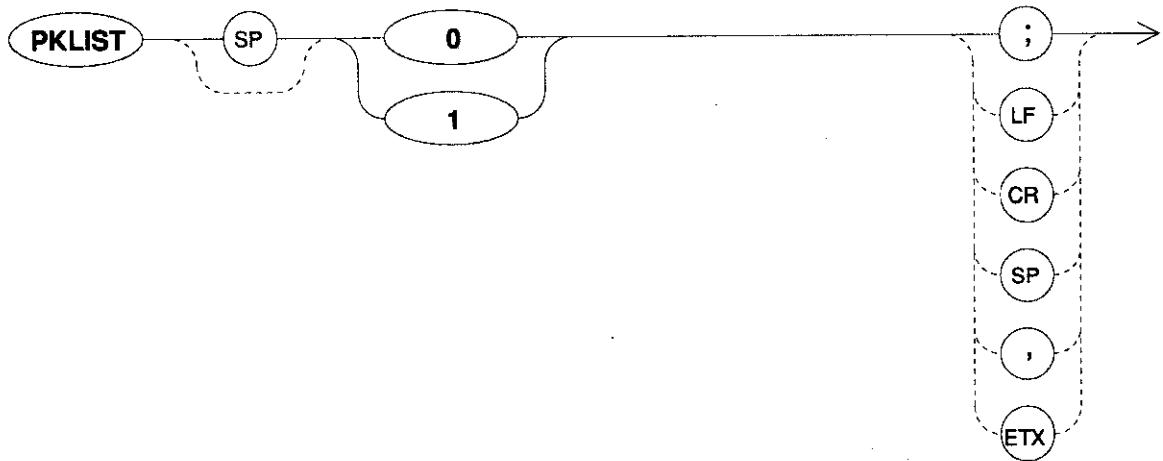
<b>PSN</b>	Search is executed to all the waveforms.
<b>PSU</b>	Level above the display line is searched.
<b>PSL</b>	Level below the display line is searched.



## PKLIST

### Next Peak List On/Off

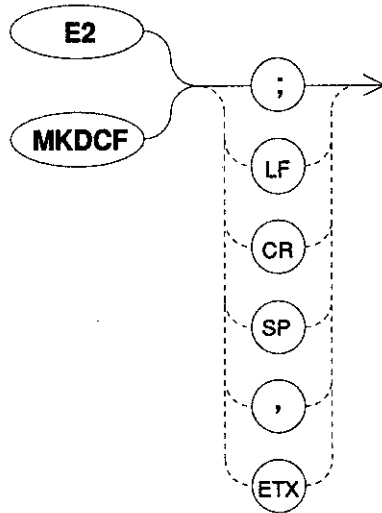
#### Syntax



## E2 / MKDCF

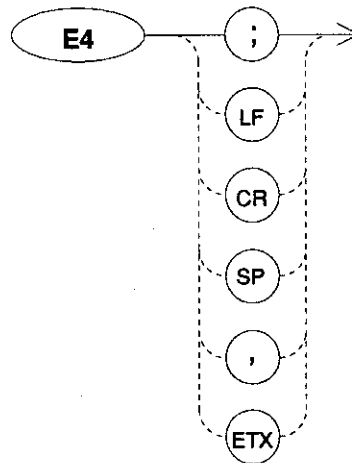
### Marker or Marker Delta to Center Frequency

#### Syntax



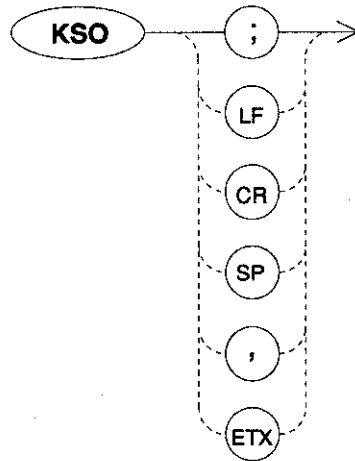
## E4 Marker Amplitude to Reference Level

### Syntax



## KSO Marker Delta to Frequency Span

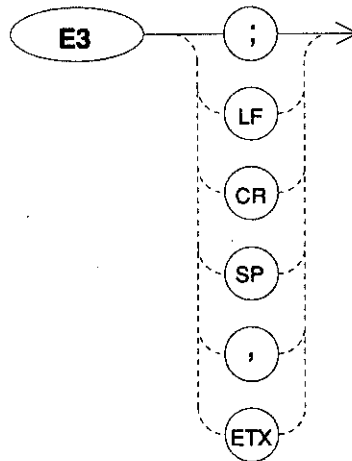
### Syntax



## E3

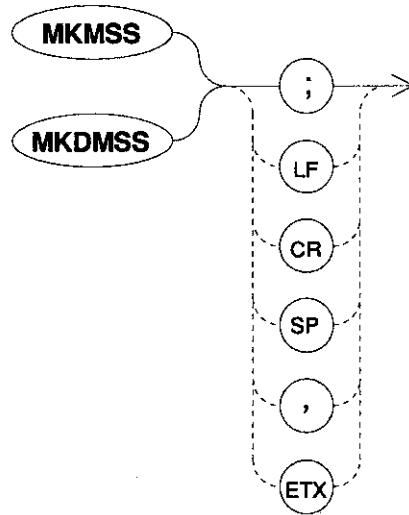
### Marker Frequency or Marker Delta to Center Frequency Step-Size

#### Syntax



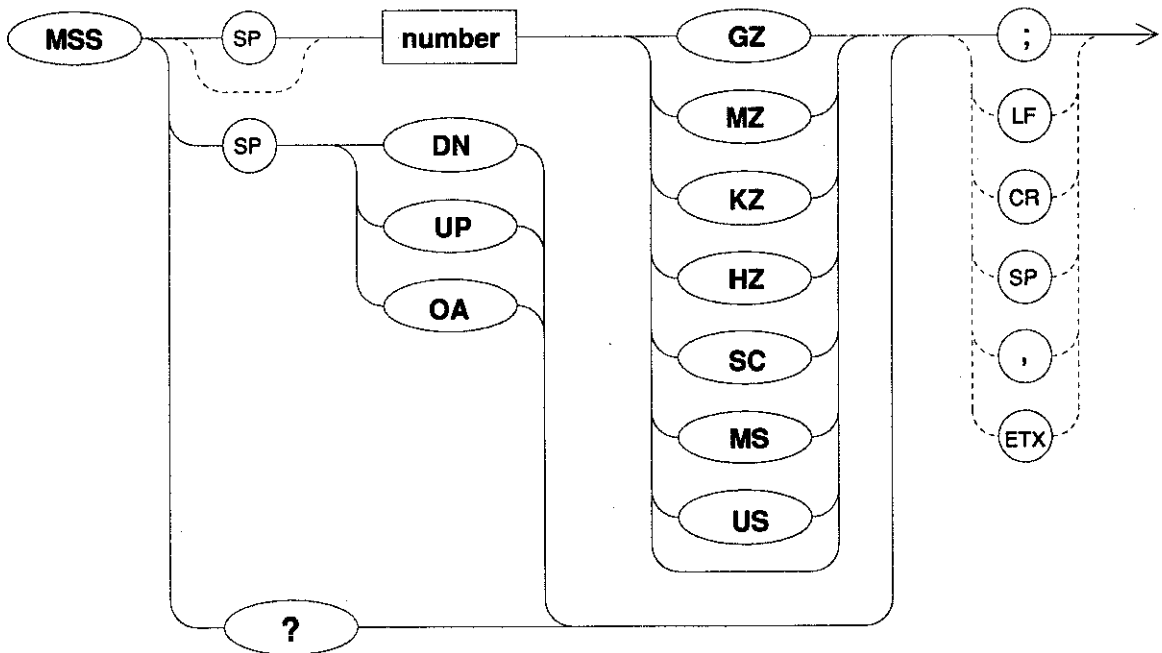
## MKMSS / MKDMSS Marker or Marker Delta to Marker Step Size

### Syntax



## MSS Marker Step Size

### Syntax



### Query Response



### Example

```

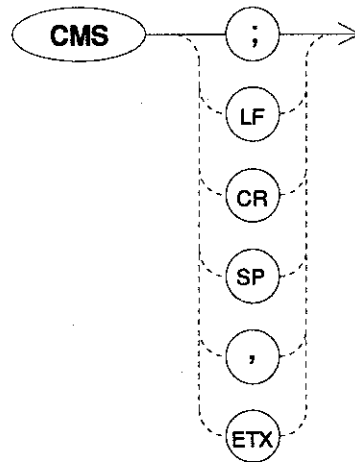
10 INPUT "ENTER DESIRED MARKER STEP SIZE",Step$
20 OUTPUT 708;"MSS ";Step$;";"
30 OUTPUT 708;"M2 DN DN DN;"
40 OUTPUT 708;"O3;MA;"
50 ENTER 708;Level1
60 OUTPUT 708;"M2 UP;"
70 OUTPUT 708;"MA;"
80 ENTER 708;Level2
90 OUTPUT 708;"M2 UP;"
100 OUTPUT 708;"MA;"
110 ENTER 708;Level3
120 PRINT Level1,Level2,Level3
130 END

```

## CMS

### Coupled Marker Step Size

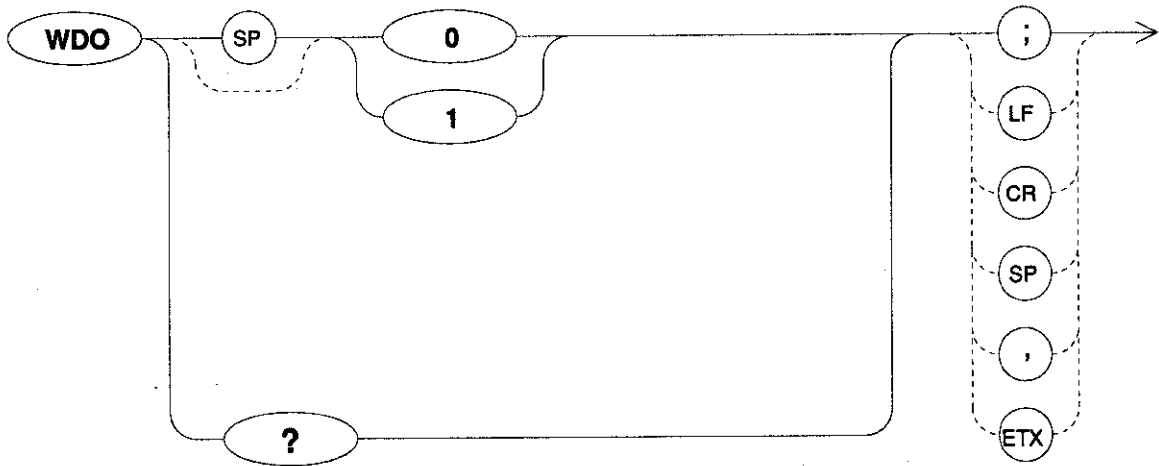
#### Syntax



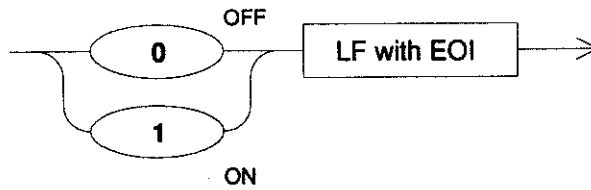


## WDO Measurement Window On/Off

### Syntax

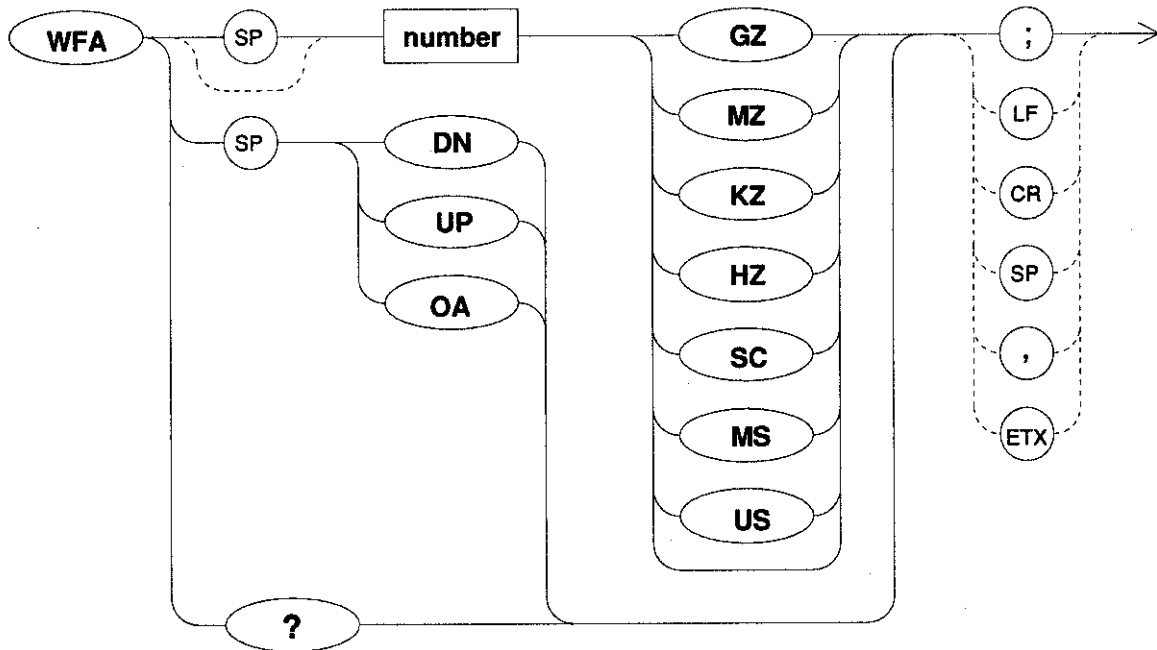


### Query Response



## WFA Measurement Window Start Frequency

### Syntax



### Query Response

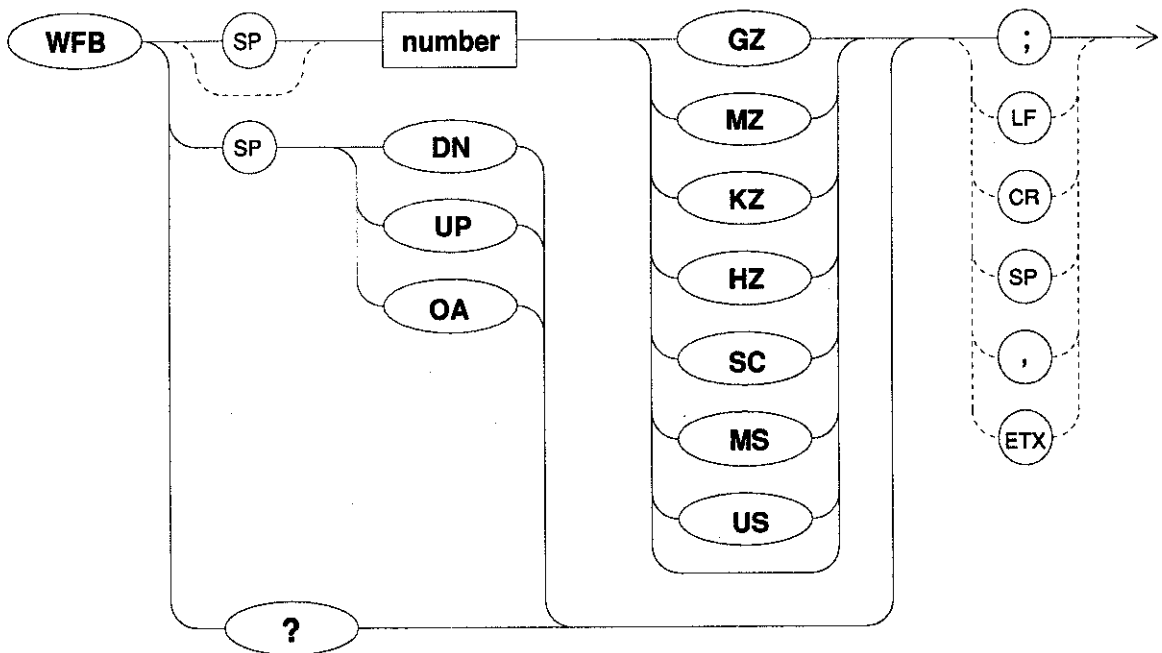


### Example

```
10 OUTPUT 708;"WDO 1;"
20 OUTPUT 708;"WFA 100MZ;WFB 300MZ;WUL -10DB;WLL -70DB;"
30 OUTPUT 708;"KSK;"
40 END
```

## WFB Measurement Window Stop Frequency

### Syntax



### Query Response



### Example

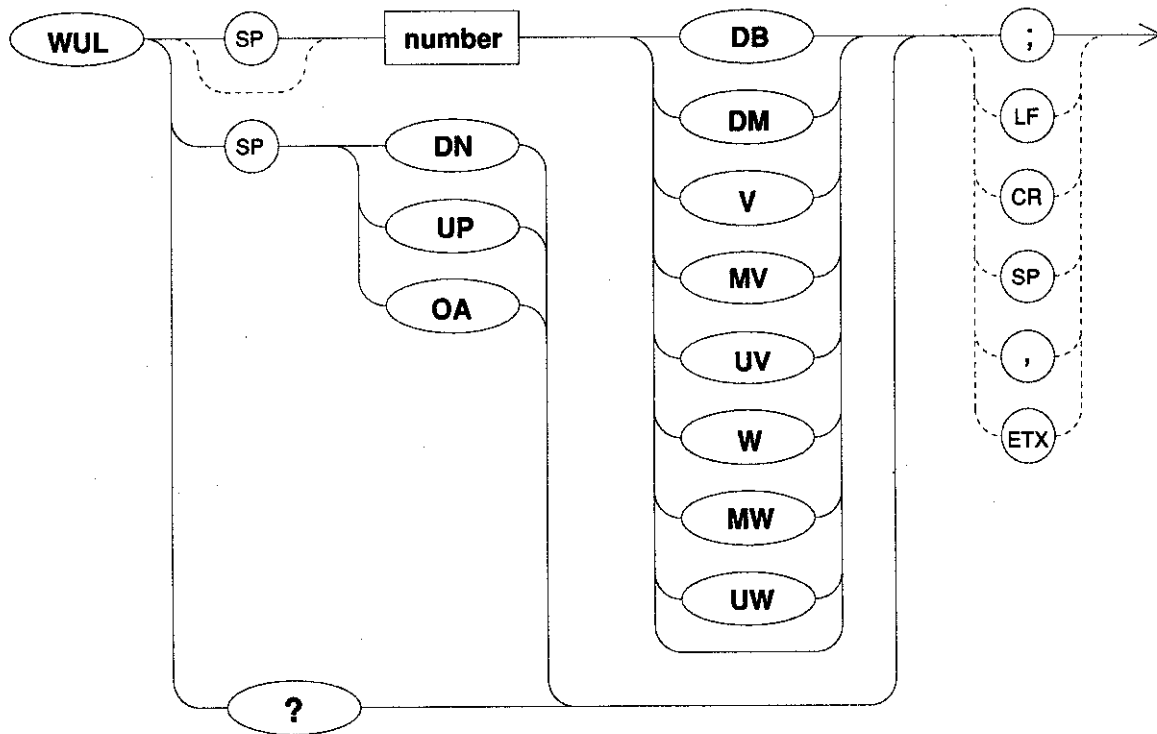
```

10 OUTPUT 708;"WDO 1;"
20 OUTPUT 708;"WFA 100MZ;WFB 300MZ;WUL -10DB;WLL -70DB;"
30 OUTPUT 708;"KSK;"
40 END

```

## WUL Measurement Window Upper Level

### Syntax



### Query Response



### Example

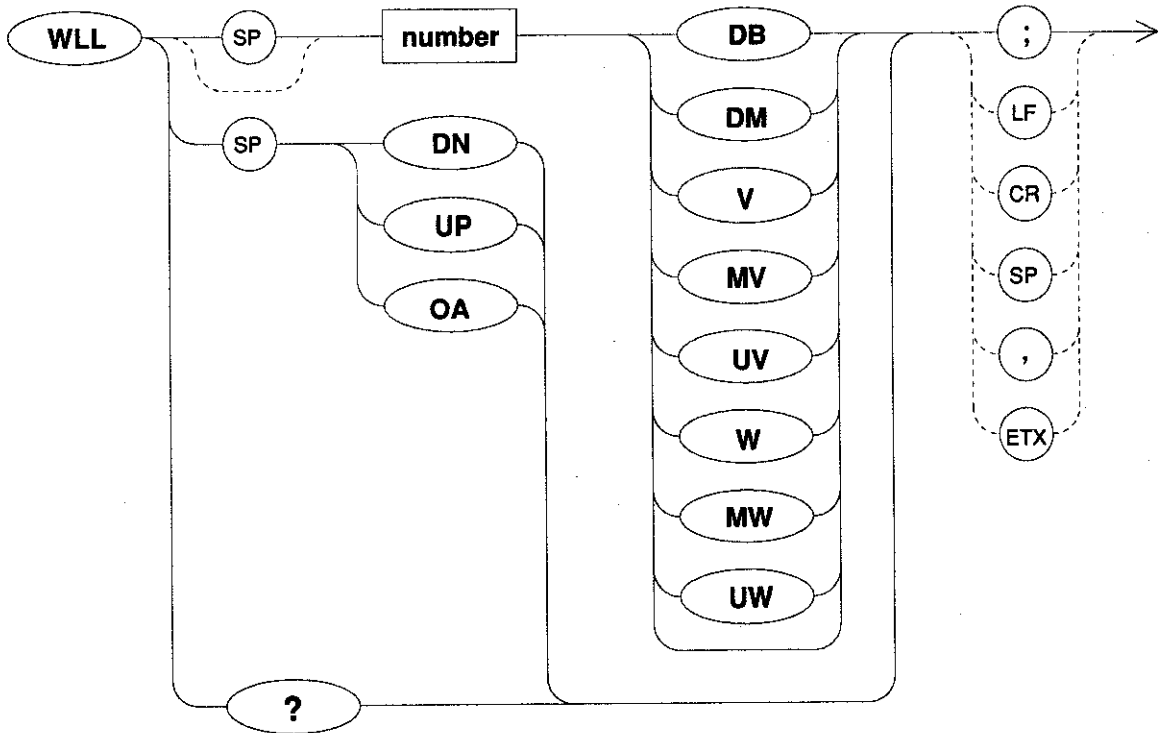
```

10 OUTPUT 708;"WDO 1;"
20 OUTPUT 708;"WFA 100MZ;WFB 300MZ;WUL -10DB;WLL -70DB;"
30 OUTPUT 708;"KSK;"
40 END

```

## WLL Measurement Window Lower Level

### Syntax



### Query Response



### Example

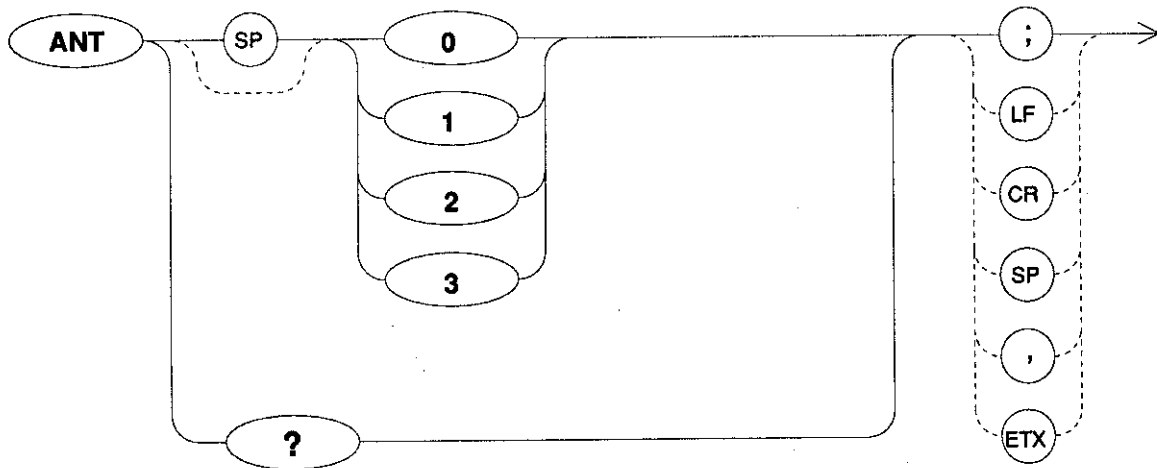
```

10 OUTPUT 708;"WDO 1;"
20 OUTPUT 708;"WFA 100MZ;WFB 300MZ;WUL -10DB;WLL -70DB;"
30 OUTPUT 708;"KSK;"
40 END

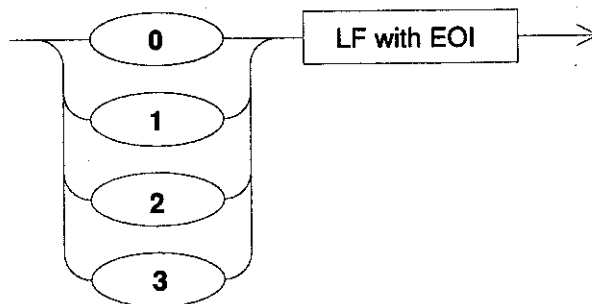
```

## ANT Antenna Type

### Syntax



### Query Response

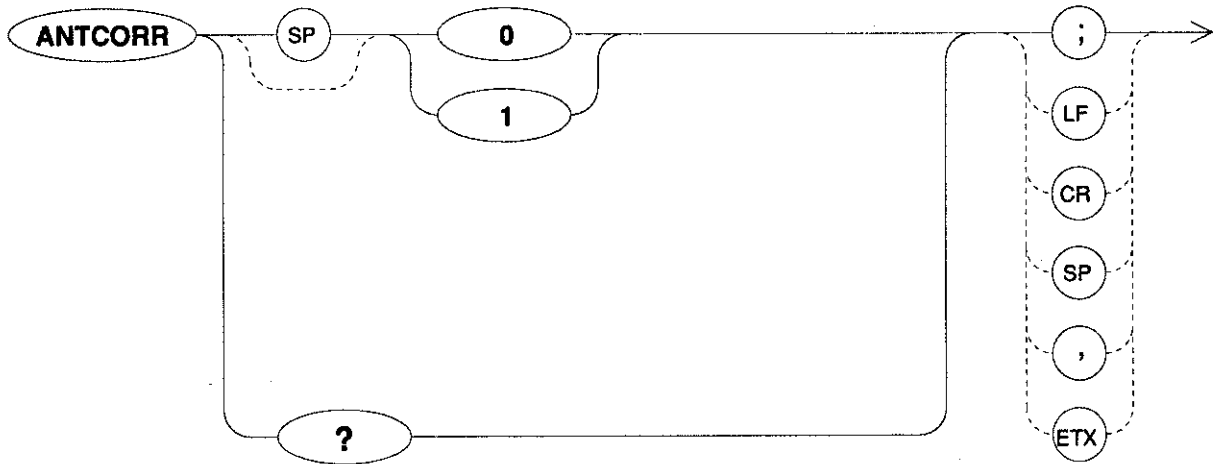


### Parameters

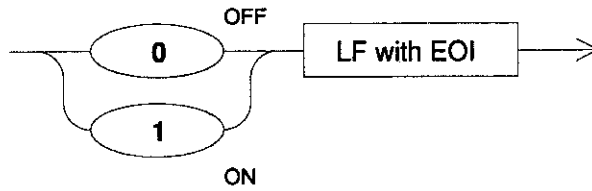
- 0 Cancel the antenna corrections.
- 1 Selects the half-wavelength dipole antenna (TR1722).
- 2 Selects the logarithmic cycle type antenna (TR1711).
- 3 Selects the active antenna (TR17203).

## ANTCORR Antenna Correction On/Off

### Syntax

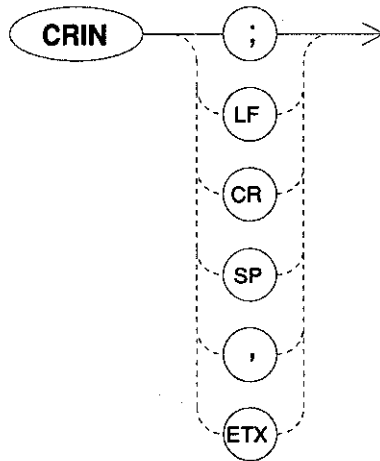


### Query Response

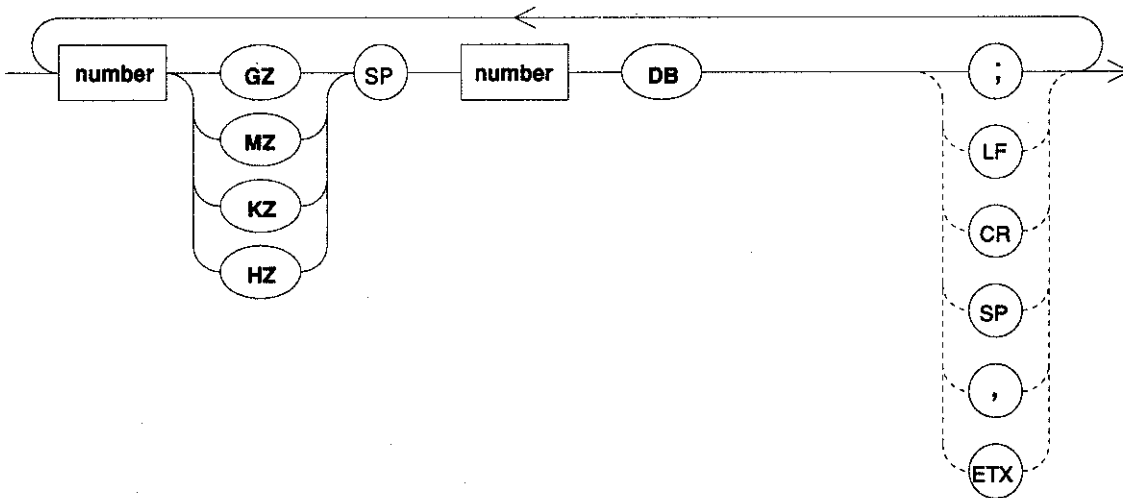


## CRIN Enter Antenna Correction Table

### Syntax



*cf:entry correction data*



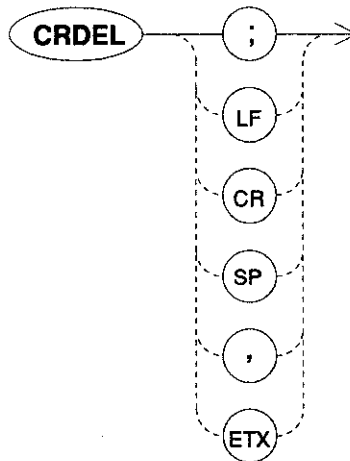
### Example

```
10 OUTPUT 708;"FA 30MZ;FB 1GHZ;VB 3MZ;"
20 OUTPUT 708;"CRIN 80MZ -5DB;150MZ -20DB;300MZ -35DB;"
30 OUTPUT 708;"ANTCORR 1;"
40 END
```



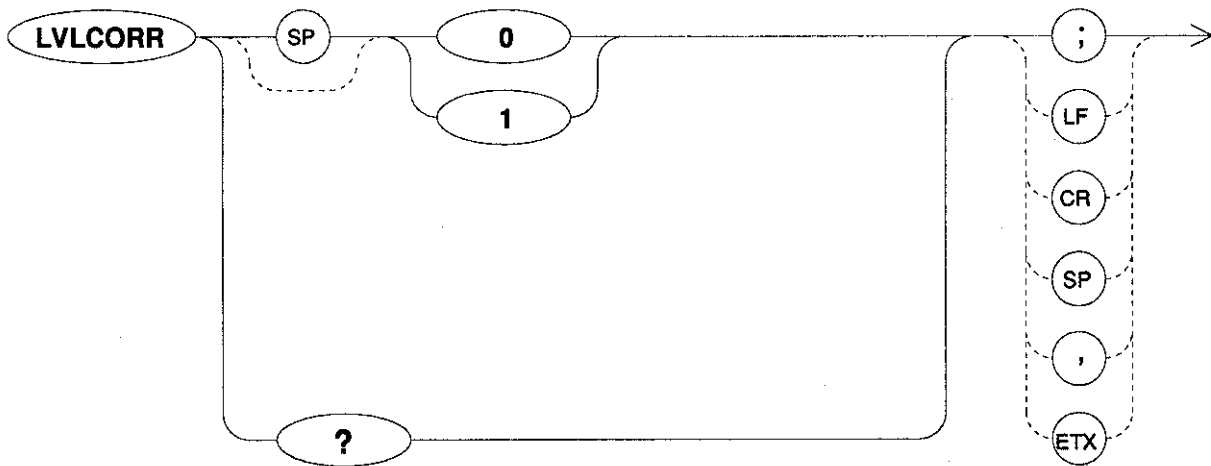
## CRDEL Initialize Antenna Correction Table

### Syntax

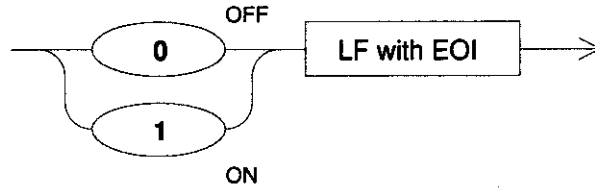


## LVLCORR Level Correction On/Off

### Syntax

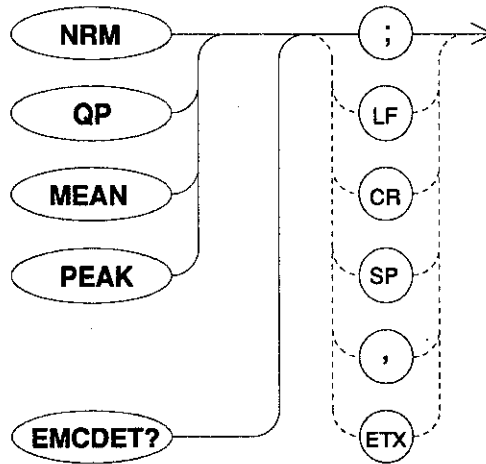


### Query Response

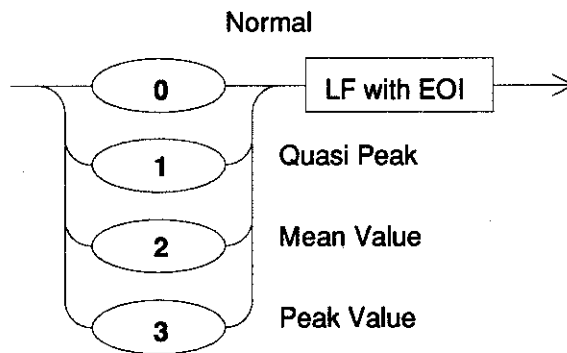


## NRM / QP / MEAN / PEAK / EMCDET? Detection Mode of EMC

### Syntax

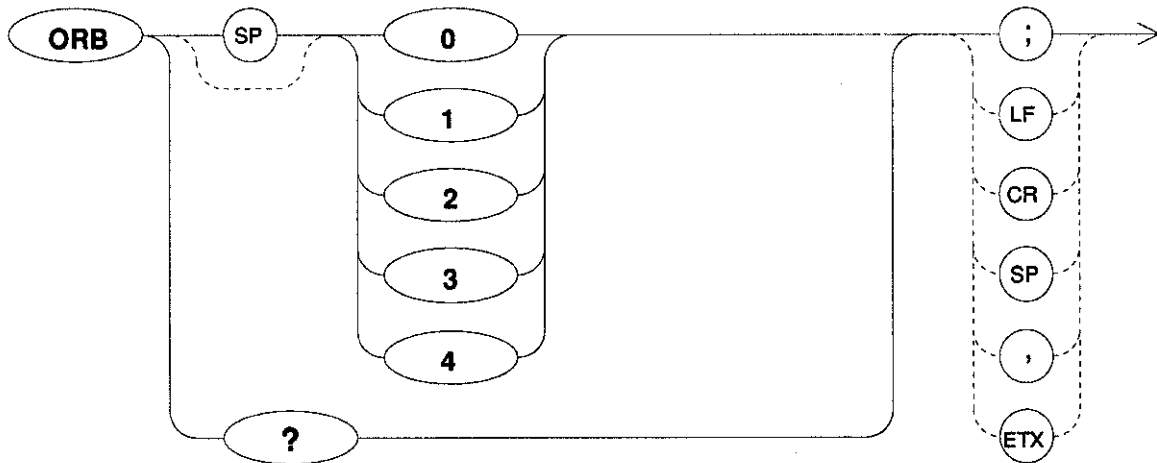


### Query Response

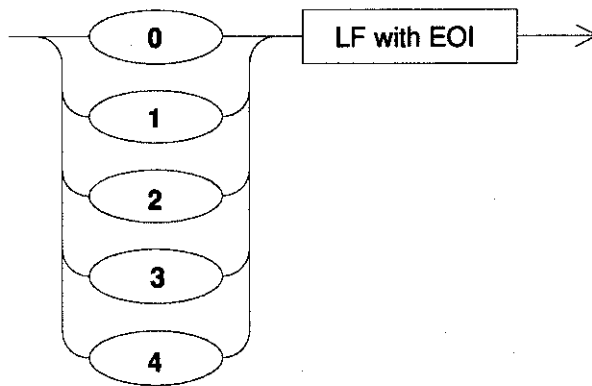


## ORB Optimal Resolution Bandwidth

### Syntax



### Query Response

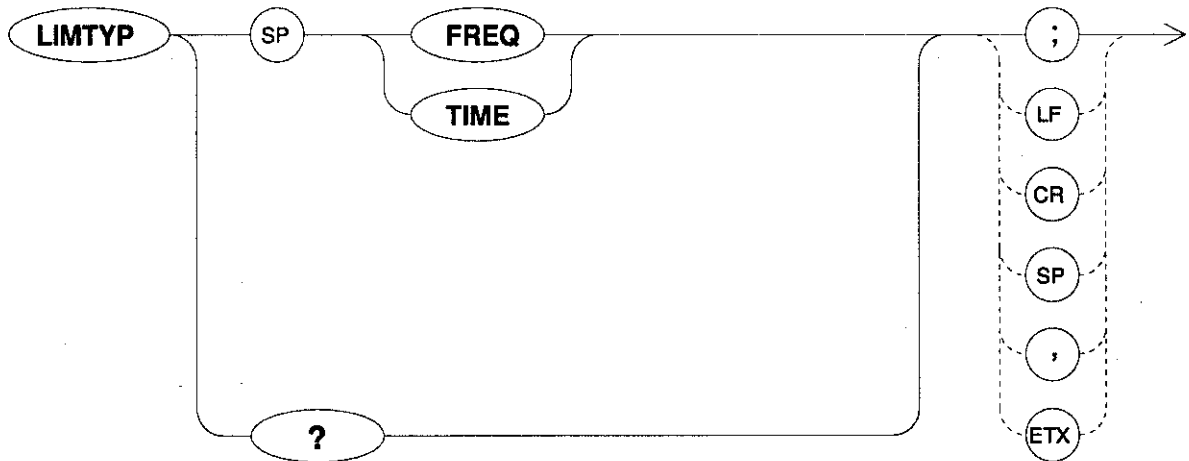


### Parameters

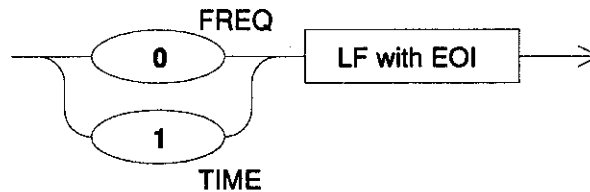
- 0 The optimal resolution bandwidth is automatically selected.
- 1 The optimal resolution bandwidth is 200Hz.
- 2 The optimal resolution bandwidth is 9kHz.
- 3 The optimal resolution bandwidth is 120kHz.
- 4 The optimal resolution bandwidth is 1MHz when only the peak detection.

## LIMTYP Selects The Limit Line Type

### Syntax



### Query Response



### Parameters

- FREQ** Selects the frequency domain type.  
**TIME** Selects the time domain type.

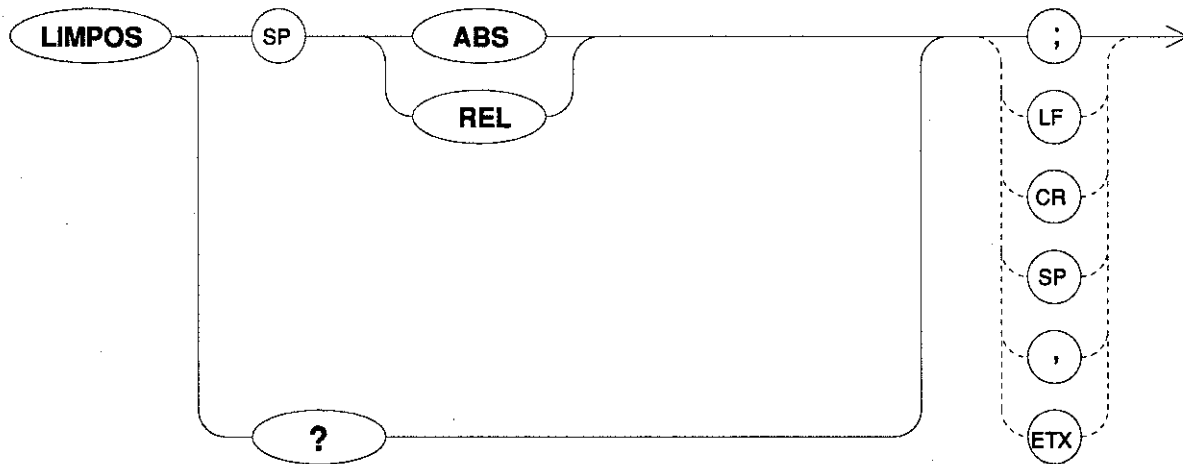
### Example

```
10 OUTPUT 708;"FA 0HZ;FB 1GZ;KSC;RL 40DB;"
20 OUTPUT 708;"LIMTYP FREQ;LIMLB INIT;LIMLB;"
30 OUTPUT 708;"0HZ 20DB;500MZ 20DB;500MZ 10DB;1GZ 10DB;"
40 OUTPUT 708;"LIMPOS ABS;LIMAPOS ABS;LIMSFT 50MZ;LIMASFT -40DB;"
50 END
```

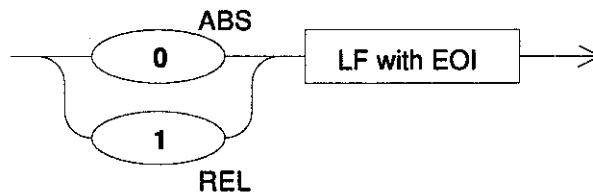
## LIMPOS

### The Horizontal Position of The Limit Line

#### Syntax



#### Query Response



#### Parameters

- ABS** Selects the absolute position of the frequency domain or the time domain.
- REL** Selects the relative position of the frequency domain or the time domain.

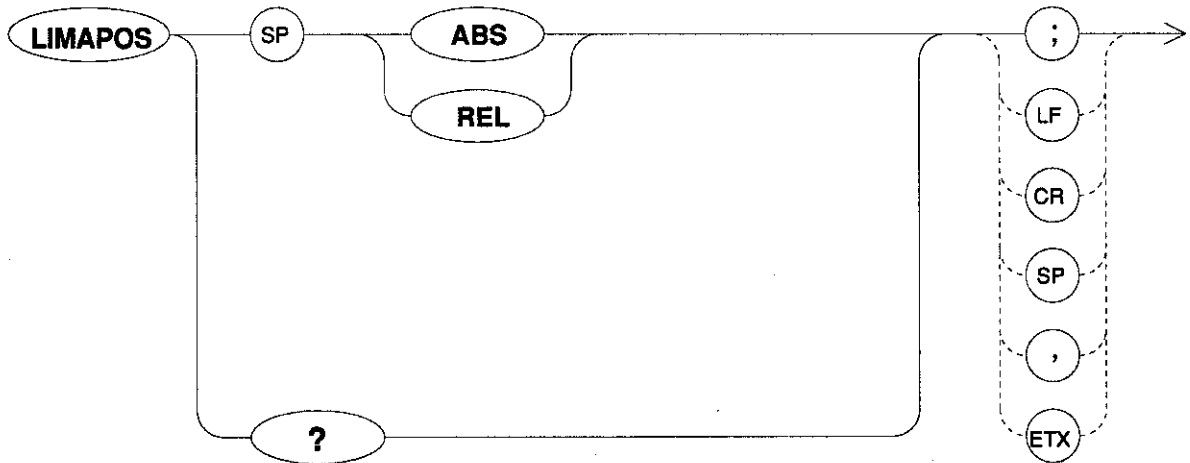
#### Example

```
10 OUTPUT 708;"FA 0HZ;FB 1GZ;KSC;RL 40DB;"
20 OUTPUT 708;"LIMTYP FREQ;LIMLB INIT;LIMLB;"
30 OUTPUT 708;"0HZ 20DB;500MZ 20DB;500MZ 10DB;1GZ 10DB;"
40 OUTPUT 708;"LIMPOS ABS;LIMAPOS ABS;LIMSFT 50MZ;LIMASFT -40DB;"
50 END
```

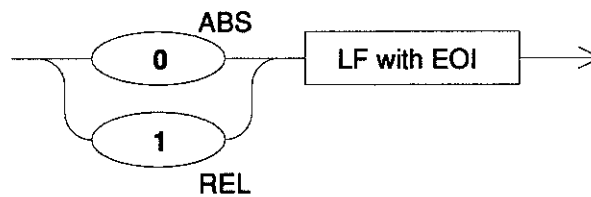
## LIMAPOS

### The Vertical Position of The Limit Line

#### Syntax



#### Query Response



#### Parameters

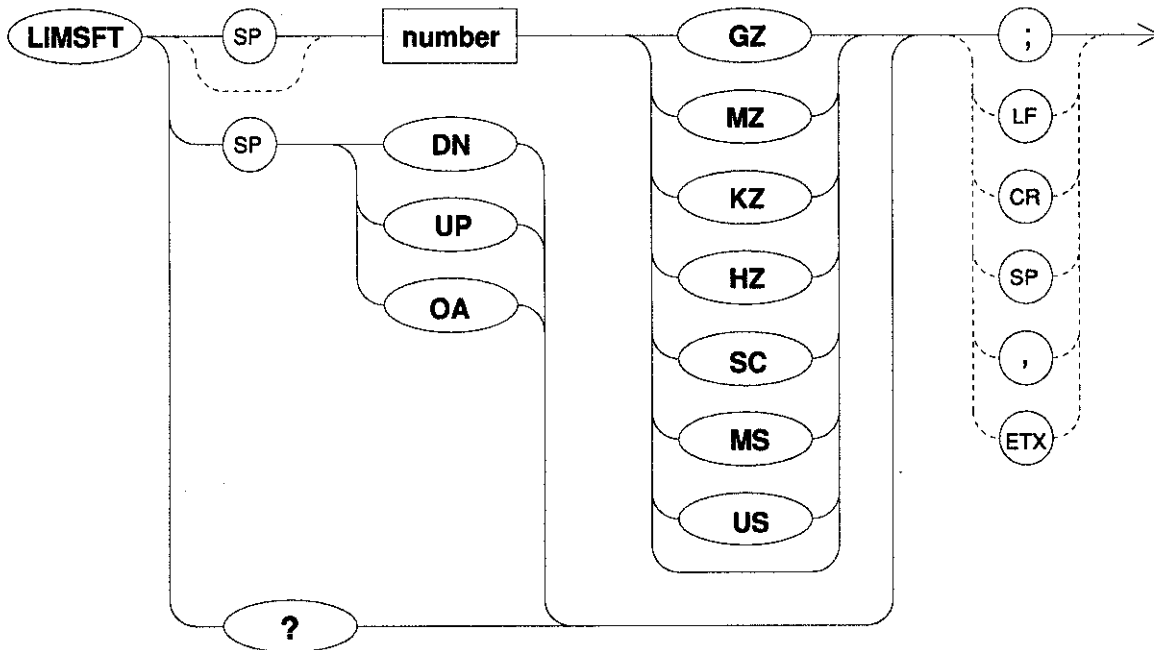
- ABS** Selects the absolute position of the amplitude.
- REL** Selects the relative position of the amplitude.

#### Example

```
10 OUTPUT 708;"FA 0HZ;FB 1GZ;KSC;RL 40DB;"
20 OUTPUT 708;"LIMTYP FREQ;LIMLB INIT;LIMLB;"
30 OUTPUT 708;"0HZ 20DB;500MZ 20DB;500MZ 10DB;1GZ 10DB;"
40 OUTPUT 708;"LIMPOS ABS;LIMAPOS ABS;LIMSFT 50MZ;LIMASFT -40DB;"
50 END
```

## LIMSFT Shift Frequency or Time

### Syntax



### Query Response



### Example

```

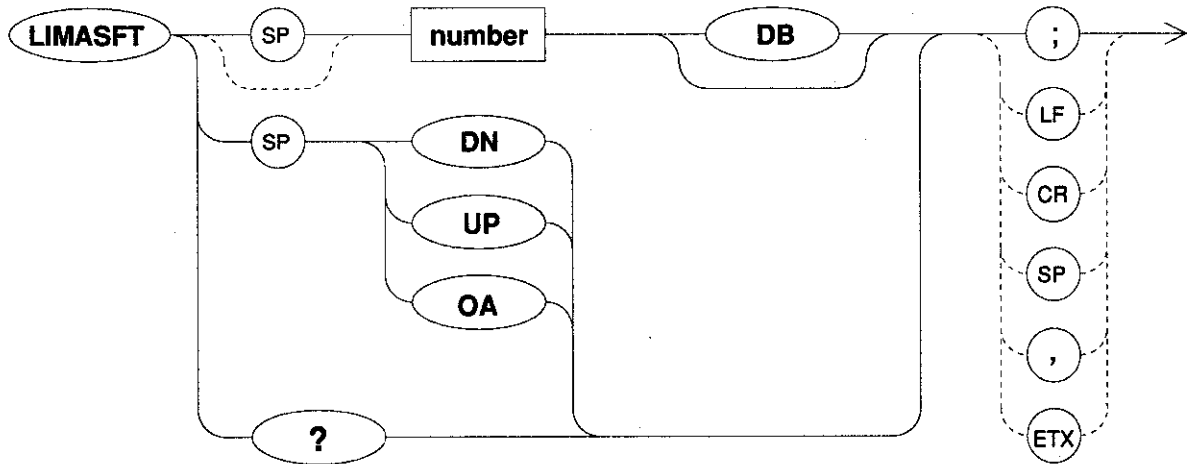
10  OUTPUT 708;"FA 0HZ;FB 1GZ;KSC;RL 40DB;"
20  OUTPUT 708;"LIMTYP FREQ;LIMLB INIT;LIMLB;"
30  OUTPUT 708;"0HZ 20DB;500MZ 20DB;500MZ 10DB;1GZ 10DB;"
40  OUTPUT 708;"LIMPOS ABS;LIMAPOS ABS;LIMSFT 50MZ;LIMASFT -40DB;"
50  END

```

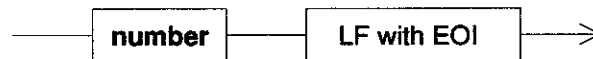


## LIMASFT Shift Amplitude

### Syntax



### Query Response



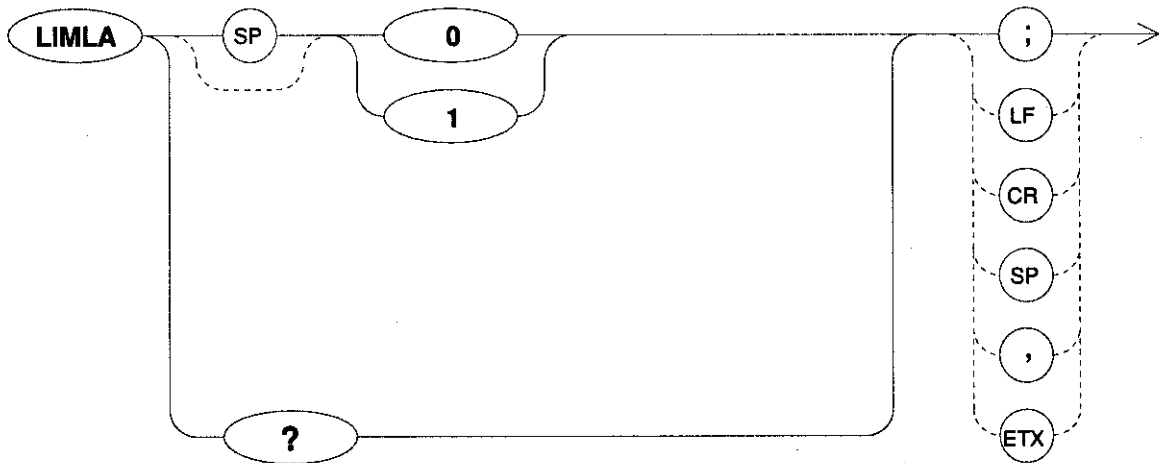
### Example

```
10 OUTPUT 708;"FA 0HZ;FB 1GZ;KSC;RL 40DB;"
20 OUTPUT 708;"LIMTYP FREQ;LIMLB INIT;LIMLB;"
30 OUTPUT 708;"0HZ 20DB;500MZ 20DB;500MZ 10DB;1GZ 10DB;"
40 OUTPUT 708;"LIMPOS ABS;LIMAPOS ABS;LIMSFT 50MZ;LIMASFT -40DB;"
50 END
```

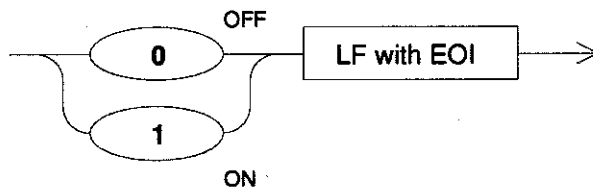
# LIMLA

## Limit Line A On/Off

### Syntax



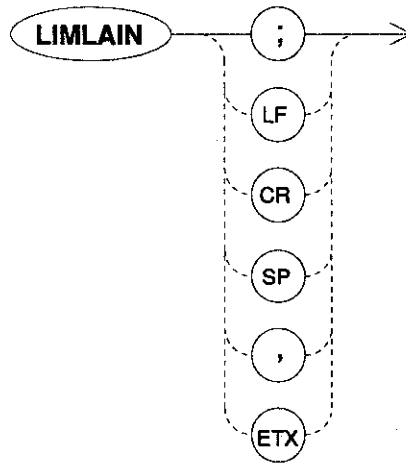
### Query Response



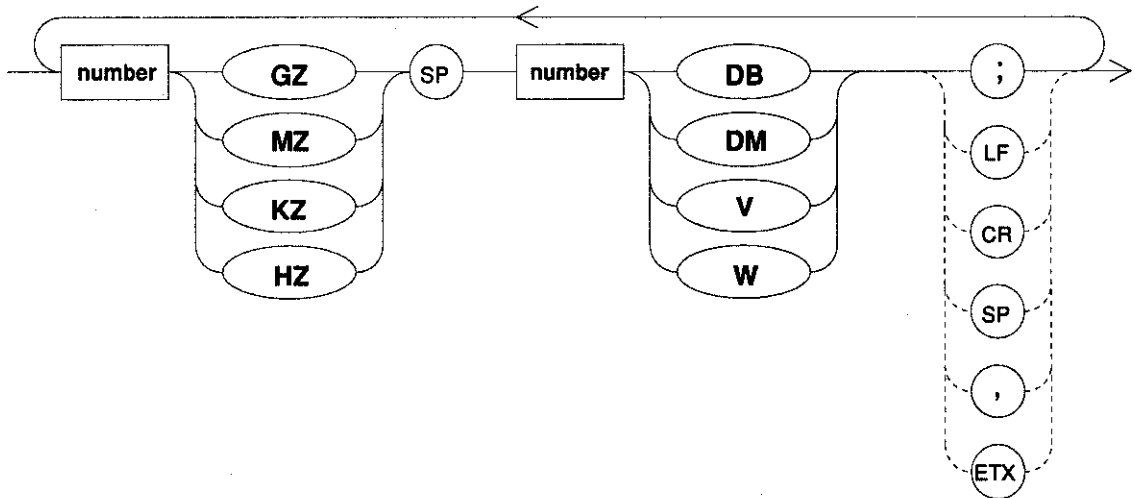
# LIMLAIN

## Enter Limit Line A Table

### Syntax



*cf:entry limit line table*



### Example

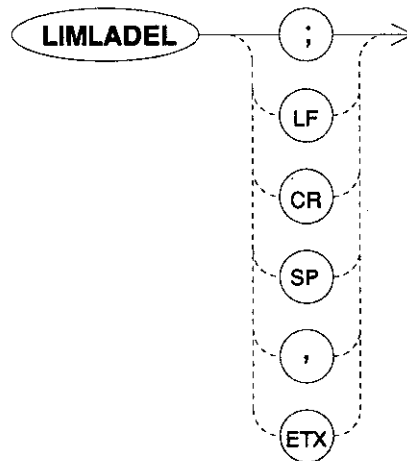
```

10 OUTPUT 708;"FA 30MZ;FB 1GHZ;VB 3MZ;"
20 OUTPUT 708;"LIMLAIN 30MZ -40DB;88MZ -40DB;88MZ -43.5DB;216MZ -43.5DB;"
30 OUTPUT 708;"216MZ -46DB;1GZ -46DB;"
40 OUTPUT 708;"LIMLA 1;"
50 END

```

## LIMLADEL Initialize Limit Line A Table

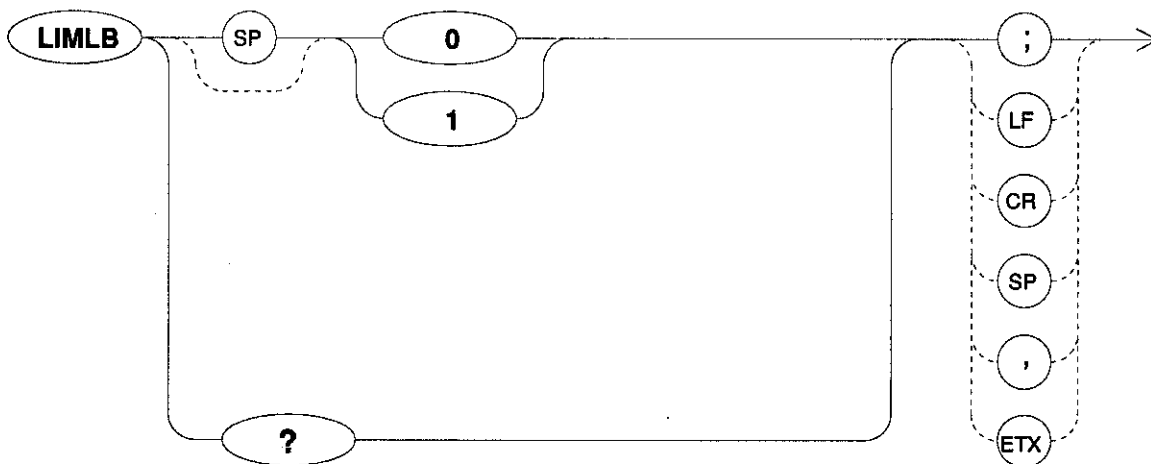
### Syntax



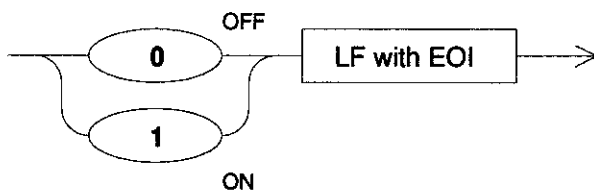
# LIMLB

## Limit Line B On/Off

### Syntax



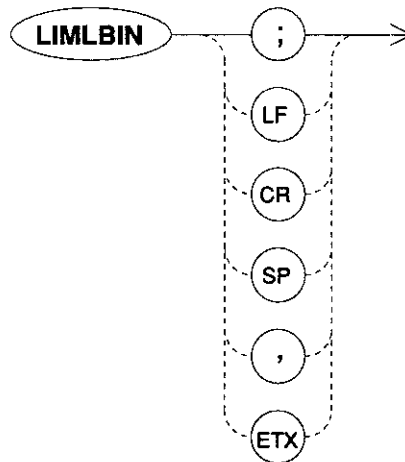
### Query Response



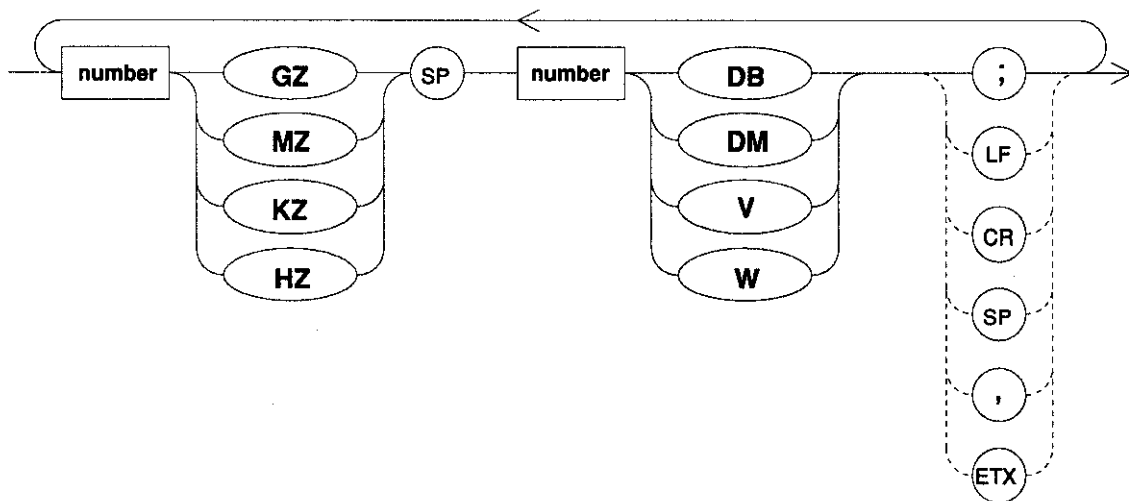
## LIMLBIN

### Enter Limit Line B Table

#### Syntax



*cf:entry limit line table*



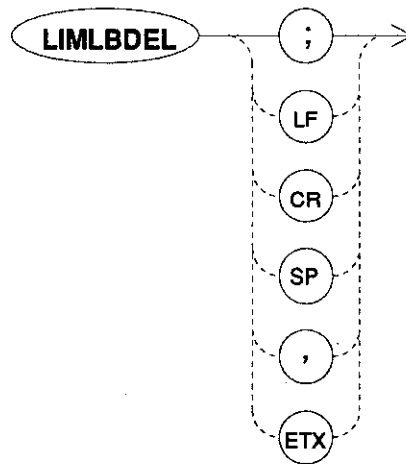
#### Example

```

10 OUTPUT 708;"FA 30MZ;FB 1GHZ;VB 3MZ;"
20 OUTPUT 708;"LIMLBIN 30MZ -40DB;88MZ -40DB;88MZ -43.5DB;216MZ -43.5DB;"
30 OUTPUT 708;"216MZ -46DB;1GZ -46DB;"
40 OUTPUT 708;"LIMLB 1;"
50 END
  
```

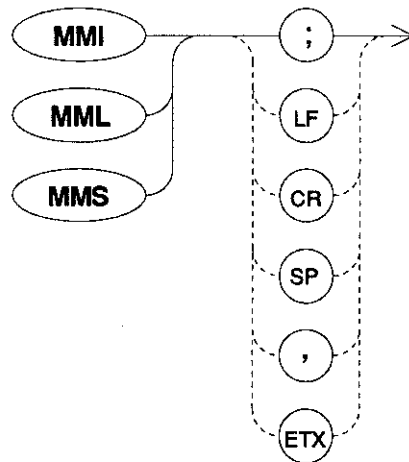
## LIMLBDEL Initialize Limit Line B Table

### Syntax



## MMI / MML / MMS Memory Card

### Syntax



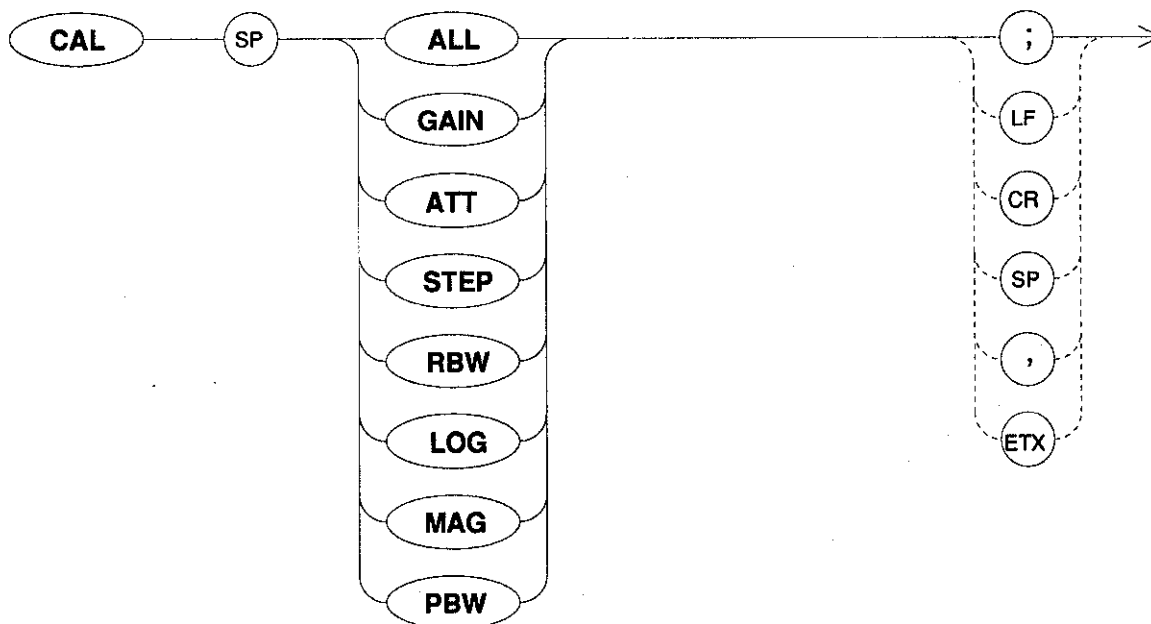
### Parameters

<b>MMI</b>	Initialize the memory card.
<b>MML</b>	Load the soft menu matrix.
<b>MMS</b>	Store the soft menu matrix.



## CAL Calibration

### Syntax

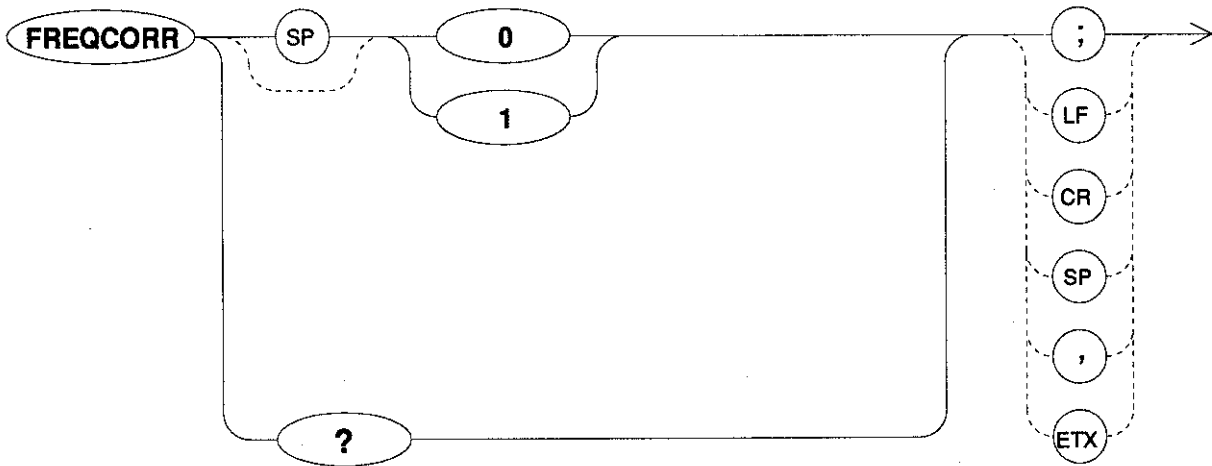


### Parameters

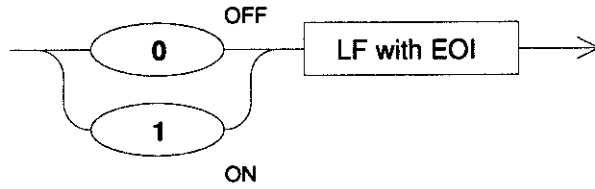
<b>ALL</b>	Calibrates all items excluding PBW are executed.
<b>GAIN</b>	Calibrates only the absolute error.
<b>ATT</b>	Calibrates only the input attenuator switching error.
<b>STEP</b>	Calibrates only the IF step amplifier error.
<b>RBW</b>	Calibrates only the IF filter resolution bandwidth switching level error.
<b>LOG</b>	Calibrates only the screen vertical axis linearity.
<b>MAG</b>	Calibrates only the switching error in LOG 10dB/div to 0.1dB/div.
<b>PBW</b>	Calibrates only the noise power bandwidth.

## FREQCORR Frequency Characteristic Correction On/Off

### Syntax

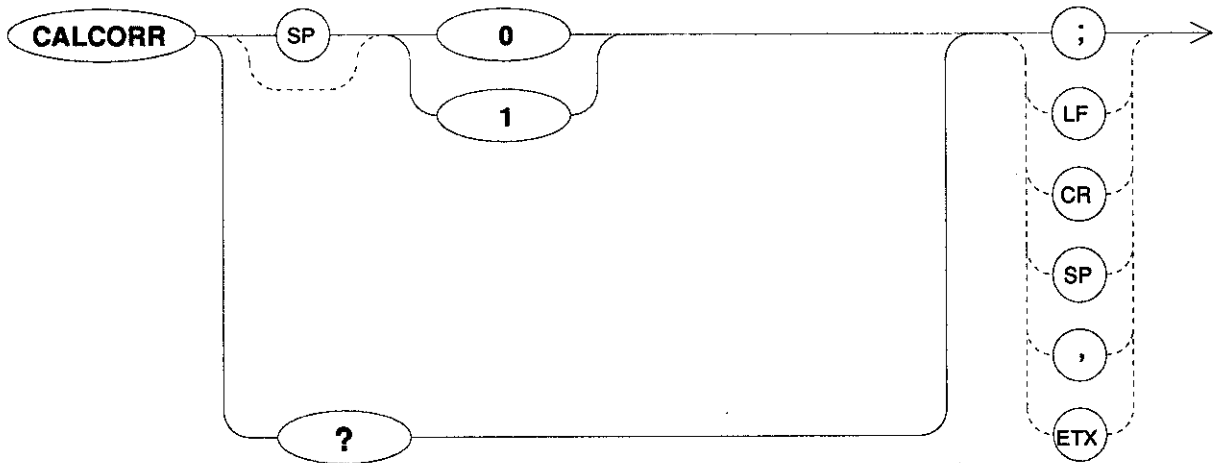


### Query Response

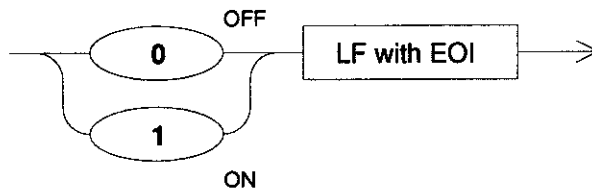


## CALCORR Calibration Correction On/Off

### Syntax



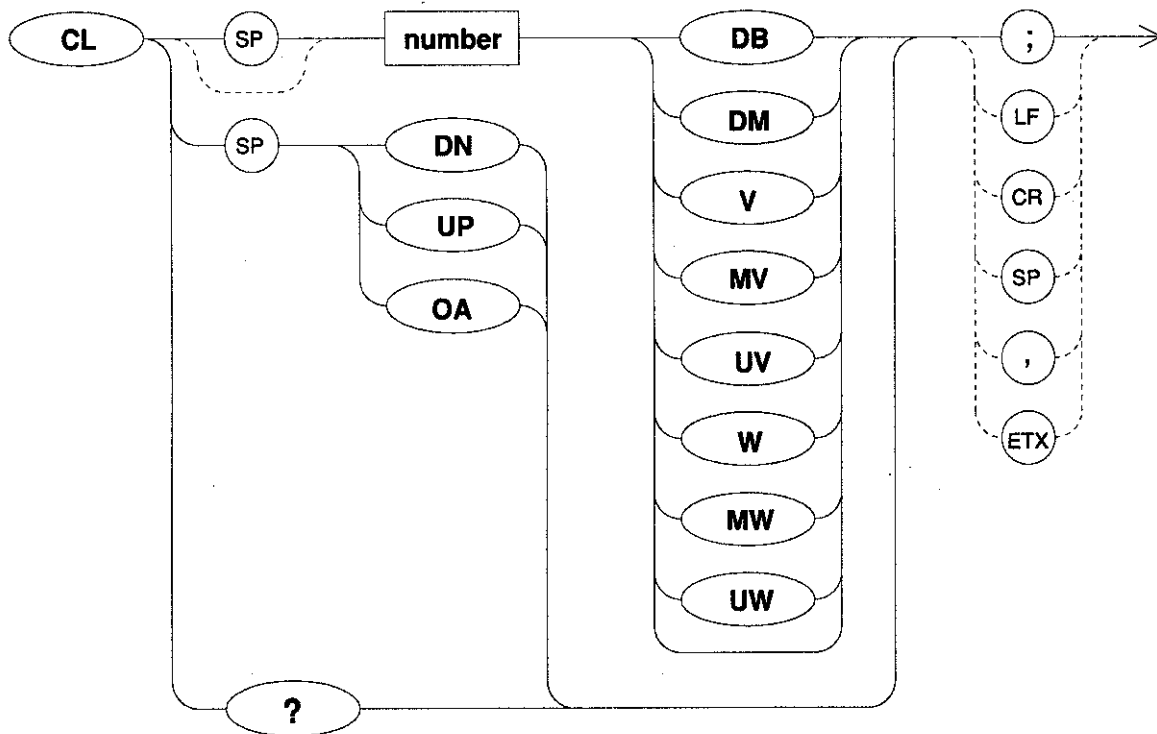
### Query Response



# CL

## Calibration Signal Level

### Syntax



### Query Response



### Example

```

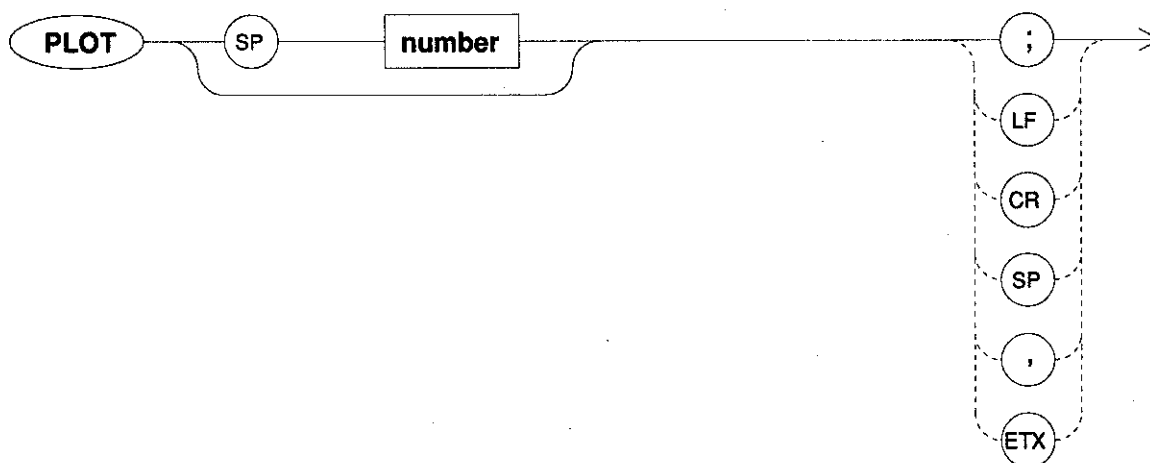
10 OUTPUT 708;"CF 25MZ;SP 20MZ;"
20 OUTPUT 708;"CL -15.0DBM;"
30 END

```

## PLOT

### Plot Execute

#### Syntax



#### Parameters

**number** Sets the plotter address when only be controlled by internal controller (OPT15).

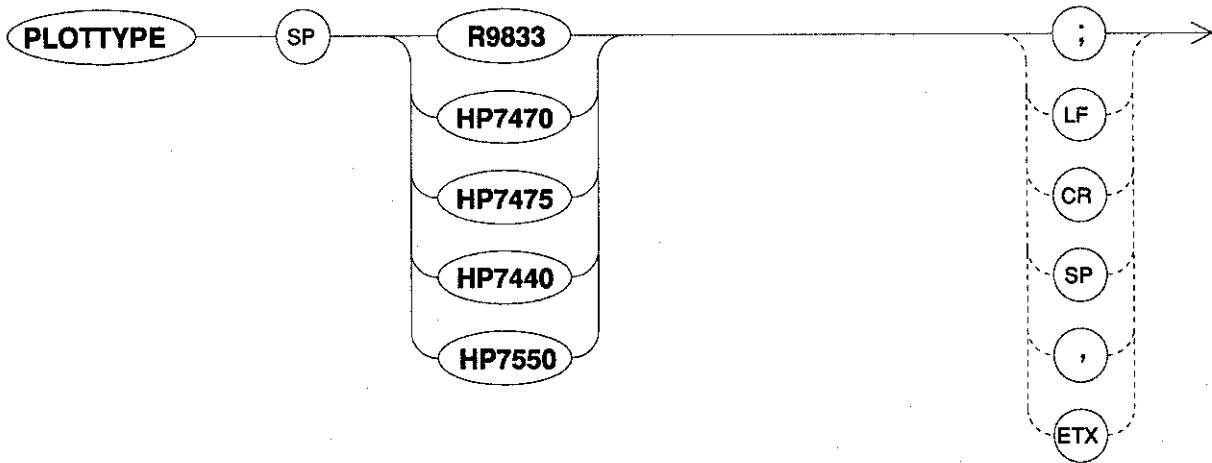
#### Example

```
10  OUTPUT 708;"SRQ ON;RQS 16;"
20  OUTPUT 708;"SRQ CLR;"
30  ON INTR 7 GOTO Done
40  ENABLE INTR 7;2
50  OUTPUT 708;"PLOTTYPE HP7550;PLOTPEN 6;PLOTSRC ALL;"
60  OUTPUT 708;"PLOT"
70  SEND 7;UNL UNT
80  SEND 7;LISTEN 5 TALK 8
90  SEND 7;DATA
100 Idle: !
110 GOTO Idle
120 Done: !
130 S=SPOLL(708)
140 PRINT "PLOT IS COMPLETE!!"
150 BEEP
160 END
```

# PLOTTYPE

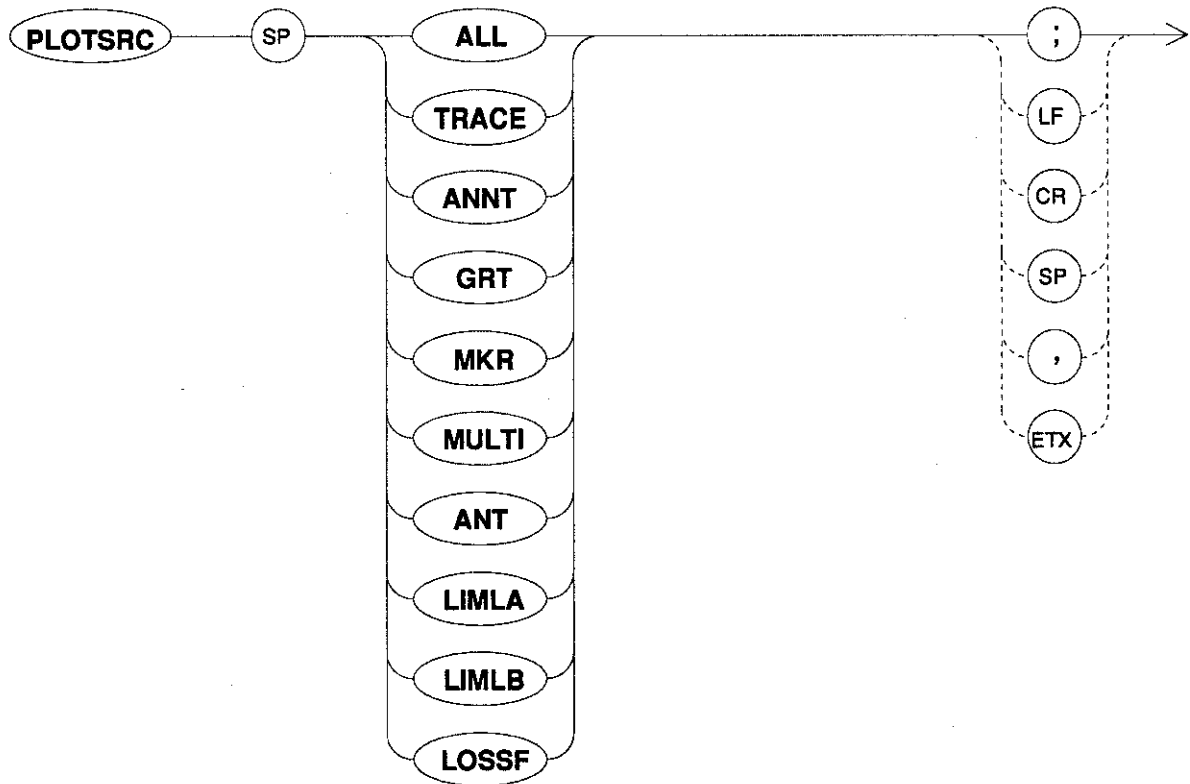
## Plotter Type

### Syntax



## PLOTSRC Plot Source

### Syntax



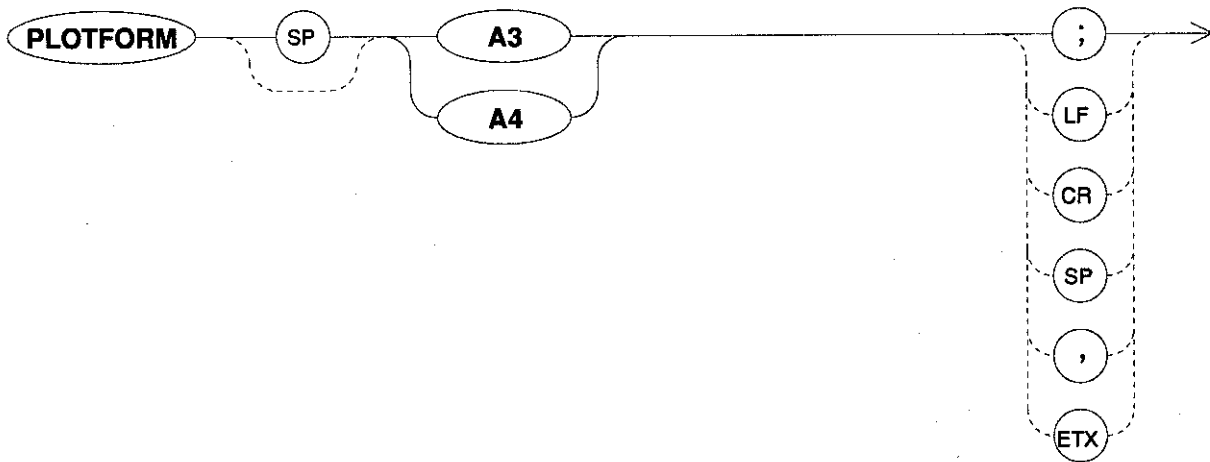
### Parameters

<b>ALL</b>	Plots the entire display.
<b>TRACE</b>	Plots only trace A/B.
<b>ANNT</b>	Plots only the annotation.
<b>GRT</b>	Plots only the graticule.
<b>MKR</b>	Plots the marker and display line and measurement window.
<b>MULTI</b>	Plots only the multi marker data.
<b>ANT</b>	Plots only the antenna correction data.
<b>LIMLA</b>	Plots only the limit line A data.
<b>LIMLB</b>	Plots only the limit line B data.
<b>LOSSF</b>	Plots only the conversion loss vs frequency correction data.

# PLOTFORM

## Plot Form

### Syntax

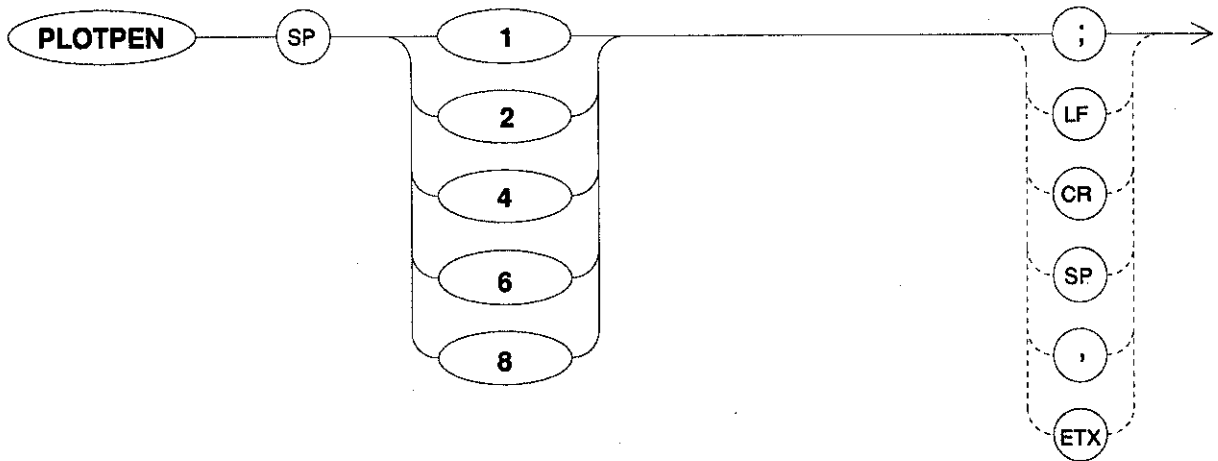




# PLOTPEN

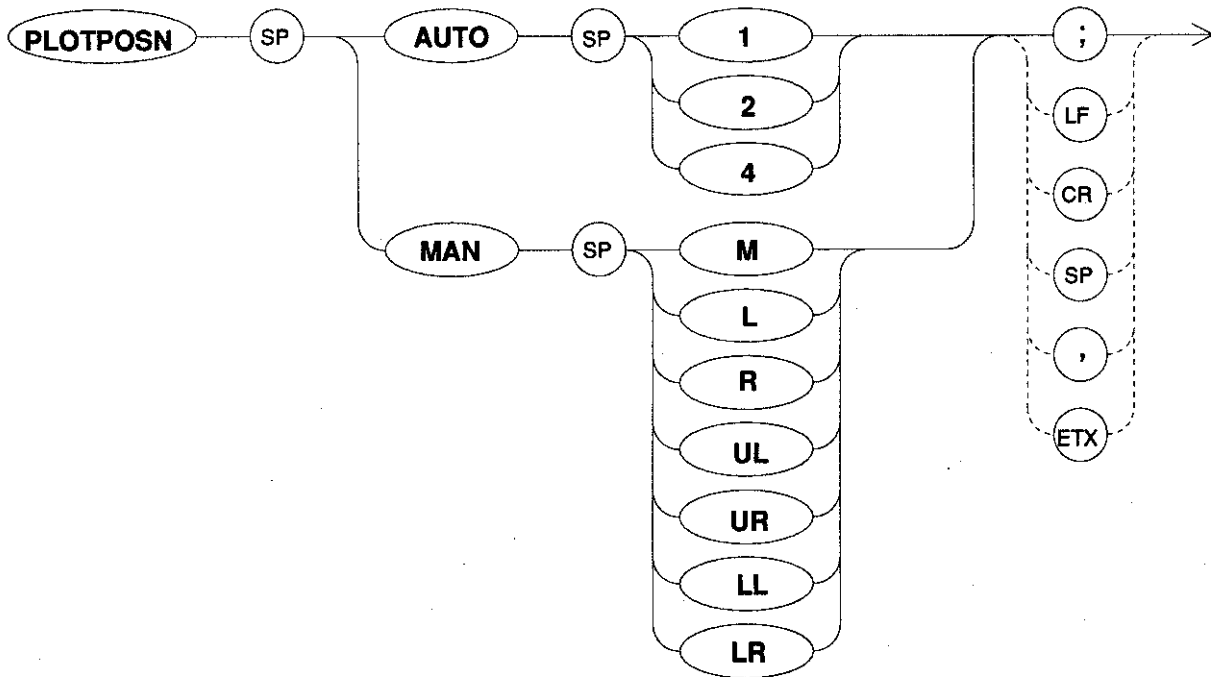
## Plot Pen

### Syntax



## PLOTPOSN Plot Position

### Syntax



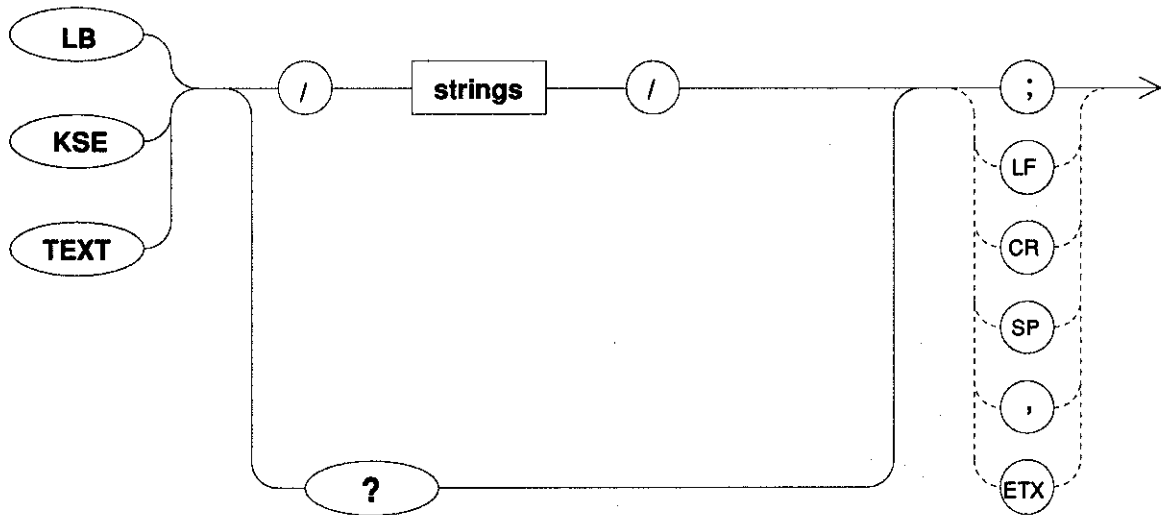
### Parameters

<b>AUTO</b>	Sets the plot location to automatic mode.
<b>MAN</b>	Sets the plot location to manual mode.
<b>1</b>	Selects the one division.
<b>2</b>	Selects the two divisions.
<b>4</b>	Selects the four divisions.
<b>M</b>	Plot position is center(when one division).
<b>L</b>	Plot position is left side(when two divisions).
<b>R</b>	Plot position is right side(when two divisions).
<b>UL</b>	Plot position is up-left side(when four divisions).
<b>UR</b>	Plot position is up-right side(when four divisions).
<b>LL</b>	Plot position is low-left side(when four divisions).
<b>LR</b>	Plot position is low-right side(when four divisions).

## LB / KSE / TEXT

### Title Entry

#### Syntax



#### Query Response

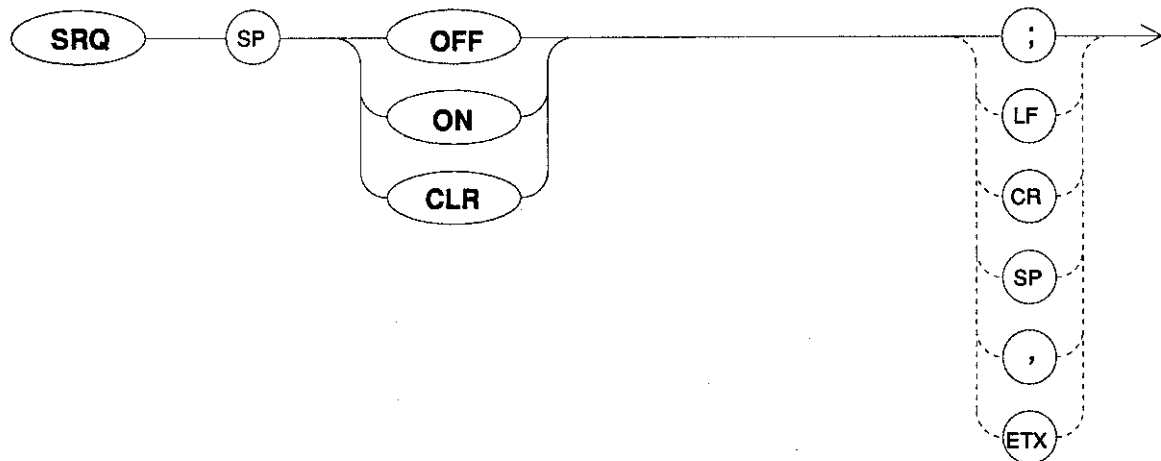


#### Example

```
10 OUTPUT 708;"KSE/THIS IS THE TITLE COMMAND./;"  
20 END
```

## SRQ Service Request

### Syntax



### Parameters

OFF	Disable the service request interrupt.
ON	Enable the service request interrupt.
CLR	Clear the status byte.

### Example

i) *HP200,300 series (interrupt off)*

```
10   OUTPUT 708;"SRQ OFF;"
20   LOOP
30   OUTPUT 708;"SRQ CLR;"
40   Polling: !
50   S=SPOLL(708)
60   IF BIT(S,2)<>1 THEN Polling
70   BEEP
80   END LOOP
90   END
```

ii) *HP200,300 series (interrupt on)*

```
10   OUTPUT 708;"SRQ ON;RQS 8;"
20   OUTPUT 708;"KSG20;"
30   Begin: !
40   OUTPUT 708;"SRQ CLR;"
50   ON INTR 7 GOTO Srq
60   ENABLE INTR 7;2
70   Srq_idle: !
80   GOTO Srq_idle
90   Srq: !
100  S=SPOLL(708)
```

**R3265/3271 OPT73  
GPIB COMMAND EXPANSION  
INSTRUCTION MANUAL**

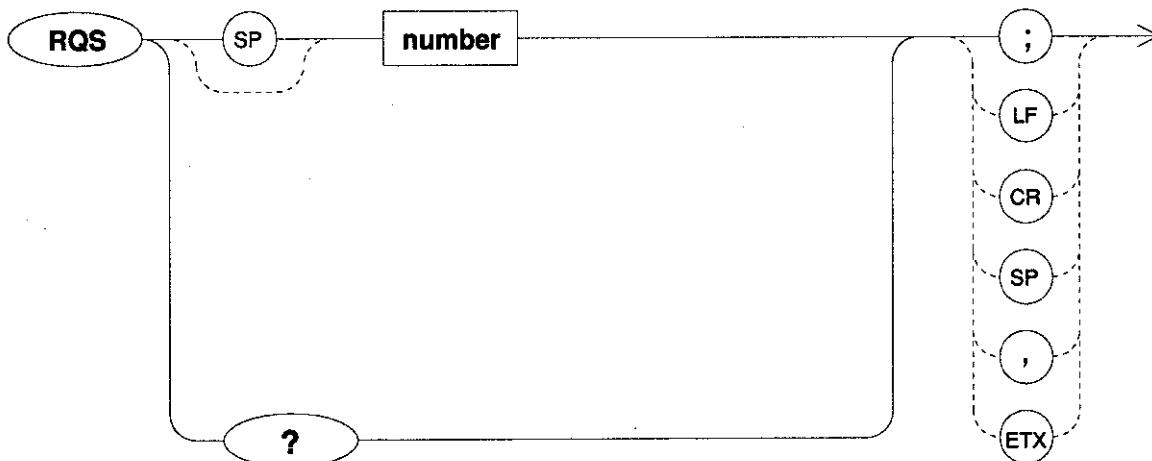
**2.3 Programming Commands**

---

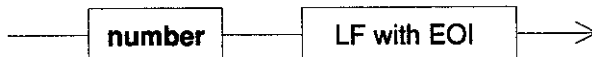
```
110 PRINT "AVERAGING IS COMPLETE"  
120 BEEP  
130 END
```

## RQS Request Service Conditions

### Syntax



### Query Response



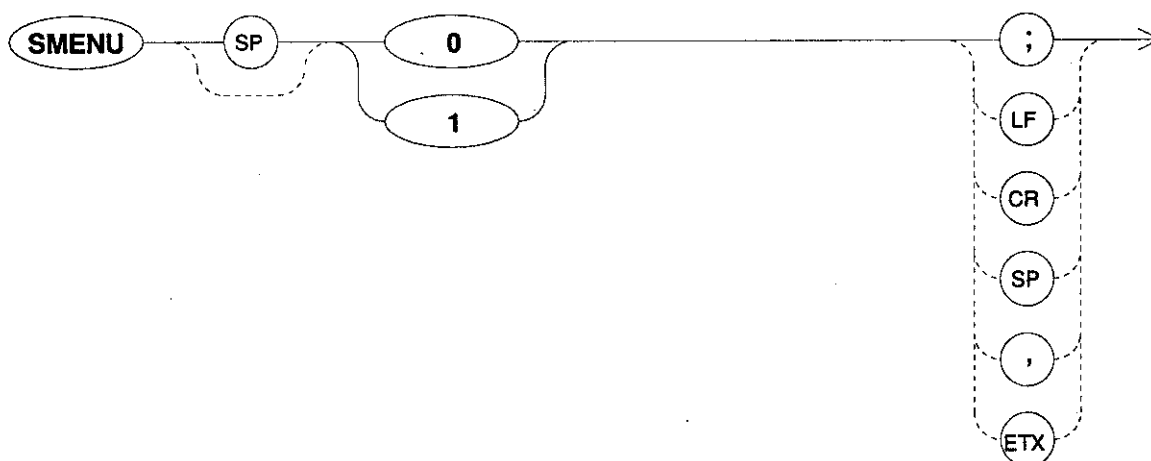
### Example

```
10     OUTPUT 708;"SRQ ON;RQS 8;"
20     OUTPUT 708;"KSG20;"
30     Begin: !
40     OUTPUT 708;"SRQ CLR;"
50     ON INTR 7 GOTO Srq
60     ENABLE INTR 7;2
70     Srq_idle: !
80     GOTO Srq_idle
90     Srq: !
100    S=SPOLL(708)
110    PRINT "AVERAGING IS COMPLETE"
120    BEEP
130    END
```

## SMENU

### Soft Menu Display On/Off

#### Syntax

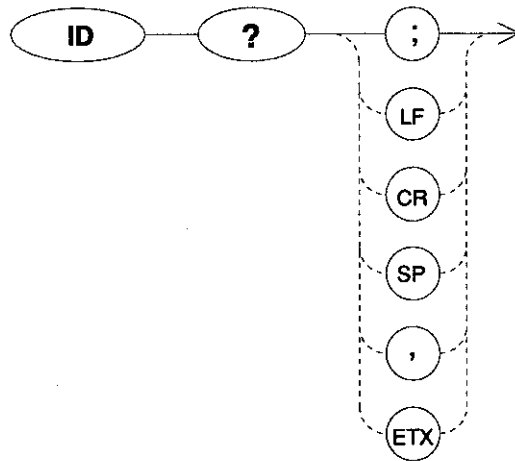


#### Example

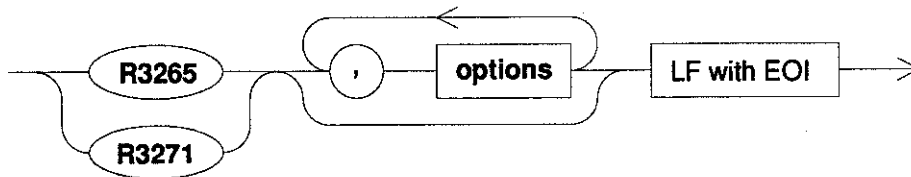
```
10 OUTPUT 708;"IP;SMENU OFF;"
20 OUTPUT 708;"SP 20MHZ;MKN;MKA?;"
30 FOR I=0 TO 3600 STEP 10
40   OUTPUT 708;"CF";I;"MZ;"
50   ENTER 708;M1
60   PRINT USING "K,DDDD,5X,K,MDDD.DD";"MARKER FREQ = ";I;"MARKER LEVEL = ",M1
70 NEXT I
80 END
```

## ID Output Identification

### Syntax



### Query Response

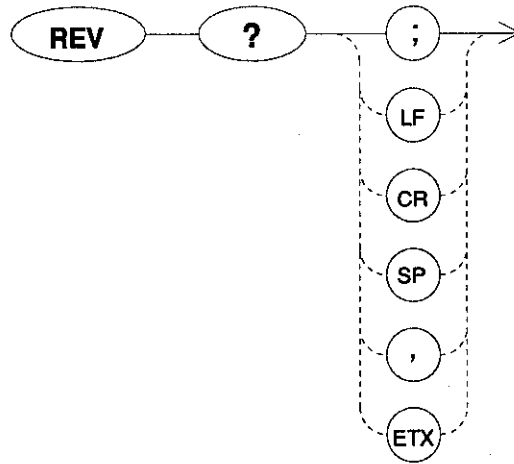




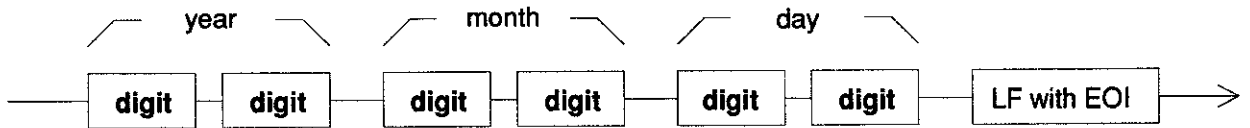
# REV

## Output Revision Number

### Syntax

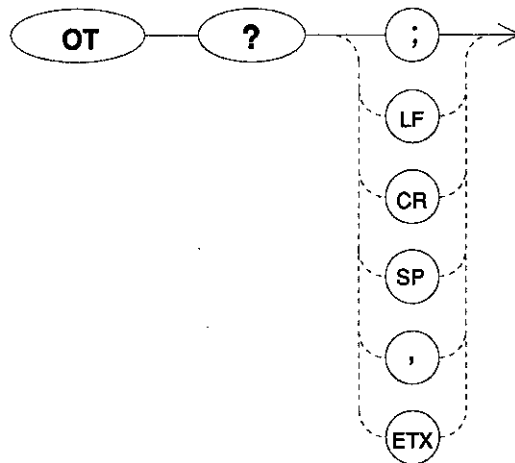


### Query Response

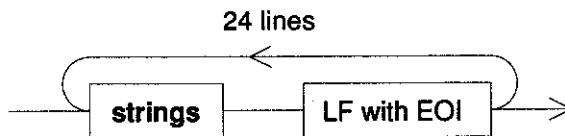


## OT Output All CRT Annotations

### Syntax



### Query Response



### Example

```
10 DIM A$[80]
20 INTEGER Tr(701)
30 !
40 GINIT
50 GRAPHICS ON
60 CONTROL 1,12;1
70 CSIZE 4,.5
80 MOVE 6,95
90 OUTPUT 708;"OT;"
100 FOR I=1 TO 24
110 ENTER 708;A$
120 LABEL A$
130 NEXT I
140 VIEWPORT 26,114,9,88
150 WINDOW 0,700,0,400
160 GRID 70,40,0,0,10,10,40
170 OUTPUT 708;"O2;TPC;TA?;"
180 ENTER 708 USING "%,W";Tr(*)
190 MOVE 0,Tr(I)
200 FOR I=1 TO 700
210 DRAW I,Tr(I)
220 NEXT I
230 END
```

## 2.4 Alphabetical Programming Code Listing

### A

A1	Clear Write Trace A	2-85
A2	Max Hold Trace A	2-88
A3	View Trace A	2-86
A4	Blank Trace A	2-87
A5	Min Hold Trace A	2-89
A6	Normalize Trace A	2-96
ADG	Adjacent Channel Leak Power Graph	2-141
ADJ	Adjacent Channel Leak Power	2-140
ADJBW	Specified Bandwidth of Adjacent Channel Power	2-142
ADJCH	Channel Space of Adjacent Channel Power	2-143
AG0	Averaging Trace A is Continue Mode	2-94
AG1	Averaging Trace A is Complete Mode	2-94
AINST	Instant Normalize Trace A	2-97
AL	Trace A Minus Display Line	2-102
ANC	Save Normalize Correction Data Trace A	2-98
ANNOT?	Annotation Query	2-79
ANT	Antenna Type	2-164
ANTCORR	Antenna Correction On/Off	2-165
AT	Input Attenuation	2-50
ATUN	Automatic Tuning	2-135
AUNITS	Absolute Amplitude Units	2-40
AUTOCP	Auto Coupled	2-52

### B

B1	Clear Write Trace B	2-85
B2	Max Hold Trace B	2-88
B3	View Trace B	2-86
B4	Blank Trace B	2-87
B5	Min Hold Trace B	2-89
B6	Normalize Trace B	2-96
BG0	Averaging Trace B is Continue Mode	2-95
BG1	Averaging Trace B is Complete Mode	2-95
BINST	Instant Normalize Trace B	2-97
BL	Trace B Minus Display Line	2-102
BMA	Trace B Minus Trace A	2-101
BNC	Save Normalize Correction Data Trace B	2-98

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**2.4 Alphabetical Programming Code Listing**

**C**

C1	Trace A Minus Trace B Off	2-100
C2	Trace A Minus Trace B On	2-100
CA	Coupled Input Attenuation	2-51
CAL	Calibration	2-183
CALCORR	Calibration Correction On/Off	2-185
CF	Center Frequency	2-16
CL	Calibration Signal Level	2-186
CM?	GO/NG Decision Query	2-105
CMA	GO/NG Decision for Trace A	2-105
CMB	GO/NG Decision for Trace B	2-105
CMS	Coupled Marker Step-Size	2-158
CNTR	Counter Mode	2-122
CNVLOSS	Conversion Loss	2-28
CONTPK	Continuous Peak Search	2-147
CONTXDB	Continuous X dB Down	2-131
CR	Coupled Resolution Bandwidth	2-45
CRDEL	Initialize Antenna Correction Table	2-167
CRIN	Antenna Correction Table Entry	2-166
CS	Coupled Center Frequency Step-Size	2-18
CT	Coupled Sweep Time	2-49
CV	Coupled Video Bandwidth	2-47

**D**

DEMODO	Demodulation	2-70
DEMODAGC	Demodulation Automatic Gain Control	2-72
DEMODT	Demodulation Time	2-71
DET?	Detection Mode Query	2-63
DGTLIF	Digital IF Mode On/Off	2-56
DL	Display Line	2-77
DX	Delta X for Peak Search	2-148
DY	Delta Y for Peak Search	2-149

**E**

E1	Peak Search	2-145
E2	Marker to Center Frequency	2-152
E3	Marker or Marker Delta to Center Frequency Step-Size	2-155
E4	Marker to Reference Level	2-153
EMCDET?	Detection Mode Query of EMC	2-169
EX	Trace A Exchange Trace B	2-99
EXTMXR	External Mixer Mode	2-21

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2.4 Alphabetical Programming Code Listing

**F**

FA	Start Frequency	2-35
FAV	Sweep Output (Frequency Analog Voltage Mode)	2-84
FB	Stop Frequency	2-36
FDSP	Frequency Display On/Off	2-81
FRE	External Frequency Reference	2-32
FREF?	Frequency Reference Query	2-32
FREQCORR	Frequency Characteristic Correction On/Off	2-184
FRI	Internal Frequency Reference	2-32
FS	Full Span	2-34
FXP	Fixed Marker Peak	2-127

**G**

GRAT?	Graticule Mode Query	2-80
-------	----------------------	------

**I**

ID?	Identification Query	2-198
INPUN?	Input Unit Query	2-82
IP	Instrument Preset	2-113

**K**

KSA	Amplitude in dBm	2-41
KSB	Amplitude in dBmV	2-41
KSC	Amplitude in dBuV	2-41
KSD	Amplitude in Voltage	2-41
KSE	Label Entry	2-193
KSG	Video Averaging On (Trace A)	2-90
KSGB	Video Averaging On (Trace B)	2-91
KSH	Video Averaging Off (Trace A)	2-92
KSHB	Video Averaging Off (Trace B)	2-93
KSK	Marker to Next Peak	2-145
KSL	Marker Noise Off	2-124
KSM	Marker Noise On	2-124
KSN	Marker to Minimum	2-146
KSO	Marker Delta to Frequency Span	2-154
KSQ	Band Unlock	2-25
KSV	Frequency Offset	2-19
KSZ	Amplitude Reference Offset	2-42
KSa	Normal Detection Mode	2-63

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2.4 Alphabetical Programming Code Listing

KSb	Positive Detection Mode	2-63
KSd	Negative Detection Mode	2-63
KSe	Sample Detection Mode	2-63
KSf	Power On in Last State	2-111
KSm	Graticule Off	2-80
KSn	Graticule On	2-80
KSo	Annotation Off	2-79
KSp	Annotation On	2-79
KSt	Band Lock	2-23
KSv	Signal Identification	2-27
KSx	External Trigger Mode	2-58
KSy	Video Trigger Mode	2-59
<b>L</b>		
LB	Label Entry	2-193
LG	Logarithmic Scale	2-38
LGS	Logarithmic Span	2-34
LIMAPOS	The Vertical Position of The Limit Line	2-173
LIMASFT	Shift Amplitude	2-175
LIMLA	Limit Line A On/Off	2-179
LIMLADEL	Initialize Limit Line A Table	2-178
LIMLAIN	Limit Line A Table Entry	2-177
LIMLB	Limit Line B On/Off	2-179
LIMLBDEL	Initialize Limit Line B Table	2-181
LIMBIN	Limit Line B Trace Entry	2-180
LIMPOS	The Horizontal Position of The Limit Line-2-172	
LIMSFT	Shift Frequency or Time	2-174
LIMTYP	Selects The Limit Line Type	2-171
LN	Linear Scale	2-39
LNS	Linear Span	2-34
LO	Display Line Off	2-78
LOSSF	Conversion Loss vs. Frequency Correction	2-29
LOWNOISE	Low Noise Mode On/Off	2-43
LTS	Last Span	2-34
LVFDEL	Initialize Conversion Loss vs. Frequency Correction Table	2-31
LVFIN	Conversion Loss vs. Frequency Correction Table Entry	2-30
LVLCORR	Level Correction On/Off	2-168

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2.4 Alphabetical Programming Code Listing

**M**

M1	Marker Off	2-144
M2	Marker Normal	2-114
M3	Marker Delta	2-116
MA	Marker Amplitude Output	2-117
MBIAS	Mixer Bias	2-22
MC	Marker Frequency Counter On/Off	2-120
MDA	Marker Display (absolute)	2-138
MDL	Marker Data Display (lower right)	2-138
MDR	Marker Display (relative)	2-138
MDU	Marker Data Display (upper right)	2-138
MEAN	Mean Detection Mode of EMC	2-169
MF	Marker Frequency Output	2-115
MINAT	Minimum Input Attenuation	2-53
MKACT	Selects Active Marker	2-132
MKBW	X dB Down Bandwidth	2-129
MKDCF	Marker Delta to Center Frequency	2-152
MKDMSS	Marker Delta to Marker Step-Size	2-156
MKDR	Reciprocal of Marker Delta	2-119
MKFCR	Frequency Counter Resolution	2-121
MKFXD	Marker Fixed On/Off	2-118
MKMSS	Marker to Marker Step-Size	2-156
MKNOISE	Marker Noise Bandwidth	2-125
MKPAUSE	Marker Pause	2-76
MLF	Marker Multi Off	2-133
MLN	Marker Multi On	2-133
MLTA?	Marker Multi Amplitude Output	2-134
MLTF?	Marker Multi Frequency Output	2-134
MMI	Initialize Memory Card	2-182
MML	Memory Card (Load the soft menu matrix)	2-182
MMS	Memory Card (Store the soft menu matrix)	2-182
MSS	Marker Step-Size	2-157
MT	Signal Track On/Off	2-123
MXE	External Mixer Mode	2-20
MXI	Internal Mixer Mode	2-20
MXR?	Mixer Mode Query	2-20

**N**

NIC	Marker Noise Execution in dBc/Hz	2-126
NIM	Marker Noise Execution in dBm/Hz	2-126
NIU	Marker Noise Execution in dBuV/Hz	2-126
NRM	Normal Detection Mode of EMC	2-169

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2.4 Alphabetical Programming Code Listing

NXA	Marker to Next Maximum/Minimum	2-145
NXL	Marker to Next Left Peak	2-145
NXM	Marker to Next Minimum	2-145
NXR	Marker to Next Right Peak	2-145

**O**

O1	Output Data Format (Decimal value 0 to 4095)	2-103
O2	Output Data Format (Two 8 bit binary)	2-103
O3	Output Data Format (Decimal value in the unit)	2-103
OHM	Input Impedance	2-83
ORB	Optimal Resolution Bandwidth	2-170
OT	Output All CRT Annotations	2-200

**P**

PEAK	Peak Detection Mode of EMC	2-169
PI	RF Input Through The Plug-In Unit	2-82
PKLIST	Next Peak List On/Off	2-151
PLOT	Plot Display	2-187
PLOTFORM	Plot Form	2-190
PLOTPEN	Plot Pen	2-191
PLOTPOSN	Plot Position	2-192
PLOTSRC	Plot Source	2-189
PLOTTYPE	Plotter Type	2-188
PP	Preselector Peak	2-136
PSDAC	Preselector DAC Number	2-137
PSL	Peak Search Effective Range (below)	2-150
PSN	Peak Search Effective Range (all)	2-150
PSU	Peak Search Effective Range (above)	2-150
PWRBW	Trace Power Bandwidth	2-139

**Q**

QP	QP Detection Mode of EMC	2-169
----	--------------------------	-------

**R**

RAMP	Aweep Output (Sweep Ramp Mode)	2-84
RB	Resolution Bandwidth	2-44
RBR	Resolution Bandwidth to Span Ratio	2-54
RC	Recalls Instrument States	2-110



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**2.4 Alphabetical Programming Code Listing**

REV?	Revision Number Query	2-199
RF	RF Input Signal	2-82
RL	Reference Level	2-37
RQS	Request Service Conditions	2-196
<b>S</b>		
S0	Reset Sweep	2-68
S1	Continuous Sweep	2-64
S2	Single Sweep	2-66
S3	Manual Sweep	2-65
SIGID	Signal Identification	2-26
SMENU	Soft Menu Display On/Off	2-197
SP	Frequency Span	2-33
SQL	Squelch Level	2-74
SQUELCH	Squelch On/Off	2-73
SRQ	Service Request	2-194
SS	Center Frequency Step-Size	2-17
ST	Sweep Time	2-48
SV	Saves Instrument States	2-112
SWPOUT?	Sweep Output Mode Query	2-84
<b>T</b>		
T1	Free Run Trigger Mode	2-57
T2	Line Trigger Mode	2-57
T3	External Trigger Mode	2-57
T4	Video Trigger Mode	2-57
T5	Vertical of TV Trigger Mode	2-57
T6	Horizontal of TV Trigger Mode (Odd-Field)	2-57
T7	Horizontal of TV Trigger Mode (Even-Field)	2-57
TA	Trace A Data Input/Output	2-106
TB	Trace B Data Input/Output	2-106
TDA?	Trace Data Accuracy Query	2-104
TEXT	Label Entry	2-193
TM?	Trigger Mode Query	2-57
TPC	Trace Data Accuracy (coarse)	2-104
TPF	Trace Data Accuracy (fine)	2-104
TRIGSLP	Trigger Slope +/-	2-61
TS	Take Sweep	2-69
TVH	Line Number of TV-H	2-60

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2.4 Alphabetical Programming Code Listing

**V**

VB	Video Bandwidth	2-46
VBR	Video Bandwidth to Resolution Bandwidth Ratio	2-55
VOL	Demodulation Volume	2-75
VTL	Video Trigger Level	2-62

**W**

WDO	Measurement Window On/Off	2-159
WDOS	Window Sweep On/Off	2-67
WFA	Measurement Window Start Frequency	2-160
WFB	Measurement Window Stop Frequency	2-161
WLL	Measurement Window Lower Level	2-163
WUL	Measurement Window Upper Level	2-162

**X**

XDB	X dB Down Execute	2-128
XDL	X dB Down Left Execute	2-128
XDR	X dB Down Right Execute	2-128
XMT	Marker Type of X dB Down Execution	2-130

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