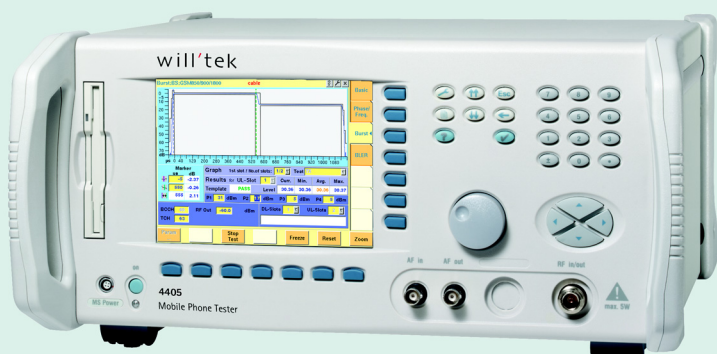


will'tek

# Willtek 4400

## Mobile Phone Tester



RAPID! Evaluation Test  
script reference guide  
version 4.00



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## About This Manual

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This reference guide describes the script commands used in the RAPID! evaluation and service tests. It assumes that you are familiar with the Willtek 4400 Mobile Phone Tester, especially with the basics of the RAPID! environment.

The manual starts with a quick reference of the script commands. This is followed by an alphabetical reference list of keywords with descriptions and explanations. At the end of the manual, possible applications of the script commands are included.

## Conventions Used in This Manual

---

The following conventions are used in this manual:

<b>BOLD</b>	Bold text in this format and size denotes the <b>KEYWORDS</b> for the script commands. <b>KEYWORDS</b> and their parameters are printed in capital letters if not explicitly stated otherwise.
MONOSPACE	Text in this font denotes syntax examples, paths (directories) and file names. Syntax examples are written in capital letters if not explicitly stated otherwise.

## Related Documentation

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The following documents contain additional information that you may find helpful when reading this manual:

- Willtek 4400 user's guides for GSM, GSM/GPRS and CDMA 1xRTT  
*chapters on RAPID!; SCPI*
- An Introduction to GSM  
*by Siegmund Redl, Matthias K. Weber, Malcolm W. Oliphant (ISBN 0-89006-785-6)*
- Mobile Station (MS) Conformance Specification (GSM 11.10)
- AT Command Set for GSM Mobile Equipment (GSM 07.07)

## Introduction to the Script Technology of the Evaluation Test

---

The evaluation test script files drive complete mobile tests with a pass/fail evaluation, printed in a test protocol. The script technique enables even nonprogrammers to easily create a test program.

Each line of a script contains one command which may have one or more parameters separated by a ",".

After starting a test the script file is loaded and is executed line by line. The first word in a line is the **KEYWORD** which represents the script command. This script command starts the corresponding subroutine which carries out the measurements, collects the results and saves the results in a temporary buffer.

At the end of the test the results are passed to the print routine. Here they are treated by the "first in first out" rule, meaning that the test protocol shows the same order as the script command list.

The script technology enables the user to create, modify or change a test in an easy, fast and exciting way.

## Programmer's Information

---

If a ";" is the first character in a script line, the whole line acts only as a comment line. The parameters can be numeric characters or string characters containing ASCII and numeric characters.

Spelling a **KEYWORD** incorrectly or using an unknown **KEYWORD** results in an error, and the message "ERR: unknown:" and the (unknown) **KEYWORD** are displayed during the test. No action is carried out on that command.

A blank line in the script terminates the test, even if it is not at the end of the test.

It can be used to finish a test, for example for debugging purposes.

The script files have the extension `.rbt` and are located in the `/rapid/evaluation/scripts/` directory.

For your convenience three empty scripts, `ev_test1.rbt`, `ev_test2.rbt` and `ev_test3.rbt` are included. If you fill in the contents in these files, you can start those tests within the menu environment already existing.

## Pass/Fail Limits

---

For GSM tests, the limits used in the tests are derived from the core specifications of the respective communication system and cannot be altered by the script commands.

The limits for CDMA tests are contained in an INI file so that they can be modified as required. The CDMA limits can be found in the following location:

`/rapid/evaluation/ini/cdma_lim.ini`

The header of this file explains how to use and modify the file to define limits for individual types of phones.

Special care should be taken when selecting limits: The power loss (coupling loss) and distortions from measurements in an unshielded environment should be taken into account.





---

## COUPLING\_LOSS

Parameters: Name

Name            Contains the name of a coupling loss file.

Description: A coupling loss is added during the test.  
The file describes the frequency response of the uplink and the downlink frequencies used during test.  
The user can create, adjust or adapt his own coupling loss files, and then choose the appropriate file name here.

Note:            The name of the coupling loss file is case-sensitive and must be a valid name.  
The file must be located in the `/rapid/cpl/` directory.  
The parameter may (but don't need to) be enclosed in **quotation marks**.  
In the configuration menu, the setup for user-cpl must be deactivated.

See also:        **COUPLING\_DATA, USER\_CPL**

Dependency: files: `ev_cmd.rbs, ev_utils.rbs`

Example:        `COUPLING_LOSS, "ev_dual.cpl"`

---

## DESCRIPTION

Parameters: Label

Label            Contains the label of a test.

Description: The description of a test is handed over by that command, it is visible on the screen during test run.

Note:            Do not separate words by comma because a comma is used to separate parameters.

Dependency: file: `ev_cmd.rbs`

Example:        `DESCRIPTION, Customer - finaltest`

---

## END

Parameters: None

Description: This command finishes the script-driven test.  
It acts like an empty line or if the last line in the script is read and no more lines are available.  
Usually not necessary because the last line stops the test anyway, but for debugging it may be helpful.

See also:        Programmer's Information at the beginning of this manual

Dependency: file: `evaluation.rbm`

Example:        `END`

---

## INIT\_COM

Parameters: Port,Rate,Timeout

Port            Number specifying the port (1 or 2).

Rate            Data rate to be used on the serial interface.

Timeout      Timeout, in seconds.

Description:    Initializes serial port COM1 or COM2 as follows:  
Data rate as given in the command string (Default 19200), 8 data bits, no parity, 1 stop bit, timeout as given in the command string, LF string delimiter. COM2 is recommended because COM1 may be used by the mouse.

See also:      **COM\_CMD**, **COM\_ASK**

Dependency:    files: ev\_cmd.rbs, rs232.rbl

Example:      `INIT_COM, 2, 19200, 20`

---

## **LOGGING**

Parameters:    Destination

Destination    Describes the type of logging, parameter is written in **lower-case** letters.

- = screen:      The log information is sent to the screen.
- = file:         Log information is sent to the `rapidlog.txt` file.
- = none:        Logging is switched off.

Description:    During test all the SCPI commands, time stamps and some comments can be captured and visualized on-screen or stored in a file. Sending the log information to a file is a very interesting tool for tracing and evaluating a test.

Note:          To log the SCPI commands the script command **SCPI\_LOG** must be activated too.

See also:      **SCPI\_LOG**

Dependency:    files: log.rbl, rapidlog.txt, scpi.rbl

Examples:      `LOGGING, screen`  
`LOGGING, file`  
`LOGGING, none`

---

## **NEW\_PAGE**

Parameters:    None

Description:    In the printout a new page is started.  
Several pages can be managed by that command.

Dependency:    files: ev\_cmd.rbs, ev\_utils.rbs, ev\_prt.rbs

Example:      `NEW_PAGE`

---

## **PUSH\_RESULT**

Parameters:    None

Description:    The collected results of a test are pushed from the temporary location to an instant location where they are available for the print routine or for an external GPIB (System) controller. Usually this command is carried out at the end of the test to forward the test protocol to screen or to a printer.

See also: **TERM\_BY\_BS**, **TERM\_BY\_MS**, **RS232\_TERM\_CALL**

Dependency: file: rbuf.rbl, evaluation.rbm, ev\_utils.rbs, ev\_prt.rbs

Example: `PUSH_RESULT`

---

### **RESET\_STOPWATCH**

Parameter: None

Description: The internal stopwatch of the test program is set to zero. It enables time measurements for certain parts of the test. This command is useful if e.g. the measurement time or the time the call needs to be established is of interest.

See also: **TIME\_STAMP**

Dependency: file: evaluation.rbm, stpwatch.rbl

Example: `RESET_STOPWATCH`

---

### **SCPI\_CMD**

Parameters: Command

Command String containing a SCPI command.

Description: This command is meant for advanced users who are familiar with SCPI programming. An extensive knowledge about the SCPI command set of the 4400 is necessary for proper usage. It enables the user to create setup procedures not yet available in the script command list.

See also: **SCPI\_ASK**

Dependency: files: ev\_cmd.rbs, scpi.rbl, log.rbl

Examples: `SCPI_CMD, *CLS`  
`SCPI_CMD, *RST`  
`SCPI_CMD, CONF:CSYS GSM`  
`SCPI_CMD, CONF:GSM:TYPE GSM9001800`

---

### **SCPI\_ASK**

Parameters: Query

Query String containing a SCPI query.

Description: This command is meant for advanced users. An extensive knowledge about the SCPI command set of the 4400 is necessary for proper usage. It enables the user to create measurement procedures not yet available in the script command list. The result of the query is displayed on the screen and written to the log file.

See also: **SCPI\_CMD**

Dependency: files: ev\_cmd.rbs, scpi.rbl, log.rbl

Examples: `SCPI_ASK, *IDN?`  
`SCPI_ASK, MEAS:RFTX:ALL?`

---

## **SCPI\_LOG**

Parameters: Switch

Switch = 0: SCPI command logging is switched off.  
1: Enables the logging of SCPI commands.

Description: Enables or disables SCPI command logging.  
SCPI command logging is very useful for tracing a test. The created SCPI log file can be easily used in GPIB-driven test environment, because RAPID! uses the same SCPI commands as used on the GPIB interface.

See also: **LOGGING**

Dependency: log.rbl, scpi.rbl

Examples: SCPI\_LOG, 0  
SCPI\_LOG, 1

---

## **TIME\_STAMP**

Parameters: Comment

Comment String containing additional information about a test step.

Description: A time stamp is set and a message is displayed on the screen and saved to the temporary result buffer. During the print of a protocol the message controls the page setup and is used for the test time calculation.

See also: **RESET\_STOPWATCH**

Dependency: files: evaluation.rbm, stpwatch.rbl, rbuf.rbl, ev\_prt.rbs

Examples: TIME\_STAMP, Call established  
TIME\_STAMP, Handover to GSM 1800  
TIME\_STAMP, Measurement finished  
TIME\_STAMP, Test finished

---

## GSM-Specific Commands

---

### ACPM

Parameters: Type[,Count]

Type =           1:           Selects ACPM "due to modulation".  
                  2:           Selects ACPM "due to switching transients".  
Count            Number of measurements.

Description: GSM specifications require that measurements of spectrum due to modulation are averaged. Spectrum due to switching transients should be measured in peak hold mode.

The second parameter defines the number of measurements. If not specified, a minimum of three measurements are carried out at least.

See also:       **ACPM\_TQ**

Dependency: files: evaluation.rbm, ev\_utils.rbs, ev\_prt.rbs

Examples:      ACPM, 1  
                  ACPM, 1, 5

---

### ACPM\_TQ

Parameters: Count

Count            Number of measurements.

Description: Measures adjacent channel power (ACP) due to transients. Only the results at  $\pm 400$  kHz,  $\pm 600$  kHz,  $\pm 1200$  kHz and  $\pm 1800$  kHz are printed.

See also:       **ACPM**

Dependency: files: evaluation.rbm, ev\_utils.rbs, ev\_prt.rbs

Example:        ACPM\_TQ, 5

---

### AUDIO

Parameters: Type

Type            String describing the type of Audio measurement.

Description: The speech loopback is activated and the incoming voice on the microphone of a mobile is echoed on the loudspeaker.

The operator can check whether both are working or not.

Before using that command, the Bit Error Rate loop must be opened first, otherwise speech loopback cannot work.

See also:       **BER\_LOOP**

Dependency: file: ev\_cmd.rbs, ev\_utils.rbs, ev\_prt.rbs

Example:        AUDIO, LOOPBACK

---

### BER\_ALL

Parameters: None

Description: RX-related measurements are performed, like Nonresidual Bit Error Rate Class Ia, Class Ib and Frame Erasure Rate.

The BER loop has to be closed first. The number of bits to be taken for comparison are specified when the BER loop is closed.

See also: **BER\_LOOP, RBER\_ALL, FBER\_ALL**

Dependency: file: evaluation.rbm, ev\_utils.rbs, ev\_prt.rbs

Example: **BER\_ALL**

---

## **BER\_LOOP**

Parameters: Type,Count,Delay

Type =	0:	Opens the BER loop.
	1:	Residual BER (A-loop).
	2:	Nonresidual BER (B-loop).
	3:	Fast BER (C-loop).
Count	Number of bits for comparison of received with transmitted bits.	
Delay	Specifies the round-trip delay, which is the delay of the bits until they are looped back to the test instrument.	
	= 0:	Autodetection of the round-trip delay is activated.

Description: If one type of BER loop is closed then the appropriate measurement is started and is running in parallel to other measurements.  
A call needs to be established first.  
Residual BER is most often used because it measures the unprotected bits.  
Fast BER depends on the mobile type, it is not supported by every mobile.

Notes: The BER loop requires a test SIM (with network parameters MCC = 001, MNC = 01) to be used in the mobile phone, otherwise the phone will not close the BER loop. A standard SIM is not appropriate for this; the Willtek 1100 Test SIM is suitable for closing the BER loop.

When the BER loop is switched on, the Audio speech loop is switched off automatically.

See also: **BER\_ALL, RBER\_ALL, FBER\_ALL, AUDIO**

Dependency: file: evaluation.rbm, ev\_utils.rbs, ev\_prt.rbs

Example: **BER\_LOOP, 1, 8200, 0**

---

## **CALL\_BY\_BS**

Parameters: None

Description: A base station call is initiated by the test program.  
If the mobile responses within 90 seconds the call will be established.  
If the call is not established a time-out is displayed and the test is stopped after 90 seconds.

Note: After switching on, the mobile starts searching for a network, and therefore the network is found in a short time. If a mobile is running already for a while, it depends on the internal algorithm when it starts the searching process again, and therefore it can take a while until the network is found and the call is established.

See also: **CALL\_BY\_MS, TERM\_BY\_BS, RS232\_BS\_CALL, RS232\_MS\_CALL, RS232\_TERM\_CALL**

Dependency: file: evaluation.rbm, ev\_utils.rbs

Example: `CALL_BY_BS`

---

### **CALL\_BY\_MS**

Parameters: None

Description: The test program waits until an MS Call is coming in. If a call is established within 90 seconds, the program continues the test. If the call is not established within 90 seconds, a time-out is displayed and the test is stopped.

Note: After switching on, the mobile starts searching for a network, and therefore the network is found in a short time. If a mobile is running already for a while, it depends on the internal algorithm when it starts the searching process again, and therefore it can take a while until the network is found and the call is established.

See also: `CALL_BY_BS`, `TERM_BY_MS`, `RS232_MS_CALL`, `RS232_BS_CALL`, `RS232_TERM_CALL`

Dependency: file: evaluation.rbm, ev\_utils.rbs

Example: `CALL_BY_MS`

---

### **CONFIG\_CH**

Parameters: `BSLevel`, `MSLevel`, `TCH`

<code>BSLevel</code>	Describes the base station level (4400 RF output level) in dBm, in the range from -10 to -120 dBm.
<code>MSLevel</code>	The MS level can be set as power level step in the range from 19 and 5 in the lower band, and from 15 to 0 in the upper band.
<code>TCH</code>	Channel number or alias name for the traffic channel. The traffic channel can be set directly using channel numbers or by alias names: LOW = Low channel, MID = Mid channel, HIGH = High channel. The extension " <code>_UP</code> " optionally added to the alias name indicates a channel in the upper band (1800 MHz or 1900 MHz).

Description: This command configures the frequency and the level of the test instrument and of the mobile under test.

See also: `GSM_TYPE`, `SET_CHANNEL`, `SET_BCCH`, `TRIPLEBAND`, `CONFIG_TCH_MSLEVEL`

Dependency: files: evaluation.rbm, ev\_utils.rbs, ev\_menu.rbs, evconfig.rbs

Example: `CONFIG_CH, -60, 10, 5`  
`CONFIG_CH, -80, 19, LOW`  
`CONFIG_CH, -100, 0, MID_UP`

---



## **CONFIG\_TCH\_MSLEVEL**

Parameters: TCH,MSLevel

TCH Channel number or alias name for the traffic channel. The traffic channel can be set directly using channel numbers or by alias names:  
LOW = Low channel, MID = Mid channel, HIGH = High channel.  
The extension "\_UP" optionally added to the alias name indicates a channel in the upper band (1800 MHz or 1900 MHz).

MSLevel The MS level can be set as power level step in the range from 19 and 5 in the lower band, and from 15 to 0 in the upper band.

Description: This command configures the TCH and the Power level at once within one signaling period. The traffic channel can be set directly using channel numbers or by alias names.

See also: **CONFIG\_CH**

Dependency: files: evaluation.rbm, ev\_utils.rbs

Example: `CONFIG_TCH_MSLEVEL, 5, 10`  
`CONFIG_TCH_MSLEVEL, LOW, 19`  
`CONFIG_TCH_MSLEVEL, MID_UP, 0`

---

## **FBER\_ALL**

Parameters: None

Description: Fast Bit Error Rate measurement is performed.  
The BER loop has to be closed first. The number of bits to be taken into account are specified when the loop is closed.

See also: **BER\_LOOP, RBER\_ALL, BER\_ALL**

Dependency: files: evaluation.rbm, ev\_utils.rbs, ev\_prt.rbs

Example: `FBER_ALL`

---

## **GSM\_TYPE**

Parameters: Band

Band = 900: GSM band configuration 900/1800 activated.  
1900: GSM band configuration 900/1900 activated.

Description: To change from 900/1800 to 900/1900 during the test the TCH and the BCCH have to be in the 900 MHz band because channel numbers in the 1800 and 1900 MHz bands are the same.

See also: **SET\_BCCH, CONFIG\_CH, CONFIG\_TCH\_MSLEVEL, TCH\_TYPE, TRIPLEBAND**

Dependency: file: evaluation.rbm, ev\_utils.rbs, ev\_prt.rbs

Example: `GSM_TYPE, 900`  
`GSM_TYPE, 1900`

---

## **MES\_TADV**

Parameters: None

Description: The measurement of the Timing Advance is carried out. It describes the offset to the current setting in microseconds, and should be zero at each setup. The setting of one bit corresponds to 3.69  $\mu$ s.  
The settling time is taken into consideration by the measurement driver automatically.

See also: **SET\_TADV**

Dependency: files: evaluation.rbm, ev\_utils.rbs, ev\_prt.rbs

Example: MES\_TADV

---

## **MS\_INFO**

Parameters: None

Description: The report from the mobile is read. It includes the following information: IMSI number, IMEI number, the MS Class, and the dialed number if it was an MS Call. The dialed number will show only blank characters if a BS Call was performed.  
Usually this command is carried out just after the call has been established to get this unique IMEI number. Consequently the test protocol can be attached to the right mobile even if the test does not reach the end.

See also: **MS\_REPORT**

Dependency: files: evaluation.rbm, ev\_utils.rbs, ev\_prt.rbs

Example: MS\_INFO

---

## **MS\_REPORT**

Parameters: ExpRxQual

ExpRxQual Describes the number of the expected RX Quality of the mobile.

Description: The report from the mobile is read. It includes:  
RX Level, RX Qual, Power Control, Timing Advance.  
The measurement itself is performed by the mobile, and because of the nature of GSM it takes about 500 milliseconds until the correct result is transferred to the tester. The report is then evaluated by the test program to ensure the correct report is read in and to avoid early (old) reports. This can be done by evaluating the RX Qual and the RX Level, because the test program knows the BS Level and hence the limits for the RX Level report. The program is able to find the correct report by asking for several reports until it is in the expected limits or it takes the latest report after a certain period of time (frames). The value 3 results from the ETSI specification, it says at an RX Level of  $-102$  dBm the mobile is allowed to report an RX Qual between zero and three. At input levels higher than  $-82$  dBm, the parameter for the expected RX Quality must be 0, to fulfill the ETSI and GSM limits.

Note: RX Quality measurements made by the mobile are similar to the RBER measurements made by the test instrument.

See also: **MS\_INFO**, **RBER\_ALL**

Dependency: file: evaluation.rbm, ev\_utils.rbs, ev\_prt.rbs

Examples: MS\_REPORT  
MS\_REPORT, 3

---

### **PHASE\_MAX**

Parameters: Count

Count            Number specifying how many measurements are carried out.

Description: TX Phase Error RMS measurements are performed as many times as given by the parameter and then the maximum is calculated.  
Could be carried out after TX\_ALL measurement if maximum value is needed for Phase Error RMS only.

See also: TX\_ALL, TX\_ALL\_MAX, TX\_ALL\_AVG

Dependency: file: evaluation.rbm, ev\_utils.rbs, ev\_prt.rbs

Example: PHASE\_MAX, 5

---

### **RBER\_ALL**

Parameters: None

Description: RX-related measurements are performed, like Residual Bit Error Rate, Class Ib, Class II and Frame Erasure Rate.  
The number of bits to be taken into account is specified when the BER loop is closed.

Note: The BER loop has to be closed first.

See also: BER\_LOOP, BER\_ALL, FBER\_ALL, MS\_REPORT

Dependency: files: evaluation.rbm, ev\_utils.rbs, ev\_prt.rbs

Example: RBER\_ALL

---

### **RS232\_BS\_CALL**

Parameters: None

Description: The program is looking for a BS Call initialized by AT Modem commands carried out by the serial interface connection.  
First the program checks whether a network is available, and then the BS Call is initiated while the mobile responses via the RS-232 interface (COM2).

Note: This function uses COM2. Use INIT\_COM to initialize this serial interface.

See also: RS232\_TERM\_CALL, RS232\_MS\_CALL, INIT\_COM

Dependency: files: ev\_cmd.rbs, ev\_utils.rbs, rs232.rbl

Example: RS232\_BS\_CALL

---

### **RS232\_MS\_CALL**

Parameters: Phone

Phone            Number specifying the phone number for the call.

Description: The program is looking for an MS Call initialized by AT Modem commands carried out by the serial interface connection.

After network detection the program sends a serial command to the serial interface, and the mobile establishes an MS Call with phone number included.

Note: This function uses COM2. Use `INIT_COM` to initialize this serial interface.

See also: `RS232_TERM_CALL`, `RS232_BS_CALL`, `INIT_COM`

Dependency: files: `ev_cmd.rbs`, `ev_utils.rbs`, `rs232.rbl`

Example: `RS232_MS_CALL,123456789`

---

### **RS232\_TERM\_CALL**

Parameters: None

Description: Terminates the call by using AT Command via the serial interface. The mobile station releases an existing call and the test is finished afterwards. If the BER loop is still closed it will be opened and measurement will be finished automatically, the operator does not need to take care about an existing BER loop.

Notes: This function uses COM2. Use `INIT_COM` to initialize this serial interface.

The test protocol can be printed by carrying out the `PUSH_RESULT` script command.

See also: `TERM_BY_MS`, `TERM_BY_BS`, `PUSH_RESULT`, `INIT_COM`

Dependency: files: `ev_cmd.rbs`, `ev_utils.rbs`, `rs232.rbl`

Example: `RS232_TERM_CALL`

---

### **SET\_BCCH**

Parameters: BCCH

BCCH =      Number:      Channel number of the broadcast channel (BCCH).

              MID:         Mid channel.

              MID\_UP:     Middle channel in the upper band (1800 MHz).

              MID\_TRI:    Middle channel in the 1900 MHz band.

Description: The Broadcast Control Channel can be set directly by using channel numbers or alias names.

Note: During a call it is not allowed to change the BCCH.

See also: `GSM_TYPE`, `SET_CHANNEL`, `CONFIG_CH`

Dependency: files: `evaluation.rbm`, `ev_utils.rbs`, `ev_menu.rbs`, `evconfig.rbs`, `ev_prt.rbs`

Examples: `SET_BCCH,63`  
`SET_BCCH,MID`  
`SET_BCCH,MID_UP`  
`SET_BCCH,MID_TRI`

---

### **SET\_CHANNEL**

Parameters: Band

Band           String describing the frequency range used during the test.

Description: The Low, Mid, and High channels are defined by this command. The real channel numbers can be modified by the user in the Evaluation Test Configuration Menu. This command has to be carried out before a channel setup is performed, usually at the beginning of a script file. Real triple-band mobiles with handover in all three bands may not yet be available, it is necessary to switch them manually.

See also: **GSM\_TYPE, CONFIG\_CH, CONFIG\_TCH\_MSLEVEL, SET\_BCCH, TRIPLEBAND**

Dependency: files: evaluation.rbm, ev\_utils.rbs, ev\_menu.rbs, evconfig.rbs

Examples: SET\_CHANNEL, GSM900  
SET\_CHANNEL, GSM9001800  
SET\_CHANNEL, GSM9001900  
SET\_CHANNEL, E-GSM9001800  
SET\_CHANNEL, E-GSM9001900  
SET\_CHANNEL, E-GSM90018001900

---

### **SET\_IMSI**

Parameters: IMSI  
IMSI String containing the IMSI number of a SIM card.

Description: With this command different SIM card numbers can be defined at the beginning of the test, like the Willtek standard test SIM card or German Telecom test SIM card or special user test SIM card. If BS Call is activated the IMSI number must be known by the tester. The default number is the Willtek test SIM card number.

See also: In the configuration of the Evaluation Test there is a setup included for your convenience.

Dependency: files: ev\_cmd.rbs, ev\_utils.rbs, ev\_menu.rbs, evconfig.rbs

Example: SET\_IMSI, 001010123456789

---

### **SET\_TADV**

Parameters: TA  
TA Number in the range from 0 to 63 bits describing the Timing Advance in bit periods.

Description: The Timing Advance can be set by this command.

Note: After setting the Timing Advance the mobile needs some time for readjusting itself.

See also: **MES\_TADV**

Dependency: files: evaluation.rbm, ev\_utils.rbs, ev\_prt.rbs

Examples: SET\_TADV, 10  
SET\_TADV, 63

## **TCH\_TYPE**

Parameters: Codec

Codec =       FR:           Selects a Full Rate voice traffic channel.  
              EFR:          Selects an Enhanced Full Rate voice channel.

Description: Selects the type of voice traffic channel. The default is FR for Full Rate. If a setup is necessary it should be done before a call is established.

Dependency: file: evaluation.rbm, ev\_utils.rbs, ev\_prt.rbs

Examples:    TCH\_TYPE, FR  
              TCH\_TYPE, EFR

---

## **TERM\_BY\_BS**

Parameters: None

Description: Prompts the user to initiate a call release on the phone (message "DISCONNECT" appears on the screen). The call will be released. If the BER loop was closed it will be opened and measurements will be finished automatically, the operator does not need to take care about existing BER loops. The test protocol can be printed by carrying out the **PUSH\_RESULT** script command.

See also:    **TERM\_BY\_MS, RS232\_TERM\_CALL, PUSH\_RESULT**

Dependency: file: evaluation.rbm, ev\_utils.rbs

Example:     TERM\_BY\_BS

---

## **TERM\_BY\_MS**

Parameters: None

Description: The mobile station releases an existing call and the test is finished afterwards. If the BER loop is still closed it will be opened and measurement will be finished automatically, the operator does not need to take care of existing BER loops. The test protocol can be printed by carrying out the **PUSH\_RESULT** script command.

See also:    **TERM\_BY\_BS, RS232\_TERM\_CALL, PUSH\_RESULT**

Dependency: file: evaluation.rbm, ev\_utils.rbs

Example:     TERM\_BY\_BS

---

## **TRIPLEBAND**

Parameters: None

Description: The triple-band instruction is shown on the screen and the test program is halted till the test is continued by pressing a button. It enables the user to switch the mobile into PCS 1900 mode. Real triple-band mobiles with handover in all three bands are not available yet, momentarily it is necessary to switch them manually.

See also:    **SET\_CHANNEL, GSM\_TYPE, CONFIG\_CH, SET\_BCCH**

Dependency: files: ev\_cmd.rbs, ev\_utils.rbs, ev\_prt.rbs

Example: TRIPLEBAND

---

### **TX\_ALL**

Parameters: Count

Count            Number specifying how many measurements are carried out.

Description: All TX-related measurements are carried out, like Phase Error RMS, Phase Error Peak, Frequency Error, TX Power, Template check, Corner points and Flatness.

See also: **TX\_POWER\_AVG, TX\_ALL\_MAX, PHASE\_MAX**

Dependency: files: evaluation.rbm, ev\_utils.rbs, ev\_prt.rbs

Example: TX\_ALL, 1

---

### **TX\_ALL\_AVG**

Parameters: Count

Count            Number specifying how many measurements are carried out.

Description: Average of all TX measurements is calculated.  
TX measurements are: Phase Error RMS, Phase Error Peak, Frequency Error, TX Power, Template check, Corner points and Flatness.

See also: **TX\_POWER\_AVG, TX\_ALL, TX\_ALL\_MAX, PHASE\_MAX**

Dependency: files: evaluation.rbm, ev\_utils.rbs, ev\_prt.rbs

Example: TX\_ALL\_AVG, 5

---

### **TX\_ALL\_MAX**

Parameters: Count

Count            Number specifying how many measurements are carried out.

Description: Maximum of all TX measurements is calculated.  
TX measurements are: Phase Error RMS, Phase Error Peak, Frequency Error, TX Power, Template check, Corner points and Flatness.

See also: **TX\_POWER\_AVG, TX\_ALL, TX\_ALL\_AVG, PHASE\_MAX**

Dependency: file: ev\_cmd.rbs, ev\_utils.rbs, ev\_prt.rbs

Example: TX\_ALL\_MAX, 5

---

### **TX\_POWER**

Parameters: Count

Count            Number specifying how many measurements are carried out.

Description: The TX Power of a mobile is measured only. The number of measurements is visible on the printout.  
No averaging or any other statistical evaluation is done.

See also: **TX\_POWER\_AVG, TX\_ALL, TX\_ALL\_MAX, TX\_ALL\_AVG**

Dependency: file: evaluation.rbm, ev\_utils.rbs, ev\_prt.rbs

Examples: TX\_POWER, 1  
TX\_POWER, 5

---

### **TX\_POWER\_AVG**

Parameters: Count

Count            Number specifying how many measurements are carried out.

Description: The TX Power of a mobile is measured only. MAX, MIN and AVG is calculated for the number of measurements carried out.

See also: **TX\_POWER, TX\_ALL, TX\_ALL\_MAX, TX\_ALL\_AVG**

Dependency: file: evaluation.rbm, ev\_utils.rbs, ev\_prt.rbs

Example: TX\_POWER\_AVG, 5

---



## CDMA 1xRTT-Specific Commands

---

### Common Parameters

Some parameter values used in the CDMA commands can be shortened or used by other terms as follows:

Original parameter value	Equivalent value	Meaning
NULL	SAME SKIP	Used to indicate that a parameter does not need to be changed.
PRIMARY	PRIME PRIM FIRST 1 1ST	All of these indicate the first band in a dual-band test as selected in the RAPID! menu.
SECONDARY	SECOND SEC 2 2ND	All of these indicate the second band in a dual-band tests as selected in the RAPID! menu.
CELLULAR	CELL US800	All of these are used to indicate the US 800 (Cellular) band.
PCS	USPCS US1900	All of these are used to indicate the US PCS (1900 MHz) band.
KOREAN	KPCS KOR	All of these are used to indicate the Korean PCS (1700 MHz) band.
CONTROL	CONT	These are used to indicate the same value as the control channel selected in the RAPID! menu.
LOW	LO	These are used to indicate the Low channel value selected in the RAPID! menu for the long test.
MID	MIDDLE MED	These are used to indicate the Mid channel value selected in the RAPID! menu for the long test.
HIGH	HI	These are used to indicate the High channel value selected in the RAPID! menu for the long test.
TRAFFIC	TRAFF TRAF	These are used to indicate the traffic channel value selected in the RAPID! menu for the fast test.

CONFIG	CONFIGURATION DEFAULT DEF	Used to indicate that the appropriate value from the RAPID! menu is used.
MINIMUM	MIN	Used to indicate the Minimum Base Power selected in the RAPID! menu is used.

### **BOX\_NEW**

Parameters: None

Description: This command is used to close a box started by the INITIALIZE\_BOX command. It will also create a new box if more tests are run that cause information to be sent to the printout. This command only affects the appearance of printouts on the 4400 screen. It does not affect the appearance of printouts sent to a printer.

### **CDMA\_ACPM**

Parameters: Count

Count = NULL: Count is set to 1  
number: (1 to 100)

Description: This command performs a number of (Count) adjacent channel power measurements on the mobile. If Count is not supplied a single measurement is made. A pass/fail response is reported based on the spurious emissions limits in the 4400 manual mode ACPM parameters menu.

Example: CDMA\_ACPM,  
A single ACPM measurement is performed since Count is not supplied and a pass/fail indication is reported.

### **CDMA\_CALL\_BY\_BS**

Parameters: [NotPrintMobileInfo]

NotPrintMobileInfo (optional parameter)  
number: 0 = Do print the registration information. The value is automatically set to 0 if it is not specified.  
1 = Do not print the mobile registration information on the test printout

Description: This command is used to page the mobile. Once the mobile is on a call registration information is retrieved from the mobile and printed. The optional parameter can be used to stop the printing of the registration information. This may be desirable if this information has already been printed by some other means (CDMA\_MS\_INFO).

Example: CDMA\_CALL\_BY\_BS  
This will cause the mobile to be paged, and the registration information will be printed since the optional parameter has not been used.



**Description:** This performs a frame error rate (FER) test. Count is used to indicate the number of FER tests to be conducted. If Count is greater than 1 an average of the results will be reported. Large FER Count values result in long test times and are discouraged under normal testing circumstances. The FER test will be conducted in accordance with the parameters supplied in the CDMA\_FER\_SETUP command, using the Base Station RF Level and the Traffic Channel Level supplied. This allows for both sensitivity and dynamic range testing.

**Example:** `CDMA_FER, 1, MIN, CONFIG`  
 The frame error rate (FER) test will be performed once, at the minimum base power level, and the FER test traffic level supplied by RAPID!.

**CDMA\_FER\_SETTING OR CDMA\_FER\_SET OR CDMA\_FER\_SETUP**

**Parameters:** MaxFram, ConfLev, LimLev, EnabOnOff

MaxFram = NULL:	Do not change the frame error rate (FER) maximum frame count
number:	Set the frame error rate (FER) maximum frame count to the number specified (100 to 10000)
CONFIG:	Set the frame error rate (FER) maximum frame count to the values specified in the RAPID! cdma_lim.ini file
ConfLev = NULL:	Do not change the frame error rate (FER) pass/fail confidence level
number:	Set the frame error rate (FER) pass/fail confidence level to the number specified (90.0 to 100.0%)
CONFIG:	Set the frame error rate (FER) maximum frame count to the values specified in the RAPID! cdma_lim.ini file
LimLev = NULL:	Do not change the frame error rate (FER) pass/fail limit
number:	Set the frame error rate (FER) pass/fail limit to the number specified (0.0 to 5.0%)
CONFIG:	Set the frame error rate (FER) maximum frame count to the values specified in the RAPID! cdma_lim.ini file
EnabOnOff = NULL:	Do not change the frame error rate (FER) pass/fail limit enable status
ON:	Enable the frame error rate (FER) pass/fail limit
OFF:	Disable the frame error rate (FER) pass/fail limit

**Description:** This command can be used to enable and use the FER, conf. level and frames parameters found in the 4400 manual mode FER menu. This allows for the control of the maximum number of frames that will be transmitted to the mobile during an FER test as well as the pass/fail parameters.

**Example:** `CDMA_FER_SETUP, 200, 100, , ON`  
 The maximum FER test frame count is set to 200, the confidence level is set to 100% ensuring that all 200 frames will be transmitted, the pass/fail limit is not changed (set to NULL) and the limit status is enabled.

## CDMA\_FER\_VERR

Parameters: Count,BSLevel,TCHLevel[,AddTest] [,PowerControlReset][,PrintOut]

Count =	NULL:	Count is set to 1
	number:	Count is set to number (1 to 100)
BSLevel =	NULL:	Do not change the 4400 RF output level
	MINIMUM:	Set the 4400 RF output level to the minimum base power specified in RAPID!
	number:	Set the 4400 RF output level to the specified number in dBm (-120.0 to -10.0)
TCHLevel =	NULL:	Do not change the 4400 traffic channel level
	DEFAULT:	Set the 4400 traffic channel level to the FER test traffic level specified in RAPID!
	number:	Set the 4400 traffic channel level to the number specified (-5.0 to -32.0)
AddTest =	NULL:	AddTest is set to 0
	number:	(7 if not supplied) Additional TX tests are performed concurrently to frame error rate (FER) as follows: 0 = No TX tests 1 = TX vector error 2 = TX max power 3 = TX vector error and max power 4 = TX minimum power 5 = TX Vector error and minimum power 6 = TX average power 7 = TX vector error and average power
PowerControlReset =	NULL:	PowerControlReset is set to FALSE
	FALSE:	No power control reset of the mobile is performed at the conclusion of the FER test (default if not supplied)
	TRUE:	A power control reset of the mobile is performed at the conclusion of the FER test
PrintOut =	number:	(2047 (all) if not supplied) The tests that are to be printed in the printout. This number is the sum of the following numbers. Only add up the number of the tests desired in the printout: 1 = waveform quality (rho) 2 = frequency error 4 = time error 8 = carrier feedthrough 16 = IQ imbalance 32 = peak phase error 64 = rms phase error 128 = rms vector error 256 = peak magnitude error 512 = rms magnitude error 1024 = RF power

**Description:** The 4400 has the ability to perform RX and TX measurements concurrently, drastically reducing test times. This command utilizes this capability and allows TX vector error test and a mobile power test to be performed during a frame error rate (FER) test. The maximum power and minimum power tests run during FER utilize all up and all down power control bits respectively. Average power is run in accordance with the open loop estimate formula. A single occurrence of the TX vector error and power measurement is performed. The Count parameter controls the number of FER measurements performed.

**Examples:** `CDMA_FER_VERR, 1, MIN, CONFIG`  
This command performs a single FER sensitivity test (the 4400 RF output level is set to the minimum base power specified in RAPID!), and all of the TX tests listed under the Printout parameter (2047). The RF power test is average power, so the closed loop power control is not changed during the test.

`CDMA_FER_VERR, 1, -25, CONFIG, 4`  
This command performs a single FER dynamic range test (the 4400 RF output level is set to -25 dBm), and a Minimum RF power test. Closed loop power control is set to all down bits during the test and is returned to the previous mode once the test is complete. The vector error tests are performed, but do not appear on the printout.

`CDMA_FER_VERR, 1, MIN, CONFIG, 3`  
This command performs a single FER sensitivity test (the 4400 RF output level is set to the minimum base power specified in RAPID!), and all of the TX tests listed under the Printout parameter (2047). The RF power test is max power, so the closed loop power control is all up. A power control reset is not performed at the conclusion of the test, but the power control mode is returned to its initial state. All of the vector error tests are reported on the printout.

`CDMA_FER_VERR, 1, MIN, CONFIG, 3, TRUE`  
This command performs a single FER sensitivity test (the 4400 RF output level is set to the minimum base power specified in RAPID!), and all of the TX tests listed under the Printout parameter (2047). The RF power test is max power, so the closed loop power control is all up. A power control reset is performed at the conclusion of the test, and the power control mode is returned to its initial state. All of the vector error tests are reported on the printout.

`CDMA_FER_VERR, 1, MIN, CONFIG, 3, TRUE, 1163`  
This command performs a single FER sensitivity test (the 4400 RF output level is set to the minimum base power specified in RAPID!), and all of the TX tests listed under the Printout parameter (2047). The RF power test is max power, so the closed loop power control is all up. A power control reset is performed at the conclusion of the test, and the power control mode is returned to its initial state. The vector error tests reported are RF power, rms vector error, carrier feedthrough, frequency error, and waveform quality (rho) (1024 + 128 + 8 + 2 + 1).

---

### **CDMA\_FILENAME\_HEX**

Parameters: Print

Print =	1:	Use the mobile hex ESN as the default file name for results
	0:	Use the mobile decimal ESN as the default file name for results

Description: This command determines which ESN format is used as the default file name for saving results to the 4400 hard drive.

Example: `CDMA_FILENAME_HEX, 1`  
The hex ESN of the mobile is used as the default file name for saving test results to the 4400 hard drive.

---

### **CDMA\_FREQ\_ERR**

Parameters: Count

Count =	NULL:	Count is set to 1
	number:	1 to 100

Description: This command measures the mobile TX frequency error. Count is used to control the number of measurements taken. If Count is greater than 1, maximum, minimum and average values are reported.

Example: `CDMA_FREQ_ERR`  
Since Count is not specified it is automatically set to 1. A single TX frequency measurement is performed and the single value is reported.

---

### **CDMA\_GATED**

Parameters: Count,DRate

Count =	NULL:	Count is set to 1
	number:	(1 to 100)
DRate =	NULL:	Do not change the FCH data rate
	HALF:	Sets the FCH to the half data rate
	QUARTER:	Sets the FCH to the quarter data rate
	EIGHTH:	Sets the FCH to the eighth data rate

Description: This command performs a number (Count) of gated power measurements on the mobile at the specified data rate. If Count is not specified Count is set to 1. The previous data rate is restored after the measurements are taken. A pass/fail response is reported using the limits mask in the 4400 manual Gated Power menu. Care should be taken to ensure that the mobile is in a gated power condition by using the appropriate radio configuration and data rate. If on an IS-2000 call (Radio Configuration  $\geq$  3) the data rate must be EIGHTH. Any data rate will produce a gated power condition if on an IS-95 call.

Example: `CDMA_GATED, , EIGHTH`  
A single gated power measurement is taken at the eighth data rate. The previous data rate is restored after the measurement is taken.

---

## CDMA\_HOFF\_TRAF

Parameters: Band,Chan,Rcon,Sopt

Band =	NULL:	Do not change the band
	PRIMARY:	Set the band to the first band in the dual-band test in the RAPID! menu
	SECONDARY:	Set the band to the second band in the dual-band test in the RAPID! menu
	US800:	Set the band to the US 800 MHz cellular band
	USPCS:	Set the band to the US PCS 1900 MHz band
	KPCS:	Set the band to the Korean PCS 1700 MHz band
Chan =	NULL:	Do not change the channel
	CONTROL:	Set the channel to the same value as the control channel in the RAPID! menu
	LOW, MID, HIGH:	Set the channel to the value set in the RAPID! menu for one of the channels in the long test
	TRAFFIC:	Set the channel to the value set in the RAPID! menu in the traffic channel for the short test
	number:	Set the channel to this number (must be a valid channel number for the band selected)
Rcon =	NULL:	Do not change the radio configuration
	CONFIG:	Set the radio configuration to the value set in the RAPID! menu
	number:	Set the radio configuration to the value specified (1 – 5)
Sopt =	NULL:	Do not change the service option
	CONFIG:	Set the service option to the value set in the RAPID! menu
	number:	Set the radio configuration to the value specified (1, 2, 3, 9, 17, 55, 32768)

Description: This command performs a handoff, and allows for changes in the band, channel, radio configuration, and service option. Changes in all four of these parameters are not recommended.

Example: `CDMA_HOFF_TRAF,US800,MID,,`  
This command performs a handoff to the US 800 (cellular) band with the channel specified in RAPID! for the long test middle channel. The Rcon and Sopt are NULL indicating that the current settings should be maintained.

---

## CDMA\_LEVEL

Parameters: BaseLevel

BaseLevel =	NULL:	Do not change the 4400 RF output level
	MINIMUM:	Set the 4400 RF output level to the minimum base power specified in RAPID!
	number:	Set the 4400 RF output level to the specified number in dBm (–120.0 to –10.0)

Description: This command sets the 4400 RF output level to the BaseLevel value. If BaseLevel is not supplied then no change is made.

Example: `CDMA_LEVEL,-40`  
The 4400 RF output level is set to –40.0 dBm.



## CDMA\_MS\_INFO

Parameters: None

Description: This command places information about the test mobile into the printout.

Example: `CDMA_MS_INFO`  
The following mobile-dependent information is printed:  
Mobile Information:  
Phone ID: (973) 656-7005  
Phone Serial Number 3F 8BF7D9  
Phone Class: US 800-3  
Protocol Version: 6

---

## CDMA\_OPEN

Parameters: StepSize

StepSize = NULL: Do not change the base power step  
number: Set the base power step to the size indicated  
(-30.0 to +30.0 dB)

Description: This command performs an open loop power response measurement on the mobile. If StepSize is not supplied the base power step value in the 4400 manual open loop power menu is used. The initial power value and pass/fail status is reported. The pass/fail status is in accordance with the open loop power response template in the 4400 manual Open Loop Power menu.

Example: `CDMA_OPEN,`  
An open loop power response measurement is made using the base power step value in the 4400 manual Open Loop Power menu.

---

## CDMA\_POW

Parameters: Count

Count = NULL: Count is set to 1  
number: (1 to 100)

Description: This command performs a number (Count) of open loop power measurements on the mobile. If Count is greater than 1, minimum, maximum and average values are reported. If Count is NULL or 1 then the single measurement value is reported. The limits are determined by the open loop estimate formula.

Example: `CDMA_POW, 10`  
10 open loop power measurements are made and the maximum, minimum and average values are reported.

---

## CDMA\_POW\_2

Parameters: Level, NewLevel, PowerControlReset

Level = NULL: Do not change the 4400 RF output level  
MINIMUM: Set the 4400 RF output level to the minimum  
base power specified in RAPID!  
number: Set the 4400 RF output level to the specified  
number in dBm (-120.0 to -10.0)

NewLevel = NULL: Do not change the posttest 4400 RF output level  
MINIMUM: Set the 4400 posttest RF output level to the  
minimum base power specified in RAPID!

RETURN:	Set the 4400 posttest RF output level to the pretest value
number:	Set the 4400 posttest RF output level to the specified number in dBm (–120.0 to –10.0)
PowerControlReset = NULL:	PowerControlReset is set to FALSE
TRUE:	Perform a power control reset after the measurement
FALSE:	Do not perform a power control reset after the measurement

**Description:** This command performs an open loop power measurement on the mobile. The 4400 RF output level is set to the Level value, and a power measurement is made 100 ms later. The 4400 RF output level is set to the NewLevel value after the measurement is taken, and a power control reset procedure is performed at the new level if desired. The limits used are determined by the open loop estimate formula.

**Example:** `CDMA_POW_2, -40, -60`  
 The 4400 RF output level is set to –40.0 dBm, and a power measurement taken after 100 ms. The 4400 RF output level is then set to –60.0 dBm and no power control reset is performed.

#### **CDMA\_POW\_CTRL or CDMA\_POWER\_CONTROL**

**Parameters:** PowCtrlCmd,[ PowCtrlCmd]

PowCtrlCmd = UP:	All power control bits set to up
DOWN:	All power control bits set to down
ALTERNATING:	Alternating power control bits
ACTIVE:	Active power control
number:	A specific number of down or up power control bits (–100 to +100 but not 0)
PowCtrlCmd = RESET:	Causes a power control reset procedure to be performed on the mobile

**Description:** This command is used to set the closed loop power control mode of the 4400. The 4400 can send all power up bits, all power down bits, or a specific number of power up or power down bits to the mobile. It can send alternating power up and power down bits to the mobile. It can also send the appropriate number of power up or power down bits to actively set the mobile output power to the correct level as determined by the open loop estimate formula (active). The optional second parameter (reset) can be used in the alternating or active power control mode to reset the mobile output power to the value determined by the open loop estimate formula. This is a single shot operation. Once the reset is complete, the 4400 returns to the alternating or active power control mode.

**Example:** `CDMA_POW_CTRL, ALT, RESET`  
 The 4400 is set to the alternating power control mode, and the mobile is sent the appropriate number of power up or power down bits necessary to correct its power output as determined by the open loop estimate formula. Once the reset is complete, the 4400 remains in the alternating mode.

## CDMA\_POW\_MAX

Parameters: Count,Level

Count =	NULL:	Count is set to 1
	number:	(1 to 100)
Level =	NULL:	Do not change the 4400 RF output level
	MINIMUM:	Set the 4400 RF output level to the minimum base power specified in RAPID!
	number:	Set the 4400 RF output level to the specified number in dBm (-120.0 to -10.0)

Description: This command performs a number (Count) of maximum power measurements on the mobile using the same procedure as the 4400 manual mode menu. The 4400 RF output level is set to the Level value. If Level is not supplied, the max power test base power level in the 4400 manual mode Min Max Power menu is used. The power control mode is set to all down and Count measurements are performed. If Count is greater than 1 a maximum, minimum, and average value is reported. If Count is not supplied or is 1 then the single measurement is reported. The 4400 RF output level is returned to its previous value, the power control mode is restored, and a power control reset procedure is performed.

Example: `CDMA_POW_MIN, ,`  
The 4400 RF output level is set to the max power test base power level in the 4400 manual mode Min Max Power menu. The power control mode is set to all down. A single minimum power measurement is taken and reported since Count is not supplied. The 4400 RF output level is restored to its previous value. The previous power control mode is restored, and a power control reset procedure is performed.

---

## CDMA\_POW\_MAX\_2

Parameters: Level,NewLevel,PowerControlReset

Level =	NULL:	Do not change the 4400 RF output level
	MINIMUM:	Set the 4400 RF output level to the minimum base power specified in RAPID!
	number:	Set the 4400 RF output level to the specified number in dBm (-120.0 to -10.0)
NewLevel =	NULL:	Do not change the posttest 4400 RF output level
	MINIMUM:	Set the 4400 posttest RF output level to the minimum base power specified in RAPID!
	number:	Set the 4400 posttest RF output level to the specified number in dBm (-120.0 to -10.0)
PowerControlReset =	NULL:	PowerControlReset is set to TRUE
	TRUE:	Perform a power control reset after the measurement
	FALSE:	Do not perform a power control reset after the measurement

**Description:** This command performs a maximum power measurement on the mobile. Closed loop power control is set to all power up, the 4400 RF output level is set to the Level value, and a power measurement is taken 100 ms later. The RF output level is set to the NewLevel value, the previous power control mode is restored, and a power control reset procedure is performed if desired.

**Example:** `CDMA_POW_MAX_2,MIN,-60,TRUE`  
The 4400 power control mode is set to all power up, the 4400 RF output level is set to minimum base power specified in RAPID!, and a power measurement is taken after 100 ms. The 4400 RF output level is set to -60.0 dBm after the measurement is taken, the power control mode is restored, and a power control reset procedure is performed.

---

### **CDMA\_POW\_MIN**

**Parameters:** Count,Level

Count =	NULL:	Count is set to 1
	number:	(1 to 100)
Level =	NULL:	Do not change the 4400 RF output level
	MINIMUM:	Set the 4400 RF output level to the minimum base power specified in RAPID!
	number:	Set the 4400 RF output level to the specified number in dBm (-120.0 to -10.0)

**Description:** This command performs a number (Count) of minimum power measurements on the mobile using the same procedure as the 4400 manual mode menu. The 4400 RF output level is set to the Level value. If Level is not supplied the min power test base power level in the 4400 manual mode Min Max Power menu is used. The power control mode is set to all down and Count measurements are performed. If Count is greater than 1 a maximum, minimum, and average value is reported, If Count is not supplied or is 1 then the single measurement is reported. The 4400 RF output level is returned to its previous value, the power control mode is restored, and a power control reset procedure is performed.

**Example:** `CDMA_POW_MIN,,`  
The 4400 RF output level is set to the min power test base power level in the 4400 manual mode Min Max Power menu. The power control mode is set to all down. A single minimum power measurement is taken and reported since Count is not supplied. The 4400 RF output level is restored to its previous value. The previous power control mode is restored, and a power control reset procedure is performed.

---

### **CDMA\_POW\_MIN\_2**

**Parameters:** Level,NewLevel,PowerControlReset

Level =	NULL:	Do not change the 4400 RF output level
	MINIMUM:	Set the 4400 RF output level to the minimum base power specified in RAPID!
	number:	Set the 4400 RF output level to the specified number in dBm (-120.0 to -10.0)
NewLevel =	NULL:	Do not change the posttest 4400 RF output level
	MINIMUM:	Set the 4400 RF output level to the minimum base power specified in RAPID!
	number:	Set the 4400 RF output level to the specified number in dBm (-120.0 to -10.0)

PowerControlReset = NULL: PowerControlReset is set to TRUE  
 TRUE: Perform a power control reset after the measurement  
 FALSE: Do not perform a power control reset after the measurement

Description: This command performs a minimum power measurement on the mobile. Closed loop power control is set to all power down, the 4400 RF output level is set to the Level value, and a power measurement is taken 100 ms later. The RF output level is set to the NewLevel value, the previous power control mode is restored, and a power control reset procedure is performed if desired.

Example: `CDMA_POW_MIN_2, -25, -60, TRUE`  
 The 4400 power control mode is set to all power down, the 4400 RF output level is set to -25 dBm, and a power measurement is taken after 100 ms. The 4400 RF output level is set to -60.0 dBm after the measurement is taken, the power control mode is restored, and a power control reset procedure is performed.

### **CDMA\_PRI\_HEADER**

Parameters: File  
 File = file name: This is the name of a text file that resides in the /rapid/evaluation folder

Description: This command is used to print custom information to the RAPID! printout. The File parameter is the name of a text file that resides in the /rapid/evaluation folder on the 4400. RAPID! opens this file and copies the text it contains into the printout and then closes the file. If the file does not exist in this folder, an error will occur.

Example: `CDMA_PRI_HEADER, header.hdr`  
 The header.hdr file in the /rapid/evaluation folder on the 4400 is opened, the text information in this file is copied to the RAPID! printout, and header.hdr is closed. An error is generated if header.hdr does not exist in the /rapid/evaluation folder on the 4400.

### **CDMA\_REL\_BY\_BS**

Parameters: There are no parameters for this function.

Description: This performs a base station release.

Example: `CDMA_REL_BY_BS`  
 This will cause the mobile to be released from the call, by the 4400.

### **CDMA\_SET\_SECTOR\_1**

Parameters: `PILLev, SYNCLev, QPCHLev, QPCHStat, PAGLev, FCHLev, SCHLev`  
 Count = NULL: Do not change the forward sector 1 level  
 number: Set the forward sector 1 level to the value specified. The allowable values for each individual parameter are shown below  
 PILLev = number: Forward pilot channel level (-32.0 to -5.0 dB)  
 SYNCLev = number: Forward sync channel level (-32.0 to -5.0 dB)  
 QPCHLev = number: Forward quick paging channel level (-5 to +2 dB)

PAGLev = number:	Forward paging channel level (-32.0 to -5.0 dB)
FCHLev = number:	Forward fundamental channel level (-32.0 to -5.0 dB)
SCHLev = number:	Forward supplemental channel level (-32.0 to -5.0 dB)
QPCHStat = NULL:	Do not change the forward quick paging channel state
ON:	Turn the forward quick paging channel on
OFF:	Turn the forward quick paging channel off

Description: This command sets the levels of the 4400 forward CDMA code channels. The forward quick paging channel can also be turned on or off.

Example: `CDMA_SET_SECTOR_1,-7,-16,,,-12,-7.4,`  
The forward pilot channel is set to -7.4 dB, while the sync channel level is set to -16.0 dB, the paging channel level is set to -12 dB, and the fundamental channel level is set to -7.4 dB. The quick paging channel level and state, and the supplemental channel level remain unchanged since they are not specified.

### CDMA\_TRAF

Parameters: Band,Chan,Rcon,Sopt

Band =	NULL:	Do not change the band
	PRIMARY:	Set the band to the first band in the dual-band test in the RAPID! menu
	SECONDARY:	Set the band to the second band in the dual-band test in the RAPID! menu
	CELLULAR:	Set the band to the US 800 MHz cellular band
	PCS:	Set the band to the US PCS 1900 MHz band
Chan =	KOREAN:	Set the band to the Korean PCS 1700 MHz band
	NULL:	Do not change the channel
	CONTROL:	Set the channel to the same value as the control channel in the RAPID! menu
	LOW, MID, HIGH:	Set the channel to the value set in the RAPID! menu for one of the channels in the long test
	TRAFFIC:	Set the channel to the value set in the RAPID! menu in the traffic channel for the short test
Rcon =	number:	Set the channel to this number (must be a valid channel number for the band selected)
	NULL:	Do not change the radio configuration
	CONFIG:	Set the radio configuration to the value set in the RAPID! menu
Sopt =	number:	Set the radio configuration to the value specified (1 - 5)
	NULL:	Do not change the service option
	CONFIG:	Set the service option to the value set in the RAPID! menu
	number:	Set the radio configuration to the value specified (1, 2, 3, 9, 17, 55, 32768)

Description: This command is used to set the CDMA traffic channel parameters (Band, RF Channel, Radio Configuration, and Service Option) to explicit values (numbers) or values set in the RAPID! menu.

Example: `CDMA_TRAF, PRIME, LOW, DEF, DEF`  
Sets the CDMA traffic band to the first band selected in the RAPID! menu for a dual-band test. Sets the CDMA traffic channel to the low channel value selected in the RAPID! menu for the long test. Sets the CDMA traffic radio configuration and service option to the values selected in the RAPID! menu.

---

#### **CDMA\_TX\_CODE**

Parameters: Count

Count = NULL: Count is set to 1  
          number: (1 to 100)

Description: This command performs a number of (Count) code domain measurements on the mobile. The power, phase, and time error of the reverse fundamental channel (RFCH) relative to the reverse pilot channel (RPCH) is reported. Only the average value is reported. The mobile must be on an IS-2000 call. The RFCH power limits are based on the mobile data rate.

Example: `CDMA_TX_CODE,`  
A single code domain measurement is performed at the current data rate. RFCH power, phase and time error relative to the RPCH measurements are reported.

---

#### **CDMA\_TX\_WQU**

Parameters: Count[,Printout]

Count = NULL: Count is set to 1  
          number: (1 to 100)  
Printout = number: (2047 (all) if not supplied) The tests that are to be printed in the printout. This number is the sum of the following numbers. Only add up the number of the tests desired in the printout:  
1 = waveform quality (rho)  
2 = frequency error  
4 = time error  
8 = carrier feedthrough  
16 = IQ imbalance  
32 = peak phase error  
64 = rms phase error  
128 = rms vector error  
256 = peak magnitude error  
512 = rms magnitude error  
1024 = RF power

Description: This command performs a number of (Count) TX waveform quality measurements. If Count is not supplied it is set to 1. If Count is greater than 1 maximum, minimum, and average values are reported. Only the tests included in Printout are reported. If Printout is not supplied it is set to 2047 (all tests). The RF power test performed is open loop. Limits for RF power are based on the open loop estimate formula.

Examples: `CDMA_TX_WQU,`  
Since Count and Printout are not supplied, one TX waveform quality measurement is performed, and all tests are reported as single values.

`CDMA_TX_WQU,,3`  
Since Count is not supplied, tests are reported as single values. Only waveform quality (rho) and frequency error are reported.

---

### **CDMA\_VOICE\_CHECK**

Parameters: There are no parameters for this function.

Description: This performs a voice loopback check. The operator is prompted to perform a voice check and provide a pass/fail decision through the 4400 softkeys.

Example: `CDMA_VOICE_CHECK`

---

### **CHANGE\_CCCH**

Parameters: Band,Chan,SID,Level,MCC,MNC,NID

Band =	NULL:	Do not change the band
	PRIMARY:	Set the band to the first band in the dual-band test in the RAPID! menu
	SECONDARY:	Set the band to the second band in the dual-band test in the RAPID! menu
	CELLULAR:	Set the band to the US 800 MHz cellular band
	PCS:	Set the band to the US PCS 1900 MHz band
Chan =	KOREAN:	Set the band to the Korean PCS 1700 MHz band
	NULL:	Do not change the channel
	CONTROL:	Set the channel to the same value as the control channel in the RAPID! menu
	LOW, MID, HIGH:	Set the channel to the value set in the RAPID! menu for one of the channels in the long test
	TRAFFIC:	Set the channel to the value set in the RAPID! menu in the traffic channel for the short test
SID =	number:	Set the channel to this number (must be a valid channel number for the band selected)
	NULL:	Do not change the SID
	SID:	Set the SID to the value set in the RAPID! menu
Level =	number:	Set the SID to the value specified (0 – 32768)
	NULL:	Do not change the RF level of the control channel
	number:	Set the RF level of the control channel to the value specified (0 to –120 dBm)
MCC =	number:	Set the mobile country code to the value specified (0 to 999)
	NULL:	Do not change the mobile country code
	CONFIG:	Set the mobile country code to the value set in the <code>cdma_car.ini</code> file



MNC =	NULL:	Do not change the mobile network code
	number:	Set the mobile network code to the value specified (0 to 99)
	CONFIG:	Set the mobile network code to the value set in the cdma_mob.ini file
NID =	NULL:	Do not change the network ID
	number:	Set the network ID to the value specified (0 to 65535)
	CONFIG:	Set the network ID to the value set in the cdma_car.ini file

Description: This command is used to set the CDMA Control Channel parameters (Band, RF Channel, SID, RF Level, MCC, MNC, and NID) to explicit values (numbers) or values set in the RAPID! menu and ini files.

Example: `CHANGE_CCCH, CELL, 384, , -60, , ,`  
 Sets the CDMA control channel to the cellular band channel 384. The SID (NULL) used is from the RAPID! menu. The RF level is set to -60 dBm. The MCC, MNC, and NID are not changed.

### **DIVIDER\_BLANK**

Parameters: None

Description: This command places a blank line into a printout.

### **INITIALIZE\_BOX**

Parameters: None

Description: This command is used to start a printout in the 4400 menu. It creates a box (looks like thick lines) into which test results or other information are printed. This command only affects the appearance of printouts on the 4400 screen. It does not affect the appearance of printouts sent to a printer.

### **MEASUREMENT\_HEADERS**

Parameters: None

Description: This command places the following text line into a printout:  
`BS (dBm) Ch. LL UL Measured`  
 This line indicates the 4400 RF output level, channel, lower limit, upper limit, and measured value of subsequent tests.

### **MS\_REG**

Parameters: There are no parameters for this function.

Description: This forces the mobile phone to perform a registration. This will provide the 4400 with the information necessary to page the mobile.

Example: `MS_REG`  
 Forces the mobile phone to register.

## SET\_AWGN

Parameters: Mode,Level

Mode =	NULL:	Do not change the AWGN state
	ON:	Turn the AWGN on
	OFF:	Turn the AWGN of
Level =	NULL:	Do not change the AWGN level
	number:	Set the AWGN level to the value specified (-10.0 to +5.0 dB)

Description: This command is used to turn the additive white gaussian noise (AWGN) generator on or off and to set its level relative to the 4400 RF output level.

Example: `SET_AWGN, ON, 0`  
The AWGN generator is turned on and the level is set to 0 dB relative to the 4400 RF output level.

---

## Script Example 1 (GSM)

Script	Description
,dualband test, version 1.0	Header information at the beginning of a script
,Wittmann Andreas, 26.09.2000	Who did it and when was it created, modified
LOGGING,file	Logging to file enabled
SCPI_LOG, 1	SCPI commands are written to the log file
DESCRIPTION,Evaluation: Test1	Description used during test
GSM_TYPE,900	GSM Network 900/1800
SET_CHANNEL,E-GSM9001800	Channels alias names enabled for that frequency range
SET_BCCH,MID	Sets the BCCH of the Network to the Mid channel
CONFIG_CH,-65,13,MID	BS Level = -65 dBm, MS Pwr Level = 13, TCH = Mid
COUPLING_LOSS,"ev_dual.cpl"	Coupling loss file used
RESET_STOPWATCH	Resets the stopwatch, time is measured from now on
,CALL_BY_MS	Not used, if comma removed then MS CALL is enabled
CALL_BY_BS	<b>Base Station Call active from now on</b>
RESET_STOPWATCH	Resets the stopwatch, time is measured from now on
TIME_STAMP,Call established	Takes time stamp, comment is visible during test run
MS_INFO	Information from the MS, like IMEI number etc...
BER_LOOP,1,8200,0	Loop for RBER, 8200 Bits, autodetect. round-trip delay
CONFIG_CH,-102,5,LOW	BS Level = -102 dBm, MS Pwr Level = 5, TCH = Low
TX_ALL,1	All TX measurements, one time
RBER_ALL	RBER measurements, class Ib, class II, FER
MS_REPORT	Reports information from MS, like RX Lev, RX Qual ...
CONFIG_CH,-102,5,MID	BS Level = -102 dBm, MS Pwr Level = 5, TCH = Mid
TX_ALL,1	All TX measurements, one time
ACPM,1,5	ACPM, modulation, averaging 5 times
ACPM,2,5	ACPM, switching, maximum over 5 times
RBER_ALL	RBER measurements, class Ib, class II, FER
MS_REPORT	Report information from MS, like RX Lev, RX Qual ...
CONFIG_CH,-102,5,HIGH	BS Level = -102 dBm, MS Pwr Level = 5, TCH = High
TX_ALL,1	All TX measurements, one time
RBER_ALL	RBER measurements, class Ib, class II, FER
MS_REPORT	Report information from MS, like RX Lev, RX Qual ...
CONFIG_CH,-80,10,HIGH	BS Level = -80 dBm, MS Pwr Level = 10, TCH = High
TX_ALL,1	All TX measurements, one time
MS_REPORT	Report information from MS, like RX Lev, RX Qual ...
CONFIG_CH,-65,19,HIGH	BS Level = -65 dBm, MS Pwr Level = 19, TCH = High
TX_ALL,1	All TX measurements, one time
MS_REPORT	Report information from MS, like RX Lev, RX Qual ...
TIME_STAMP,Handover to GSM 1800,	Take test time, comment
CONFIG_CH,-65,7,MID_UP	BS Level = -65 dBm, MS Pwr Level = 7, TCH = Mid_up
TX_ALL,1	All TX measurements, one time
MS_REPORT	Report information from MS, like RX Lev, RX Qual ...
CONFIG_CH,-100,0,MID_UP	BS Level = -100 dBm, MS Pwr Level = 0, TCH = High_up
TX_ALL,1	All TX measurements, one time
ACPM,1,5	ACPM, modulation, averaging 5 times
ACPM,2,5	ACPM, switching, maximum over 5 times
RBER_ALL	RBER measurements, class Ib, class II, FER
MS_REPORT	Report information from MS, like RX Lev, RX Qual ...
CONFIG_CH,-80,10,LOW_UP	BS Level = -80 dBm, MS Pwr Level = 10, TCH = Low_up
TX_ALL,1	All TX measurements, one time
MS_REPORT	Report information from MS, like RX Lev, RX Qual ...
CONFIG_CH,-65,15,HIGH_UP	BS Level = -65 dBm, MS Pwr Level = 15, TCH = High_up
TX_ALL,1	All TX measurements, one time
MS_REPORT	Reports information from MS, like RX Lev, RX Qual ...
TIME_STAMP,Measurement finished	Takes test time, comment
CONFIG_CH,-60,15,HIGH_UP	Keeps the network active for the next mobile
TERM_BY_BS	Terminates the call by the Base Station
TIME_STAMP,Test finished	Takes test time, comment
PUSH_RESULT	Pushes the results from temporary location to the print location for the protocol print

## Script Example 2 (GSM)

Script	Description
,RS-232 controlled test, version 1.0	Header information at the beginning of a script
,Wittmann Andreas, 26.09.2000	Who did it and when was it created, modified
LOGGING,file	Logging to file enabled
SCPI_LOG, 1	SCPI commands are written to the log file
DESCRIPTION,Evaluation: Test1	Description used during test
GSM_TYPE,900	GSM Network 900/1800
SET_CHANNEL,E-GSM9001800	Channels alias names enabled for that frequency range
SET_BCCH,MID	Sets the BCCH of the Network to the MID channel
CONFIG_CH,-65,13,MID	BS Level = -65 dBm, MS Pwr Level = 13, TCH = Mid
COUPLING_DATA,test2,900,1.0,1800,2.0	Coupling loss data, one factor for 900 and one for 1800
INIT_COM,2	Initialization of COM Port 2
RESET_STOPWATCH	Resets the stopwatch, time is measured from now on
RS232_MS_CALL,1234567890	<b>RS-232-controlled MS CALL, No. 1234567890</b>
,CALL BY BS	Not used, if comma removed then BS CALL is enabled
RESET_STOPWATCH	Resets the stopwatch, time is measured from now on
TIME_STAMP,Call established	Takes time stamp, comment is visible during test run
MS_INFO	Information from the MS, like IMEI number etc...
BER_LOOP,1,8200,0	Loop for RBER, 8200 Bits, autodetect. round-trip delay
CONFIG_CH,-102,5,LOW	BS Level = -102 dBm, MS Pwr Level = 5, TCH = Low
TX_ALL,1	All TX measurements, once
RBER_ALL	RBER measurements, class Ib, class II, FER
MS_REPORT	Reports information from MS, like RX Lev, RX Qual ...
CONFIG_CH,-102,5,MID	BS Level = -102 dBm, MS Pwr Level = 5, TCH = Mid
TX_ALL,1	All TX measurements, one time
ACPM,1,5	ACPM, modulation, averaging 5 times
ACPM,2,5	ACPM, switching, maximum over 5 times
RBER_ALL	RBER measurements, class Ib, class II, FER
MS_REPORT	Reports information from MS, like RX Lev, RX Qual ...
CONFIG_CH,-102,5,HIGH	BS Level = -102 dBm, MS Pwr Level = 5, TCH = High
TX_ALL,1	All TX measurements, once
RBER_ALL	RBER measurements, class Ib, class II, FER
MS_REPORT	Reports information from MS, like RX Lev, RX Qual ...
CONFIG_CH,-80,10,HIGH	BS Level = -80 dBm, MS Pwr Level = 10, TCH = High
TX_ALL,1	All TX measurements, one time
MS_REPORT	Reports information from MS, like RX Lev, RX Qual ...
CONFIG_CH,-65,19,HIGH	BS Level = -65 dBm, MS Pwr Level = 19, TCH = High
TX_ALL,1	All TX measurements, once
MS_REPORT	Reports information from MS, like RX Lev, RX Qual ...
TIME_STAMP,Handover to GSM 1800,	Takes test time, comment
CONFIG_CH,-65,7,MID_UP	BS Level = -65 dBm, MS Pwr Level = 7, TCH = Mid_up
TX_ALL,1	All TX measurements, one time
MS_REPORT	Reports information from MS, like RX Lev, RX Qual ...
CONFIG_CH,-100,0,MID_UP	BS Level = -100 dBm, MS Pwr Level = 0, TCH=High_up
TX_ALL,1	All TX measurements, one time
ACPM,1,5	ACPM, modulation, averaging 5 times
ACPM,2,5	ACPM, switching, maximum over 5 times
RBER_ALL	RBER measurements, class Ib, class II, FER
MS_REPORT	Reports information from MS, like RX Lev, RX Qual ...
CONFIG_CH,-80,10,LOW_UP	BS Level = -80 dBm, MS Pwr Level = 10, TCH = Low_up
TX_ALL,1	All TX measurements, one time
MS_REPORT	Reports information from MS, like RX Lev, RX Qual ...
CONFIG_CH,-65,15,HIGH_UP	BS Level = -65 dBm, MS Pwr Level = 15, TCH = High_up
TX_ALL,1	All TX measurements, once
MS_REPORT	Reports information from MS, like RX Lev, RX Qual ...
TIME_STAMP,Measurement finished	Takes test time, comment
CONFIG_CH,-60,15,HIGH_UP	Keeps the network active for the next mobile
RS232_TERM_CALL	Termination of the call by MS via RS-232 control
TIME_STAMP,Test finished	Takes test time, comment
PUSH_RESULT	Pushes the results from temporary location to the print location for the protocol print

### Script Example 3 (CDMA)

Script	Description
CDMA_DEBUG_PRINT,0	Turn debug off
CDMA_CLR_POW,0	Clear power control
INITIALIZE_BOX	Initialize box for printout
SET_AWGN,OFF,SAME	Turn off AWGN
CDMA_POWER_CONTROL,ALT	Set power control mode to alternating
CHANGE_CCCH,US800,384,80,-65,DEF,DEF,DEF	Start control channel, Band = US 800, Channel = 384, SID = 80, RF Level = 65 dBm, MNC, MCC, NID = default
CDMA_COUPLING_LOSS,"01db.cpl"	Set coupling loss to "01db.cpl" file
CDMA_TRAF,US800,100,DEF,DEF	Setup traffic channel, Band = US800, Channel = 100, Radio Configuration and Service Option = default
MS_REG	Perform registration
BOX_NEW	Draw a new box
CDMA_CALL_BY_BS	Call by Base Station
RESET_STOPWATCH	Reset stopwatch, time is measure from now on
TIME_STAMP,Call established	Display time on the screen
, ----- Test at US 800, mid channel	Comment
BOX_NEW	Draw a new box
MEASUREMENT_HEADERS	Place headers (BS, Ch, LL, UL, Measured) on the screen and printout
GOSUB,CDMA_TEST_SEQUENCE	Perform measurements
CDMA_HOFF_TRAF,USPCS,500,CONFIG,CONFIG	Handoff to next band and channel, band = US-PCS, channel = 25
WAIT,500	Wait 500 ms to make sure handoff passed
, ----- Test at US-PCS mid channel	Comment
BOX_NEW	Draw a new box
MEASUREMENT_HEADERS	Place headers (BS, Ch, LL, UL, Measured) on the screen and printout
GOSUB,CDMA_TEST_SEQUENCE	Perform measurements
, ----- All done	Comment
WAIT,200	Wait 200 ms
CDMA_REL_BY_BS	Release call from base
CHANGE_CCCH,US800,384,80,-65,DEF,DEF,DEF	Start control channel, Band = US 800, Channel = 384, SID = 80, RF Level = -65dBm, MNC, MCC, NID = default
BOX_NEW	Draw new box
TIME_STAMP,Test finished	Place test time on display and printout
CDMA_DEBUG_PRINT,0	Turn debug off
END	End of script
, ----- Measurement subroutine	Comment
CDMA_TEST_SEQUENCE:	Subroutine label
CDMA_FER_SETUP,1000,95,0.5,	Max = 1000 frames, 95% confidence, 0.5% limit
CDMA_LEVEL,-75	Step power down gradually so phones don't drop the call
WAIT,1000	Wait 1 second for phone to respond
CDMA_LEVEL,85	Step power down gradually so phones don't drop the call
WAIT,1000	Wait 1 second for phone to respond
CDMA_LEVEL,-90	Step power down gradually so phones don't drop the call
WAIT,1000	Wait 1 second for phone to respond
CDMA_FER_VERR,1,MIN,DEF,3,FALSE,1919	Perform FER, TX modulation quality and max power test
CDMA_LEVEL,-65	Set base level to -65dBm
WAIT,200	Wait 200 ms
RETURN	Return from subroutine



# Publication History

Revision	Comment
0012-282-A	Initial revision
0012-282-B	RS-232 basic control features added
0102-282-C	SET_TADV and MES_TADV added
0103-284-A	Document extended for evaluation and service scripts
0105-284-B	Document revised and edited
0210-200-A	New company name
0401-400-A	Amendments for CDMA 1xRTT; modified document structure

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