
Appendix
MS2711.EXE

Anritsu 2711 Spectrum Analyzers Driver

[To Index](#)

Overview	2
Sweep Measurements.....	2
Zero Span Measurements	2
Programming Language.....	3
Resolution Bandwidth.....	3
Video Bandwidth.....	3
Attenuator Setting.....	3
Reference Level	3
Sweep Averages.....	3
Start Frequency	3
Stop Frequency.....	4
Preamplifier On/Off.....	4
Anritsu Native Command	4
Flow of Driver Operation.....	5
Establish Communications.....	5
Initial Commands	5
Measurement Loop.....	5
<name>.REC FILE STRUCTURE:	7
[Compatibility].....	7
[Global Settings]	7
[Initial Commands]	7
[Measurement Commands n].....	8
[Freq List].....	8
An_AB-CELL.REC Example.....	10
Anritsu_SA.INI File.....	11
Analyzer Serial Cable.....	12

Overview

The MS2711.EXE driver is designed to operate with Anritsu 2711 portable analyzers. It has been tested on the MS2711A with accommodation for the MS2711B. Measurements are totally automated by the MS2711 driver.

The cable used with these analyzers is a Female to Female Null Modem cable. A cable of this type is supplied with the analyzer. See the section Cable Connection below for a wiring diagram of the cable included with the analyzer.

Sweep Measurements

Measurements are made by setting the analyzer so a desired spectrum of signals are fully displayed on the screen. To average the effects of Raleigh patterns several sweeps may be averaged.

A delay is implemented in the driver to wait for the appropriate number of sweeps to be averaged in the analyzer. Then the entire sweep display, 400 points, is down loaded into the computer. The driver then selects the maximum (peak) value on the screen in the region defined by the channel center frequency, within a tolerance defined by the 'Bucket Width' parameter.

This measurement always results in a measurement for every displayed frequency in the frequency list. However, when the signal is very low the recorded amplitude will be a noise level and when a nearby signal is very strong the recorded level will be a value on the skirt of the nearby signal.

Zero Span Measurements

Measurements can also be made by setting the analyzer to zero span, centered at the frequency under test. The desired sweeps are then averaged and all readings from the sweep are averaged and logged in the appropriate frequency in the [Freq List].

Zero span is setup by setting start and stop frequencies to the same value. The settings required for this method of measurement are described more fully in the Programming Language section below.

Programming Language

The Anritsu 2711 programming interface is based upon numeric commands values sent to the analyzer in binary form. The MS2711.EXE driver has translated several of the common commands to easier to understand form for entry into the <name>.REC test setup file. These translated commands are described below.

Resolution Bandwidth

The command to set resolution bandwidth is:

Line number = RB <freq, KHz>

Example: 1=RB 10KHZ

Video Bandwidth

The command to set video bandwidth is:

Line number = VB <freq, KHz>

Example: 1=VB 10KHz

Attenuator Setting

The command to set attenuator value is:

Line number = AT <value, dB>

Example: 1=AT 0DB

Reference Level

The command to set the analyzer reference level is:

Line number = RL <value, dB>

Example: 1=RL -20Db

Sweep Averages

The command to set the number of sweeps to average is:

Line number = AV <number, Integer>

Example: 1=AV 3

Start Frequency

The command to set the start frequency of an analyzer display is:

Line number = FA <freq, MHz>

Example: 1=FA 880.000MHz

Stop Frequency

The command to set the right frequency of an analyzer display is:

Line number = FB <freq, MHz>

Example: 1=FB 880.640MHz

Note: If FA is set equal to FB the analyzer will be in Zero Span mode.

Preamplifier On/Off

The command to turn the preamplifier on or off is:

Line number = PA <On/Off>

Example: 1=PA OFF

Note: If the 2711 does not have a preamplifier option this command may generate an error.

Anritsu Native Command

Finally, if there is a need to send a command not included above binary values can be sent to the analyzer with the Native Binary, NB, command below.

Line number = NB <series of comma delimited values>

Example: 1=NB 118,3

This command will set the sweep average setting to 3 averages.

Note: Only Native Binary commands may be used that create an "Operation Complete" response. Any other response to an NB command will create an error. See the Anritsu Programming Manual for details.

Flow of Driver Operation

The flow diagram at the end of this section shows the measurement process of the Anritsu_SA driver.

Establish Communications

Communication with the analyzer is tested by sending a Enter Remote Mode command. When successful the analyzer responds with the model name and firmware version. After successful communication is established with the analyzer the baud rate is set to 38400 baud. When this is successfully completed the analyzer model name and firmware version is displayed in the driver window.

Error messages are displayed if communication with the analyzer can not be established. In this case, check the hardware and software interface to the analyzer and reinitialize the analyzer with a power off on cycle.

Initial Commands

After successful communication interface has been established and the analyzer name and version is displayed, the commands listed in the [Initial Commands] section are sent to the analyzer. An error message will be displayed if a problem is encountered with any of these commands. The error message will indicate the line in the [Initial Commands] section that is the most likely source of the problem.

Note: If line numbers are not consecutive in the section, this number displayed in the error is the number of the command in the section not the line number.

Measurement Loop

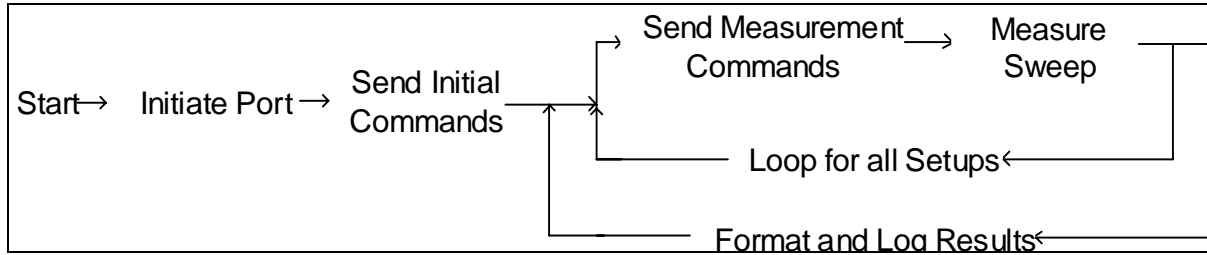
After the initial commands are successfully sent the measurement loop is entered. At this point the driver status window shows the word "Running".

Commands in the first [Measurement Commands 1] section are sent to the analyzer then the analyzer is placed into local mode for a time to complete the required measurement. The analyzer is then returned to remote mode and the sweep is down loaded into the computer. The appropriate measurements are taken from the sweep data and formatted into log file records. Then the next [Measurement Commands n] section is implemented.

When all [Measurement Commands n] sections have been implemented the complete log file record is sent from the driver to the main Field Test 6 program for display and logging in the measurement database.

Note: If a signal is not displayed on the analyzer screen by one of the measurement command sections it will not be measured and will not have a value in the measurement database.

This process repeats continuously until stopped by clicking the Stop control on the Receiver Window.



<name>.REC FILE STRUCTURE:

A <name>.REC file is an ASCII, Windows .INI type of file that controls the measurement functions of the MS2711.EXE driver and spectrum analyzer. This file has at least five sections. The name of each of the sections is critical to successful parsing of the .REC file, so they must be retained exactly.

[Compatibility]

The compatibility section lists the driver program name in the line (driver=MS2711.EXE) with which this specific .REC file is compatible. Also included in this section are lines showing the software version with which this file is compatible.

Note: The entries in this section should not be changed.

[Global Settings]

The global setup section contains settings for the driver program in the form of parameters as described below.

Bucket Width = 10000 Bucket width accounts for frequency error in the source as well as frequency measurement error in the analyzer.

It is not the same as the width of the channel, although it may be set equal to the channel spacing. It is used by the driver program to set the tolerance of acceptable frequencies that a frequency reading will fit into (match) for a particular channel frequency. Bucket width is centered at the frequencies in the frequency list.

Added Hold Off =1000 Adds the indicated number of milliseconds to the hold off computed internally by the driver. Can be used if the computed hold off is either too long or too short. The computed hold off in milliseconds is:
HoldOff=1500 + SweepAverages * 750

[Initial Commands]

The [Initial Commands] section contains a list of instrument commands sent to the analyzer to set it up for making the desired measurements. These commands are sent once prior to starting the measurement

process. Refer to the section Programming Language above for details. The format for these command lines is:

<line number>=<command> <value>

and are sent to the instrument in line number order.

[Measurement Commands n]

The [Measurement Commands n] section(s) contain a list of instrument commands that are sent to the analyzer the during each measurement cycle. This command list should be minimized to reduce measurement cycle time. Commands, such as setting the start and stop frequencies, are necessary here. The format for these command lines is:

<line number>=<instrument command> ‘<comment>

and are sent to the instrument in order of line number.

The MS2711.EXE driver can sequence through as many as 32 [Measurement Commands n] sections to set different frequency bands or displays, reading signal amplitudes from each display.

The file, AN_AB-Cell.REC is an example in which the A system cellular control channels are set up in the first, [Measurement Commands 1], section and the B system control channels are set up in the second, [Measurement Commands 2], section.

Zero Span

Setting FA = FB will cause the analyzer to go to zero span mode for the FA frequency. When this measurement is completed the driver status window will display “Running – Zero Span” indicating that a Zero Span measurement has been made.

[Freq List]

Each line in the [Freq List] section must have the following format.

<line number> = <channel name>, <channel frequency in MHz>

Each frequency in the frequency list has a corresponding field in the measurement database in which measured amplitude is recorded. One line is required for each item in the frequency list. Line numbers must be in order.

Channel names are used by the Field Test 6 program to label the X axis of the Signals Display, to name the fields in the measurement database and to name files when generating analysis results, so they must satisfy Windows file naming restrictions.

The Frequency and BucketWidth parameters are used by MS2711.EXE to assign amplitude readings to appropriate frequency channels and measurement database fields.

Note: When editing the .REC file, the semicolon (;) can be used as the first character for a comment line. Field Test 6 programs ignore lines with a semicolon as the leading character.

Blank lines are also ignored.

An_AB-CELL.REC Example

This sample .REC file contains to measure A and B cellular control channels. Two measurement setups are used, one for A and another for B channels. This file may be edited to make measurements in other frequency band(s).

```
'A and B control channels

[Compatibility]
File Version=5
Driver=MS2711.EXE

[Global Settings]
Bucket Width=10000
Added Hold Off=10

[Initial Commands]
1=RB 10KHZ
2=VB 10KHZ
3=AT 0DB
4=RL -20DB
9=AV 3
;8=NB 118,10           `Example of NB command
;10=PA Off

[Measurement Commands 1]
1=FA 879.37MHZ
2=FB 880.00MHZ

[Measurement Commands 2]
1=FA 880.00MHZ
2=FB 880.64MHZ

[Freq List]
1=ch 313,879.390
2=ch 314,879.420
3=ch 315,879.450
...
20=ch 332,879.960
21=ch 333,879.990
22=ch 334,880.020
23=ch 335,880.050
24=ch 336,880.080
...
40=ch 352,880.560
41=ch 353,880.590
42=ch 354,880.620
```

Anritsu_SA.INI File

When the receiver driver is started for the first time the Anritsu_SA.INI file is initialized with serial port communications settings. Below is the contents of this after proper initialization.

```
[Serial Port Settings]
Forced Port Search=
Baud Sequence=9600,38400
Port=COM1
Baud=38400
Settings=n,8,1
Handshake= 0
```

Analyzer Serial Cable

The serial cable for Anritsu 2711 analyzer is wired as a null modem with the following wiring connections. This cable is included with the analyzer.

Female Computer DB9			Female Analyzer DB9		
Pin	Function		Pin	Function	
1	DCD	<-->	4	DTR	
2	Rx	<-->	3	Tx	
3	Tx	<-->	2	Rx	
4	DTR	<-->	1	DCD	
5	Gnd	<-->	5	Gnd	
6	DSR	NC	6	DSR	NC
7	RTS	<-->	8	CTS	
8	CTS	<-->	7	RTS	
9	Ring	NC	9	Ring	NC