Agilent 84000 3G Support Release Information
Rev. 10/20/00

With the recent Agilent A.03.00 software release, high-bandwidth third-generation (3G) wireless test capability support is now available. To achieve the full support for this functionality it is necessary to ensure the ESG-D Series E443xA/B Digital RF Signal Generator has the appropriate hardware version and option mix configuration, upgrade the system IF processor, and operate using Agilent 84000 A.03.00 (or higher) software.

This document is provide in order to: provide an upgrade to supported modulation formats, provide customers with a method to upgrade system performance/features, provide a minimal test system down time, and, provide the lowest cost to the customer/manufacturing/field.

Included in this document is information for ordering the upgrade packages for those Agilent ESG-D Series Digital RF Signal Generators (ESG-D E443xA/B) requiring upgrades. Also included is reference to the upgrade of the IF processor and the Agilent 84000 system software.

Agilent ESG-D E443xA/B Signal Generator Upgrade

Full Support Option Configuration

The following table provides the current full feature support option list. Customers may decide to upgrade "firmware only" options in the future as the need arises. It may not be necessary to order all firmware options as some ESG-D E443xA/B's may already contain a portion of these options. Please use this information as a guideline to ensure that all appropriate firmware options are included in your specific ESG-D E443xA/B signal generator.

NOTE: The below list may change with development of future modulation formats developed for the ESG-D E443xB signal generator and Agilent 84000 RFIC test system. Contact WSTS factory support for further information.

E443xB		
	#1CM	Rackmount kit, p/n 5063-9214
	#1EM	Move all front panel connectors to rear panel
	#UND	Internal dual arbitrary waveform generator
	#UN5	Multicarrier, Multichannel CDMA personality based on Option UND
	#UN8	Real-time I/Q Baseband generator with TDMA standards
	#UN9	Additional 7Mbits RAM memory for UN8
	#100	*Multichannel W-CDMA personality based on Option UND
	#101	*Multichannel cdma 2000 personality based on Option UND
	#200	*W-CDMA receiver test based on Option UN8
	#201	*cdma 2000 receiver test based on Option UN8
	#202	*EDGE personality based on Option UN8
		* firmware options

Table 1 – ESG-D E443xB Full Support Option Configuration

ESG-D E443xA Upgrade Process

ESG-D E443xA Upgrade Process - General Information

NOTE: This upgrade procedure is only compatible and required to provide 3G capability to the ESG-D E443xA utilized as RF Sources in the Agilent 84000. The ESG-D E443xA utilized as system LO sources do not require modification.

To upgrade the ESG-D E443xA, the signal generator must be returned to the factory. Any additional options ordered at the same time will be added at the time of upgrade with no premium pricing involved. Refer to pricing listed on the CPL.

ESG-D E443xA Upgrade Process - Step by Step Upgrade Procedure

1. Place order for the ESG-D E443xBU (e.g. E4432BU; or, E4433BU) required configuration, qty (1) each.

   Product:
   E4432BU Upgrade from E4432A, Model A, to E4432B, Model B, 3.0 GHZ Signal Generator

   Required Options: (If Model already contains UND or UN8 do not reorder)
   UND Internal Dual arbitrary waveform generator
   UN8 Real-Time I/Q Baseband generator, TDMA standards

   Option for IS-95 CDMA:
   #UN5 Multicarrier, Multichannel CDMA personality for UND

   Options for W-CDMA and cdma2000:
   #100 Multi-Channel W-CDMA personality for UND
   #101 Multi-Channel cdma2000 personality for UN8

   Options for Real-Time W-CDMA and Real-Time cdma2000 – Future availability software in test
   #200 W CDMA Real Time
   #201 Real-time cdma2000 Personality for UN8

   Option for EDGE – Future availability software in test
   #202 EDGE Personality for UN8

   Suggested Option: (to optimize performance of EDGE – Option #202):
   UN9 Add 7 MB RAM for data patterns & accommodations for future enhancements

Note –
Option #1CM should be retained by customer for re-use.
Option #1EM should already be installed; if not, reorder.

Arrangements have been made with the production manager to provide expedited processing of the ESG-D E443xBU signal generator. Refer to Ordering Instructions segment of ePAL listing.

The following information **must** be included in the "Special Instructions of the order:

1. Model Number of the unit to be upgraded
2. Serial Number of the unit to be upgraded
3. "Michael Christensen, has committed to a 1-week turnaround. Please expedite."
4. "Attention: Sasha Wright, Telnet 794-4919"

When multiple units are submitted at the same time, planning information should be submitted **prior** to placing the order. Please contact Order Processing for details, Sasha Wright, Telnet 794-4919.

Other arrangements may be made by the local field support personnel to effect a timely and efficient ESG-D 443xA signal generator upgrade. Methods may include swapping the signal generator from on-hand spares or other sources.

The targeted turn-around time of (5) working days does **not** include order processing or shipping time.

NOTE – Option @200 may not appear on the CPL. Please use the following information to override and enter the order

Product Number:	E4432BU	Option Number:	200						
PL:	15	Supplier:	5320						
SRT:	MRF	Mfg:	5320	Wty:	5300	Mkt:	5332	Com:	US
Prod Class:	HW	Tax Class:	A005						
Local Price*:	3000.00	Int TAX($)	1680.00						

* Local price is USD

Prior to removing the ESG-D E443xA signal generator (RF Source) from the Agilent 84000 system, run the Agilent 84000 'pvst' utility. The utility should be run in the medium/medium mode and include the following tests: Instrument Self Test, RF Path Self Test, and RF Frequency Accuracy Check. All tests must pass prior to any system upgrade. If a particular test fails, the system must be repaired prior to performing the upgrade. Refer to the Agilent 84000 documentation for the procedures.

2. Customer/field ship the ESG-D E443xA signal generator to factory.
   Address:

   Agilent Technologies
   1212 Valley House Dr.
   Rohnert Park, CA 94928
   Attention of – Upgrade Returns / 1 Lower
3. The upgraded ESG-D E443xA will be shipped back (5-7) working days after receipt in Rohnert Park. The model of the ESG-D signal generator will be changed from ESG-D E443x**A** to ESG-D E443x**BU** to note that it is an upgraded unit.
4. Perform a software backup of the Agilent 84000 test system. This is necessary to recover the system software in the event of a hard drive failure during the upgrade process.
5. The ESG-D E443xBU signal generator can then be re-installed or swapped into the customers Agilent 84000 system.
6. The "Testhead.C" file must be modified to recognize the presence of the appropriate options contained in the E443xBU RF Signal Generator. The Agilent 84000 measurement option package reviews the option list and ensures that the appropriate options are present.

   Refer to Testhead.C Modifications in Appendix for instructions.

7. Run the Agilent 84000 pvst utility. The utility should be run in the medium/medium mode and include the following tests: Instrument Self Test, RF Path Self Test, and RF Frequency Accuracy Check. All tests must pass after the system upgrade. If a particular test fails, the system must be repaired. Refer to the Agilent 84000 documentation for the procedures.

NOTE: All software changes made to the Agilent 84000 system must be communicated to the factory. Please forward Testhead.C file to WSTS Division Factory Support personnel. This is an essential step in providing the factory with any field changes made to the TESTHEAD.C file.

8. Provide a copy of the TESTHEAD.C file to the factory. A recommended procedure would be to 'tar' the file and email to WSTS Division support.

   Provide system information to the factory. The information is required to ensure the factory has the latest customer configuration information.

   This information is to include:

System Model Number (e.g. E5462A, E5417B Exx, etc.)
System Serial Number
Customer Name
Physical installed location
Field Application Engineer contact information

ESG-D E443xB Upgrade Process

ESG-D E443xB Upgrade Process - General Information

E443xB			Upgrade Kit Part Number
	#1CM	Rackmount kit, p/n 5063-9214	N/A
	#1EM	Move all front panel connectors to rear panel	N/A
	#UND	Internal dual arbitrary waveform generator	#004
	#UN5	Multicarrier, Multichannel CDMA personality based on Option UND	#005
	#UN8	Real-time I/Q Baseband generator with TDMA standards	#008 (See below if intention is to include upgrade #UN9)
	#UN9	Additional 7Mbits RAM memory for UN8	#009 (This adds both #UN8 and #UN9. Do not order #UN8)
	#100	*Multichannel W-CDMA personality based on Option UND	#150
	#101	*Multichannel cdma 2000 personality based on Option UND	#151
	#200	*W-CDMA receiver test based on Option UN8	#250
	#201	*cdma 2000 receiver test based on Option UN8	#251
	#202	*EDGE personality based on Option UN8	#252
		* firmware options	

Table 2 – ESG-D E443xB Option Upgrade Kit Part Numbers

If the customer's ESG-D E443xB signal generator firmware is older than the most current release, and it hasn't been upgraded, the customer would be missing the most recently released features. Updating the firmware in the ESG-D E443xB signal generator lets the customer take advantage of feature enhancements and improvements. Agilent has also periodically enhanced the ESG-D E443xB signal generator hardware and software to add capability or improve performance, based on customer requests.

ESG-D E443xB Upgrade Process - Additional Information

1. ESG-D E443xB firmware version B.03.60 may be available at the time this upgrade is performed. ESG-D E443xB firmware version B.03.60 used in conjunction with Agilent 84000 software revision of A.03.01 and the FastFalcon Driver feature package (Rel G, or greater), will provide the most improved performance for the RF stimulus to date. It is recommended for production test systems to be at this software and hardware revision level.

NOTE: UN8 hardware board revision C, or greater is required for any ESG-D E443xB signal generator software option #200, #201, or #202.

2. In general, any instrument with core firmware revision less than B.03.00 will **not** have the UN8 rev C board. Instruments with core firmware revisions at B.03.00 or greater **may** have UN8 rev C. Follow these instructions to verify UN8 rev C is installed:
    1. Press the 'Local' key.
    2. Press the 'Utility' key.
    3. Press the 'Diagnostic Info' soft key.
    4. Press by the 'Instrument Info/Help Mode' soft key.
    5. Press the 'Diagnostic Info' soft key.
    6. Look at the text in the 'Firmware Revision...' line. Any reference to 'DG:' in this line will indicate at least a UN8 rev C board. Example text showing a UN8 rev C installed board follows:

```
Firmware Revision: B.03.60 (ARB: 12.97/DG: DG.03.11)
```

3. ESG-D E443xB option #UN3 must be removed from the falcon when UN8 is installed.
4. The ESG-D E443xB upgrades should to be performed by an Agilent field support AE and/or CE.
5. It will need to be determined if the ESG-D E443xB contains UND, UN8, and UN9. If NOT, the order must include these options.
6. If the ESG-D E443xB includes firmware options UND, UN8, and UN9, than the upgrade can be completed by ordering some or all of the firmware upgrade kits as shown in Table 2 – ESG-D E443xB Option Upgrade Kit Part Numbers.

ESG-D E443xB Upgrade Process - Step by Step Upgrade Procedures

1. Run the Agilent 84000 pvst utility. The utility should be run in the medium/medium mode and include the following tests: Instrument Self Test, RF Path Self Test, and RF Frequency Accuracy Check. All tests must pass pvst prior to any system upgrade. Refer to the Agilent 84000 documentation for the procedures.
2. Backup the Agilent 84000 test system. This is necessary to recover the system controller in the event of a hard drive failure during the upgrade process.
3. Upgrade the ESG-D E443xB signal generator firmware to the minimum recommended revision.
4. Upgrade the ESG-D E443xB signal generator firmware options to the recommended option list as shown in Table 1 – ESG-D E443xB Full Support Option Configuration.
5. The "Testhead.C" file must be modified to recognize the presence of the appropriate options contained in the ESG-D E443xB signal generator. The Agilent 84000 measurement option package reviews the option list and ensures that the appropriate options are present. Refer to Testhead.C Modifications in Appendix for instructions.
6. Run the Agilent 84000 pvst utility. The utility should be run in the medium/medium mode and include the following tests: Instrument Self Test, RF Path Self Test. Refer to the Agilent 84000 documentation for the procedures.

NOTE: All software changes made to the demo system must be communicated to the factory. Please forward Testhead.C file to WSTS Division Factory Support personnel. This is an essential step in providing the factory with any field changes made to the TESTHEAD.C file.

7. Provide a copy of the TESTHEAD.C file to the factory. A recommended procedure would be to 'tar' or UUENCODE the file and email to WSTS Division support.
8. Provide system information to the factory. The information is required to ensure the factory has the latest customer configuration information.

   This information is to include:
   - System Model Number (e.g. E5462A, E5417B Exx)
   - System Serial Number
   - Customer Name
   - Physical installed location
   - Field Application Engineer contact information

Agilent 84000 Software Upgrade Details

In order to achieve 3G, W-CDMA and cdma2000, both standard and real-time modes, the customer's Agilent 84000 system must be loaded with the A.03.00 (or greater) software release. Software upgrades are provided as part of the first year warranty (excluding the E5473A) or as part of the Software Update Service (SUS) contract. For further information regarding A.03.00, including SUS ordering information please click on the link below and you'll be taken to the A.03.00 Software Release Information Internal Web page.

http://atginside.agilent.com/atg/rfst/a300_info.htm

ESG-D E443xB signal generator firmware version B.03.60 may be available at the time this upgrade is performed. ESG signal generator firmware version B.03.60 used in conjunction with Agilent 84000 software revision of A.03.01 (and later) and the FastFalcon Driver feature package (Rel G, or greater) will provide the most improved performance for the RF stimulus to date. It is recommended for production test systems to be at this software and hardware revision level.

Agilent 84000 IF Processor Upgrade Details

With the new wider bandwidth receiver, the Agilent 84000 can measure ACLR on 3G RFICs with a minimal number of acquisitions, thus reducing test times. For applicable upgrade kit details, including ordering instructions, please refer to the link below and you will be taken to the A.03.00 Software Release Information Internal Web page.

http://atginside.agilent.com/atg/rfst/a300_info.htm

Appendix

Testhead.C Modifications

Testhead.C Modifications - Agilent 84000 Software Versions A.03.00 and earlier

The below is a sample, with notations that highlight the modifications needed. The Agilent Application Engineers are the most appropriate personnel to provide this change. They are known to have a high proficiency with Testhead code.

Existing code:

```
//=========================================
// E4433B 4GHz RF Digital Signal Generator
//=========================================
RfSource*
rfSource1 = new RfSourceFastFalcon(ADDR_HPIB_RfSource1,
        RfSourceFalcon::HpE4433B,
        RfSourceFalcon::Opt_UND |
        RfSourceFalcon::Opt_UN3 |
        RfSourceFalcon::Opt_UN5 |
        RfSourceFalcon::Opt_UN8 |
        RfSourceFalcon::Opt_Ignore,
        “rfSource1”,
        “E4433B RF Source #1 (HPIB address 18)”,
        toneCombiner.getBlankSwitchForPort(TwoTone::RF1)
);
thead->addInstrument(rfSource1);
```

or,

```
//----------// Alternate standard falcon for rfSource1
RfSource *
rfSource1 = new RfSourceFalcon(ADDR_HPIB_RfSource1,
        RfSourceFalcon::HpE4433B,
        RfSourceFalcon::Opt_UND |
        RfSourceFalcon::Opt_UN3 |
        RfSourceFalcon::Opt_UN5 |
        RfSourceFalcon::Opt_UN8 |
        RfSourceFalcon::Opt_Ignore,
        “rfSource1”,
        “E4433B RF Source #1 (HPIB address 18)”,
        toneCombiner.getBlankSwitchForPort(TwoTone::RF1)
);
thead->addInstrument(rfSource1); rfSource1->addAttribute(new LowNoiseAvailable);
**************************/
```

Make the following additions as appropriate for the upgraded RF signal generator option list:

```
//=========================================
// E4433B 4GHz RF Digital Signal Generator
//=========================================
RfSource*
rfSource1 = new RfSourceFastFalcon(ADDR_HPIB_RfSource1,
        RfSourceFalcon::HpE4433B,
        RfSourceFalcon::Opt_UND |
        RfSourceFalcon::Opt_UN8 |
        RfSourceFalcon::Opt_UN9 |
        RfSourceFalcon::Opt_100 |
        RfSourceFalcon::Opt_101 |
        RfSourceFalcon::Opt_200 |
        RfSourceFalcon::Opt_201 |
        RfSourceFalcon::Opt_202,
        “rfSource1”,
        “E4433B RF Source #1 (HPIB address 18)”,
        toneCombiner.getBlankSwitchForPort(TwoTone::RF1)
);
thead->addInstrument(rfSource1);
```

or, possibly

```
//----------// Alternate standard falcon for rfSource1
RfSource *
rfSource1 = new RfSourceFalcon(ADDR_HPIB_RfSource1,
       RfSourceFalcon::HpE4433B,
       RfSourceFalcon::Opt_UND |
       RfSourceFalcon::Opt_UN8 |
       RfSourceFalcon::Opt_UN9 |
       RfSourceFalcon::Opt_100 |
       RfSourceFalcon::Opt_101 |
       RfSourceFalcon::Opt_200 |
       RfSourceFalcon::Opt_201 |
       RfSourceFalcon::Opt_202,
       “rfSource1”,
       “E4433B RF Source #1 (HPIB address 18)”,
       toneCombiner.getBlankSwitchForPort(TwoTone::RF1)
);
thead->addInstrument(rfSource1); rfSource1->addAttribute(new LowNoiseAvailable);
*****************************/
```

Testhead.C Modifications - Agilent 84000 Version A.03.01 and later

With the release of Agilent 84000 software version A.03.01, the above modifications will not be necessary when each new option is added to the ESG-D E443xB signal generator. The software release provides support for a 'query' method to determine what the installed ESG-D options are available.

For existing systems, if the following changes are made, then subsequent upgrades to the ESG-D rf signal generator will not require the Testhead.C modifications. Modifications would be made to the option storage file. This would then not require a re-compile of the system software, thus, alleviating the need to re-qualify the system software.

This is a sample of the old constructor:

```
RfSourceFalcon(U16 address,
               HpEsg_Model _model          = HpEsgUnknwn,
               U32         _options        = Opt_Unknwn,
               const char * name           = "FalconDefault",
               const char * summary        = "Default Falcon Source Summary",
               SwitchList * rfOnOffSwitches = 0,
               U16          stateSize      = sizeof(State)
               );
```

This is a sample of the new constructor:

```
RfSourceFalcon(U16 address,
               const char * name           = "FalconDefault",
               const char * summary        = "Default Falcon Source Summary",
               const char * systemName     = "",
               SwitchList * rfOnOffSwitches = 0,
               U16          stateSize      = sizeof(State)
               );
```

Sample use of the new constructor:

```
rfSource1 = new RfSourceFalcon(24,
                               "rfSource1",
                               "some description",
                               "a120t"
                               );
```

The systemName entry contains the system name. It is used in the directory path for storing the options in a file. It is very useful for systems that have more than one testhead installed. It will default to the empty string. The path to the file is:

```
/var/opt/hp84000/instrumentOptions/falconOptions/<system name>/<source name>.
```

In this case, it would be:

```
/var/opt/hp84000/instrumentOptions/falconOptions/a120t/rfSource1
```

The content of the file containing the ESG-D options will contain the following information.

```
model:  ESG_D3000B
options:  1EH, UND, 100, 101, 200, 201, 202
```

Additional Information

The Falcon is manufactured by the Electronic Products and Solutions Group, EPSG, click on the link below to access their August/September newsletter containing information and additional links.
http://mktdev.soco.agilent.com

To access the Field Support Tools area (subjects are listed below) for 3G technologies, W-CDMA and cdma2000 click on the link below:
http://mktwww.soco.agilent.com/Markets/Wireless-Comm/3G/