MX702600B
CDMA2000 Scenario Composer

MD8470A
Signalling Tester

/Inritsu

MX702600B
CDMA2000 Scenario Composer
-Product Introduction-

**-Efficient Scenario Creation
and High Test Quality-**

**April 2007
ANRITSU CORPORATION
Ver. 1.00**

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MX702600B-E-L-1

Slide 1

** Λnritsu**

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2. Product Specifications
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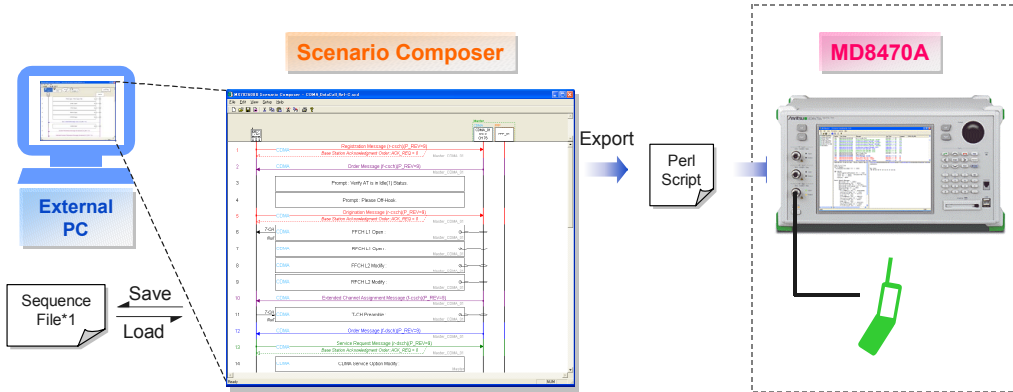Discover What's Possible™

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Slide 2

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1. Product Overview (1/3)

The MX702600B CDMA2000 Scenario Composer software application greatly increases the speed and efficiency of creating and modifying test scenarios for the MX847030A CDMA2000 Simulation Kit used with the MD8470A Signalling Tester.
Tests sequences created using the editor are converted to Perl script and output for execution on the MX847030A.

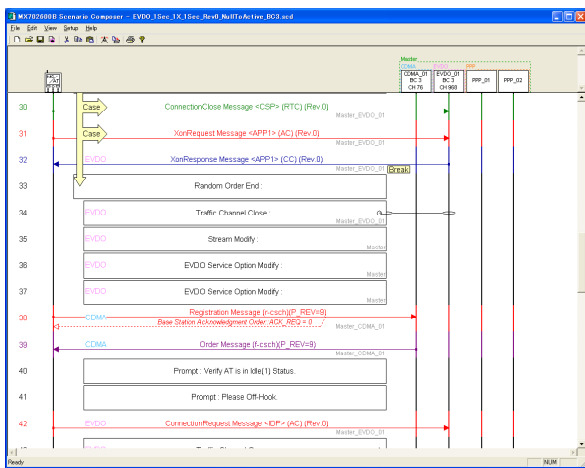*1: Sequence means the processing order for the BS behavior.

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1. Product Overview (2/3)

Main Screen

1. Send and receive messages are displayed as a ladder sequence diagram.

2. The horizontal axis indicates MS/AT and sector.

3. The vertical axis indicates time.

4. Parameter details can be set by double-clicking each message.

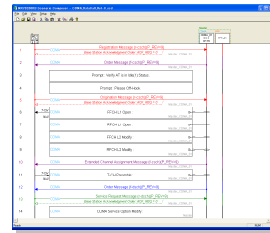5. Extended functions, such as power level and wait setting, can be input using the Tag function.

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1. Product Overview (3/3)

Four Features

- **Intuitive Test Sequence Creation with Image of Standard**
  It is common for mobile communication standrads to show the protocol sequence in ladder diagram. The MX702600B can create and edit test sequences as images designed as a ladder sequence. Users can create customized test sequences for running on the MX847030A without knowledge of Perl, the MX847030A description method or interface.

- **Easy-to-Operate**
  Test sequences are easily edited using a mouse and keyboard, and work efficiency is greatly increased by various useful functions, such as copy/paste for sequences and messages.

- **Full Range of Sample Sets**
  A full range of sample sets for standard test sequences are included. Development time is cut dramatically by editing these samples to create new scenarios. Sample sets are available for voice and data communications and each type of handoff test; more will made available via the Anritsu download website in the future.

- **Defined PPP Server Operation**
  The MX702600B can describe the PPP server operation as a ladder sequence. In addition, since the MX847030A has a built-in function for simulating PPP server, there is no need to provide an external PPP server and normal and quasi-normal test sequences can be created for testing data communications of mobile terminals.

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2. Product Specifications (1/2)

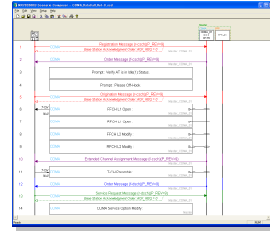## Standard

- 1X Release 0/A/C
- 1xEV-DO Revision 0/A
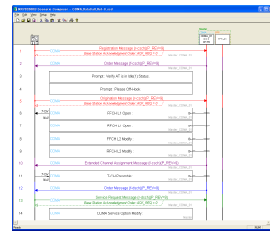
- **Reference Standard**
  The MX702600B CDMA2000 Scenario Composer specifications are based on the 3GPP2 (3rd Generation Partnership Project 2) and Request For Comments (RFC).

Number	Name
C.S0005-0	Upper Layer (Layer 3) Signaling Standard for cdma2000 Spread Spectrum Systems - Release 0
C.S0005-A	Upper Layer (Layer 3) Signaling Standard for cdma2000 Spread Spectrum Systems - Release A, Addendum 2
C.S0005-C	Upper Layer (Layer 3) Signaling Standard for cdma2000 Spread Spectrum Systems - Release C
C.S0024-0	cdma2000 High Rate Packet Data Air Interface Specification
C.S0024-A	cdma2000 High Rate Packet Data Air Interface Specification
C.S0054-0	cdma2000 High Rate Broadcast-Multicast Packet Data Air Interface Specification
C.S0057-A	Band Class Specification for cdma2000 Spread Spectrum Systems

Note: No guarantee of proper operation for 1X Release D.

2. Product Specifications (2/2)

■ Specifications

CDMA2000 1X	Standard	CDMA2000 1X Release 0/A/C
	Protocol Revision	PREV6, PREV7, PREV9/10
	Service Option	SO3, SO6, SO15, SO33, SO32768
	Sector	Max. 6 sectors (max. 12 sectors when using the two MD8470A units)*1
	Data Communications	Transparent IP data transmission/Simple IP PPP Simulation: LCP/IPCP/PAP/CHAP
	Functions	Automatic setting: BS-Ack reply Transmitter: 3GPP2-compliant channels Receiver: 3GPP2-compliant channels
CDMA2000 1xEV-DO	Standard	CDMA2000 1xEV-DO Revision 0/A, BCMCS
	Sector	Max. 3 sectors (max. 6 sectors when using the two MD8470A units)*1
	Data Communications	Transparent IP data transmission/Simple IP PPP Simulation: LCP/IPCP/PAP/CHAP
	Functions	Automatic setting: Transaction ID/Message Sequence Transmitter: 3GPP2-compliant channels Receiver: 3GPP2-compliant channels
Common Functions		User defined variable: 128 Wait tag, Power Change tag, Inline tag, Prompt tag Print sequence hard copy

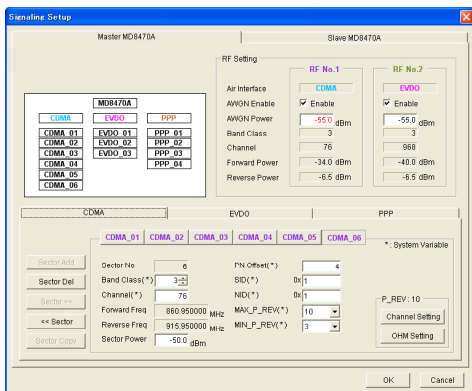*1: The number of settable sectors depends on the Band Class setting.

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3. Functions - Signaling Setup (1/2) -

Batch Setting of Each Base Station

This function supports batch setting of parameters ranging from the configuration of the RF environment to the Overhead Message (OHM) for each type of Base Station at the Signaling Setup window.

● Automatic allocation of RF resources using sector setting

● Batch setting of common parameters by system variables

● The Overhead Message (OHM) used in each sector can be selected

● Support for CDMA2000 1X/1xEV-DO Multi-carrier, Multi-sector

● Expansion to four carriers by linking two MD8470A units

- Max. Sector/PPP Node
    1X: 6, 1xEV-DO: 3, PPP Node: 4

- Max. Carrier
    When using one MD8470A unit: 2 carriers
    When using two MD8470A units: 4 carriers
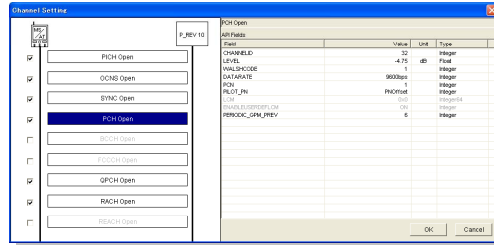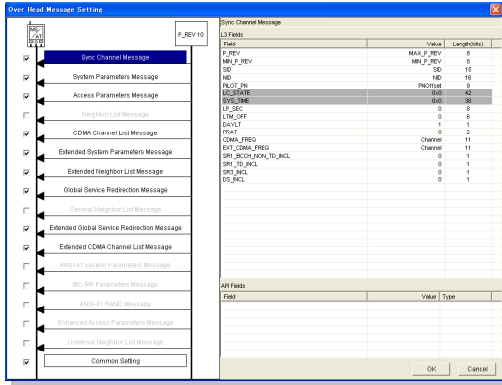   (With MD8470A-01 second RF option)

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3. Functions - Signaling Setup (2/2) -

- OHM (Overhead Message) Setting
The Overhead Message (OHM) used in each sector can be selected and checked at a glance.

- Channel Setting
Channel can be selected.

---

3. Functions - Message Edition (1/2) -

1X Message Edition

Each parameter in the Layer-3 Field of send and receive messages can be edited. Parameters that can be set at the field comply with the 3GPP2 standard.

Step 1 Message Selecting ➡ **Step 2 Message Editing** ➡ **Step 3 Field Editing**
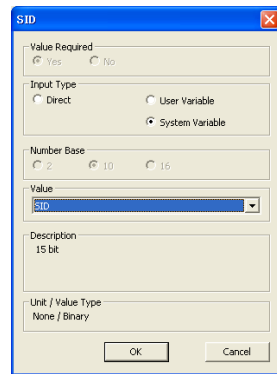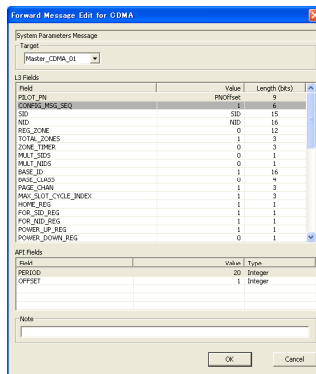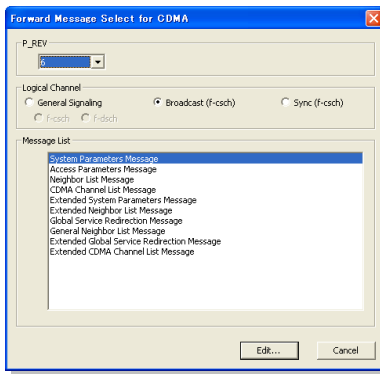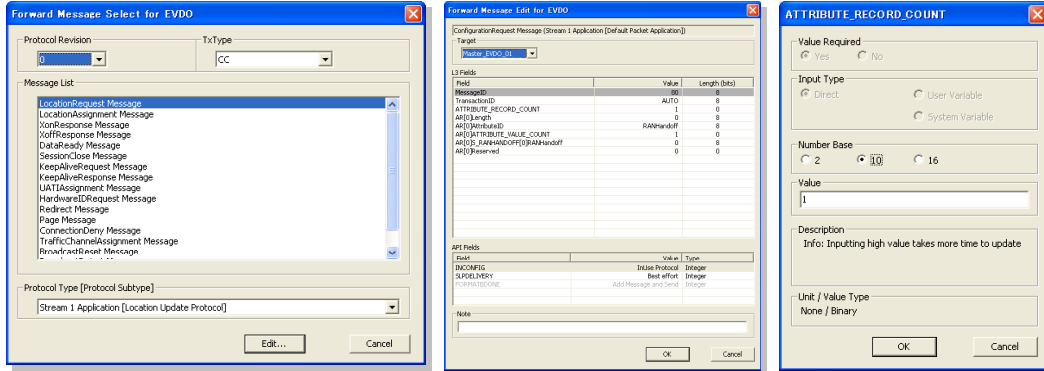
3. Functions - Message Edition (2/2) -

1xEV-DO Message Edition

Each parameter in the Layer-3 Field of send and receive messages can be edited.
Parameters that can be set at the field comply with the 3GPP2 standard.

Step 1 Message Selecting ➤ **Step 2 Message Editing** ➤ **Step 3 Field Editing**

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3. Functions - Tag List -

Test Sequence Expansion Function

The Tag function expands the expression of the test sequence.

	Wait	: Wait for specified length of time for script execution (setting resolution: 10 ms)
	Prompt	: Wait for input from console
	Trace	: Output specified character string on PVT
Common Use Tag	Comment	: Input comment in script
	Inline	: Describe Perl script directly
	Power Change	: Change output power of each sector in time sequence Used at handoff test script
	Random Order	: Branch processing at specified segment by Reverse Message Used when Reverse Message order random

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3. Functions - Power Change Tag -

Fine Control of RF Power

RF power can be fine-controlled using the power change tag, facilitating setting levels for handoff tests.
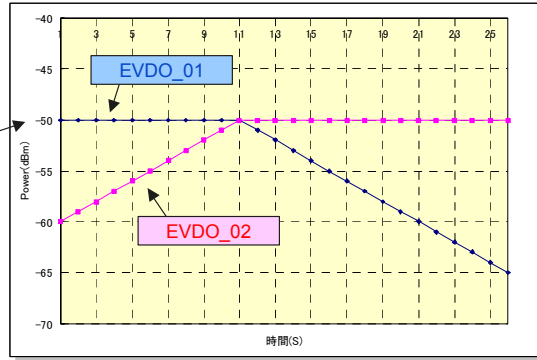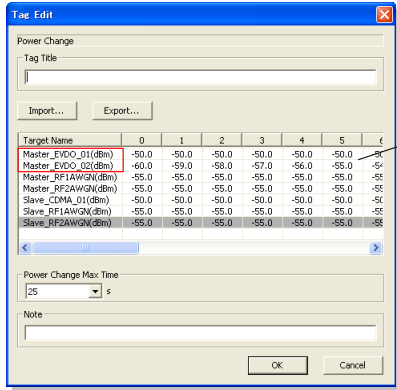
Power can be changed every 1 second.

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3. Functions - Random Order Tag -

Describes Processing for Random Order Reverse Message

The process of random order Reverse Messages can be described at 1xEV-DO Session Open, etc., using the random order tag.

- Usage Example

In the above diagram, Configuration Request Messages from AT are ordered randomly. After the signaling tester receives the Configuration Request Message, it sends the Configuration Response Message. The random order process stops after the Configuration Complete Message is received.

3. Functions - Packing -

Gathering Items in One Pack

Selected items can be collected in one named pack. Entire test sequences that hardly ever change or are used frequently can be checked easily by packing. Packed items can be copied and pasted.
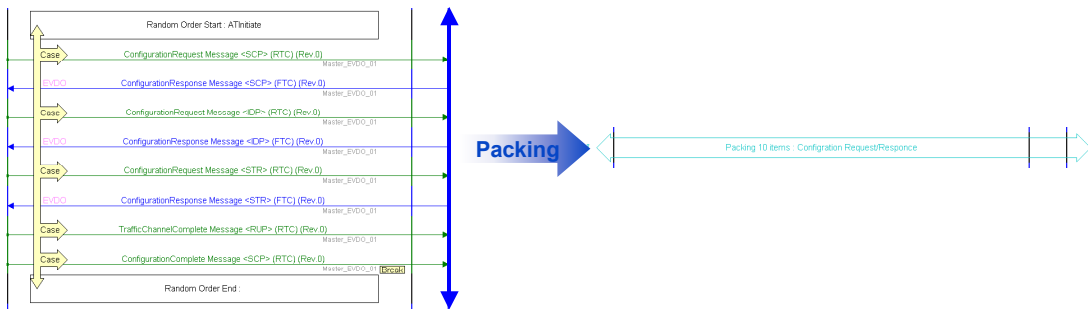
- Usage Example -

The above diagram shows an example when the Configuration Request/Response processes described on the previous slide are collected in one pack.

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3. Functions - PPP Server -

Defined PPP Server Operation

PPP server operation can be defined in the same sequence, eliminating the need to provide a separate PPP server and supporting data communications tests with a single MD8470A unit.

3. Functions - Copy & Paste -

Secondary Script Creation using Copy & Paste Function

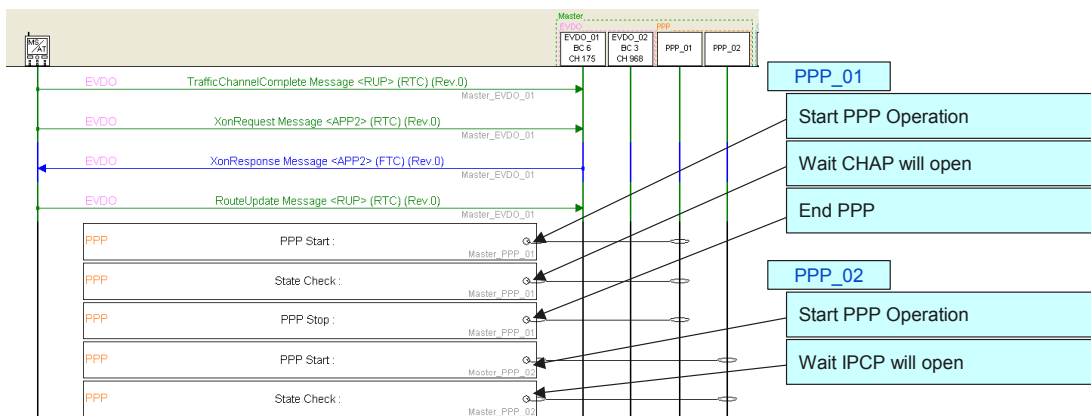Required items can be copied and pasted from other test sequences by running multiple Scenario Composer.

- Usage Example -

This adds voice receive (1X) processing during 1xEV-DO data communications.

Paste required process

Paste

Pacing & Copy

Packing 17 items : 1X Page Script

Voice Receive Sequence (1X)

Pacing & copy only necessary processes from voice receive (1X) sequence.

---
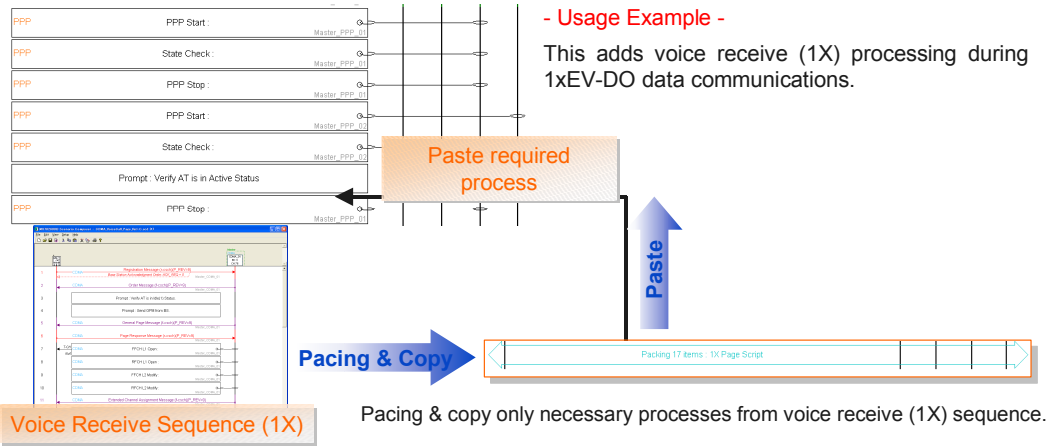
3. Functions - Export -

Immediate Operation of Exported Perl Script

The Export function converts the MX702600B-created test sequence into a Perl script for running on the MX847030A CDMA2000 Simulation Kit installed in MD8470A Signalling Tester. The converted Perl script is operated using the MX847030A PVT (Protocol Visualization Tool).

Export

Perl Script

Sequence File

*1: Importing from a Perl script into Scenario Composer is not supported.
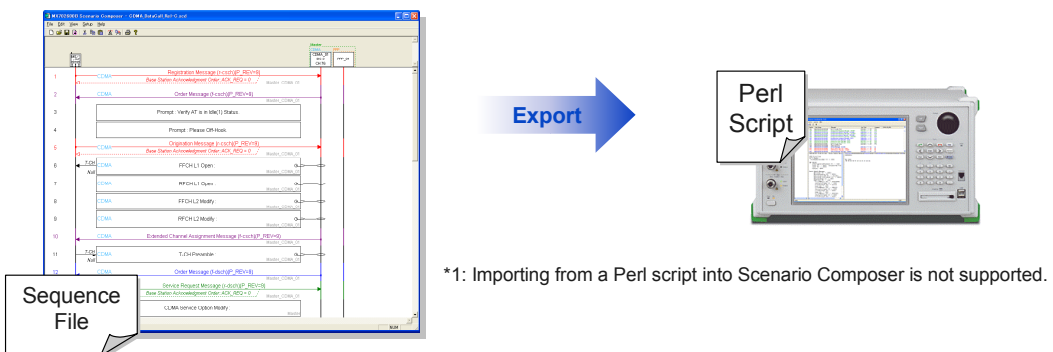
4. Sample Sequence

Bundled Sample Sequences

Sample scripts are bundled with the MX702600B as standard. Anritsu will add more sample sequences in the future.

1X Total 7

1. Rel. C (PREV9) Voice Call (Sending)
2. Rel. C (PREV9) Voice Call (Receiving)
3. Rel. C (PREV9) Hard Handoff
4. Rel. C (PREV9) Data Call (Sending)
5. Hard Handoff at Rel.C (PREV9) Data Call Sending
6. Soft Handoff at Rel.C (PREV9) Data Call Sending

1xEV-DO Total 12

1. EV-DO → 1X Hand Down at Location Registration
2. EV-DO → 1X Hand Down at Sending
3. Rev. 0 Null → Idle → Active Packet Communication
4. Rev. 0 Active Soft Handoff
5. Rev. 0 Active Soft Handoff
6. Rev. 0 Active Hard Handoff (between Channels)
7. Rev. 0 Active Hard Handoff (between Band Classes)
8. Rev. A Null → Idle → Active Packet Communication
9. Rev. A Active Soft Handoff
10. Rev. A Active Hard Handoff (between Channels)
11. Rev. A Active Hard Handoff (between Band Classes)
12. Rev. A → Rev.0 Hand Down

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5. Support Service

MX702600B-SS110: 1 Year Support Service

– Basic policy
  • 1-year support contract

– Support details
  • Responses to enquiries by email
  • Software version upgrades (Web download) for contract duration
  • Maintenance releases (including bug fixes)

This option is mandatory.

6. Operation Environment

MX702600B CDMA2000 Scenario Composer operates under the following environment.

PC	IBM-PC/AT or compatible
CPU	1 GHz Pentium Ⅲ processor or better
Main Memory	256 MB min.
Display	1024 × 768 pixels min.
OS	Microsoft Windows XP Professional Service Pack 2 or later
Hard Disk	At least 20 MB of free space on boot disk
USB	USB Version 1.1/2.0

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Pentium is the registered trademark of Intel Corporation or its subsidiaries in the USA and other countries.
Other companies, product names and service names are registered trademarks of their respective companies.

Scenario Composer Perl scripts operate under the following environment.

Signalling Tester	MD8470A Signalling Tester
Simulation Kit	MX847030A CDMA2000® Simulation Kit Version 2.0 or later
Other	The MD8470A hardware and software configuration differ according to the test contents.

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7. Appendix (1/2)

MD8470A Configurations

Units/Options/ Software Configurations	MU847030A CDMA2000® 1X Signalling Unit	MU847032A CDMA2000® 1xEV-DO Signalling Unit	MD8470A-01 Second RF Option	MX847030A CDMA2000® Simulation Kit	MX847030A-01 Multi Sector/ Multi Carrier
CDMA2000 1X Test Configuration*1	Required			Required	
CDMA2000 1X + Multi Sector/Multi Carrier Test Configuration*2	Required		Required	Required	Required
CDMA2000 1X/1xEV-DO Test Configuration *3	Required	Required	Required	Required	
CDMA2000 1X/1xEV-DO + Multi Sector / Multi Carrier Test Configuration*4	Required	Required	Required	Required	Required

*1: CDMA2000 1X Test Configuration: Simulates CDMA2000 1X with one carrier and one sector
*2: CDMA2000 1X + Multi Sector/Multi Carrier Test Configuration: Simulates CDMA2000 1X with multi-carriers and multi-sectors
*3: CDMA2000 1X/1xEV-DO Test Configuration: Simulates CDMA2000 1X/1xEV-DO with one carrier and one sector
*4: CDMA2000 1X/1xEV-DO + Multi Sector/Multi Carrier Test Configuration: Simulates CDMA2000 1X/1xEV-DO with multi-carriers and multi-sectors
CDMA2000® is a registered trademark of the Telecommunications Industry Association (TIA-USA).

7. Appendix (2/2)

System Variables

The variables in the table are defined as system variables that can be used in each messages.

Name	Type	Explanation
PNOffset	CDMA	Setting value specified on Signaling Setup screen
BandClass	CDMA	
Channel	CDMA	
SID	CDMA	
NID	CDMA	
MAX_P_REV	CDMA	
MIN_P_REV	CDMA	
Address_Type	CDMA	Setting type 2 when receiving Registration Message[1] Used as API Fields ADDRTYPE when sending f-csch (general signaling) message[2]
Address_Length	CDMA	Setting type 5 when receiving Registration Message[1] Used as API Fields ADDRLEN when sending f-csch (general signaling) message[2]
Address	CDMA	Setting IMSI_S calculated from API Fields ADDR when receiving Registration Message Becomes undefined value when IMSI_S not included Used as API Fields ADDR when sending f-csch (general signaling) message[2]
ESN	CDMA	Setting ESN calculated from API Fields ADDR when receiving Registration Message Becomes undefined value when ESN not included Used as ESN for following tags[2] FFCH L1 Open, FSCH L1 Open, FDCCH L1 Open RFCH L1 Open, RSCH L1 Open, RDCCH L1 Open
PNOffset	EVDO	Setting value specified on Signaling Setup screen
BandClass	EVDO	
Channel	EVDO	
SectorID	EVDO	
ColorCode	EVDO	
UATI024	EVDO	
MacIndex	EVDO	Setting MacIndex reported from MX847030A when executing sector Traffic Channel Open or SHO sector add tag
MacIndexMSB	EVDO	Setting MacIndex extended at Revision A when USEEXTENDEDMACINDEX in BS setting dialog = True

*1: The MX702600B is preset as Address Type = 2, Address Len = 5.
*2: It is preset to use the existing variable. The setting can be released freely.

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Specifications are subject to change without notice.

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