

NJZ-2000多制式手机综测仪



NJZ-2000 Product Overview

Existing JRC Testers

NJZ-917BJ GSM/GPRS



NJZ-1900 W-CDMA



NJZ-1800BJ/C CDMA

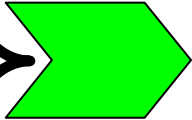


Meas. Accuracy compliance with STD

Low Cost

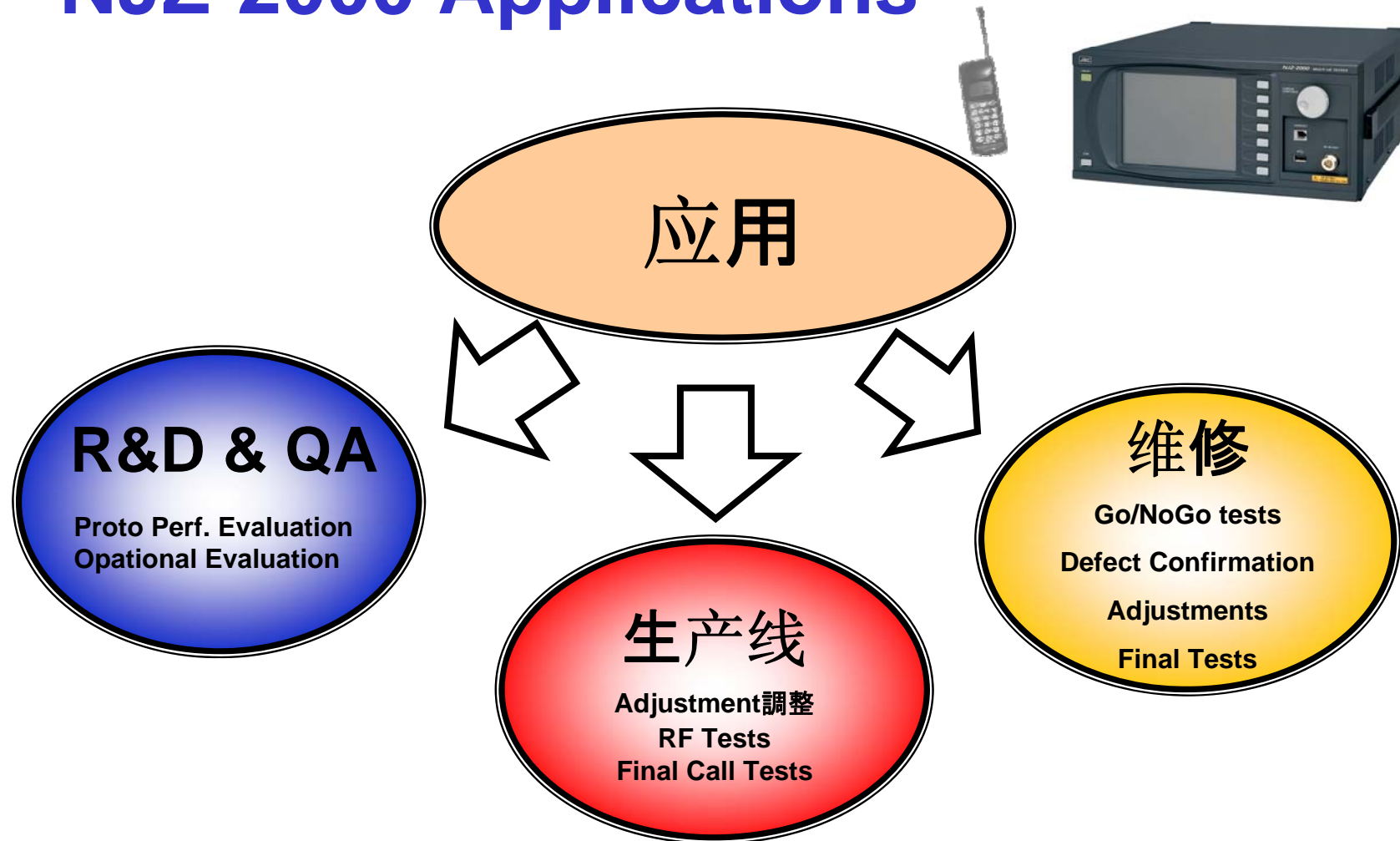
Multi System

One Box



EDGE、CDMA2000 1xEV-DO、HSDPA

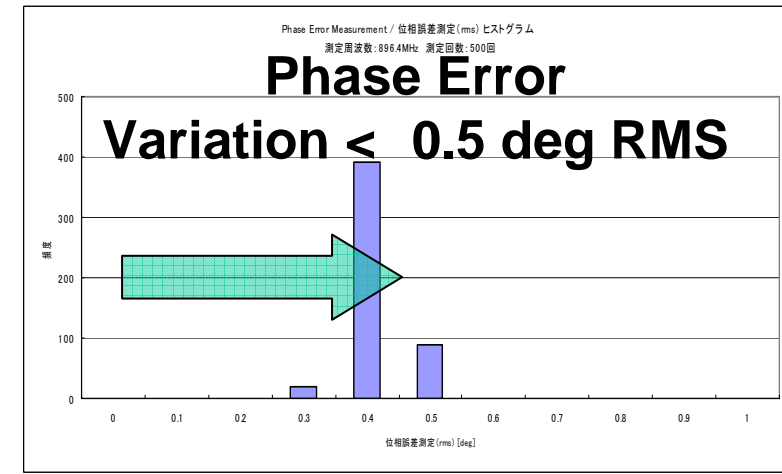
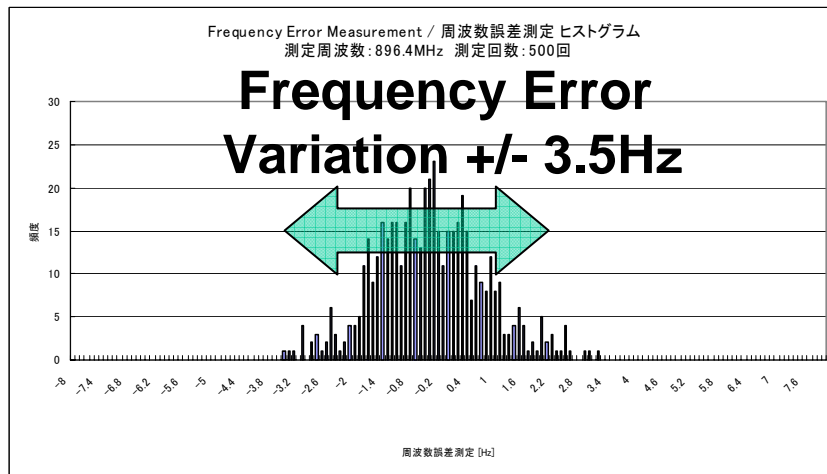
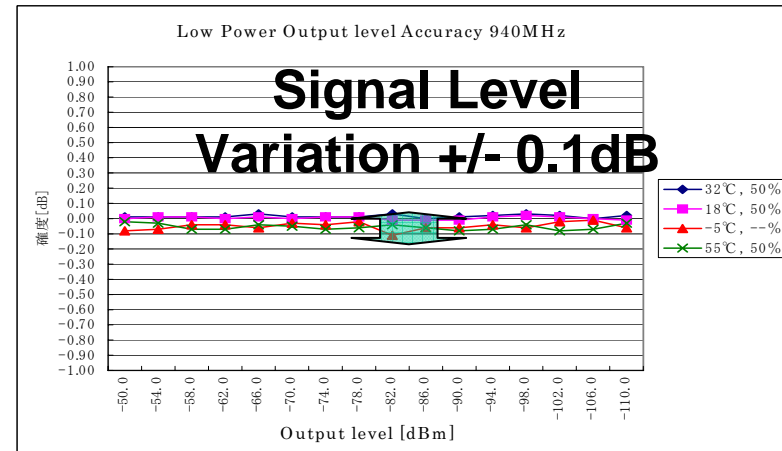
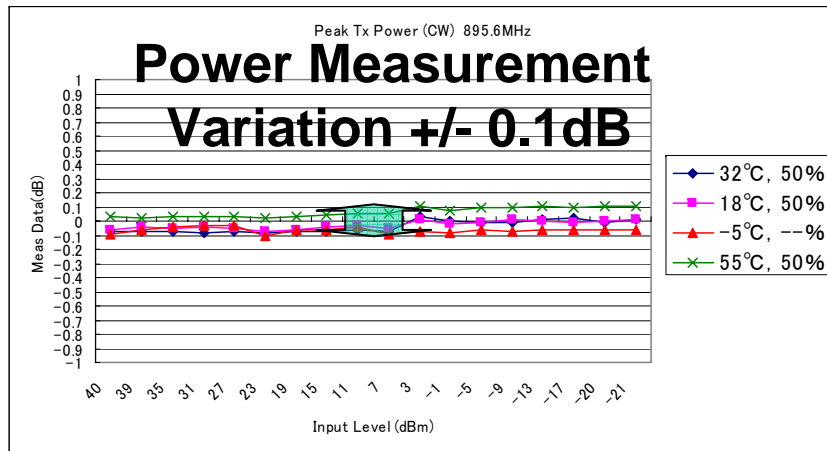
NJZ-2000 Applications



JRC 建议: 使用 NJZ-2000来降低测试仪的成本

NJZ-2000 有很高的 RF 性能

You can use NJZ-2000 in place of existing high end testers at Production and Repair.



Actual Evaluation Data at Temperature around 25 degC, Humidity around 60%

中国总代: 香港中仪集团有限公司 4/14



Japan Radio Co., Ltd.

NJZ-2000 Supports 3GPP Conformance Tests

The NJZ-2000 covers all RF performance tests of 3GPP TS 51.010 (GSM/GPRS/EGPRS) typically required at Production and Repair.

Pragraph	Subject	NJZ-2000 Support
13	Transmitter	-
13.1	Frequency error and phase error	OK
13.2	Frequency error under multipath and interference condition	None
13.3	Transmitter output power and burst timing	OK
13.4	Output RF spectrum	OK
13.9	Output RF spectrum for MS supporting the R-GSM band	OK
13.16	GPRS transmitter tests	-
13.16.1	Frequency error and phase error in GPRS multislot configuration	OK
13.16.2	Transmitter output power in GPRS multislot configuration	OK
13.16.3	Output RF spectrum in GPRS multislot configuration	OK
13.17	EGPRS transmitter tests	-
13.17.1	Frequency error and Modulation accuracy in EGPRS Configuration	OK
13.17.2	Frequency error under multipath and interference conditions	None
13.17.3	EGPRS Transmitter output power	None
13.17.4	Output RF spectrum in EGPRS configuration	OK
14	Receiver	-
14.1	Bad frame indication	-
14.2	Reference Sensitivity	OK
14.3	Usable receiver input level range	None
14.4	Co-channel rejection	None
14.5	Adjacent channel rejection	None
14.6	Intermodulation rejection	None
14.7	Blocking and spurious response	None
14.8	AM suppression	None
14.9	Paging performance at high input levels	None
14.16	GPRS receiver tests	-
14.16.1	Minimum Input level for reference performance	OK
14.16.2	Co-channel rejection	None
14.16.3	Acknowledged mode/Downlink TBF/I_LEVEL measurement report	None
14.18	EGPRS receiver tests	-
14.18.1	Minimum Input level for reference performance	OK
14.18.2	Co-channel rejection	None
14.18.3	Adjacent channel rejection	None
14.18.4	Intermodulation rejection	None
14.18.5	Blocking and spurious response	None
14.18.6	EGPRS Usable receiver input level range	None
14.18.7	Incremental Redundancy Performance	None

NJZ-2000 Supports 3GPP Conformance Tests

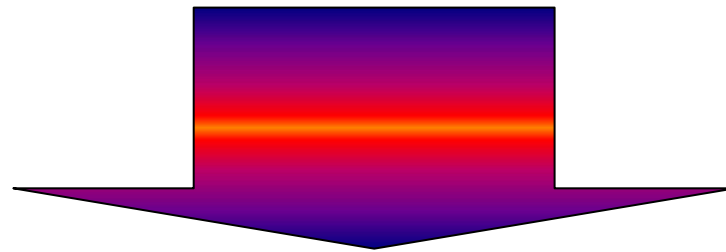
The NJZ-2000 covers all RF performance tests of 3GPP TS 34.121 (W-CDMA) typically required at Production and Repair.

Pragraph	Subject	NJZ-2000 Support
5	Transmitter Characteristics	
5.2	Maximum Output Power	OK
5.3	Frequency Error	OK
5.4.1	Open Loop Power Control in the Uplink	OK (JRC original method)
5.4.2	Inner Loop Power Control in the Uplink	OK (JRC original method)
5.4.3	Minimum Output Power	OK
5.4.4	Out-of-synchronisation handling of output power	None
5.5	Transmit ON/OFF Power	None
5.6	Change of TFC	OK
5.7	Power setting in uplink compressed mode	None
5.8	Occupied Bandwidth(OBW)	OK
5.9	Spectrum emission mask	Planned
5.10	Adjacent Channel Leakage Power Ratio(ACLR)	OK (JRC original method)
5.11	Spurious Emissions	Planned
5.12	Transmit Intermodulation	None
5.13.1	Error Vector Magnitude(EVM)	OK
5.13.2	Peak code domain error	None
5.13.3	UE Phase discontinuity	None
5.13.4	PRACH preamble quality	None
6	Receiver Characteristics	-
6.2	Reference Sensitivity Level	OK
6.3	Maximum Input Level	OK
6.4	Adjacent Channel Selectivity(ACS)	None
6.5	Blocking Characteristics	None
6.6	Spurious Response	None
6.7	Intermoduration Characteristics	None
6.8	Spurious Emissions	None

Note: Not including the tests for HSDPA.

JRC 建议: 降低测试仪成本至1/3

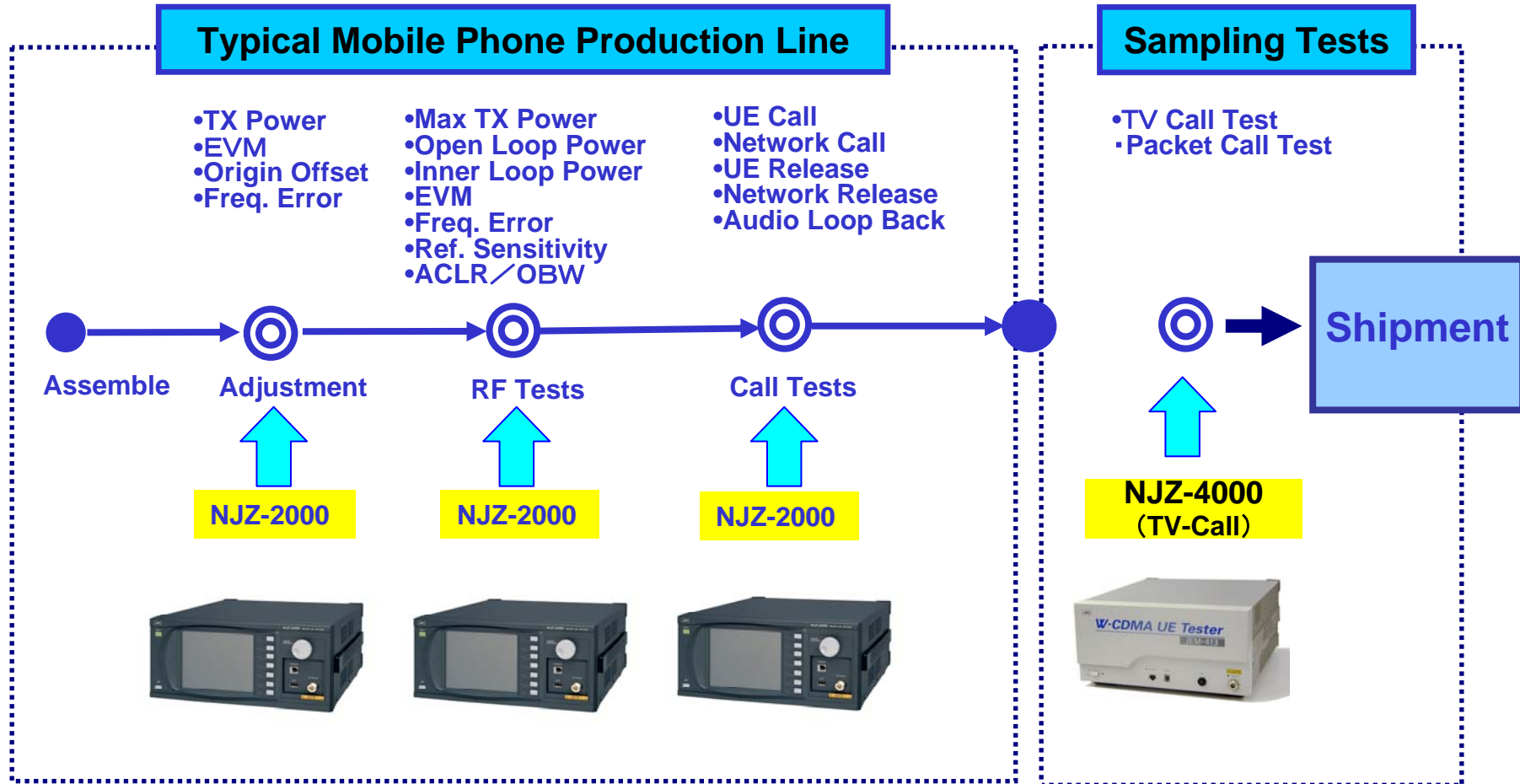
by replacing a high end test with a low cost tester of 1/3 price.



By using NJZ-2000
Price: Low End
Performance: High End

典型生产线应用示例

(WCDMA Mobile Phone Production Line)



NJZ-2000 产品配置

Configuration

- NJZ-2000-G00 GSM/GPRS (See Note.)
- NJZ-2000-W00 W-CDMA (See Note.)
- NJZ-2000-G0W0 GSM/GPRS/W-CDMA (See Note.)
- NJZ-2000-C00 CDMA 1X\1X EVDO(See Note.)

Options

- ACLR_(DSB)/OBW Test Capability
- Ext Data Input BER Meter
- EGPRS Test Capability
- GPIB Interface
- RS-232 Interface
- NFG-235 Shield Case
- PoST software for NJZ-2000

Note: Including Accessories

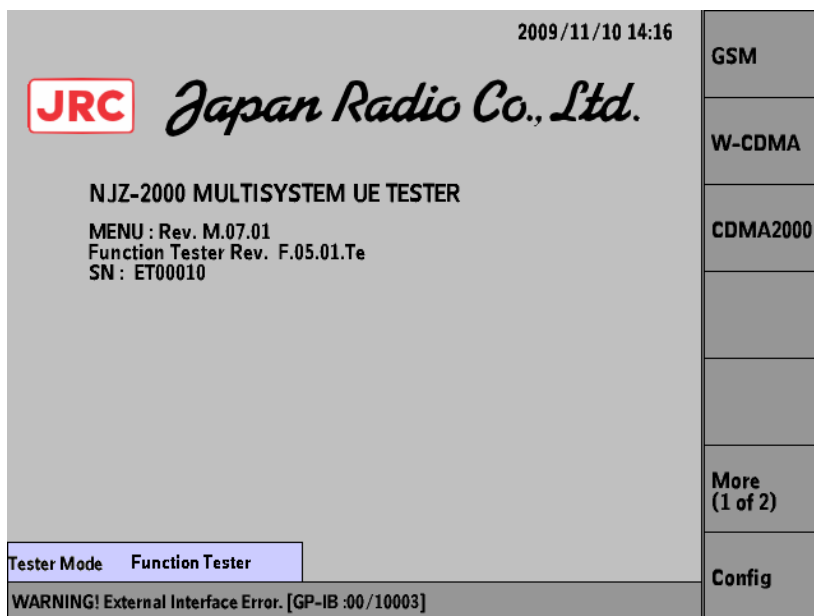
- Quick Reference Guide
- Manual CD-ROM
 - User's guide
 - Programmable guide
- Antenna Coupler (Outside Japan)
- UI RF cable (Japan only)
- Power Cable

NJZ-2000 典型配置

	W-CDMA Production (Note1)	GSM/W-CDMA Repair (Lvl1&2)	GSM/W-CDMA Repair (Lvl 3) (Note 1)
Base Unit Configuration			
NJZ-2000 G00			
NJZ-2000 W00	X		
NJZ-20000 G0W0		X	X
Options			
ACLR(DSB)/OBW	X		X
Ext Data Input BER Meter	X		
EGPRS		X	X
GPIB Interface	X		X
RS-232 Interface			
NFG-235 Shield Case		X	X
PoST software for NJZ-2000		X	

Note1: Assuming that the customer develop the external control software used for production and for the level 3 repair.

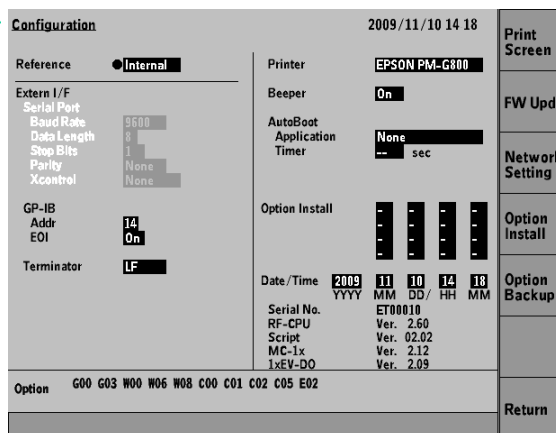
NJZ-2000 操作: 启动菜单



You can select the function by pressing a softkey menu.



- ➔ Auto Test
- ➔ Manual Test
- ➔ TX Analyzer
- ➔ Signal Generator



- ➔ FW Update
- ➔ Opt Install
- ➔ Opt Backup

NJZ-2000 操作: 自动测试

GSM

Auto Test : Stand-by 2009/11/10 14:23

GSM900	Location Update	IMSI	001012345678901	Start
	MS Call	IMEI		Previous
	Talk	Caller ID		
	RF Test			
	MS Release			

W-CDMA

Radio System	GS
TCH	
Peak TX Power(High)	
Peak TX Power(Mid)	
Peak TX Power(Low)	
Burst Timing	
Power Ramp	
Phase Error(RMS)	
Phase Error(Peak)	
Frequency Error	
Sens/BER II	
Sens/BER	
RX Quality	
RX Level	

RF On

Procedure

Press [Start] to begin a test.

Auto Test : Stand-by 2009/11/10 14:23

W-CDMA	Location Update	IMSI	001010123389980	Start
	MS Call	IMEI		Previous Screen
	Talk	Caller ID	01234567890123456789	
	MS Release	Dialed No.		
	BS Call (AMR)			
	Talk			
	BS Release			
	BS Call (RMC)			
	RF Test			
	BS Release			

cdma2000

Auto Test : Stand-by 2009/11/10 14:23

RFCH	B1	9
Open Loop TX Power	9612	9
ILP(Down Min)		
ILP(Down Max)		
ILP(Up Min)		
ILP(Up Max)		
ILP(10slots Down)		
ILP(10slots Up)		
MAX TX Power		
Frequency Error		
EVM		
Sensitivity/BER		
MIN TX Power		

RF On

Procedure

Press [Start] to begin a test.

Auto Test(MC-1x) : Stand-by 2009/11/10 15 22

CDMA2000 MC-1x	Location Update	IMSI	001012345678901	Start
	MS Call(Talk)	ESN		Previous Screen
	Talk	MEID		Next Screen
	MS Release	Caller ID	01234567890123456789	Screen >> (Value)
	BS Call(Talk)	Dialed No.		More (1 of 2)
	Talk			Return
	BS Release			
	BS Call(RF)			
	RF Test			
	Softer Handoff			
	BS Release			

RFCH	B0 Cel US	B0 Cel US	B0 Cel US	----	----	----	UNIT
Access Probe Power	1024	991	799	----	----	----	dBm
ILP(Down)							dB
ILP(Up)							dB
Max TX Power							dBm
Min TX Power							dBm
Frequency Error							Hz
Multi-code Rho							usec
Time Offset							%
Sensitivity/BER							

RF On

Procedure FILE_002

3GPP-SYS 2 SIG-PTN 1 3GPP2-CONF 1

Press [Start] to begin a test.

Note: The Radio System is defined in the selected procedure file.

NJZ-2000 操作: 手动操作

Manual Test (GSM) : Stand-by 2009/11/10 14:38

Location Update	<input type="checkbox"/>	Peak TX Power	dBm	
MS Call	<input checked="" type="checkbox"/>	Burst Timing	Bits	
MS Release	<input type="checkbox"/>	Power Ramp		
BS Call	<input type="checkbox"/>	Phase Error(RMS)	deg	
BS Release	<input type="checkbox"/>	Phase Error(Peak)	deg	
Connection	<input type="checkbox"/>			
Handover	<input type="checkbox"/>			

IMSI 001012345678901
IMEI

Caller ID 01234567890123456789
Diald No.

GSM Version
Power Class
ACT Tim ADV

RF On

Procedure

Radio System **GSM900**

Press [Loc Update], [BS Call] or c

GSM

Manual Test (W-CDMA) : Stand-by 2009/11/10 14:41

Location Update	<input type="checkbox"/>	TX Power	dBm	-
MS Call	<input type="checkbox"/>	Frequency Error	Hz	
MS Release	<input type="checkbox"/>	EVM	%	
BS Call (AMR)	<input type="checkbox"/>	Origin Offset	dB	
BS Call (RMC)	<input type="checkbox"/>			
BS Release	<input type="checkbox"/>			
Connection (AMR)	<input type="checkbox"/>			
Connection (RMC)	<input type="checkbox"/>			
Handover	<input type="checkbox"/>			

IMSI 001010123389980
IMEI

Caller ID 01234567890123456789
Diald No.

PRACH Power

RF On

Procedure

Radio System **W-CDMA**

Press [BS Call] or dial and call from the mo

W-CDMA

Manual Test (MC-1x) : Stand-by 2009/11/10 15:17

Location Update	<input type="checkbox"/>	TX Power	dBm	-
MS Call	<input type="checkbox"/>	Frequency Error	Hz	
MS Release	<input type="checkbox"/>	Multi-code Rho		
BS Call	<input type="checkbox"/>	Origin Offset	dBc	
BS Release	<input type="checkbox"/>	Time Offset	usec	
Connection	<input type="checkbox"/>	FER	Err Cnt	%
Softer Handoff	<input type="checkbox"/>	Frm Cnt		
Hard Handoff	<input type="checkbox"/>	Max TX Power	dBm	
Band Handoff	<input type="checkbox"/>	Min TX Power	dBm	
		Access Probe Power	dBm	

IMSI 001012345678901
ESN
MEID
Caller ID 01234567890123456789
Diald No.

3GPP-SYS 2 SIG-PTN 1 3GPP2-CONF 1

Pilot Strength dB 80 : Cel US
RFCH 1024: 815.04 MHz
BS Level -75.0 dBm
Service Option 3
(3:EVRC 9.6K Voice)
RX Power On
Caller ID On
Averaging Off

PWR CNTL HOLD (1 dB)
Max Frames 10000
Confidence 95%
Radio Config F3R3

Procedure **FILE_002**

Radio System **CDMA2000**

Press [Loc Update], [BS Call] or dial and call from the mobile.

cdma2000

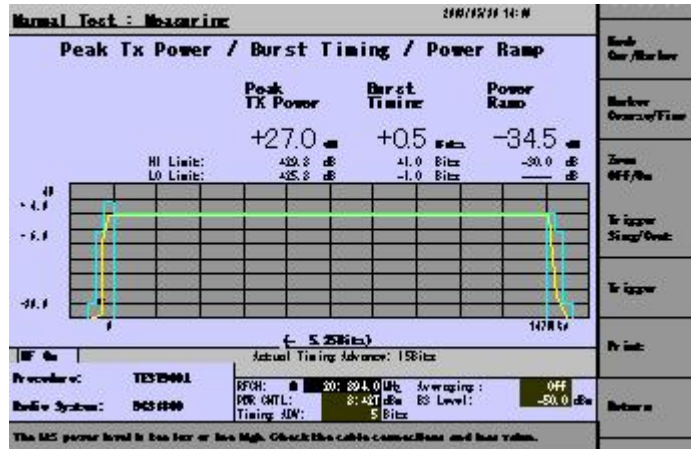
Note:

- User interface is similar among radio systems.
- Settable parameters depend on each radio system.

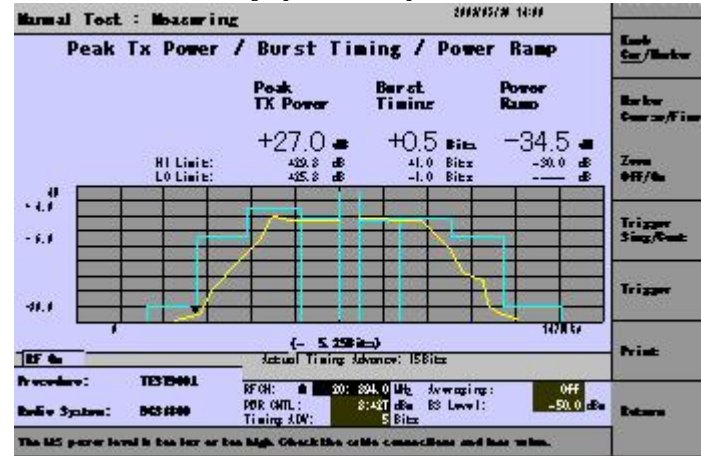
NJZ-2000 操作: 自动/手动测试

Detailed Result (GSM Only)

Power Ramp



Power Ramp(Zoom)



Freq Err/Phase



Spectrum Monitor



NJZ-2000 操作: TX Analyzer

GSM

W-CDMA

cdma2000

cdma2000

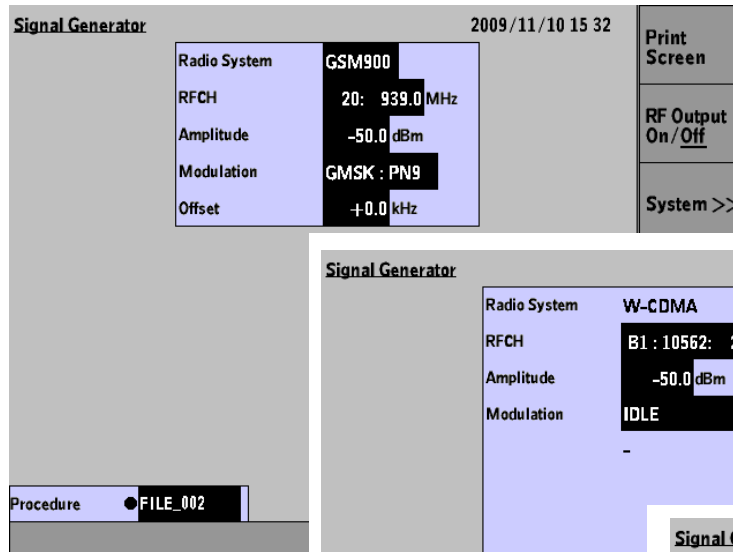
cdma2000

Note:

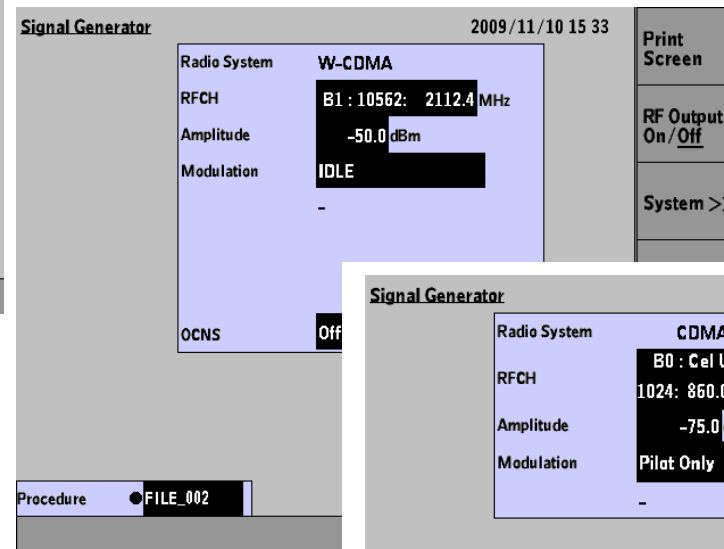
- User interface is similar among radio systems.
- Settable parameters depend on each radio system.

NJZ-2000 操作: Signal Generator

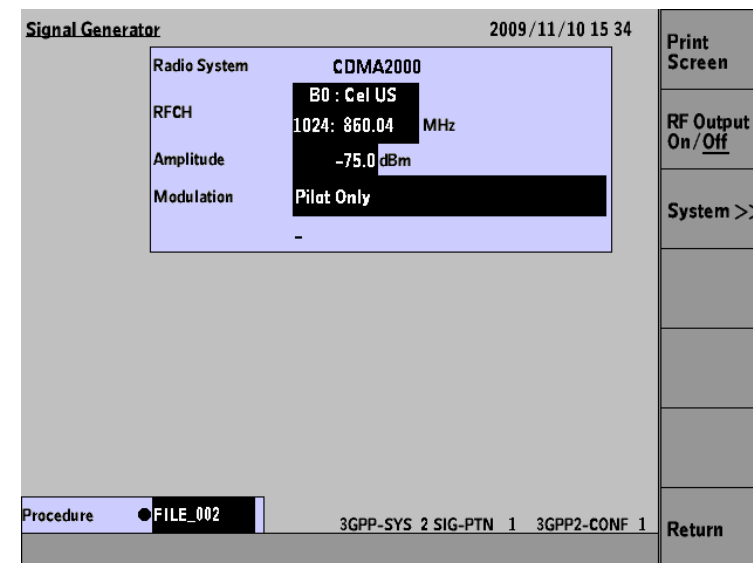
GSM



W-CDMA



cdma2000



Note:

- User interface is similar among radio systems.
- Settable parameters depend on each radio system.

NJZ-2000 操作: 仪器配置

Configuration 2009/11/10 15 35

Procedure **FILE_002** Printer **EPSON PM-G800**

Panel Key **Unlock** Beeper **On**

Reference **Internal** MS EXT Control Signal **H/L**

Extern I/F
Serial Port
Baud Rate **9600**
Data Length **8**
Stop Bits **1**
Parity **None**
Xcontrol **None**

GP-IB
Addr **2**
EOI **Off**

Terminator **CR+LF**

Local Time **2009 11 10 15 34**
YYYY MM DD / HH MM

Time Zone **GMT +9 00**
HH MM

Date/Time **2009 11 10 15 34**
YYYY MM DD / HH MM

Serial No. **ET00010**
RF-CPU Ver. 2.60
Script Ver. 02.02
MC-1x Ver. 2.12
1xEV-DO Ver. 2.09

Option **G00 G03 W00 W06 W08 C00 C01 C02 C05 E02**

Test Sequence

Test Condition

File Mngmt

Network Setting

Mintnance

More (1 of 3)

Return



File Mgmt
Network Setting

Test Sequence Screen

Configuration : Test Sequence(Page 1of2) 2009/11/10 15:37

Radio System 1 **GSM900** 2 -----

Sequence No. **1** GSM Mode STD

1	Location Update	Run	Run	Run	Run	Run	Run
2	MS Call	Run	Run	Run	Run	Run	Run
3	Talk	Run	Run	Run	Run	Run	Run
4	RF Test	Run	Run	Run	Run	Run	Run
5	MS Release	Run	Run	Run	Run	Run	Run
6	BS Call	Run	Run	Run	Run	Run	Run
7	BS Release	Run	Run	Run	Run	Run	Run

RF Output **On**
Release Delay **3.0** sec
3GPP System **2**
BCCCH **20**: 894.0 MHz GSM900
TCH **1**: 890.2 MHz GSM900

Detail of RF Test

Radio System	GSM900	GSM900	GSM900	-----	-----	-----
TCH	Run	Run	Run	Run	Run	Run
Peak TX Power(High)	Run	Run	Run	Run	Run	Run
Peak TX Power(Mid)	Run	Run	Run	Run	Run	Run
Peak TX Power(Low)	Run	Run	Run	Run	Run	Run
Burst Timing	Run	Run	Run	Run	Run	Run
Power Ramp	Run	Run	Run	Run	Run	Run
Phase Error(RMS)	Run	Run	Run	Run	Run	Run
Phase Error(Peak)	Run	Run	Run	Run	Run	Run
Frequency Error	Run	Run	Run	Run	Run	Run
Sensitivity/BER	Run	Run	Run	Run	Run	Run
Sensitivity/FER	Run	Run	Run	Run	Run	Run
RX Quality	Run	Run	Run	Run	Run	Run
RX Level	Run	Run	Run	Run	Run	Run
ATT In	+0.0	+0.0	+0.0	+0.0	+0.0	+0.0
ATT Out	+0.0	+0.0	+0.0	+0.0	+0.0	+0.0

Print Screen

Previous Page

Next Page

Return

Note: The Radio System is set in the Radio System field.

Test Condition Screen

Configuration(MC-1x) : Test Condition 2009/11/10 15:38

Current System **CDMA2000** Loopback Delay **Mid**

Radio System **CDMA2000** Connection Wait **0** sec

CDMA Mode **MC-1x** Radio Conf **F3R3**

Band **50-Cel US** SCH Rate **9.6** kbps

3GPP System **2** SCH Encoder **CONV**

Signaling Pattern **1** SCH Level **-3.50** dB

3GPP2 Config **1**

Base Station
MCC **111** Max TX Power BS Level **-104.0** dBm
MNC **11** Min TX Power BS Level **-75.0** dBm
NID **1** Averaging **Off**
SID **7** Rgstr NID **12** Max Frames **10000**
Rgstr SID **12** Confidence **95%**

Power Up Rgstr **Off** MEID **On**

Max Slot Cycle Index **0**

Access Probe
Nom Pwr **0** Init Pwr **0**
Pwr Step **0** Num Step **4**
Max Req Seq,Max Rsp Seq **4**

Access Probe Pwr Meas **On**

SEM Template Offset **+0.00** dB
SEM RBW **1E30k** Hz

Print Screen

Loss

Limit

Return

Note: The Radio System is set in the current system field.

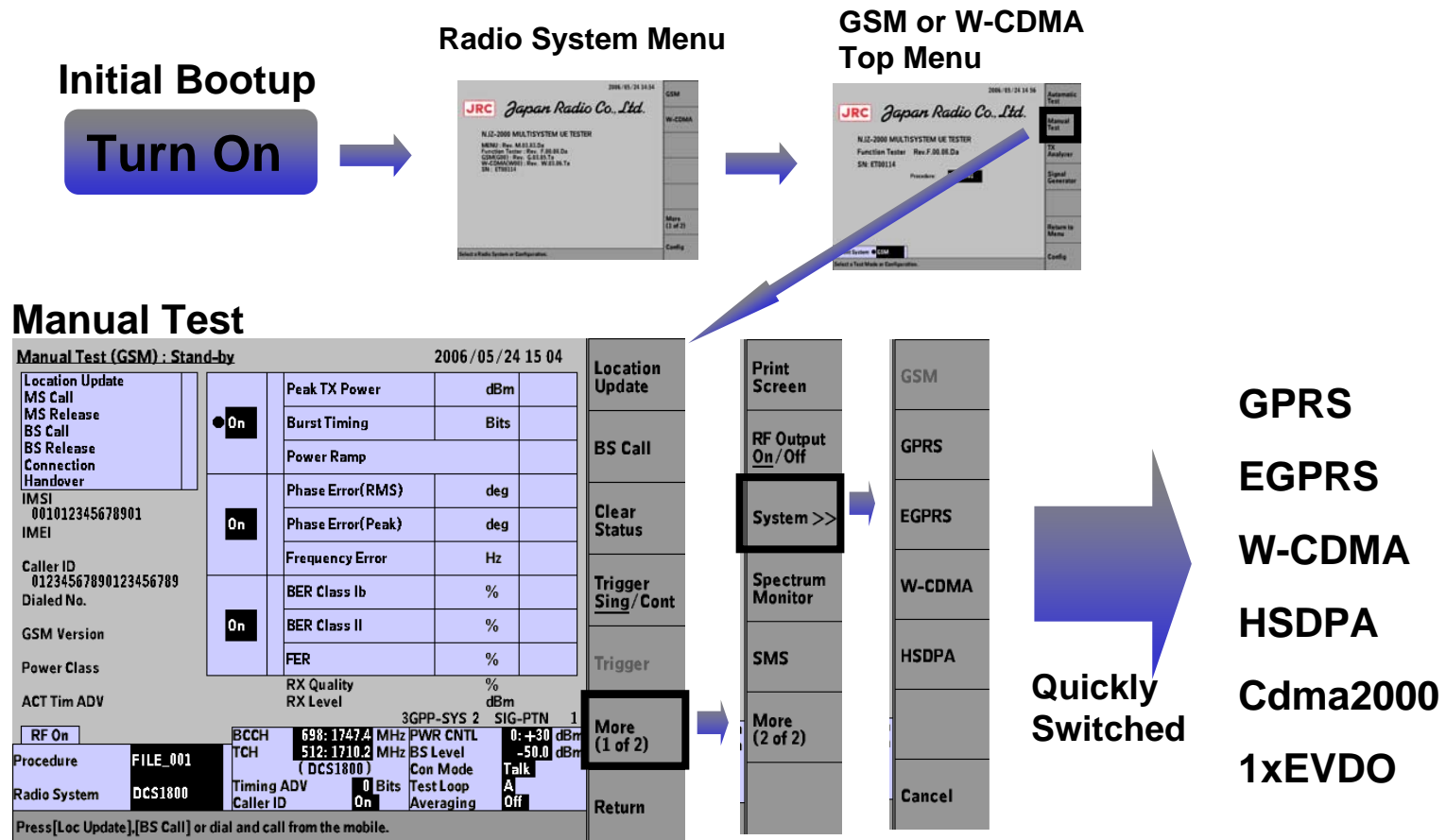
Note:

- User interface is similar among the radio systems.
- Settable parameters depend on each radio system.

简单快速的 无线制式切换

Improves your Operational Efficiency.

You can switch quickly radio system without re-booting.

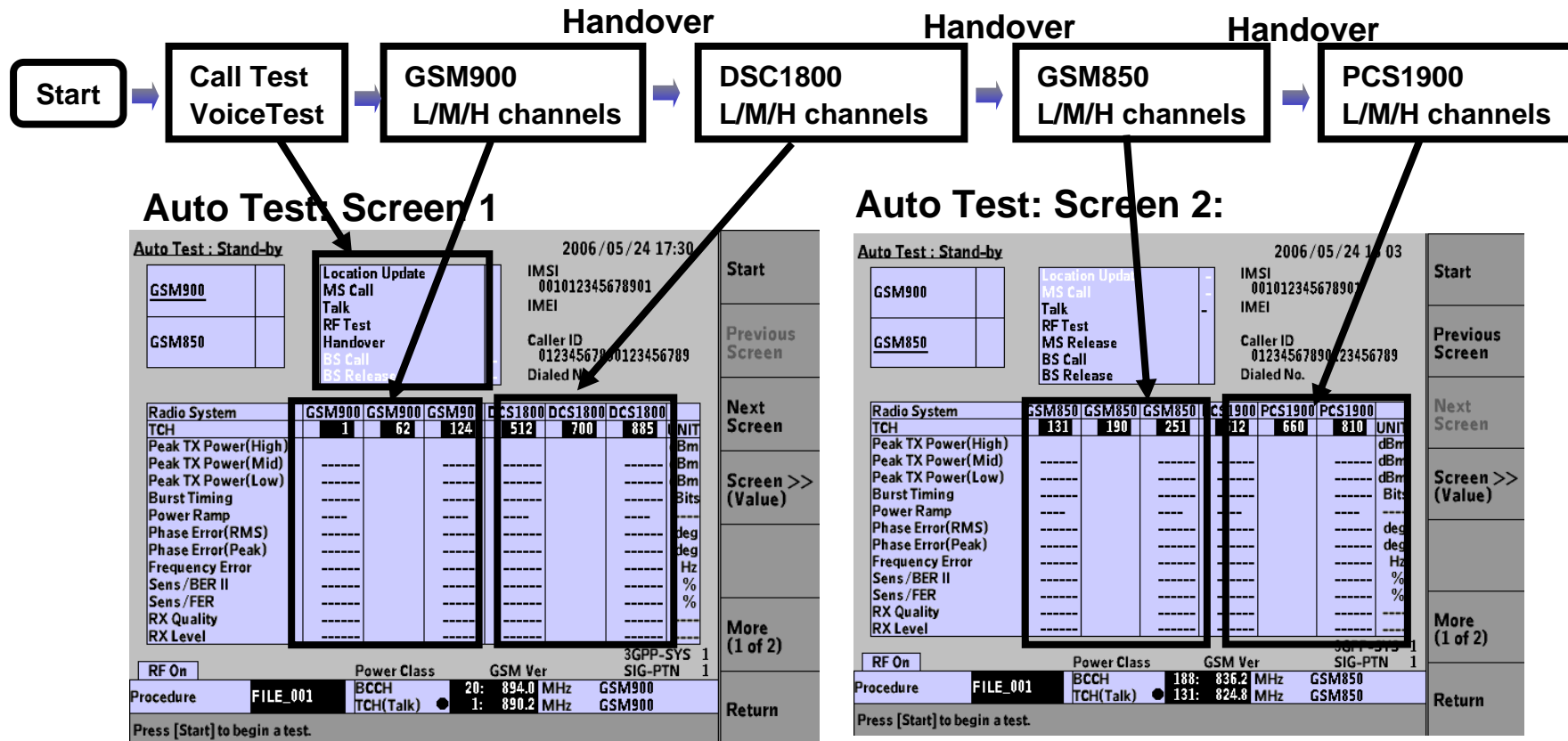


Built-in Full Automatic Test (1/2)

Example: Quad Band GSM phone (12 channels test)

Improves your Operational Efficiency.

- You can perform fully automatic test for a quad band mobile phone at Low/Mid/High channels of GSM900/ DCS1800/GSM850/PCS1900.



Built-in Full Automatic Test (2/2)

- Easy to configure the automatic test script by using Test Sequence screens.

Example:



Select Sequence No.

Specify the desired call tests To be performed.

Specify the desired RF channels and the measurements to be performed.

Sequence 1

Configuration : Test Sequence 2006/05/24 17 19

Radio System	1 GSM900	2 GSM850
Sequence No.	1	GSM Mode STD
1	Location Update	Run
2	MS Call	Run
3	Talk	Run
4	RF Test	Run
5	Handover	Run
6	MS Call	---
7	MS Release	---

Detail of RF Test

Radio System	GSM900	GSM900	GSM900	DSC1800	DSC1800	DSC1800
TCH	1	62	12	512	700	885
Peak TX Power(High)	Run	Run	Run	Run	Run	Run
Peak TX Power(Mid)	---	Run	---	---	Run	---
Peak TX Power(Low)	---	Run	---	---	Run	---
Burst Timing	---	Run	---	---	Run	---
Power Ramp	---	Run	---	---	Run	---
Phase Error(RMS)	---	Run	---	---	Run	---
Phase Error(Peak)	---	Run	---	---	Run	---
Frequency Error	---	Run	---	---	Run	---
Sensitivity /BER	---	Run	---	---	Run	---
Sensitivity /FER	---	Run	---	---	Run	---
RX Quality	---	Run	---	---	Run	---
RX Level	---	Run	---	---	Run	---
ATT In	+0.0	+0.0	+0.0	+0.0	+0.0	+0.0
ATT Out	+0.0	+0.0	+0.0	+0.0	+0.0	+0.0

Sequence 2

Configuration : Test Sequence 2006/05/24 18 05

Radio System	1 GSM900	2 GSM850
Sequence No.	1	GSM Mode STD
1	Location Update	---
2	MS Call	---
3	Talk	---
4	RF Test	Run
5	MS Release	Run

Detail of RF Test

Radio System	SM850	GSM850	GSM850	PCS1900	PCS1900	PCS1900
TCH	131	190	251	512	660	810
Peak TX Power(High)	Run	Run	Run	Run	Run	Run
Peak TX Power(Mid)	---	Run	---	---	Run	---
Peak TX Power(Low)	---	Run	---	---	Run	---
Burst Timing	---	Run	---	---	Run	---
Power Ramp	---	Run	---	---	Run	---
Phase Error(RMS)	---	Run	---	---	Run	---
Phase Error(Peak)	---	Run	---	---	Run	---
Frequency Error	---	Run	---	---	Run	---
Sensitivity /BER	---	Run	---	---	Run	---
Sensitivity /FER	---	Run	---	---	Run	---
RX Quality	---	Run	---	---	Run	---
RX Level	---	Run	---	---	Run	---
ATT In	+0.0	+0.0	+0.0	+0.0	+0.0	+0.0
ATT Out	+0.0	+0.0	+0.0	+0.0	+0.0	+0.0

电缆损耗补偿功能

Easy to calibrate the external RF path loss.

This is available for GSM, W-CDMA, and cdma2000 1x, but not for GPRS, EGPRS, HSDPA, and EVDO.

Procedure:

1. Prepare the mobile handset having the verified RF performance.
2. Establish the call connection between the NJZ-2000 and the handset of the step 1.
3. Press {Loss Cal} softkey. (You can see the {Loss Cal} softkey by pressing {More} some times.)

Measurement Before Loss Cal

+23.4 dBm

Peak TX Power	+23.4 dBm	Fail
Burst Timing	+0.5 Bits	Pass
Power Ramp		Pass
Phase Error(RMS)	1.5 deg	Pass
Phase Error(Peak)	3.8 deg	Pass
Frequency Error	+26.4 Hz	Pass

Rx Level 52:-59 to -58 dBm

Condition
PWR CNTL 5:+33dBm
BS Level -50dBm

Loss On/Off
Loss Cal

Measurement After Loss Cal

+33.0 dBm

Peak TX Power	+33.0 dBm	Pass
Burst Timing	+0.5 Bits	Pass
Power Ramp		Pass
Phase Error(RMS)	1.1 deg	Pass
Phase Error(Peak)	3.8 deg	Pass
Frequency Error	+23.6 Hz	Pass

Rx Level 60:-51 to -50 dBm

Condition
Same as those before loss cal.

Release

Configuration : Test Condition (Loss)

Loss On GSM

	RF In	RF Out
GSM850	0.0 dB	0.0 dB
GSM900	0.0 dB	0.0 dB
DCS1800	0.0 dB	0.0 dB
PCS1900	0.0 dB	0.0 dB

By pressing {Loss Cal} softkey, a measurement is automatically performed, then the loss data are automatically calculated and set at Test Condition (Loss) screen.

Configuration : Test Condition (Loss)

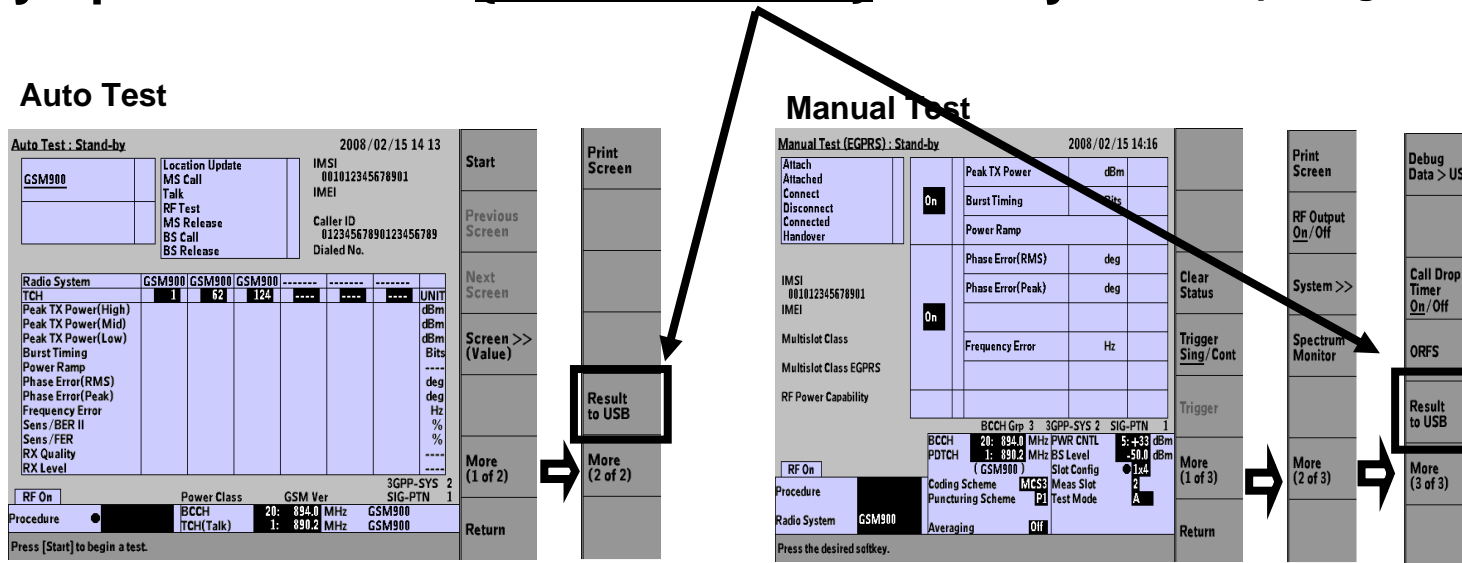
Loss On GSM

	RF In	RF Out
GSM850	9.6 dB	8.5 dB
GSM900	0.0 dB	0.0 dB
DCS1800	0.0 dB	0.0 dB
PCS1900	0.0 dB	0.0 dB

其他: 保存测试结果

Test results can be stored into USB memory device.

Easy operation. Push {Result to USB} softkey after completing a test.

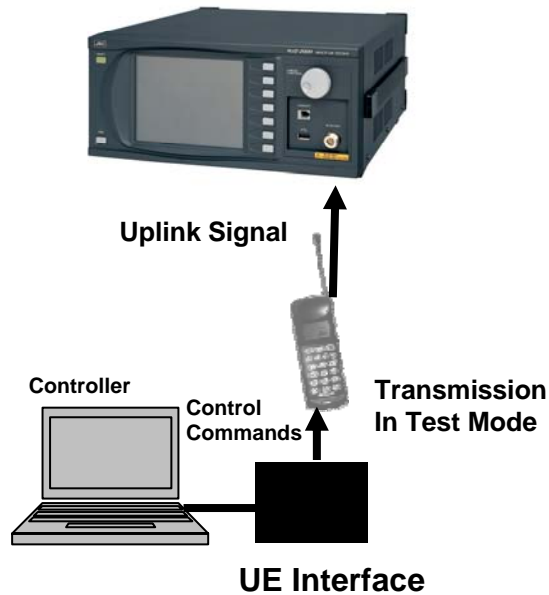


- File name: measyyyymmdd_hhMMx.csv (automatically assigned)
yyyy: year, mm: month, dd: day, hh: hour, MM: minute, x: a to z
- Format: CSV format
- Contents: tester ID, procedure name, date/time, test condition, test limits, test results, and so on

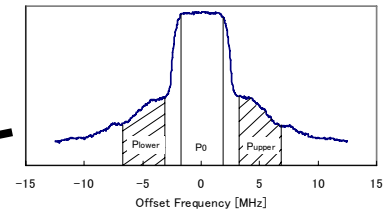
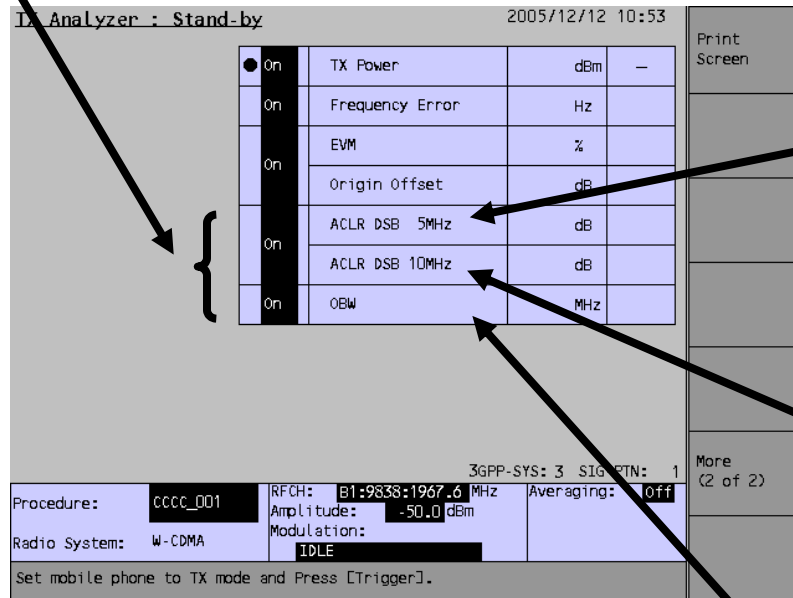
W-CDMA: ACLR/OBW in TX Analyzer (Opt)

Support a fast ACLR/OBW Measurement without call connection.

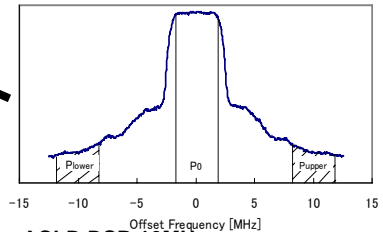
Typical Connection



Press {TX Analyzer} menu.
The you can access to the screen shown below.



ACLR DSB 5MHz =
Plower at -5MHz offset +
Pupper at +5MHz offset



ACLR DSB 10MHz =
Plower at -10MHz offset +
Pupper at +10MHz offset

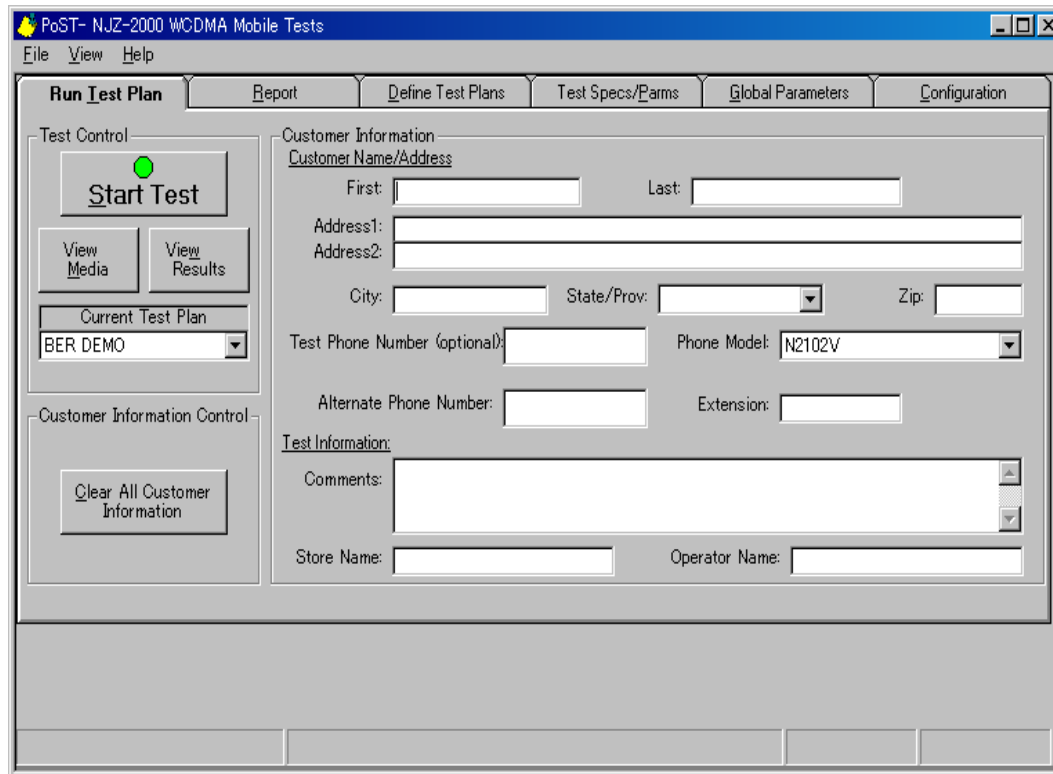
OBW (Occupied BandWidth) =
The bandwidth of 99% power of the +/-1
5MHz channel power.

A controller is connected to the UE under test through the UE interface. The controller is used to put the UE into a manufacturer unique Test Mode where the UE transmits the uplink power without call connection.

The NJZ-2000 measures the ACLR and OBW of the uplink signal from the UE under test.

NJZ-2000 选件: PC测试软件

Automatic Test Software running on an external PC



- **Automatic Test Solution**
 - Arbitrary Test Script
 - One Key Operation
- **Easy to Use**
 - Distribution of Test Script
- **Data Base Management**
 - Storage
 - Search
 - Print Out
 - File Save
 - Protection

NJZ-2000 选件: 屏蔽箱

NFG-235 Shield Case



- RF Isolation)
 - > 50 dB (typ. 60dB)
 - Frequency 800 MHz to 2 GHz
- Small (Space saving)
 - 230(W) × 153(H) × 319(D)mm
 - < 2.8kg
- Built-in Antenna