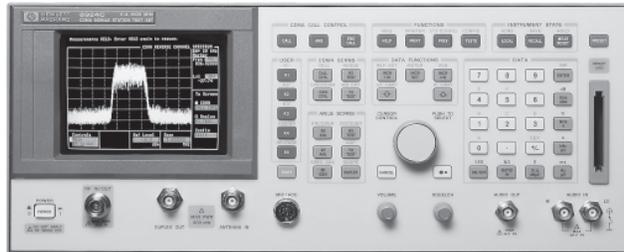# Establishing a Cell Band CDMA Phone Call
using the *Agilent Technologies 8924C/E*
CDMA Mobile Station Test Sets

Product Note

Introduction

This procedure is adapted from Chapter 2 of the *Agilent Technologies 8924C CDMA Mobile Station Test Set Application Guide*. This procedure applies to firmware revision A.06.15 and above in the 8924C and A.02.11 and above in the 8924E.

Get Started

1. Preset the Test Set. Press the SHIFT key, then the TESTS key to go to the CONFIGURE screen.

2. Correct for RF path loss.

Note: An over-the-air connection (where you attach an antenna to the Test Set to send signals through the air to the phone) is not recommended.

a. Measure the cable and adapter loss. Measure the whole path from the RF IN/OUT port to the phone. Refer to the "Determining RF Path Loss" procedure in the *8924C CDMA Mobile Station Test Set Application Guide*.

b. Enter the loss in the RF In/Out offset field. Remember, this should be a negative number.

c. Select On in the RF Level Offset field.

Set the SYSTEM ID and NETWORK ID

1. Press the SHIFT key, then the CDMA, CALL CTRL key to go to the CELL SITE CONFIGURATION screen.

2. Scroll to the System ID (SID) field and enter the correct number.

3. Enter the same number in the Rgstr SID field.

4. Scroll to the Network ID (NID) field and enter the phone's NID.

5. Enter the same number in the Rgstr NID field.

Choose the Registration Type

Choose one of the following registration types:

• **Power Up Registration** (Pwr Up Reg)

• **Timer Registration** (Timer Reg)

• **Implicit Registration**

• **Zone-Based Registration**

Power Up Registration (the slowest method of registration)

a. If needed, press the SHIFT key, then the CDMA, CALL CTRL key to go to the CELL SITE CONFIGURATION screen.

b. Set the Pwr Up Reg field to On. Verify that Timer Reg is Off.

Timer Registration

a. Press the SHIFT key, then the CDMA, CALL CTRL key to go to the CELL SITE CONFIGURATION screen.

b. Set the Timer Reg field to On. Verify that Pwr Up Reg is Off.

c. Set the Reg Period field to the desired period. Minimum is 29 units, which will make the phone register approximately every 12 seconds.

Note: Setting the Reg Period Field to its maximum will cause the period to be longer than one day. **Choose this time carefully.**

Implicit (the fastest registration type) or Zone-Based Registration

a. Press the SHIFT key, then the CDMA, CALL CTRL key to go to the CELL SITE CONFIGURATION screen.

b. Set the Timer Reg field to Off. Set the Pwr Up Reg field to Off.

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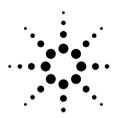
Set Up Transmitter

1. Press the CDMA, CALL CTRL key to go to the CDMA, CALL CONTROL screen.

2. Enter the phone's Protocol (IS-95, IS-95A...).

3. Enter the phone's RF Channel Std (MS AMPS...).

4. Enter the phone's primary CDMA channel in the RF Channel field.

5. Adjust Sector A Power (or Sector Power, if using the 8924E) as needed. If outside interference is expected or present, increase the power to between −50 dBm and −30 dBm.

6. Select the desired Service Option (SVC Option 001 is for voice echo, SVC Option 002 is data loopback. Other options are available as well).

Connect Phone to Test Set

Connect the phone to the Test Set. See figure at right. The isolation box is optional, but recommended.

How to Know if Your Mobile is Locked to the Test Set, and Not a Nearby Base Station
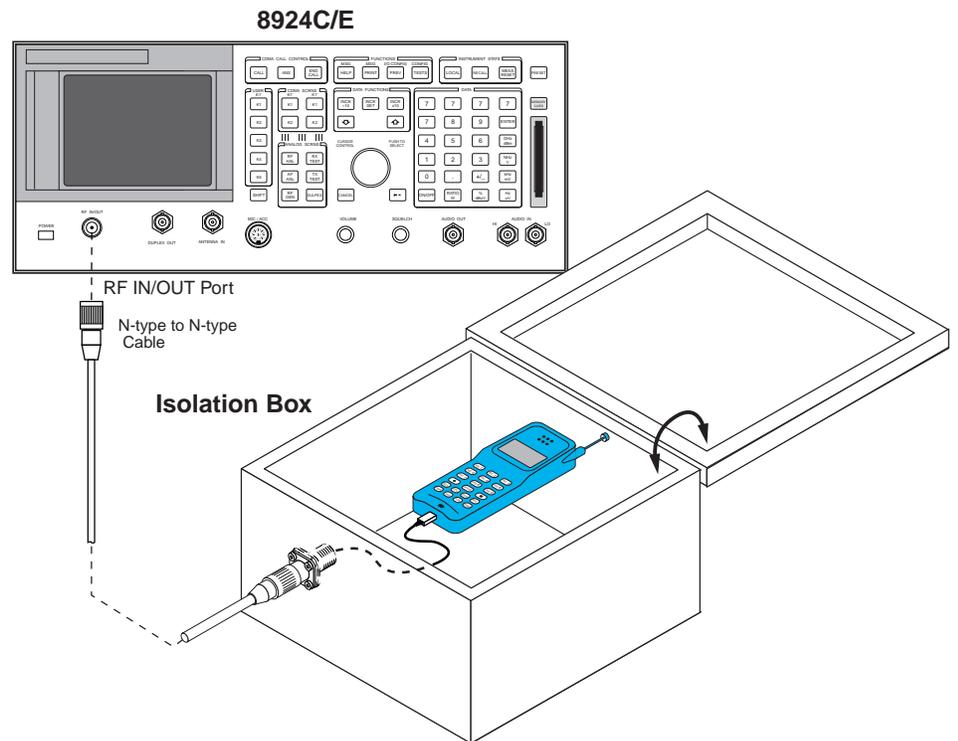
It is very easy for a CDMA mobile phone to lock onto a nearby base station instead of the Test Set. Here is a setup task that will let you quickly determine if the phone is locked onto the Test Set or a base station.

1. Press the SHIFT key, then the TESTS key to go to the CONFIGURE screen.

2. Set the date and time fields to not match the correct date and time. Then, if the phone displays your entered date and time, you know it is locked to your Test Set. If it shows today's date and time, the phone is locked to the local service provider, not the Test Set.

8924C/E

RF IN/OUT Port

N-type to N-type Cable

Isolation Box

Connect a Call

Use the procedure that matches the type of registration you selected.

Power-Up Registration

1. Power on the phone and wait for it to find digital service (usually a series of bars on the display, and with a D in the display if it is dual-mode). This can take a few moments, depending on the phone.

2. Wait about 20 seconds. The phone should register automatically. MS database will display a number when phone has registered.

Note: The IS-95 standard requires a 20 second delay at phone power-up before the phone will send a registration message to the base station to prevent unnecessary registrations wasting airtime. This is because many people turn on the phone, then decide not to use the phone.

3. On the Test Set press the CALL key to page the phone, or key in a sequence of at least four numbers on the phone and press the SEND or TALK key on the phone.

Implicit Registration

1. Power on the phone and wait for it to find digital service (usually a series of bars on the display, and with a D in the display if it is dual-mode). This can take a few moments, depending on the phone.

2. As soon as you see the phone's service indicator, key in a sequence of at least four numbers on the phone and press the SEND or TALK key on the phone. The phone should quickly register with the Test Set, and then the call should connect.

Note: If you wait too long, the Test Set and phone may be trying to do a power-up registration, so implicit registration may fail.

Zone-Based Registration

1. Turn the phone off.

2. If necessary, enter System ID and Network ID in the CDMA, CELL SITE CONFIGURATION screen to match the phone.

3. Set the Register NID to a different number from the NID.

4. Turn the phone on.

5. Select the Register field in the CDMA, CALL CONTROL screen. The phone should register in about 12 seconds.

6. After registration the ESM will be displayed, and you can press the Test Set's CALL key to page the phone. Answer the phone to connect.

Timer Registration

1. Power on the phone and wait for it to register. This will occur periodically, set by the interval of the Reg Period field in the CDMA CELL SITE CONFIGU-RATION screen. The periodic registration will stop after a call has been placed.

2. After registration the ESN will be displayed, and you can press the Test Set's CALL key to page the phone. Answer the phone to connect.

Solving Problems

1. If you suspect interference, put the phone in a shielded box or screen room. You can also increase the sector power.

2. Make sure both Sector B (for the 8924C only) and AWGN are turned off on the CDMA GENERATOR CONTROL screen.

3. If the phone keeps locking onto an external base station, increase the sector power and turn the phone's power off, then back on. Or put the phone in an isolation box.

Note: IMSI Class 1 phones do not work with this Test Set. This includes 8924C firmware A.05.30 and older. Example of problem: phone can make a call to the Test Set, but a call cannot be made from the Test Set to the phone. Firmware revision A.06.25 (8924C) or higher can be installed to correct this problem.

4. Check the phone's power supply (battery or external power supply). You should test registration with full battery power.

5. For a CDMA phone, if you don't know the SID, try setting the Esc Mode to On in the CDMA CELL SITE CONFIGURATION screen.

Note: The CDMA Development Group (CDG) defined a bit pattern that the Test Set sends when Esc Mode is set to On. To the phone, this pattern matches its country and network codes, but not its SID. Esc (escape) Mode works on all protocols except IS-95.

For more product information visit our web site at:

http://www.agilent.com/find/8924support

For more information about Agilent Technologies test and measurement products, applications, services, and for a current sales office listing, visit our web site:

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You can also contact one of the following centers and ask for a test and measurement sales representative.

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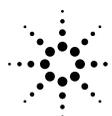(fax) (64 4) 802 6881

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