	Table 10-9: Shut Down Sector Signaling Functions Procedure For a Packet BTS	
✔	**Step**	**Action**
	8	**NOTE** This step edits the REDIRECT2 parameters so that the Global Service Redirect Message to be broadcast on the paging channel redirects all subscribers away from the sector with the failed equipment and onto a CDMA channel at a neighbor sector/site. Enter the following command at the prompt: omc–000000>**EDIT SECTOR–**<bts#>**–**<sector#> **REDIRECT2 !** The system prompts you to enter each command parameter value one at a time. Answer the prompts in the following order: *expecting an integer number (from 0 to 65535)* *<EXPNID= ? >* (Use the Network ID the subscriber units should expect to find on the system they are being redirected to. This example uses 555.) *expecting an integer number (from 0 to 2047)* *<CHAN1= ? >, <CHAN2= ? > ... <CHAN15= ?>* (A list of CDMA channels for neighbor sites that the subscriber units can use for redirection. This example uses 200, 350, 400, 725, 75, 175, 100, 575 and 950.) *expecting an enumerated value:* *CDMA1900 CDMA800 CDMA900 JAPANCDMA* *<BANDCLASS= ? >* (Use CDMA1900 for 1.9 GHz systems, and CDMA800 for 800 MHz systems. This example uses CDMA1900.) The system displays the command to be sent. Verify the command syntax. omc–000000>Accept [yes/no]? Enter **Y** to accept the command or **N** to go back and enter the correct value(s).
	9	View the status of the sector signaling REDIRECT2 parameters to verify that the sector is ready for maintenance. omc–000000>**DISPLAY SECTOR–**<bts#>**–**<sector#> **REDIRECT2** Ensure that the values in the system display response match the values input in Step 8 (see example below).

```
                                           REDIRECT CHAN
    CARRIER ID          EXP     BAND
(bts-sector-carrier)    NID     CLASS   1   2   3   4   5   6   7    8    9   10   11   12   13   14   15
-------------------    -----  --------- --- --- --- --- --- --- ---- ---- ---- ---- ---- ---- ---- --- ----
  CARRIER-146-2-1        555   CDMA1900  200 350 400 725 75  175 100  575  950  –    –    –    –    –    –
```

✔	Step	Action
		Table 10-9: Shut Down Sector Signaling Functions Procedure For a Packet BTS

✔	Step	Action
	10	View the existing congestion control parameters for all carriers equipped for the applicable sector by entering the following command at the prompt: omc-000000>**DISPLAY SECTOR–**<bts#>**–**<sector#> **CONGESTCONF** Observe the following *typical* system display response for sector 1: <pre> CARRIER NEWCALL REG AGG (bts#-sector#-carrier#) SET ALARMFLAG ALARMFLAG ALARMFLAG ANALOGREDIRECT GLOBALREDIRECT ---------------------- --- --------- --------- --------- -------------- -------------- 146-2-1 1 ENABLE ENABLE ENABLE DISABLE DISABLE</pre>
		NOTE In this step, you will change the value of the Global Service Redirection Flag (GLOBALREDIRECT) in the congestion control parameters so that the Global Service Redirect Message is broadcast on the sector paging channel.
	11	Enter the following command at the prompt: omc-000000>**EDIT SECTOR–**<bts#>**–**<sector#> **CONGESTCONF !** The system prompts you to enter each control parameter value one at a time. Skip through the prompts until you get to the following: *<globalredirect>*, enter **ENABLE** (This forces the Global Service Redirect Message to be broadcast on the sector paging channel.) The system displays the values of the control parameters. Verify that only the GLOBALREDIRECT value changed. omc-000000>Accept [yes/no]? Enter **Y** to accept the change. Now the Global Service Redirection Message is sent over the sector paging channels. All subscribers are redirected away from the sector and onto a different system. This effectively shuts down the sector.
	12	Verify that the CONGESTCONF *globalredirect* is enabled for each carrier on the sector by entering the following command at the prompt: omc-000000>**DISPLAY SECTOR–**<bts#>**–**<sector#> **CONGESTCONF** Observe the following *typical* system display response for sector 1: <pre> CARRIER NEWCALL REG AGG (bts#-sector#-carrier#) SET ALARMFLAG ALARMFLAG ALARMFLAG ANALOGREDIRECT GLOBALREDIRECT ---------------------- --- --------- --------- --------- -------------- -------------- 146-2-1 1 ENABLE ENABLE ENABLE DISABLE ENABLE</pre>
	13	Display the status of all devices at the BTS by entering the following command at the prompt: omc-000000>**DISPLAY BTS–**<bts#> **STATUS** Record the system response for all devices that are OOS_AUTOMATIC.

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✔	Step	Action
		Table 10-9: Shut Down Sector Signaling Functions Procedure For a Packet BTS
		NOTE SHUTDOWN and REDIRECT both prevent future calls from being originated on the targeted resource, but only SHUTDOWN waits indefinitely for the calls to terminate. When the resource becomes idle, SHUTDOWN automatically transitions the resource to the locked/disabled state.
	14	If you redirected subscribers but do not want to use SHUTDOWN, go to step 15. If you redirected subscribers and want to use SHUTDOWN, go to step 16.
	15	Wait three minutes to allow any active calls to terminate then go to step 18.
	16	Shutdown all carriers equipped for the target sector at the BTS by repeatedly entering the following command at the prompt: omc–000000>**SHUTDOWN CARRIER–**<bts#>**–**<sector#>-<carrier#> Repeat this command for each sector–carrier associated with the target sector.
	17	**NOTE** When a BBX is keyed, it is in an UNLOCKED/ENABLED/ACTIVE state. When a BBX is in an UNLOCKED/ENABLED/IDLE state, it is dekeyed and INS_STANDBY. As long as the sector–carrier associated with the BBX is LOCKED/DISABLED/IDLE, the BBX cannot be keyed. Also the redundant BBX does not switchover for an INS_STANDBY primary BBX. Observe that the system automatically returns a "Network Element State Change Event" message for each carrier after it is shutdown. This message shows the old and new states for the carrier. The CARRIER will go from UNLOCKED/ENABLED/ACTIVE to SHUTTINGDOWN/ENABLED/ACTIVE to LOCKED/DISABLED/IDLE. When each BTS carrier shutdown in step 16 is reported as LOCKED/DISABLED/IDLE, the primary BBXs associated with the target sector–carrier will be reported as UNLOCKED/ENABLED/IDLE. If you determine that it is taking too long for carriers to shutdown and the associated primary BBXs to transition to UNLOCKED/ENABLED/IDLE state, perform step 18 to abort the shutdown process and LOCK/DISABLE the carriers.
	18	Lock/disable all carriers equipped for the target sector at the BTS by repeatedly entering either of the following commands at the prompt: omc–000000>**DISABLE CARRIER–**<bts#>**–**<sector#>-<carrier#> **UNC** omc–000000>**LOCK CARRIER–**<bts#>**–**<sector#>-<carrier#> Repeat the command for each sector–carrier associated with the target sector.

**Shut Down Carrier Signaling Functions
for a Packet BTS**

If a carrier shutdown is required for the FRU replacement and the site is currently under CBSC control, follow the procedure in Table 10-10 to disable the carrier at a packet BTS.

⚠ **CAUTION**

This carrier shut down procedure takes a carrier out–of–service (OOS) but does not affect the other carriers. To minimize system impact, it may be advisable (but not necessary) to perform this procedure during a maintenance window.

⚠ **IMPORTANT**

The **EDIT CARRIER REDIRECT** or **REDIRECT2** command does NOT affect calls in progress and does NOT move these calls to another sector/carrier. The command only prevents future calls from being originated on the targeted sector/carrier. If active call processing is still taking place in the target sector/carrier, wait for any active calls to terminate before disabling the sector/carrier.

⚠ **IMPORTANT**

The **SHUTDOWN** command does NOT affect calls in progress and does NOT move these calls to another BTS. Shutdown is a camp–on state, it prevents future calls from being originated on the targeted resource and waits for calls to terminate. When the resource becomes idle, it is automatically transitioned to the locked/disabled state. Shutdown does not redirect subscribers to another site/carrier.
Shutdown camp–on time is indefinite. Shutdown can be aborted at anytime by invoking the **LOCK** or **DISABLE** command.

NOTE

Refer to the *System Commands Reference* manual (68P09256A58) part/of *Cellular System Administration CDMA2000 1X* – 99R09255A10 CD–ROM for a complete explanation of OMC–R commands.

<table>
<tr><td colspan="3" align="center">**Table 10-10:** Shut Down Carrier Signaling Functions Procedure For a Packet BTS</td></tr>
<tr><td>✒</td><td>**Step**</td><td align="center">**Action**</td></tr>
<tr><td colspan="3">**AT THE OMC–R**</td></tr>
<tr><td></td><td>1</td><td>Open a CLI window. Refer to the *Accessing OMC–R CLI Window* section on page 10-2.</td></tr>
<tr><td></td><td>2</td><td>

* IMPORTANT
It is recommended that you redirect subscribers to another sector/carrier and then wait for any active calls to terminate before locking/disabling the sector/carrier.

NOTE
SHUTDOWN and REDIRECT both prevent future calls from being originated on the targeted resource, but only SHUTDOWN waits indefinitely for the calls to terminate. When the resource becomes idle, SHUTDOWN automatically transitions the resource to the locked/disabled state.

If you are not concerned about redirecting subscribers and waiting for any active calls to terminate and you just want to lock/disable the sector/carrier, perform step 15 and step 20 only.
If you are not concerned about redirecting subscribers but you want to use SHUTDOWN and wait for all active calls to terminate before locking/disabling the sector/carrier, perform step 15, step 18 and step 19.
If you want to redirect subscribers and then wait for any active calls to terminate before locking/disabling the sector/carrier, go to step 3.
</td></tr>
<tr><td></td><td></td><td>

NOTE
The REDIRECT command is used to redirect subscribers to an 1.9 GHz site or to invoke the REDIRECT2 command which is then used to redirect subscribers to a different CDMA carrier frequency. REDIRECT2 is the preferred command if an alternate CDMA carrier is available.
</td></tr>
<tr><td></td><td>3</td><td>

* IMPORTANT
Record the values shown in the following system display response. These values are used to answer the prompts for the EDIT CARRIER REDIRECT command when restoring signaling operations at the end of the replacement procedure.

View the status of the carrier signaling REDIRECT parameters for an applicable carrier equipped for a specific sector by entering the following command at the prompt:

omc-000000>**DISPLAY CARRIER–**<bts#>**–**<sector#>–<carrier#> **REDIRECT**

Observe the following *typical* system display response for carrier 1, sector 1 (this example shows initial standard values):

```
                               Access Overload Class Redirect Flags   ROTATE
        CARRIER ID          RETURN    0 0 0 0 0 0 0 0 0 0 1 1 1 1 1 1   TIMER    RECORD   EXP   IGNORE     SYS
    (bts-sector-carrier)    IF FAIL   0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5   (SEC)     TYPE    SID    CDMA    ORDERING
    --------------------    -------   - - - - - - - - - - - - - - - -   -----    ------   ---   ------   --------
      CARRIER-146-1-1          N      N N N N N N N N N N N N N N N N     4         1       0      N      CUSTOM
```
</td></tr>
</table>

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Table 10-10: Shut Down Carrier Signaling Functions Procedure For a Packet BTS		
✔	**Step**	**Action**
	4	**NOTE** This step edits the REDIRECT parameters so that the Global Service Redirect Message to be broadcast on the paging channel redirects subscribers assigned to the sector carrier away from the carrier/sector with the failed equipment and onto a different carrier, sector, BTS, or system. Enter the following command at the prompt: omc-000000>**EDIT CARRIER–**<bts#>**–**<sector#>**-**<carrier#> **REDIRECT !** The system prompts you to enter each command parameter value one at a time. Answer the prompts in the following order: *<accolc0>*enter **Y**, *<accolc1>*enter **Y**,... *<accolc15>*enter **Y** (All Access Overload Classes *must* be set to yes to ensure that all subscribers are redirected.) *<returniffail>* , enter **N** (Must be set to no to ensure that subscribers do not return if redirect is unsuccessful.) *<recordtype>* , enter **1** or **2** (A value of 2 will invoke REDIRECT2 which is used to redirect subscribers to a CDMA channel at a neighbor sector/site. A value of 1 redirects subscribers to a 1.9 GHz site. This example uses 2.) *<expectedsid>* , enter **13** (Use the Area ID the subscriber units should expect to find on the system where they are being redirected. This example uses 13. The valid range is 0 – 32767; the default is 0.) *<ignorecdma>* , enter **Y** *<sysordering>* , enter **CUSTOM** (The system acquisition ordering value tells the mobiles the order to use when attempting to obtain service on the different analog systems. Valid values are: CUSTOM – use custom system selection; AONLY – try the A system only; BONLY – use the B system only; AFIRST – try the A system first. If unsuccessful, try the B system; BFIRST – try the B system first. If unsuccessful, try the A system; AORB – try A or B. If unsuccessful try the alternative system; CUSTOM is the default.) *<rotatetimer>* , enter **4** (Call processing continuously rotates, circular right–shifts, the Y/N values of Access Overload Class Redirect Flags 0 to 9. Values are shifted one flag at the end of the timer period; then timer re–starts. Valid values are 0–255; 4 is the default.) The system displays the command to be sent. Verify the command syntax. omc-000000>Accept [yes/no]? Enter **Y** to accept the command or **N** to go back and enter the correct value(s).

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✐	Step	Action
	5	View the status of the carrier signaling redirect parameters to verify that the carrier is ready for maintenance. omc-000000>**DISPLAY CARRIER–**<bts#>**–**<sector#>-<carrier#> **REDIRECT** Ensure that the values in the system display response match the values input in Step 4 (see example below). <pre> Access Overload Class Redirect Flags ROTATE CARRIER ID RETURN 0 0 0 0 0 0 0 0 0 0 1 1 1 1 1 1 TIMER RECORD EXP IGNORE SYS (bts-sector-carrier) IF FAIL 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 (SEC) TYPE SID CDMA ORDERING -------------------- ------- - - - - - - - - - - - - - - - - ----- ---- ---- --- -------- CARRIER-146-1-1 N Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y 4 2 13 Y CUSTOM</pre>
	6	Repeat Steps 3 through 5 as required for other sectors with this carrier.
	7	If 2 was entered for *<recordtype>* in step 4, go to step 8. If 1 was entered for *<recordtype>* in step 4, go to step 12.
	8	*** IMPORTANT** Record the values shown in the following system display response. These values are used to answer the prompts for the EDIT CARRIER REDIRECT2 command when restoring signaling operations at the end of the replacement procedure. View the status of the carrier signaling redirect parameters for the carrier and sector by entering the following command at the prompt: omc-000000>**DISPLAY CARRIER–**<bts#>**–**<sector#>-<carrier#> **REDIRECT2** Observe the following *typical* system display response for carrier 1, sector 1 (this example shows initial standard values): <pre> REDIRECT CHAN CARRIER ID EXP BAND (bts-sector-carrier) NID CLASS 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 -------------------- ----- --------- --- --- --- --- --- --- ---- ---- ---- ---- ---- ---- ---- --- ---- CARRIER-146-1-1 65535 CDMA1900 - - - - - - - - - - - - - - -</pre>

<table>
<tr><td colspan="3" align="center">Table 10-10: Shut Down Carrier Signaling Functions Procedure For a Packet BTS</td></tr>
</table>

✔	Step	Action
		NOTE This step edits the redirect parameters so that the Global Service Redirect Message to be broadcast on the paging channel redirects all subscribers away from the carrier with the failed equipment and onto a different CDMA carrier frequency.
	9	Enter the following command at the prompt: omc-000000>**EDIT CARRIER–**<bts#>**–**<sector#>-<carrier#> **REDIRECT2 !** The system prompts you to enter each command parameter value one at a time. Answer the prompts in the following order: *expecting an integer number (from 0 to 65535)* *<EXPNID= ? >* (Use the Network ID the subscriber units should expect to find on the system they are being redirected to. This example uses 555.) *expecting an integer number (from 0 to 2047)* *<CHAN1= ? >, <CHAN2= ? > ... <CHAN15= ?>* (A list of CDMA channels for neighbor sites that the subscriber units can use for redirection. This example uses 200, 350, 400, 725, 75, 175, 100, 575 and 950.) *expecting an enumerated value:* *CDMA1900 CDMA800 CDMA900 JAPANCDMA* *<BANDCLASS= ? >* (Use CDMA1900 for 1.9 GHz systems, and CDMA800 for 800 MHz systems. This example uses CDMA1900.) The system displays the command to be sent. Verify the command syntax. omc-000000>Accept [yes/no]? Enter **Y** to accept the command or **N** to go back and enter the correct value(s).
	10	View the status of the carrier signaling redirect parameters to verify that the sector is ready for maintenance. omc-000000>**DISPLAY CARRIER–**<bts#>**–**<sector#>-<carrier#> **REDIRECT2** Ensure that the values in the system display response match the values input in Step 9 (see example below). <pre> REDIRECT CHAN CARRIER ID EXP BAND (bts-sector-carrier) NID CLASS 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 ------------------- ----- --------- --- --- --- --- --- --- ---- ---- ---- ---- ---- ---- ---- --- ---- CARRIER-146-1-1 555 CDMA1900 200 350 400 725 75 175 100 575 950 – – – – – –</pre>
	11	Repeat Steps 8 through 10 as required for other sectors with this carrier.

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✔	Step	Action
		Table 10-10: Shut Down Carrier Signaling Functions Procedure For a Packet BTS
	12	View the existing congestion control parameters for the applicable carrier equipped for a specific sector by entering the following command at the prompt: omc-000000>**DISPLAY CARRIER–**<bts#>**–**<sector#>-<carrier#> **CONGESTCONF** Observe the following *typical* system display response for carrier 1, sector 1: ``` CARRIER NEWCALL REG AGG (bts#-sector#-carrier#) SET ALARMFLAG ALARMFLAG ALARMFLAG ANALOGREDIRECT GLOBALREDIRECT ---------------------- --- --------- ---------- ---------- -------------- -------------- 146-1-1 1 ENABLE ENABLE ENABLE DISABLE DISABLE ```
		NOTE In this step, you will change the value of the Global Service Redirection Flag (GLOBALREDIRECT) in the congestion control parameters so that the Global Service Redirect Message is broadcast on the sector paging channel of a specific carrier.
	13	Enter the following command at the prompt using the carrier number and the applicable sector number: omc-000000>**EDIT CARRIER–**<bts#>**–**<sector#>-<carrier#> **CONGESTCONF !** The system prompts you to enter each control parameter value one at a time. Skip through the prompts until you get to the following: *<globalredirect>*, enter **ENABLE** (This will force the Global Service Redirect Message to be broadcast on the sector paging channel.) The system displays the values of the control parameters. Verify that only the GLOBALREDIRECT value changed. omc-000000>Accept [yes/no]? Enter **Y** to accept the change. Now the Global Service Redirection Message is sent over the sector paging channel. All subscribers are redirected away from the carrier/sector and onto a different system. This effectively shuts down the carrier/sector.
✔	14	Repeat Steps 12 and 13 as required for other sectors, selecting the proper sector number for the sector# parameter.
	15	Display the status of all devices at the BTS by entering the following command at the prompt: omc-000000>**DISPLAY BTS–**<bts#> **STATUS** Record the system response for all devices that are OOS_AUTOMATIC.
		NOTE SHUTDOWN and REDIRECT both prevent future calls from being originated on the targeted resource, but only SHUTDOWN waits indefinitely for the calls to terminate. When the resource becomes idle, SHUTDOWN automatically transitions the resource to the locked/disabled state.
	16	If you redirected subscribers but do not want to use SHUTDOWN, go to step 17. If you redirected subscribers and want to use SHUTDOWN, go to step 18.

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✔	Step	Action
		Table 10-10: Shut Down Carrier Signaling Functions Procedure For a Packet BTS
	17	Wait three minutes to allow any active calls to terminate then go to step 20.
	18	Shutdown the target carrier on all sectors equipped for the BTS by repeatedly entering the following command at the prompt: omc-000000>**SHUTDOWN CARRIER–**<bts#>**–**<sector#>-<carrier#> Repeat this command for each sector–carrier associated with the target carrier.
	19	**NOTE** When a BBX is keyed, it is in an UNLOCKED/ENABLED/ACTIVE state. When a BBX is in an UNLOCKED/ENABLED/IDLE state, it is dekeyed and INS_STANDBY. As long as the sector–carrier associated with the BBX is LOCKED/DISABLED/IDLE, the BBX cannot be keyed. Also the redundant BBX does not switchover for an INS_STANDBY primary BBX. Observe that the system automatically returns a "Network Element State Change Event" message for each carrier after it is shutdown. This message shows the old and new states for the carrier. The CARRIER will go from UNLOCKED/ENABLED/ACTIVE to SHUTTINGDOWN/ENABLED/ACTIVE to LOCKED/DISABLED/IDLE. When each BTS carrier shutdown in step 18 is reported as LOCKED/DISABLED/IDLE, the primary BBXs associated with the target sector–carrier will be reported as UNLOCKED/ENABLED/IDLE. If you determine that it is taking too long for carriers to shutdown and the associated primary BBXs to transition to UNLOCKED/ENABLED/IDLE state, perform step 20 to abort the shutdown process and LOCK/DISABLE the carriers.
	20	Lock/disable the target carrier on all sectors equipped for the BTS by repeatedly entering either of the following commands at the prompt: omc-000000>**DISABLE CARRIER–**<bts#>**–**<sector#>-<carrier#> **UNC** omc-000000>**LOCK CARRIER–**<bts#>**–**<sector#>-<carrier#> Repeat the command for each sector–carrier associated with the target carrier.

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**Restore Site Signaling
Operations for a Packet BTS**

Restore site signaling operations according to the procedure in Table 10-11.

✓	Step	Action
Table 10-11: Restore Site Signaling Operations Procedure For a Packet BTS		

Table 10-11: Restore Site Signaling Operations Procedure For a Packet BTS

✓	Step	Action
		AT THE OMCR
	1	Open a CLI window. Refer to the *Accessing OMCR CLI Window* section on page 10-2.
	2	Unlock/enable the BTS by entering either of the following commands at the prompt: `omc-000000>`**ENABLE BTS–**`<bts#>` **UNC** `omc-000000>`**UNLOCK BTS–**`<bts#>`
	3	Observe that the system automatically returns a "Network Element State Change Event" message for the BTS. These messages show the old and new states for the devices. The new state should be UNLOCKED/ENABLED/ACTIVE.
	4	Display the status of all devices at the BTS by entering the following command at the prompt: `omc-000000>`**DISPLAY BTS–**`<bts#>` **STATUS** Observe the system response. Make sure that there are not more OOS_AUTOMATIC devices than what was observed in step 13 of the shut down site signaling functions procedure for a packet BTS Table 10-8. Devices that were previously OOS_AUTOMATIC may now be INS.
	5	If you *did not* redirect subscribers according to the steps in the shut down site signaling functions procedure for a packet BTS Table 10-8, stop here. If you *did* redirect subscribers according to the steps in the shut down site signaling functions procedure for a packet BTS Table 10-8, perform the remaining steps of this table.

	6	View the existing congestion control parameters for all carriers equipped for the BTS by entering the following command at the prompt:
		
		`omc-000000>`**DISPLAY BTS–**`<bts#>` **CONGESTCONF**
		
		Observe the following *typical* system display response for a BTS:
		
		<pre> CARRIER NEWCALL REG AGG
		(bts#-sector#-carrier#) SET ALARMFLAG ALARMFLAG ALARMFLAG ANALOGREDIRECT GLOBALREDIRECT
		---------------------- --- --------- --------- --------- ------------- -------------
		          146-1-1 1 ENABLE ENABLE ENABLE DISABLE ENABLE
		          146-1-2 1 ENABLE ENABLE ENABLE DISABLE ENABLE
		          146-2-1 1 ENABLE ENABLE ENABLE DISABLE ENABLE
		          146-2-2 1 ENABLE ENABLE ENABLE DISABLE ENABLE
		          146-3-1 1 ENABLE ENABLE ENABLE DISABLE ENABLE
		          146-3-2 1 ENABLE ENABLE ENABLE DISABLE ENABLE</pre>

10

<table>
<tr><td colspan="3" align="center">Table 10-11: Restore Site Signaling Operations Procedure For a Packet BTS</td></tr>
</table>

✔	Step	Action
	7	**NOTE** In this step, you will change the value of the Global Service Redirection Flag (GLOBALREDIRECT) in the congestion control parameters so that the Global Service Redirect Message is only broadcast on the sector paging channel when there is traffic congestion in the sector. Enter the following command at the prompt using the applicable BTS number: `omc-000000>`**EDIT BTS –**`<bts#>` **CONGESTCONF !** The system prompts you to enter each control parameter value one at a time. Skip through the prompts until you get to the following: *`<globalredirect>`*, enter **DISABLE** (This will revert the Global Service Redirect Message to congestion control.) The system displays the values of the control parameters. Verify that only the GLOBALREDIRECT value changed. `omc-000000>Accept [yes/no]?` Enter **Y** to accept the change. Now the Global Service Redirection Message will only be sent over the sector paging channels when there is traffic congestion in the sector.
	8	Enter the following command at the prompt: `omc-000000>`**DISPLAY BTS–**`<bts#>` **CONGESTCONF** Observe the system display response. Verify that the CONGESTCONF *`globalredirect`* is disabled for each carrier at the BTS.
	9	View the status of the signaling REDIRECT parameters for all carriers equipped for the applicable BTS by entering the following command at the prompt: `omc-000000>`**DISPLAY BTS–**`<bts#>` **REDIRECT** Observe that the values in the system display response should match the values input in step 4 of the shut down site signaling functions procedure for a packet BTS Table 10-8 (see example below). <pre> Access Overload Class Redirect Flags ROTATE
CARRIER ID   RETURN   0 0 0 0 0 0 0 0 0 0 1 1 1 1 1 1   TIMER   RECORD   EXP   IGNORE   SYS
(bts-sector-carrier)   IF FAIL   0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5   (SEC)   TYPE   SID   CDMA   ORDERING
-------------------   -------   - - - - - - - - - - - - - - - -   -----   ----   ----   ---   --------
CARRIER-146-1-1   N   Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y   4   2   13   Y   CUSTOM
CARRIER-146-1-2   N   Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y   4   2   13   Y   CUSTOM
CARRIER-146-2-1   N   Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y   4   2   13   Y   CUSTOM
CARRIER-146-2-2   N   Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y   4   2   13   Y   CUSTOM
CARRIER-146-3-1   N   Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y   4   2   13   Y   CUSTOM
CARRIER-146-3-2   N   Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y   4   2   13   Y   CUSTOM</pre>

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<table>
<tr><td colspan="3" align="center">Table 10-11: Restore Site Signaling Operations Procedure For a Packet BTS</td></tr>
<tr><td>✔</td><td>Step</td><td align="center">Action</td></tr>
<tr>
<td></td>
<td>10</td>
<td>

* IMPORTANT

In this step, use the values recorded in step 3 of the shut down site signaling functions procedure for a packet BTS Table 10-8 to answer the prompts for the EDIT BTS REDIRECT command; except for record type enter 2.

NOTE

This step shows the entry of initial standard values which is consistent with the original example; except record type must be 2. Your entries may be different.

Restore the values of all REDIRECT parameters by entering the following command at the prompt:

`omc–000000>`**EDIT BTS–**`<bts#>` **REDIRECT !**

The system will prompt you to enter each command parameter one at a time. Answer the prompts in the following order (Note that the following specified values are consistent with the original example. Yours may be different):

`<accolc0>` enter **N**, `<accolc1>`enter **N**, `...` `<accolc15>`enter **N**

`<returniffail>`, enter **N**

`<recordtype>`, enter **2**

`<expectedsid>`, enter **0**

`<ignorecdma>`, enter **N**

`<sysordering>`, enter **CUSTOM**

`<rotatetimer>`, enter **4**

The system will display the command that will be sent. Verify the command syntax.

`omc–000000>Accept [yes/no]?`

Enter **Y** to accept the command or **N** to go back and enter the correct value(s).

</td>
</tr>
<tr>
<td></td>
<td>11</td>
<td>

View the status of the signaling REDIRECT parameters by entering the following command at the prompt:

`omc–000000>`**DISPLAY BTS–**`<bts#>` **REDIRECT**

Ensure that the values in the system display response match the values input by the operator in step 10 (see example below).

```
                      Access Overload Class Redirect Flags
                 RETURN                                          ROTATE  RECORD  EXP    IGNORE   SYS
    CARRIER ID   IF FAIL  0 0 0 0 0 0 0 0 0 0 1 1 1 1 1 1        TIMER   TYPE    SID    CDMA     ORDERING
(bts-sector-carrier)     0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5        (sec)
------------------- -------  - - - - - - - - - - - - - - - -     ------  ------  -----  ------   --------
  CARRIER-146-1-1      N      N N N N N N N N N N N N N N N N      4       2       0      N       CUSTOM
  CARRIER-146-1-2      N      N N N N N N N N N N N N N N N N      4       2       0      N       CUSTOM
  CARRIER-146-2-1      N      N N N N N N N N N N N N N N N N      4       2       0      N       CUSTOM
  CARRIER-146-2-2      N      N N N N N N N N N N N N N N N N      4       2       0      N       CUSTOM
  CARRIER-146-3-1      N      N N N N N N N N N N N N N N N N      4       2       0      N       CUSTOM
  CARRIER-146-3-2      N      N N N N N N N N N N N N N N N N      4       2       0      N       CUSTOM
```

</td>
</tr>
</table>

Restore Sector Signaling Operations for a Packet BTS

Restore sector signaling operations according to the procedure in Table 10-12.

✓	Step	Action
Table 10-12: Restore Sector Signaling Operations Procedure For a Packet BTS		
	AT THE OMCR	
	1	Open a CLI window. Refer to the *Accessing OMCR CLI Window* section on page 10-2.
	2	Unlock/enable all sector–carriers equipped for the target sector at the BTS by repeatedly entering either of the following commands at the prompt: omc-000000>**ENABLE CARRIER–**<bts#>**–**<sector#>-<carrier#> **UNC** omc-000000>**UNLOCK CARRIER–**<bts#>**–**<sector#>-<carrier#> Repeat the command for each sector–carrier associated with the target sector.
	3	Observe that the system automatically returns a "Network Element State Change Event" message for each CARRIER device and its associated BBX. These messages show the old and new states for the devices. The new state should be UNLOCKED/ENABLED/ACTIVE.
	4	Display the status of all devices at the BTS by entering the following command at the prompt: omc-000000>**DISPLAY BTS–**<bts#> **STATUS** Observe the system response. Make sure that there are not more OOS_AUTOMATIC devices than what was observed in step 13 of the shut down sector signaling functions for a packet BTS Table 10-9.
	5	If you *did not* redirect subscribers according to the steps in the shut down sector signaling functions procedure for a packet BTS Table 10-9, stop here. If you *did* redirect subscribers according to the steps in the shut down sector signaling functions procedure for a packet BTS Table 10-9, perform the remaining steps of this table.
	6	View the congestion control parameters for all carriers equipped for the applicable sector by entering the following command at the prompt: omc-000000>**DISPLAY SECTOR–**<bts#>**–**<sector#> **CONGESTCONF** Observe the following *typical* system display response for sector 2: ``` CARRIER NEWCALL REG AGG (bts#-sector#-carrier#) SET ALARMFLAG ALARMFLAG ALARMFLAG ANALOGREDIRECT GLOBALREDIRECT ---------------------- --- --------- ---------- ---------- -------------- -------------- 146-2-1 1 ENABLE ENABLE ENABLE DISABLE ENABLE 146-2-2 1 ENABLE ENABLE ENABLE DISABLE ENABLE ```

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✔	Step	Action
		Table 10-12: Restore Sector Signaling Operations Procedure For a Packet BTS

Table 10-12: Restore Sector Signaling Operations Procedure For a Packet BTS

✔	Step	Action
	7	**NOTE** In this step, you will change the value of the Global Service Redirection Flag (GLOBALREDIRECT) in the congestion control parameters so that the Global Service Redirect Message is only broadcast on the sector paging channel when there is traffic congestion in the sector. Enter the following command at the prompt using the applicable sector number: omc-000000>**EDIT SECTOR–**<bts#>**–**<sector#> **CONGESTCONF !** The system will prompt you to enter each control parameter value one at a time. Skip through the prompts until you get to the following: *<globalredirect>*, enter **DISABLE** (This will revert the Global Service Redirect Message to congestion control.) The system will display the values of the control parameters. Verify that only the GLOBALREDIRECT value changed. omc-000000>Accept [yes/no]? Enter **Y** to accept the change. Now the Global Service Redirection Message will only be sent over the sector paging channels when there is traffic congestion in the sector.
	8	Enter the following command at the prompt: omc-000000>**DISPLAY SECTOR–**<bts#>**–**<sector#> **CONGESTCONF** Observe the system display response. Verify that the CONGESTCONF *globalredirect* is disabled for each carrier on the sector.
	9	View the status of the sector signaling REDIRECT parameters for all carriers equipped for the applicable sector by entering the following command at the prompt: omc-000000>**DISPLAY SECTOR–**<bts#>**–**<sector#> **REDIRECT** Observe that the values in the system display response should match the values input in step 4 of the shut down sector signaling functions procedure for a packet BTS Table 10-9 (see example below).

```
                               Access Overload Class Redirect Flags   ROTATE
        CARRIER ID      RETURN  0 0 0 0 0 0 0 0 0 1 1 1 1 1 1          TIMER  RECORD  EXP   IGNORE    SYS
    (bts-sector-carrier) IF FAIL 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5       (SEC)  TYPE    SID   CDMA    ORDERING
    -------------------- ------- - - - - - - - - - - - - - - - -      -----  ----    ----  ---     --------
    CARRIER-1-2-1           N     Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y       4      2      13    Y       CUSTOM
    CARRIER-1-2-2           N     Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y       4      2      13    Y       CUSTOM
```

✔	Step	Action

Table 10-12: Restore Sector Signaling Operations Procedure For a Packet BTS

Step 10

* IMPORTANT

In this step, use the values recorded in step 3 of the shut down sector signaling functions procedure for a packet BTS Table 10-9 to answer the prompts for the EDIT SECTOR REDIRECT command; except for record type enter 2.

NOTE

This step shows the entry of initial standard values which is consistent with the original example; except record type must be 2. Your entries may be different.

Restore the values of all REDIRECT parameters by entering the following command at the prompt:

omc-000000>**EDIT SECTOR–**<bts#>**–**<sector#> **REDIRECT !**

The system will prompt you to enter each command parameter one at a time. Answer the prompts in the following order (Note that the following specified values are consistent with the original example. Yours may be different):

<accolc0> enter **N**, *<accolc1>*enter **N**, ... *<accolc15>*enter **N**

<returniffail> , enter **N**

<recordtype> , enter **2**

<expectedsid> , enter **0**

<ignorecdma> , enter **N**

<sysordering> , enter **CUSTOM**

<rotatetimer> , enter **4**

The system will display the command that will be sent. Verify the command syntax.

omc-000000>Accept [yes/no]?

Enter **Y** to accept the command or **N** to go back and enter the correct value(s).

Step 11

View the status of the sector signaling REDIRECT parameters by entering the following command at the prompt:

omc-000000>**DISPLAY SECTOR–**<bts#>**–**<sector#> **REDIRECT**

Ensure that the values in the system display response match the values input by the operator in step 10 (see example below).

```
                               Access Overload Class Redirect Flags   ROTATE
      CARRIER ID         RETURN 0 0 0 0 0 0 0 0 0 1 1 1 1 1 1   TIMER    RECORD   EXP   IGNORE    SYS
 (bts-sector-carrier)    IF FAIL 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5  (SEC)    TYPE    SID    CDMA   ORDERING
 -------------------     ------- - - - - - - - - - - - - - - - - -  -----    ----    ---    ----   -------
     CARRIER-1-2-1          N     N N N N N N N N N N N N N N N N    4        2       0      N     CUSTOM
     CARRIER-1-2-2          N     N N N N N N N N N N N N N N N N    4        2       0      N     CUSTOM
```

Restore Carrier Signaling Operations for a Packet BTS

Restore carrier signaling operations according to the procedure in Table 10-13.

✔	Step	Action
Table 10-13: Restore Carrier Signaling Operations Procedure For a Packet BTS		
		AT THE OMCR
	1	Open a CLI window. Refer to the *Accessing OMCR CLI Window* section on page 10-2.
	2	Unlock/enable the target carrier on all sector–carriers equipped for the BTS by repeatedly entering either of the following commands at the prompt: omc-000000>**ENABLE CARRIER–**<bts#>**–**<sector#>-<carrier#> **UNC** omc-000000>**UNLOCK CARRIER–**<bts#>**–**<sector#>-<carrier#> Repeat the command for each sector–carrier associated with the target carrier.
	3	Observe that the system automatically returns a "Network Element State Change Event" message for each CARRIER device and its associated BBX. These messages show the old and new states for the devices. The new state should be UNLOCKED/ENABLED/ACTIVE.
	4	Display the status of all devices at the BTS by entering the following command at the prompt: omc-000000>**DISPLAY BTS–**<bts#> **STATUS** Observe the system response. Make sure that there are not more OOS_AUTOMATIC devices than what was observed in step 15 of the shut down carrier signaling functions procedure for a packet BTS Table 10-10.
	5	If you *did not* redirect subscribers according to the steps in the shut down carrier signaling functions procedure for a packet BTS Table 10-10, stop here. If you *did* redirect subscribers according to the steps in the shut down carrier signaling functions procedure for a packet BTS Table 10-10, perform the remaining steps of this table.
	6	View the congestion control parameters for all carriers equipped for the applicable sector by entering the following command at the prompt: omc-000000>**DISPLAY SECTOR–**<bts#>**–**<sector#> **CONGESTCONF** Observe the following *typical* system display response for sector 2:

```
     CARRIER                     NEWCALL        REG          AGG
(bts#-sector#-carrier#)   SET    ALARMFLAG      ALARMFLAG    ALARMFLAG    ANALOGREDIRECT   GLOBALREDIRECT
----------------------    ---    ---------      ----------   ----------   --------------   --------------
       146-2-1             1      ENABLE         ENABLE       ENABLE        DISABLE          ENABLE
       146-2-2             1      ENABLE         ENABLE       ENABLE        DISABLE          ENABLE
```

 ✓	Step	Action
		Table 10-13: Restore Carrier Signaling Operations Procedure For a Packet BTS
	7	**NOTE** In this step, you will change the value of the Global Service Redirection Flag (GLOBALREDIRECT) in the congestion control parameters so that the Global Service Redirect Message is only broadcast on the sector paging channel of a specific carrier when there is traffic congestion in the carrier/sector. Enter the following command at the prompt using one of the applicable carrier number and the applicable sector number: omc-000000>**EDIT CARRIER–**<bts#>**–**<sector#>**–**<carrier#> **CONGESTCONF !** The system will prompt you to enter each control parameter value one at a time. Skip through the prompts until you get to the following: *<globalredirect>*, enter **DISABLE** (This will revert the Global Service Redirect Message to congestion control.) The system will display the values of the control parameters. Verify that only the GLOBALREDIRECT value changed. omc-000000>Accept [yes/no]? Enter **Y** to accept the change. Now the Global Service Redirection Message will only be sent over the sector paging channel when there is traffic congestion in the carrier/sector.
	8	Repeat step 7 for each remaining sector number disabled in step 14 of the shut down carrier signaling functions procedure for a packet BTS Table 10-10.
	9	Enter the following command at the prompt: omc-000000>**DISPLAY BTS–**<bts#> **CONGESTCONF** Observe the system display response. Verify that the CONGESTCONF *globalredirect* is disabled for the specific carrier on each the applicable sectors.

	10	View the status of the carrier signaling redirect parameters to verify the applicable carrier equipped for the specific sector.
		
		omc-000000>**DISPLAY CARRIER–**<bts#>**–**<sector#>-<carrier#> **REDIRECT**
		
		Observe that the values in the system display response should match the values input in step 4 of the shut down carrier signaling functions procedure for a packet BTS Table 10-10.
		
		<pre> Access Overload Class Redirect Flags ROTATE
		      CARRIER ID RETURN 0 0 0 0 0 0 0 0 0 0 1 1 1 1 1 1 TIMER RECORD EXP IGNORE SYS
		  (bts-sector-carrier) IF FAIL 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 (SEC) TYPE SID CDMA ORDERING
		  -------------------- ------- - - - - - - - - - - - - - - - - ----- ---- ---- --- --------
		  CARRIER-146-2-1 N Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y 4 2 13 Y CUSTOM</pre>

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Table 10-13: Restore Carrier Signaling Operations Procedure For a Packet BTS		
✔	**Step**	**Action**
	11	*** IMPORTANT** In this step, use the values recorded in step 3 of the shut down carrier signaling functions procedure for a packet BTS Table 10-10 to answer the prompts for the EDIT CARRIER REDIRECT command; except for record type enter 2. **NOTE** This step shows the entry of initial standard values which is consistent with the original example; except record type must be 2. Your entries may be different. Restore the values of all REDIRECT parameters by entering the following command at the prompt: omc-000000>**EDIT CARRIER–**<bts#>**–**<sector#>**–**<carrier#> **REDIRECT !** The system will prompt you to enter each command parameter one at a time. Answer the prompts in the following order (Note that the following specified values are consistent with the original example. Yours may be different): *<accolc0>* enter **N**, *<accolc1>*enter **N**, ... *<accolc15>*enter **N** *<returniffail>* , enter **N** *<recordtype>* , enter **2** *<expectedsid>* , enter **0** *<ignorecdma>* , enter **N** *<sysordering>* , enter **CUSTOM** *<rotatetimer>* , enter **4** The system will display the command that will be sent. Verify the command syntax. omc-000000>Accept [yes/no]? Enter **Y** to accept the command or **N** to go back and enter the correct value(s).
	12	Repeat steps 5 and 11, as required, for each remaining sector number disabled in step 14 of the shut down carrier signaling functions procedure for a packet BTS Table 10-10.

	13	View the status of the signaling REDIRECT parameters by entering the following command at the prompt:
		
		omc-000000>**DISPLAY BTS–**<bts#> **REDIRECT**
		
		Ensure that the values in the system display response match the values for the specific carrier on each the applicable sector(s) input by the operator in step 11 (see example below).
		
		<pre> Access Overload Class Redirect Flags
		                 RETURN ROTATE RECORD EXP IGNORE SYS
		    CARRIER ID IF FAIL 0 0 0 0 0 0 0 0 0 0 1 1 1 1 1 1 TIMER TYPE SID CDMA ORDERING
		(bts-sector-carrier) 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 (sec)
		------------------- ------- - - - - - - - - - - - - - - - - ------ ------ ----- ------ --------
		  CARRIER-146-1-1 N N N N N N N N N N N N N N N N N 4 2 0 N CUSTOM
		  CARRIER-146-1-2 N N N N N N N N N N N N N N N N N 4 2 0 N CUSTOM
		  CARRIER-146-2-1 N N N N N N N N N N N N N N N N N 4 2 0 N CUSTOM
		  CARRIER-146-2-2 N N N N N N N N N N N N N N N N N 4 2 0 N CUSTOM
		  CARRIER-146-3-1 N N N N N N N N N N N N N N N N N 4 2 0 N CUSTOM
		  CARRIER-146-3-2 N N N N N N N N N N N N N N N N N 4 2 0 N CUSTOM</pre>

Packet BTS Start–Up Procedures – continued

Notes

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Chapter 11: Basic Troubleshooting

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Notes

Overview

The information in this chapter addresses some of the scenarios likely to be encountered by Customer Field Engineering (CFE) team members while performing BTS optimization and acceptance testing. This troubleshooting guide was created as an interim reference document for use in the field. It provides "what to do if" basic troubleshooting suggestions when the BTS equipment does not perform according to the procedures documented in the manual.

Comments are consolidated from inputs provided by CFEs and information gained from experience in Motorola labs and classrooms.

\<center\>**Table 11-1:** Login Failure Troubleshooting Procedures	
Step	**Action**
1	If the GLI LED is solid RED, it implies a hardware failure. Reset GLI by re-seating it. If this persists, install GLI card in GLI slot and retry. A Red LED may also indicate no termination on an external LAN connector (power entry compartment at rear of frame).
2	Verify that the span line is disconnected at the Span I/O card. If the span is still connected, verify the CBSC has disabled the BTS.
3	Try to *'ping'* the GLI.
4	Verify the LMF is connected to the *primary* LAN (LAN A) at the LAN shelf below the CCP2 cage. If LAN A is not the active LAN, force a LAN switch to LAN A by following the procedure in Table 11-2.
5	Verify the LMF was configured properly.
6	If a Xircom parallel BNC LAN interface is being used, verify the BTS-LMF cable is RG-58 (flexible black cable less than 2.5 feet in length).
7	Verify the external LAN connectors are properly terminated (power entry compartment at rear of frame).
8	Verify a T-adapter is *not* used on LMF computer side connector when connected to the primary LAN at the LAN shelf.
9	Try connecting to the Ethernet Out port in the power entry compartment (rear of frame). Use a TRB–to–BNC (triax–to–coax) adapter at the LAN connector for this connection.
10	Re-boot the LMF and retry.
11	Re-seat the GLI and retry
12	Verify GLI IP addresses are configured properly by following the procedure in Table 11-3.

Table 11-2: Force Ethernet LAN A to Active State as Primary LAN	
Step	**Action**
1	If LAN A is not the active LAN, make certain all external LAN connectors are either terminated with 50Ω loads or cabled to another frame.
2	*If it has not already been done*, connect the LMF computer to the stand–alone or starter frame, as applicable (Table 6-6).
3	*If it has not already been done*, start a *GUI* LMF session and log into the BTS on the active LAN (Table 6-7).
4	Remove the 50Ω termination from the LAN B IN connector in the power entry compartment at the rear of the stand–alone or starter frame. The LMF session will become inactive.
5	Disconnect the LMF computer from the LAN shelf LAN B connector and connect it to the LAN A connector.
6	If the LAN was successfully forced to an active state (the cards in any cage can be selected and statused), proceed to step 13.
7	With the 50Ω termination still removed from the LAN B IN connector, remove the 50Ω termination from LAN B OUT connector. If more than one frame is connected to the LAN, remove the termination from the last frame in the chain.
8	If the LAN was successfully forced to an active state (the cards in any cage can be selected and statused), proceed to step 13.
9	With the 50Ω terminations still removed from LAN B, unseat each GLI card in each frame connected to the LAN, until all are disconnected from the shelf backplanes.
10	Reseat each GLI card until all are reconnected.
11	Allow the GLIs to power up, and attempt to select and status cards in the CCP shelves. If LAN A is active, proceed to step 13.
12	If LAN A is still not active, troubleshoot or continue troubleshooting following the procedures in 13.
13	Replace the 50Ω terminations removed from the LAN B IN and OUT connectors.

Table 11-3: GLI IP Address Setting	
Step	**Action**
1	If it has not previously been done, establish an MMI communication session with the GLI card as described in Table 6-11.

2	Enter the following command to display the IP address and subnet mask settings for the card:
	
	config lg0 current
	
	A response similar to the following will be displayed:
	
	`GLI3>config lg0 current`
	
	`lg0: IP address is set to`
	`DEFAULT (configured based on card location)`
	
	`lg0: netmask is set to`
	`DEFAULT (255.255.255.128)`

3	If the IP address setting response shows an IP address rather than "`Default (configured based on card location)`," enter the following:
	
	config lg0 ip default
	
	A response similar to the following will be displayed:
	
	`GLI3>config lg0 ip default`
	
	`_param_config_lg0_ip(): param_delete(): 0x00050001`
	`lg0: ip address set to DEFAULT`

4	If the GLI subnet mask setting does not display as "`DEFAULT (255.255.255.128)`," set it to default by entering the following command:
	
	config lg0 netmask default
	
	A response similar to the following will be displayed:
	
	`GLI3>config lg0 netmask default`
	
	`_param_config_lg0_netmask(): param_delete(): 0x00050001`
	`lg0: netmask set to DEFAULT`

Table 11-3: GLI IP Address Setting	
Step	**Action**

5	Set the GLI route default to default by entering the following command:
	
	config route default default
	
	A response similar to the following will be displayed:
	
	`GLI3>config route default default`
	
	`_esh_config_route_default(): param_delete(): 0x00050001`
	`route: default gateway set to DEFAULT`

	NOTE Changes to the settings will not take effect unless the GLI is reset.
6	When changes are completed, close the MMI session, and reset the GLI card.

7	Once the GLI is reset, re–establish MMI communication with it and issue the following command to confirm its IP address and subnet mask settings:
	
	config lg0 current
	
	A response similar to the following will be displayed:
	
	`GLI3>config lg0 current`
	
	`lg0: IP address is set to`
	`DEFAULT (configured based on card location)`
	
	`lg0: netmask is set to`
	`DEFAULT (255.255.255.128)`

Cannot Communicate with Power Meter

Table 11-4: Troubleshooting a Power Meter Communication Failure	
Step	**Action**
1	Verify power meter is connected to LMF with GPIB adapter.
2	Verify cable connections as specified in Chapter 4.
3	Verify the GPIB address of the power meter is set to the same value displayed in the applicable GPIB address box of the **LMF Options** window **Test Equipment** tab. Refer to Table 6-23 or Table 6-24 and the Setting GPIB Addresses section of Appendix B for details.
4	Verify the GPIB adapter DIP switch settings are correct. Refer to Test Equipment Preparation section of Appendix F for details.
5	Verify the GPIB adapter is not locked up. Under normal conditions, only 2 green LEDs must be 'ON' (Power and Ready). If any other LED is continuously 'ON', then cycle GPIB box power and retry.
6	Verify the LMF computer COM1 port is not used by another application; for example, if a HyperTerminal window is open for MMI, close it.
7	Reset *all* test equipment by clicking **Util** in the BTS menu bar and selecting **Test Equipment > Reset** from the pull–down lists.

Cannot Communicate with Communications System Analyzer

Table 11-5: Troubleshooting a Communications System Analyzer Communication Failure	
Step	**Action**
1	Verify analyzer is connected to LMF with GPIB adapter.
2	Verify cable connections as specified in Chapter 4.
3	Verify the analyzer GPIB address is set to the same value displayed in the applicable GPIB address box of the **LMF Options** window **Test Equipment** tab. Refer to Table 6-23 or Table 6-24 and the Setting GPIB Addresses section of Appendix B for details.
4	Verify the GPIB adapter DIP switch settings are correct. Refer to Test Equipment Preparation section of Appendix F for details.
5	Verify the GPIB adapter is not locked up. Under normal conditions, only 2 green LEDs must be 'ON' (Power and Ready). If any other LED is continuously 'ON', then cycle GPIB box power and retry.
6	Verify the LMF computer COM1 port is not used by another application; for example, if a HyperTerminal window is open for MMI, close it.
7	Reset *all* test equipment by clicking **Util** in the BTS menu bar and selecting **Test Equipment > Reset** from the pull–down lists.

**Cannot Communicate with
Signal Generator**

Step	Action
Table 11-6: Troubleshooting a Signal Generator Communication Failure
1	Verify signal generator is connected to LMF with GPIB adapter.
2	Verify cable connections as specified in Chapter 4.
3	Verify the signal generator GPIB address is set to the same value displayed in the applicable GPIB address box of the **LMF Options** window **Test Equipment** tab. Refer to Table 6-23 or Table 6-24 and the Setting GPIB Addresses section of Appendix B for details.
4	Verify the GPIB adapter DIP switch settings are correct. Refer to Test Equipment Preparation section of Appendix F for details.
5	Verify the GPIB adapter is not locked up. Under normal conditions, only 2 green LEDs must be 'ON' (Power and Ready). If any other LED is continuously 'ON', then cycle GPIB box power and retry.
6	Verify the LMF computer COM1 port is not used by another application; for example, if a HyperTerminal window is open for MMI, close it.
7	Reset *all* test equipment by clicking **Util** in the BTS menu bar and selecting **Test Equipment > Reset** from the pull–down lists.

Cannot Download

Step	Action
Table 11-7: Troubleshooting Code Download Failure
1	Verify T1 or E1 span is disconnected from the BTS.
2	Verify LMF can communicate with the BTS devices using the LMF **Status** function.
3	Communication with GLI must first be established before trying to communicate with any other BTS device. GLI must be INS_ACT state (bright green).
4	Verify the target card is physically present in the cage and powered-up.
5	If the target card LED is solid RED, it implies hardware failure. Reset card by re-seating it. If LED alarm persists, replace with *same type of* card from another slot and retry.
6	Re-seat card and try again.
7	If a BBX reports a failure message and is OOS_RAM, the code load was OK. Use the LMF **Status** function to verify the load.
8	If the download portion completes and the reset portion fails, reset the device by selecting the device and **Reset**.

Basic Troubleshooting – continued

Table 11-7: Troubleshooting Code Download Failure	
Step	**Action**
9	If a BBX or an MCC remains OOS_ROM (blue) after code download, use the LMF **Device** > **Status** function to verify that the code load was accepted.
10	If the code load was accepted, use LMF **Device** > **Download** > **Flash** to load RAM code into flash memory.

Cannot Download DATA to Any Device (Card)

Table 11-8: Troubleshooting Data Download Failure	
Step	**Action**
1	Re-seat card and repeat code and data load procedure.
2	Verify the ROM and RAM code loads are of the same release by statusing the card. Refer to Download the BTS section of Chapter 6 for more information.

Cannot ENABLE Device

Before a device can be enabled (placed in service), it must be in the OOS_RAM state (yellow in LMF display) with data downloaded to the device. The color of the device on the LMF changes to green once it is enabled.

The four device states that can be displayed by the LMF are:

- Enabled (bright green, INS_ACT)
- Stand–by (olive green, INS_SBY – redundant CSM and GLI only)
- Disabled (yellow, OOS_RAM)
- Reset (blue, OOS_ROM)

Table 11-9: Troubleshooting Device Enable (INS) Failure	
Step	**Action**
1	Re-seat card and repeat code and data load procedure.
2	If CSA cannot be enabled, verify the CDF has correct latitude and longitude data for cell site location and GPS sync.
3	Ensure primary CSM is in INS_ACT (bright green) state.
	NOTE MCCs will not enable without the CSA being INS.
4	Verify 19.6608 MHz CSA clock is present; MCCs will not enable without it.

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Table 11-9: Troubleshooting Device Enable (INS) Failure	
Step	**Action**
5	BBXs should not be enabled for ATP tests.
6	If MCCs give "invalid or no system time," verify the CSA is enabled.
7	Log out of the BTS, exit the LMF, restart the application, log into the BTS, and re–attempt device–enable actions.

cCLPA Errors

Table 11-10: cCLPA Errors	
Step	**Action**
1	If cCLPAs give continuous alarms, cycle power with the applicable DC PDA circuit breakers.
2	Establish an MMI session with the cCLPA (Table 6-11), connecting the cable to the applicable MMI port.
2a	– Type **alarms** at the HyperTerminal window prompt and press **Enter**. — The resulting display may provide an indication of the problem.
2b	– Call Field Support for further assistance.

Appendix A: MCC–Data Only

Appendix Content

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Notes

MCC–DO Tests

MCC–DO Testing

| ⚠ | **IMPORTANT** |

The tests in this appendix are provided for **information** only. The tests contained herein are not proven, and recommended equipment and equipment setup is not provided.

The following acceptance tests evaluate different performance aspects of the BTS with MCC–DO. This allows the CFE to select testing to meet the specific requirements for individual maintenance and performance verification situations.

The WinLMF must be version 2.16.4.0.04 or higher (with FR8000 – EV–DO manual ATP test support).

Prerequisites

Before attempting to run any *performance verification* ATP tests, all procedures outlined in previous *Optimization* chapters should have been successfully completed. At *a minimum*, successful completion of all BTS BLO calibration, and Bay Level Offset tests is recommended.

Test Equipment

Listed below are the recommended test equipment required to test MCC–DO.

Signal Generator:

- Agilent E4432B, with options UN8/(008 for upgrade) and 201/(251 for upgrade)
- E4430BK–404 – CDMA2000–1xEV–DO signal studio software

OR

- Agilent E4438C, with options UN8/(008 for upgrade) and 201/(251 for upgrade)
- E4438CK–404 – CDMA2000–1xEV–DO signal studio software

Spectrum Analyzer:

- Agilent E4406A), with option B78 and Firmware version A.04.21
- E4406AU–204 – 1xEV–DO measurement personality

MCC–DO Code Domain

The code domain power test verifies the noise floor of a carrier keyed up at a specific frequency per the CDF file.

Code domain power is the power in each code channel of a CDMA Channel. The CDMA time reference used in the code domain power test is derived from the Pilot Channel and is used as the reference for demodulation of all other code channels. This test verifies that orthogonality is maintained between the code channels. When transmit diversity is enabled, this test also verifies that time alignment is also maintained.

MCC–DO Tests – continued

Follow the procedure in Table A-1 to test the MCC–DO Code Domain Power.

Table A-1: Procedure to Test MCC–DO Code Domain Power	
Step	**Action**
1	Click the BBX(s) on DO carrier to be tested.
2	On the menu, click the **EvDO Tests > TX>Start Manual Tx ATP**.
3	Select the appropriate carrier from the **Sector/Carrier** list.
4	Click the **OK** button. A status report window is displayed.
5	Test tesults are displayed in the window.
6	Connect an MMI cable to the MCC–DO card.
7	Open a HyperTerminal application.
8	Open the COM to the MCC–DO MMI. Set parameters as follows: • Bits per second: 9600 • Data bits: 8 • Parity: None • Stop bits: 1 • Flow control: None
9	When the login prompt appears, enter login **mmi**.
10	When **MMI>** appears, type in the following command: **set_sc *\<modem number\> \<sector number\> \<channel\> \<PN offset\>*** where: • *\<modem number\>* is the modem on MCC–DO card to be tested • *\<sector number\>* is the sector number of the appropriate BBX (according to carrier selected in LMF) • *\<channel\>* is the appropriate channel (according to carrier selected in LMF) in the hexadecimal format 0xHHHH or NNNN format (normal decimal) • *\<PN offset\>* is set to 0 (zero)
11	Enable the modem on MCC–DO card by entering the following command: **enable *\<modem number\>*** where: • *\<modem number\>* is the modem selected in step 10.

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MCC–DO Tests – continued

<table>
<tr><td colspan="2" align="center">**Table A-1:** Procedure to Test MCC–DO Code Domain Power</td></tr>
<tr><td>**Step**</td><td align="center">**Action**</td></tr>
<tr>
<td>12</td>
<td>To generate a pattern, enter the following command:

fl_pattern 3</td>
</tr>
<tr>
<td>13</td>
<td>On the Agilent E4406, set the Code Domain:

- Press **Measure** button
- Press **More** button until **Code Domain** option is displayed
- Select **Code Domain**
- Press **Meas Setup** button, then press **Meas Interval**, enter **3**.
- Press **Meas Control** button, then press **Measure** to set it to **Cont**
- Press **Meas Control** button
- Set **Channel Type** to MAC
- Press **More** button until **Trig Source** option is displayed
- Press **Trig Source** key and select **Ext Rear** option
- Press **More** button until **Advanced** option is displayed
- Select **Advanced** option
- If **Chip Rate** option is set to a value different than 1.228800, select **Chip Rate** and set it to 1.228800
- Select **Active Set Th** option to a value calculated using the following formula:
  - **xcvr_gain – cable_loss – 2dB**
- Press **Display** button and set the **I/Q Combined Power Bar** to **On**
- Press **Display** button, press Code Order button, select **Hadamard** option
- To set appropriate frequency value, press **Frequency** and enter the value calculated according to the following formula:
  - **<tx_base_band_value> + 0.05*<chan_no> [MHz]**</td>
</tr>
<tr>
<td>14</td>
<td>Read the value of the power for each MAC channel.</td>
</tr>
<tr>
<td>15</td>
<td>Note the **Max Inactive Ch** value. The **Max Inactive Ch** value is –31dB or lower.</td>
</tr>
</table>

MCC–DO TX Mask

Follow the procedure in Table A-2 to test the MCC–DO TX Mask.

Table A-2:Procedure to Test the MCC–DO TX Mask	
Step	**Action**
1	Click the BBX(s) on DO carrier to be tested.
2	On the menu, click the **EvDO Tests > TX>Start Manual Tx ATP**.
3	Select the appropriate carrier from the **Sector/Carrier** list.
4	Click the **OK** button. A status report window is displayed.
5	Connect test equipment as the instructions are displayed.
6	Connect an MMI cable to the MCC–DO card.
7	Open a HyperTerminal application.
8	Open the COM to the MCC–DO MMI. Set parameters as follows: • Bits per second: 9600 • Data bits: 8 • Parity: None • Stop bits: 1 • Flow control: None
9	When the login prompt appears, enter login **mmi**.
10	When **MMI>** appears, type in the following command: **set_sc *\<modem number\> \<sector number\> \<channel\> \<PN offset\>*** where: • *\<modem number\>* is the modem on MCC–DO card to be tested • *\<sector number\>* is the sector number of the appropriate BBX (according to carrier selected in LMF) • *\<channel\>* is the appropriate channel (according to carrier selected in LMF) in the hexadecimal format 0xHHHH or NNNN format (normal decimal). • *\<PN offset\>* is set to 0 (zero)
11	Enable the modem on MCC–DO card by entering the following command: **enable *\<modem number\>*** where: • *\<modem number\>* is the modem selected in step 10.

table continued on next page

<table>
<tr><td colspan="2" align="center">**Table A-2:** Procedure to Test the MCC–DO TX Mask</td></tr>
<tr><td align="center">**Step**</td><td align="center">**Action**</td></tr>
<tr><td align="center">12</td><td>To generate a pattern, enter the following command:

fl_pattern 3</td></tr>
<tr><td align="center">13</td><td>On Agilent E4406, set **Spectrum** (Freq Domain) measurement as follows:
• Press **Measure** button
• Press **More** button until **Spectrum (Freq Domain)** option is displayed
• Select **Spectrum** option
• Press **SPAN** key to set its value to 4 [MHz]
• To set the frequency value. press **Frequency** and enter the value calculated as follows:
  – **<tx_base_band_value> + 0.05*<chan_no> [MHz]**</td></tr>
<tr><td align="center">14</td><td>Use the formula from step 13 to calculate the four frequencies to measure the Power.
• check_point_1 = freq – 750 [kHz]
• check_point_2 = freq + 750[kHz]
• check_point_3 = freq – 1980 [kHz]
• check_point_4 = freq + 1980 [kHz]</td></tr>
<tr><td align="center">15</td><td>Press **MARKER** key:
• Select 1, 2, 3, or 4 (frequency points)
• Press **FUNCTION** key and select **Off** option
• Press **TRACE** key and select **Spectrum** option
• Press **NORMAL** key
• Use the numeric keypad to enter the calculated frequency, assigning the proper unit.
• Note the Power value of marker
• Repeat step for all calculated frequency checkpoints
The check point values are as follows:
• Check_point_1 > –40 dBm
• Check_point_2 > –40 dBm
• Check_point_3 > –60 dBm
• Check_ point_4 > –60 dBm</td></tr>
</table>

MCC–DO Pilot Time Offset

The pilot time offset test verifies the transmitted pilot channel element pilot time offset of a carrier keyed up at a specific frequency per the CDF file.

The calibrated communications test set measures the pilot time offset in microseconds, verifying that the result is within 3 microseconds (10 microseconds for JCDMA systems) of the target pilot time offset (zero microseconds).

Pilot time is defined as the estimate of CDMA System Time derived from observation of the pilot signal at the base station RF output port. Pilot time alignment error is the difference between the measured pilot time and the expected time, taking into account CDMA System Time and pilot offset.

Follow the procedure in Table A-3 to test the MCC–DO Pilot Time Offset.

Table A-3: Procedure to Test MCC–DO Pilot Time Offset	
Step	**Action**
1	Click the BBX(s) on DO carrier to be tested.
2	On the menu, click the **EvDO Tests > TX>Start Manual Tx ATP**.
3	Select the appropriate carrier from the **Sector/Carrier** list.
4	Click the **OK** button. A status report window is displayed. Test results are displayed in the window.
5	Connect an MMI cable to the MCC–DO card.
6	Open a HyperTerminal application.
7	Open the COM to the MCC–DO MMI. Set parameters as follows: • Bits per second: 9600 • Data bits: 8 • Parity: None • Stop bits: 1 • Flow control: None
8	When the login prompt appears, enter login **mmi**.

table continued on next page

Table A-3: Procedure to Test MCC–DO Pilot Time Offset	
Step	**Action**
9	When **MMI>** appears, type in the following command: **set_sc** *<modem number> <sector number> <channel> <PN offset>* where: • *<modem number>* is the modem on MCC–DO card to be tested • *<sector number>* is the sector number of the appropriate BBX (according to carrier selected in LMF) • *<channel>* is the appropriate channel (according to carrier selected in LMF) in the hexadecimal format 0xHHHH or NNNN format (normal decimal). • *<PN offset>* is set to 0 (zero)
10	Enable the modem on MCC–DO card by entering the following command: **enable** *<modem number>* where: • *<modem number>* is the modem selected in step 10.
11	To generate a pattern, enter the following command: **fl_pattern 3**

12	On the Agilent E4406, set the **Mod Accuracy (composite Rho)** measurement:
	• Press **Measure** button
	• Press **More** button until **Mod Accuracy (composite Rho)** option is displayed
	• Select **Mod Accuracy (composite Rho)**
	• Press **Meas Setup** button
	• Press **More** button until **Trig Source** option is displayed
	• Press **Trig Source** key and select **Ext Rear** option
	• Press **More** button until **Advanced** option is displayed
	• Select **Advanced** option
	• If **Chip Rate** option is set to a value different than 1.228800, select **Chip Rate** and set it to 1.228800
	• Select Active Set Th option to a value calculated using the following formula:
	    – **xcvr_gain – cable_loss – 2dB**
	• To set appropriate frequency value, press **Frequency** and enter the value calculated according to the following formula:
	    – **<tx_base_band_value> + 0.05*<chan_no> [MHz]**

13	Read the value of the **Pilot Offset**. The **Pilot Offset** is less than 3 microseconds

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MCC–DO Rho

The Rho test verifies the transmitted pilot channel element digital waveform quality of the carrier keyed up at a specific frequency per the CDF file.

Waveform quality is measured by determining the normalized correlated power between the actual waveform and the ideal waveform.

Follow the procedure in Table A-4 to test the MCC–DO Rho.

Step	Action
Table A-4: Procedure to Test MCC–DO Rho
1	Click the BBX(s) on DO carrier to be tested.
2	On the menu, click the **EvDO Tests > TX>Start Manual Tx ATP**.
3	Select the appropriate carrier from the **Sector/Carrier** list.
4	Click the **OK** button. A status report window is displayed. Test results are displayed in the window.
5	Connect an MMI cable to the MCC–DO card.
6	Open a HyperTerminal application.
7	Open the COM to the MCC–DO MMI. Set parameters as follows: • Bits per second: 9600 • Data bits: 8 • Parity: None • Stop bits: 1 • Flow control: None
8	When the login prompt appears, enter login **mmi**.
9	When **MMI>** appears, type in the following command: **set_sc *<modem number> <sector number> <channel> <PN offset>*** where: • *<modem number>* is the modem on MCC–DO card to be tested • *<sector number>* is the sector number of the appropriate BBX (according to carrier selected in LMF) • *<channel>* is the appropriate channel (according to carrier selected in LMF) in the hexadecimal format 0xHHHH or NNNN format (normal decimal). • *<PN offset>* is set to 0 (zero)

table continued on next page

MCC–DO Tests – continued

Table A-4: Procedure to Test MCC–DO Rho	
Step	**Action**
10	Enable the modem on MCC–DO card by entering the following command: **enable** *<modem number>* where: • *<modem number>* is the modem selected in step 10.
11	To generate a pattern, enter the following command: **fl_pattern 3**

12	On the Agilent E4406, set the **Mod Accuracy (composite Rho)** measurement:
	• Press **Measure** button
	• Press **More** button until **Mod Accuracy (composite Rho)** option is displayed
	• Select **Mod Accuracy (composite Rho)**
	• Press **Meas Setup** button
	• Press **More** button until **Trig Source** option is displayed
	• Press **Trig Source** key and select **Ext Rear** option
	• Press **More** button until **Advanced** option is displayed
	• Select **Advanced** option
	• If **Chip Rate** option is set to a value different than 1.228800, select **Chip Rate** and set it to 1.228800
	• Select **Active Set Th** option to a value calculated using the following formula:
	  – **xcvr_gain – cable_loss – 2dB**
	• To set appropriate frequency value, press **Frequency** and enter the value calculated according to the following formula:
	  – **<tx_base_band_value> + 0.05*<chan_no> [MHz]**

13	Read the value of the **Rho**. **Rho** normalized cross coefficient (ρ) is greater than 0.912

MCC–DO Packet Error Rate

The PER test verifies PER (Packet Error Rate) of traffic channels of an XCVR carrier keyed up at a specific frequency per the current CDF file. The XCVR is keyed to generate a CDMA carrier (with pilot channel element only) of the correct level.

The calibrated communications test set measures the all zero long code and verifies that the PER is not greater than 1 percent. A total number of packets to be received is dependent on Rate Set chosen.

PER Prerequisites

To perform the following test, the Agilent E4432B Signal Generator must have the following installed:

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- Agilent Signal Studio – 1xEV Reverse Link" (requires installation of "Agilent IO Libraries" application)
- Agilent E4432B Signal Generator with option 404

Follow the procedure in Table A-5 to test the MCC–DO Packet Error Rate.

Step	Action
Table A-5: Procedure to Test MCC–DO Packet Error Rate
1	Click the BBX(s) on DO carrier to be tested.
2	On the menu, click the **EvDO Tests > TX>Start Manual Tx ATP**.
3	Select the appropriate carrier from the **Sector/Carrier** list.
4	Click the **OK** button. A status report window is displayed. Test results are displayed in the window.
5	Connect the lap top computer to the Agilent E4432B Signal Generator and run the Agilent Signal Studio – 1x EV Reverse Link application.

MCC–DO Tests – continued

Table A-5: Procedure to Test MCC–DO Packet Error Rate	
Step	**Action**
6	Enter the following parameters for signal generation. Channel Configuration: • RRI Channel – checked RRI Bits – 1 • DRC Channel – checked Rel. gain (dB) – 3 • ACK Channel – checked Rel. gain (dB) – 0 • Data Channel – checked Rel. gain (dB) – 3.75 • Data Channel encoder active – checked • Data Channel Data rate – 9.6 kbps • Data Channel bit stream – PN15 • I Mask – 3FF80000000 • Q Mask – 3FF00000001 Signal Generation: • Oversampling ratio – 4 • Filter Type – IS 95 Std • Mirror Spectrum – unchecked ESG Configuration: • Frequency – calculated according to the formula: <rx_base_band_value> + 0,05 * <chan_no> [MHz] • Amplitude – depending on attenuation applied – overall signal value should be –122 [dBm] • Sampling rate 4.1952 [MHz] • Reconstruction filter 2.5 [MHz] • RF Blanking – unchecked • Internal Reference • + Mkrs
7	Press **Time Slot Setup** button and set the following parameters: ACK Channel • Active – All On • Data – 0s DRC Channel • Active – All On • Data – F (1111) • Cover – 1
8	Press **DOWNLOAD** button on the ”Agilent Signal Studio – 1xEV Reverse Link” application.

	Table A-5: Procedure to Test MCC–DO Packet Error Rate
Step	**Action**
9	Connect an MMI cable to the MCC–DO card.
10	Open a HyperTerminal application.
11	Open the COM to the MCC–DO MMI. Set parameters as follows: • Bits per second: 9600 • Data bits: 8 • Parity: None • Stop bits: 1 • Flow control: None
12	When the login prompt appears, enter login **mmi**.
13	When **MMI>** appears, type in the following command: **set_sc *<modem number> <sector number> <channel> <PN offset>*** where: • *<modem number>* is the modem on MCC–DO card to be tested • *<sector number>* is the sector number of the appropriate BBX (according to carrier selected in LMF) • *<channel>* is the appropriate channel (according to carrier selected in LMF) in the hexadecimal format 0xHHHH or NNNN format (normal decimal). • *<PN offset>* is set to 0 (zero)

MCC–DO Tests – continued

Table A-5: Procedure to Test MCC–DO Packet Error Rate	
Step	**Action**
14	Enter the command to receive the PER measurements results: **rl_test 1 60 dflt dflt dflt dflt dflt dflt dflt dflt dflt dflt dflt dflt dflt dflt** this will set the MCC–DO to measure the PER with following parameters: • Perform PER Test at 9.6 KBPS • Duration 60 seconds • DataOffsetNominal dflt=0dB • DataOffset9k6 dflt=0dB • DataOffset19k2 dflt=0dB • DataOffset38k4 dflt=0dB • DataOffset76k8 dflt=0dB • DataOffset153k6 dflt=0dB • MacIndex dflt=5 • FrameOffset dflt=0 • DRCGating dflt=0 Continuous transmission • DRCLength dflt = 0 • DRCCover dflt = 1 • UATI dflt = 0x1234ABCD • AckChannelGain dflt=0dB • DRCChannelGain dflt=3dB
15	Read the results (after 1 minute) and calculate the PER value from the MCC–DO mmi result screen: Compute PER using the outcome of the rl_test PER = (expect–total+invalid) /expect Example output: Reverse Link Test has completed Reverse Link Test OK MODEM#1 pattern = 1 (9.6 kbps) expect = xxx total = xxx invalid = xxx
16	Receiver sensitivity is below –121.2 dBm at a signal rate of 9.6 kbps. Read the value of the **PER**. **PER** is less than 0.01 (1%)

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Notes

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Appendix Content

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B

Notes

Test Equipment Preparation

Purpose

This appendix provides information on pre–testing set–up for the following test equipment items (not required for the Cybertest test set):

- Agilent E7495A test equipment setup
- Agilent E4406A transmitter test set
- Agilent E4432B signal generator
- Advantest R3267 spectrum analyzer
- Advantest R3562 signal generator
- Agilent 8935 analyzer (formerly HP 8935)
- HP 8921 with PCS interface analyzer
- Advantest R3465 analyzer
- Motorola CyberTest
- HP 437 power meter
- Gigatronics 8541C power meter
- GPIB adapter

Pre–testing set–up information covered includes verification and setting GPIB addresses, inter–unit cabling, connectivity testing, pre–test control settings, and equipment calibration for items which are not calibrated with the **Calibrate Test Equipment** function of the LMF.

The following procedures cover verification and changing GPIB addresses for the various items of CDMA test equipment supported by the LMF.

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B

Agilent R7495A Test Equipment Setup

This test equipment requires a warm-up period of at least 30 minutes before BTS testing or calibration begins.

Using the Agilent E7495A with the LMF

The Agilent E7495A does not require the use of the 19MHz frequency reference; if connected, it will be ignored. The Even Sec SYNC connection is required.

The Agilent E7495A signal generator is only calibrated down to –80db. In order to achieve accurate FER testing, be sure the RX setup includes at least 40db of attenuation. This will ensure the signal generator will output sufficient power to operate in the calibrated range.

Set the IP Address as described in Table B-1.

✔	Step	Action
Table B-1: Set IP Address on Agilent E7495A test set		
	1	Use the **System Button > Controls >IPAdmin** to set an IP address on the E7495A as **128.0.0.49**, and Netmask to **255.255.255.128**.

Connections

It is recommended that you use a hub with BNC and RJ–45 connections. [Suggested models: Netgear model EN104 (4 port) or EN108 (8 port). Do NOT use model numbers ending with "TP"; those have no BNC connectors.]

The LMF will connect to the hub which in turn is connected to the BTS and to the Agilent E7495A.

Agilent E7495A to Hub – This is an Ethernet cable, RJ–45 to RJ–45.

LMF to Hub – Use one of the following cables to connect the LMF to the Hub:

– Ethernet cable, RJ–45 to RJ–45 (be sure that the LAN card is set for either AUTO or to use the RJ–45 only).

– Coax cable between LAN card and Hub. (Use a "T" on the hub and connect a cable between the other end of the "T" and the BTS LAN connection).

Hub to BTS – Use BNC "T" connector on the hub. [If your hub doesn't have BNC ports, use a BNC to UTP adapter.]

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B

Detecting Test Equipment

Check that no other equipment is connected to the LMF. Agilent equipment must be connected to the LAN to detect it. Then perform the procedures described in Table B-2.

✔	Step	Action
		Table B-2: Detecting Agilent E7495A Test Equipment
	1	Click the **Tools** Menu.
	2	Choose **Options**.
	3	Check **Agilent E7495A** option in non–GPIB Test Equipment and enter its IP number.
	4	Click **Apply** and wait a moment.
	5	Click **Dismiss**.

Power Sensor Calibration

Table B-3 describes the E7495A Power Sensor Calibration.

✔	Step	Action
		Table B-3: E7495A Power Sensor Calibration
	1	Display the power meter screen.
	2	Zero the power meter. Make sure you are connected as shown in Figure B-1. – Press the Zero softkey. – Press the Continue softkey.
	3	Calibrate the power meter: – Press Ref CF. – Enter the reference cal factor, reading it off the label on the power sensor head. – Press Calibrate. – Connect the power sensor (see Figure B-2). – Press Continue. – Press Cal Factor. – Enter the cal factor from the label on the power sensor head. Select a cal factor that's within the operating frequency of the base station.

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Figure B-1: Agilent E7495A Pre–Power Sensor Calibration Connection
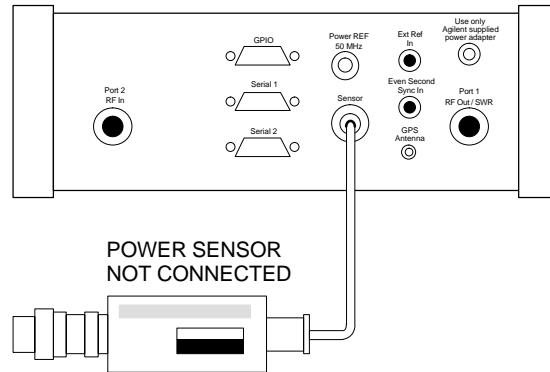
Figure B-2: Agilent E7495A Power Sensor Calibration Connection
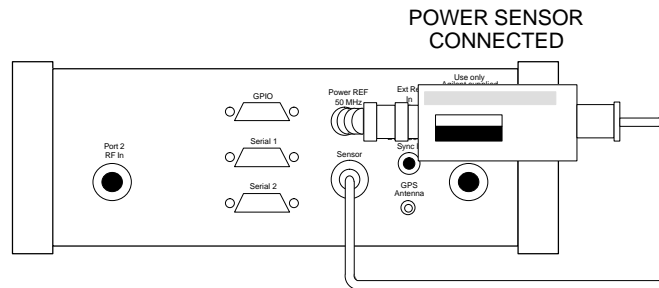
Cable Calibration

Follow the directions in the WinLMF program to calibrate cables.

– Calibrate the short cable (see Figure 6-12 or Figure 6-14) and two 10 dB pads to get a base line and then calibrate the TX and RX setup. Since you need at least 40 dB of loss when doing the FER test, the setup for RX is the same as TX.

ATP Setup

TX Path Calibration setup is shown in Test Equipment Setup (see Figure 6-19 through Figure 6-22).

Verifying and Setting GPIB Addresses

Agilent E4406A Transmitter
Tester GPIB Address

Refer to Figure B-3 and follow the procedure in Table B-4 to verify and, if necessary, change the Agilent E4406A GPIB address.

Figure B-3: Setting Agilent E4406A GPIB Address
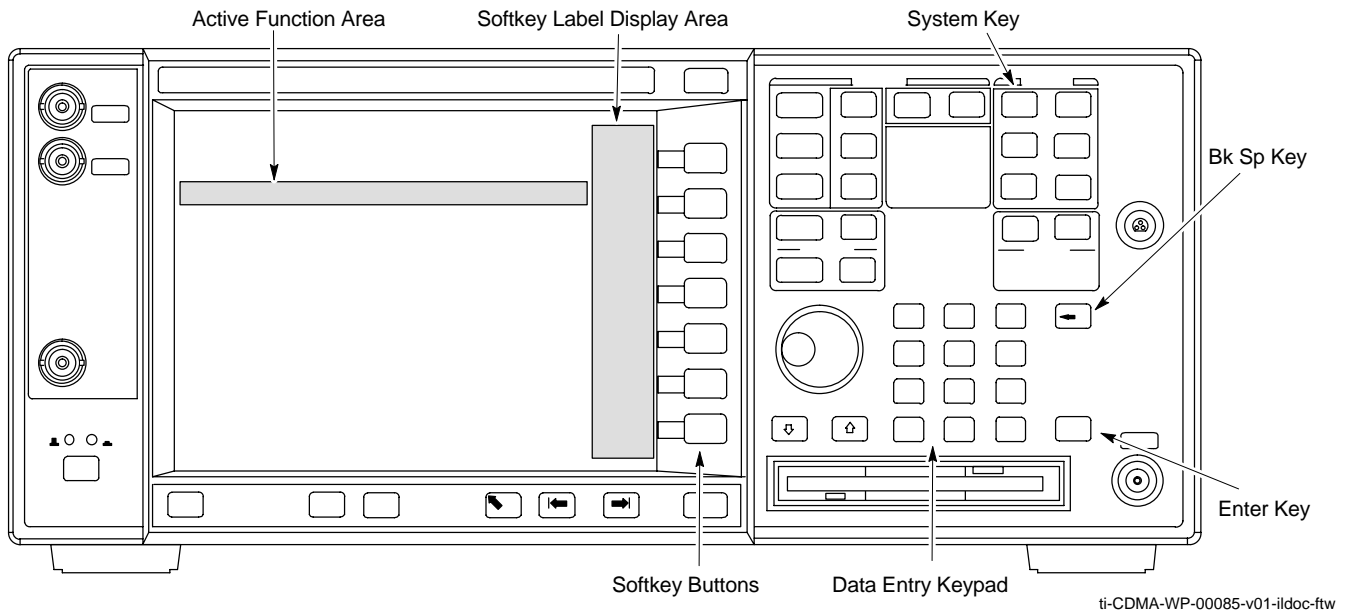
ti-CDMA-WP-00085-v01-ildoc-ftw

Table B-4: Verify and Change Agilent E4406A GPIB Address	
Step	**Action**
1	In the **SYSTEM** section of the instrument front panel, press the **System** key. – The softkey labels displayed on the right side of the instrument screen will change.
2	Press the **Config I/O** softkey button to the right of the instrument screen. – The softkey labels will change. – The current instrument GPIB address will be displayed below the **GPIB Address** softkey label.
3	If the current GPIB address is not set to **18**, perform the following to change it:
3a	Press the GPIB Address softkey button. In the on–screen Active Function Area, **GPIB Address** will be displayed followed by the current GPIB address.

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Table B-4: Verify and Change Agilent E4406A GPIB Address	
Step	**Action**
3b	On front panel Data Entry keypad, enter the communications system analyzer GPIB address of **18**. – The **GPIB Address** label will change to **Enter**. – Characters typed with the keypad will replace the current GPIB address in the Active Function Area. **NOTE** To correct an entry, press **Bk Sp** key to delete one character at a time.
3c	Press the **Enter** softkey button or the keypad **Enter** key to set the new GPIB address. – The **Config I/O** softkey labels will reappear. – The new GPIB address will be displayed under the **GPIB Address** softkey label.

Agilent E4432B Signal Generator GPIB Address

Refer to Figure B-4 and follow the procedure in Table B-5 to verify and, if necessary, change the Agilent E4432B GPIB address.

Figure B-4: Setting Agilent E4432B GPIB Address

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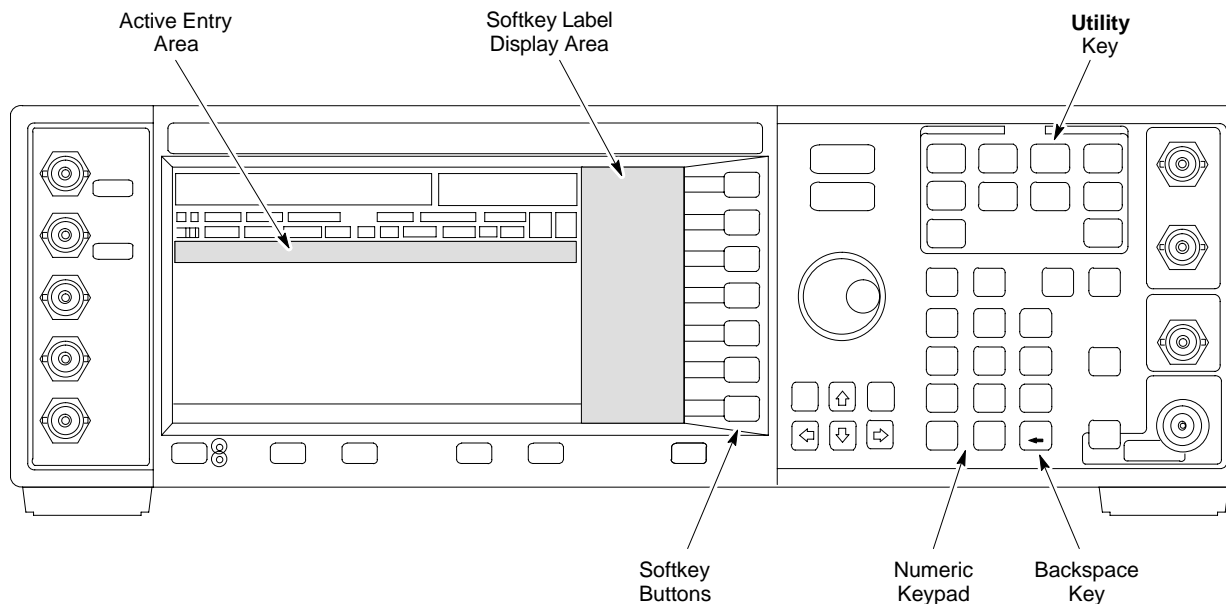
	Table B-5: Verify and Change Agilent E4432B GPIB Address
Step	**Action**
1	In the **MENUS** section of the instrument front panel, press the **Utility** key.
	– The softkey labels displayed on the right side of the instrument screen will change.
2	Press the **GPIB/RS232** softkey button to the right of the instrument screen.
	– The softkey labels will change.
	– The current instrument GPIB address will be displayed below the **GPIB Address** softkey label.
3	If the current GPIB address is not set to **1**, perform the following to change it:
3a	Press the **GPIB Address** softkey button.
	– The **GPIB Address** label and current GPIB address will change to boldface.
	– In the on–screen Active Entry Area, **Address:** will be displayed followed by the current GPIB address.
3b	On the front panel Numeric keypad, enter the signal generator GPIB address of **1**.
	– The **GPIB Address** label will change to **Enter**.
	– Characters typed on the keypad will replace the current GPIB address in the Active Entry display.
	NOTE
	To correct an entry, press the backspace key at the lower right of the keypad to delete one character at a time.
3c	Press the **Enter** softkey button to set the new GPIB address.
	– The new GPIB address will be displayed under the **GPIB Address** softkey label.

**Advantest R3267 Spectrum
Analyzer GPIB Address**

Refer to Figure B-5 and perform the procedure in Table B-6 to verify and, if necessary, change the Advantest R3267 spectrum analyzer GPIB address.

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Figure B-5: Setting Advantest R3267 GPIB Address
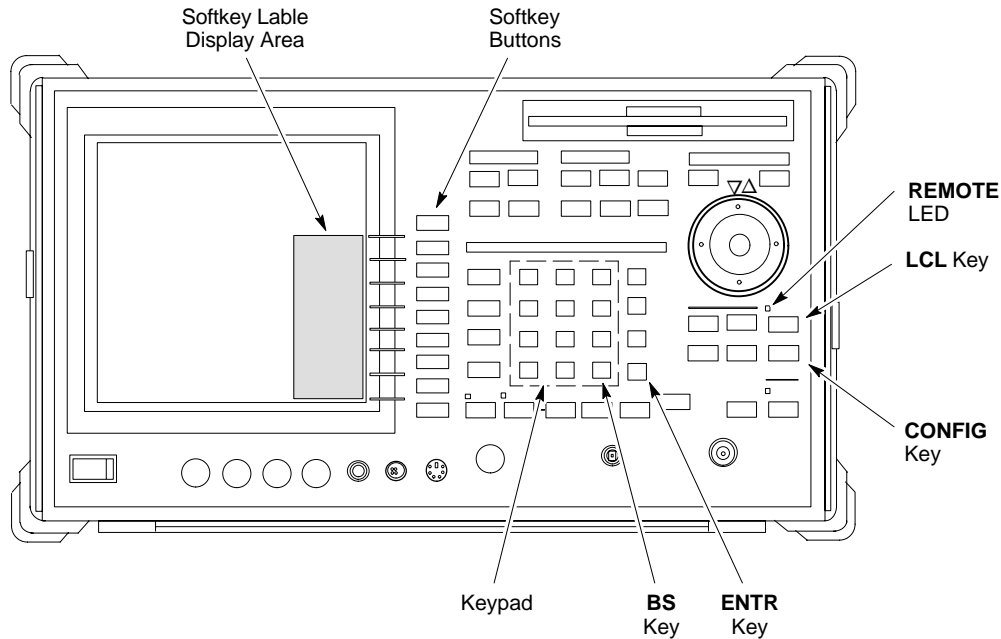
Table B-6: Verify and Change Advantest R3267 GPIB Address	
Step	**Action**
1	If the **REMOTE** LED is lighted, press the **LCL** key. – The LED extinguishes.
2	Press the **CONFIG** key. – **CONFIG** softkey labels will appear in the softkey label display area of the instrument display. – The current GPIB address will be displayed below the **GPIB Address** softkey label.
3	If the current GPIB address is not set to **18**, perform the following to change it:
3a	Press the **GPIB Address** softkey. A **GPIB Address** entry window will open in the instrument display showing the current GPIB address.
3b	Enter **18** on the keypad in the **ENTRY** section of the instrument front panel. – Characters typed on the keypad will replace the address displayed in the **GPIB Address** entry window. **NOTE** To correct an entry, press the **BS** (backspace) key at the lower right of the keypad to delete one character at a time.
3c	Press the **ENTR** key to the lower right of the keypad to set the new GPIB address. – The **GPIB Address** entry window closes. – The new address is displayed in the bottom portion of the **GPIB Address** softkey label.

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Verifying and Setting GPIB Addresses – continued

Advantest R3562 Signal Generator GPIB Address

Set the **GP–IB ADDRESS** switch on the rear of the Advantest R3562 signal generator to address **1** as shown in Figure B-6.

Figure B-6: Advantest R3562 GPIB Address Switch Setting
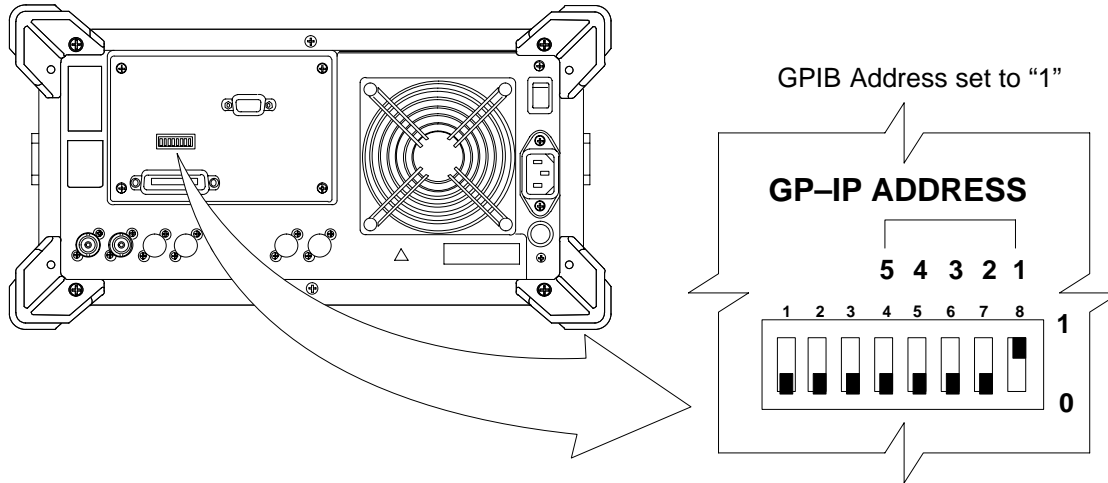
Agilent 8935 Series E6380 (formerly HP 8935) Test Set GPIB Address

Refer to Figure B-7 and follow the procedure in Table B-7 to verify and, if necessary, change the Agilent 8935 GPIB address.

Figure B-7: Agilent 8935 Test Set
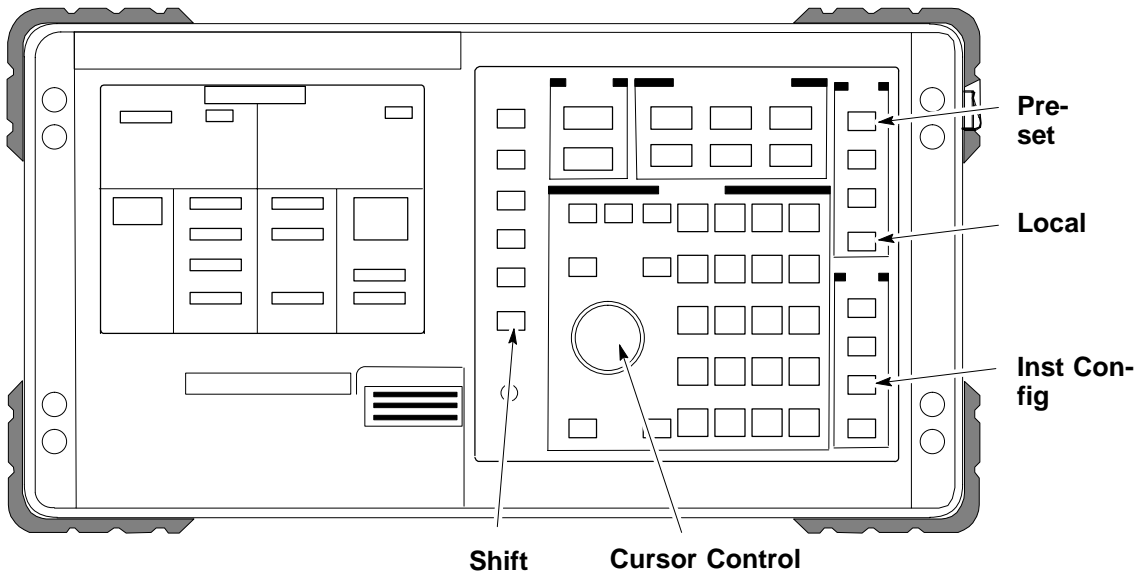
FW00885

NOTE	This procedure assumes that the test equipment is set up and ready for testing.

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Verifying and Setting GPIB Addresses
– continued

Table B-7: Verify and/or Change Agilent 8935 (formerly HP 8935) GPIB Address	
Step	**Action**
1	**NOTE** The HP I/O configuration MUST be set to **Talk & Listen,** or *no* device on the GPIB will be accessible. (Consult test equipment OEM documentation for additional information as required.) To verify that the GPIB addresses are set correctly, press **Shift** and **LOCAL** on the Agilent 8935. – The current HP–IB address is displayed at the top of the screen. **NOTE** HP–IB is the same as GPIB.
2	If the current GPIB address is not set to **18**, perform the following to change it:
2a	– Press **Shift** and **Inst Config**.
2b	– Turn the **Cursor Control** knob to move the cursor to the **HP–IB Adrs** field.
2c	– Press the **Cursor Control** knob to select the field.
2d	– Turn the **Cursor Control** knob as required to change the address to **18**.
2e	– Press the **Cursor Control** knob to set the address.
3	Press **Preset** to return to normal operation.

B

Verifying and Setting GPIB Addresses – continued

Hewlett Packard HP8921A and
HP83236A/B GPIB Address

Refer to Figure B-8 and follow the procedure in Table B-8 to verify and, if necessary, change the HP 8921A HP 83236A GPIB addresses.

Figure B-8: HP 8921A and HP 83236A/B
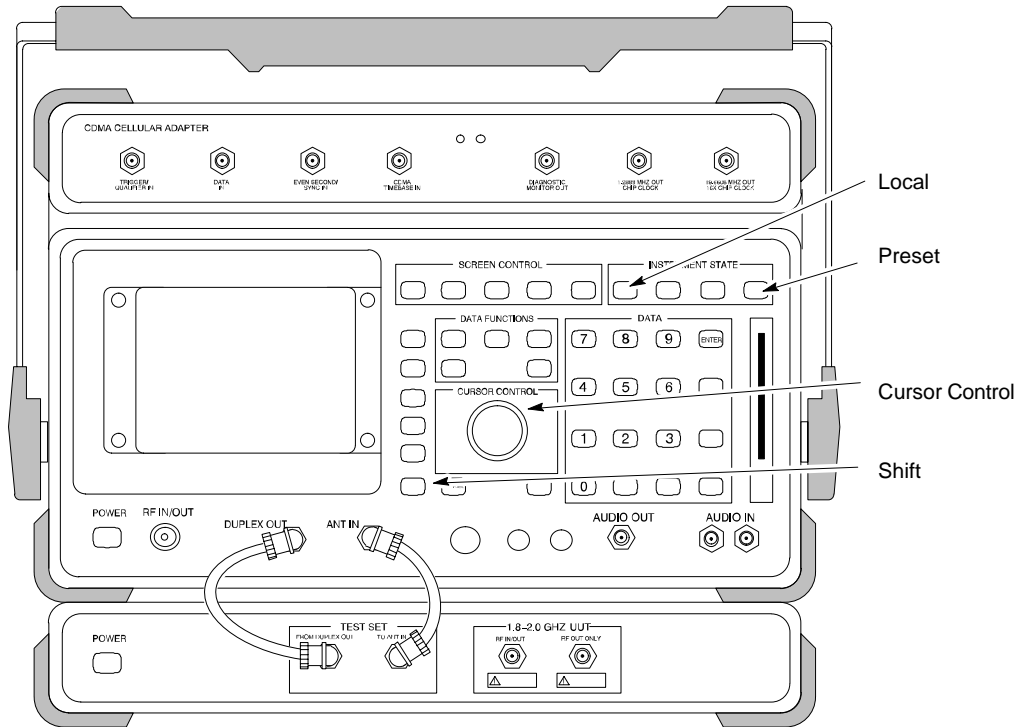
NOTE	This procedure assumes that the test equipment is set up and ready for testing.

Table B-8: Verify and/or Change HP 8921A and HP 83236A GPIB Addresses	
Step	**Action**
1	To verify that the GPIB addresses are set correctly, press **Shift** and **LOCAL** on the HP 8921A. – The current HP–IB address is displayed at the top of the screen. **NOTE** HP–IB is the same as GPIB.
2	If the current HP–IB address is not set to **18**, perform the following to change it:
2a	– Turn the **Cursor Control** knob to move the cursor to **More** and press the knob to select the field.
2b	– Turn the **Cursor Control** knob to move the cursor to **I/O Config** and press the knob to select the field.
2c	– Turn the **Cursor Control** knob to move the cursor to **Adrs** and press the knob to select the field.
2d	– Turn the **Cursor Control** knob to change the HP–IB address to **18** and press the knob to set the address.

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Table B-8: Verify and/or Change HP 8921A and HP 83236A GPIB Addresses

Step	Action
2e	– Press **Shift** and **Preset** to return to normal operation.
3	To set the HP 83236A (or B) PCS Interface GPIB address=**19**, set the DIP switches as follows: – A1=1, A2=1, A3=0, A4=0, A5=1, HP–IB/Ser = 1

**Advantest R3465
Communications Test Set GPIB
Address**

Refer to Figure B-9 and follow the procedure in Table B-9 to verify and, if necessary, change the GPIB address for the Advantest R3465.

Figure B-9: R3465 Communications Test Set
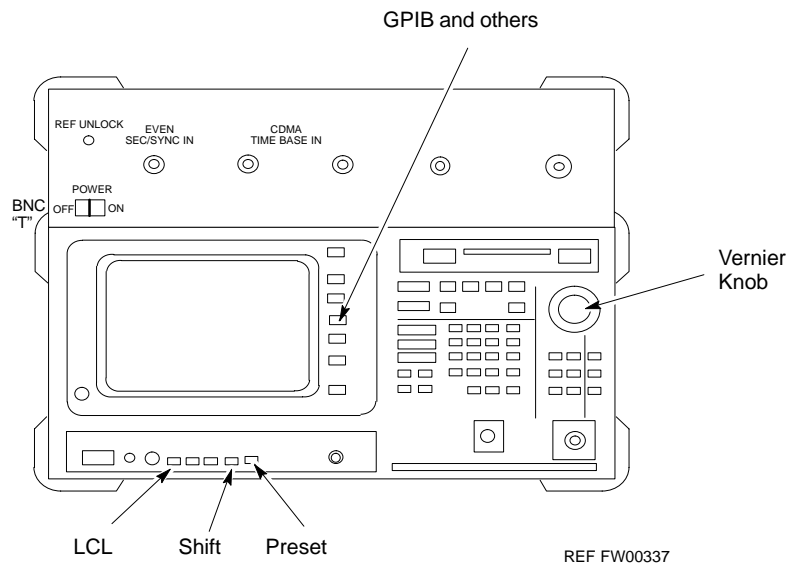
NOTE	This procedure assumes that the test equipment is set up and ready for testing.

Table B-9: Verify and/or Change Advantest R3465 GPIB Address

Step	Action
1	To verify that the GPIB address is set correctly, perform the following:
1a	– Press **SHIFT** then **PRESET**.
1b	– Press **LCL**.
1c	– Press the **GPIB and Others** CRT menu key to view the current address.
2	If the current GPIB address is not set to **18**, perform the following to change it:
2a	– Turn the vernier knob as required to select **18**.

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Table B-9: Verify and/or Change Advantest R3465 GPIB Address	
Step	**Action**
2b	– Press the vernier knob to set the address.
3	To return to normal operation, press **Shift** and **Preset**.

Motorola CyberTest GPIB Address

Follow the steps in Table B-10 to verify and, if necessary, change the GPIB address on the Motorola CyberTest. Changing the GPIB address requires the following items:

- Motorola CyberTest communications analyzer.
- Computer running Windows 3.1/Windows 95.
- Motorola CyberTAME software program "TAME".
- Parallel printer port cable (shipped with CyberTest).

NOTE	This procedure assumes that the test equipment is set up and ready for testing.

Table B-10: Verify and/or Change Motorola CyberTest GPIB Address	
Step	**Action**
1	On the LMF desktop, locate the CyberTAME icon. Double click on the icon to run the CyberTAME application.
2	In the CyberTAME window taskbar, under **Special,** select **IEEE.488.2.**
3	CyberTAME software will query the CyberTest Analyzer for its current GPIB address. It then will open the IEEE 488.2 dialog box. If the current GPIB address is not **18**, perform the following procedure to change it:
3a	Use the up or down increment arrows or double–click in the field and type the number to set the address to **18**.
3b	Click on the **OK** button. The new address will be written to the CyberTest through the parallel port and saved.
4	Verify that the address has been set by repeating steps 2 and 3. The new address should now appear in the IEEE 488.2 dialog box Address field.

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HP 437 Power Meter GPIB Address

Refer to Figure B-10 and follow the steps in Table B-11 to verify and, if necessary, change the HP 437 GPIB address.

Figure B-10: HP 437 Power Meter
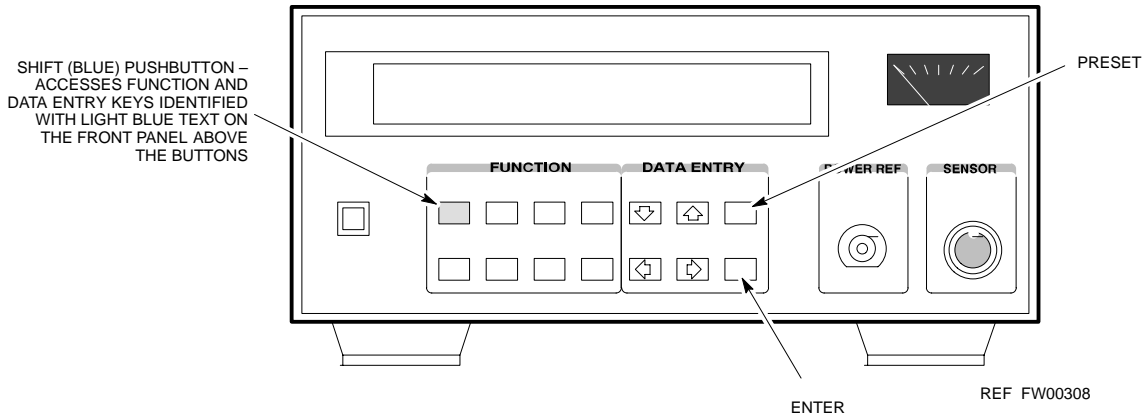
SHIFT (BLUE) PUSHBUTTON – ACCESSES FUNCTION AND DATA ENTRY KEYS IDENTIFIED WITH LIGHT BLUE TEXT ON THE FRONT PANEL ABOVE THE BUTTONS

PRESET

FUNCTION   DATA ENTRY   POWER REF   SENSOR

ENTER

REF FW00308

NOTE	This procedure assumes that the test equipment is set up and ready for testing.

Table B-11: Verify and/or Change HP 437 Power Meter GPIB Address	
Step	**Action**
1	Press **Shift** and **PRESET**.
2	Use the ▲ arrow key to navigate to HP–IB ADRS and press **ENTER**. The HP–IB address is displayed. **NOTE** HP–IB is the same as GPIB.
3	If the current GPIB address is not set to **13**, perform the following to change it: – Use the ▲ ▼ arrow keys to change the HP–IB ADRS to **13**. – Press **ENTER** to set the address.
4	Press **Shift** and **ENTER** to return to a standard configuration.

Gigatronics 8541C Power
Meter GPIB Address

Refer to Figure B-11 and follow the steps in Table B-12 to verify and, if necessary, change the Gigatronics 8541C power meter GPIB address.

Figure B-11: Gigatronics 8541C Power Meter Detail

NOTE	This procedure assumes that the test equipment is set up and ready for testing.

Table B-12: Verify and/or Change Gigatronics 8541C Power Meter GPIB Address	
Step	**Action**
1	**! CAUTION** Do not connect/disconnect the power meter sensor cable with AC power applied to the meter. Disconnection could result in destruction of the sensing element or miscalibration. Press **MENU**.
2	Use the ⬇ arrow key to select **CONFIG MENU** and press **ENTER**.
3	Use the ⬇ arrow key to select **GPIB** and press **ENTER**. The current **Mode** and GPIB **Address** are displayed.
4	If the **Mode** is not set to **8541C**, perform the following to change it: Use the ◀ ▶ arrow keys as required to select **MODE**. Use the ⬇⬆ arrow keys as required to set **MODE** to **8541C**.
5	If the GPIB address is not set to **13**, perform the following to change it: Use the ▶ arrow key to select **ADDRESS**. Use the ⬇⬆ arrow keys as required to set the GPIB address to **13**.
6	Press **ENTER** to return to normal operation.

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Verifying and Setting GPIB Addresses – continued

RS232 GPIB Interface Adapter

Be sure that the RS–232 GPIB interface adapter DIP switches are set as shown in Figure B-12.

Figure B-12: RS232 GPIB Interface Adapter

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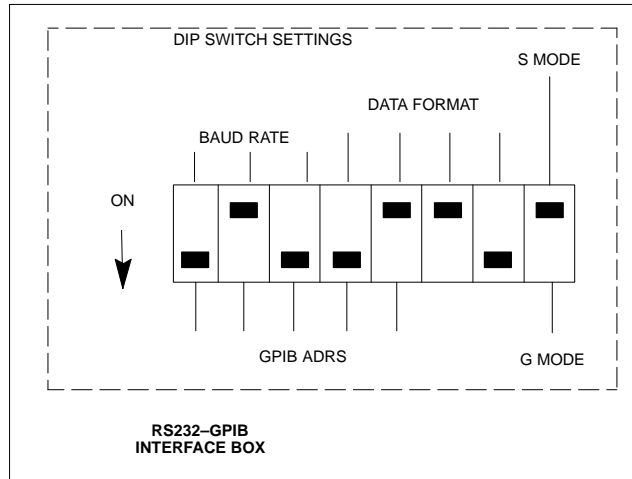
Inter–unit Connection, Testing, and Control Settings

The following illustrations, tables, and procedures provide the information necessary to prepare various items of CDMA test equipment supported by the WinLMF for BTS calibration and/or acceptance testing.

HP 8921A with PCS Interface Test Equipment Connections

The following diagram depicts the rear panels of the HP 8921A test equipment as configured to perform automatic tests. All test equipment is controlled by the WinLMF via an IEEE–488/GPIB bus. The WinLMF expects each piece of test equipment to have a factory-set GPIB address (refer to Table B-8 and Figure B-8). If there is a communications problem between the WinLMF and any piece of test equipment, verify that the GPIB addresses have been set correctly and that the GPIB cables are firmly connected to the test equipment.

Table B-13 shows the connections when *not using* an external 10 MHz Rubidium reference.

Table B-13: HP 8921A/600 Communications Test Set Rear Panel Connections Without Rubidium Reference

From Test Set:	To Interface:		Connector Type
8921A	**83203B CDMA**	**83236A PCS**	
CW RF OUT	CW RF IN		SMC–female – SMC–female
114.3 MHZ IF OUT	114.3 MHZ IF IN		SMC–female – SMC–female
IQ RF IN	IQ RF OUT		SMC–female – SMC–female
DET OUT	AUX DSP IN		SMC–female – SMC–female
CONTROL I/O	CONTROL I/O		45–pin custom BUS
10 MHZ OUT	SYNTH REF IN		BNC–male – BNC–male
HPIB INTERFACE		HPIB INTERFACE	HPIB cable
	10 MHZ OUT	REF IN	BNC–male – BNC–male

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Figure B-13: HP 8921A/600 Cable Connections for 10 MHz Signal and GPIB without Rubidium Reference
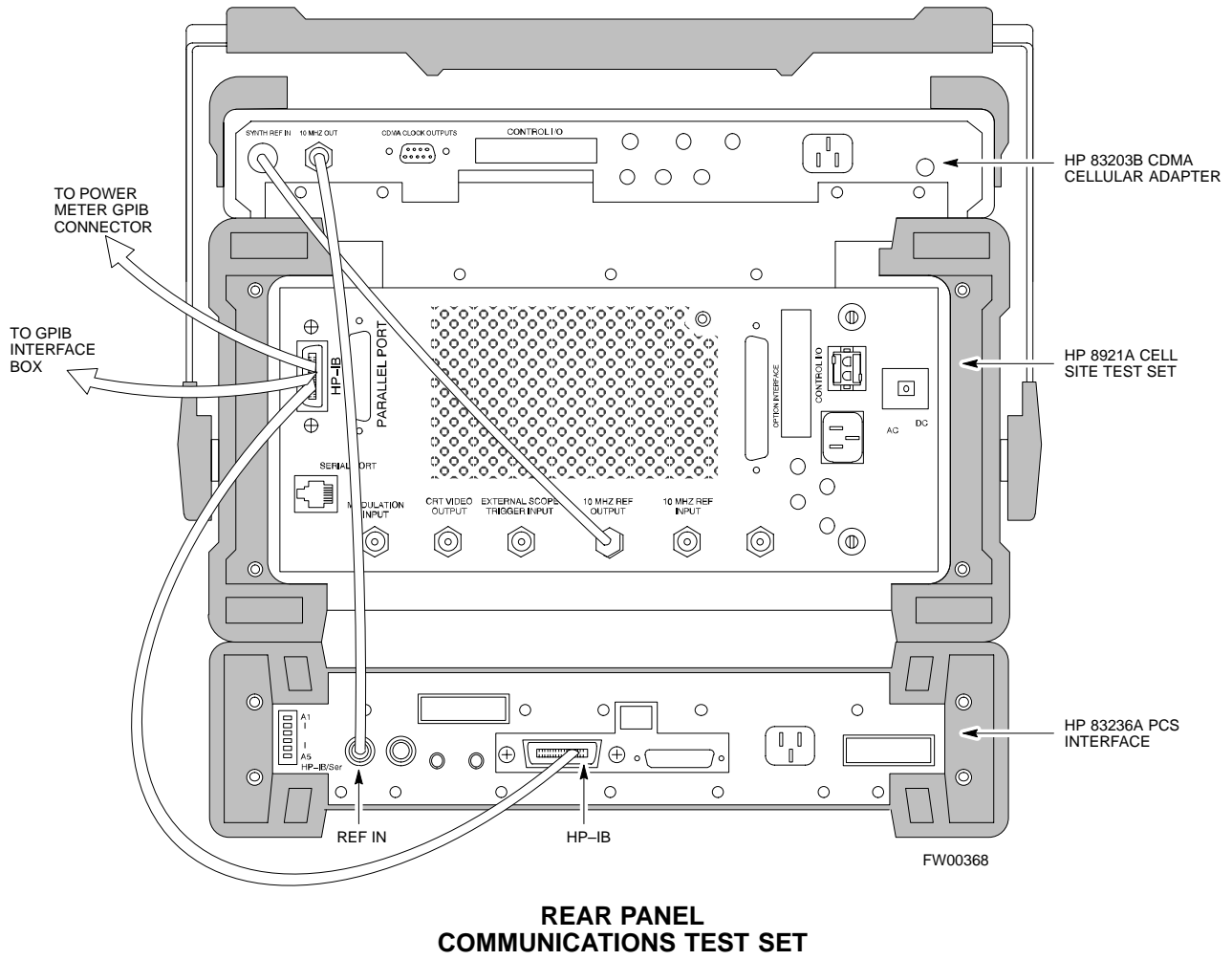
REAR PANEL
COMMUNICATIONS TEST SET

Figure B-14 shows the connections when *using* an external 10 MHz Rubidium reference.

Table B-14: HP 8921A/600 Communications Test Set Rear Panel Connections With Rubidium Reference

From Test Set:	To Interface:		Connector Type
8921A	83203B CDMA	83236A PCS	
CW RF OUT	CW RF IN		SMC–female – SMC–female
114.3 MHZ IF OUT	114.3 MHZ IF IN		SMC–female – SMC–female
IQ RF IN	IQ RF OUT		SMC–female – SMC–female
DET OUT	AUX DSP IN		SMC–female – SMC–female
CONTROL I/O	CONTROL I/O		45–pin custom BUS
10 MHZ OUT		REF IN	BNC–male – BNC–male
HPIB INTERFACE		HPIB INTERFACE	HPIB cable
10 MHZ INPUT	10 MHZ OUT		BNC–male – BNC–male

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Figure B-14: HP 8921A Cable Connections for 10 MHz Signal and GPIB with Rubidium Reference

10 MHZ WITH
RUBIDIUM STANDARD

HP 83203B CDMA
CELLULAR ADAPTER

TO POWER
METER GPIB
CONNECTOR

TO GPIB
INTERFACE
BOX

HP 8921A CELL
SITE TEST SET

HP 83236A PCS
INTERFACE

REF IN

HP–IB

FW00369

REAR PANEL
COMMUNICATIONS TEST SET
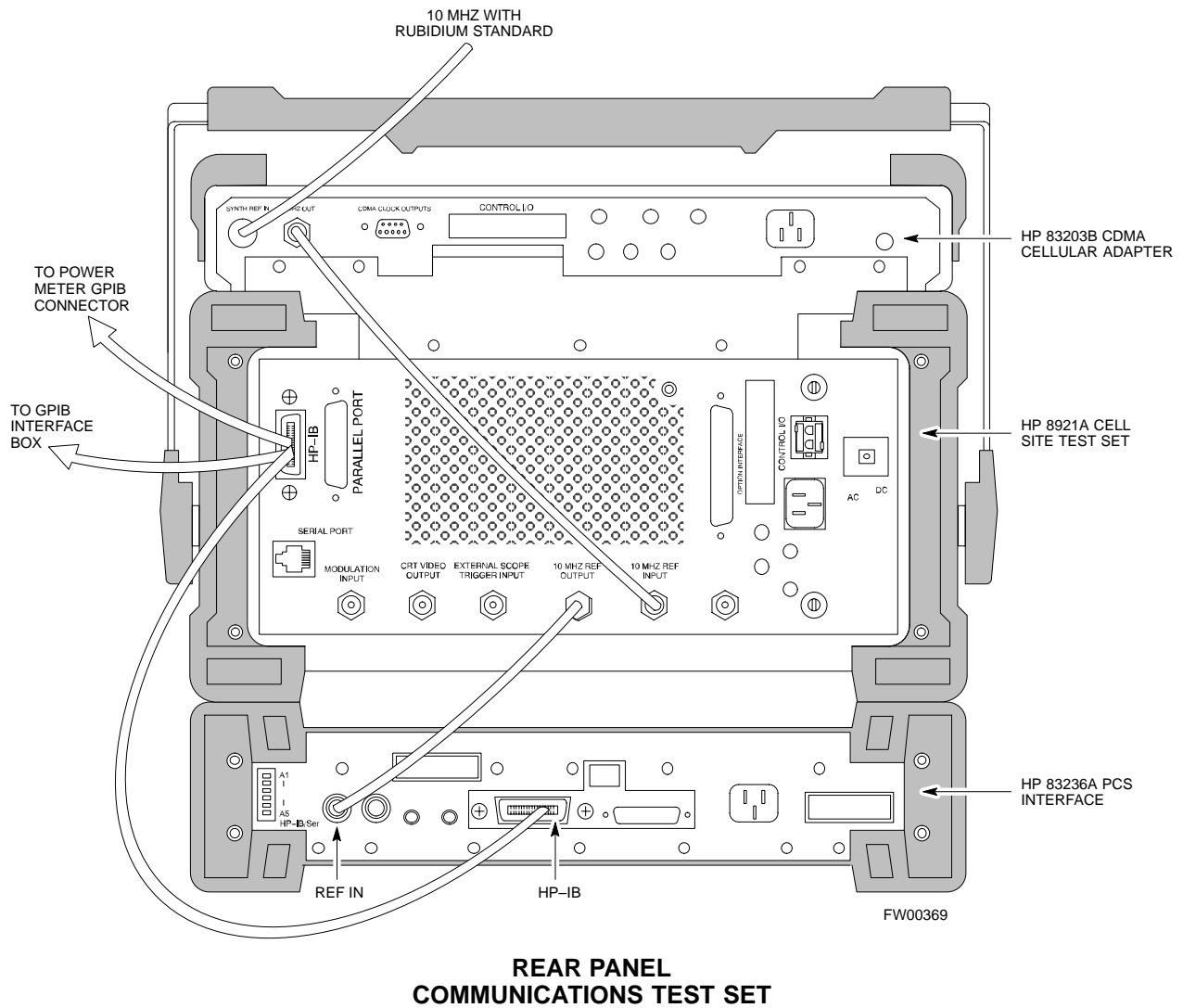
HP 8921A with PCS Interface
System Connectivity Test

Follow the steps outlined in Table B-15 to verify that the connections between the PCS Interface and the HP 8921A are correct and cables are intact. The software also performs basic functionality checks of each instrument.

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> **NOTE**
>
> Disconnect other GPIB devices, especially system controllers, from the system before running the connectivity software.

	Table B-15: System Connectivity
Step	**Action**
	NOTE – Perform this procedure *after* test equipment has been allowed to warm–up and stabilize for a *minimum of 60 minutes*.
1	Insert HP 83236A Manual Control/System card into memory card slot.
2	Press the **[PRESET]** pushbutton.
3	Press the Screen Control **[TESTS]** pushbutton to display the "Tests" Main Menu screen.
4	Position the cursor at **Select Procedure Location** and select it by pressing the cursor control knob. In the Choices selection box, select **Card.**
5	Position the cursor at **Select Procedure Filename** and select it by pressing the cursor control knob. In the Choices selection box, select **SYS_CONN**.
6	Position the cursor at **RUN TEST** and select it. The software will provide operator prompts through completion of the connectivity setup.
7	Do the following when the test is complete, • position cursor on **STOP TEST** and select it • OR press the **[K5]** pushbutton.
8	To return to the main menu, press the **[K5]** pushbutton.
9	Press the **[PRESET]** pushbutton.

Pretest Setup for HP 8921A

Before the HP 8921A CDMA analyzer is used for WinLMF–controlled testing it must be set up correctly for automatic testing. Perform the procedure in Table B-16.

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Table B-16: Pretest Setup for HP 8921A	
Step	**Action**
1	Unplug the memory card if it is plugged in.
2	Press the **CURSOR CONTROL** knob.
3	Position the cursor at **IO CONFIG** (under **To Screen** and **More**) and select it.
4	Select Mode and set for **Talk&Lstn**.

Pretest Setup for Agilent 8935

Before the Agilent 8935 analyzer is used for WinLMF controlled testing it must be set up correctly for automatic testing. Perform the procedure in Table B-17.

Table B-17: Pretest Setup for Agilent 8935	
Step	**Action**
1	Unplug the memory card if it is plugged in.
2	Press the **Shift** button and then press the **I/O Config** button.
3	Press the **Push to Select** knob.
4	Position the cursor at **IO CONFIG** and select it.
5	Select **Mode** and set for **Talk&Lstn**.

Advantest R3465 Connection

The following diagram depicts the rear panels of the Advantest R3465 test equipment as configured to perform automatic tests. All test equipment is controlled by the WinLMF via an IEEE–488/GPIB bus. The WinLMF expects each piece of test equipment to have a factory-set GPIB address (refer to Table B-9 and Figure B-9). If there is a communications problem between the WinLMF and any piece of test equipment, verify that the GPIB addresses have been set correctly and that the GPIB cables are firmly connected to the test equipment.

Figure B-15 shows the connections when *not using* an external 10 MHz Rubidium reference.

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Figure B-15: Cable Connections for Test Set without 10 MHz Rubidium Reference

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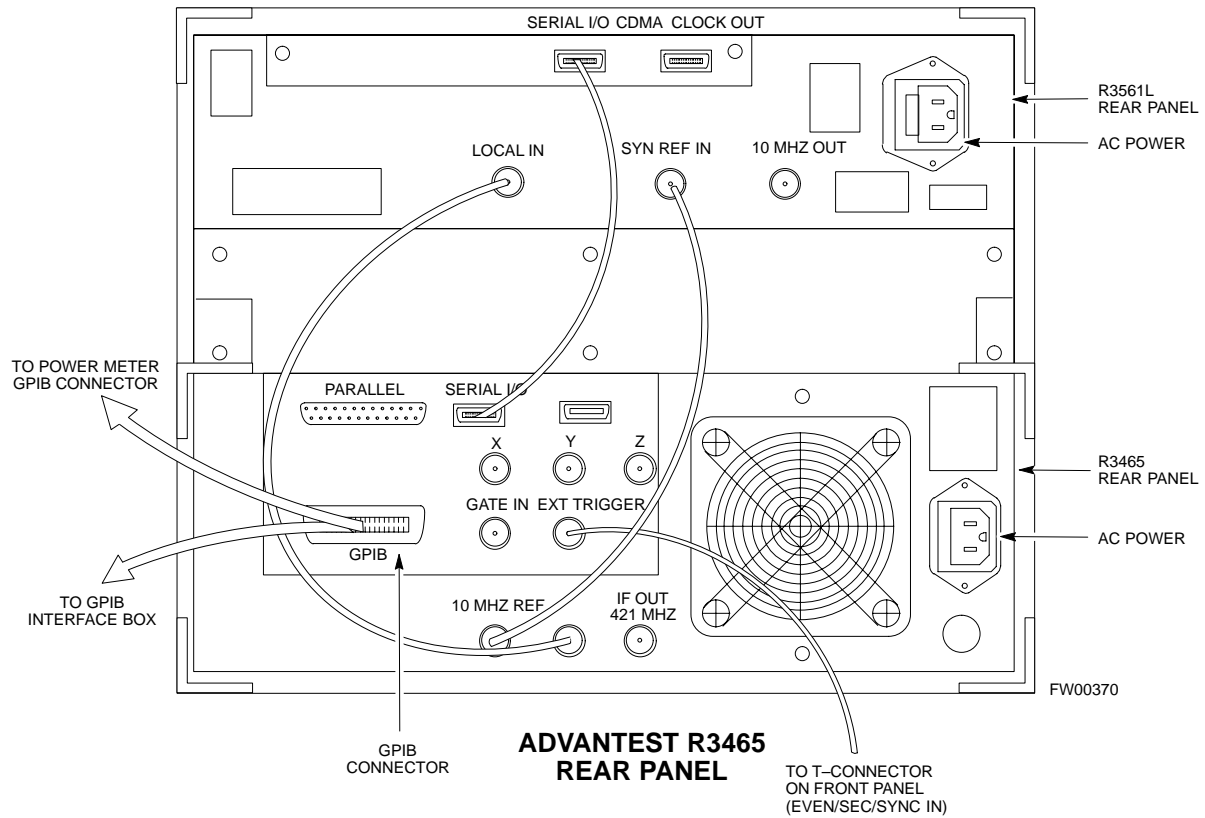
B

Figure B-16 shows the connections when *using* an external 10 MHz Rubidium reference.

Figure B-16: Cable Connections for Test Set with 10 MHz Rubidium Reference
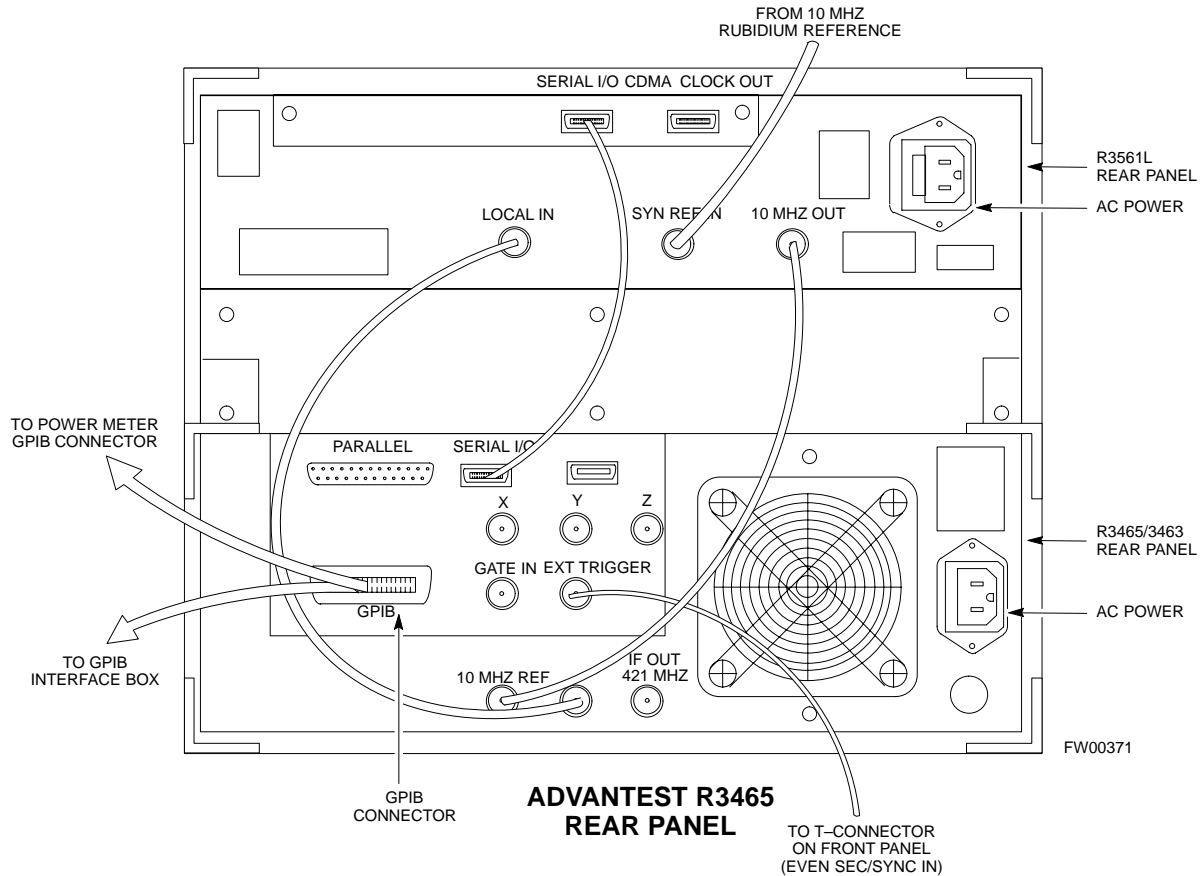
R3465 GPIB Clock Set–up

Table B-18 describes the steps to set the clock for the **Advantest** R3465 equipment.

Step	Action
Table B-18: Advantest R3465 Clock Setup
1	Observe the current date and time displayed in upper right of the CRT display.
2	If the date and time are incorrect, perform the following to change them:
2a	– Push the **Date/Time CRT** menu key.
2b	– Rotate the vernier knob to select and set.
2c	– Push the vernier knob to enter.
2d	– Push the **SHIFT** then **PRESET** pushbutton (just below the CRT display).

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Pretest Setup for Advantest R3465

Before the Advantest R3465 analyzer is used for WinLMF–controlled testing it must be set up correctly for automatic testing. Perform the procedure in Table B-19.

Step	Action
— **Table B-19:** Pretest Setup for Advantest R3465	
1	Press the **SHIFT** button so the LED next to it is illuminated.
2	Press the **RESET** button.

Agilent 8932/E4432B Test Equipment Interconnection

To perform FER testing on a 1X BTS with the Agilent 8935, a 1X–capable signal generator, such as the Agilent E4432B, must be used in conjunction with the CDMA base station test set. For proper operation, the test equipment items must be interconnected as follows:

10 MHz reference signal – Connect a BNC (M)–BNC (M) cable from the 8935 **10 MHz REF OUT** connector to the E4432B **10MHz IN** connector as shown in Figure B-17

Even second pulse reference – Refer to Figure B-17, and connect a BNC "T" connector to the 8935 **EVEN SEC SYNC IN** connector. Connect a BNC (M)–BNC (M) cable from one side of the BNC "T" to the E4432B **PATTERN TRIG IN** connector. Connect the other side of the BNC "T" to the CSA Card **SYNC MONITOR** connector using a BNC (M)–BNC (M) cable.

Test Equipment Connection, Testing, and Control – continued

Figure B-17: Agilent 8935/E4432B 10MHz Reference and Even Second Tick Connections

E4432B
PATTERN TRIG IN

E4432B
10 MHz IN

TO GPIB

8935
**10 MHz
REF OUT**

8935
**EVEN SECOND
SYNC IN**
WITH BNC "T"

TO CSA CARD
SYNC MONITOR
(EVEN SEC TICK)
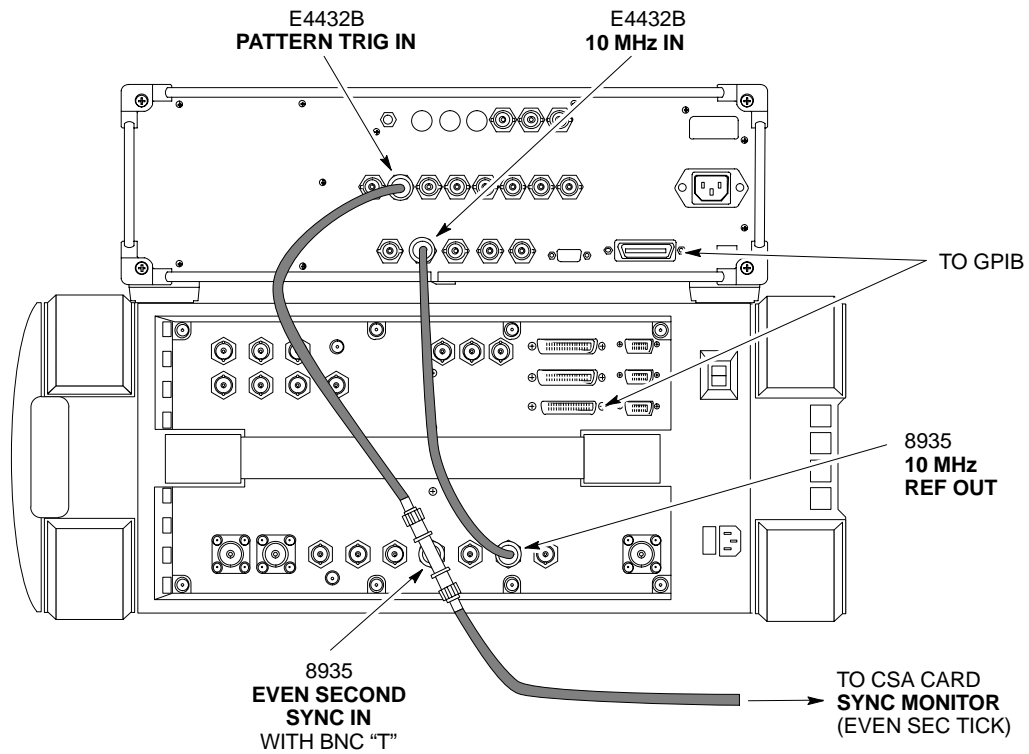
TDME0011–1

Agilent E4406A/E4432B Test Equipment Interconnection

To provide proper operation during testing when both units are required, the 10 MHz reference signal from the E4406A transmitter test set must be provided to the E4432B signal generator. Connect a BNC (M)–BNC (M) cable from the E4406A **10 MHz OUT (SWITCHED)** connector to the E4432B **10MHz IN** connector as shown in Figure B-18.

Figure B-18: Agilent 10 MHz Reference Connections

E4432B
10 MHz IN

TO GPIB BOX

E4406A
**10 MHz OUT
(SWITCHED)**

TDME0009–1

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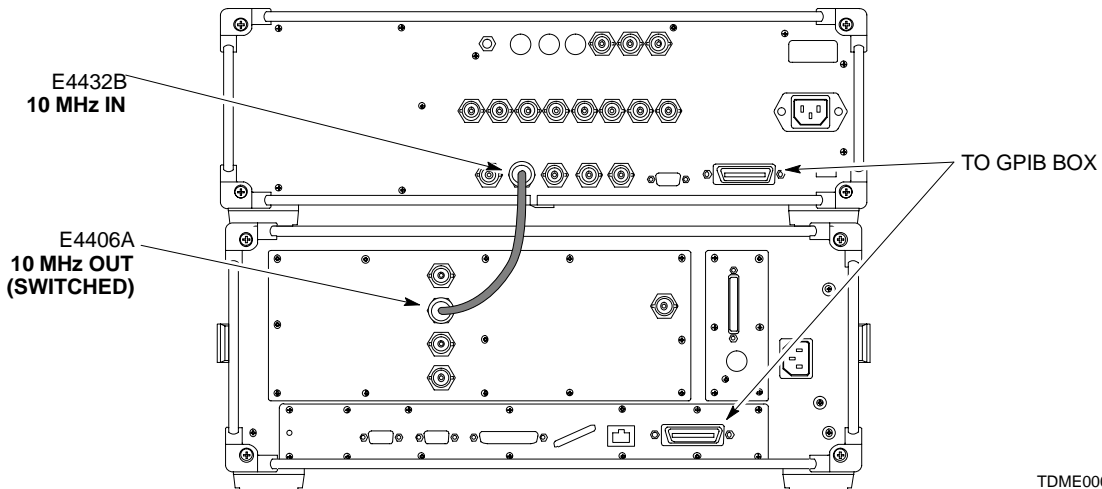
Advantest R3267/R3562 Test Equipment Interconnection

To provide proper operation during testing when both units are required, the R3257 spectrum analyzer must be interconnected with the R3562 signal generator as follows:

10 MHz reference signal – Connect a BNC (M)–BNC (M) cable between the R3562 **SYNTHE REF IN** connector and the R3267 **10 MHz OUT** connector as shown in Figure B-19.

Serial I/O – Using the Advantest cable provided, connect the R3267 **SERIAL I/O** connector to the R3562 **SERIAL I/O** connector as shown in Figure B-19.

Figure B-19: Advantest 10 MHz Reference and Serial I/O Connections

TDME0010–1

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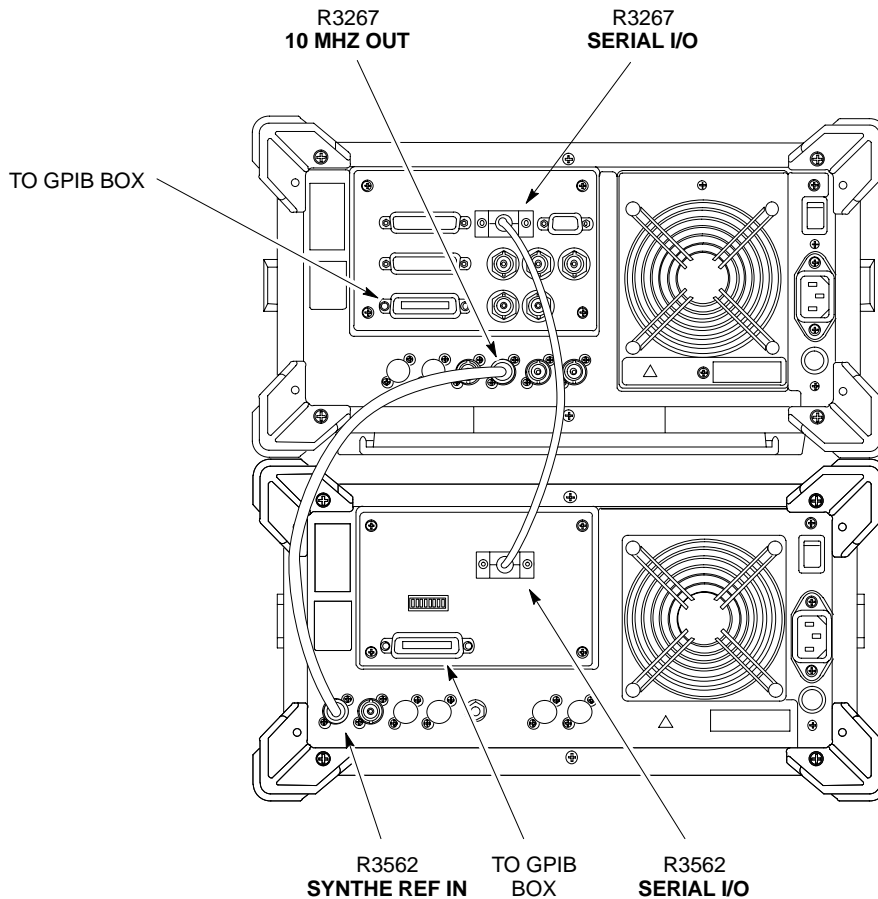
Equipment Calibration

Calibration Without the LMF

Several test equipment items used in the optimization process require pre–calibration actions or calibration verification which are not supported by the LMF. Procedures to perform these activities for the applicable test equipment items are covered in this section.

Agilent E4406A Transmitter Tester Self–alignment (Calibration)

Figure B-20: Performing Agilent E4406A Self–alignment (Calibration)

Softkey Label Display Area

System Key

Softkey Buttons
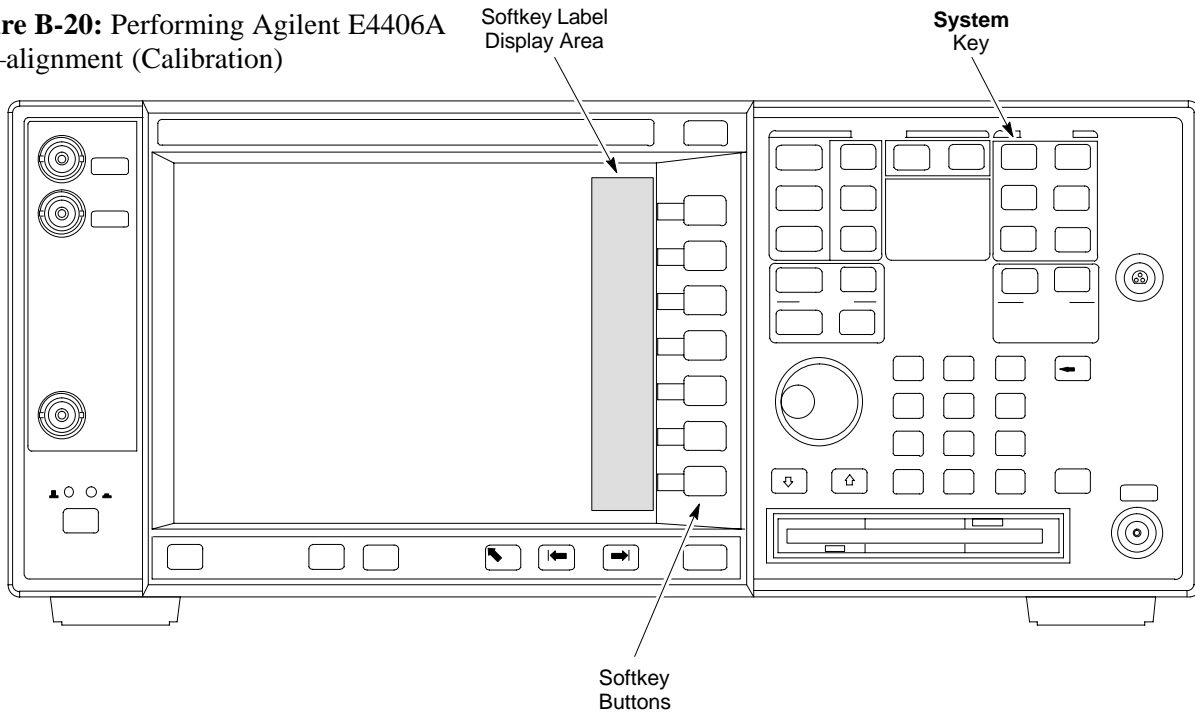
Refer to Figure B-20 and follow the procedure in Table B-20 to perform the Agilent E4406A self–alignment (calibration).

Table B-20: Perform Agilent E4406A Self–alignment (Calibration)	
Step	**Action**
1	In the **SYSTEM** section of the instrument front panel, press the **System** key. – The softkey labels displayed on the right side of the instrument screen will change.
2	Press the **Alignments** softkey button to the right of the instrument screen. – The softkey labels will change.
3	Press the **Align All Now** softkey button. – All other instrument functions will be suspended during the alignment. – The display will change to show progress and results of the alignments performed. – The alignment will take less than one minute.

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Equipment Calibration – continued

**Calibrating HP 437 Power
Meter**

Precise transmit output power calibration measurements are made using a bolometer–type broadband power meter with a sensitive power sensor. Follow the steps outlined in Table B-21 to enter information unique to the power sensor before calibrating the test setup. Refer to Figure B-21 as required.

NOTE	This procedure must be done *before* the automated calibration to enter power sensor specific calibration values.

Figure B-21: Power Meter Detail

FW00308
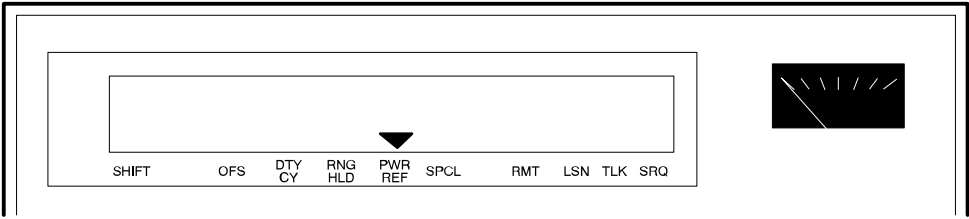
Table B-21: HP 437 Power Meter Calibration Procedure	
Step	**Action**
1	**! CAUTION** Do not connect/disconnect the power meter sensor cable with AC power applied to the meter. Disconnection could result in destruction of the sensing element or mis–calibration. Make sure the power meter **AC LINE** pushbutton is **OFF**.
2	Connect the power sensor cable to the **SENSOR** input.
3	Set the **AC LINE** pushbutton to **ON.** **NOTE** The calibration should be performed only after the power meter and sensor have been allowed to warm–up and stabilize for a *minimum of 60 minutes*.
4	Perform the following to set or verify the correct power sensor model:
4a	– Press **[SHIFT]** then **[◀]** to select **SENSOR**.
4b	– Identify the power sensor model number from the sensor label.
4c	– Use the **[▲]** or **[▼]** button to select the appropriate model; then press **[ENTER]**.
5	Refer to the illustration for step 8, and perform the following to ensure the power reference output is OFF:

. . . continued on next page

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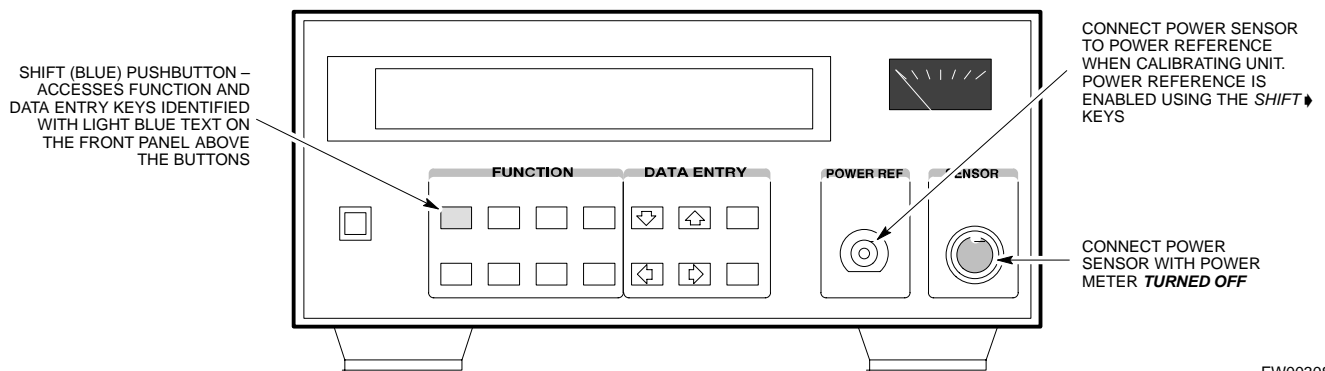| Step	Action
	Table B-21: HP 437 Power Meter Calibration Procedure
5a	– Observe the instrument display and determine if the triangular indicator over **PWR REF** is displayed.
5b	– If the triangular indicator is displayed, press **[SHIFT]** then **[▶]** to turn it off.
6	Press **[ZERO]**. – Display will show "Zeroing ******." – Wait for process to complete.
7	Connect the power sensor to the **POWER REF** output.
8	Turn on the **PWR REF** by performing the following:
8a	– Press **[SHIFT]** then **[▶]**.
8b	– Verify that the triangular indicator (below) appears in the display above **PWR REF**.
9	Perform the following to set the **REF CF%**:
9a	– Press (**[SHIFT]** then **[ZERO]**) for **CAL**.
9b	– Enter the sensor's **REF CF%** from the sensor's decal using the arrow keys and press **[ENTER]**. (The power meter will display "CAL *****" for a few seconds.) **NOTE** If the REF CAL FACTOR (REF CF) is not shown on the power sensor, assume it to be 100%.
10	Perform the following to set the **CAL FAC %**:
10a	– Press **[SHIFT]** then **[FREQ]** for **CAL FAC**.
10b	– On the sensor's decal, locate an approximate calibration percentage factor (**CF%**) at 2 GHz.
10c	– Enter the sensor's calibration % (**CF%**) using the arrow keys and press **[ENTER]**. — When complete, the power meter will typically display 0.05 dBm. (Any reading between 0.00 and 0.10 is normal.)
11	To turn off the **PWR REF**, perform the following:
11a	– Press **[SHIFT]** then **[▶]**.
11b	– Disconnect the power sensor from the **POWER REF** output.

Equipment Calibration – continued

Calibrating Gigatronics 8541C Power Meter

Precise transmit output power calibration measurements are made using a bolometer–type broadband power meter with a sensitive power sensor. Follow the steps in Table B-22 to enter information unique to the power sensor.

Step	Action
	Table B-22: Calibrate Gigatronics 8541C Power Meter
1	**! CAUTION** Do not connect/disconnect the power meter sensor cable with AC power applied to the meter. Disconnection could result in destruction of the sensing element or miscalibration. Make sure the power meter **POWER** pushbutton is **OFF**.
2	Connect the power sensor cable to the **SENSOR** input.
3	Set the **POWER** pushbutton to **ON.** **NOTE** Allow the power meter and sensor to warm up and stabilize for a *minimum of 60 minutes* before performing the calibration procedure.
4	Connect the power sensor to the **CALIBRATOR** output connector.
5	Press **ZERO**. – Wait for the process to complete. Sensor factory calibration data is read to power meter during this process.
6	When the zeroing process is complete, disconnect the power sensor from the **CALIBRATOR** output.

Figure B-22: Gigatronics 8541C Power Meter Detail
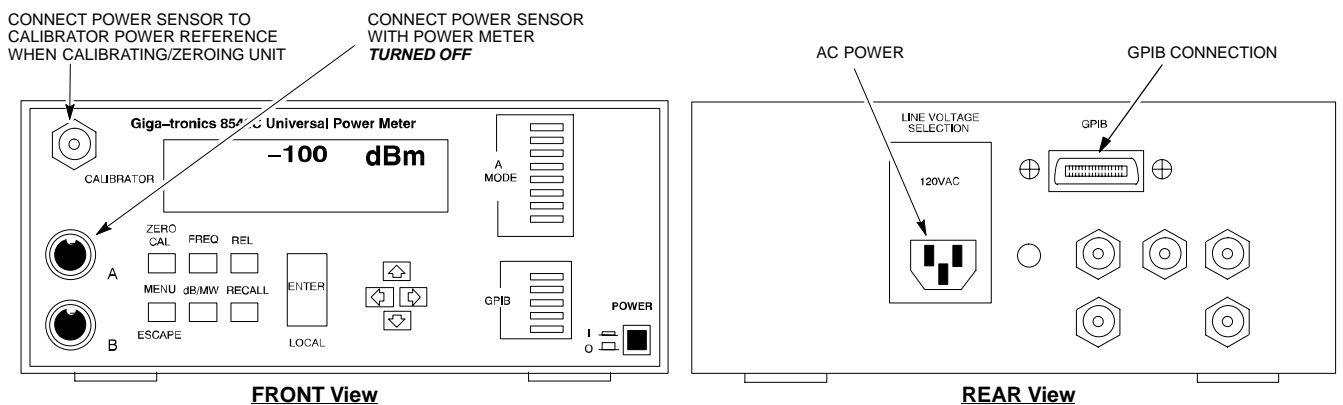
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Manual Cable Calibration

**Calibrating Test Cable Setup
Using HP PCS Interface
(HP83236)**

Table B-23 covers the procedure to calibrate the test equipment using the HP8921 Cellular Communications Analyzer equipped with the HP83236 PCS Interface.

NOTE	This calibration method *must be executed with great care.* Some losses are measured close to the minimum limit of the power meter sensor (–30 dBm).

Prerequisites

Ensure the following prerequisites have been met before proceeding:

- Test equipment to be calibrated has been connected correctly for cable calibration.
- Test equipment has been selected and calibrated.

Table B-23: Calibrating Test Cable Setup (using the HP PCS Interface)	
Step	**Action**
	NOTE Verify that GPIB controller is turned off.
1	Insert HP83236 Manual Control System card into memory card slot.
2	Press the **Preset** pushbutton.
3	Under **Screen Controls**, press the **TESTS** pushbutton to display the **TESTS** (Main Menu) screen.
4	Position the cursor at **Select Procedure Location** and select it. In the Choices selection box, select **CARD.**
5	Position the cursor at **Select Procedure Filename** and select it. In the Choices selection box, select **MANUAL**.
6	Position the cursor at **RUN TEST** and select it. HP must be in Control Mode **Select YES.**
7	If using **HP83236A:** Set channel number=<*chan#*>: – Position cursor at **Channel Number** and select it. – Enter the *chan#* using the numeric keypad; press **[Enter]** and the screen will go blank. – When the screen reappears, the *chan#* will be displayed on the channel number line. If using **HP83236B:** Set channel frequency: – Position cursor at **Frequency Band** and press **Enter**. – Select **User Defined Frequency**. – Go **Back to Previous Menu**. – Position the cursor to **83236** generator frequency and enter actual RX frequency. – Position the cursor to **83236** analyzer frequency and enter actual TX frequency.
8	Set RF Generator level: – Position the cursor at **RF Generator Level** and select it. – Enter **–10** using the numeric keypad; press [**Enter**] and the screen will go blank. – When the screen reappears, the value –10 dBm will be displayed on the RF Generator Level line.

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Table B-23: Calibrating Test Cable Setup (using the HP PCS Interface)	
Step	**Action**
9	Set the user fixed Attenuation Setting to **0 dBm:** – Position cursor at **Analyzer Attenuation** and select it – Position cursor at **User Fixed Atten Settings** and select it. – Enter 0 (zero) using the numeric keypad and press [**Enter**].
10	Select **Back to Previous Menu**.
11	Record the HP83236 Generator Frequency Level: Record the HP83236**B** Generator Frequency Level: – Position cursor at **Show Frequency and Level Details** and select it. – Under HP83236 Frequencies and Levels, record the Generator Level. – Under HP83236**B** Frequencies and Levels, record the Generator Frequency Level (1850 – 1910 MHz). – Position cursor at **Prev Menu** and select it.
12	Click on **Pause for Manual Measurement**.
13	Connect the power sensor directly to the *RF OUT ONLY* port of the PCS Interface.
14	On the HP8921A, under **To Screen,** select **CDMA GEN**.
15	Move the cursor to the **Amplitude** field and click on the Amplitude value.
16	Increase the Amplitude value until the power meter reads **0 dBm ±0.2 dB**.
	NOTE The Amplitude value can be increased coarsely until 0 dBM is reached; then fine tune the amplitude by adjusting the **Increment Set** to 0.1 dBm and targeting in on 0 dBm.
17	Disconnect the power sensor from the *RF OUT ONLY* port of the PCS Interface.
	NOTE The Power Meter sensor's lower limit is –30 dBm. Thus, only components having losses ≤30 dB should be measured using this method. **For further accuracy, always re-zero the power meter before connecting the power sensor to the component being calibrated. After connecting the power sensor to the component, record the calibrated loss immediately.**

18	Disconnect all components in the test setup and calibrate each one separately by connecting each component, one-at-a-time, between the *RF OUT ONLY PORT* and the power sensor. Record the calibrated loss value displayed on the power meter.
	
	• Example: (A) Test Cable(s) = –1.4 dB
	               (B) 20 dB Attenuator = –20.1 dB
	               (B) Directional Coupler = –29.8 dB

19	After all components are calibrated, reassemble all components together and calculate the total test setup loss by adding up all the individual losses: • Example: Total test setup loss = –1.4 –29.8 –20.1 = –51.3 dB. This calculated value will be used in the next series of tests.
20	Under **Screen Controls** press the **TESTS** button to display the **TESTS** (Main Menu) screen.

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Manual Cable Calibration – continued

	Table B-23: Calibrating Test Cable Setup (using the HP PCS Interface)
Step	**Action**
21	Select **Continue** (K2).
22	Select **RF Generator Level** and set to –119 dBm.
23	Click on **Pause for Manual Measurement**.

24	Verify the HP8921A Communication Analyzer/83203A CDMA interface setup is as follows (fields not indicated remain at default):
	
	• Verify the GPIB (HP–IB) address:
	  – under **To Screen,** select **More**
	  – select **IO CONFIG**
	  – Set HP–IB Adrs to **18**
	  – set Mode to **Talk&Lstn**
	
	• Verify the HP8921A is displaying frequency (instead of RF channel)
	  – Press the blue **[SHIFT]** button, then press the Screen Control **[DUPLEX]** button; this switches to the **CONFIG** (CONFIGURE) screen.
	  – Use the cursor control to set RF Display to **Freq**

25	Refer toChapter 3 for assistance in setting the cable loss values into the LMF.

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Manual Cable Calibration – continued

Figure B-23: Cable Calibration Using HP8921 with PCS Interface

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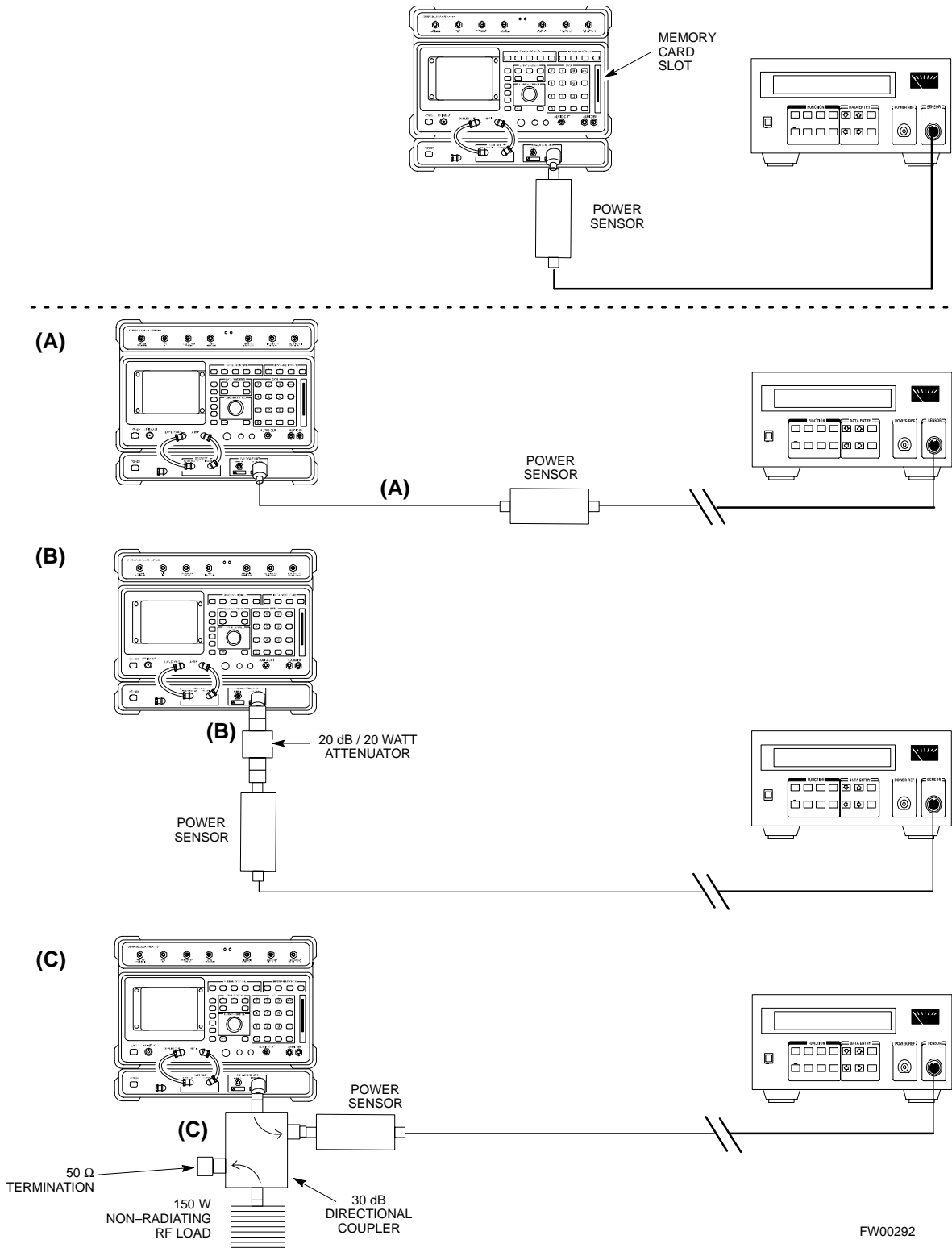
**Calibrating Test Cable Setup
Using Advantest R3465**

NOTE	Be sure the GPIB Interface is OFF for this procedure.

Advantest R3465 Manual Test setup and calibration must be performed at both the TX and RX frequencies.

Table B-24: Procedure for Calibrating Test Cable Setup Using Advantest R3465

Step	Action
	* IMPORTANT – This procedure can only be performed *after* test equipment has been allowed to warm–up and stabilize for a *minimum of 60 minutes*.
1	Press the **SHIFT** and the **PRESET** keys located below the display
2	Press the **ADVANCE** key in the MEASUREMENT area of the control panel**.**
3	Select the **CDMA Sig** CRT menu key
4	Select the **Setup** CRT menu key
5	Using the vernier knob and the cursor keys set the following parameters **NOTE** Fields not listed remain at default **Generator Mode:** SIGNAL **Link:** FORWARD **Level Unit:** dBm **CalCorrection:** ON **Level Offset:** OFF
6	Select the **return** CRT menu key
7	Press **FREQ** key in the ENTRY area
8	Set the frequency to the desired value using the keypad entry keys
9	Verify that the **Mod** CRT menu key is highlighting OFF; if not, press the **Mod** key to toggle it OFF.
10	Verify that the **Output** CRT menu key is highlighting OFF; if not, press the **Output** key to toggle it OFF.
11	Press the **LEVEL** key in the ENTRY area.
12	Set the LEVEL to **0 dBm** using the key pad entry keys.
13	Zero power meter. Next connect the power sensor directly to the "RF OUT" port on the R3561L CDMA Test Source Unit.
14	Press the **Output** CRT menu key to toggle Output to ON.
15	Record the power meter reading _____

B

Table B-24: Procedure for Calibrating Test Cable Setup Using Advantest R3465	
Step	**Action**
16	Disconnect the power meter sensor from the R3561L RF OUT jack.
	* IMPORTANT The Power Meter sensor's lower limit is –30 dBm. Thus, only components having losses $\leq$ 30 dB should be measured using this method. **For best accuracy, always re–zero the power meter before connecting the power sensor to the component being calibrated. Then, after connecting the power sensor to the component, record the calibrated loss immediately.**

17	Disconnect all components in the the test setup and calibrate each one separately. Connect each component one–at–a–time between the "RF OUT" port and the power sensor (see Figure B-24, "Setups A, B, and C"). Record the calibrated loss value displayed on the power meter for each connection.
	
	Example: (A) 1st Test Cable = –0.5 dB
	               (B) 2nd Test Cable = –1.4 dB
	               (C) 20 dB Attenuator = –20.1 dB
	               (D) 30 dB Directional Coupler = –29.8 dB

18	Press the **Output** CRT menu key to toggle Output OFF.
19	Calculate the total test setup loss by adding up all the individual losses: Example: Total test setup loss = 0.5 + 1.4 + 20.1 + 29.8 = 51.8 dB This calculated value will be used in the next series of tests.
20	Press the **FREQ** key in the ENTRY area
21	Using the keypad entry keys, set the test frequency to the RX frequency
22	Repeat steps 9 through 19 for the RX frequency.
23	Refer to Chapter 3 for assistance in setting the cable loss values into the LMF.

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Figure B-24: Cable Calibration Using Advantest R3465

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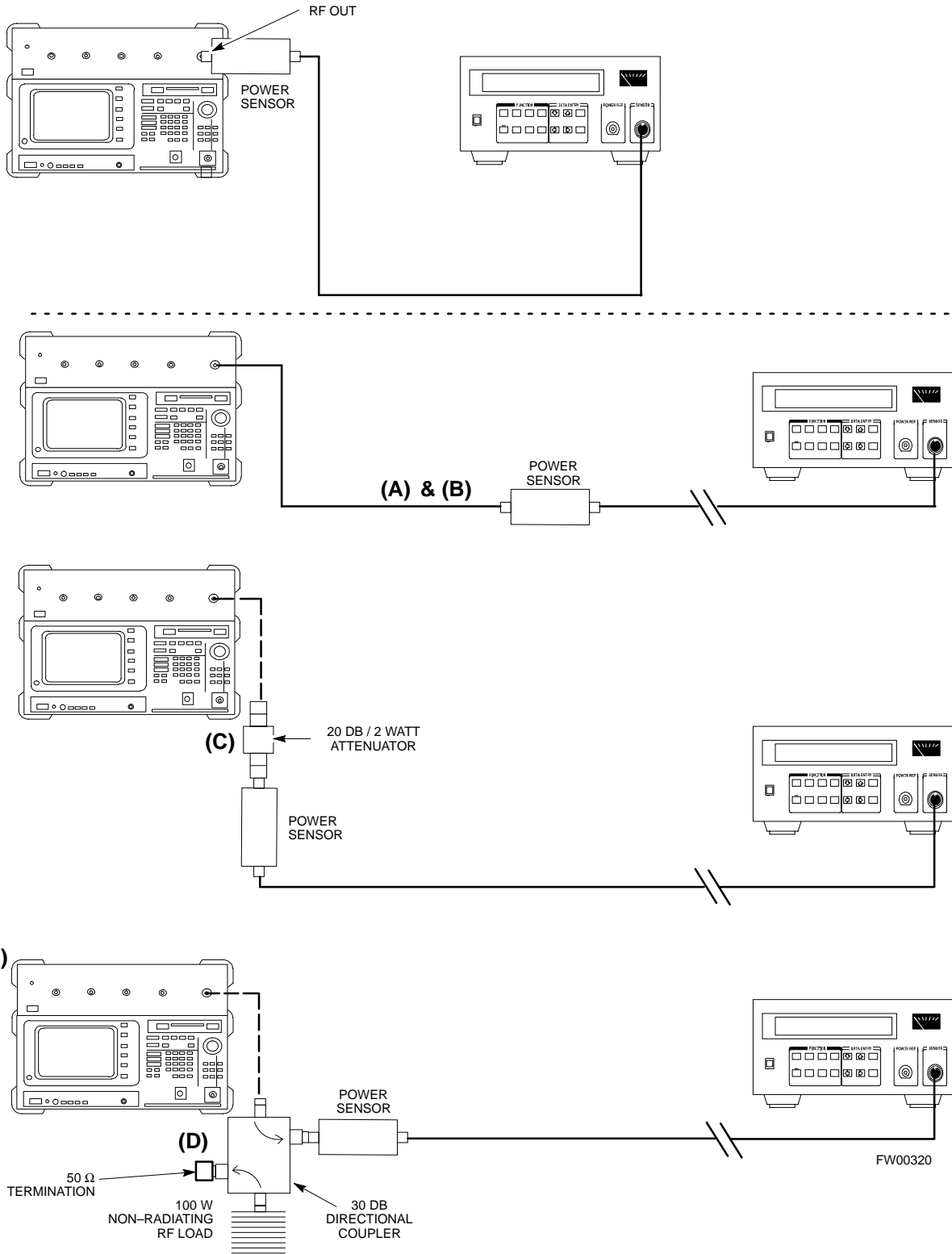
Appendix C: Download ROM Code

Appendix Content

C

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Notes

C

Downloading ROM Code

**Exception Procedure –
Downloading ROM Code**

This procedure is not part of a normal optimization.

Perform this procedure only on an exception basis when no alternative exists to load a BTS device with the correct version of ROM code.

> **NOTE**
>
> One GLI must be INS_ACT (bright green) before ROM code can be downloaded to non–GLI devices.

C

> ⚠ **CAUTION**
>
> The correct ROM and RAM codes for the software release used on the BSS must be loaded into BTS devices. To identify the correct device ROM and RAM code loads for the software release being used on the BSS, refer to the Version Matrix section of the SC™ CDMA Release Notes (supplied on the tapes or CD–ROMs containing the BSS software).
>
> All devices in a BTS must be loaded with the ROM and RAM code specified for the software release used on the BSS before any optimization or ATP procedures can be performed.
>
> If a replacement device is loaded with ROM code which is not compatible with the BSS software release being used, the device ROM code can be changed using the LMF before performing the BTS optimization and ATPs. *A device loaded with later release ROM code can not be converted back to a previous release ROM code in the field without Motorola assistance*

If it is necessary to download ROM code to a device from the LMF, the procedure in Table C-1 includes steps *for both ROM and RAM code download using the LMF.*

Prerequisites

Prior to performing this procedure, ensure the correct ROM and RAM code files exist in the LMF computer's applicable ***<x>:\<lmf home directory>*cdma\loads***<codeload#>***\code** folder for each of the devices to be loaded.

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⚠

CAUTION

The Release level of the ROM code to be downloaded must be the one specified for the software release installed in the BSS. The release level of the ROM code resident in the other devices in the BTS must also be correct for the BSS software release being used. ROM code must not be downloaded to a frame loaded with code for a BSS software release with which it is not compatible.

This procedure should only be used to upgrade replacement devices for a BTS. It should NOT be used to upgrade all devices in a BTS. If a BTS is to be upgraded from R15.x to R16.0, the upgrade should be done by the OMC–R using the DownLoad Manager.

Table C-1: Download ROM and RAM Code to Devices	
Step	**Action**
1	Click on the device to be loaded.
	NOTE
	More than one device of the *same* type can be selected for download by either clicking on each one to be downloaded or from the BTS menu bar **Select** pull–down menu, select the *device* item that applies.
	Where: *device* = the type of device to be loaded (BBX, CSA, GLI, MCC)
2	From the BTS menu bar **Device** pull–down menu, select **Status**.
	– A status report window will appear.
3	Make a note of the number in the **HW Bin Type** column.
	NOTE
	"HW Bin Type" is the Hardware Binary Type for the device. This code is used as the last four digits in the filename of a device's binary ROM code file. Using this part of the filename, the ROM code file can be matched to the device in which it is to be loaded.
4	Click **OK** to close the status window.
5	Click on the device to be loaded.
	NOTE
	ROM code is automatically selected for download from the `<x>:\<lmf home directory>\version folder>\<code folder>` specified by the NextLoad property in the `bts-#.cdf` file. To check the value of the NextLoad property, click on **Util > Examine > Display** Nextload. A pop–up message will show the value of the NextLoad.
6	From the BTS menu bar **Device** pull–down menus, select **Download > ROM**.
	– If the file matching the Hardware Binary Type of the device is found in the code folder, a status report shows the result of the download. Proceed to Step 11.
	– If a file selection window appears, select the ROM code file manually.
7	Double–click on the version folder with the desired version number for the ROM code file (for example *2.16.0.x*).

Step	Action
	Table C-1: Download ROM and RAM Code to Devices
8	Double–click the **Code** folder. – A list of ROM and RAM code files will be displayed.
9	**! CAUTION** A ROM code file with the correct HW Bin Type must be chosen. Using a file with the wrong HW Bin Type can result in unpredictable operation and damage to the device. Click on the ROM code file with the filename which matches the device type and HW Bin Type number noted in step 3 (for example, file **bbx_rom.bin.0604** is the ROM code file for a BBX with a HW Bin Type of 0604). – The file should be highlighted.
10	Click on the **Load** button. – A status report window is displayed showing the result of the download. **NOTE** If the ROM load failed for some devices, load them *individually* by clicking on one device, perform steps 6 through 10 for it, and repeat the process for each remaining device.
11	Click **OK** to close the status window.
12	From the LMF window menu bar **Tools** pull–down menus, select **Update NextLoad > CDMA**.
13	In the left–hand pane of the window which opens, click on the BTS number for the frame being loaded (for example, *BTS–14*).
14	On the list of versions displayed in the right–hand pane, click the button next to the version number of the folder that was used for the ROM code download (for example, *2.16.0.x*) and click **Save**. – A pop–up message will appear showing the CDF has been updated.
15	Click on the **OK** button to dismiss the pop–up message.
16	Click on the device that was loaded with ROM code.
17	**NOTE** RAM code is automatically selected for download. From the BTS menu bar **Device** pull–down menus, select **Download > Code/Data** to download RAM code and dds file data. – A status report is displayed showing the result of the download.
18	Click **OK** to close the status window.
19	Observe the downloaded non–GLI device to ensure it is OOS_RAM (yellow).
20	Click on the device which was loaded with code.
21	From the BTS menu bar **Device** pull–down menu, select **Status**. Verify that the correct ROM and RAM version numbers are displayed in the status report window.
22	Click **OK** to close the status window.

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Appendix Content

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Notes

D

MMI Cable Fabrication

Purpose

When the Motorola SLN2006A MMI Interface Kit is not available, a cable can be fabricated by the user to interface a nine–pin serial connector on an LMF computer platform with an MMI connector on GLI cards and other Motorola BTS assemblies. This section provides information necessary for fabricating this cable.

Required Parts

Table D-1: Parts Required to Fabricate MMI Cable			
Item	**Part Number**	**Qty**	**Description**
A	Motorola 3009786R01	1	Ribbon cable assembly, 1.524 M, one 8–contact MMI connector, one 10–contact connector
B	AMP 749814–1, Belkin A4B202BGC, or equivalent	1	Receptacle kit, unassembled, 9–position, socket contacts, unshielded, metal or plastic shell, solder or crimp–type contacts

Cable Details

Figure D-1 illustrates the details of the fabricated MMI cable.

Figure D-1: Fabricated MMI Cable Details

**8–Contact MMI Plug
Socket Numbering
(Mating Side)**

1 3 5 7

2 4 6 8

Item B

**DB–9 Plug
Socket Numbering
(Mating Side)**

5 4 3 2 1

9 8 7 6

Item A: Cable assembly 3009786R01 (with 10–contact plug removed)
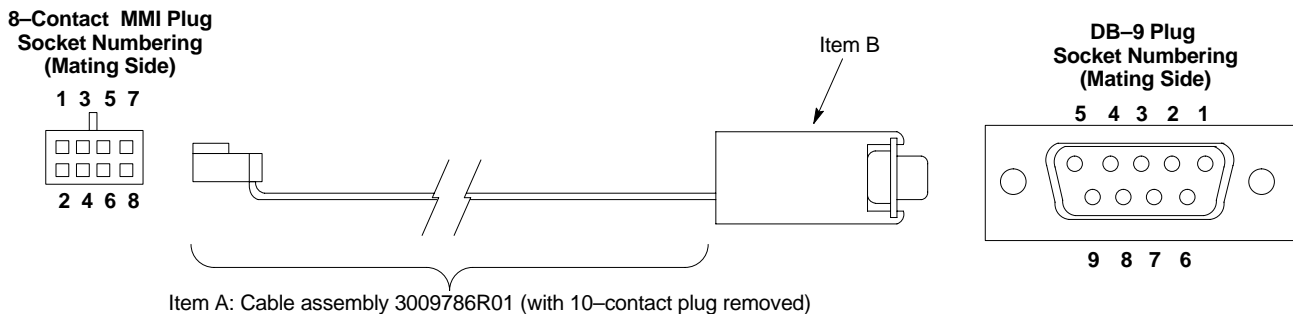
FABRICATION NOTES:
1. Remove 10–contact connector from ribbon cable of cable assembly 3009786R01
2. Separate wires at unterminated end of ribbon cable as required to connect to DB–9 connector contacts
3. Dark wire on ribbon cable of cable assembly 3009786R01 connects to pin 1 of the 8–contact plug
4. Strip three ribbon cable wires with connections specified in Table D-2 and connect to DB–9 plug contacts as specified in Table D-2
5. Shorten un–connected ribbon cable wires enough to prevent contacting DB–9 contacts, leaving enough wire to egage any strain relief in the DB–9 connector shell

MMIFAB001–0

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Wire Run List

Table D-2 provides the wire run/pin–out information for the fabricated MMI cable.

Table D-2: Fabricated MMI Cable Wire Run List		
8–CONTACT MMI PLUG CONTACT		**DB–9 PLUG CONTACT**
1	————————	5
2	————————	2
3	————————	3
4		No Connection (NC)
5		NC
6		NC
7		NC
8		NC

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Appendix E: Multiple BTS Configurations

Appendix Content

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Compact BTS Expansion Configuration (Indoor)

Introduction

This appendix covers the indoor and outdoor version of the Compact BTS Expansion configuration. This configuration is set up for only using other Compact BTSes. Power and ground cabling is not shown. Figure E-1 through Figure E-3 show expansion BTSes using two cCLPAs.

Figure E-4 through Figure E-6 show expansion BTSes using one cCLPA.

Expansion BTSes for 1.9 GHz, +27V A or B band circuit configurations are not supported.

Materials Needed

The following materials are required to configure expansion BTSes.

- Interconnect cabling of varying lengths
- Various sized conduit (if used)
- Data cable for cCLPA (if used)
- Customer I/O cabling

External Combiner and Directional Coupler

A combiner and directional coupler are required for some of the configurations. The following are the recommended specifications for the combiner and directional coupler.

Table E-1: Combiner and Directional Coupler Specifications	
Item	**Specifications**
Combiner	
Connector:	N–Type
Frequency Range:	Up to 2 GHz
Insertion Loss:	3.5 dB maximum
Return Loss:	16 dB minimum
Average Input Power:	60 Watts minimum
Directional Coupler	
Connector:	N–Type
Frequency Range:	810 to 950 MHz
Coupling:	30 +/–1 dB
Directivity:	28 dB minimum

table continued on next page

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| Table E-1: Combiner and Directional Coupler Specifications ||
Item	Specifications
Return Loss:	18 dB minimum
Average Input Power:	10 Watts minimum

- Motorola recommended directional coupler is P/N 809643T03
- Recommended cable with combiner is Andrew LDF4–50 or equivalent

Frame ID Switch Settings

Refer to Chapter 5, Figure 5-1 or Figure 5-2 or Table 5-1 through Table 5-4 for the Frame DIP Switch settings.

Installation Procedure for Expansion Compact BTS with Dual cCLPAs

Follow the procedure in Table E-2 for installation of expansion Compact BTS with Dual cCLPAs.

| Table E-2: Procedure for Installing Expansion Compact BTS with Dual cCLPA ||
Step	Action
1	Follow the procedure in Chapter 4 for installing a Compact BTS in a rack.
2	For a 3 BTS expansion configuration, follow Figure E-1. Proceed to step 3.
2a	For a 2 BTS expansion configuration, follow Figure E-2. Proceed to step 3.
2b	For a 1 BTS expansion configuration, follow Figure E-3. Proceed to step 3.
3	If not using conduit, dress cables as necessary.
4	Perform Optimization and ATP as described in Chapter 6. *LMF Help* provides further information.

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**Starter and Three Expansion
BTSes Interconnect Cabling for
Dual cCLPA**

Table E-3 shows in tabular format the interconnect cabling of
Figure E-1.

BTS	Expansion 1	Expansion 2	Expansion 3	cCLPA
Starter TX–1	–	–	–	cCLPA–1 (TX IN)
Starter TX–2	–	–	–	cCLPA–2 (TX IN)
Starter EXP–TX 2	EXP TX–2	–	–	*cCLPA–2
Starter EXP–TX 3	–	EXP TX–2	–	*cCLPA–1
Starter EXP–TX 4	–	–	EXP TX–2	*cCLPA–2
Starter RX MAIN	–	–	–	cCLPA–1 (RX OUT)
Starter EXP–RX MAIN 2	–	EXP – RX MAIN 2	–	*cCLPA–1
Starter EXP–RX MAIN 3	EXP – RX MAIN 2	–	–	*cCLPA–2
Starter EXP–RX MAIN 4	–	–	EXP – RX MAIN 2	*cCLPA–2
Starter RX DIV	–	–	–	cCLPA–2 (RX OUT)
Starter EXP–RX DIV 2	EXP – RX DIV 2	–	–	*cCLPA–2
Starter EXP–RX DIV 3	–	EXP – RX DIV 2	–	*cCLPA–1
Starter EXP–RX DIV 4	–	–	EXP – RX DIV 2	*cCLPA–2
Starter SDCX 2	SDC INPUT EXPANSION	–	–	–
Starter SDCX 3	–	SDC INPUT EXPANSION	–	–
Starter SDCX 4	–	–	SDC INPUT EXPANSION	–

Table E-3: Starter and Three Expansion BTS Interconnect Cabling for Circuit or Packet Configuration with Dual cCLPA

* Not actual physical connections to cCLPA, but software connections through the Starter BTS.

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Figure E-1: Three Expansion BTSes Cabling Diagram with Two cCLPAs

Power and Ground not shown

Ensure that the expansion
BTSes have an Expansion
cMPC card installed.

**Starter and Two Expansion
BTSes Interconnect Cabling for
Dual cCLPA**

Table E-4 shows in tabular format the interconnect cabling of Figure E-2.

BTS	Expansion 1	Expansion 2	Expansion 3	cCLPA
Table E-4: Starter and Two Expansion BTS Interconnect Cabling for Circuit or Packet Configuration with Dual cCLPA				
Starter TX–1	–	–	–	cCLPA–1 (TX IN)
Starter TX–2	–	–	–	cCLPA–2 (TX IN)
Starter EXP–TX 2	EXP TX–2	–	–	*cCLPA–2
Starter EXP–TX 3	–	EXP TX–2	–	*cCLPA–1
Starter EXP–TX 4	–	–	–	–
Starter RX MAIN	–	–	–	cCLPA–1 (RX OUT)
Starter EXP–RX MAIN 2		EXP – RX MAIN 2	–	*cCLPA–1
Starter EXP–RX MAIN 3	EXP – RX MAIN 2		–	*cCLPA–2
Starter EXP–RX MAIN 4	–	–	–	–
Starter RX DIV	–	–	–	cCLPA–2 (RX OUT)
Starter EXP–RX DIV 2	EXP – RX DIV 2	–	–	*cCLPA–2
Starter EXP–RX DIV 3	–	EXP – RX DIV 2	–	*cCLPA–1
Starter EXP–RX DIV 4	–	–	–	–
Starter SDCX 2	SDC INPUT EXPANSION	–	–	–
Starter SDCX 3	–	SDC INPUT EXPANSION	–	–
Starter SDCX 4	–	–	–	–
* Not actual physical connections to cCLPA, but software connections through the Starter BTS.				

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Figure E-2: Two Expansion BTSes Cabling Diagram with Two cCLPAs

Power and Ground not shown

Ensure that the expansion BTSes have an Expansion cMPC card installed.

LOCAL GPS

LA

EXPANSION 2

cCLPA 1

STARTER

EXPANSION 1

cCLPA 2

LA

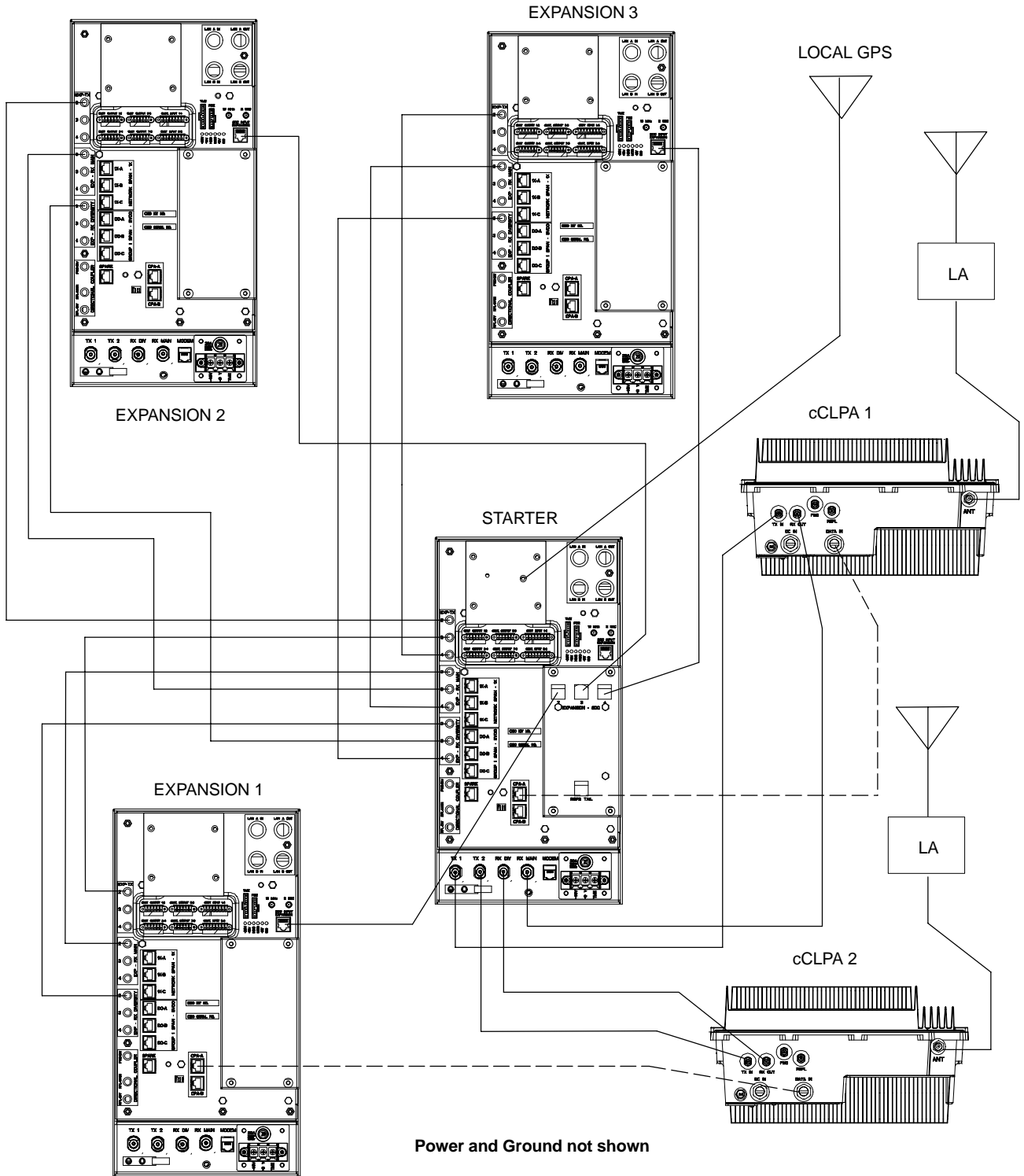**Starter and One Expansion
BTSes Interconnect Cabling for
Dual cCLPA**

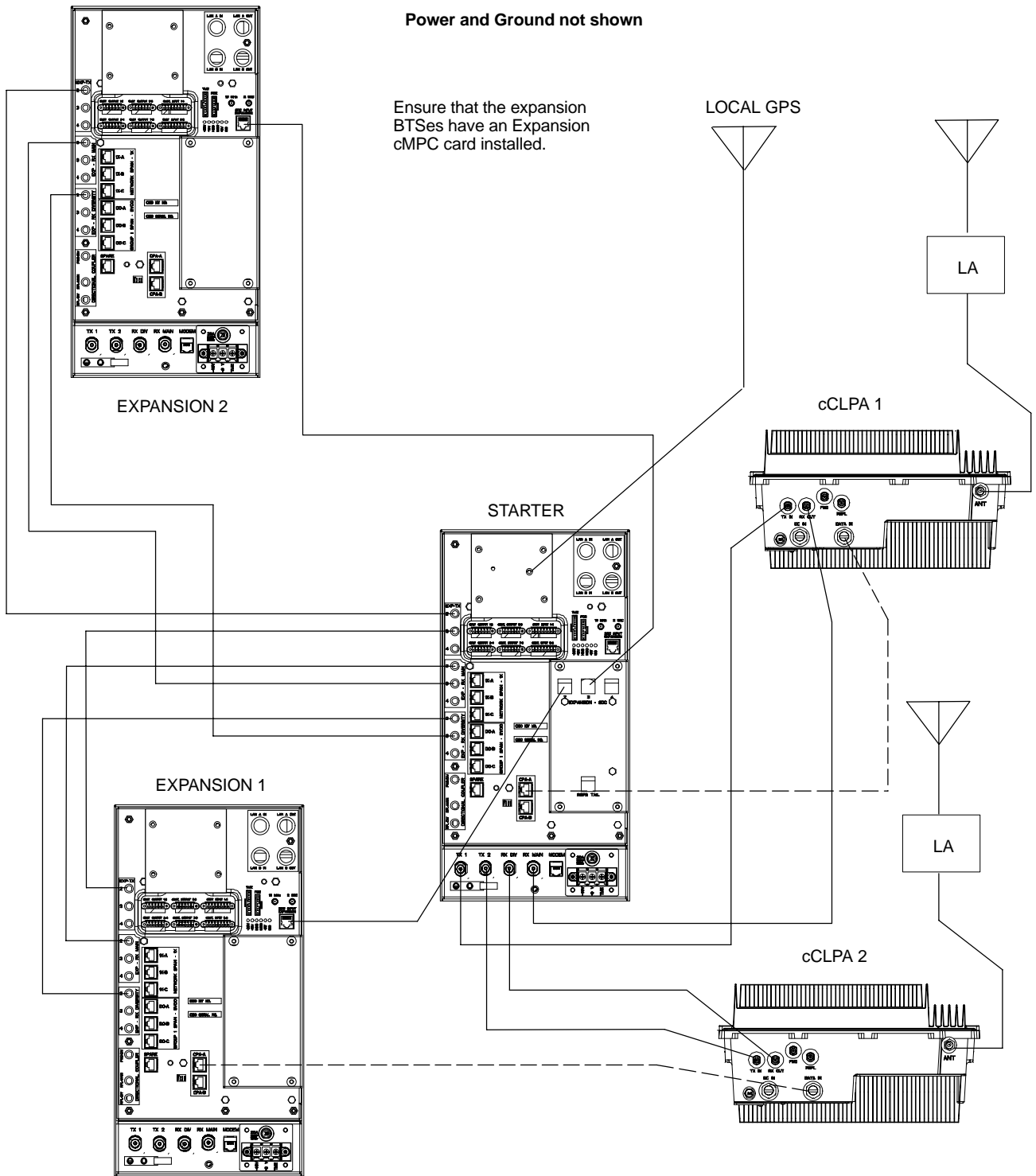Table E-5 shows in tabular format the interconnect cabling of Figure E-3.

Table E-5: Starter and One Expansion BTS Interconnect Cabling for Circuit or Packet Configuration with Dual cCLPA				
BTS	**Expansion 1**	**Expansion 2**	**Expansion 3**	**cCLPA**
Starter TX–1	–	–	–	cCLPA–1 (TX IN)
Starter TX–2	–	–	–	cCLPA–2 (TX IN)
Starter EXP–TX 2	EXP TX–2	–	–	–
Starter EXP–TX 3	–	–	–	–
Starter EXP–TX 4	–	–	–	–
Starter RX MAIN	–	–	–	cCLPA–1 (RX OUT)
Starter EXP–RX MAIN 2	–	–	–	–
Starter EXP–RX MAIN 3	EXP – RX MAIN 2	–	–	*cCLPA–2
Starter EXP–RX MAIN 4	–	–	–	–
Starter RX DIV	–	–	–	cCLPA–2 (RX OUT)
Starter EXP–RX DIV 2	EXP – RX DIV 2	–	–	*cCLPA–2
Starter EXP–RX DIV 3	–	–	–	–
Starter EXP–RX DIV 4	–	–	–	–
Starter SDCX 2	SDC INPUT EXPANSION	–	–	–
Starter SDCX 3	–	–	–	–
Starter SDCX 4	–	–	–	–
* Not actual physical connections to cCLPA, but software connections through the Starter BTS.				

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Figure E-3: One Expansion BTS Cabling Diagram with Two cCLPAs
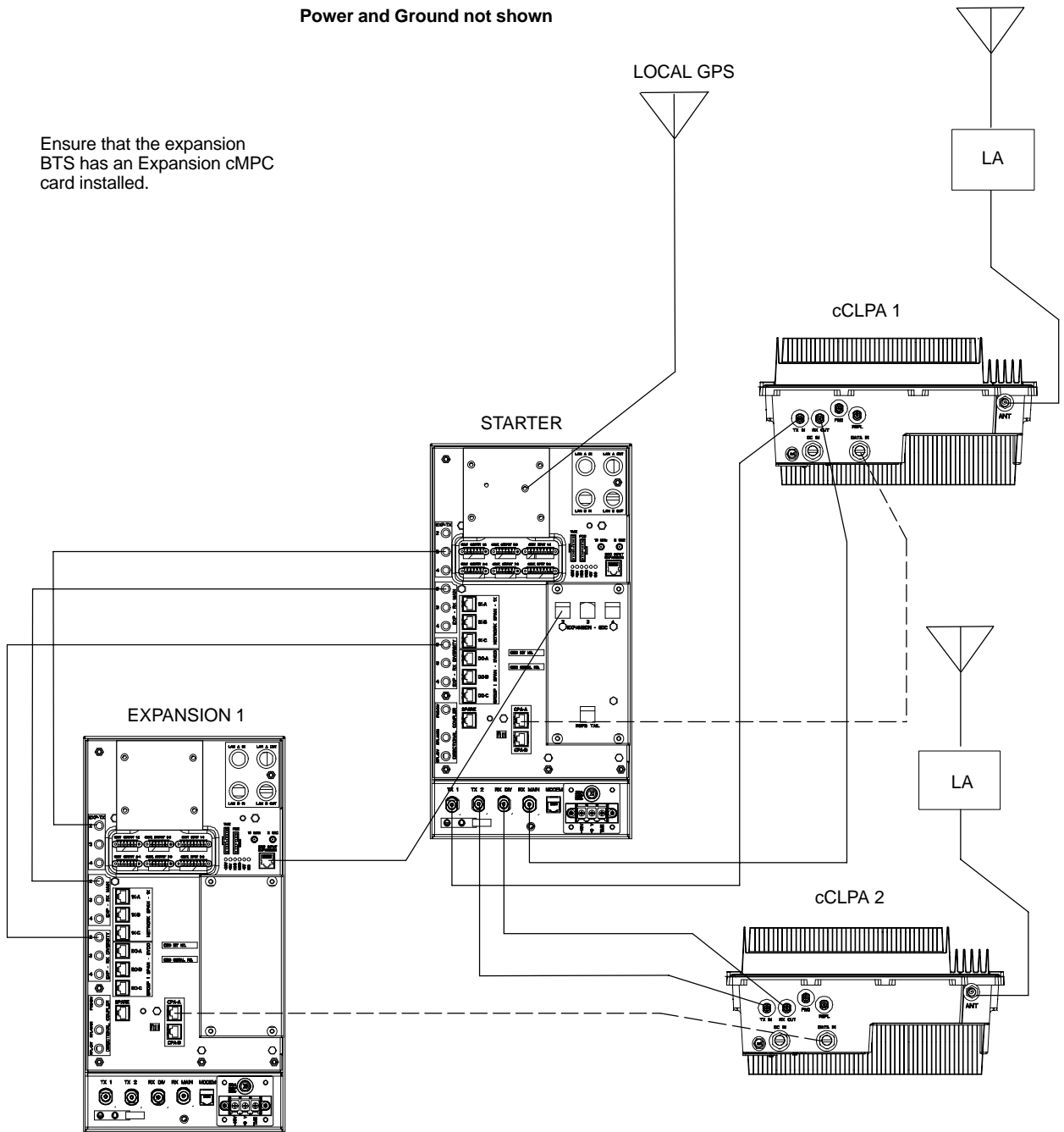
Power and Ground not shown

LOCAL GPS

Ensure that the expansion
BTS has an Expansion cMPC
card installed.

LA

cCLPA 1

STARTER

E

EXPANSION 1

LA

cCLPA 2

**Installation Procedure for
Expansion Compact BTS with
Single cCLPA**

Follow the procedure in Table E-2 for installation of expansion Compact BTS with Dual cCLPAs.

Table E-6: Procedure for Installing Expansion Compact BTS with Single cCLPA	
Step	**Action**
1	Follow the procedure in Chapter 4 for installing a Compact BTS in a rack.
2	For a 3 BTS expansion configuration, follow Figure E-4. Proceed to step 3.
2a	For a 2 BTS expansion configuration, follow Figure E-5. Proceed to step 3.
2b	For a 1 BTS expansion configuration, follow Figure E-6. Proceed to step 3.
3	If not using conduit, dress cables as necessary.
4	Perform Optimization and ATP as described in Chapter 6. *LMF Help* provides further information.

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**Starter and Three Expansion
BTSes Interconnect Cabling for
Single cCLPA**

Table E-7 shows in tabular format the interconnect cabling of
Figure E-4.

BTS	Expansion 1	Expansion 2	Expansion 3	cCLPA
Table E-7: Starter and Three Expansion BTS Interconnect Cabling for Circuit or Packet Configuration with Single cCLPA				
Starter TX–1	Signals are sent thruogh an external combiner and directional coupler			cCLPA–1 (TX IN)
Starter TX–2				
Starter EXP–TX 2	EXP TX–2	–	–	*cCLPA–1
Starter EXP–TX 3	–	EXP TX–2	–	*cCLPA–1
Starter EXP–TX 4	–	–	EXP TX–2	*cCLPA–1
Starter RX MAIN	–	–	–	Antenna
Starter EXP–RX MAIN 2	EXP – RX MAIN 2	–	–	*cCLPA–1
Starter EXP–RX MAIN 3	–	EXP – RX MAIN 2	–	*cCLPA–1
Starter EXP–RX MAIN 4	–	–	EXP – RX MAIN 2	*cCLPA–1
Starter RX DIV	–	–	–	cCLPA–1 (RX OUT)
Starter EXP–RX DIV 2	EXP – RX DIV 2	–	–	*cCLPA–1
Starter EXP–RX DIV 3	–	EXP – RX DIV 2	–	*cCLPA–1
Starter EXP–RX DIV 4	–	–	EXP – RX DIV 2	*cCLPA–1
Starter SDCX 2	SDC INPUT EXPANSION	–	–	–
Starter SDCX 3	–	SDC INPUT EXPANSION	–	–
Starter SDCX 4	–	–	SDC INPUT EXPANSION	–
* Not actual physical connections to cCLPA, but software connections through the Starter BTS.				

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Figure E-4: Three Expansion BTSes Cabling Diagram with One cCLPA

EXPANSION 2

EXPANSION 3

LOCAL GPS

LA

cCLPA 1

STARTER

DC

EXPANSION 1

COMBINER

TX 1

TX 2

RX DIV

RX MAIN

LA

Ensure that the expansion
BTSes have an Expansion
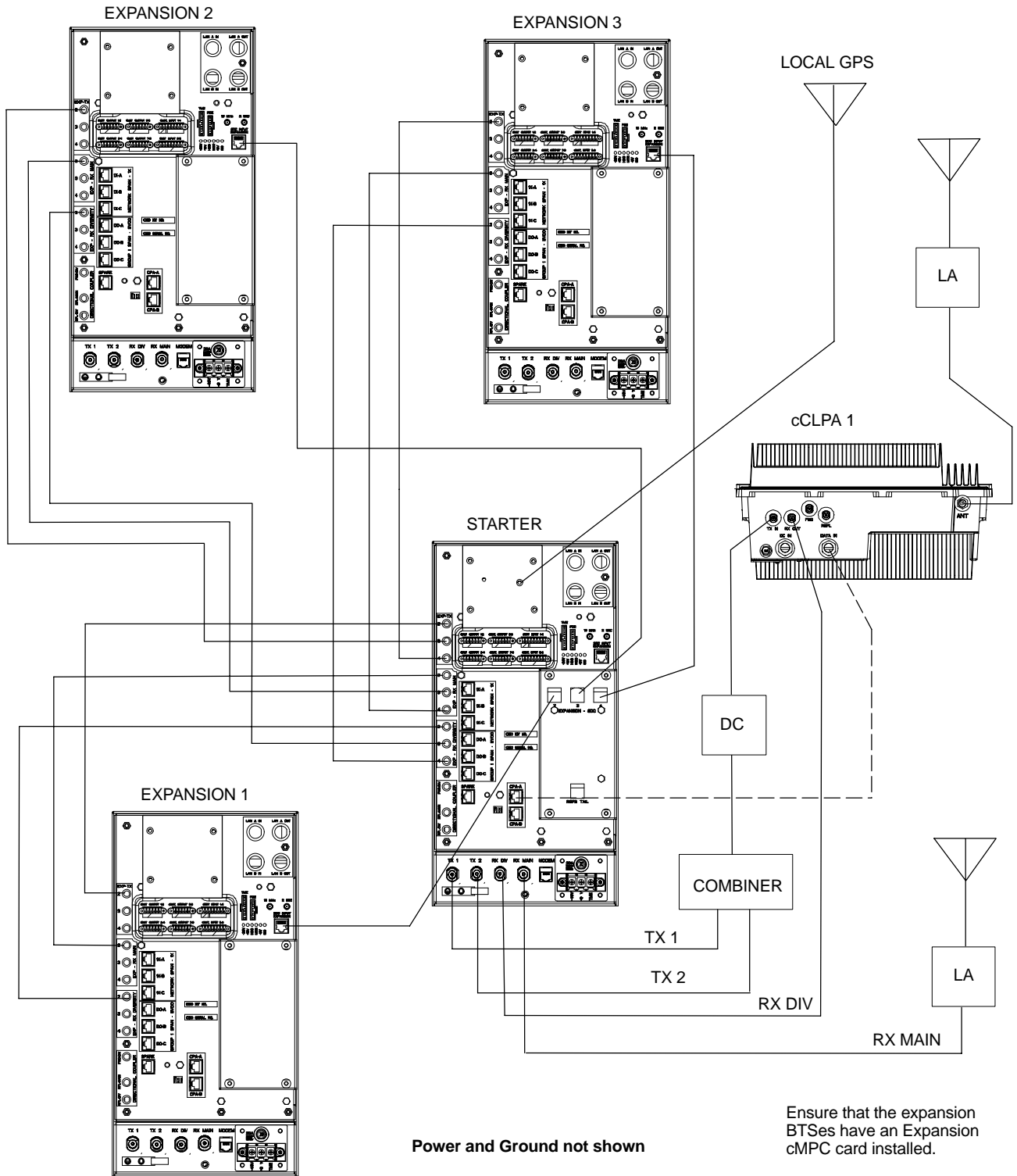cMPC card installed.

Power and Ground not shown

E

**Starter and Two Expansion
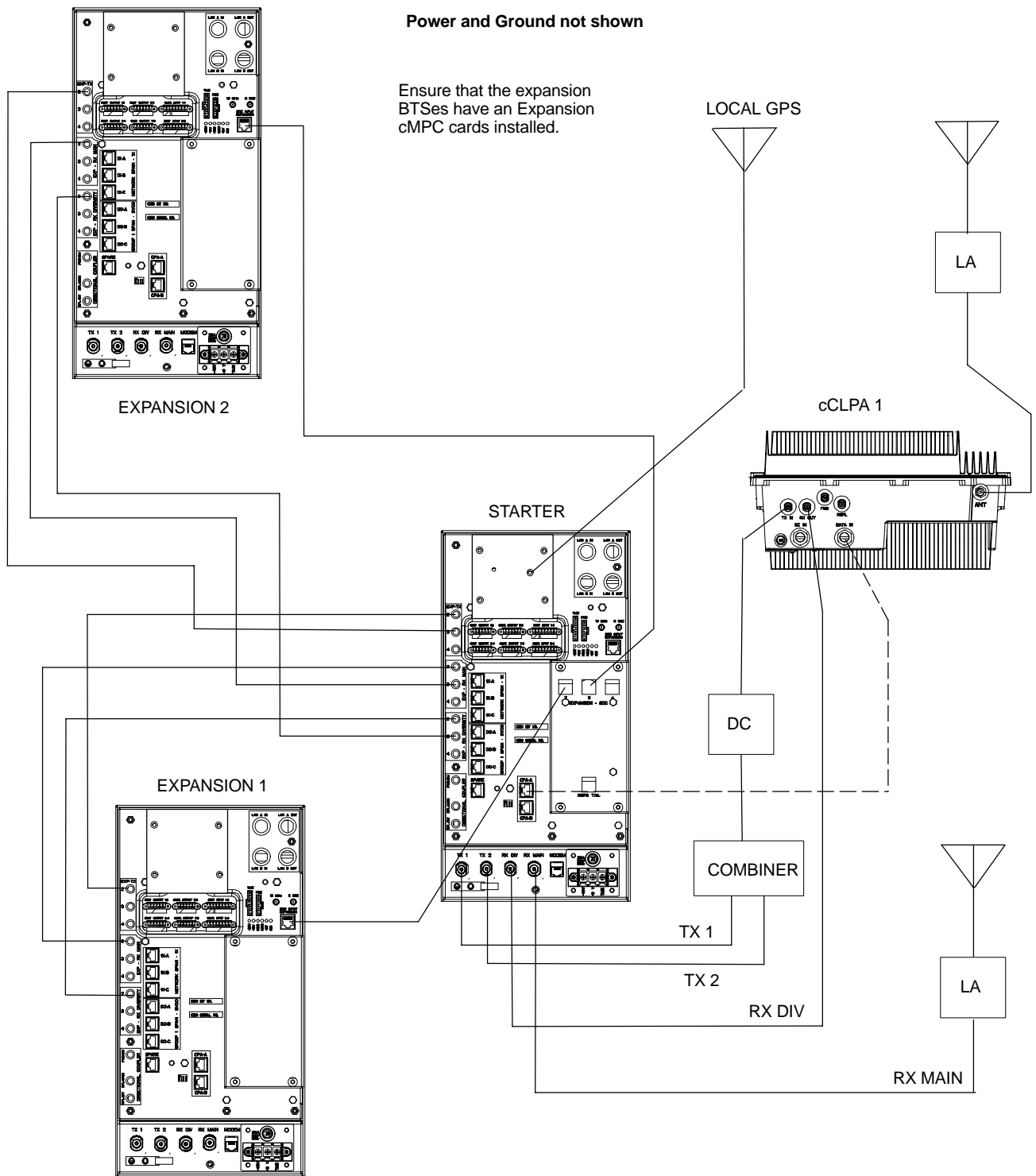BTSes Interconnect Cabling for
Single cCLPA**

Table E-8 shows in tabular format the interconnect cabling of
Figure E-5.

Table E-8: Starter and Two Expansion BTS Interconnect Cabling for Circuit or Packet Configuration with Single cCLPA				
BTS	**Expansion 1**	**Expansion 2**	**Expansion 3**	**cCLPA**
Starter TX–1	Signals are sent thruogh an external combiner and directional coupler			cCLPA–1 (TX IN)
Starter TX–2				
Starter EXP–TX 2	EXP TX–2	–	–	*cCLPA–1
Starter EXP–TX 3	–	EXP TX–2	–	*cCLPA–1
Starter EXP–TX 4	–	–	–	–
Starter RX MAIN	–	–	–	Antenna
Starter EXP–RX MAIN 2	EXP – RX MAIN 2	–	–	*cCLPA–1
Starter EXP–RX MAIN 3	–	EXP – RX MAIN 2	–	*cCLPA–1
Starter EXP–RX MAIN 4	–	–	–	–
Starter RX DIV	–	–	–	cCLPA–1 (RX OUT)
Starter EXP–RX DIV 2	EXP – RX DIV 2	–	–	*cCLPA–1
Starter EXP–RX DIV 3	–	EXP – RX DIV 2	–	*cCLPA–1
Starter EXP–RX DIV 4	–	–	–	–
Starter SDCX 2	SDC INPUT EXPANSION	–	–	–
Starter SDCX 3	–	SDC INPUT EXPANSION	–	–
Starter SDCX 4	–	–	–	–
* Not actual physical connections to cCLPA, but software connections through the Starter BTS.				

Figure E-5: Two Expansion BTSes Cabling Diagram with One cCLPA

Power and Ground not shown

Ensure that the expansion
BTSes have an Expansion
cMPC cards installed.

LOCAL GPS

LA

EXPANSION 2

cCLPA 1

STARTER

DC

EXPANSION 1

COMBINER

TX 1

TX 2

RX DIV

LA

RX MAIN

**Starter and One Expansion
BTSes Interconnect Cabling for
Single cCLPA**

Table E-9 shows in tabular format the interconnect cabling of
Figure E-6.

Table E-9: Starter and One Expansion BTS Interconnect Cabling for Circuit or Packet Configuration with Single cCLPA				
BTS	**Expansion 1**	**Expansion 2**	**Expansion 3**	**cCLPA**
Starter TX–1	–	–	–	cCLPA–1 (TX IN)
Starter TX–2	–	–	–	–
Starter EXP–TX 2	EXP TX–2	–	–	–
Starter EXP–TX 3	–	–	–	–
Starter EXP–TX 4	–	–	–	–
Starter RX MAIN	–	–	–	Antenna
Starter EXP–RX MAIN 2	–	–	–	–
Starter EXP–RX MAIN 3	EXP – RX MAIN 2	–	–	*cCLPA–1
Starter EXP–RX MAIN 4	–	–	–	–
Starter RX DIV	–	–	–	cCLPA–1 (RX OUT)
Starter EXP–RX DIV 2	EXP – RX DIV 2	–	–	*cCLPA–1
Starter EXP–RX DIV 3	–	–	–	–
Starter EXP–RX DIV 4	–	–	–	–
Starter SDCX 2	SDC INPUT EXPANSION	–	–	–
Starter SDCX 3	–	–	–	–
Starter SDCX 4	–	–	–	–
* Not actual physical connections to cCLPA, but software connections through the Starter BTS.				

Compact BTS Expansion Configuration (Indoor) – continued

Figure E-6: One Expansion BTS Cabling Diagram with One cCLPA
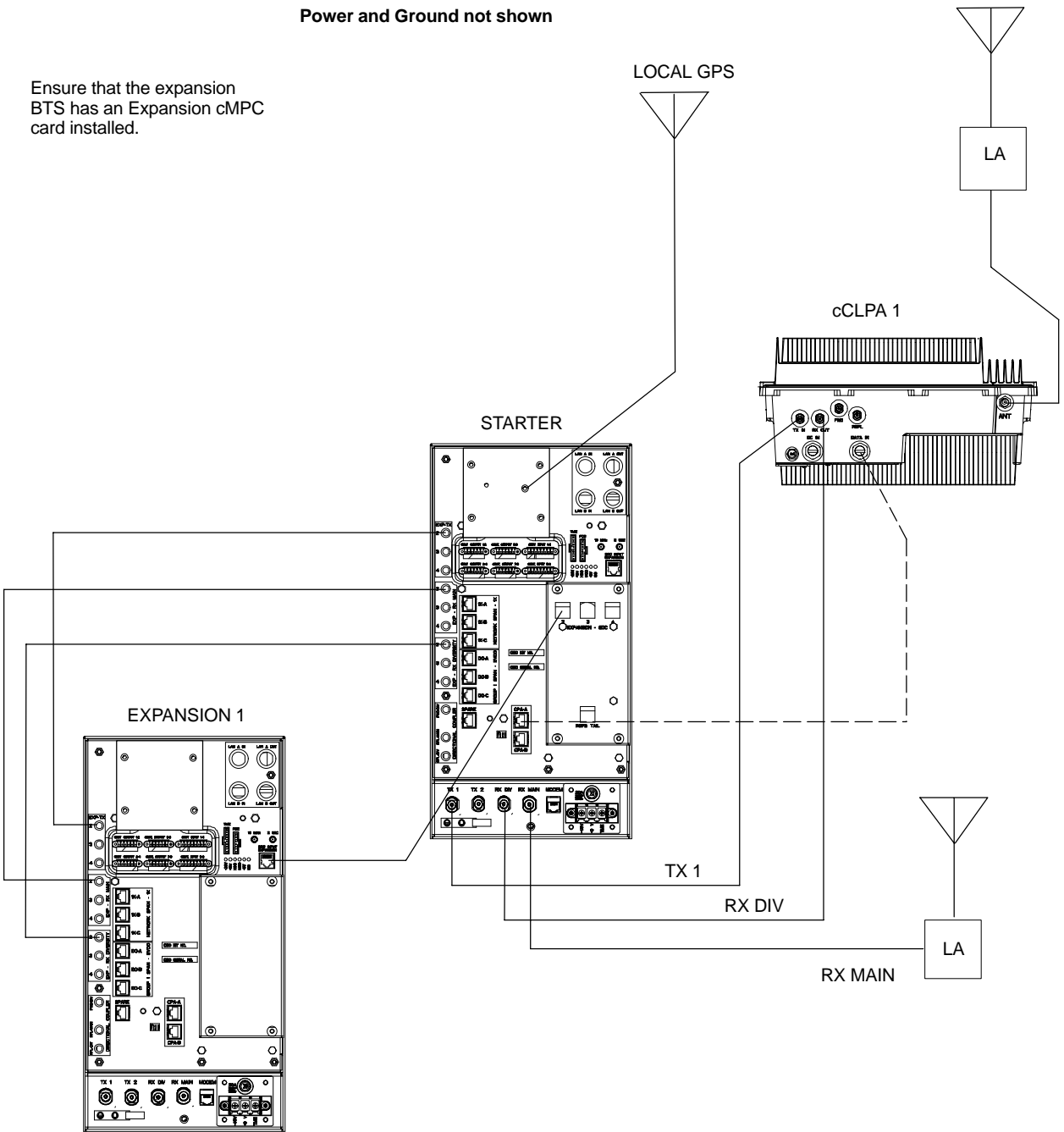
Compact BTS Expansion Configuration (Indoor) – continued

**Installation Procedure for
Expansion Compact BTS
without cCLPA**

Follow the procedure in Table E-2 for installation of expansion Compact BTS without cCLPAs. Table E-7 through Table E-9 (less the cCLPA) are virtually the same and are can be used for the diagrams without cCLPA, and so separate tables will not be included here.

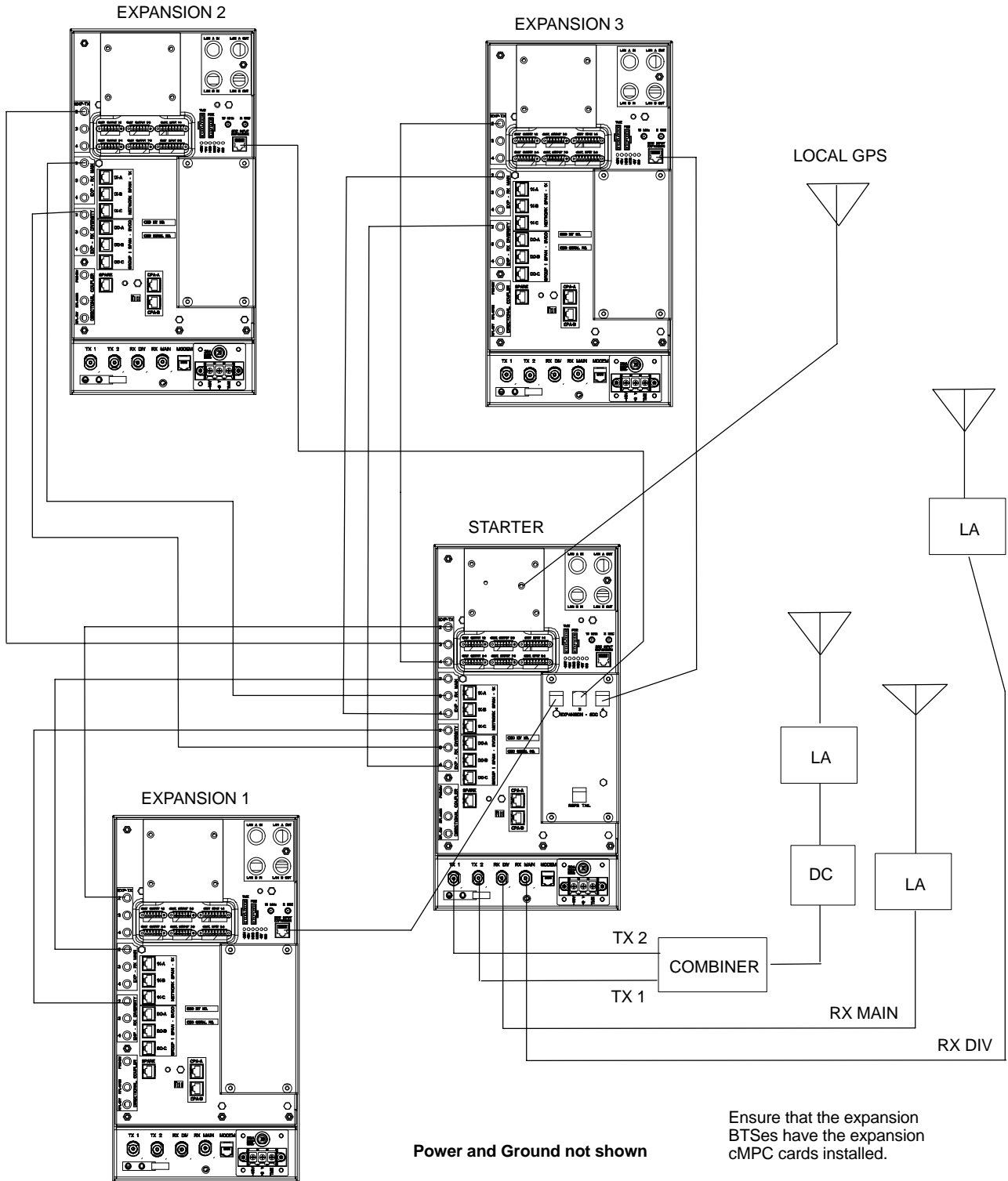| Table E-10: Procedure for Installing Expansion Compact BTS without cCLPA	
Step	**Action**
1	Follow the procedure in Chapter 4 for installing a Compact BTS in a rack.
2	For a 3 BTS expansion configuration, follow Figure E-7. Proceed to step 3.
2a	For a 2 BTS expansion configuration, follow Figure E-8. Proceed to step 3.
2b	For a 1 BTS expansion configuration, follow Figure E-9. Proceed to step 3.
3	If not using conduit, dress cables as necessary.
4	Perform Optimization and ATP as described in Chapter 6. *LMF Help* provides further information.

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**Starter and Expansion BTSes
Interconnect Cabling without
cCLPA**

Table E-7 through Table E-9 are virtually the same and are can be used for the diagrams without cCLPA. Separate tables will not be included here.

Figure E-7: Three Expansion BTSes Cabling Diagram

Power and Ground not shown

Ensure that the expansion
BTSes have the expansion
cMPC cards installed.