

2.2 Verify/Download HU and RU System Software

The HU's and RU's may require a system software download if they are not loaded with the current system software. Use the following procedure to check the version number of the system software and if necessary to download the current system software:

1. Click on the **HOST Prg Load** tab and on the **REMOTE Prg Load** tab. The **HOST Prg Load** display and the **Remote Prg Load** display will open within the DEMS main window as shown in [Figure 4-3](#).

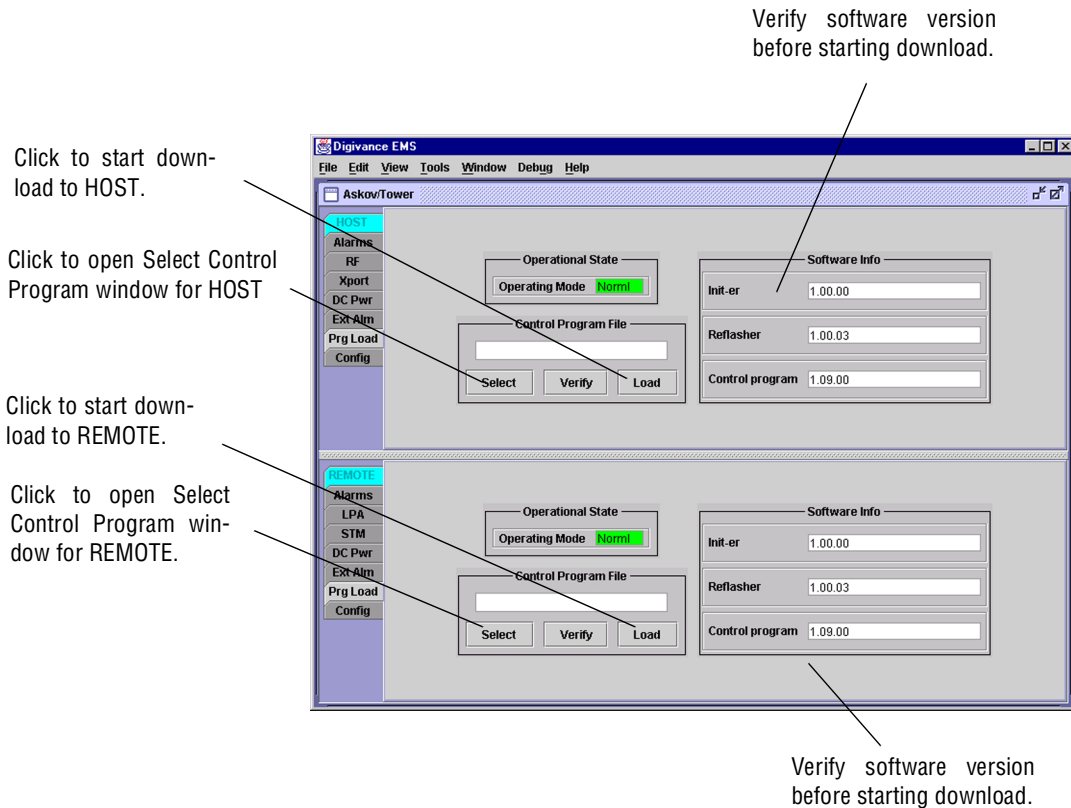


Figure 4-3. HOST and REMOTE Prg Load Displays

2. Click on the **HOST Select** button (see [Figure 4-3](#)). The **Select Control Program File** window will open as shown in [Figure 4-4](#). Browse until the folder where the Control Program files are located is selected and the software files are displayed in the window.

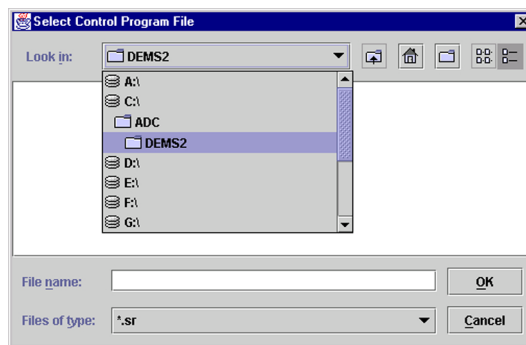


Figure 4-4. Select Control Program File Window

3. Check the software version numbers shown in the Software Info section of the **Prg Load** display against the version numbers of the software files displayed in the **Select Control Program File** window. If files in the **Select Control Program File** window are a later version than those shown in the **Prg Load** display, proceed with the software download. If the version numbers shown in the Software Info section are the same as the version numbers of the files in the **Select Control Program File** window, the software download is not required.
4. Select the required file to download and click on the **OK** button.
5. Click on the **HOST Load** button (see [Figure 4-3](#)) to start the download.
6. Repeat steps 2 through 4 for the **REMOTE**.

2.3 Determine Forward Path Input Signal Level

The level of the composite RF input signal at the FORWARD RF IN port at the HU will vary depending on the type of BTS, the cable loss, the number of channels present, and the required forward path composite power. If maximum composite RF output is required, the signal level of the composite forward path RF signal at the HU forward path input must be adjusted to fall within a range of **-10 to -40 dBm**. If the signal level is not within this range, it must be adjusted to fall within this range through the use of an external attenuator capable of handling the BTS forward path output power.

If using the Conditioning Panel or Duplexing Panel, refer to the Digivance 800 and 1900 MHz Interface Panels User Manual (ADCP-75-147) for the procedures for measuring and adjusting the input RF signal level at the HU. If connecting a single HU to a single BTS, use the following procedure to measure and adjust the input RF signal level at the HU:

1. Connect a spectrum analyzer or power meter to the forward path output port of the BTS. The required signal levels and test points are shown in [Figure 4-5](#).

► **Note:** Check the input rating of the test equipment and the output rating of the BTS. To avoid burning out the spectrum analyzer or power meter, it may be necessary to insert a 30 dB 100W (or similar) attenuator between the BTS and test equipment.

2. If using a spectrum analyzer, proceed to step 3. If using a power meter, measure the composite signal power from the BTS and then proceed to step 5.
3. Measure the RF level of a single carrier, such as the control channel, in dBm. Make sure the resolution bandwidth of the spectrum analyzer is 30 kHz. Maximum power in any channel should not exceed 5W (+37 dB).
4. Calculate the total composite signal power from the BTS using the following formula:

$$P_{\text{tot}} = P_c + 10\text{Log } N - (\text{see Note})$$

Where,

P_{tot} is the total composite power in dBm

P_c is the power per carrier in dBm as measured in step 3, and

N is the total number of channels.

► **Note:** If calculating the composite power for a CDMA system, reduce the initial result by 16.23 dBm

5. Determine the total cable loss that is imposed by the forward path coaxial cable that links the BTS to the HU and also any insertion loss imposed by splitters or combiners.
6. Subtract the total cable loss and any insertion losses from the total composite power calculated in step 4.
7. Subtract -25 (midpoint of the required range) from the value determined in step 6. The difference (which should be positive) equals the value of the external attenuator that is required to reduce the forward path signal level to fall within the required range. The following formula outlines the required calculations for steps 6 and 7:

$$P_{\text{tot}} - (\text{Cable and insertion loss}) - (-25) = \text{Value of external attenuator required}$$

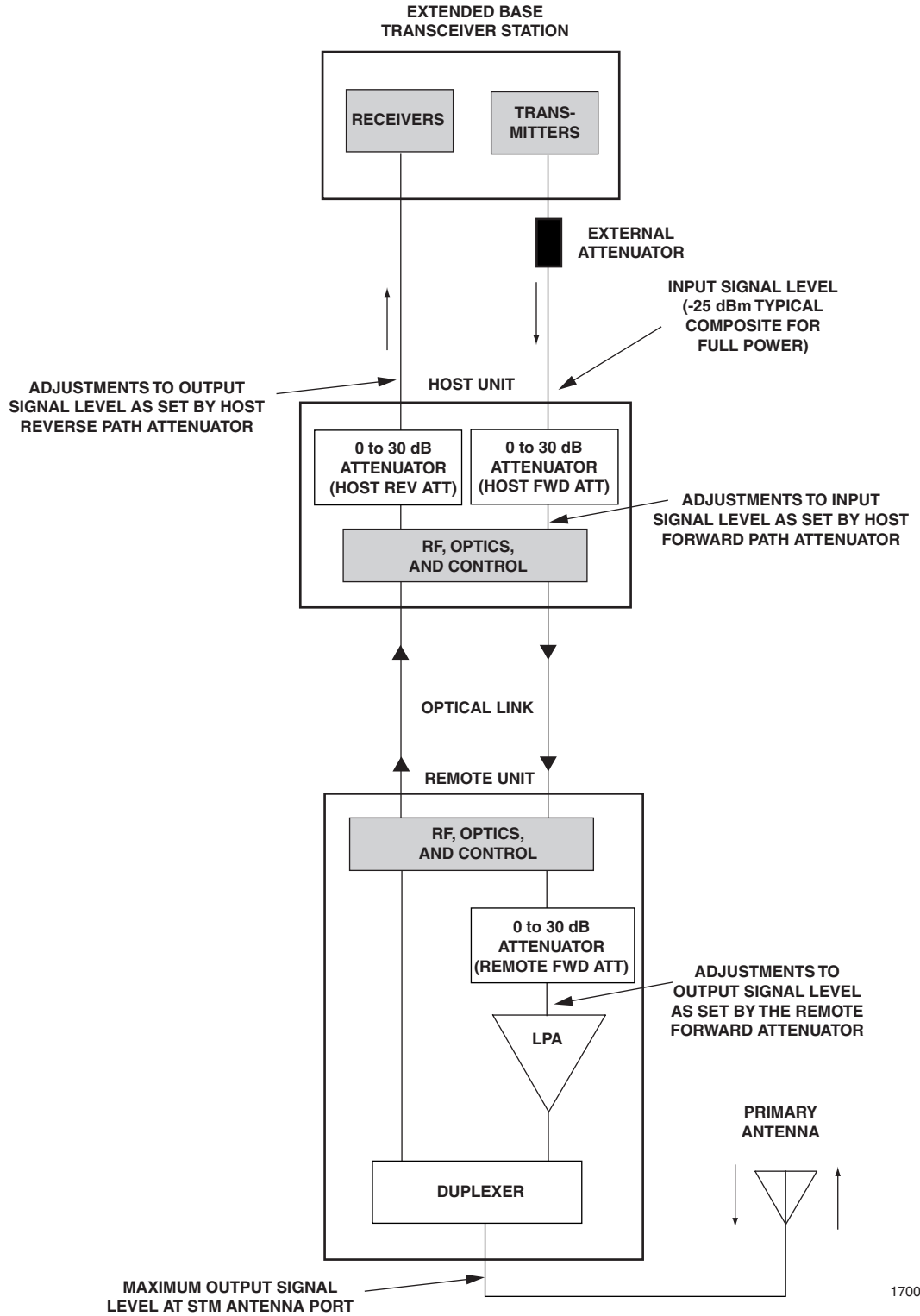
► **Note:** If the input signal level is already within the required range of -10 to -40 dBm, then no external attenuator is required.

8. Select an attenuator that is as close to the value calculated in step 7 as possible. Select a value that will adjust the signal level of the composite input signal to fall within the specified range.
9. Install the external attenuator in the coaxial cable that is connected to the FORWARD RF IN port at the HU.



Caution: *The Host Unit can be damaged if it is overdriven by the BTS. Always install an external protective attenuator at the Host Unit FORWARD RF IN port if the forward path composite input signal level is greater than -10 dBm.*

10. Subtract the value of the external attenuator used in step 9 from the total composite signal power (P_{tot}) and record the result. This value will be required when setting the attenuation of the HU's internal forward attenuator.



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Figure 4-5. Signal Levels, Test Points, and Adjustments

2.4 Enter Site Name and Site Number

All HU's and RU's are programmed with the same site name and site number. It is therefore necessary to assign a unique site name and site number to the HU and RU before they can be connected to the same CAN. Use the following procedure to assign a unique site name and number to each HU and RU system:

1. Click on the **HOST Config** tab and on the **REMOTE Config** tab. The **HOST Config** display and the **REMOTE Config** display will open within the DEMS main window as shown in [Figure 4-6](#).

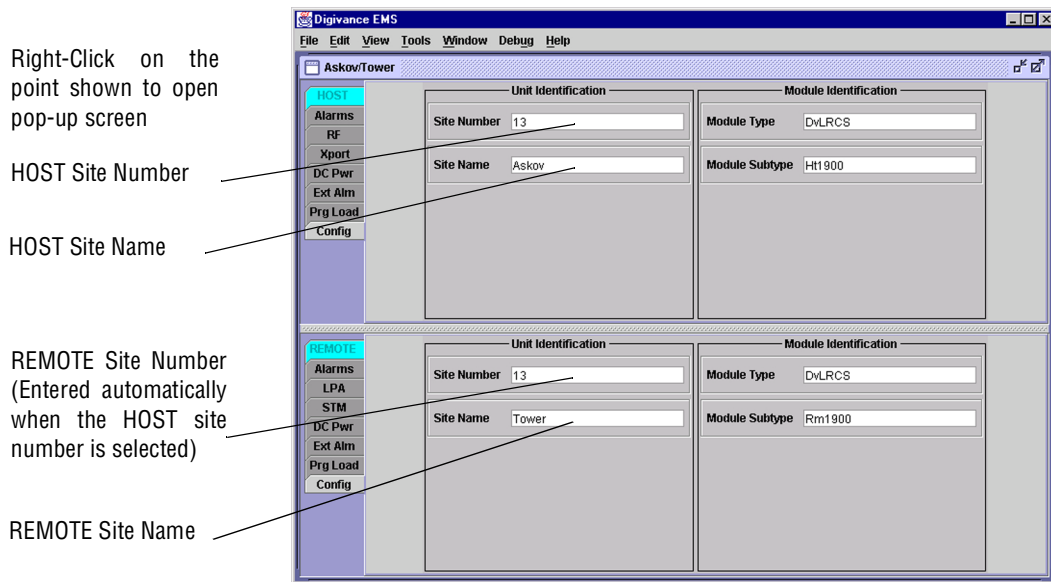


Figure 4-6. HOST and REMOTE Config Displays

2. Right-click on the **HOST Site Name** field (see [Figure 4-6](#)). The **Site Name** pop-up screen will open as shown in [Figure 4-7](#). Enter a unique name for the HOST. The name may be up to 32 characters long and must not contain any spaces. The name may include numbers, punctuation, and upper or lower case letters and must always begin with a letter. Click on **OK** to close the screen and make the changes take effect.

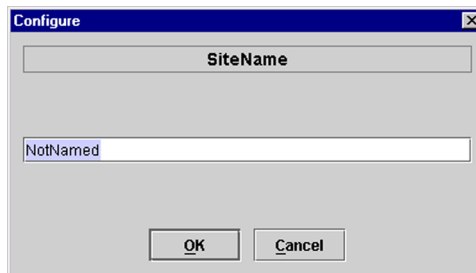


Figure 4-7. HOST Site Name Pop-Up Screen

3. Right-click on the **HOST Site Number** (see [Figure 4-6](#)). The **Site Number** pop-up screen will open. Enter any number between 1 and 24 and then click on OK to close the screen and make the changes take effect.
4. Check the **REMOTE Site Number** field (see [Figure 4-6](#)). The **REMOTE Site Number** does not have to be entered. When the **HOST Site Number** is entered, the system will automatically enter the same number for the **REMOTE Site Number**.
5. Right-click on the **REMOTE Site Name** field (see [Figure 4-6](#)). The **Site Name** pop-up screen will open. Enter a unique name for the **REMOTE**. The name may be up to 32 characters long and must not contain any spaces. The name may include numbers, punctuation, and upper or lower case letters and must always begin with a letter. Click on OK to close the screen and make the changes take effect.
6. Open the Tools menu at the top of the main window and then select Refresh Catalog to make the new Host and Remote site names appear in the View menu.

2.5 Enter Host Forward Attenuation

The HU internal forward path attenuator setting determines the maximum composite output signal level at the STM antenna port. The appropriate attenuation value for any particular system is based on the number of channels the system is transporting and the level of the composite forward path signal input at the HU's FORWARD RF IN port. The maximum output power that can be provided by the system is 40.5 dBm (11 Watts). The total forward path gain that is provided by the system (with host and remote forward attenuators set to 0 dB) is 80.5 dBm. Use the following procedure to set the forward path attenuation to provide the maximum composite output signal level:

1. Click on the **HOST RF** tab. The **HOST RF** display will open within the DEMS main window as shown in [Figure 4-8](#).
2. Right-click on the **Host Fwd Att** section of the display (see [Figure 4-8](#)). The **Host Fwd Att** pop-up screen will open as shown in [Figure 4-9](#).
3. Obtain the value of the total composite input signal level as determined in step 10 of [Section 2.3](#).
4. Determine the appropriate value to enter for the Host forward path attenuator by subtracting the required system output level (per system design plan) from 80.5 (the total system gain) and then adding the composite input signal level. The result (see sample calculation) is the amount of attenuation required.

$$\text{Atten Required} = 80.5 - (\text{Required System Output Power}) + (\text{Composite Input Power})$$

5. Enter the attenuation value and click OK to close the pop-up screen and to make the changes take effect.