



Application Note

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Installing DIRECTV MFH1 with a Super Buddy™ satellite meter

The DIRECTV MFH1 Distribution System utilizes three dishes, a stacking system, a single cable home run distribution system and customer devices to un-stack the signals.

The three dishes are:

- Model SL5 LNB for 101, 110, 119 West DBS and 99, 103 West Ka satellites ("SlimLine")
- DBS dish for 72.5 West satellite ("Single Sat 72.5")
- FSS dish for 95 West satellite ("Internatnl 95")

Antenna Pointing

DIRECTV SL5 Slimline KaKu Phase 4 AT9 & AU9 Antenna Pointing

Connections: DIRECTV SL5 LNB Cluster (99°, 101°, 103°, 110°, 119°) connected to top (SIGNAL IN) port of Super Buddy satellite meter with single coax cable.

Meter set-up

Press the **SYST** System soft-key (located near top left corner of LCD screen) to enter the System Setup menu. Then select the following:

- REGION your geographic region
- SERVICE **DIRECTV**
- SYSTEM **SL5 LNB**
- LNB MODEL defaults to **SL5 LNB** (but user may change to other menu options for LNB model if going through a 6x8 multi-switch and/or if using a wing dish aimed at the 72.5 or 95 satellites)
- SWITCH TYPE defaults to **22 kHz** (may default to DTV6x8 if user has indicated that he is passing signal through 6x8 multi-switch before entering meter)

To make selections, arrow up or down to the item to change and press **Enter**, then arrow up or down to the desired option and press **Enter**. Press **EXIT** or **DONE** to return to Run Mode.

Antenna Pointing

Install the mast plumb, preset the antenna vertical angle, mount to mast and grossly align azimuth. You may want to use the ZIP zip code look-up feature to obtain rough antenna settings (magnetic compass heading, elevation, and tilt/skew).

After completing the System Setup:

- 1) Press DONE or EXIT to return to the main Run screen.
- 2) Adjust the tilt or skew of the dish based on the parameters provided by the Super Buddy's zip code lookup feature (ZIP soft-key in lower left corner of main Run screen).
- 3) Connect a coax jumper cable from the top (Signal-In) port of your Super Buddy meter to a LNB output port.

To find the 101° satellite:

- Press the LNB soft-key (located on middle right side of LCD screen) to apply power to the LNB. LNB1 is for the 101° satellite
- Adjust the azimuth and elevation of the dish to optimize the alignment by maximizing the signal level (left bar graph) and signal quality (right bar graph) on the 101 satellite. Align antenna until a LOCK status is obtained.
- After you see LOCK, press ID soft-key (located on middle left side of LCD screen) and verify that the 101 satellite has been found.

To check the status of the 119° satellite:

- Press the LNB soft-key again to switch to LNB2 (22 kHz). LNB2 is for the 110° & 119° satellites.
- Adjust the tilt/skew of the dish to optimize the alignment by maximizing the signal level (left bar graph) and signal quality (right bar graph) on the 119° satellite. Align antenna until a LOCK status is obtained.
- After you see LOCK, press ID soft-key (located on middle left side of LCD screen) and verify that the 119 satellite has been found.

Note: Transponders 22 through 32 of the 110/119 Combo come from the 119 satellite

To check the status of the 110° satellite:

- While still selected on LNB2, use your Up/Down arrow keys to scroll to transponders 8, 10, or 12 of the 110/119 Combo
- Check to make sure you have a LOCK status and a good signal level and C/N value
- Press ID and verify that the 110 satellite has been found

Note: Transponders 8, 10, and 12 of the 110/119 Combo come from the 110 satellite

Now press the LNB power soft-key four times to return to LNB1 (the 101 satellite). Complete the dithering/fine tuning process, adjusting the azimuth and elevation of the dish while looking at the 101 satellite, as directed by DIRECTV. This will ensure good signal reception from all five satellites (99, 101, 103, 110, 119) if your mast/pole is plumb.

DIRECTV has strictly stated that they do NOT want the technicians modifying the alignment of the dish while looking only at the Ka signal level (dBm) because if they improve signal reception from the 103 satellite, they will likely be hurting the alignment on the 99 satellite at the same time. DIRECTV recommends adjusting the azimuth and elevation of the dish while looking at the 101 satellite, adjusting the tilt/skew of the dish while looking at the 119 satellite, and then performing their fine-tuning/dithering process while looking at the 101 satellite. Please refer to DIRECTV's official instructions regarding their dithering/fine-tuning process for more information.

The Super Buddy satellite meter cannot identify and get a LOCK on the DIRECTV 99 & 103 Ka satellites. The Super Buddy can only display signal level (dBm) on your left bar graph for the non-SWM DIRECTV 99 & 103 Ka satellites. The right bar graph (signal quality) will be empty and the meter will NOT indicate a lock status since the Super Buddy meter isn't able to demodulate or obtain a lock on the DIRECTV Ka signals due to the DVB-S2 modulation type and level of encryption. Only the DIRECTV IRD/satellite receiver can show you the signal quality of the 99 & 103 Ka satellites signals because the receiver has been authorized and cuts through the layer of encryption found on the Ka satellites.

To check the Ka High Transponders on 99° Spaceway 2

- Press the LNB soft-key (located on middle right side of LCD screen) multiple times to toggle to LNB3 (99° satellite)
- Press your up/down arrow keys to scroll through transponders 1-6
- Pay attention to the signal level (dBm) on your left bar graph. You can ignore the right bar graph (C/N) since the Super Buddy meter isn't able to demodulate or obtain a LOCK on the DIRECTV Ka signal.

To check the Ka High Transponders on 103° Spaceway 1

- Press the LNB soft-key (located on middle right side of LCD screen) multiple times to toggle to LNB4 (103° satellite)
- Press your up/down arrow keys to scroll through transponders 1-6
- Pay attention to the signal level (dBm) on your left bar graph. You can ignore the right bar graph (C/N) since the Super Buddy meter isn't able to demodulate or obtain a LOCK on the DIRECTV Ka signal.

Note: the Super Buddy is not able to check the signal level of the Ka Low transponders on either 99 or 103 unless you have a B-Band converter in-line because they are not in the frequency range of the meter. If you have the B-Band converter in-line, you'll need to choose "SL5 w/B-Band" as your System type in the System Setup software menu.

You may choose to use the PoP Scan function of the meter to record the measurements.

Please refer to the operations manual for more info and instructions related to the Proof of Performance scan feature.

Single Sat 72.5 Antenna Pointing

Preset the antenna and mast hardware per the directions of DIRECTV.

Connections: Circular LNBF (possibly Eagle Aspen model DTV32+) connected to top (Signal In) port of Super Buddy meter with coax cable

Meter Set-Up:

Push the **SYST** System soft-key to select the following:

- REGION your geographic region
- SERVICE **DIRECTV**
- SYSTEM **Single Sats**
- LNB MODEL **Single Sat 72.5**
- SWITCH TYPE none

To make selections, arrow up or down to the item to change and press **Enter**, then arrow up or down to the desired option and press **Enter**. Press **EXIT** or **DONE** to return to Run Mode

Antenna Pointing

Install the mast plumb, preset the antenna vertical angle, mount to mast and grossly align azimuth. You may want to use the ZIP zip code look-up feature to obtain rough antenna settings (magnetic compass heading and elevation).

- Ensure that you have selected the 72.5W satellite. Use left / right arrow keys to select the desired satellite (orbital position displayed in upper left).
- Press the **ZIP** zip code soft-key (located in bottom left of LCD screen), type in the local zip code, and press **ENTER**. Approximate antenna settings will be displayed. Press **EXIT** soft-key to return to the main Run screen.

Run Mode

- Press **LNB** soft-key (located on middle right side of LCD screen) to power the LNB.

After selecting the satellite and pressing the **LNB** soft-key to power the LNB:

- Adjust antenna azimuth and elevation to obtain maximum signal level (left bar graph), signal quality (right bar graph), and LOCK status.
- Press the **ID** soft-key to verify the satellite. "ID VERIFIED" means you are pointed correctly.
- If "ID FAILED" is displayed, press **SCAN** soft-key and Super Buddy will find which satellite you are aimed at.

- If desired, you may also use Up/Down arrow keys to scroll through other transponders to check for proper RF signal level and quality.

Use the PoP Scan function to record the measurements.

International 95 Antenna Pointing

Preset the antenna and mast hardware per the directions of DIRECTV.

Connections: Linear LNB (possibly Eagle Aspen model P170KU) connected to top (SIGNAL IN) port of Super Buddy meter with coax cable.

Meter Set-Up:

Push the **SYST** System soft-key to select the following:

- REGION your geographic region
- SERVICE **DIRECTV**
- SYSTEM **Single Sats**
- LNB MODEL **Intl 95**
- SWITCH TYPE none

*To make selections, arrow up or down to the item to change and press **Enter**, then arrow up or down to the desired option and press **Enter**. Press **EXIT** or **DONE** to return to Run Mode*

Antenna Pointing

Install the mast plumb, preset the antenna vertical angle, mount to mast and grossly align azimuth. You may want to use the ZIP zip code look-up feature to obtain rough antenna settings (magnetic compass heading, elevation, and polarization offset).

- Ensure that you have selected the 95W Galaxy 3C satellite. Use left / right arrow keys to select the desired satellite (orbital position displayed in upper left).
- Press the **ZIP** zip code soft-key (located in bottom left of LCD screen), type in the local zip code, and press **ENTER**. Approximate antenna settings will be displayed. Press **EXIT** soft-key to return to the main Run screen.

Run Mode

- Press **LNB** soft-key (located on middle right side of LCD screen) to power the LNB.

After selecting the satellite and pressing the **LNB** soft-key to power the LNB:

- Adjust antenna azimuth and elevation to obtain maximum signal level (left bar graph), signal quality (right bar graph), and LOCK status.
- Rotate the LNB and feed horn assembly (adjusting the polarity offset) to maximize signal level and quality.
- Press the **ID** soft-key to verify the satellite. "ID VERIFIED" means you are pointed correctly.
- If "ID FAILED" is displayed, press **SCAN** soft-key and Super Buddy will find which satellite you are aimed at.
- If desired, you may also use Up/Down arrow keys to scroll through other transponders to check for proper level and quality.

Input Verification

When the antennas are properly aligned, verify and document the quality of the signals at the input to the riser system using the procedure below.

This test is performed at the input to the riser system, specifically at the end of the cables that connect to the PI-6S Power Inserter.

Equipment Setup:

- Disconnect one input cable at a time from PI-6S and connect it to the Super Buddy's top (SIGNAL IN) LNB input port.

Meter Set-Up:

Push the **SYST** System soft-key to select the following:

- REGION your geographic region
- SERVICE **DIRECTV**
- SYSTEM **MFH-1 systems**
- LNB MODEL defaults to **MFH-1 basic** (user may also choose between **MFH-1 w/95** or **MFH-1 w/72.5/95**)
- SWITCH TYPE **Manual**

To make selections, arrow up or down to the item to change and press **Enter**, then arrow up or down to the desired option and press **Enter**.

After selecting the MFH-1 model, you must up arrow to the switch type and select "Manual". If you leave the switch type at the default DTV6x8, your readings may not be optimal because the meter will be sending invalid switch commands to the LNBF.

Press **EXIT** or **DONE** to return to Run Mode

Verify Port 1

- Disconnect the cable from the PI-6S Port 1 and connect it to the Super Buddy "Signal In" LNB input port.
- Select LNB1 on the meter by pressing the LNB soft-key (located on middle right side of LCD screen)

This will set the Super Buddy to use the odd transponders from the 101 satellite and output the proper voltage to the SL5 LNBF to obtain this signal.

- Verify that a signal lock is obtained.
- Press ID to verify the correct satellite has been obtained.
- Press MENU and select PoP Scan to start collecting data.

The meter will now scan through all the transponders and collect the data for each. When it finishes a summary screen will show the minimum and maximum level and signal quality.

- Press SAVE
- Enter the date
- Enter the location
- Enter your name
- Enter any other comments about the installation (the port number may be useful)
- Press SAVE
- Enter a unique file name (location and port are suggested)
- Press SAVE or ENTER

The meter will save the file in flash storage and reboot.

Remove the LNB cable from the Super Buddy and replace it on Port 1 of the PI-6S.

Verify Port 2

This procedure verifies the signal quality on Port 2 of the riser system which is used for the even transponders from 101 West.

- Disconnect the cable from Port 2 of the PI-6S and connect it to the Super Buddy LNB port.
- Select LNB2 on the meter by pressing the LNB soft-key.
- Follow the rest of the procedure described above for Port 1.
- Remove the LNB cable from the Super Buddy and replace it on Port 2 of the PI-6S.

NOTE: Port 2 will not pass the ID Verification test because there is no way to distinguish the 101 even transponders from the 72.5 even transponders.

Verify Port 3

This procedure verifies the signal quality on Port 3 of the riser system which is used for the odd transponders from 119 West.

- Disconnect the cable from Port 3 of the PI-6S and connect it to the Super Buddy LNB port.
- Select LNB3 on the meter by pressing the LNB soft-key.
- Follow the rest of the procedure described above for Port 1.
- Remove the LNB cable from the Super Buddy and replace it on Port 3 of the PI-6S.

Verify Port 4

This procedure verifies the signal quality on Port 4 of the riser system which is used for the even transponders from 119 and 110 West.

- Disconnect the cable from Port 4 of the PI-6S and connect it to the Super Buddy LNB port.
- Select LNB4 on the meter by pressing the LNB soft-key.
- Follow the rest of the procedure described above for Port 1.
- Remove the LNB cable from the Super Buddy and replace it on Port 4 of the PI-6S.

Note: Transponders 8, 10, and 12 are related to the 110 West satellite. Transponders 22 through 32 are related to the 119 West satellite.

Verify Port 5

This procedure verifies the signal quality on Port 5 of the riser system which is used for the even transponders from 72.5 West.

- Disconnect the cable from Port 5 of the PI-6S and connect it to the Super Buddy LNB port.
- Select LNB5 on the meter by pressing the LNB soft-key.
- Follow the rest of the procedure described above for Port 1.
- Remove the LNB cable from the Super Buddy and replace it on Port 5 of the PI-6S.

NOTE: Port 5 will not pass the ID Verification test because there is no way to distinguish the 101 even transponders from the 72.5 even transponders.

Verify Port 6

This procedure verifies the signal quality on Port 6 of the riser system which is used for the even transponders from 95 West.

- Disconnect the cable from Port 6 of the PI-6S and connect it to the Super Buddy LNB port.
- Select LNB6 on the meter by pressing the LNB soft-key.
- Follow the rest of the procedure described above for Port 1.
- Remove the LNB cable from the Super Buddy and replace it on Port 6 of the PI-6S.

Customer Drop Verification

This test is performed at the customer drop location, at the output from the Customer Unit.

Equipment Setup:

- Connect a cable from the Super Buddy “Signal In” LNB port to the Customer Unit receiver port.

Meter Set-Up:

Push the **SYST** System soft-key to select the following:

- REGION your geographic region
- SERVICE **DIRECTV**
- SYSTEM **MFH-1 systems**
- LNB MODEL defaults to **MFH-1 basic** (user may also choose between **MFH-1 w/95** or **MFH-1 w/72.5/95**)
- SWITCH TYPE **DTV6x8**

Note: You must have the DTV6x8 switch selected for this part of the procedure. This switch type is necessary for the meter to send the proper switch commands to the customer unit.

The procedure is basically the same as the input verification procedure above except that the cable does not change between ports.

Verify Port 1

- Select LNB1 on the meter by pressing the LNB soft-key.
- Verify that a signal lock is obtained.
- Press ID to verify the correct satellite has been obtained.
- Press MENU and select PoP Scan to start collecting data.
- When scan completes, press SAVE
- Enter the date
- Enter the location
- Enter your name
- Enter any other comments about the installation (the port number may be useful)
- Press SAVE
- Enter a unique file name (location and port are suggested)
- Press SAVE or ENTER

Verify Other Ports

Repeat the above except for selecting the desired port with the LNB soft-key.

Transferring Data To PC

Use the SatTransfer program to transfer the files to a PC for viewing, printing and archival. This program is described in the Application Note "Proof of Performance Testing"

Other Notes:

-It is NOT recommended to keep Super Buddy meter in line while checking receiver status due to attenuation from our circuitry.

Please ensure that you have the latest versions of North American Field Guide, Software, and USA Zip Codes loaded into your meter. If your meter has older versions loaded, please use the FlashUpdate program to update your meter, as described in the [Operations Manual](#).