APPLIED INSTRUMENTS, INC.

RF TEST AND MEASUREMENT

09/23/2014

Installing **Norsat Ku Quad Band LNB VSAT** System with VSAT 7850 satellite meter

Connections: LNB connected to ODU / LNB port of VSAT 7850 meter with coax cable

A Norsat Ku Quad Band LNB is designed to cover the entire Ku band. It uses different voltage and 22 kHz tone settings to select between four local oscillators (LOs) inside the LNB:

Band	Voltage	22kHz tone	RF Input Range (GHz)	LO Frequency (GHz)	IF Frequency Range (MHz)
Band 1	13 V	OFF	10.7 - 11.7	9.75	950 - 1950
Band 2	13 V	ON	10.95 - 11.7	10.00	950 - 1700
Band 3	18 V	OFF	11.7 - 12.75	10.75	950 - 2000
Band 4	18 V	ON	12.25 - 12.75	11.30	950 - 1450

When the user selects the desired band on the meter, the VSAT 7850 automatically supplies the required voltage and 22 kHz tone if necessary, thereby selecting the related LO.

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

- REGION   your geographic region (i.e. **NE Continental US**)
- SERVICE   **Generic Ku Band**
- SYSTEM   Selection based on the style of your LNB and feed horn (most likely **H/V Sngl Pol LNB** for linearly polarized signals, but could also possibly be **Circ Sngl Pol LNB** for circularly polarized signals)
- LNB MODEL   **Norsat Ku Quad Band**
- SWITCH TYPE   defaults to **manual** assuming you'll have meter connected directly to LNB with no multi-switch in line

To make selections, arrow up or down to the item to change (using the meter's Up and Down arrow buttons) 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, grossly align azimuth, and preset the polarization offset by rotating the feed horn assembly or skew of antenna reflector (if applicable). You may want to use the AZ/EL lat/long or postal code look-up feature to obtain rough antenna settings.

- Use left / right arrow keys to select the desired satellite (orbital position displayed in upper left). Refer to your service paperwork to know which satellite to aim dish at (i.e. Galaxy 28 satellite at 89°W or Galaxy 16 satellite located at 99°W).
- Press the **AZ/EL** soft-key (located near lower left corner of main Run screen), type in the local postal code or latitude and longitude, and press **ENTER**. Approximate antenna settings (i.e. magnetic compass heading, azimuth, elevation, and polarization offset) will be displayed. Press **EXIT** soft-key to return to the main Run screen.

Run Mode

- Select the appropriate receive polarity (**VT** or **HZ** if using a linear feed horn) or (**RGHT** or **LEFT** if using a circular feed horn) with the upper right soft-key. Refer to your service paperwork to know which receive polarity to choose. You must have your feed horn physically oriented for the same downlink/receive polarization that you specify to the meter.
- Press **LNB** soft-key (located near middle right side of LCD screen) to power the LNB and select the desired band of the LNB. Press LNB soft-key once to select Band1, press it a 2nd time to select Band2, a 3rd time to select Band 3, etc.
  - LNB1 = Band1 = 9.75 GHz LO for 10.7 to 11.7 GHz downlink & 950 to 1950 MHz IF output frequency range
  - LNB2 = Band2 = 10.00 GHz LO for 11.7 to 12.75 GHz downlink & 950 to 2000 MHz IF output frequency range
  - LNB3 = Band3 = 10.75 GHz LO for 11.7 to 12.75 GHz downlink & 950 to 2000 MHz IF output frequency range
  - LNB4 = Band4 = 11.30 GHz LO for 12.25 to 12.75 GHz downlink & 950 to 1450 MHz IF output frequency range
- Adjust antenna reflector alignment (azimuth and elevation) to obtain maximum signal level (shown on left bar graph in dBm or dBmV or dBμV), signal quality (shown on right bar graph in IRD, C/N, Eb/No, or Es/No), and LOCK status.
- Rotate the LNB and feed horn assembly (adjusting the polarization offset) or skew of dish antenna reflector (if applicable) 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 VSAT 7850 will find which satellite you are aimed at.
- You may also use the Up/Down arrow keys to scroll through other transponders (besides the default transponder) to check for LOCK (for more supporting evidence you're aimed at desired sat) and proper level and quality.
- If signals are linearly polarized, adjust cross-pol using methods described in SatProf's VSAT courses (i.e. while verbally talking to NOC, using modem software, etc.). Visit www.satprof.com or www.gvf.org/training for more information.

Other Notes:
-It is NOT recommended to keep VSAT 7850 meter in line while checking IRD/receiver/modem status due to attenuation from the meter's circuitry.
-Various Ku Band VSAT systems are offered in the market. Examples are iDirect™, Spacenet™, StarBand™, Gilat™, HughesNet™, etc.