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Replacing Satellite System Components

I. Purpose:

This document describes how to replace three field-replaceable components of the satellite system: Low Noise Block (LNB), High Power Up Converter (HPUC), and modem.

II. Background:

The satellite system consists of three field-replaceable components:

1. **LNB** – converts the satellite signals to a baseband frequency useable by the modem.
2. **HPUC** – converts the low-level baseband signals from the modem to the satellite frequency.
3. **Modem** – converts the received baseband signals from the LNB to a data signal, and on the transmit side converts the data signal to baseband to feed to the HPUC.

III. Cautions and Hazards:

The transmit signal from the HPUC is amplified many times by the gain of the antenna (approximately 20,000 times). This signal is potentially dangerous if you were to be at the focal point of the antenna. Policy for replacement of either the LNB or the HPUC must include a safety warning of these dangers and how to minimize the risk of becoming exposed to harmful radiation.

IV. Requirements:

- Step ladder

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V. Procedure:

A. Replacing the LNB

(The LNB is located on the feed arm assembly of the dish antenna.)

1. Notify Brewster (phone: 001-509-689-1000) that the circuit will be going down and provide circuit number as follows:
 - Manus: D326-001 or
 - Nauru: D326-002
2. Shut down the transmitter by either of the following two methods:
 - a) Turn off the modem in the SDS rack and remove the RF cables from the SDS rack (see Figure 1), or
 - b) Remove the RF cables from the SDS rack (see Figure 1).

Note: Because the signal levels from the modem are very low, no harm will be done to the modem if it is left running without the cables connected. Removing the RF cables ensures the system cannot be brought back up accidentally, and these cables should be tagged to prevent inadvertent reconnection.

Figure 1



3. Replace the LNB
 - a) Using a step ladder, move close to the feed assembly (see Figure 2).

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- b) Remove the water proof sealing tape on the connector on the bottom of the LNB, and disconnect the coaxial connector.
- c) Remove the earth cable.
- d) Undo the bolts holding the LNB to the feed assembly.
- e) Install the new LNB making sure that it is in the same orientation as the original unit and that the gasket seal functional.
- f) Reconnect the earth wire.
- g) Reconnect the coaxial cable.
- h) Apply water proof tape to the connector assembly.
- i) Reconnect the RF cables to the modem making sure that the Tx cable is connected to the Tx port and the Rx cable is connected to the Rx port.
- j) Turn the modem back on (if it was turned off).
- k) Notify Brewster the circuit has been restored.
- l) Check and record the signal strength and EBNo from the panel meter on the modem in the SDS rack.

Note: Switching between Sno and EBNo is accomplished by using the left and right arrows near the meter assembly.

Figure 2



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B. Replacing the HPUC

(The HPUC is located on the feed arm assembly of the dish antenna.)

1. Notify Brewster (phone: 001-509-689-1000) that the circuit will be going down and provide circuit number as follows:
 - Manus: D326-001 or
 - Nauru: D326-002
2. Shut down the transmitter by either of the following two methods:
 - a) Turn off the modem in the SDS rack and remove the RF cables from the SDS rack (see Figure 1), or
 - b) Remove the RF cables from the SDS rack (see Figure 1).

Note: Because the signal levels from the modem are very low, no harm will be done to the modem if it is left running without the cables connected. Removing the RF cables ensures the system cannot be brought back up accidentally, and these cables should be tagged to prevent inadvertent reconnection.
3. Replace the LNB
 - a) Using a step ladder, move close to the feed assembly (see Figure 3).
 - b) Remove the water proof sealing tape on the connector on the side of the HPUC, and disconnect the coaxial connectors.
 - c) Remove the coax to waveguide adaptor on the top of the HPUC.
 - d) Undo the bolts holding the HPUC to the feed assembly.
 - e) Install the new HPUC making sure that it is in the same orientation as the original unit.
 - f) Reconnect the coaxial cable.
 - g) Apply water proof tape to the connector assembly.
 - h) Reconnect the coax to waveguide adaptor making sure that it has the same orientation as the original.
 - i) Reconnect the RF cables to the modem making sure that the Tx cable is connected to the Tx port and the Rx cable is connected to the Rx port.
 - j) Turn the modem back on (if it was turned off).
 - k) Notify Brewster the circuit has been restored.
 - l) Ask Brewster to confirm circuit is normal

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Figure 3



C. Replacing the Modem

(The modem is located in the SDS rack in the D-Van. See Figure 4.)

1. Notify Brewster (phone: 001-509-689-1000) that the circuit will be going down and provide circuit number as follows:
 - Manus: D326-001 or
 - Nauru: D326-002 [Text]
2. Turn off the modem (power switch is in rear) in the SDS rack.
3. Remove the RF cables from the rear of the modem to the patch panel.
4. Remove the data connections noting where they were connected.
5. Remove the power connector.
6. Remove the modem from the rack.
7. Replace the old modem with the spare. **Note: The replacement should be set up and pre-programmed for operations at either the Manus or Nauru site.**
8. Reconnect the power connector.
9. Reconnect the data connections.
10. Reconnect the RF connectors.
11. Notify Brewster that the circuit is back in service.

12. Check and record the signal strength and EBNo from the from the panel meter on the modem in the SDS rack.

Note: Switching between Sno and EBNo is accomplished by using the left and right arrows near the meter assembly.

Figure 4



VI. References:

None.

VII. Attachments:

None.