System operational description

Description of the LAUR

The LAUR operates within the frequency band from 215 MHz to 250 MHz. Within that band, it uses a 200-kHz or 800-kHz bandwidth channel, depending on the selected data rate. The user is responsible for inquiring about local radio frequency regulations and using the frequency band accordingly.

The LAUR unit operates from a 10.5 VDC to 15.0 VDC power supply voltage. The power supply should be capable of generating a minimum current of 15 A. A 12 VDC battery can be used as a power supply. The power supply used shall be compliant with the rules and regulations of the FCC, of Canada or with other local regulations.

The antenna impedance to be used is 50 Ohm. The maximum VSWR measured at the transceiver output must be less than 1.5:1 at the operating frequencies.

Antenna

mast extender

LAUR   12 VDC

12 V

Figure 1

The allowable temperature range for both operating and storage is -40°C to +70°C.

The LAUR unit comes with Sercel standard Line, Power and XDEV connectors. The Type-N, radio connector is waterproof when connected. Attention should be paid to put the cap in place on the radio connector whenever the unit is not in use, in order to keep the connector clean and the unit waterproof.

The LAUR is used in a radio cell, replying to queries from the LRU present in that cell and using a half-duplex transmission protocol. The clock in the LAUR is locked on that of the associated LRU, which continuously transmits a time mark signal (every 50 ms) for that purpose.

Supplied along with each LAUR is an omnidirectional antenna. A mast extender is also supplied.
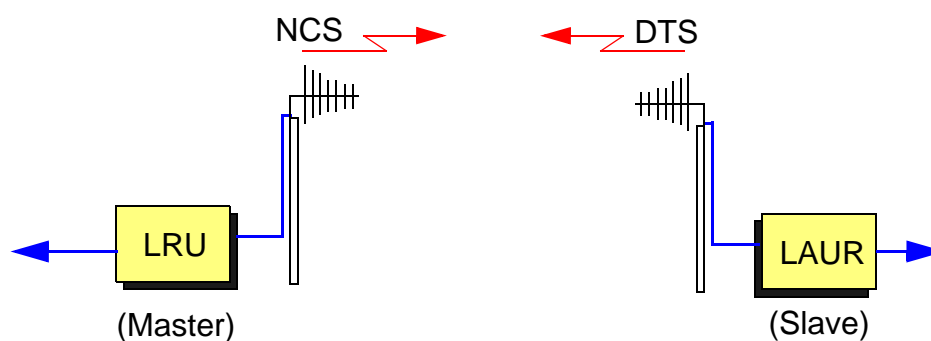
Half-duplex

Figure 2

In the transmission protocol, time is shared between transmission of Master-to-Slave messages and transmission of Slave-to-Master messages.

Master-to-Slave messages are called Network Control Sequences (**NCS**), used for synchronization, zero-time transmission and control.

Slave-to-Master messages are called Data Transfer Sequences (**DTS**), used for data retrieval, seismonitor and collecting test results.
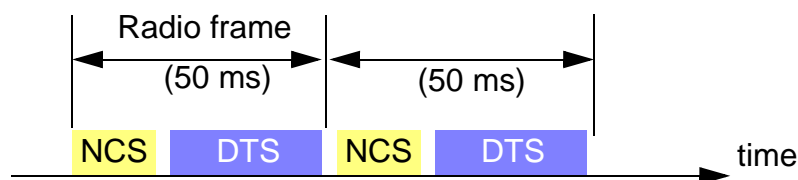

Figure 3

Typically, NCS messages are transmitted every 50 ms. In reply to an NCS message, the LAUR transmits a DTS message (1.5 to 40 ms long). The LAUR does not transmit its DTS until and unless its clock is locked onto that of the LRU.

LAUR frequency management

NOTE: The available frequency band depends on the regional settings chosen by the user when installing software on the HCI workstation and on the handheld terminal. For compliance with Canadian and US communications regulations, the frequency band is limited to respectively:

- Canada: 217 to 218 MHz and 219 to 220 MHz.

- USA: 216 to 217 MHz and 218 to 219 MHz.

The LAUR uses QPSK modulation @ 256 kbps, or 16 QAM @ 512 kbps (for transmission only), or DQPSK modulation @ 1024 kbps.

The RF transceiver in the LAUR unit uses a single 2-MHz band for both transmission and reception. That band is selected between 216 MHz and 249 MHz using the "**Center Frequency**" parameter.

Within the 2-MHz bandwidth, you can choose which channel(s) to use for NCS and DTS messages, by specifying:

- a **Control Channel Frequency** for NCS messages,

- a **Data Channel Frequency** for DTS messages.

The necessary bandwidth for a Data Channel depends on the expected **Data Rate** (256, 512, or 1024 kbps).
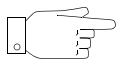
NOTE: Because the LAUR uses a half-duplex protocol, you can choose the same frequency for the **Control Channel** and the **Data Channel**.

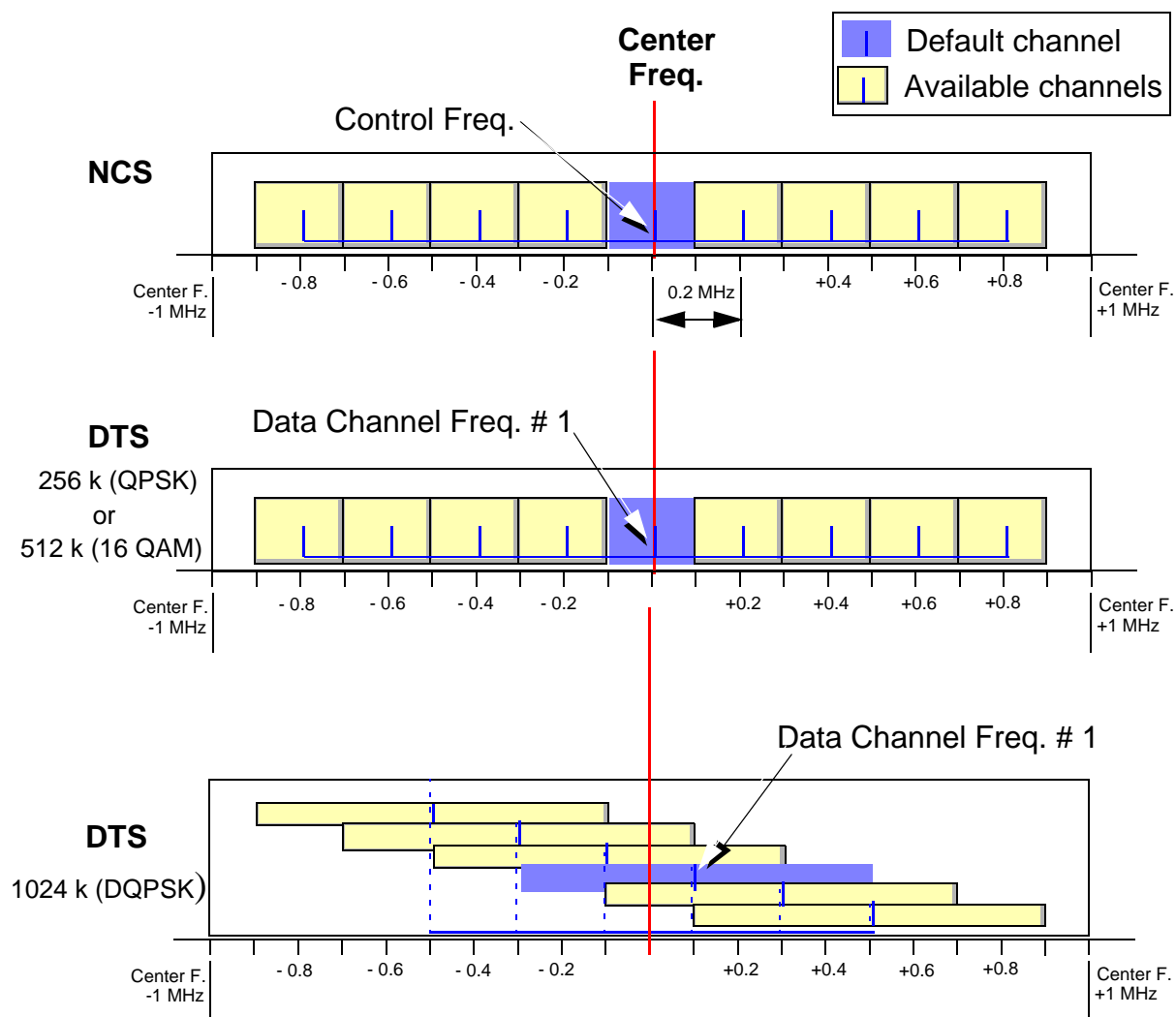The LAUR has the same **frequency** and **data rate** settings as the associated LRU.

Figure 4