

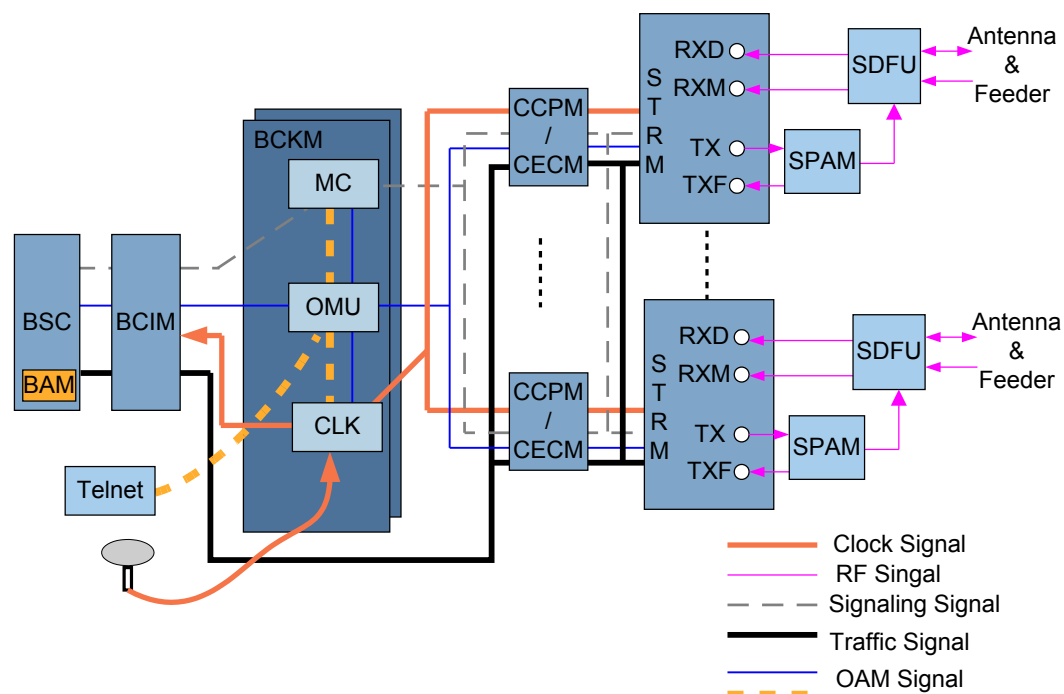
8 Signal Flows in the BTS

About This Chapter

This topic describes the signal flows in the BTS. From the Abis interface to the Um interface, the signals in the BTS form signal flows during transmission. The signal flows in the BTS are the Abis traffic signal flow, Abis signaling signal flow, OM signal flow, and clock signal flow.

The signal flows in the BTS are shown in **Figure 8-1**, where different types of lines are used to mark different types of signal flows.

Figure 8-1 Signal flows in the BTS



The Abis traffic signals, Abis signaling signals, and OM signals are adapted and carried through the asynchronous transfer mode (ATM)/IP protocols. The ATM/IP links over different interfaces are provided by different physical links. The details are as follows:

- The physical links over the Abis interface are E1/T1/FE links.
- The physical links between baseband subracks are cell buses.
- The CCPMs/CECMs are connected to the STDM through SFP cables.

The Abis traffic signals and Abis signaling signals are baseband signals. They are processed by the STRM and converted into RF signals, and then transmitted by the RF modules. The STRM also receives RF signals and converts them into baseband signals.

8.1 Abis Traffic Signal Flow in the BTS

This topic describes the Abis traffic signal flow in the BTS. The Abis traffic signals consist of voice service traffic signals, inband signaling signals, and data service traffic signals.

8.2 Abis Signaling Signal Flow in the BTS

This topic describes the Abis signaling signal flow in the BTS. Two types of signals, namely, BTS control signaling signals and outband signaling signals, are transmitted on the Abis common signaling channel.

8.3 OM Signal Flow in the BTS

This topic describes the OM signal flow in the BTS. The OM of the BTS, either originated from the far-end BAM server or from the near-end maintenance console, is realized through the operation & maintenance unit (OMU) of the BCKM.

8.4 Clock Signal Flow in the BTS

This topic describes the clock signal flow in the BTS.

8.1 Abis Traffic Signal Flow in the BTS

This topic describes the Abis traffic signal flow in the BTS. The Abis traffic signals consist of voice service traffic signals, inband signaling signals, and data service traffic signals.

Forward Traffic Signal Flow

The forward traffic signal flow is as follows:

1. The ATM cells or IP packets from the BSC are sent to the BCIM, which reassembles them and sends them to the CCPM or CECM through the cell bus.
2. The CCPM or CECM encodes, interleaves, spreads, modulates, and multiplexes the baseband signals that are sent from the BCIM and carry traffic. Then, the CCPM or CECM sends the processed baseband signals to the STRM.
3. The STRM performs demultiplexing, up-conversion, and filtering for the received baseband signals, and then sends them to the SPAM.
4. The SPAM amplifies the signals and sends them to the SDFU, which transmits the signals through the antenna subsystem.

Reverse Traffic Signal Flow

The reverse traffic signal flow is as follows:

1. Through the main and diversity antennas, the SDFU receives two paths of CDMA signals from the MS and then sends them to the STRM.
2. The STRM performs filtering, down-conversion, and multiplexing for the main and diversity signals, and then sends them to the CCPM or CECM through the SFP port.
3. The CCPM or CECM demultiplexes, demodulates, de-interleaves, and decodes the baseband signals, which carry traffic. Then, the CCPM or CECM sends the processed signals to the BCIM through the cell bus.
4. The BCIM converts the received signals into ATM cells or IP packets that are adapted to Abis link types, and then sends them to the BSC over the E1/T1/FE link.

8.2 Abis Signaling Signal Flow in the BTS

This topic describes the Abis signaling signal flow in the BTS. Two types of signals, namely, BTS control signaling signals and outband signaling signals, are transmitted on the Abis common signaling channel.

BTS Control Signaling

The BTS control signaling signals contains parameters or control messages sent from the BSC to the BTS for processing. The BTS control signaling signals are not transmitted as RF signals. For example, the BSC sends PN codes to the BTS so that the channel boards can process them.

Forward Outband Signaling Signal Flow

The forward outband signaling signal flow is as follows:

1. The ATM cells or IP packets from the BSC are sent to the BCIM, which reassembles them, uses its own main control unit to process them, and sends them to the CCPM or CECM through the cell bus.
2. The CCPM or CECM encodes, interleaves, spreads, modulates, and multiplexes the baseband signals that are sent from the BCIM and carry Abis signaling. Then, the CCPM or CECM sends the processed baseband signals to the STRM.
3. The STRM performs demultiplexing, up-conversion, and filtering for the received baseband signals, and then sends them to the SPAM.
4. The SPAM amplifies the signals and sends them to the SDFU, which transmits the signals through the antenna subsystem.

Reverse Outband Signaling Signal Flow

The reverse outband signaling signal flow is as follows:

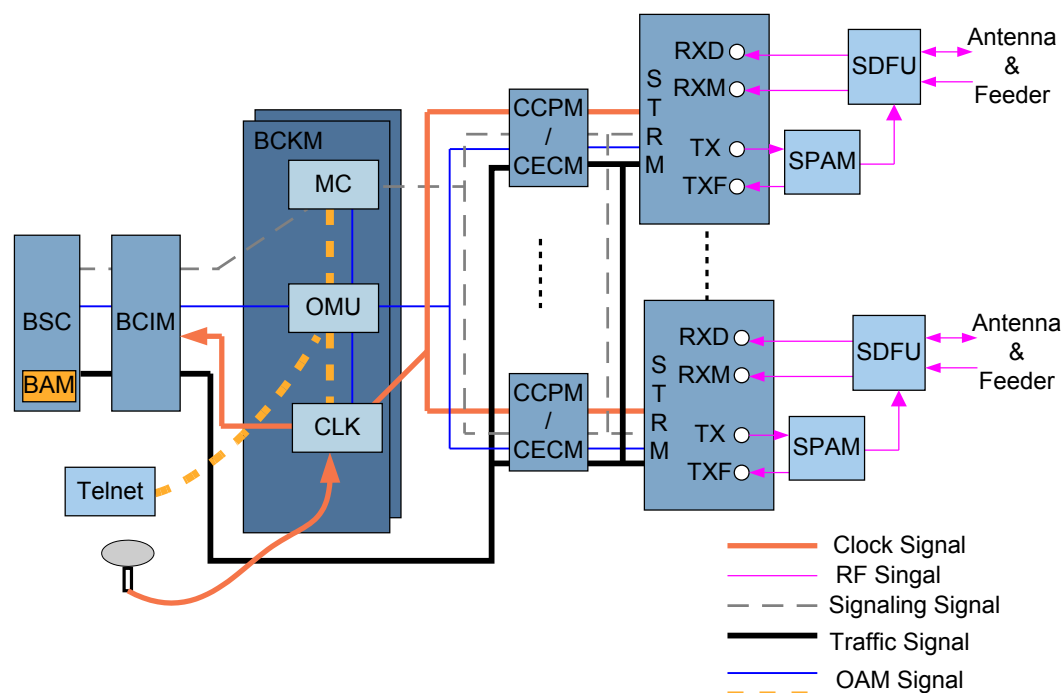
1. Through the main and diversity antennas, the SDFU receives two paths of CDMA signals from the MS and then sends them to the STRM.
2. The STRM performs filtering, down-conversion, and multiplexing for the main and diversity signals, and then sends them to the CCPM or CECM.
3. The CCPM or CECM demultiplexes, demodulates, de-interleaves, and decodes the baseband signals, which carry Abis signaling. After that, the signals are processed by the BCKM and sent to the BCIM through the cell bus.
4. The BCIM converts the received signals into ATM cells or IP packets that adapted to Abis link types, and then sends them to the BSC over the E1/T1/FE link.

8.3 OM Signal Flow in the BTS

This topic describes the OM signal flow in the BTS. The OM of the BTS, either originated from the far-end BAM server or from the near-end maintenance console, is realized through the operation & maintenance unit (OMU) of the BCKM.

Figure 8-2 shows the OM signal flow in the BTS.

Figure 8-2 OM signal flow in the BTS

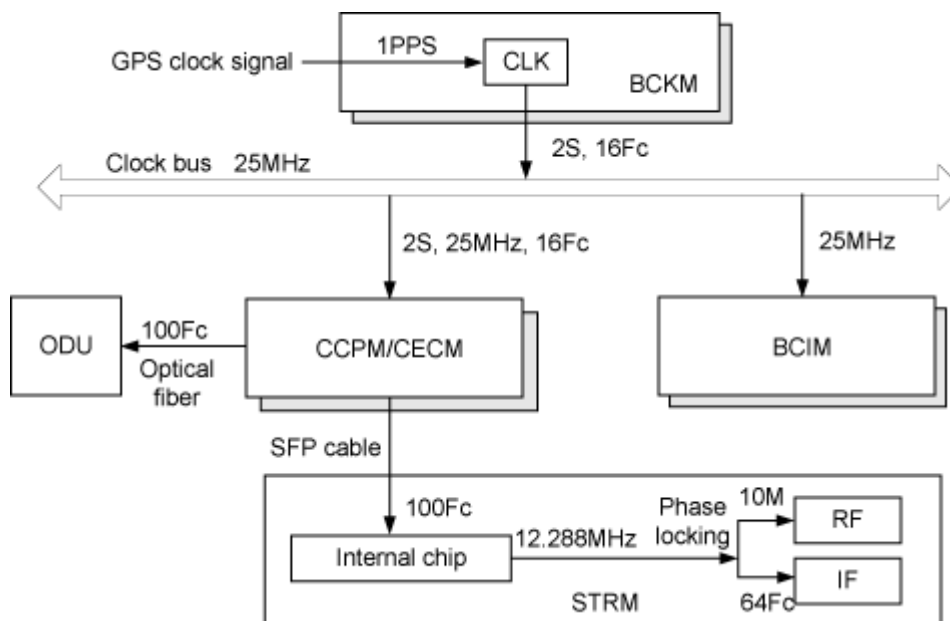


8.4 Clock Signal Flow in the BTS

This topic describes the clock signal flow in the BTS.

Figure 8-3 shows the clock signal flow in the BTS.

Figure 8-3 Clock signal flow in the BTS



The clock signal flow in the BTS is as follows:

- The satellite receiver of the BCKM receives 1 pulse per second (PPS) synchronization signals from GPS and GLONASS satellites through the satellite antenna. Then, the CLKM processes the 1PPS signals to generate 2S and 16Fc clock signals (19.6608 MHz) required by the CCPM or CECM and outputs 2S and 10 MHz signals for testing.
- The BCIM obtains 25 MHz clock signals from the clock bus.
- The CCPM or CECM obtains 2S signals, 25 MHz signals, and 16Fc signals from the clock bus. Then, the CCPM or CECM converts these signals into internal clock signals that it requires and 100Fc clock signals that other boards require. The 2S signals are sent to the logic, which converts them into the signals required by the processing chip.
- Through the SFP port, the STRM uses the internal chip to obtain 100Fc clock signals from the CCPM or CECM. Then, the 100Fc clock signals are converted into 12.288 MHz clock signals after undergoing 10 frequency division. Through phase locking, the 12.288 MHz clock signals are converted to 10 MHz clock signals, used by the RF part, and 64Fc clock signals, used by the intermediate frequency (IF) part.
- If ODU cascading is used, the ODUs obtain 100Fc clock signals from the CCPM or CECM.