

6 Antenna Subsystem of the BTS

About This Chapter

The BTS antenna subsystem transmits and receives RF signals between the antenna port of the BTS cabinet and the antenna. The antenna subsystem consists of the following components: antenna, feeder, jumper, and TMA.

[6.1 Functions of the Antenna Subsystem](#)

The BTS antenna subsystem receives uplink (UL) signals and transmits downlink (DL) signals on the Um interface.

[6.2 Typical Antenna Subsystem](#)

This part describes the typical structure of the antenna subsystem and its installation modes.

[6.3 Typical RET Antenna Subsystem](#)

A typical RET antenna subsystem does not share the antennas and feeders with other systems.

6.1 Functions of the Antenna Subsystem

The BTS antenna subsystem receives uplink (UL) signals and transmits downlink (DL) signals on the Um interface.

The BTS antenna subsystem performs the following functions:

- Transmitting DL signals
- Receiving UL signals
- Amplifying UL signals
- Implementing the lightning protection functions

6.2 Typical Antenna Subsystem

This part describes the typical structure of the antenna subsystem and its installation modes.

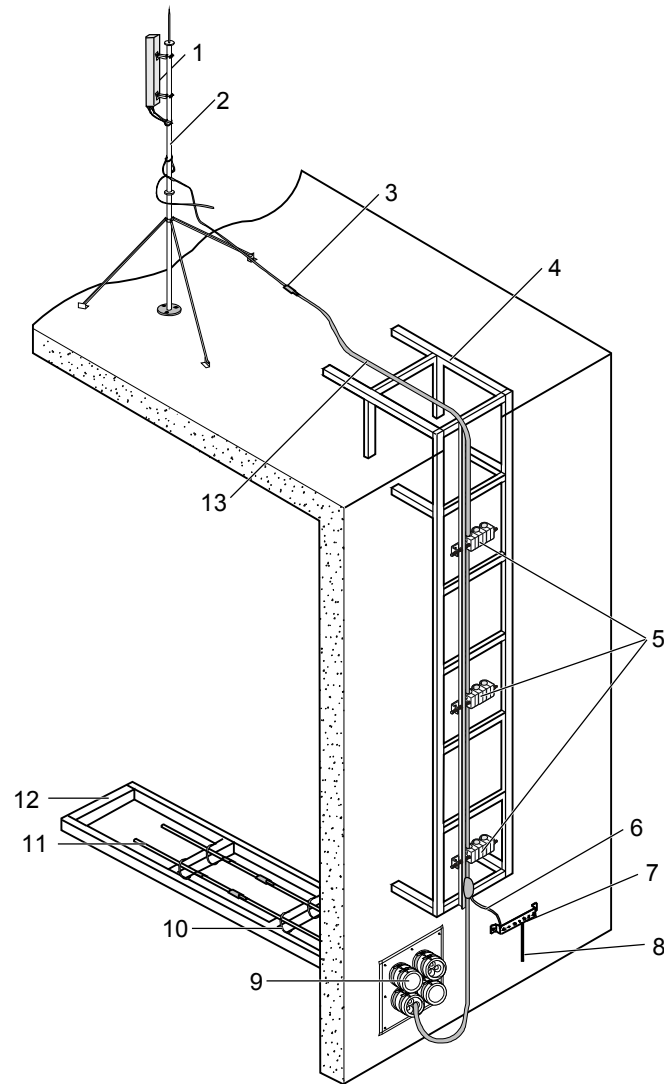
Table 6-1 Features of the GSM antenna subsystem

Application scenario	Support	Not support
Single polarization antenna		
Dual polarization antenna		
TMA (optional)		
Antenna installed on the rooftop		
Antenna installed on a tower		

Two types of typical antenna subsystem are listed below:

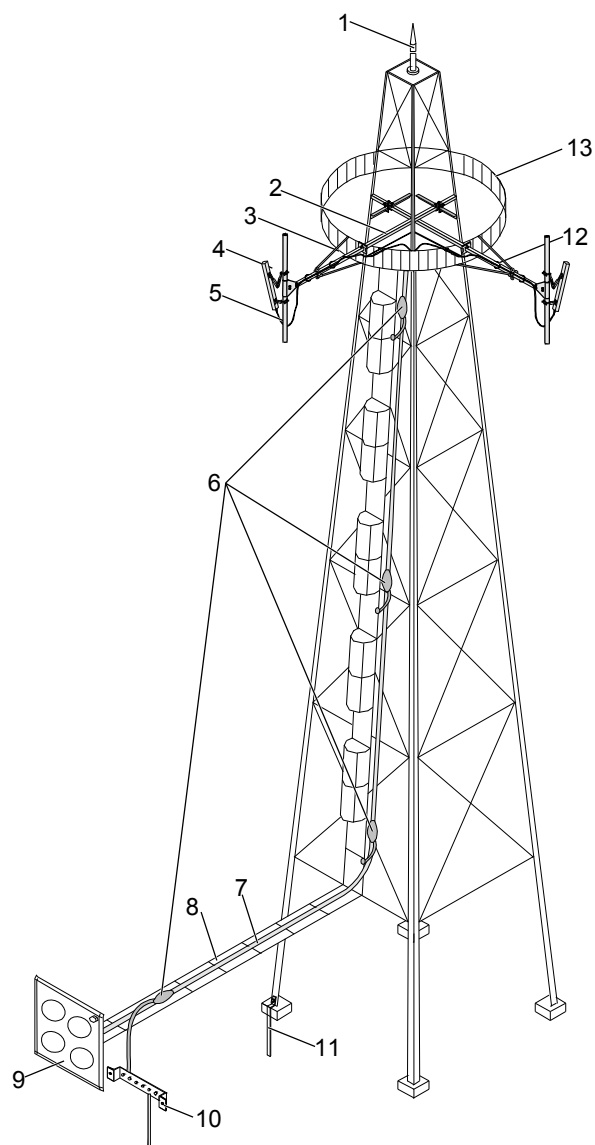
- **Figure 6-1** shows a typical structure of the antenna subsystem, which is installed on the rooftop with a dual polarization antenna and without a TMA.
- **Figure 6-2** shows a typical structure of the antenna subsystem, which is installed on the tower with a dual polarization antenna and a TMA.

Figure 6-1 Typical structure of the antenna subsystem (installed on the rooftop with a dual polarization antenna and without a TMA)



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|--------------------------------|-----------------------------|--------------------|---|
| (1) Directional antenna | (2) Antenna support | (3) Outdoor jumper | (4) Outdoor cabling rack |
| (5) Feeder fixing clip | (6) Feeder grounding cable. | (7) Grounding bar | (8) Cable connecting to the lightning protection ground |
| (9) Feeder encapsulated window | (10) Cable tie | (11) Indoor jumper | (12) Indoor cabling rack |
| (13) Feeder | | | |

Figure 6-2 Typical structure of the antenna subsystem (installed on the tower with a dual polarization antenna and a TMA)



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|---------------------------------------|---------------------------|--------------------------------|--------------------------|
| (1) Lightning rod | (2) Antenna support | (3) TMA | (4) Directional antenna |
| (5) Waterproof curve of the jumper | (6) Feeder grounding clip | (7) Feeder | (8) Outdoor cabling rack |
| (9) Feeder encapsulated window | (10) Grounding bar | (11) Tower grounding conductor | (12) Cable tie |
| (13) Guard rail of the tower platform | | | |

6.3 Typical RET Antenna Subsystem

A typical RET antenna subsystem does not share the antennas and feeders with other systems.

6.3.1 Cabinet + BT + RET Antennas + RCU + SBT

In this typical configuration, the antenna system consists of the RET antenna, BT, SBT, RCU, and feeders. The AISG port on the SBT is connected to the RCU through an AISG control cable.

6.3.2 Cabinet + BT + Cascaded RET Antennas + RCU + SBT

In this typical configuration, the antenna system consists of the cascaded RET antenna, BT, SBT, RCU, and feeders. The AISG port on the SBT is connected to the RCU through an AISG control cable.

6.3.1 Cabinet + BT + RET Antennas + RCU + SBT

In this typical configuration, the antenna system consists of the RET antenna, BT, SBT, RCU, and feeders. The AISG port on the SBT is connected to the RCU through an AISG control cable.

NOTE

The common BT transmits DC signal and RF signal, and the OOK BT transmits DC signal, RF signal, and OOK signal. For the RET antenna system, the OOK BT must be used.

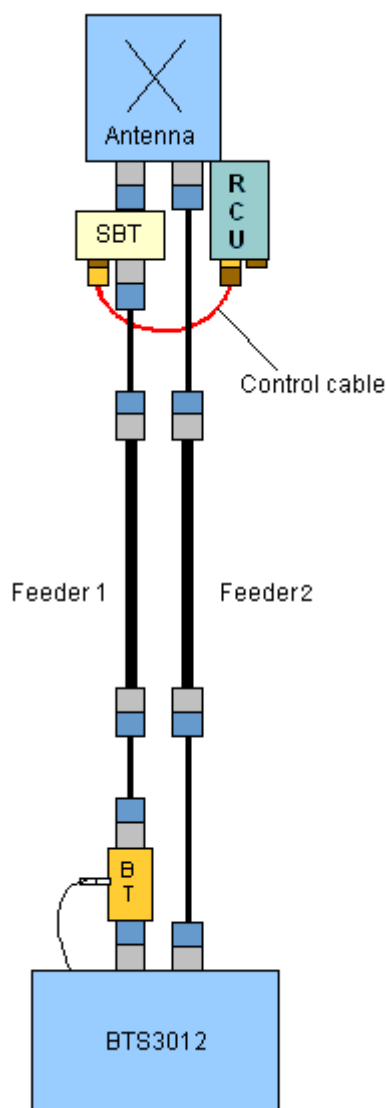
You should **install splitters** if multiple antennas are used in one sector in the case of split sectors. Splitters are installed between the base station and the antennas using jumpers.

The RET antenna can be controlled through the Huawei OMC or the LMT. The OMC or the LMT sends the control signals to the base station. The base station converts the control signals into OOK signals, and then transfers the OOK signals and DC power to the BT. Then, the BT couples the OOK signals and DC power into the internal conductor of Feeder 1.

After the OOK signals and DC power enters the SBT, the DC power is transferred to the RCU through the control cable between the SBT and the RCU. In the SBT, the OOK signals are demodulated and converted into RS485 signals. Then, the RS485 signals are sent to the RCU.

After the RCU receives the RS485 signals, it runs the command as specified in the signals.

Figure 6-3 shows the configuration of cabinet + BT + RET antenna + RCU + SBT.

Figure 6-3 Cabinet + BT + RET Antennas + RCU + SBT

6.3.2 Cabinet + BT + Cascaded RET Antennas + RCU + SBT

In this typical configuration, the antenna system consists of the cascaded RET antenna, BT, SBT, RCU, and feeders. The AISG port on the SBT is connected to the RCU through an AISG control cable.

NOTE

The common BT transmits DC signal and RF signal, and the OOK BT transmits DC signal, RF signal, and OOK signal. For the RET antenna system, the OOK BT must be used.

You should **install splitters** if multiple antennas are used in one sector in the case of split sectors. Splitters are installed between the base station and the antennas using jumpers.

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After the OOK signals and DC power enters the SBT, the DC power is transferred to the RCU through the control cable between the SBT and the RCU. In the SBT, the OOK signals are demodulated and converted into RS485 signals. Then, the RS485 signals are sent to the RCU.

After the RCU receives the RS485 signals, it runs the command as specified in the signals.

Cascaded RCUs can be used when the antennas for three sectors are installed on the same pole or tower and within a short distance of each other.

Figure 6-4 shows the configuration of cabinet + BT + cascaded RET antenna + RCU + SBT.

Figure 6-4 Cabinet + BT + cascaded RET Antennas + RCU + SBT

