noted that in other standards, such as the TD-SCDMA standard, one frequency is used for both uplink and downlink communications.

[0055] In a GSM environment, signals may be communicated in different frequencies over a period of time, which is divided into frames that are each divided into eight time slots, or channels. Each time slot, or channel, is either a control channel or a traffic channel. Control channels are operable to carry control signals and/or signaling or paging signals, while traffic channels are operable to carry voice and/or other data signals. In the GSM standard, one of the eight channels in a particular frequency, which may be referred to hereinafter as the control frequency, is designated as the control channel. The remaining channels in the control frequency may be traffic channels operable to carry conversations. The control frequency thus consists of one control channel and seven traffic channels. Each remaining frequency may be referred to as a traffic frequency consisting of eight traffic channels. Generally, each traffic channel can support one conversation or other communication in full rate, two conversations or other communications in half rate, or an unlimited number of conversations or other communications in GPRS or group mode.

[0056] When a particular mobile station **15** is engaged in a call, voice and/or other data signals intended for that mobile station **15** are transmitted from base station system **12** via smart antenna array **28** within a particular traffic channel (or time slot) in a particular frequency. The mobile station **15** will "listen" for the voice and/or data signals only in the particular traffic channel in the particular frequency. Thus, mobile station **15** must know when, and at which frequency, to "listen" for the voice signals, and thus must be synchronized to base station transceiver **24**.

[0057] Smart antenna apparatus **16** must also be synchronized with base station transceiver **24** in order to operate properly. For example, smart antenna apparatus **16** must be synchronized with base station transceiver **24** in order to perform its beam-switching functions as discussed above. Further, in some embodiments, smart antenna apparatus **16** should be synchronized with base station **12** more accurately than mobile station **15** is synchronized with base station **12**. The synchronization of smart antenna apparatus **16** with base station **12** is discussed in greater detail below with reference to FIGS. **5** through **8**.

[0058] FIG. **2** illustrates the general architecture and operation of smart antenna system **14**. As discussed above, smart antenna system **14** includes smart antenna apparatus **16** and antenna unit **18**. Smart antenna apparatus **16** includes a receiving system **100**, a processing system **102**, a storage system **103**, a control channel monitoring module **104**, and a signaling information monitoring system **106**. In some embodiments, smart antenna apparatus **16** also includes one or more diplexers, such as diplexers **120** and **122**.

[0059] Receiving system **100** is generally operable to receive radio signals communicated from mobile stations **15**. In particular, receiving system **100** may receive analog radio signals communicated from mobile stations **15**, received at antenna unit **18**, and communicated to receiving system **100** via paths **150** and **152**. Receiving system **100** may be further operable to convert the analog radio signals to digital signals and communicate the digital signals to processing system **102**.

[0060] As shown in FIG. **3**, receiving system **100** may include one or more frequency receiver units **108**, each corresponding with a particular frequency (in other words, a frequency band) and thus operable to receive signals communicated by mobile stations **15** via that frequency. Each frequency receiver unit **108** may include one or more beam receivers **112** operable to receive signals communicated in a particular frequency. Each frequency receiver unit **108** may include a beam receiver **112** corresponding with each narrow beam **34**. For example, in one embodiment in which smart antenna system **14** divides wide beam **32** into seven narrow beams **34**, each frequency receiver unit **108** includes eight beam receivers **112**, one for each of the seven narrow beams **34** and one for wide beam **32**, which is received by sector antenna **31**. Beam receivers **112** may be operable to convert received radio frequency signals into baseband signals. In a particular embodiment, the beam receivers **112** are identical to each other.

[0061] Receiving system **100** may also include one or more samplers **116** operable to convert signals from analog to digital. In particular, one or more samplers **116** may convert analog signals received by each beam receiver **112** to digital signals such that the signals may be processed by processing system **102**.

[0062] Referring again to FIG. **2**, processing system **102** is generally operable to perform beam-selection functions. In particular, processing system **102** may execute one or more algorithms based on various inputs and/or parameters to determine a transmitting beam selection **124** and a receiving beam selection **126**. In other words, processing system **102** is operable to select one of the narrow beams **34** to communicate signals received by antenna unit **18** to base station transceiver **24**, and one of the narrow beams **34** (which may be the same or a different narrow beam **34**) to transmit downlink signals to mobile stations **15**.

[0063] As shown in FIG. **4**, processing system **102** may include one or more processing modules **62** operable to process received signals, such as signaling signals, control signals, and/or traffic signals. In some embodiments, processing system **102** includes one processing module **62** for each frequency used by smart antenna system **14**. Thus, each processing module **62** may process signals communicated in one of the frequencies used by base station transceiver **24**. Each processing module **62** is generally operable to perform one or more functions, including beam-selection functions. In an environment using time division muliplexing, such as a GSM environment, each processing module **62** may be operable to determine both uplink and downlink beam selections for communicating signals in each time slot. Thus, in some embodiments, each processing module **62** is operable to determine both uplink and downlink beam selections for each time slot in a particular frequency.

[0064] Processing modules **62** may make beam selection decisions based on one or more inputs or parameters, including signals received from receiving system **100** and/or signaling information received from signaling information monitoring system **106**. For example, each processing module **62** may be operable to execute one or more beam-selection algorithms to make beam selection determinations. In one embodiment, each processing module **62** is operable to execute a fast decision beam-selection algorithm or a smart decision beam-selection algorithm based on one or