CLAIMS

1. A device comprising: an encoder configured to: select a left channel or a right channel as a non-reference target channel based on a high-band reference channel indicator; generate a high-band portion of the non-reference target channel; generate a synthesized non-reference high-band channel based on a non-reference high-band excitation corresponding to the non-reference target channel; estimate one or more spectral mapping parameters based on the synthesized non-reference high-band channel and the high-band portion of the non-reference target channel; apply the one or more spectral mapping parameters to the synthesized non-reference high-band channel to generate a spectrally shaped synthesized non-reference high-band channel; estimate a gain mapping parameter based on the spectrally shaped synthesized non-reference high-band channel, the gain mapping parameter distinct from the one or more spectral mapping parameters; and generate an encoded bitstream based on the one or more spectral mapping parameters, the gain mapping parameter, and the spectrally shaped synthesized non-reference high-band channel; and a transmitter configured to transmit the encoded bitstream to a second device.

2. The device of claim 1, wherein the encoder is further configured to: apply a first gain to a harmonic high-band excitation to generate a gain-adjusted harmonic high-band excitation; apply a second gain to modulated noise to generate gain-adjusted modulated noise; and combine the gain-adjusted harmonic high-band excitation and the gain-adjusted modulated noise to generate the non-reference high-band excitation.

3. The device of claim 1, wherein the synthesized non-reference high-band channel is generated using a linear prediction coefficient synthesis filter.

4. The device of claim 1, wherein the encoder is further configured to filter the synthesized non-reference high-band channel based on a spectral-mapping filter.

5. The device of claim 1, wherein the gain mapping parameter is further based on a high-band mid channel, a synthesized high-band mid channel, and a non-reference high-band channel.

6. The device of claim 1, wherein the one or more spectral mapping parameters are estimated based on a first autocorrelation value of the non-reference target channel at lag index one and a second autocorrelation value of the non-reference target channel at lag index zero.

7. The device of claim 1, wherein the one or more spectral mapping parameters include a spectral mapping parameter corresponding to a criteria satisfied by at least two spectral mapping parameter candidates to match a spectral shape of the non-reference target channel and a spectral shape of the spectrally shaped synthesized non-reference high-band channel.

8. The device of claim 7, wherein the spectral mapping parameter corresponds to a spectral mapping parameter of a previous frame if the at least two spectral mapping parameter candidates

are non-real candidates.

9. The device of claim 7, wherein the spectral mapping parameter corresponds to a spectral mapping parameter of a previous frame if each spectral mapping parameter candidate of the at least two spectral mapping parameter candidates has an absolute value that is greater than one.

10. The device of claim 7, wherein the spectral mapping parameter corresponds to a spectral mapping parameter candidate having an absolute value less than one if only one spectral mapping parameter candidate of the at least two spectral mapping parameter candidates has an absolute value less than one.

11. The device of claim 7, wherein the spectral mapping parameter corresponds to a spectral mapping parameter candidate having a smallest value if more than one of the at least two spectral mapping parameter candidates have an absolute value less than one.

12. The device of claim 7, wherein the spectral mapping parameter corresponds to a spectral mapping parameter of a previous frame if more than one of the at least two spectral mapping parameter candidates have an absolute value less than one.

13. The device of claim 1, wherein the encoded bitstream corresponds to an inter-channel bandwidth extension (ICBWE) bitstream, the ICBWE bitstream based on a high-band reference channel indicator bitstream, a high-band spectral mapping bitstream, and a high-band gain mapping bitstream.

14. The device of claim 1, wherein the encoder and the transmitter are integrated into a mobile device.

15. The device of claim 1, wherein the encoder and the transmitter are integrated into a base station.

16. A method of encoding audio data, the method comprising: selecting, at an encoder of a first device, a left channel or a right channel as a non-reference target channel based on a high-band reference channel indicator; generating a high-band portion of the non-reference target channel; generating a synthesized non-reference high-band channel based on a non-reference high-band excitation corresponding to the non-reference target channel; estimating one or more spectral mapping parameters based on the synthesized non-reference high-band channel and the high-band portion of the non-reference target channel; applying the one or more spectral mapping parameters to the synthesized non-reference high-band channel to generate a spectrally shaped synthesized non-reference high-band channel; estimating a gain mapping parameter based on the spectrally shaped synthesized non-reference high-band channel, the gain mapping parameter distinct from the one or more spectral mapping parameters; generating an encoded bitstream based on the one or more spectral mapping parameters, the gain mapping parameter, and the spectrally shaped synthesized non-reference high-band channel; and transmitting the encoded

bitstream to a second device.

17. The method of claim 16, further comprising: applying a first gain to a harmonic high-band excitation to generate a gain-adjusted harmonic high-band excitation; applying a second gain to modulated noise to generate gain-adjusted modulated noise; and combining the gain-adjusted harmonic high-band excitation and the gain-adjusted modulated noise to generate the non-reference high-band excitation.

18. The method of claim 16, further comprising generating the synthesized non-reference high-band channel based on a linear prediction coefficient synthesis filter.

19. The method of claim 16, wherein the one or more spectral mapping parameters include a spectral mapping parameter corresponding to a criteria satisfied by at least two spectral mapping parameter candidates to match a spectral shape of the non-reference target channel and a spectral shape of the spectrally shaped synthesized non-reference high-band channel.

20. The method of claim 19, wherein the spectral mapping parameter corresponds to a spectral mapping parameter of a previous frame if the at least two spectral mapping parameter candidates are non-real candidates.

21. The method of claim 19, wherein the spectral mapping parameter corresponds to a spectral mapping parameter of a previous frame if each spectral mapping parameter candidate of the at least two spectral mapping parameter candidates has an absolute value that is greater than one.

22. The method of claim 19, wherein the spectral mapping parameter corresponds to a spectral mapping parameter candidate having an absolute value less than one if only one spectral mapping parameter candidate of the at least two spectral mapping parameter candidates has an absolute value less than one.

23. The method of claim 19, wherein the spectral mapping parameter corresponds to a spectral mapping parameter candidate having a smallest value if more than one of the at least two spectral mapping parameter candidates have an absolute value less than one.

24. The method of claim 19, wherein the spectral mapping parameter corresponds to a spectral mapping parameter of a previous frame if more than one of the at least two spectral mapping parameter candidates have an absolute value less than one.

25. The method of claim 16, wherein estimating the one or more spectral mapping parameters and applying the one or more spectral mapping parameters are performed at a mobile device.

26. The method of claim 16, wherein estimating the one or more spectral mapping parameters and applying the one or more spectral mapping parameters are performed at a base station.

27. A device comprising: mean for selecting a left channel or a right channel as a non-reference target channel based on a high-band reference channel indicator; means for generating a high-band portion of the non-reference target channel; means for generating a synthesized non-reference high-band channel based on a non-reference high-band excitation corresponding to the non-reference target channel; means for estimating one or more spectral mapping parameters based on the synthesized non-reference high-band channel and the high-band portion of the non-reference target channel; means for applying the one or more spectral mapping parameters to the synthesized non-reference high-band channel to generate a spectrally shaped synthesized non-reference high-band channel; means for estimating a gain mapping parameter based on the spectrally shaped synthesized non-reference high-band channel, the gain mapping parameter distinct from the one or more spectral mapping parameters; means for generating an encoded bitstream based on the one or more spectral mapping parameters, the gain mapping parameter, and the spectrally shaped synthesized non-reference high-band channel; and means for transmitting the spectral mapping parameter bitstream to a second device.

28. The device of claim 27, wherein the means for estimating the one or more spectral mapping parameters and the means for applying the one or more spectral mapping parameters are integrated into a mobile device.

29. The device of claim 27, wherein the means for estimating the one or more spectral mapping parameters and the means for applying the one or more spectral mapping parameters are integrated into a base station.

30. A device comprising: a decoder configured to: generate a reference channel and a non-reference target channel from a received low-band bitstream, the low-band bitstream received from an encoder of a second device; generate a synthesized non-reference high-band channel based on a non-reference high-band excitation corresponding to the non-reference target channel; extract one or more spectral mapping parameters from a received spectral mapping bitstream, the spectral mapping bitstream received from the encoder of the second device; extract a gain mapping parameter from a received high-band gain mapping bitstream, the high-band gain mapping bitstream received from the encoder of the second device, and the gain mapping parameter distinct from the one or more spectral mapping parameters; generate a spectrally shaped synthesized non-reference high-band channel by applying the one or more spectral mapping parameters and the gain mapping parameter to the synthesized non-reference high-band channel; and generate an output signal based at least on the spectrally shaped synthesized non-reference high-band channel, the reference channel, and the non-reference target channel.

31. The device of claim 30, further comprising a playback device configured to render the output signal.

32. The device of claim 30, wherein the encoder is further configured to: scale the spectrally shaped synthesized non-reference high-band channel based on a quantized high-band gain shape to generate a scaled signal; and generate a decoded high-band non-reference channel based on

the scaled signal, wherein the output signal is based at least on the decoded high-band non-reference channel.

33. The device of claim 30, wherein the decoder is integrated into a mobile device.

34. The device of claim 30, wherein the decoder is integrated into a base station.