CLAIMS

What is claimed is:

~~1. A combiner comprising:~~

~~N coaxial cables each configured to connect to a respective output of N radio frequency power amplifiers, where N is an integer greater than one, and wherein each of the N coaxial cables is configured to receive an amplified radio frequency signal from a respective one of the N radio frequency power amplifiers;~~

~~a board comprising a plurality of capacitances and configured to connect to each of the N coaxial cables and combine the amplified radio frequency signals, wherein the N coaxial cables and the plurality of capacitances provide N inductance and capacitance combinations; and~~

~~a connector configured to connect an output of the board to a load.~~

~~2. The combiner of claim 1, wherein the N coaxial cables comprise:~~

~~a first coaxial cable configured to connect to a first output of a first one of the N radio frequency power amplifiers; and~~

~~a second coaxial cable configured to connect to a second output of a second one of the N radio frequency power amplifiers.~~

~~3. The combiner of claim 2, wherein the N coaxial cables further comprise a third coaxial cable configured to connect to a third output of a third one of the N radio frequency power amplifiers.~~

~~4. The combiner of claim 1, wherein:~~

~~each of the N coaxial cables is connected to a respective one of the plurality of capacitances to provide one of the N inductance and capacitance combinations; and~~

~~each of the plurality of capacitances is connected between the N coaxial cables and a voltage reference.~~

5. The combiner of claim 1, wherein input impedance of each of the N coaxial cables matches output impedance of one of the N radio frequency power amplifiers.

6. The combiner of claim 1, wherein output impedance of the combiner at the connector matches an input impedance of the load.

7. The combiner of claim 1, wherein the N inductance and capacitance combinations are connected in parallel relative to each other.

8. The combiner of claim 7, wherein:

an output impedance of each the N radio frequency power amplifiers is greater than an output impedance of each of the N inductance and capacitance combinations; and

the output impedance of each the N radio frequency power amplifiers is equal to a total output impedance of the combiner.

9. The combiner of claim 1, wherein each of the N coaxial cables comprises:

a sheathed section connected to a coaxial connector, wherein the coaxial connector is configured to connect to one of the N radio frequency power amplifiers;

a shielded section configured to connect to a voltage reference;

a non-shielded section having an inductance; and

a core section connected to the board.

10. The combiner of claim 9, wherein:

the sheathed section comprises a sheath;

the shielded section comprises a shield and does not include the sheath, wherein the shield is configured to connect to the voltage reference via a clamp;

the non-shielded section comprises a dielectric insulator and does not include the sheath and the shield; and

the core section comprises a wire and does not include the sheath, the shield and the dielectric insulator.

11. The combiner of claim 10, wherein:

the dielectric insulator is disposed between the core and the shield in the sheathed section and the shielded section; and

the shield is disposed between the dielectric insulator and the sheath in the sheathed section.

12. The combiner of claim 9, wherein the inductance of each of the non-shielded sections is directly related to a length of the non-shielded sections.

13. The combiner of claim 9, wherein a first inductance of a first one of the non-shielded sections is equal to a second inductance of a second one of the non-shielded sections.

14. The combiner of claim 1, wherein the N coaxial cables are gain and phase matched to each other and equally share in power supplied to the load.

15. A power generator system comprising:

an input amplifier configured to receive a radio frequency signal and generate a conditioned signal;

a splitter configured to split the conditioned signal into a plurality of radio frequency signals;

the N radio frequency power amplifiers configured to amplify the plurality of radio frequency signals to generate the amplified radio frequency signals; and

the combiner of claim 1.

16. A combiner comprising:

a first coaxial cable configured to connect to a first output of a first radio frequency power amplifier, wherein the first coaxial cable comprises a first nonshielded section with a first inductance;

a second coaxial cable configured to connect to a second output of a second radio frequency power amplifier, wherein the second coaxial cable comprises a second non-shielded section with a second inductance; and

a board comprising

a first capacitance connected to the first non-shielded section to provide a first inductance and capacitance combination, and

a second capacitance connected to the second non-shielded section to provide a second inductance and capacitance combination, wherein the second inductance and capacitance combination is equal to the first inductance and capacitance combination.

17. The combiner of claim 16, wherein:

the first coaxial cable comprises

a first sheathed section connected to a first coaxial connector, wherein the first coaxial connector is configured to connect to the first radio frequency power amplifier,

a first shielded section configured to connect to a voltage reference, and

a first core section connected to the board; and

the second coaxial cable comprises

a second sheathed section connected to a second coaxial connector, wherein the second coaxial connector is configured to connect to the second radio frequency power amplifier,

a second shielded section configured to connect to the voltage reference, and

a second core section connected to the board.

18. The combiner of claim 17, wherein:

the first sheathed section comprises a first sheath;

the second sheathed section comprises a second sheath;

the first shielded section comprises a first shield and does not include the first sheath;

the second shielded section comprises a second shield and does not include the second sheath;

the first shield and the second shield are configured to connect to the voltage reference via a clamp;

~~the first non-shielded section comprises a first dielectric insulator and does not include the first sheath and the first shield;~~

~~the second non-shielded section comprises a second dielectric insulator and does not include the second sheath and the second shield;~~

~~the first core section comprises a first wire and does not include the first sheath, the first shield and the first dielectric insulator; and~~

~~the second core section comprises a second wire and does not include the second sheath, the second shield and the second dielectric insulator.~~

~~19. The combiner of claim 16, wherein:~~

~~a first gain of the first coaxial cable matches a second gain of the second coaxial cable; and~~

~~a first phase of the first coaxial cable matches a second phase of the second coaxial cable.~~

~~20. The combiner of claim 16, wherein:~~

~~a first impedance of the first coaxial cable matches an impedance of an output of the first radio frequency power amplifier;~~

~~a second impedance of the second coaxial cable matches an impedance of an output of the second radio frequency power amplifier; and~~

~~a third impedance of an output of the board matches an impedance of an input of a load, wherein the output of the board is configured to connect to the input of the load via a connector.~~

1. A combiner comprising:

N coaxial cables each configured to connect to a respective output of N radio frequency power amplifiers, where N is an integer greater than one, and wherein each of the N coaxial cables is configured to receive an amplified radio frequency signal from a respective one of the N radio frequency power amplifiers;

a board comprising a plurality of capacitances and configured to connect to each of the N coaxial cables at respective first, unconnected ends of the N coaxial cables and combine the amplified radio frequency signals, wherein the N coaxial cables and the plurality of capacitances provide N inductance and capacitance

combinations, wherein the N coaxial cables connect at positive ends from the first ends; and

a connector configured to connect an output of the board to a load.

2. The combiner of claim 1, wherein the N coaxial cables comprise:

a first coaxial cable configured to connect to a first output of a first one of the N radio frequency power amplifiers; and

a second coaxial cable configured to connect to a second output of a second one of the N radio frequency power amplifiers.

3. The combiner of claim 2, wherein the N coaxial cables further comprise a third coaxial cable configured to connect to a third output of a third one of the N radio frequency power amplifiers.

4. The combiner of claim 1, wherein

each of the N coaxial cables is connected to a respective one of the plurality of capacitances to provide one of the N inductance and capacitance combinations; and

each of the plurality of capacitances is connected between the N coaxial cables and a voltage reference.

5. The combiner of claim 1, wherein input impedance of each of the N coaxial cables matches output impedance of one of the N radio frequency power amplifiers.

6. The combiner of claim 1, wherein output impedance of the combiner at the connector matches an input impedance of the load.

7. The combiner of claim 1, wherein the N inductance and capacitance combinations are connected in parallel relative to each other.

8. The combiner of claim 7, wherein:

an output impedance of each the N radio frequency power amplifiers is greater than an output impedance of each of the N inductance and capacitance combinations; and

the output impedance of each the N radio frequency power amplifiers is equal to a total output impedance of the combiner.

9. The combiner of claim 1, wherein the N coaxial cables are gain and phase matched to each other and equally share in power supplied to the load.

10. A combiner comprising:

N coaxial cables each configured to connect to a respective output of N radio frequency power amplifiers, where N is an integer greater than one, and wherein each of the N coaxial cables is configured to receive an amplified radio frequency signal from a respective one of the N radio frequency power amplifiers;

a board comprising a plurality of capacitances and configured to connect to each of the N coaxial cables and combine the amplified radio frequency signals, wherein the N coaxial cables and the plurality of capacitances provide N inductance and capacitance combinations;

a connector configured to connect an output of the board to a load;

a sheathed section connected to a coaxial connector, wherein the coaxial connector is configured to connect to one of the N radio frequency power amplifiers;

a shielded section configured to connect to a voltage reference

a non-shielded section having an inductance; and

a core section connected to the board.

11. The combiner of claim 10, wherein:

the sheathed section comprises a sheath;

the shielded section comprises a shield and does not include the sheath, wherein the shield is configured to connect to the voltage reference via a clamp;

the non-shielded section comprises a dielectric insulator and does not include the sheath and the shield; and

the core section comprises a wire and does not include the sheath, the shield and the dielectric insulator.

12. The combiner of claim 11, wherein:

the dielectric insulator is disposed between the core and the shield in the sheathed section and the shielded section; and

the shield is disposed between the dielectric insulator and the sheath in the sheathed section.

13. The combiner of claim 10, wherein the inductance of each of the non-shielded sections is directly related to a length of the non-shielded sections.

14. The combiner of claim 10, wherein the non-shield section comprises a first one and second one non-shield section, and a first inductance of the first one of the non-shielded sections is equal to a second inductance of a second one of the non-shielded sections.

15. A power generator system comprising:

an input amplifier configured to receive a radio frequency signal and generate a conditioned signal;

a splitter configured to split the conditioned signal into a plurality of radio frequency signals;

the N radio frequency power amplifiers configured to amplify the plurality of radio frequency signals to generate the amplified radio frequency signals; and the combiner of claim 1.

16. A combiner comprising:

a first coaxial cable configured to connect to a first output of a first radio frequency power amplifier, wherein the first coaxial cable comprises a first non-shielded section with a first inductance;

a second coaxial cable configured to connect to a second output of a second radio frequency power amplifier, wherein the second coaxial cable comprises a second non-shielded section with a second inductance; and

a board comprising

a first capacitance connected to the first non-shielded section to provide a first inductance and capacitance combination, and

a second capacitance connected to the second non-shielded section to provide a second inductance and capacitance combination, wherein the second inductance and capacitance combination is equal to the first inductance and capacitance combination.

17. The combiner of claim 16, wherein:

the first coaxial cable comprises

a first sheathed section connected to a first coaxial connector, wherein the first coaxial connector is configured to connect to the first radio frequency power amplifier,

a first shielded section configured to connect to a voltage reference, and

a first core section connected to the board; and

the second coaxial cable comprises

a second sheathed section connected to a second coaxial connector, wherein the second coaxial connector is configured to connect to the second radio frequency power amplifier,

a second shielded section configured to connect to the voltage reference, and

a second core section connected to the board.

18. The combiner of claim 17, wherein:

the first sheathed section comprises a first sheath;

the second sheathed section comprises a second sheath;

the first shielded section comprises a first shield and does not include the first sheath;

the second shielded section comprises a second shield and does not include the second sheath;

the first shield and the second shield are configured to connect to the voltage reference via a clamp;

the first non-shielded section comprises a first dielectric insulator and does not include the first sheath and the first shield;

the second non-shielded section comprises a second dielectric insulator and does not include the second sheath and the second shield;

the first core section comprises a first wire and does not include the first sheath, the first shield and the first dielectric insulator; and

the second core section comprises a second wire and does not include the second sheath, the second shield and the second dielectric insulator.

19. The combiner of claim 16, wherein:

a first gain of the first coaxial cable matches a second gain of the second coaxial cable; and

a first phase of the first coaxial cable matches a second phase of the second coaxial cable.

20. The combiner of claim 16, wherein:

a first impedance of the first coaxial cable matches an impedance of an output of the first radio frequency power amplifier;

a second impedance of the second coaxial cable matches an impedance of an output of the second radio frequency power amplifier; and

a third impedance of an output of the board matches an impedance of an input of a load, wherein the output of the board is configured to connect to the input of the load via a connector.