Taps **20**:

Taps **20** are to be constructed and placed at points along the inductor **18**. Each tap provides an individual output voltage into the rectifying portion of the apparatus **10**.

The number of taps **20** from the inductor **18** can be calculated by the following formula (Formula 2):

Tn=Bw times pi

Where
Tn=Total number of taps.
Bw=Effective Bandwidth of inductor (in Megahertz).
Pi=3.1416

The default position of each tap on the inductor **18** is equidistant along the inductor **18**. Tap positions can also be calculated for optimum output voltage. When calculating the taps **20**, one must take into consideration known frequencies within the chosen band segment that contain higher RF energies, And using a standard resonance inductance formula (1) each individual tap can be calculated for the required frequency and optimum voltage output.

Rectifiers:

The RF energy available at each tap is converted to DC voltage via a rectifying device. The type of rectifying device to be used is dependent on the chosen frequency band, and includes crystal, germanium, silicon and any other types.

Integrator:

A voltage integrator is composed of capacitors C**1**–Cx. The values of these capacitors are dependent on the chosen frequency band, the unique characteristics of the rectifiers and the load imposed by the Storage stage. The reactance of this circuit varies greatly, even during normal operation. However, one can use a standard formula for capacitive reactance as a starting point for preliminary calculations:

$$Xc=1/(2*pi*F*C)$$

Where
Xc=Capacitive reactance in ohms
C=Capacitance in Microfarads.
F=Frequency in Hertz.
Pi=3.1416

Storage:

Storage component(s) are determined by the power requirements of the attached device(s), and the available RF energy absorbed by the inductor (L).

Using a Medium Wave example, a 2,200 micro-farad electrolytic capacitor is used as storage.

Sample Apparatus **10**: Medium Wave (AM) Wireless Power Supply

A device has been constructed, using the method stated above, which uses the ambient (existing) AM Broadcast band of the RF spectrum as its source of energy. The device's primary purpose is to optimize the energy absorbed, collected and converted to reusable power.

The size and characteristics of the antenna **22** required for the circuit to operate are not considered a design requirement for the apparatus **10**. The antenna **22** needed to obtain sufficient energy to charge a storage device **28** in a typical urban area with several AM radio stations, would be similar to one used for a standard AM radio. In areas where there is a higher concentration of RF energy, the apparatus **10** itself, without an antenna **22**, is sufficient to develop stored power.

The inductor **18** is in the form of an air coil comprised of enameled #28 gauge wire wound onto a 2" form. The coil is a continuous tightly wound wire with taps **20** placed every twenty turns with a total of six taps **20** available (T**1**–T**6**). The top of the coil is where the antenna **22** is connected. The bottom of the coil is connected to ground.

Germanium diodes (IN34A) (D**1**–D**6**) are connected to each tap on the coil. The series capacitor integrator (C**1**–C**6**) is constructed as illustrated with the C**6** attached to ground. C**1**–C**6** are poly capacitors with a 0.068 uF rating. The power storage device **28** utilized in this sample apparatus **10**, C**7**, is a 2200 uF electrolytic capacitor.

Very wide band operation can be utilized by coupling multiple instances of the Broadband Wireless Power Supply together.

For Example:

A BWPS circuit designed and constructed (see design considerations) for a Very Low Frequency wave segment (60 Hz center frequency), can be coupled into another BWPS circuit designed and constructed (see design considerations) for an Ultra High Frequency wave segment (5 GHz center frequency). The outputs of each individual circuit connect (via another integrator circuit) into a common storage device **28** (i.e., capacitor) to "pool" collected and converted RF energy together. This technique can be repeated for any or all segments of the energy spectrum.

Although the invention has been described in detail in the foregoing embodiments for the purpose of illustration, it is to be understood that such detail is solely for that purpose and that variations can be made therein by those skilled in the art without departing from the spirit and scope of the invention except as it may be described by the following claims.

What is claimed is:

1. An apparatus for a wireless power supply comprising:
means for receiving a range of RF radiation across a collection of frequencies; and
means for converting the RF radiation across the collection of frequencies into DC, the converting means includes an absorbing mechanism which is resonant for a desired band of RF spectrum.

2. An apparatus as described in claim **1** wherein the absorbing mechanism includes an inductor which is resonant for the desired band of RF spectrum.

3. An apparatus as described in claim **2** wherein the converting means includes a plurality of taps placed at points along the inductor to access the RF energy.

4. An apparatus as described in claim **3** wherein the tap points are calculated by matching the inductor's impedance to the desired band of RF spectrum.

5. An apparatus as described in claim **4** wherein the receiving means includes an antenna.

6. An apparatus as described in claim **5** wherein the converting means includes a rectifying mechanism which rectifies the RF energy and converts it into DC voltage.

7. An apparatus as described in claim **6** wherein the rectifying mechanism includes a plurality of diodes at each tap point which rectifies the RF energy and converts it into DC voltage.

8. An apparatus as described in claim **7** including a storage device for storing the DC voltage.