WHAT IS CLAIMED IS:

1. An apparatus for generating AC electrical signals for application to a first pair of electrodes and a second pair of electrodes, the apparatus comprising:

an AC voltage generator having an output;

an electronic switch having an input that receives the output of the AC voltage generator, a first power output, and a second power output, wherein the electronic switch is configured to (a) operate in a first mode that routes the output of the AC voltage generator to the first power output, and (b) operate in a second mode that routes the output of the AC voltage generator to the second power output, and wherein the electronic switch is further configured to cycle through a repeating sequence that includes the first mode and the second mode; and

a controller configured to synchronize the operation of the AC voltage generator and the electronic switch such that switching of the electronic switch to either the first mode or the second mode is restricted to windows of time that correspond to the first 5.7°, the middle 11.4°, and the last 5.7° of each 360° cycle of the AC voltage generator,

wherein, within 20 ms after the electronic switch switches to either the first mode or the second mode, the AC voltage generator's output voltage is at least 80% of the AC voltage generator's steady-state output voltage.

2. The apparatus of claim 1, wherein the electronic switch is further configured to (c) operate in a third mode in which the output of the AC voltage generator is not routed to either the first power output or the second power output, and (d) cycle through the first mode, the second mode, and the third mode in the following repeating sequence (1) first mode, (2) third mode, (3) second mode, and (4) third mode.

3. The apparatus of claim 1, wherein the controller is configured to synchronize the operation of the AC voltage generator and the electronic switch such that switching of the electronic switch to either the first mode or the second mode is restricted to windows of time that correspond to the first 1.1°, the middle 2.2°, and the last 1.1° of each 360° cycle of the AC voltage generator.

4. The apparatus of claim 1, wherein, within 5 ms after the electronic switch switches to either the first mode or the second mode, the AC voltage generator's output voltage is at least 80% of the AC voltage generator's steady-state output voltage.

5. The apparatus of claim 1, wherein, within 1 ms after the electronic switch switches to either the first mode or the second mode, the AC voltage generator's output voltage is at least 80% of the AC voltage generator's steady-state output voltage.

6. The apparatus of claim 1, wherein the AC voltage generator continues to operate at its full steady-state AC output voltage during transitions of the electronic switch to either the first mode or the second mode.

7. The apparatus of claim 1, wherein the controller synchronizes the operation of the AC voltage generator and the electronic switch by controlling timing of transitions of the electronic switch so that the transitions coincide with windows of time that correspond to the first 5.7°, the middle 11.4°, and the last 5.7° of each 360° cycle of the AC voltage generator.

8. The apparatus of claim 1, wherein the controller synchronizes the operation of the AC voltage generator and the electronic switch by controlling the AC voltage generator so that the output of the AC voltage generator is turned off whenever a transition of the electronic switch occurs.

9. The apparatus of claim 1, wherein the controller synchronizes the operation of the AC voltage generator and the electronic switch by both (a) controlling timing of transitions of the electronic switch so that the transitions coincide with windows of time that correspond to the first 5.7°, the middle 11.4°, and the last 5.7° of each 360° cycle of the AC voltage generator and (b) controlling the AC voltage generator so that the output of the AC voltage generator is turned off whenever a transition of the electronic switch occurs.

10. The apparatus of claim 1, wherein the electronic switch is configured to cycle through the first mode and the second mode in the following repeating sequence (1) first mode, (2) second mode, and wherein the electronic switch is configured to switch directly from the first mode to the second mode and to switch directly from the second mode to the first mode.