WHAT IS CLAIMED IS:

1. A microphone and body coupler for use in an infrascope for monitoring physiological processes of a patient, said microphone and body coupler comprising:

a microphone body comprising a proximal end, a distal end, a body side wall extending between the proximal end and the distal end, an end wall at the proximal end, and an aperture at the distal end;

the body coupler attached to the distal end and over the aperture so as to form a substantially air-tight seal, wherein the body coupler is capable of engagement with the patient;

a cavity surrounded by the body side wall, the end wall and the body coupler;

a conductive backplate within the cavity and defining a backchamber between the conductive backplate and the end wall;

a conductive membrane within the cavity, the conductive backplate and the conductive membrane being spaced apart from each other to form a capacitor; and

a preamplifier board within the cavity and in electrical connection with the conductive backplate, the preamplifier (i) being capable of measuring a capacitance between the conductive membrane and the conductive backplate and converting the measured capacitance into a voltage signal, and (ii) being parallel to each of the conductive backplate and the conductive membrane,

said microphone and body coupler being capable of detecting acoustic signals as low as 0.03 Hertz up to 1000 Hertz.

2. The microphone and body coupler of claim 1, further comprising:

a conductive support plate attached to an internal surface of the body side wall within the cavity, the conductive support plate (i) comprising a base wall that divides the cavity into a distal chamber between the base wall and the distal end of the body and a proximal chamber between the base wall and the proximal end of the microphone body, (ii) a base wall aperture within the base wall, and (iii) at least one aperture or slot within the base wall to allow air to flow from the distal chamber to the proximal chamber;

an insulating member extending through the base wall aperture in the conductive support plate;

a conductor extending through the insulating member and extending therefrom, the conductive member being electrically connected to the conductive backplate and to the preamplifier board,

wherein the conductive backplate is on one side of the conductive support plate and the preamplifier board is on an opposite side of the conductive support plate.

3. The microphone and body coupler of claim 1 or 2, wherein (i) the conductive backplate defines a plurality of holes, (ii) a slot is defined between an outer diameter of the conductive backplate and an inner wall of the microphone body, and (iii) locations and sizes of the holes and a size of the slot are selected such that membrane motion is substantially critically damped.

4. The microphone and body coupler of claim 2 or 3, wherein the conductive backplate is seated on the insulating member.

5. The microphone and body coupler of any one of claim 1 to 4, wherein a slot is defined between the preamplifier board and the body side wall, and extends around the preamplifier board.

6. The microphone and body coupler of any one of claim 2 to 5, wherein the preamplifier board defines a first proximal chamber between the preamplifier board and the end wall, and a second distal chamber between the preamplifier board and the base wall of the conductive support plate.

7. The microphone and body coupler of claim 6, wherein the first proximal chamber has a volume of approximately 0.1287 cubic inch, and the second distal chamber has a volume of approximately 0.6 cubic inch.

8. The microphone and body coupler of any one of claim 1 to 7, wherein the body coupler is formed of an outer ring having a flexible, non-conductive diaphragm attached thereto, and the outer ring is attached to the microphone body.

9. The microphone and body coupler of any one of claim 1 to 8, further comprising a sealed electrical connection extending though the body side wall, said sealed electrical connection enabling electrical connection of said microphone to an electronics board.

10. The microphone and body coupler of any one of claim 1 to 9, further comprising a digitizer board which is remote from the microphone, said digitizer board being capable of digitizing the voltage signal from the preamplifier.

11. The microphone and body coupler of any one of claim 1 to 10, wherein the voltage signal is digitized and electronically transmitted to a remote location.

12. An infrascope for monitoring physiological processes of a patient, said infrascope comprising the microphone and body coupler of any one of claim 1 to 11.

13. A method of using the microphone and body coupler of any one of claim 1 to 11 or the infrascope of claim 12 to detect sound pressure from one or more locations within a patient's body, said method comprising:

positioning the microphone or the infrascope along an outer surface of the patient's body.

14. A method of using two microphones to detect sound pressure from one or more locations within a patient's body, each of the two microphones comprising the microphone and body coupler of any one of claim 1 to 11, said method comprising:

positioning the two microphones along an outer surface of the patient's body.

15. A method of using the microphone and body coupler of any one of claim 1 to 11 to generate a physiological process signal from detected sound pressure from one or more locations within a patient's body within a frequency range of 0.03 Hertz to 1000 Hertz, the physiological process signal being transmittable in real time, said method comprising:

positioning the microphone along an outer surface of the patient's body.

16. A method of using the microphone and body coupler of any one of claim 1 to 11 to generate a digitized signal from detected sound pressure from one or more locations within a patient's body within a frequency range of 0.03 Hertz to 1000 Hertz, the digitized signal being transmittable to a remote workstation, said method comprising:

positioning the microphone along an outer surface of the patient's body.

17. A method of using the microphone and body coupler of any one of claim 1 to 11 to generate a digitized signal from detected sound pressure from one or more locations within a patient's body within a frequency range of 0.03 Hertz to 1000 Hertz, the digitized signal being transmittable to a remote workstation comprising a laptop computer, a personal computer, a remote computer monitor, a smartphone, or a tablet, said method comprising:

positioning the microphone along an outer surface of the patient's body.

18. A method of using the microphone and body coupler of any one of claim 1 to 11 in (i) a stress phonocardiography test, (ii) for fetal heart monitoring during pregnancy, labor and delivery, (iii) for Doppler phonocardiography, (iv) for biometric identification, or (v) for polygraphs, said method comprising:

positioning the microphone or the infrascope along an outer surface of the patient's body.