able commodity within an interval of six months. Morris L. Settler, President of the Company and a biomedical engineer, says the unit meets five major criteria for a commercial pulse rate meter.

"It's small, it's inexpensive, it's clinically reliable, it has a rugged sensor which won't easily be damaged and it uses a power supply which is both economical and safe," he says.

Weighing less than one pound and contained in a unit measuring three and one quarter inches wide, five and one half inches long and about two inches deep, it fulfills the first criterion. Selling for \$175, Mr. Settler says it is the most reasonably-priced of comparable pulse rate monitors. Lengthy testing of the unit under actual hospital conditions has attested to its reliability.

While the meter itself is less likely to be dropped or to receive a heavy jolt, the sensor could well be abused. Tests have displayed its resistance to damage under such conditions. The unit is powered by two nine-volt batteries which sell for less than one dollar each and are widely available; many transistor radios use them. Mr. Settler estimates that a set of batteries will provide 100 hours of continuous use.

"The batteries should last about a month when used in a large, general hospital with up to 1,000 beds," he says.

Harco Electronics provides a two-year warranty on the unit itself.

"We haven't yet manufactured units specifically for the individual consumer, such as the person who likes to jog and keep track of his heart rate," says Mr. Settler. "Marketing has centred on the health-care community, but the consumer comes next."

Mr. Settler's company has incorporated several features in the final company product. A flashing systole light and a beeper with an adjustable volume have been added. A battery check button is also incorporated, which displays the batteries' state of charge on the heart-rate meter. A surgeon or anesthetist can then rely on the instrument in three ways: a visual check of the actual meter, which has readings from 40 to 200 beats per minute; a visual check of the light-emitting diode; or an audible check using the beeper. The beeper has a wide volume adjustment, from a piercing sound, through one that is audible but not annoying under operating room conditions, to total silence.

Another model of the instrument, developed by NRC and manufactured by Harco Electronics, incorporates an electrocardiograph-activated input as an alternative to the pulsesensing finger transducer. The user then will have a choice of either the finger pressure transducer or two electrodes placed on the chest to pick up the electrical activity of the heart. In the latter mode of operation one electrode is connected to a skin-surface contact on the left side of the chest and another to a similar contact on the right side. This method produces readings generated from the electrical rather than the pressure signal produced by the heart and is better suited to the measurement of heart rate during physical activity. The ECGtriggered heart rate meter is insensitive to motion and produces correct readings even during the most violent activity.

Both instruments utilize Canadian-made (Microsystems International Limited) components. They are designed primarily for use in operating rooms, emergency wards, ambulances and dentists' offices but should eventually find application by the health-conscious jogger or by individuals with heart disorders. David Smithers



The pickup and transducer used in conjunction with the pulse rate monitor. A Velcro strap holds the transducer to the skin of a finger or thumb. The diaphragm in the centre of the pickup moves with the pulse, creating signals which are transmitted to the meter. • Le capteur intégré à la bande de Velcro qui permet de le placer facilement autour d'un doigt ou d'un pouce. La membrane au centre du capteur transmet les signaux au pulsomètre.



Electronic circuitry and transistors contained within the pulse rate monitor. • Circuit électronique du pulsomètre.