ANO and ACT. As previously described, seven types of data can be recorded from these two outputs:

ZCA - Zero crossing above threshold in counts
ZCB - Zero crossing below threshold in counts
ZAB - Zero crossing above and below threshold in counts
TCA - Time crossing above threshold in time
TCB - Time crossing below threshold in time
TAB - Time crossing above and below threshold in time
AAD - Analog out a/d conversion

At the time of initialization, the user typically selects one of the seven options listed. The activity monitor **10** then collects data for the full duration of its run-time. This is in the fixed initialization mode.

With the floating initialization, many of the initialization variables can be changed according to a predetermined schedule and the nature of the data being collected. This amounts to apriori and adaptive hardware and software reconfiguration during run-time. In the case of data variables, the monitor can change from one type to another according to a schedule or because of some data characteristic. For example, a simple experiment might use a protocol that requires alternating between ZCA and TCA. A more advanced experiment could require simultaneous recording of ZCA and TCA. The monitor may periodically examine a limited past data record for the purpose of evaluating whether or not the correct data mode (actually any variable under control of the processor) is in effect. Recognizing the limited amount of AAD data that may be gathered during a single run-time leads to possible special oases where only limited periods of analog activity are to be recorded by the analog channel. They are determined on the basis of historical data contemporaneously recorded and evaluated. This concept embraces a type of artificial intelligence that may optimize the monitor for recording wide dynamic range variable bandwidth data from human motion.

In one type of auto mode, the activity monitor gain is automatically switched according to the following algorithm:

If V analog is greater or equal than V SAT for 60% of epoch, then choose lower gain for not less than 10 minutes or less than 100 epochs.

If V analog is less than or equal to 0.2 volts for 60% of epoch, then choose high gain for not less than 10 minutes or less than 100 epochs.

Floating initialization permits the activity monitor to alter its initialization and other parameters while in operation. Users may now input a schedule consisting of sets of initialization parameters or an algorithm. At various times the monitor will interrupt data collection and retrieve new initialization parameters just as if it had been inserted into the monitor and re-initialized. In the fixed floating mode the user provides a schedule of re-initialization parameters. The format for these parameters are the same as that used in the fixed initialization case.

In the floating floating initialization, initialization parameters are controlled by the nature of the data being collected instead of by apriori schedule. This is an adaptive situation. For example, a particular test might result in no analog saturation but saturation in zero crossing. This is a frequency problem and can be remedied one way by filter switching. In practice, the method is selected at the time of initialization by the user. A user-written program installed in RAM will initialize the monitor for the start time. One of the event channels is used to monitor the initialization parameter changes, and this information becomes a part of the data record. Floating floating and fixed floating initialization methods can be combined. Some parameters are not subject to adaptive change but are under control of a master schedule. Others are modified according to a user-specified algorithm that utilizes activity data to decide the best hardware and software configuration to choose contemporaneously with an on-going test.

While a particular embodiment of the invention has been shown and described, it will be obvious to those skilled in the art that changes and modifications may be made therein without departing from the invention in its broader aspects, and, therefore, the aim in the appended claims is to cover all such changes and modifications as fall within the true spirit and scope of the invention.

I claim:

1. An activity monitor responsive to body motion for detecting and recording the occurrence of predetermined body movements in a human subject wherein each said predetermined body movement has a characteristic frequency spectrum, said activity monitor comprising: a motion detector for producing a detector output signal in response to body movements of the subject; highpass filter means for attenuating the spectrum of said detector output signal below a predetermined lower threshold frequency; lowpass filter means for attenuating the spectrum of said detector output signal above a predetermined upper threshold frequency; said detector output signal being filtered by said highpass and lowpass filter means whereby the spectrum of said signal corresponds to the characteristic frequency spectrum of the predetermined body movement; memory means of finite capacity; conversion means for sampling said detector output signal and storing the resulting sample signals in said memory means; said upper threshold frequency and said lower threshold frequency each being configurable in response to an applied configuration control signal; and said activity monitor further including a processor circuit having a plurality of selectable operating modes, each mode corresponding to at least one said predetermined body movement, said processor circuit applying configuraton control signals to each said filter means to obtain a frequency spectrum in said detector output signal corresponding to the characteristic frequency spectrum of the predetermined body movement selected by selection of a said operating mode.

2. An activity monitor as defined in claim **1**, wherein said processor circuit includes a resident operating program for controlling the configuration of said filter circuits.

3. An activity monitor as defined in claim **2** wherein the monitor includes a data port, and said resident program is changeable through said data port.

4. An activity monitor as defined in claim **2** wherein said resident program is changeable in response to said sampled signals.

5. An activity monitor as defined in claim **1**, wherein each said filter means includes an analog switch device responsive to said applied configuration control signal for controlling its respective threshold frequency.

6. An activity monitor as defined in claim **1** including saturation inhibit means responsive to said filtered detector output signal for inhibiting the storing of said output signal in the event said signal exceeds a predetermined threshold level.