

Equipment Review

Lifepak 5 ECG / Voice Recorder

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Strict records-keeping during the initial task-intensive minutes in the care of critically ill patients is often a secondary concern. This is particularly true of prehospital care, where there is often insufficient manpower to designate someone to record events during the initiation of care. While approximated records of this crucial period can be rendered, the inherent imprecision and frank loss of data with records made "after-the-fact" severely limit their reliability for retrospective medical review or research purposes. The PhysioControl ECG/Voice Recorder, used with the Lifepak®5, Defibrillator/Monitor, provides an elegant solution to the problem of documentation during acute situations. Properly used, the ECG/Voice Recorder can provide a continuous and precise record, either self contained or by transcription, of patient encounters in the field or hospital.

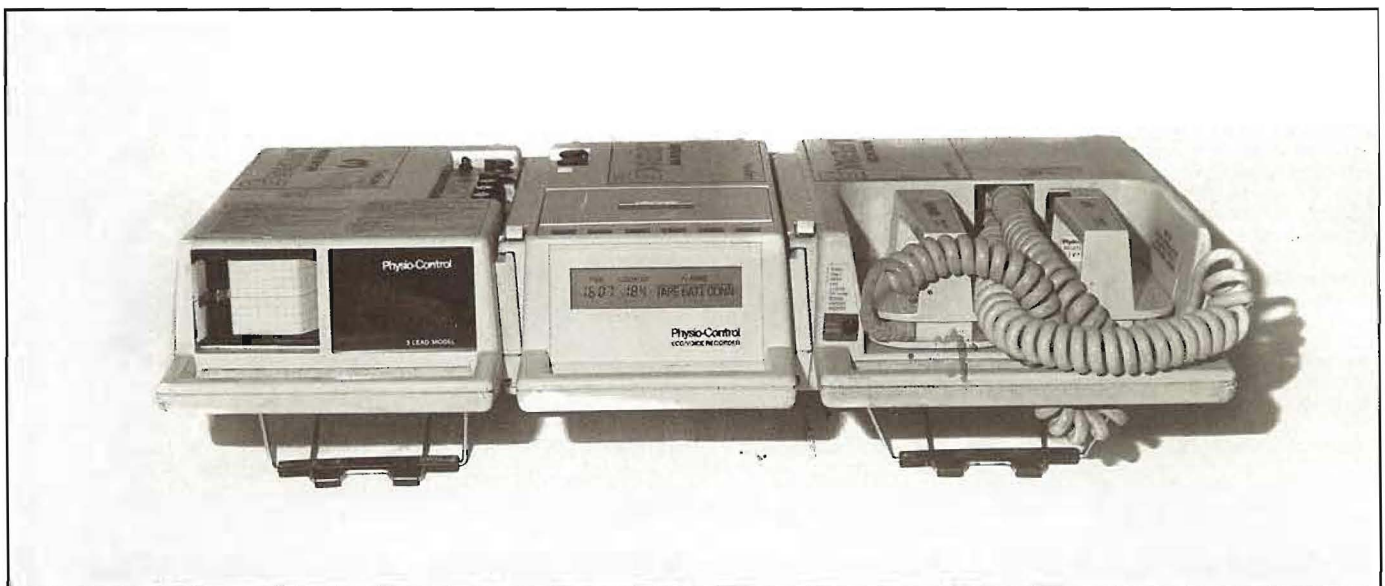
DESCRIPTION

The Lifepak®5 ECG/Voice Recorder is essentially a portable cassette recorder that simultaneously and continuously records both audio from the scene and the patient's ECG on a standard cassette tape. The unit is designed to fit between the

Lifepak 5 monitor and defibrillator modules (Figure 1). This allows monitoring, recording, and defibrillation to be performed with a single, integrated unit. The recorder's ECG channel interfaces automatically with new Lifepak®5 monitors that have two sets of electrical contacts where the modules slide together. ECG interface with older monitors requires the use of a cable from the ECG signal jack (used for telemetry) to the recorder unit. The voices and sounds from the scene are recorded with a condenser microphone located on the top of the recorder chassis. A speaker for playback is located on the bottom of the chassis.

The recorder control panel features membrane switches and a lighted LCD display for the real time clock, tape counter, and visual alarm indicators. The recorder alarm system alerts the operator by audible and visual signals to low battery power, interruption of tape transport, or loss of ECG signal. The recorder module utilizes the standard Lifepak®5 system batteries. An additional 1.5 volt "AA" battery is used to run the real time clock, independently of the rest of the Lifepak®5 battery system.

The ECG/Voice Recorder alone weighs 6.6 lbs. and adds 6.8 inches to the overall width of the defibrillator-monitor system.



D. Konegay

Figure 1 - Lifepak 5 ECG / Voice Recorder, shown in place between oscilloscope and defibrillator modules.

OPERATION

Operation of the ECG/Voice Recorder is an uncomplicated and almost totally "hands-off" procedure. Unlike periodic recording where the ECG strip writer must be manually switched on and off with times and events written on the strip and/or a separate record, the ECG/Voice Recorder runs continuously. The clinicians simply vocalize the time, their actions and observations as they occur.

The audible and visible alarms assist the operator in assuring that battery power, tape transport, and ECG signal are uninterrupted. Actuation of any of the recorder controls triggers an audible confirmation signal and a red status indicator light, incorporated into each of the control switches. When the ECG/Voice Recorder is used with newer Lifepak®5 monitors, turning on the monitor will automatically activate audio and ECG recording. Replay is accomplished by pressing the "playback" switch three times within five seconds. The tape position counter is reset by pressing the "stop" switch twice. The recorder can be shut off by pressing the eject switch. Alternatively, the unit will shut off automatically if left in the "stop" mode for over ten minutes. When an alarm condition occurs, the audible alert persists only a few seconds, but the visual indicator will continue to be displayed on the LCD panel until the problem is corrected or the unit is shut off. The controls of the ECG/Voice Recorder are clearly marked and operation of the unit is a logical and straightforward process.

DISCUSSION

Medical event recording with the ECG/Voice Recorder has unique advantages and drawbacks. By virtue of its continuous operation, all ECG events are recorded. When coupled with clear vocalizations of events, observations, and times, very sophisticated records can be made. Further, recording with this precision can be accomplished without diverting rescuers from the primary tasks involved in critical situations.

There are drawbacks to electronic recording. Continuous hard copy records of the ECG can be more rapidly reviewed,

but are cumbersome to handle in the field. The time required to review or make transcriptions from the tape equals or exceeds the time period recorded on the tape. Alarm situations, if not expeditiously corrected, will result in loss of data. In practice, this can easily happen when all personnel are actively engaged in activity when an alarm condition occurs. The increase in size and weight of the recorder/monitor/defibrillator package, while significant, may be offset by the advantages gained by electronic recording.

SUGGESTIONS

When considering the ideal characteristics of an electronic data recorder, several features suggest themselves. An auto-reverse on the tape drive would eliminate the temporary loss of data incurred by manually ejecting, flipping and re-inserting the cassette. The need to vocalize real time could be eliminated if real time was electronically recorded onto the tape and displayed during tape playback. The time required to review the tape or make transcriptions could be significantly reduced if there was a method for rapid review of the tape similar to the method for review of Holter monitor tapes. Alternatively, a manually triggered electronic event marker might allow rapid, automatic advance of the tape to significant events. Lastly, audible alarm signals would be more informative if each had its own unique sound, all of which must be distinguishable from the QRS beeper on the ECG monitor.

CONCLUSION

The PhysioControl ECG/Voice Recorder, used with the Lifepak®5 defibrillation/monitor, is an excellent device for acquiring complete and precise records during both hospital and prehospital care. The complete and accurate records obtained with this device makes it one of the best adjuncts currently available for documentation of critical care. These records can facilitate accurate data acquisition for research, quality assurance, and medical review programs.