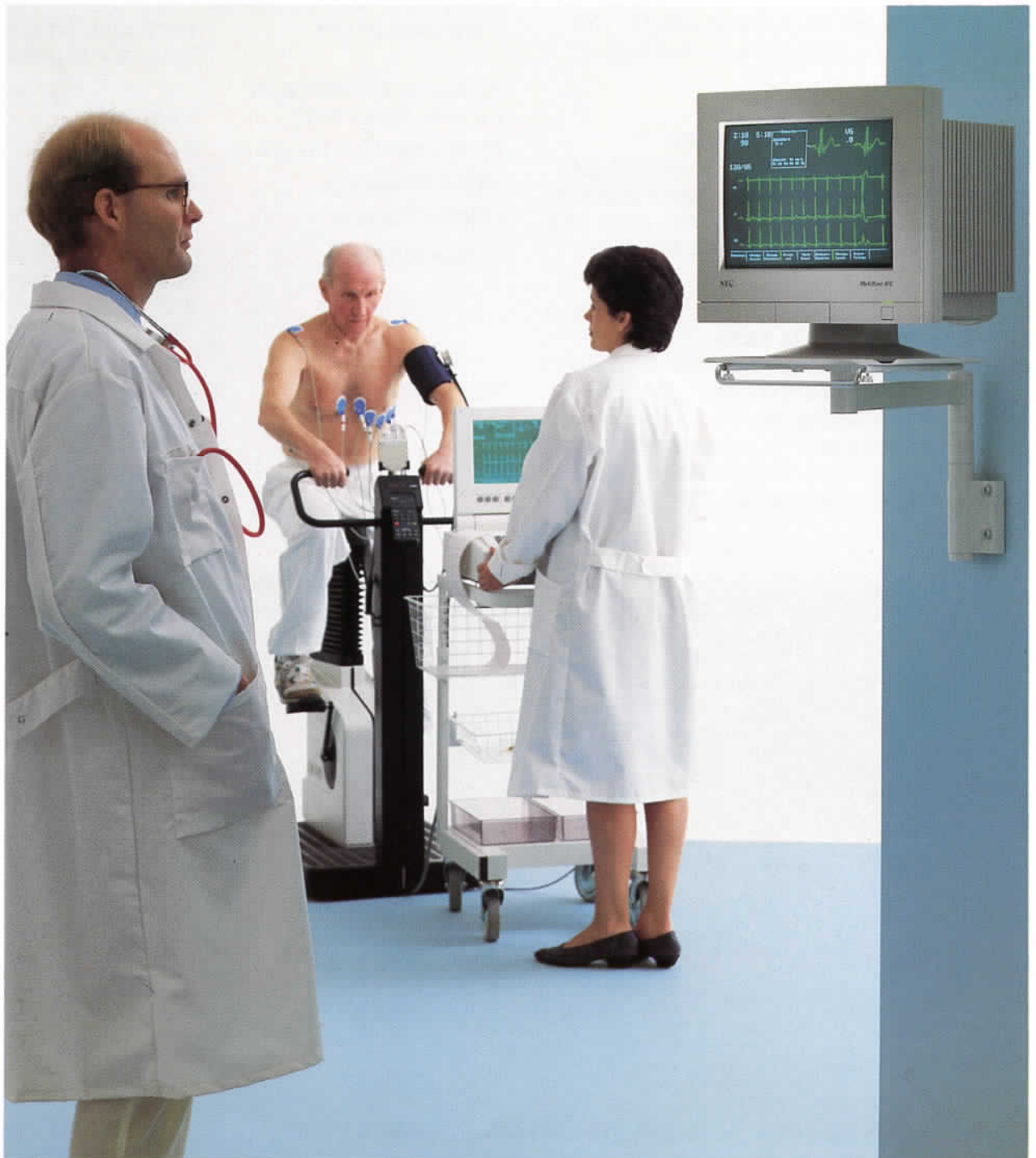


SIEMENS

MEGACART offers
efficient monitoring of exercise ECG
with two colour slave monitors



You sometimes need one or two slave monitors for efficient monitoring of exercise ECG's. MEGACART offers this option.

Close to the patient during the exercise test

To an ever increasing degree, physicians conducting exercise tests have been expressing the following wish: to be able to observe the patient's subjective response from near by while simultaneously monitoring ECG activity, having the nurse or lab technician make the actual recording. The ability to conduct several simultaneous exercise tests while retaining a close check on patients from a position in the same or an adjacent room is another frequently expressed wish. In both instances, the use of one or two slave monitors is the answer. With MEGACART as the ECG recorder in the examination room, the setup is simple. The Slave Monitor Option supplies the double output sockets required.

Local monitor and remote monitor

One of the option sockets is for a simple, PC-type monitor (cable length 2 meters). The second option socket is for a high performance monitor, such as a multisynch device, and can accommodate cable lengths up to 10 meters.

Ensuring patient safety is easy

No extra arrangements are needed if slave monitors are set up outside the patient environment. The simplest way to achieve this is to mount the monitors away from the patient on a wall console or shelf, also ensuring that the instructions provided in the "Installation instructions" document are followed.

Ordering and delivery information

The Slave Monitor Option comprises the following:

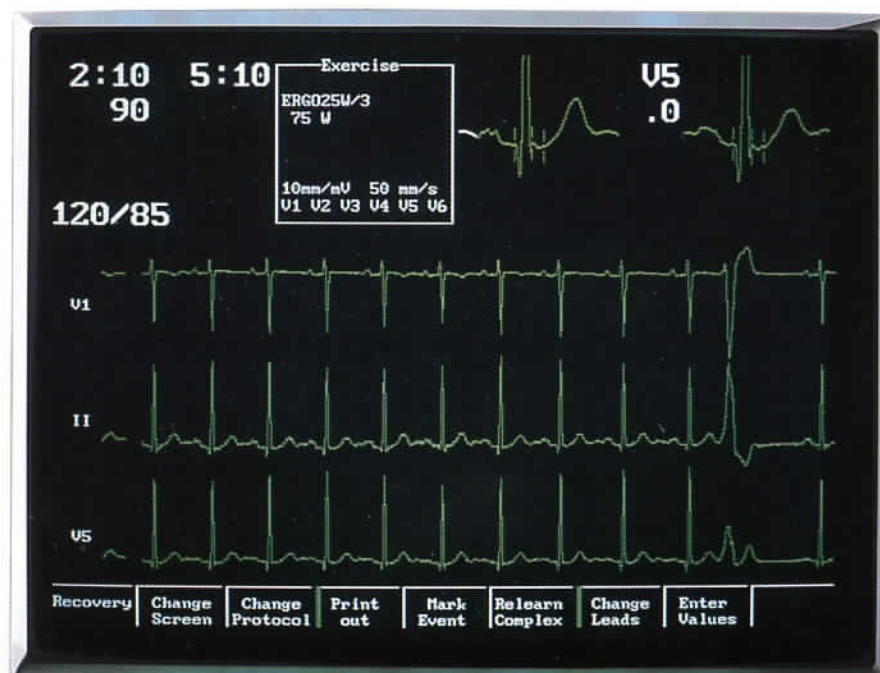
- Graphics controller board (Art. no. 61 16 466 E285E)
- Cable, 8 meters (Art. no. 61 61 819 B5620)
- Isolation transformer (Art. no. 61 61 777 B5610)

Available for delivery in April 1992.

Monitors and wall consoles are to be procured from a local source.

Technical specifications for the Graphics Controller circuit board

Resolution (VGA)	Horizontal: 640 pixels Vertical 480 pixels
Vertical scan frequency (Screen frequency)	59.95 kHz
Horizontal scan frequency	31.47 kHz
Video frequency	25.2 MHz
Display colours	16
Output socket 1	Video: 0.7 V/75 Ohms. Separate horizontal and vertical synch. TTL levels. Prescribed cable length: 2 m.
Output socket 2	Analog video 0.7 V/75 Ohms. Synch on green 0.3 V. Prescribed cable length: 10 m.



The high-legibility reproduction of the MEGACART display makes exercise tests safer and more efficient also from a distance.

Subject to change without notice

SIEMENS

MEGACART.

For consensus in cardiography.





'I have my own way of working. I expect resting ECGs to be presented the way I want them'.

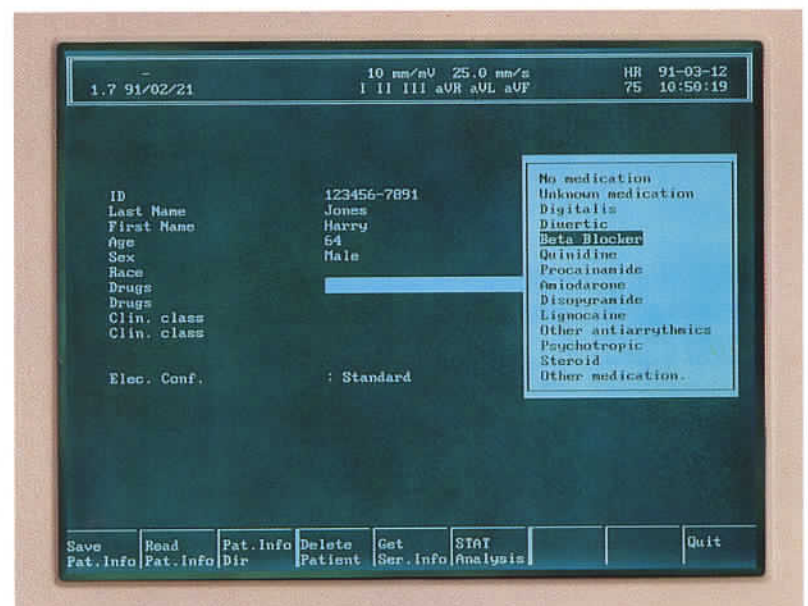
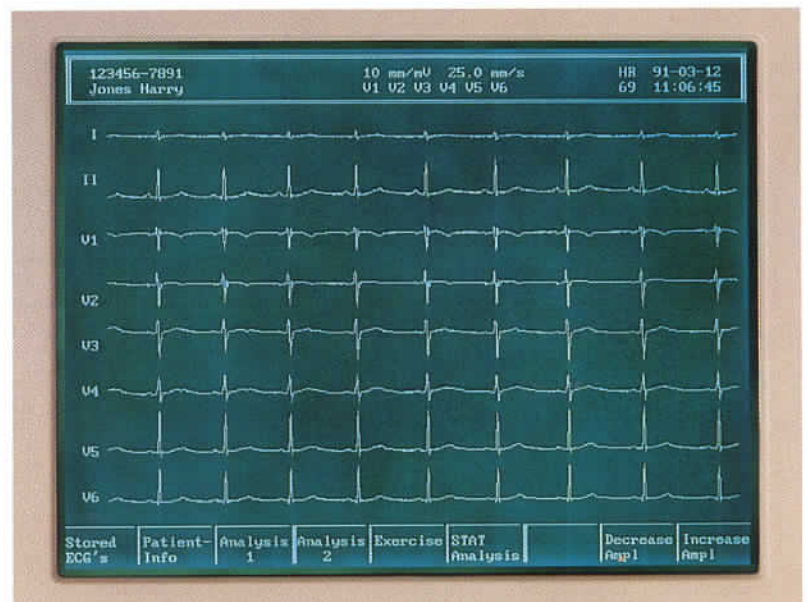
The MEGACART is a new, fully up-gradeable electrocardiograph range from Siemens designed precisely to cardiologists' specifications and featuring unique, advanced signal processing. It is defined at three separate levels, from resting ECG through exercise ECG to advanced exercise ECG level, with a clear, open upgrade path throughout. Additional, optional upgrades will include late potential analysis, a pediatric analysis program, pulse/phono capability and pacemaker monitoring. There is also the option of unlimited resting ECG storage on RAM memory cards.

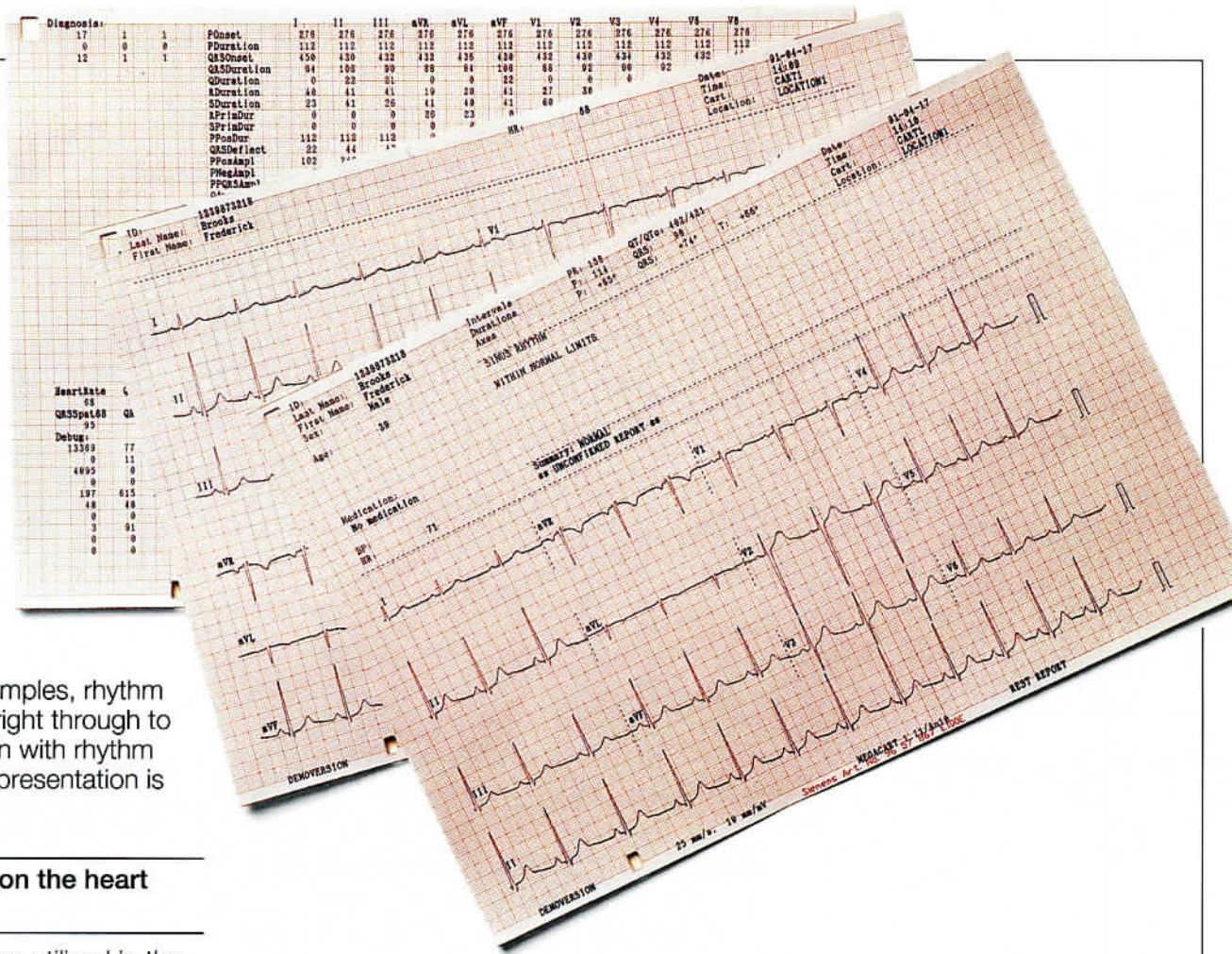
A breakthrough for resting ECG.

There's nothing basic about the 'basic' resting ECG configuration. For starters MEGACART is able to present an unprecedented, user-selectable eight or three lead, eight second waveform display. This gives you a valuable overview and allows you to preview trace quality before printing out. You get better quality, and you save paper.

As you like it.

Emphasis was placed on fulfilling the individual preferences of the cardiologist. Not only is lead display and lead combination user-selectable, but the format of the final print-out can be specified too. You decide the exact extent and layout of the print-out — from a complete report on a





single page with samples, rhythm and analysis right through to multi-page version with rhythm strips. Vector loop presentation is also possible.

Putting the finger on the heart of the matter.

The analysis program utilized in the MEGACART has rightly gained recognition for its exceptional accuracy. The program was developed under the leadership of Professor Peter W. Macfarlane at Glasgow University Dept. of Medical Cardiology. It has been independently evaluated on many occasions and has consistently achieved high ratings for diagnostic accuracy and recognition of normals. The program is also much appreciated for the user-friendly way it presents its interpretation — an interpretation substantiated by relevant measurements and reasons, drawing attention directly to the pertinent waveform abnormalities. The interpretation program will operate using minimal patient data — a simple ID is sufficient — but it is designed to consider multiple clinical factors such as age and sex, medication, provisional clinical diagnosis and previous ECG findings. Analyses are presented in plain language (your choice of language), with sample traces from all leads. Physicians' comments and confirmation of the analysis can be added later using MEGACART's editing facilities.

Late potential analysis.

MEGACART will also feature a highly effective late potential analysis option to complete your ECG tests on post-infarct patients. All the information — from the standard resting ECG right through to the completion of late potential analysis — is stored and can be presented in a comprehensive document.

Highly maneuverable MEGACART.

MEGACART comes with a battery option for mains-independent acquisition of around 50 resting ECGs. Low battery warning is given and connection with the mains immediately returns the unit to readiness. This battery option is particularly useful when the MEGACART is being transported on the height-adjustable UNICAR M® cart. The combination gives complete flexibility and maneuverability for hassle-free ECG acquisition anywhere in the hospital. The direction of the wheels can be locked for wheeling down straight corridors or released for negotiating bedside aisles.

MEGACART AND RESTING ECG

- * Thoroughly validated analysis program
- * Advanced signal processing
- * Simultaneous 12 lead acquisition
- * 8-lead, 8-second preview display
- * User-definable lead combinations
- * Pediatric sensitivity — 500 Hz sampling rate
- * Upgradeable to any level of exercise testing
- * User-definable document format
- * Print preview facility — saves paper
- * Highly maneuverable UNICAR M cart
- * Late potential monitoring upgrade possibility
- * Compatible with Siemens ECG management systems
- * Easy to use with clearly-labelled "soft key" controls
- * Unlimited ECG storage on RAM memory cards



With multiple display options, preview displays, and a wide choice of exercise protocols, MEGACART is an attractive proposition for exercise ECG applications. Its value is further enhanced by Advanced Baseline Control — a unique Siemens development that eliminates baseline movement without suppressing sensitivity.





‘A lot of effort goes into exercise ECG, so I place even greater demands on the equipment’.

In exercise ECG configuration, MEGACART features a PC-type keyboard. In other respects the instrument is outwardly identical to its resting ECG brother. The Siemens ergometer or treadmill is controlled by the MEGACART, so you only need to operate a single keyboard during testing. Because each physician may have his or her own preference of exercise protocols, we program each unit at the factory with eight treadmill and six ergometer default programs, all of which can also be individually modified. Naturally, a manual over-ride of the protocol is always available enabling you to stop or alter the procedure as you choose. Similarly, recording can be initiated at any time. You have full control over MEGACART at all times.

Multiple display capability.

MEGACART allows you to view precisely what you need on screen, as well as what you want printed out on paper. If required, one or two remote slave monitors can be connected for monitoring from an adjacent room. During any phase of the test, you can have the option to view three leads, three leads and their averages, one monitoring lead and 12 averages or one monitoring lead and full trends. Typically the display also features an ST value and a three-times magnification of a selected lead from the current phase beside a comparable tracing taken from the pre-exercise phase. Tick

marks indicate QRS onset and offset. Heart rate and blood pressure are also displayed as well as elapsed time and stage time.

Multiple report capability.

MEGACART features the same versatility when it comes to print out. Depending on your requirements and preferences you can select for final reporting: an exercise summary plus data, one or more pages of averages from selected phases of the test, trends and arrhythmia examples. Arrhythmias are detected and stored automatically, either for immediate or later print-out without manual intervention, leaving you to concentrate on your patient instead.

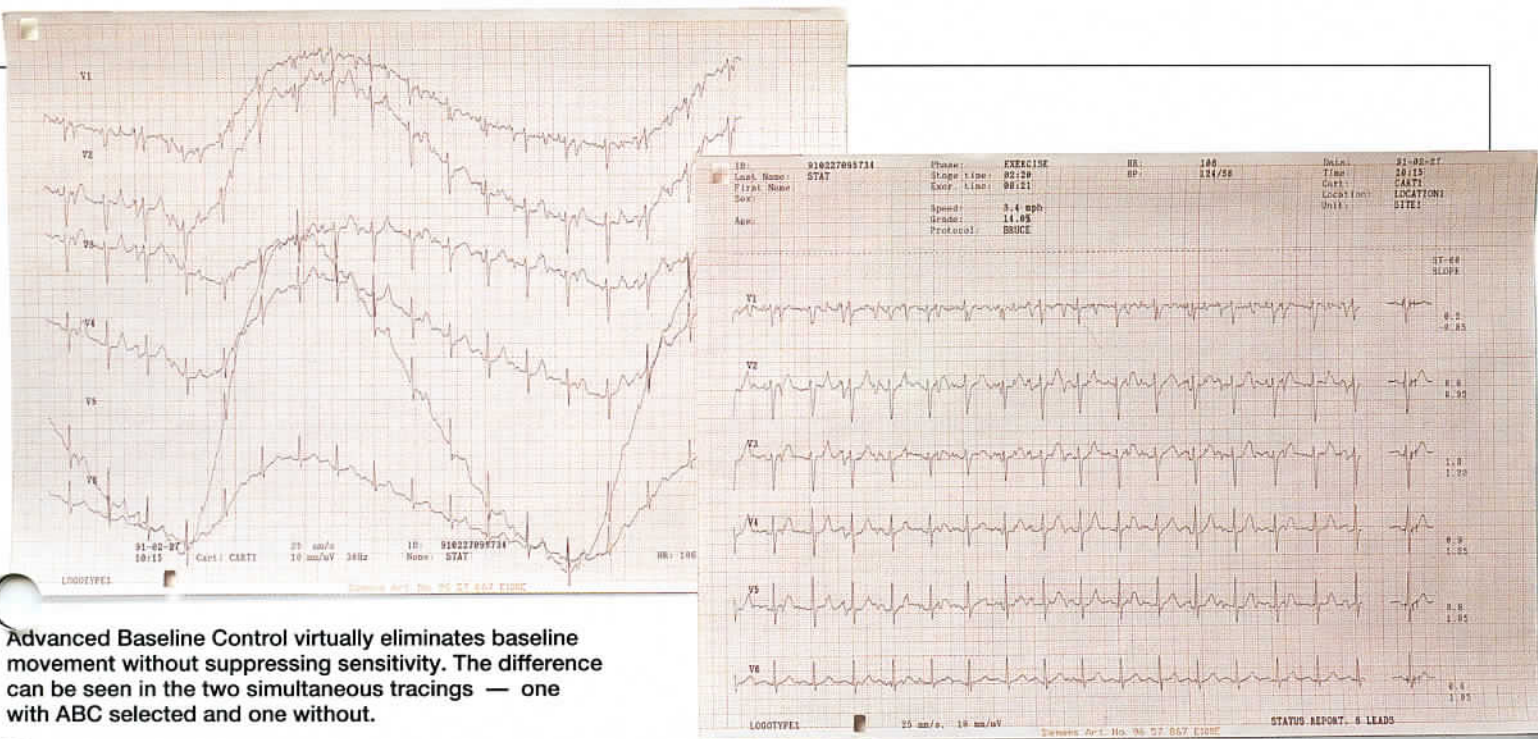
Arrhythmia detection you can trust.

At the onset of a potential arrhythmia, MEGACART checks all the other leads for cross-reference. If the ‘arrhythmia’ in one lead is not echoed in others, in other words if it is an artefact induced by e.g. electrode problems, the artefact is rejected. In this way, though you can implicitly trust the equipment to detect, record and identify all genuine arrhythmias, you won’t be plagued by false alarms.

Advanced Baseline Control.

MEGACART makes another invaluable contribution to exercise ECG testing by eliminating the problem of





Advanced Baseline Control virtually eliminates baseline movement without suppressing sensitivity. The difference can be seen in the two simultaneous tracings — one with ABC selected and one without.

baseline movement. The high processing power in MEGACART has allowed us to incorporate a new baseline control algorithm unique to Siemens called ABC, or Advanced Baseline Control*. ABC virtually eliminates baseline movement, the curse of most exercise and pediatric ECGs, and it provides a unique recording quality. Advanced Baseline Control is not to be confused with a filter which suppresses the sensitivity of the data presented by distorting the ST segment. ABC does not falsify the recorded ECG at all. Instead, it compares the apparent

baseline with the absolute baseline, and corrects it accordingly, displaying waveforms on a *true* baseline. This ABC function can be selected as and when required.

No more manual QRS adjustment.

Unlike other electrocardiographs, MEGACART is designed to recalculate the onset and offset of each new averaged QRS complex. This eliminates the need for manual adjustment, simplifies your work and enhances the accuracy of your trend information.

thorough examination; measurement points can be shifted, ST measurements can be verified, arrhythmias can be examined. This capability can be further enhanced by incorporating the hard disk option with the capacity to store complete raw data. This is an essential element of the highest level of MEGACART exercise ECG testing.

* patent pending

Don't waste a second.

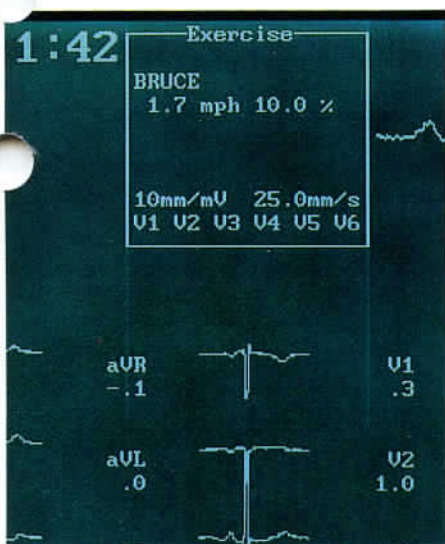
Sometimes defibrillator use cannot be avoided during exercise testing and it can lead to frustrating seconds as the electrocardiograph display struggles to cope with the high voltage spikes. MEGACART virtually eliminates that time lapse after defibrillation; post-defibrillation recovery time has been brought down to three seconds to give a clear, quick picture of your patient's condition should the unexpected arise.

Post-acquisition editing.

MEGACART allows you to review all the stored ECG data, add comments and even to re-measure complexes. The ECG is always there for your

MEGACART AND EXERCISE ECG

- * Unique ABC Advanced Baseline Control algorithm — eliminates baseline movement
- * Automatic arrhythmia detection — without false alarms
- * 12 lead ST level, slope and area measurement
- * 8 treadmill and 6 ergometer default programs — all programmable
- * Continuous recalculation of QRS onset/offset
- * Post-acquisition editing capability
- * Compatible with future MEGACARE® exercise ECG management system
- * Customized exercise reports (including user-definable trend definitions)
- * Slave monitor option for remote surveillance



MEGACART accommodates eight treadmill and six ergometer default programs all of which are programmable.



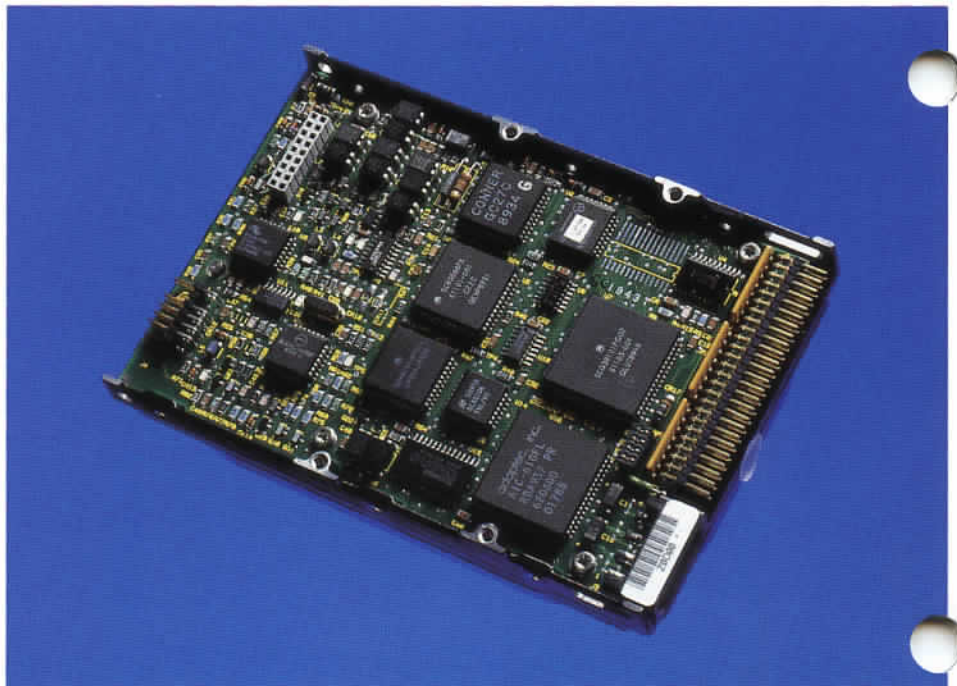
'What about when I want to take exercise testing a step further?'

There are many applications where you might wish to take even the high performance of the MEGACART exercise ECG a stage further. This is why we have built a hard disk upgrade capability into MEGACART, providing safe data back-up while also extending and enhancing your exercise ECG monitoring capabilities. Upgrading with the MEGACART is simple, taking your Siemens representative just a few minutes.

MEGACART — your personal computer.

The hard disk capability adds vastly increased data storage capacity to your MEGACART, and in doing so it extends the scope of your exercise ECG testing. With this hard disk configuration, the MEGACART virtually doubles as your personal cardiological computer. By accommodating all the raw data you acquire during the test the MEGACART lets you 're-live' the test. Averaged complexes are stored every 15th second, and re-measurement will provide complete new trends of ST levels and slopes, for example.

When the test is complete, if the need arises, you can go back through all or part of the test. So, for example, you can re-examine a particular phase and run or re-run specific sequences. It's possible to study special arrhythmias, or selected further complexes for print-out because all the data is at hand.



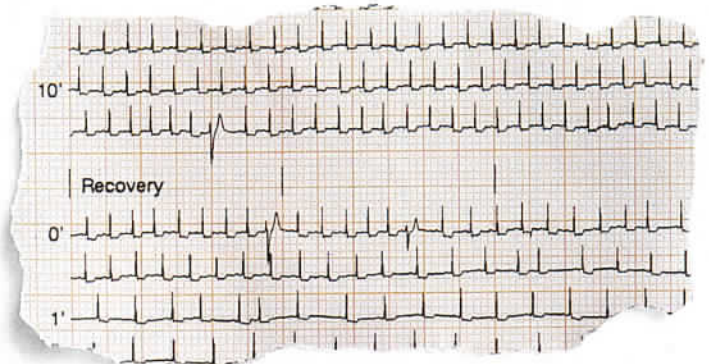
The increased storage capacity of the MEGACART hard disk lets you store and review all the exercise ECG data generated during the test.

Full editing capabilities.

Sometimes simply reviewing the data is not enough. You may wish to

experiment with the data recorded. MEGACART allows you, for example, to re-adjust the measuring points used to calculate the ST level,

MEGACART permits full disclosure Holter-type recordings from any selected lead.



PATIENT INFORMATION

ID: 1239873218
 First Name: Brooks
 Last Name: Frederick
 Age: 39
 Sex: Male
 Medication: No medication
 BP: LOCATION1
 Location: LOCATION1

Date: 01-04-17
 Time: 14:38

EXERCISE TEST

ID: 1239873218
 Last Name: Brooks
 First Name: Frederick
 Sex: Male
 Age: 39
 Phase: Recovery
 Phase Time: 03:07
 Exer. Time: 08:43
 Load: 0 W
 Protocol: ERG090W/3
 HR: 113
 BP: 179/85(?)

Date: 01-04-17
 Time: 14:46
 Cart: LOCATION1
 Location: LOCATION1
 Site: SITE1



ID: 1239873218
 Last Name: Brooks
 First Name: Frederick
 Sex: Male
 Age: 39

Date: 01-04-17
 Time: 15:38
 Cart: LOCATION1
 Location: LOCATION1
 Site: SITE1

Phase: Exercise
 Phase Time: 01:58
 HR: 108

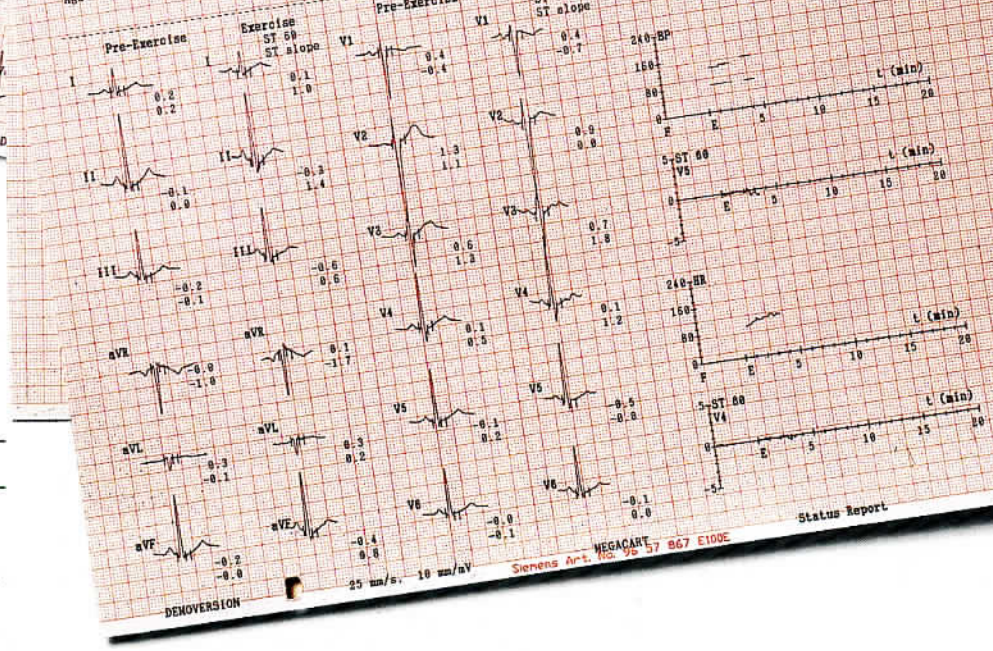
Phase: Exercise
 Phase Time: 03:03
 HR: 113
 BP: 150/80

Date: 01-04-17
 Time: 15:38
 Cart: LOCATION1
 Location: LOCATION1
 Site: SITE1

ID: 1239873218
 Last Name: Brooks
 First Name: Frederick
 Sex: Male
 Age: 39

Phase: Exercise
 Phase Time: 01:28
 Exer. Time: 03:28
 Load: 80 W
 Protocol: ERG090W/3

Date: 01-04-17
 Time: 15:38
 Cart: LOCATION1
 Location: LOCATION1
 Site: SITE1



for example. You can amend the results accordingly. Or if you prefer, following your examination, you can leave things as they were. The MEGACART allows you to scroll through all this data on the high resolution backlit screen until you find the arrhythmia or the complex you are interested in. You use the MEGACART as a terminal, editing text and data, and selecting as much or as little data as you want. Once you are satisfied with both the scope and the content of what you would like to see in the final document, you can print out in single or multiple copies.

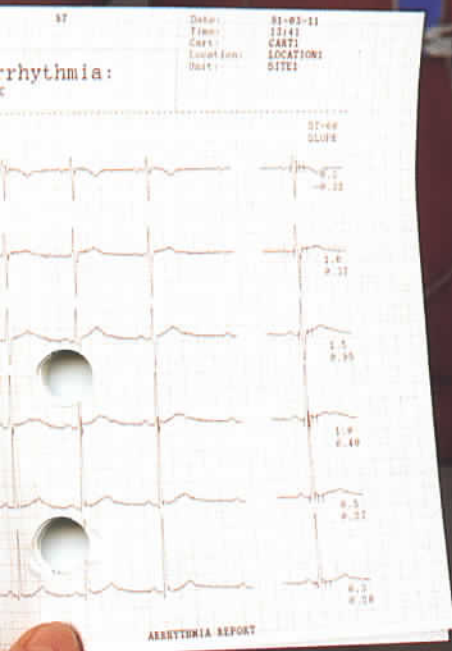
Simplified arrhythmia monitoring.

Review of arrhythmias is also simplified when they are stored on the MEGACART hard disk. Each arrhythmia event is marked for simplified location and printing. Alternatively, individual leads can be selected for print-out in compressed format so that the arrhythmias can be monitored manually and/or counted.

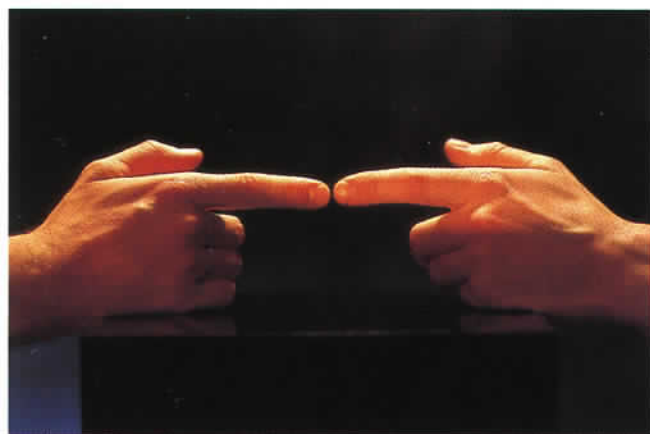
Customized exercise reports.

MEGACART also gives you the option to choose the content and format of your exercise ECG reports. You can specify what type of trend information you require, ST vs. time, ST vs. HR for example, and you can even include a Holter-type report of any selected lead.

- ### MEGACART AND HARD DISK
- * Total raw data storage of several tests
 - * Safe post-exercise back-up
 - * Re-measurement of all stored complexes possible
 - * Full editing of QRS complexes and arrhythmias
 - * Comprehensive exercise testing research tool
 - * Holter-type recording of any lead
 - * Customized final report



When the MEGACART is equipped with a hard disk, the overall scope of exercise testing is enhanced still further. By accommodating all the raw data acquired, you can re-live the test at any time and specify precisely what information you require for print-out.



'I want the integration between my ECG recorders and the ECG management system to be seamless'.

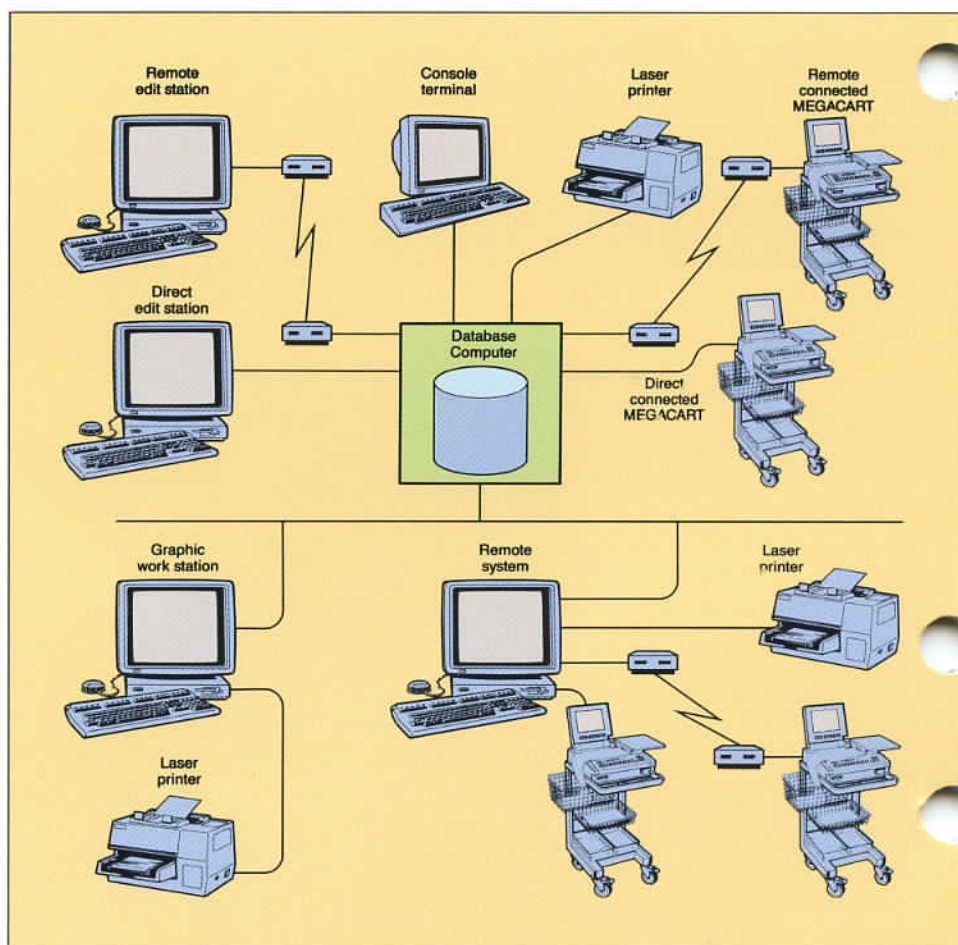
Integration is our goal. And with MEGACARE, integration brings flexibility with cost-effectiveness. Used within the ECG management system, MEGACART doubles up as an acquisition unit and as a MEGACARE editing terminal. Full communications capabilities also ensure full integration even of remote MEGACARTs. This is particularly useful to the hospital in the process of upgrading to computerized ECG management by limiting the requirement for new, dedicated terminals.

MEGACARE. The voice of reason in ECG management.

MEGACARE is designed as an open ECG management system for resting ECG and later also for exercise ECG and Holter ECG management. It allows ECG data to be sent or retrieved from a central database where all the hospital's (or hospital group's) ECG data is stored. It offers fool-proof, secure data storage, it radically reduces the amount of hard copy required and it improves the performance of the whole cardiology department.

Serial ECG comparison.

With MEGACARE earlier ECGs can be retrieved for review and comparison at any time. The complete test data is available for the cardiologist to review, printing out all or part of the report as necessary.

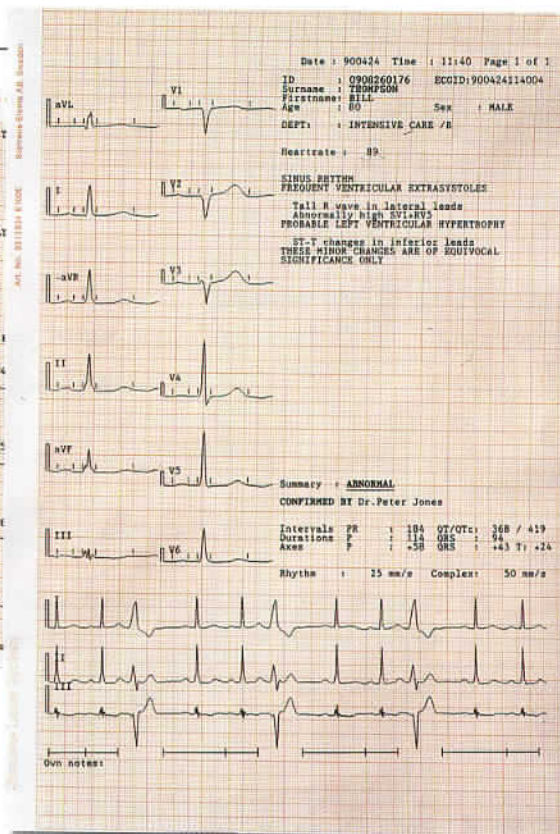
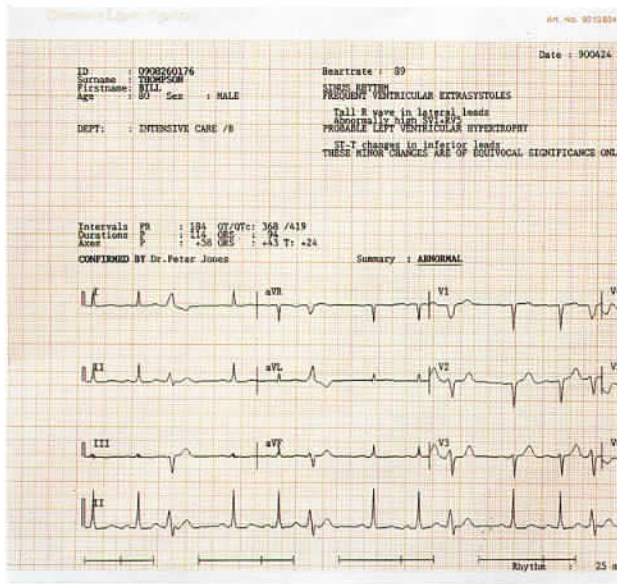


MEGACART is an integral part of the comprehensive and powerful MEGACARE ECG management system.

Simplified procedures.

Use of the MEGACARE management system also cuts down on unnecessary work. Since all previous patient and ECG data is stored, an ID alone is enough to link an ECG to

Both the layout and content of ECG reports are selectable using the MEGACARE system.



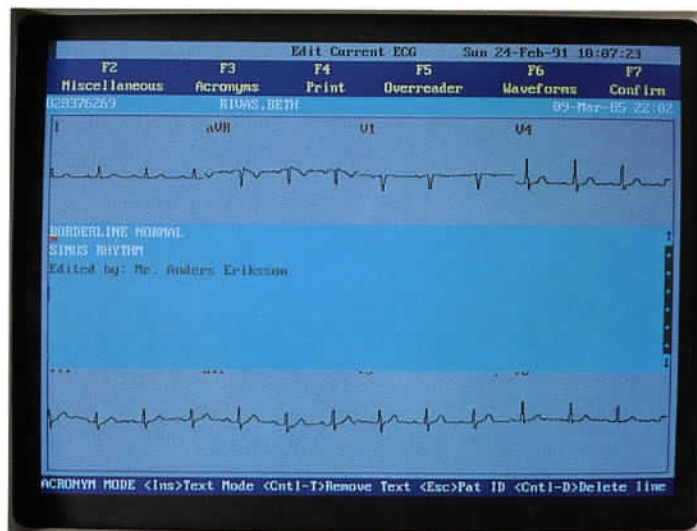
previous records. Demographic data need only be entered once in order to appear on all later ECG records.

Second opinions and educational benefits.

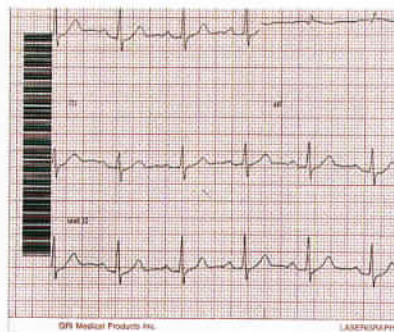
The MEGACARE database provides an invaluable source of information to everyone in the cardiology department. ECG complexes can be compared, data can be collated and research statistics can be generated. Second opinions can be obtained from anyone in the MEGACARE network regardless of whether they are in the same hospital or remotely connected. This is also a cost-effective way of spreading your cardiological expertise and making it accessible to outlying clinics, or for educational purposes.

Upgradeable MEGACARE.

Its recorder MEGACART, the MEGACARE system is also simply upgradeable in both function and size. New MEGACART recorders can be added at any time, as can additional editing and graphic workstations. The system can also be connected with a central hospital computer to further enhance productivity, generating billing and statistical information automatically when required. And the open system approach of MEGACARE makes it a natural foundation in the development of future integrated cardiological systems.



ECG data can be reviewed from any of the MEGACARE workstations.



ECGs can be retrieved instantaneously from MEGACARE storage using a bar code reader.

MEGACART IN A MEGACARE SYSTEM

- * Entry level: single MEGACART and PC
- * Bar code access to required ECG
- * Selectable ECG report layout and content
- * MEGACART permits use of custom headers
- * Clearly-defined interface to central hospital system
- * Production statistics and billing information available
- * In-built communications facilities

MEGACART Highlights

High definition backlit display.

Selectable eight or three lead preview display.

Flexible, user-definable documentation.

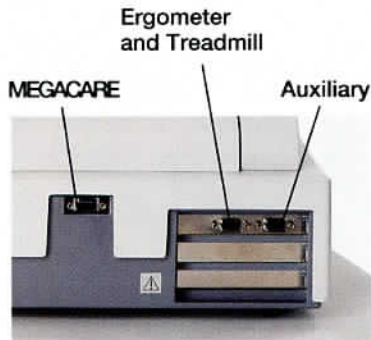
Self-explanatory soft keys.

Easy-to-use with nine direct function keys.

Membrane or PC-type keyboard.

Optional hard disk capability for storage of all raw data.

Height-adjustable instrument shelf (873 - 1198 mm).



Compatible with MEGACARE ECG management system.

Open upgrade path — resting ECG, exercise ECG and advanced exercise ECG capabilities.



ECG storage on RAM memory cards.

Highly maneuverable UNICAR M with generous accessory storage.

Lock/release wheels combine directional stability with maneuverability.

Dimensions:
Height: 1634 mm
Width: 475 mm
Depth: 491 mm

Subject to change without notice

Siemens-Elma AB
Electrocardiography Division
Solna, Sweden

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