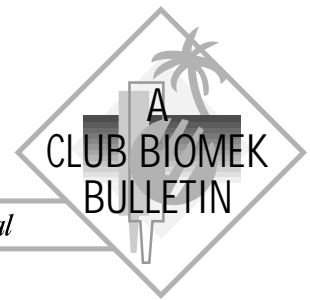


T³ UPDATE



New tips, tricks and techniques to help keep your Biomek® 2000 performing to its fullest potential

Volume No. 2

August 1996

Hello and welcome to volume two of the Biomek T³-Update user newsletter. With this issue, we institute a new theme for the Biomek users group: **Club Biomek!** What is Club Biomek? It means that Biomek users can now participate in a pool of information made available to our club members and the Beckman web site's new BioRobotics section. This site will allow users to exchange information, access a User Resources section, see the latest in developments at Beckman or elsewhere via hot-links, and share in a global community of Biomek user experience to help with system applications. Beckman takes the responsibility of maintaining this site and participating in information exchange and technical assistance. Finally there is a single place for users to go and communicate with the global community of Biomek-ers! We hope you find this news exciting. See the announcement section of this issue for more information.

Also in this issue, you will find an important announcement about an exclusive distribution alliance recently signed between Beckman Instruments and Sagian, an industry-leading systems integrator in the robotics marketplace. This alliance expands the operational envelope of your Biomek system to include many advanced and enhanced capabilities. See the announcement section of this issue for more information.

We have added more capacity to the side loader system and finalized our integration information for the Wallac TriLux plate-based scintillation counter. And, in this issue we publicize the availability of custom labware from one of our Biomek users. If you have custom labware needs, this might be a good place to start!

All-in-all, this is a very busy issue. We hope that each issue of T³-Update will add value to the ownership and operation of your Biomek system.

We are committed to continual improvement in providing you with up-to-date information about operating your Biomek.

Welcome to Club Biomek!

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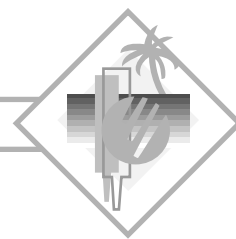
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EDITOR

Charles Powell

North America Operations-Bioresearch Marketing
Beckman Instruments, Inc.
2500 Harbor Boulevard, Fullerton, CA 92634
(714) 773-8599 • (714) 773-6764 FAX
E-Mail: crpowell@ccgate.dp.beckman.com

BECKMAN



HARDWARE INTEGRATION

The information contained in this section is in abstract form. The objective is to provide a quick look at hardware devices which have been successfully integrated into the Biomek[®] /BioWorks working envelope. There are limitations to the utility and performance of the systems described in this section, we recommend that you contact the manufacturer for any specific information about the capabilities of the systems described here. For detailed information about the integrations you find in this section, please contact your local Beckman Biomek Representative.

-INTEGRATION OF THE BIOMEK 2000 AND WALLAC MICROBETA TRI LUX MICROTITER PLATE SCINTILLATION/LUMINESCENCE DETECTOR

To meet the growing needs for automation in the research and clinical laboratory environment, the expertise of Beckman Instruments, and Wallac Oy have been merged to create a fully integrated automation system for DNA and protein microtiter plate-based assays. The system employs a user-friendly Windows* operating system which provides easy configuration of automated methods and counting protocols. With a fully integrated off-the-shelf system, the benefits of automation are appreciated without the lengthy installation and training typical of custom integrated systems.

The Biomek 2000 Laboratory Automation Workstation with the Biomek Side Loader (SL) was integrated with the MicroBeta TriLux 96-Well Scintillation/Luminescence Detector (Wallac Oy, Turku, Finland). The MicroBeta TriLux detector was best positioned behind the Biomek 2000 so that the plate loading rack occupied the 3D position on the SL. Integration of the MicroBeta TriLux with the Biomek 2000 BioRobotics system was accomplished using a single IBM Value Point Model 466DX2 computer to simultaneously operate the BioWorks operating system software of the Biomek 2000 and the MicroBeta TriLux Windows Workstation Software and download the data. Therefore, a user can observe the data output of the MicroBeta TriLux while following the Biomek 2000 method.

The integration of various devices with the Biomek 2000 requires the use of a robotic arm to perform the plate transfers. The

Biomek 2000 uses the Side Loader (SL) which can access up to 16 "stacks." When installing non-Biomek instrumentation on the Biomek Side Loader, "BioScripts" are used to teach the Side Loader arm movements to and from the instrument. "BioScript" files are prepared prior to creating a method and are easily inserted using the "BioScript insert" icon in BioWorks. A "portal" designation is used to define one of the 16 positions on the SL for simplifying the transfer of plates to and from the detector.

David Brandt, Ph.D.

-BRANDEL CAROUSEL

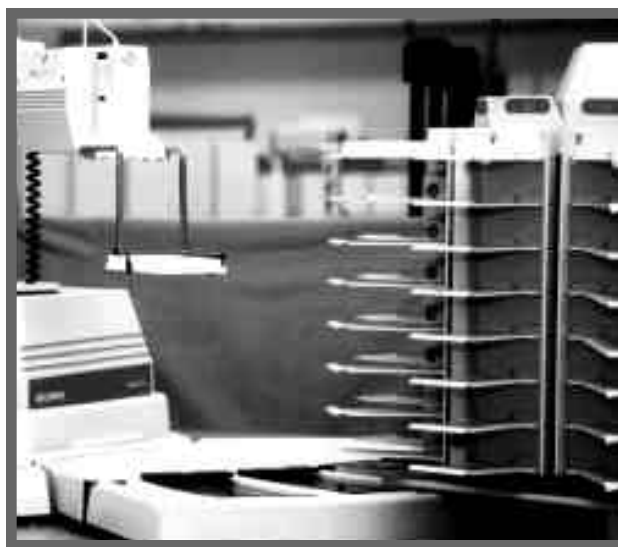
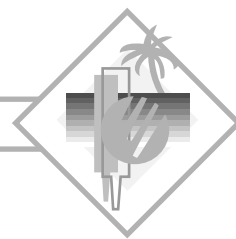


Figure 1. The Brandel Carousel installed in the 1F position on the Biomek 2000 SL system.

The Brandel Corporation (Biomedical Research and Development Laboratories) has designed and built an innovative microplate carousel system which has been integrated into the Biomek Sideloader system. Dr. David Brandt at Beckman Instruments worked closely with the engineers at Brandel to finalize the working design. Dr. Brandt has published his work with the Brandel system into a Product Bulletin which is available from Beckman. The carousel can hold either 64 plates, 32 P20 or P250 tip boxes, 32 reservoirs or 24 P1000 tip boxes. It contains eight individual shelf stacks that can be removed and altered to contain eight, four or three shelves. If attached to the "A" or "F" position of a pie section, the carousel occupies two positions. Up to three carousels can be installed on the Biomek 2000 SL which produces a robotic system that can store 128 microtiter plates; nearly tripling the capacity of the Biomek 2000 SL system.

* Windows is a registered trademark of the Microsoft Corporation.



The Carousel is integrated seamlessly into both mechanical operations and BioWorks software. The "Send to Device" function of BioWorks is utilized to physically increment the carousel stack area. The "Set Shelf" and "Next Labware" functions of BioWorks are used to program the automatic replenishment of the worksurface with labware and tips. Since BioWorks considers the carousel a single eight, four, or three shelf stack, the carousels are limited to one configuration.

For more detailed information about this integration, please contact your local Biomek[®] Representative or Brandel at:
 Brandel (Biomedical Research & Development Laboratories, Inc).
 8561 Atlas Drive, Gaithersburg, MD 20877 USA.
 Phone: (800) 948-6506 Fax: (301) 869-5570

**Note: Beckman Instruments supports the use of custom products to enhance the performance of your Biomek system. Beckman does not provide any warranty or performance claims for items not manufactured or distributed by Beckman or any Beckman subsidiary.*

SOFTWARE INTEGRATION

This section addresses the use of BioWorks software and the use third party software with the Biomek 2000 system. The Biomek user interface (BioWorks) is Windows-based and very easy to use. The Biomek software control system enables the use of a cascade of control programs which can "drive" the system to locations within the spatial domain of the hardware. In this cascade, the user can access increasing levels of detail in control, and in programming complexity-literally controlling the motors which locate the function to be performed. Don't forget to consult the Read-Me file in your Biomek software to see many tips, tricks and techniques about operation and fine-tuning of your Biomek system.

-TOOL EDITING ON THE BIOMEK 2000

The pipetting accuracy and precision of the Biomek 2000 interchangeable pipetting tools can be made even more precise by careful manipulation of the software configuration described for each tool in BioWorks. Tools can be "fine-tuned" for highly accurate transfers of specific volume ranges and/or unique buffer compositions. For example, a tool configuration can be delineated to transfer 4 μ L of a viscous solution containing 20% glycerol. In this "viscous tool" configuration all pipetting functions have been modified from the standard parameters, i.e., aspirate and dispense

have been slowed to allow the viscous solution time to move into and out of the pipette, blowout and overage volumes have been increased, prewet overage has been reduced to zero, and the tool slope (the number of millimeters the plunger moves inside the tool to aspirate one microliter) has been determined for the viscous fluid within a range of 3-5 μ L. Even though the P20 Tool would be used by the Biomek 2000 for a number of different solutions and volumes, at the appropriate time in a BioWorks method, the "viscous tool" configuration can be chosen and utilized to transfer 4 μ L of the viscous solution with extreme accuracy.

A Technical Information Bulletin (TIB) will soon be available which describes in detail the process of editing a tool in BioWorks. Accompanying this TIB will be a diskette containing a spreadsheet worksheet that will assist in tool slope determination for unique fluids and to re-calibrate an aging tool. *Stay tuned!*

LABWARE INTEGRATION

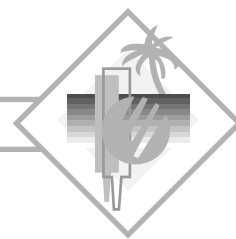
Labware editing is one of the powerful tools of BioWorks software. It allows the user to bring new pieces of labware into the labware catalog of BioWorks, and store the labware in a database. Once the new labware has been defined and saved in BioWorks, any user can access it for use within any new or existing method.

-LABWARE EDITING UPDATE

In the first issue of T³-Update, we published the availability of a document which can help with the labware editing process. We have upgraded this information with new examples in an easy-to-follow format. This new document is in process now to become a Technical Bulletin (TIB) available from Beckman. If you would like an advance copy, please contact your local Biomek Representative.

-ROBOTIC LABWARE DESIGNS

Many applications in molecular biology require the use of very new plates or other labware designs that enable certain processes to function better. An example of new labware is the new breed of thermal plates used for thermal-cycling. Other examples might include devices which provide temperature control of reagents or liquids on the worksurface of a Biomek, or even vacuum filtration capability. We have identified a source for novel labware and device designs for the Biomek system which may provide some additional capability or process control for your application.



Robotic Labware Designs (RLD) is a company that specializes in the design and manufacture of novel labware and software applications for the Biomek[®] system. The RLD staff has extensive knowledge of the Biomek system and have developed their products with the Biomek system in mind. Examples of RLD's product portfolio which work with Biomek are:

- Passive heater/cooler plates and reservoirs
- Variable line splitters
- Horizontal electrophoresis tanks and BioScripts for loading gels
- Peltier heater/coolers
- Vacuum dot blotters
- Custom cabinets for 6-port Wash Unit
- Savant modifications

RLD can design, build and program to fit customized application needs for your Biomek! For more information about RLD, contact Jim Chambers at (619)633-1623.

**Note: Beckman Instruments supports the use of custom products to enhance the performance of your Biomek system. Beckman does not provide any warranty or performance claims for items not manufactured or distributed by Beckman or any Beckman subsidiary.*

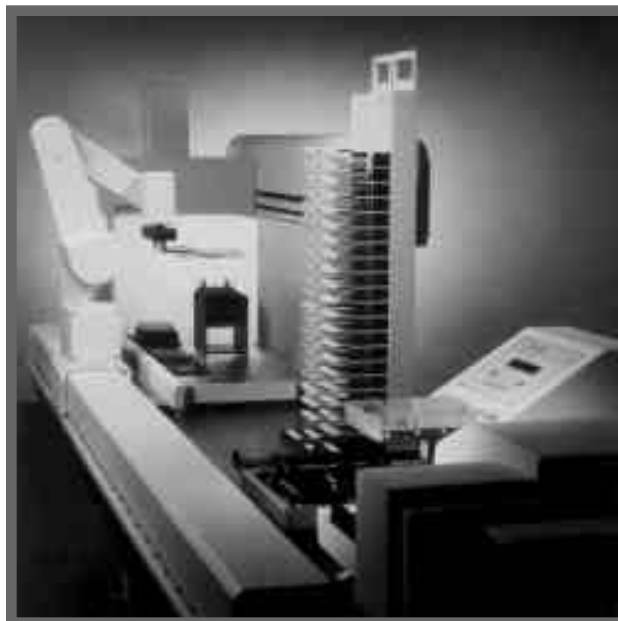
ANNOUNCEMENTS

-DISTRIBUTION AGREEMENT WITH SAGIAN, INC.

Beckman Instruments, Inc. announces the development of three new BioRobotic systems for the automation of high-throughput drug screening, named Biomek CORE Systems. They combine the Biomek 2000 Laboratory Automation Workstation from Beckman, the ORCA linear track robot system and SAMI software from SAGIAN, Inc., detectors from Wallac Oy, Molecular Devices Corp. and BMG, and additional process devices and modules. All of the components are fully integrated into systems specifically configured for high-throughput screening, an important first step for pharmaceutical and biotechnology companies in the search for new drugs.

The three applications systems were developed by SAGIAN for Beckman and include an ELISA System, a Receptor Binding System and a Cell-Based System. Under an agreement with SAGIAN, Beckman will market, sell and service these CORE

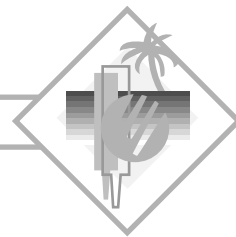
systems worldwide. With these three applications systems, Beckman expands its offering to the high-throughput screening market by providing systems with higher capacity, throughput and functionality. The graphical Windows software method editor (SAMI) makes it easy for the researcher to configure new methods and assays without complicated programming.



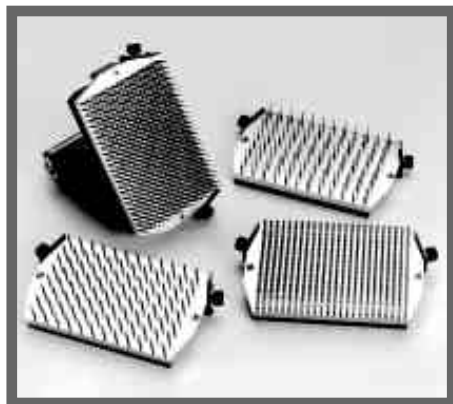
Current Biomek 2000 owners can consider these systems as part of an upgrade path for their current workstations. A few of the advantages that these systems provide are:

- Assay scheduling and interleaving (more than one assay running)
- System multi-tasking (all modules in the system run simultaneously)
- Multiple detection options (UV/Vis, Fluorescence, LSC)
- CO₂ Incubation
- Bar-code tracking of samples
- Capacity (up to 200 microplates)
- Fast delivery (90-days)

For more information about Biomek CORE Systems, please contact your local Biomek Representative.



-96/384 HDR Tool



The new 96/384 HDR tool is now available. This new tool design incorporates a fixed tool body with interchangeable pin plates. The individual pin plates hold either 96 or 384 pins. The system is available with two different pin sizes (0.015 in. and 0.045 in.) for transfer volumes of 20nL and 200nL respectively (actual volumes are dependent on the type of liquid being used). Now a user can order either 96 or 384 pin configurations for the tool, or have both. The new tool now makes spotting (gridding) libraries stored in 384-well plates much easier and definitely much faster! The 96/384 tool is operated from the same BioWorks icon as the current 96 pin tool.

For more information regarding the new 96/384 HDR Tool, please contact your local Biomek Representative.

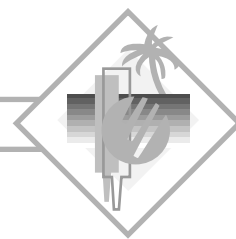
- BECKMAN WEB SITE: BIOROBOTICS PRODUCT SECTION

As mentioned previously, our BioRobotics section of the Beckman web site is active and running! All users can now get the latest product and application information about the Biomek 2000 system. Soon we will implement a User Group capability attached to this site for users to share applications, questions and comments about their Biomek systems. Users are invited to share novel applications or BioScripts with others via the User Resources Section.



- Check out:*
- *The latest developments in robotics at Beckman (announcements)*
 - *Updated literature and recent publications*
 - *Biomek product information*
 - *User resources such as:*
 - * *Hot links*
 - * *Integration information (detail)*

Those who do share “tips, tricks, or techniques” they have learned with their Biomek, will receive a special gift from Beckman. To place something on the web site, please contact Charles Powell or your local Biomek Representative. Check out our web site and see what’s happening with BioRobotics at Beckman!



TECHNICAL AND APPLICATION BULLETIN INDEX

The following information is available from Beckman.

Technical(T) and Application(A) Information Bulletins

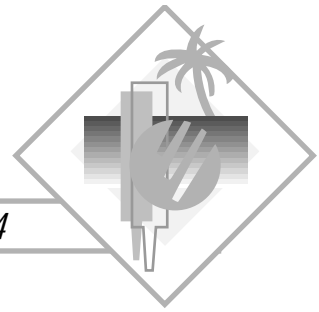
- T-1709 The Automation of Three Clinically Important ELISAs with the GenELISA V2.1 System
- T-1710A A Method for Interfacing the High-Density Replication System with the Biomek 1000 Side Loader
- T-1711 Preparation of High-Density Colony Filters for Screening Cosmid Libraries
- T-1713 Hybridoma Screening Using the High-Density Replicating System on the Biomek 1000 Automated Laboratory Workstation
- T-1721 Complete ELISA Automation Using the Biomek 1000 SL and SL Incubator
- A-1743 Validation of the Biomek 1000 BioRobotics System for LAL Endotoxin Testing Using the BioWhittaker Kinetic-QCL System
- A-1749 Complete Automation of Endotoxin Detection Using the Biomek 1000 BioRobotics System for LAL Endpoint Assays
- A-1759A Use of the Biomek Workstation for Ki Determinations
- A-1764A ELISA Automation: A Biomek 1000 to Biomek 2000 Comparison of Clinical ELISAs
- A-1765A Automation of HIV Proteinase Enzyme Assay Using Scintillation Proximity (SPA) Technology
- A-1766A High-Throughput DNA Sequencing Reactions Using the Biomek 2000 BioRobotics System
- A-1767B Contamination-Free PCR Preparation of Multiple Samples Using the Biomek 2000 Laboratory Automation Workstation
- A-1802A Radioimmunoassay Automation: Development of a Single-Step Assay Using the Biomek 2000 Laboratory Automation Workstation Integrated with the MicroBeta PLUS 96-Well Scintillation/Luminescence Detector
- T-1809A Integration of the Biomek 2000 and Wallac MicroBeta Trilux Microtiter Plate Scintillation/Luminescence Detector

ARTICLE REPRINTS

The following article reprints are available from Beckman.

- 007-134 A Flexible, Integrated System for Automation of Hybridoma and ELISA Procedures, E.W. Stewart and N.C. Appleby
- 007-135 Automated Sanger Dideoxy Sequencing Reaction Protocol, J. Zimmerman, H. Voss, C. Schwager, J. Stegemann and W. Ansorge, Federation of European Biochemical Societies, 223: 432-436 (1988)
- 007-137 Automation of Dideoxynucleotide DNA Sequencing Reactions Using a Robotic Workstation, R. K. Wilson, A.S. Yuen, S.M. Clark, C. Spence, P. Arakelian and L.E. Hood, BioTechniques 6: 776- (1988)
- 007-138 Automated Methods for Single-Stranded DNA Isolation and Dideoxynucleotide DNA Sequencing Reactions on a Robotic Workstation, E.R. Mardis and B. A. Roe, BioTechniques, 7: 840- (1989)
- 007-182 Detection and Quantification of Gene Amplification Products by a Nonisotopic Automated System, M. Holodniy, M.A. Winters and T. C. Merigan. BioTechniques 12: 37-39 (1992)
- 007-320 Pharmaceutical Biotechnology International (1995). Limited quantities available. Includes Biomek 2000 Ad, CE Ad, Beckman Corporate Profile and High-Throughput Screening Article.

FREQUENTLY ASKED QUESTIONS (FAQ)



Return via FAX to: Michael W. Clark, Ph.D., Beckman Instruments (714) 773-6764

In an effort to fulfill Club Biomek's desire to be responsive to the Biomek[®] 2000 users, we have replaced the FAQ for this issue with the User's chance to Ask The Question (ATQ). Until the interactive user site is finished on the Beckman Home Page, please write out your Biomek questions and FAX them to Michael W. Clark, Ph.D., Beckman Instruments, Inc., (714) 773-6764. Include your name, address, and e-mail address, and we will immediately answer your questions. Also in the next issue of T³, a compilation of these questions with the accompanying answers will be presented.

QUESTIONS: _____

Name: _____

Organization: _____

Address: _____

City: _____

State: _____

ZIP: _____

Phone: _____

FAX: _____

E-Mail: _____

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Beckman Instruments, Inc. • 2500 Harbor Boulevard, Box 3100 • Fullerton, California 92834-3100
Sales: 1-800-742-2345 • Service: 1-800-551-1150 • Internet: <http://www.beckman.com> • Telex: 678413 • Fax: 1-800-643-4366