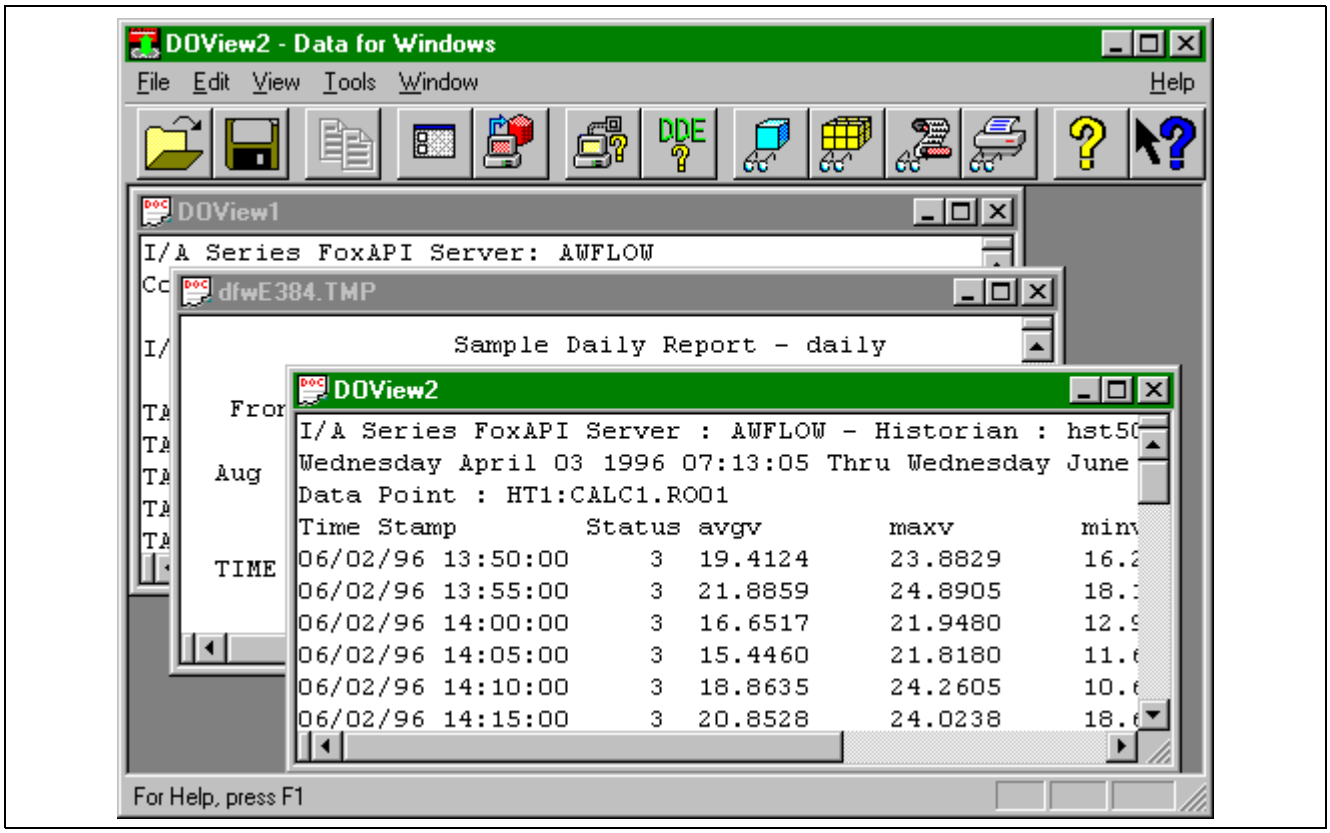
FOXBORO®

PSS 21S-2B4 B3

# I/A Series® Software
# Data for Windows V2.3




*I/A Series Data for Windows, for Microsoft Windows operating systems provides easy access to I/A Series real-time data objects and historical information from Windows-based applications.*

**OVERVIEW**

Data for Windows provides Windows-based desktop systems access to both real-time and historical information from I/A Series systems. Specifically, using low overhead client-server architecture, Data for Windows employs a *true Windows desktop system architecture,* including:

- Dynamic Data Exchange (DDE) interface to I/A Series data objects
- Open Data Base Connectivity (ODBC) interface to I/A Series historical process data (Sample Data, Reduction Groups, Manual Data Entry [MDE] data, and Messages)
- Excel Add-In for easy Historian data access without using Structured Query Language (SQL)
- OLE 2.0 and OLE automation for connection between OLE aware Windows applications and Data for Windows views, reports, and I/A Series files.

In addition, browsers enable users to generate desktop views of I/A Series data objects and Historian tables/files.

Data for Windows was developed for Windows 95 and runs on Windows 98 and Windows NT Workstation 4.0.

## BENEFITS

Using Data for Windows, virtually any 32-bit Windows-based desktop in the enterprise has access to historical and real-time information from its I/A Series systems (security control/configuration is at the I/A Series server). Data for Windows browsers provide users with the ability to scan for and view real-time and/or historical information. DDE, OLE 2.0, and ODBC interfaces provided by Data for Windows, allow for connection to the Microsoft Office suite(s) (or equivalent applications). This information access makes reporting and analyzing process-generated information easy and intuitive using familiar desktop PC tools for engineers, supervisors and managers alike.

The Data for Windows interface was developed using Microsoft guidelines for Windows 95 targeted products. These guidelines were developed by Microsoft in order to provide a consistent “look and feel” among applications. By doing this with Data for Windows, the user has a program that not only runs on Windows 95/98 but also runs on the Intel-based version(s) of Windows NT workstation with the same look and feel. Data for Windows is a powerful toolbox for automating information flow from the “Sensor to the Boardroom”.

## FEATURES

- Real-time access to process and production data in I/A Series servers using the DDE capability within the Microsoft Windows environment
- SQL query capability for the I/A Series Historian (Sample, Reduction, Message, and MDE data) via Microsoft ODBC by applications within the Windows environment
- Access to I/A Series data object parameter (compound:block.parameter) names and descriptions, FoxAPI data sets, data object values, distributed Historian(s), and available reports by means of browsers
- Real-time data object views
- Implemented as an OLE 2.0 server (object linking and embedding) application
- Connection of multiple I/A Series servers and multiple Windows-based PC clients with multiple applications
- Configurable access privileges by user and data elements
- Access to files residing in I/A Series servers
- Refined, intuitive user interface
- Support for Microsoft Windows operating systems on multiple hardware platforms
- Context-sensitive on-line Help.

## REAL-TIME READ/WRITE ACCESS VIA DDE

Data for Windows uses the standard DDE syntax of “Application, Topic, and Item” for establishing connections. “Application” and “Topic” are DDE interface mechanisms for identifying a Windows “conversation”. In this case, the “Application” is always “IAServer” and the “Topic” is always “ObjectAccess”. The “Item” part of the connection refers to the desired I/A Series object expressed as:

“AP-Alias/Compound:Block.Parameter”

Three types of interchanges constitute data object access:

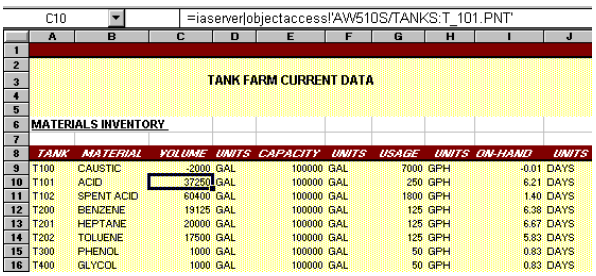
- Automatic “change-driven” updates from the I/A Series server to the requesting PC client
- Single “one-shot” updates of a requested data object
- Single writes of a specific data object.

Change-driven updates occur periodically to Windows-based applications for the specified data objects. Updates may be either DDE “hot links”, which contain the changed data value, or “warm links” that act only as a notification that a change has occurred.

Applications receive DDE data in “CF_TEXT” format of the following form:

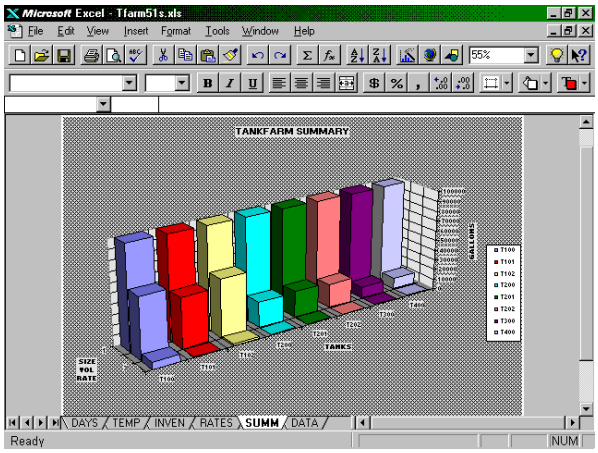
<Data Value><TAB><Status Value><CR><LF>

One typical use of the DDE capability is to link I/A Series data objects to an Excel worksheet. A typical data sheet would look like:




| TANK | MATERIAL | VOLUME | UNITS | CAPACITY | UNITS | USAGE | UNITS | ON-HAND | UNITS |
|---|---|---|---|---|---|---|---|---|---|
| T100 | CAUSTIC | -2000 | GAL | 100000 | GAL | 7000 | GPH | -0.01 | DAYS |
| T101 | ACID | 37250 | GAL | 100000 | GAL | 250 | GPH | 6.21 | DAYS |
| T102 | SPENT ACID | 60400 | GAL | 100000 | GAL | 1800 | GPH | 1.40 | DAYS |
| T200 | BENZENE | 19125 | GAL | 100000 | GAL | 125 | GPH | 6.38 | DAYS |
| T201 | HEPTANE | 20000 | GAL | 100000 | GAL | 125 | GPH | 6.67 | DAYS |
| T202 | TOLUENE | 17500 | GAL | 100000 | GAL | 125 | GPH | 5.83 | DAYS |
| T300 | PHENOL | 1000 | GAL | 100000 | GAL | 50 | GPH | 0.83 | DAYS |
| T400 | GLYCOL | 1000 | GAL | 100000 | GAL | 50 | GPH | 0.83 | DAYS |

Using this data sheet it is then possible to generate a “live-updating” graph:




## ODBC ACCESS TO I/A Series HISTORICAL INFORMATION

The architecture of ODBC is a client-server model. This makes it an ideal tool for access to I/A Series historical data. The four components of the ODBC architecture are:

- Application (e.g., Excel Spreadsheet, MS Query)
- Driver Manager (ODBC manager provided by Microsoft separately or as part of the MS Office Suite)
- Driver (e.g., Data for Windows I/A Series Historian ODBC Driver)
- Data Source (e.g., Foxboro_Historian on the I/A Series server).

The application interacts with the user via its user interface, calls ODBC functions to submit SQL statements, and retrieves/presents results.

The ODBC Driver Manager manages interactions between (multiple) applications and (multiple) ODBC drivers simultaneously. An application calls an ODBC function in the Driver Manager which routes the call to the correct (ODBC) driver.

Data for Windows ODBC Driver is a Dynamic Link Library (DLL) that implements ODBC function calls and interacts with a data source (Foxboro_Historian). The driver:

- Establishes a connection to the data source
- Submits requests to the data source
- Translates data to/from other formats if requested by the application
- Returns results to the application
- Formats errors into standard error codes and returns them to the application
- Declares and manipulates cursors if necessary
- Initiates transactions if the data source requires explicit transaction initiation.

There are two types of ODBC drivers: single-tier and multiple-tier. Multiple-tier drivers process ODBC calls and pass SQL statements to the data source. Single-tier drivers process both ODBC calls and SQL statements. The Data for Windows ODBC driver is a single-tier driver using a client-server model where SQL statements are processed by the driver for access to remote I/A Series Historian files and database tables.

The data source is a term used in ODBC for two purposes:

- As a conceptual term that defines the kind of data the end user desires to access (e.g., historical)
- As an actual name a user or system administrator assigns via an ODBC utility to describe a particular collection of software components, such as an ODBC driver, a network library, a server name/address, a DBMS.

The data source that the Data for Windows ODBC driver accesses is Foxboro_Historian. Foxboro_Historian consists of:

- Sample Data
- Reduction Groups
- MDE
- Messages
- FoxHistory Event Messages.

Each of these files/tables are accessible for read access. The MDE tables (with appropriate permissions) can be written. This enables “remote lab” or other manual entry applications to be set up using networked Windows PC applications.

To access I/A Series historical data from a Windows-based PC, the user (application) has only to specify:

- Historian name (e.g., hst01)
- Database name
- Table name
- Column name(s).

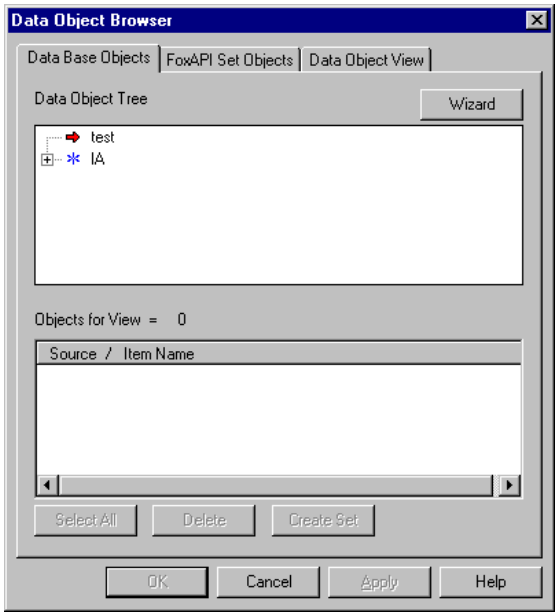
Not only is it possible to access I/A Series server Historians (via an information network), but Data for Windows enables Windows PCs secure access to other I/A Series Historians residing on other servers located on the I/A Series Nodebus.

## BROWSER ACCESS

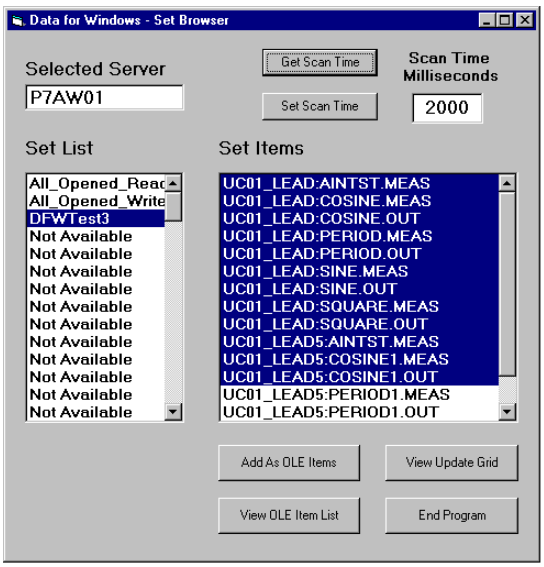
Browsers are a suite of dialogs enabling the user to view I/A Series objects and data in the Windows PC. There are several browser dialogs available.

*The Data Object Browser* enables the Windows PC user to examine all available data objects from a server which take the form of:

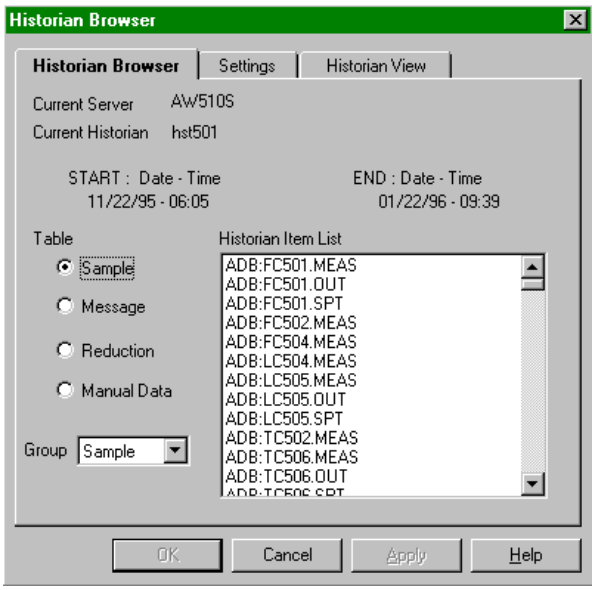
Compound:Block.Parameter or SharedVariableName



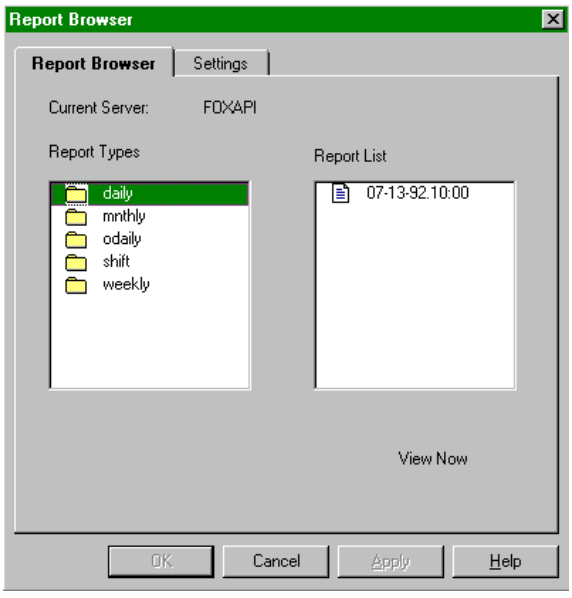

*The Set Browser* enables a Windows PC user to examine all available FoxAPI data sets and their corresponding data objects from a selected I/A Series server. Data formats can be specified and a data objects view created.




*The Historian Browser* is a tool for accessing distributed Historians and associated databases. Upon selection of a particular I/A Series server and a Historian, the user can view the contents of the historical files or table(s) and create a Historian view.



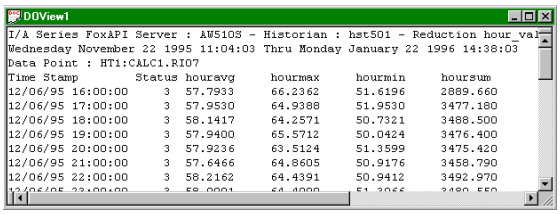

*The Report Browser* is used to access I/A Series report print files located on the selected server. Reports may be viewed, printed, or placed in a report view.



## OBJECT VIEWS

Once a user has created one of the three possible object views (Data Object, Historian, Report) via the browsers, they may be:

- Saved (for future use)
- Printed
- Linked to other PC applications (OLE 2.0).

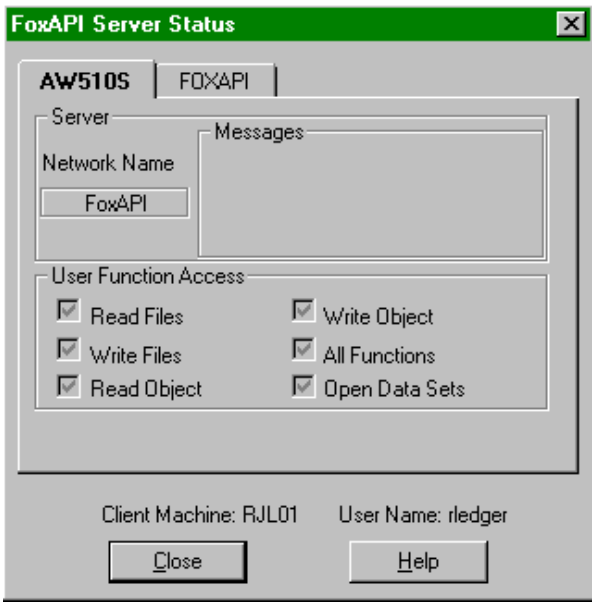



## MULTIPLE SERVERS - MULTIPLE WINDOWS PC CLIENTS - MULTIPLE APPLICATIONS

By employing a low overhead client-server architecture, Data for Windows makes it possible to set up a configuration consisting of multiple I/A Series servers and multiple Windows PC clients.

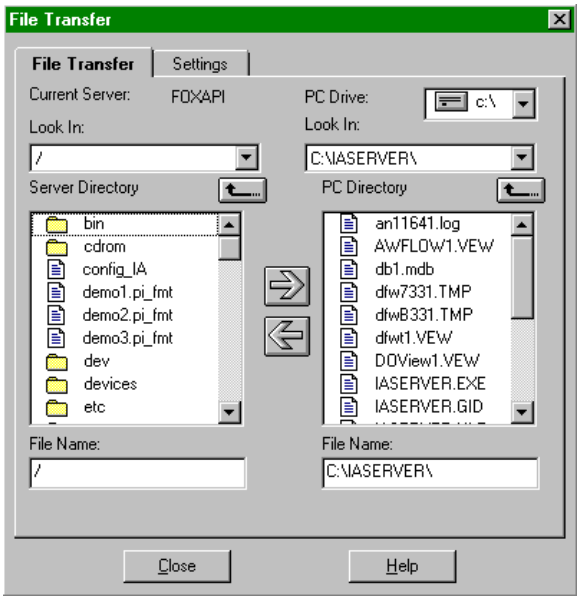
## SECURE BUT OPEN

Security is a built-in feature of Data for Windows and is maintained at the I/A Series server(s).



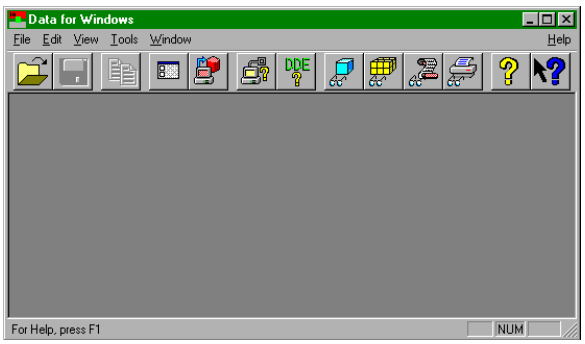

## READ/WRITE ACCESS TO I/A Series SERVER FILES

One of the needs of a Windows PC user is to transfer files from (read) or to (write) an I/A Series server. Data for Windows implements a graphical tool to accomplish this. Data for Windows OLE 2.0 capability also provides for read access of I/A Series server files.




## REFINED, INTUITIVE INTERFACE

Users of Microsoft Windows-based applications have come to expect interfaces to be more intuitive. Data for Windows provides an intuitive interface complete with a toolbar (it even tears off!).



## COMMON "LOOK AND FEEL" ACROSS ALL MICROSOFT WINDOWS OPERATING SYSTEMS

Data for Windows was designed to operate on two Microsoft Windows desktop operating systems:

- Windows 95/98
- Windows NT Workstation 3.51 (and up).

By taking advantage of the Common Dialog mechanism and the Microsoft Foundation Class (MFC) development environment, it Is possible for Data for Windows to run on all of the Microsoft desktop operating systems with the same look and feel.

## ON-LINE HELP

Microsoft Windows users have come to expect on-line Help functionality. Data for Windows provides conventional on-line Help and context-sensitive Help related to a target item. With context-sensitive Help, you first pick the Help tool on the toolbar and then the target item. The Help item associated with that target is then displayed.


## Software Requirements

Data for Windows software (includes client PC and I/A Series server components) licensing is available for single/multiple PC and I/A Series server configurations. Off-the-shelf packages consist of:

- 1 PC client
- 5 PC clients
- 10 PC clients
- 20 PC clients
- 50 PC clients
- 100 PC clients.

## Windows PC System Requirements

- Personal computer using one of the following Microsoft Windows operating systems:
  - Windows 95/98 (8 MB of RAM; 12 MB recommended)
  - Windows NT workstation 3.51 and 4.0 (12 MB of RAM; 16 MB recommended)
- One 3.5-inch high-density diskette drive
- Microsoft mouse or equivalent
- 10 MB of hard disk space recommended
- Monitor compatible with the appropriate Windows operating system (color VGA or better resolution recommended)
- Winsock (version 1.1 or later) TCP/IP based network interface. For example:
  - Windows 95/98 - Microsoft provided TCP/IP
  - Windows NT Workstation 3.51 and 4.0 - Microsoft provided TCP/IP
- Network interface card compatible with the selected Windows operating system and TCP/IP network support (e.g., 3c509)

## I/A Series Requirements

50 Series AP/AW or AW70 server with optional Information Network Interface (e.g., Ethernet, token-ring, ATM, fast Ethernet).

## Technical Specifications

- 0.5 to 30 second PC scan time range (1 ms steps)
- 10 simultaneous client DDE applications per PC (maximum)
- 1000 DDE object connections per PC (maximum)
- 10 simultaneous I/A Series server connections per PC (maximum)
- 20 simultaneous client PC connections per 50 Series server (maximum)
- 5 simultaneous client PC connections per AW70 Series server (maximum).

**The Foxboro Company**
33 Commercial Street
Foxboro, Massachusetts 02035-2099
United States of America
http://www.foxboro.com
Inside U.S.: 1-508-543-8750 or 1-888-FOXBORO (1-888-369-2676)
Outside U.S.: Contact your local Foxboro Representative.



MB 021 Printed in U.S.A. 0299