"MERLIN"

Excalibur's Graphical User Interface for MIL-STD-1553

Excalibur's customers have come to expect more than just hardware and software from us. They expect solutions to their test and simulation needs. Excalibur therefore provides all the software necessary to begin testing within minutes of opening the box.

Our menu driven software is available for Windows 9*x*, Windows NT and Windows 2000 for all our PC, PCI and PCMCIA MIL-STD 1553 and ARINC 429 products.

Menu driven software is suitable for application requiring transmission of repeatable scenarios or collection of monitored data.

The features we offer are based on requests we have received over the years from clients with a wide variety of test and simulation needs. However, our guiding principle has always been not to clutter the program with thousands of options that will rarely be useful. We, therefore, only put in those features, which we felt, would be of value to the general avionics community. Of course we also provide drivers for users who wish to write their own applications.

GUI Design Goals

Excalibur designs its GUI software with the following goals in mind:

- Ease of use
- Hardware and operating system independence

We try to keep our programs down to about half a dozen major screens. We also limit the number of menus and menu options. While this forces us to leave out options that may occasionally be useful, it greatly simplifies use of the programs for those functions most commonly needed.

Merlin+ is built around the Galahad drivers. Since these drivers are delivered in the form of DLLs this enables us to us a single executable for multiple boards and operating systems. Merlin+ works with the PC/EP, PCI/EP, PCI/P*x*, PC/P*x* and PCMCIA/EP on Windows 9*x*, Windows NT and Windows 2000. Merlin for the MCH family of boards has its own executable but a very similar user interface.

Our GUI software can be downloaded off our website www.mil-1553.com. GUI software should always be downloaded together with the drivers for the appropriate board. The programs support a simulation mode giving users a feel for the software before purchasing it. In simulation mode, users can look at all the setup screens even if no board is physically present in the computer. To use simulation mode you must install the drivers for the board you are interested in simulating as well as the GUI software. This feature is also useful for customers who have already purchased boards as it allows the setting up of test programs on computers other than those upon which the tests are intended to run. Users can therefore setup test scenarios on their development machines and transfer these scenarios to the lab for the actual run.

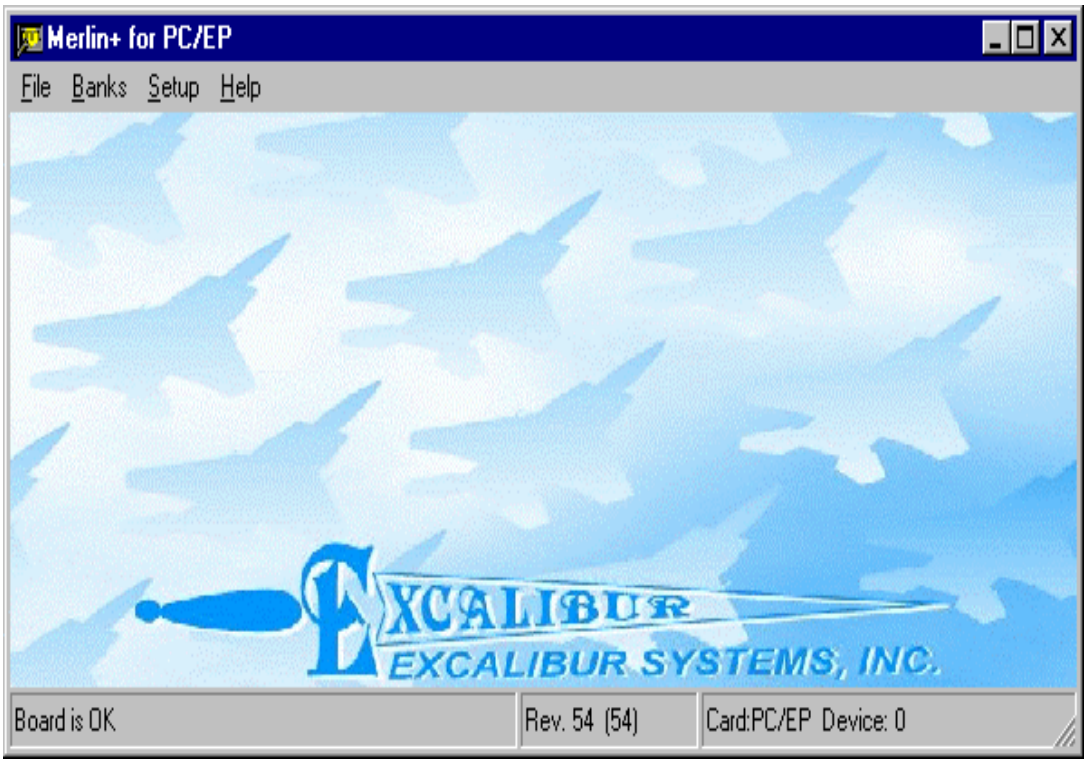
Merlin+ Description

START MENU

Merlin+ comes with complete online context sensitive help. This description is intended to give a general feel for Merlin+'s capabilities.

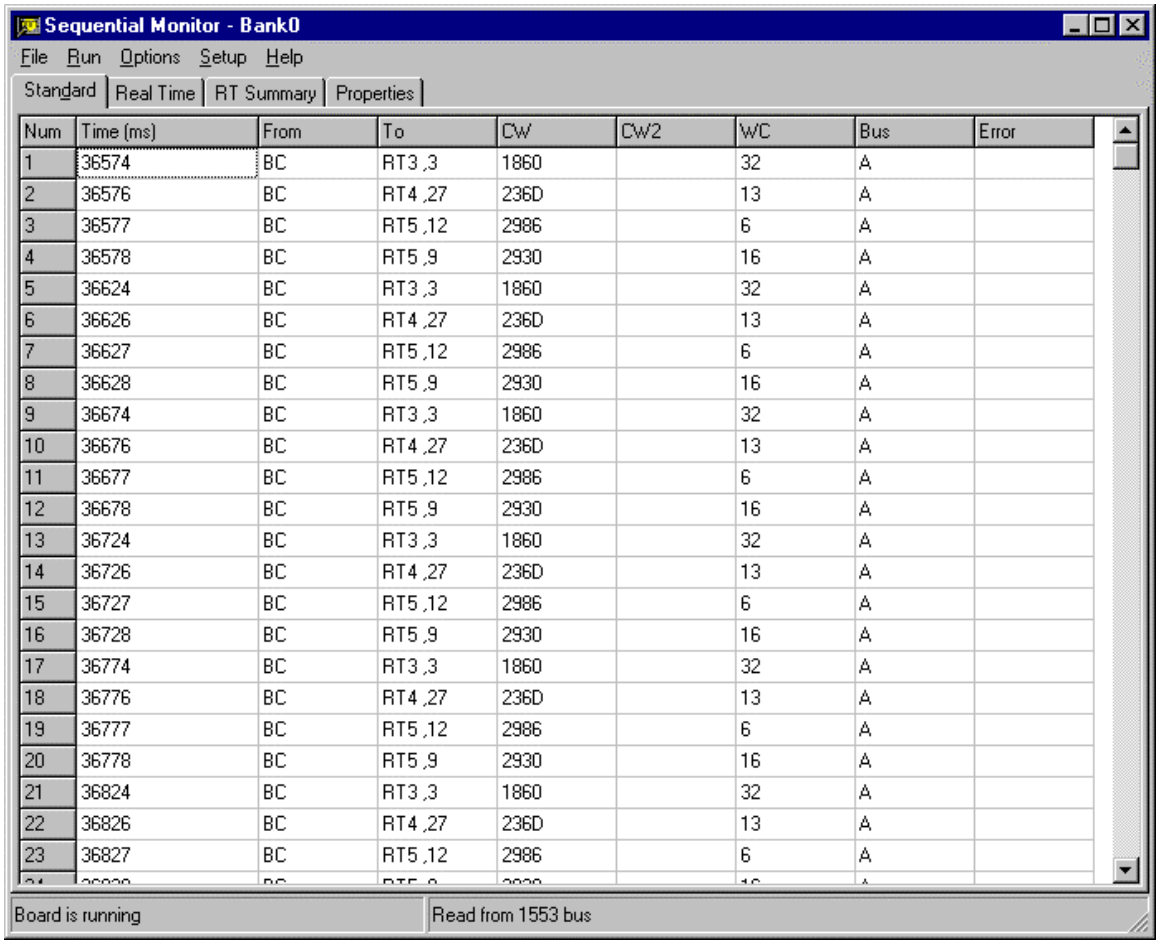
Merlin+'s main screen contains a **setup** menu with which the user selects the board to be used. An option for simulating boards is also available from this menu entry. A **banks** entry is used to select among the banks available for multi-bank or multi-channel systems and to indicate which mode is to be used. Users may select from among BC/Concurrent-RT, RT and Sequential Monitor modes.

Monitoring requires relatively little setup. Four different methods for looking at the data are provided.



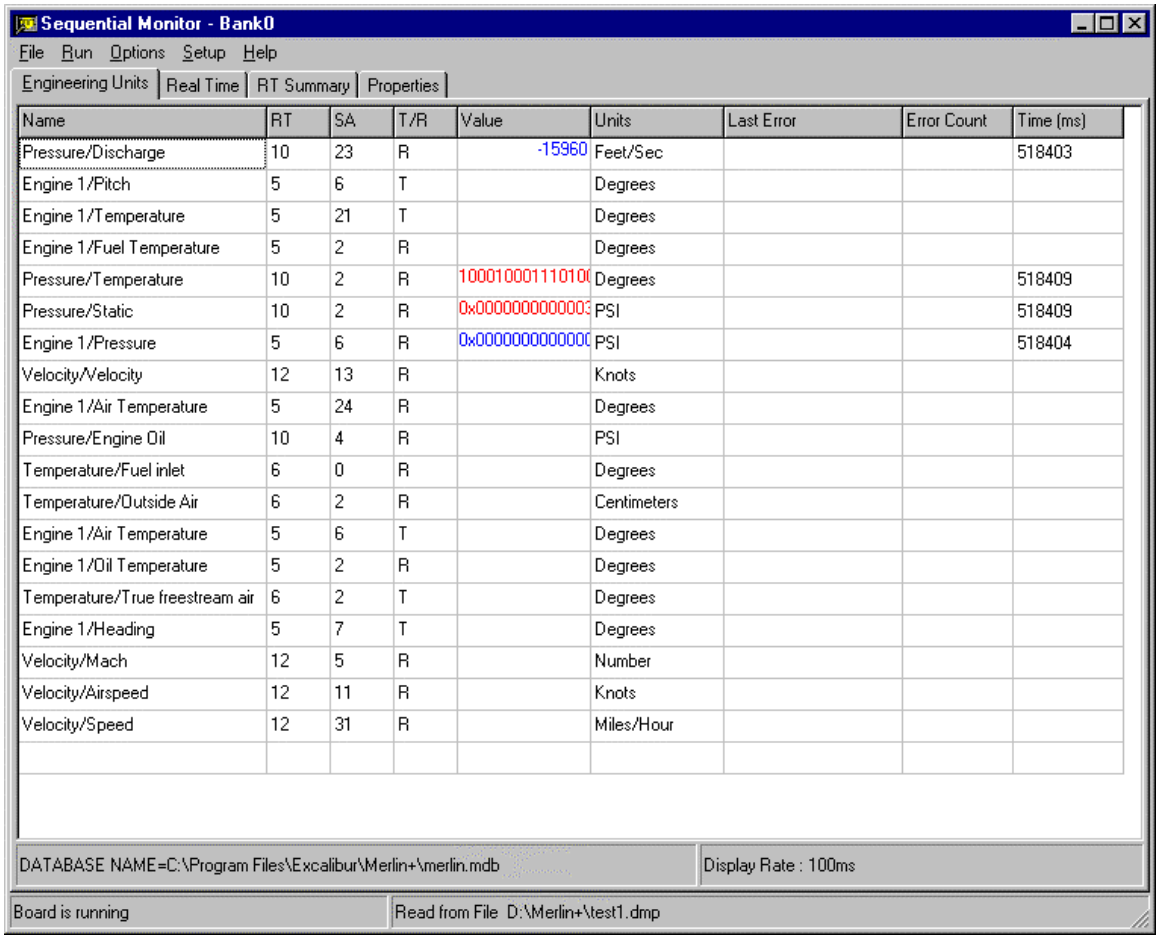
Monitor Mode

By default, the monitor shows a screen containing one line per received message in the order they arrive. The main screen exhibits the command word both in hex and parsed into its components along with timetag and other information.



Engineering Units Monitor

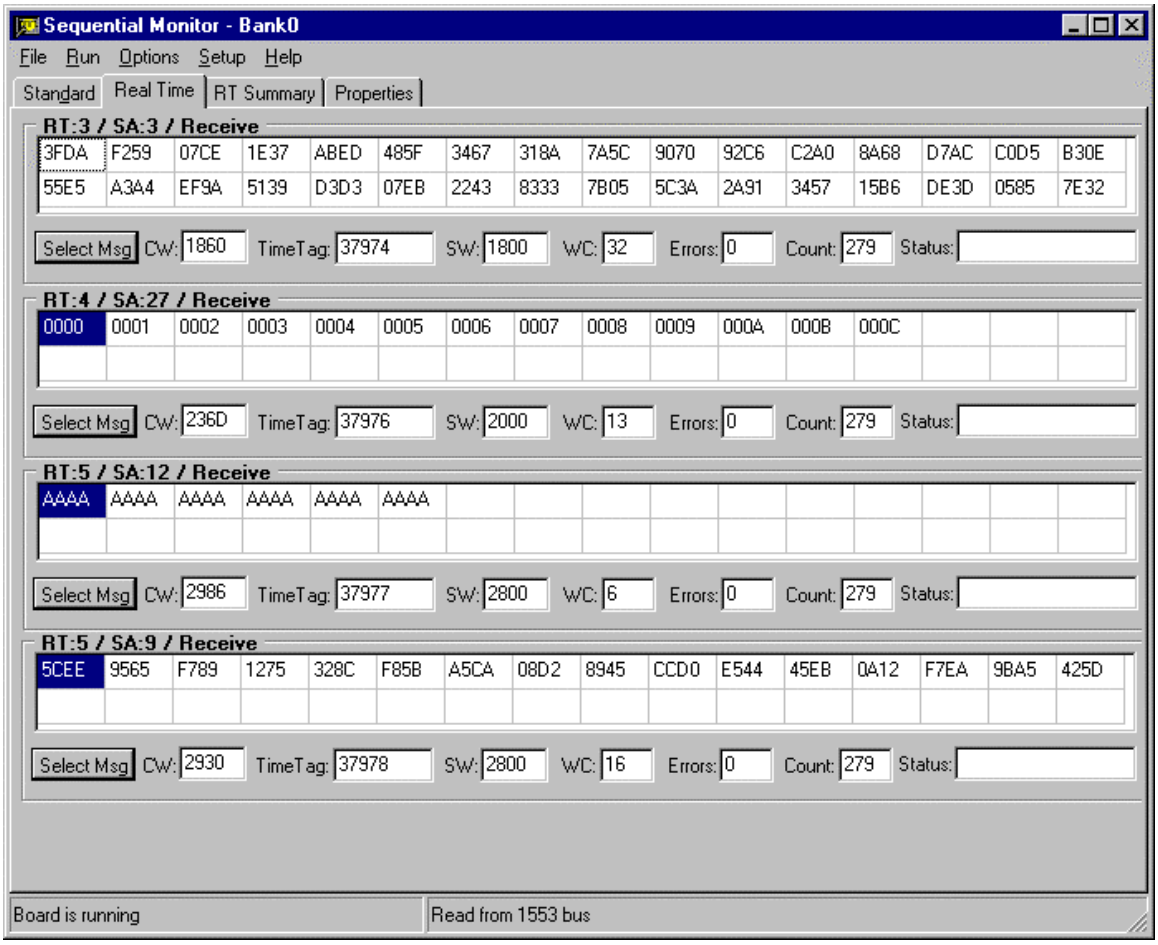
Another display format, accessible through the options menu, is the engineering monitor. For this mode the user fills in a database associating words within a particular message type with engineering units. The user then selects which units to display and where on the screen to display them. The values may be display in hex, binary or decimal adjustable in real time by double clicking on the run screen. The user may also select legitimate values for each element, which will result in a blue display for values within the selected bounds and a red display for values lying outside those bounds.



Name	RT	SA	T/R	Value	Units	Last Error	Error Count	Time (ms)
Pressure/Discharge	10	23	R	-15960	Feet/Sec			518403
Engine 1/Pitch	5	6	T		Degrees			
Engine 1/Temperature	5	21	T		Degrees			
Engine 1/Fuel Temperature	5	2	R		Degrees			
Pressure/Temperature	10	2	R	100010001110100	Degrees			518409
Pressure/Static	10	2	R	0x0000000000003	PSI			518409
Engine 1/Pressure	5	6	R	0x0000000000000	PSI			518404
Velocity/Velocity	12	13	R		Knots			
Engine 1/Air Temperature	5	24	R		Degrees			
Pressure/Engine Oil	10	4	R		PSI			
Temperature/Fuel inlet	6	0	R		Degrees			
Temperature/Outside Air	6	2	R		Centimeters			
Engine 1/Air Temperature	5	6	T		Degrees			
Engine 1/Oil Temperature	5	2	R		Degrees			
Temperature/True freestream air	6	2	T		Degrees			
Engine 1/Heading	5	7	T		Degrees			
Velocity/Mach	12	5	R		Number			
Velocity/Airspeed	12	11	R		Knots			
Velocity/Speed	12	31	R		Miles/Hour			

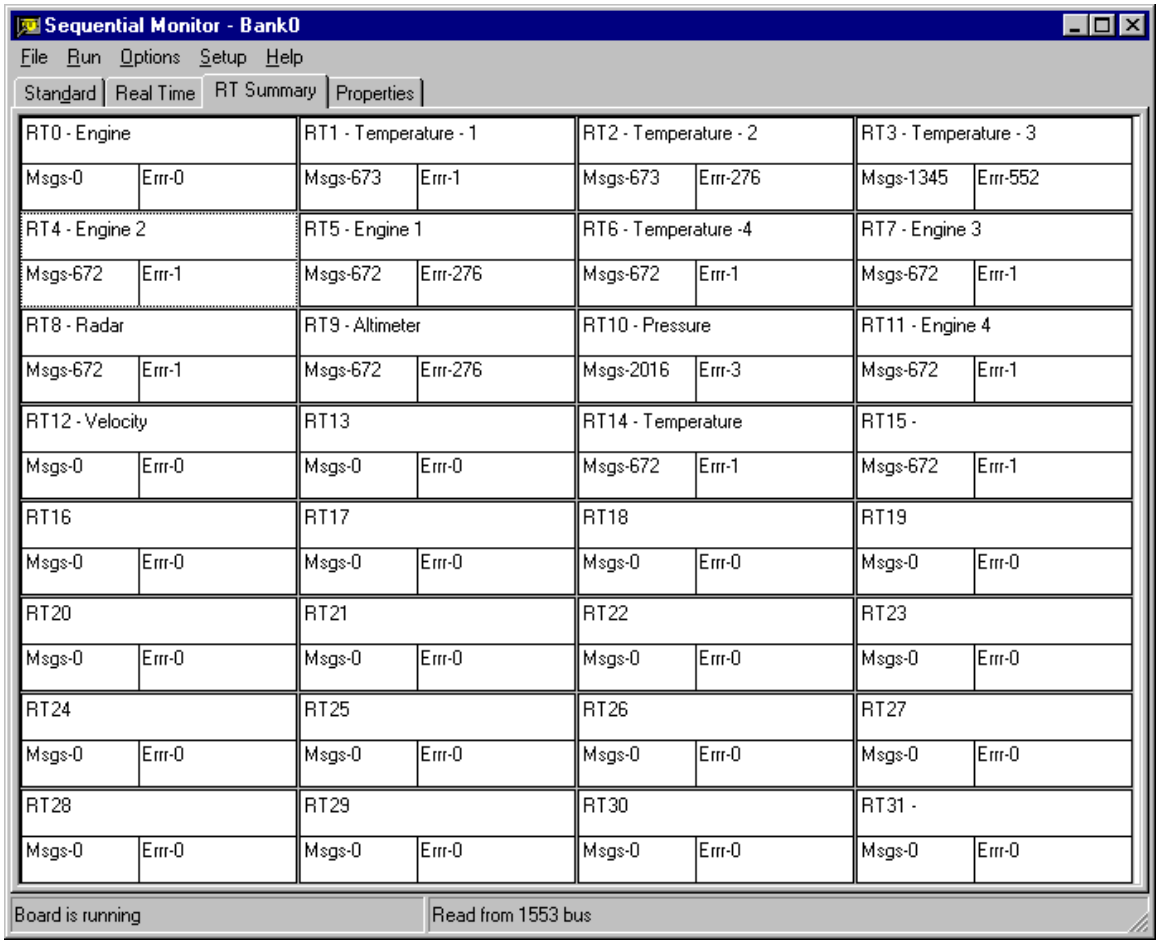
Real Time Update Monitor

A third display method permits the user to select four messages and see the data for these message updated in real time. This display is selected via a tab on the run screen.



System Status Monitor

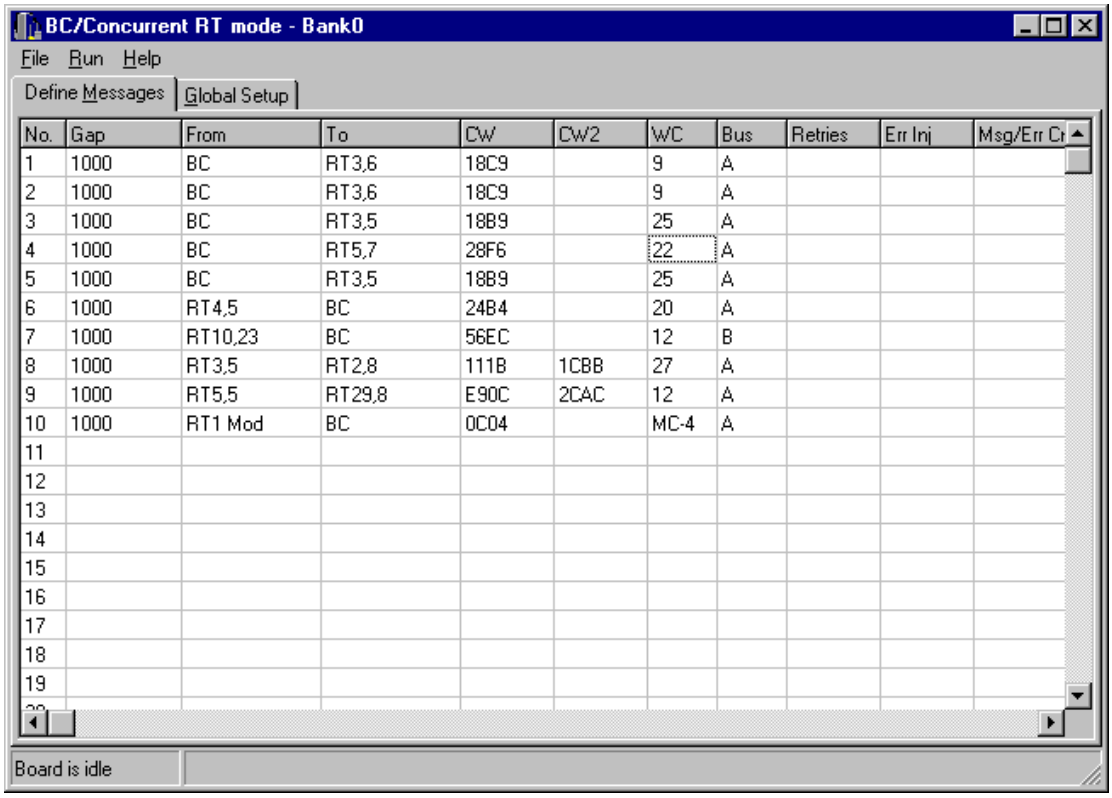
The final display option in Monitor Mode, which is also available in RT mode, is the system status or health monitor. This screen displays a running count of messages received as well as errors encountered for each RT. The user may give names to the various RTs to make the screen more user friendly. This screen is helpful in diagnosing system level problems. Which RTs are not being accessed, which are not responding, which are used more heavily etc.



BC / Concurrent RT Mode

Merlin+ facilitates the setup of bus frames in two main screens. The run screen, which is entered upon selecting BC/Concurrent RT from the Banks menu of the opening screen, is shown below. This screen shows the sequence of messages including message type, RT, subaddress, word count, primary or secondary bus and intermessage gap time. Pop up menus display error injection and retry options selected. When the board is running, the number of messages sent as well as the number of errors detected for each message is updated.

To add or alter a message, the user double clicks on the appropriate line of the screen and the Define Message screen comes up. To display data and status words associated with a particular message, the user double clicks on the Msg/Err Cnt field of the message



No.	Gap	From	To	CW	CW2	WC	Bus	Retries	Err Inj	Msg/Err Cr
1	1000	BC	RT3,6	18C9		9	A			
2	1000	BC	RT3,6	18C9		9	A			
3	1000	BC	RT3,5	18B9		25	A			
4	1000	BC	RT5,7	28F6		22	A			
5	1000	BC	RT3,5	18B9		25	A			
6	1000	RT4,5	BC	24B4		20	A			
7	1000	RT10,23	BC	56EC		12	B			
8	1000	RT3,5	RT2,8	111B	1CBB	27	A			
9	1000	RT5,5	RT29,8	E90C	2CAC	12	A			
10	1000	RT1 Mod	BC	0C04		MC-4	A			
11										
12										
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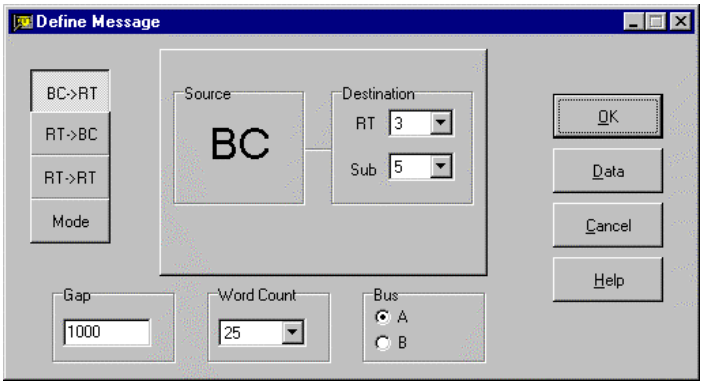
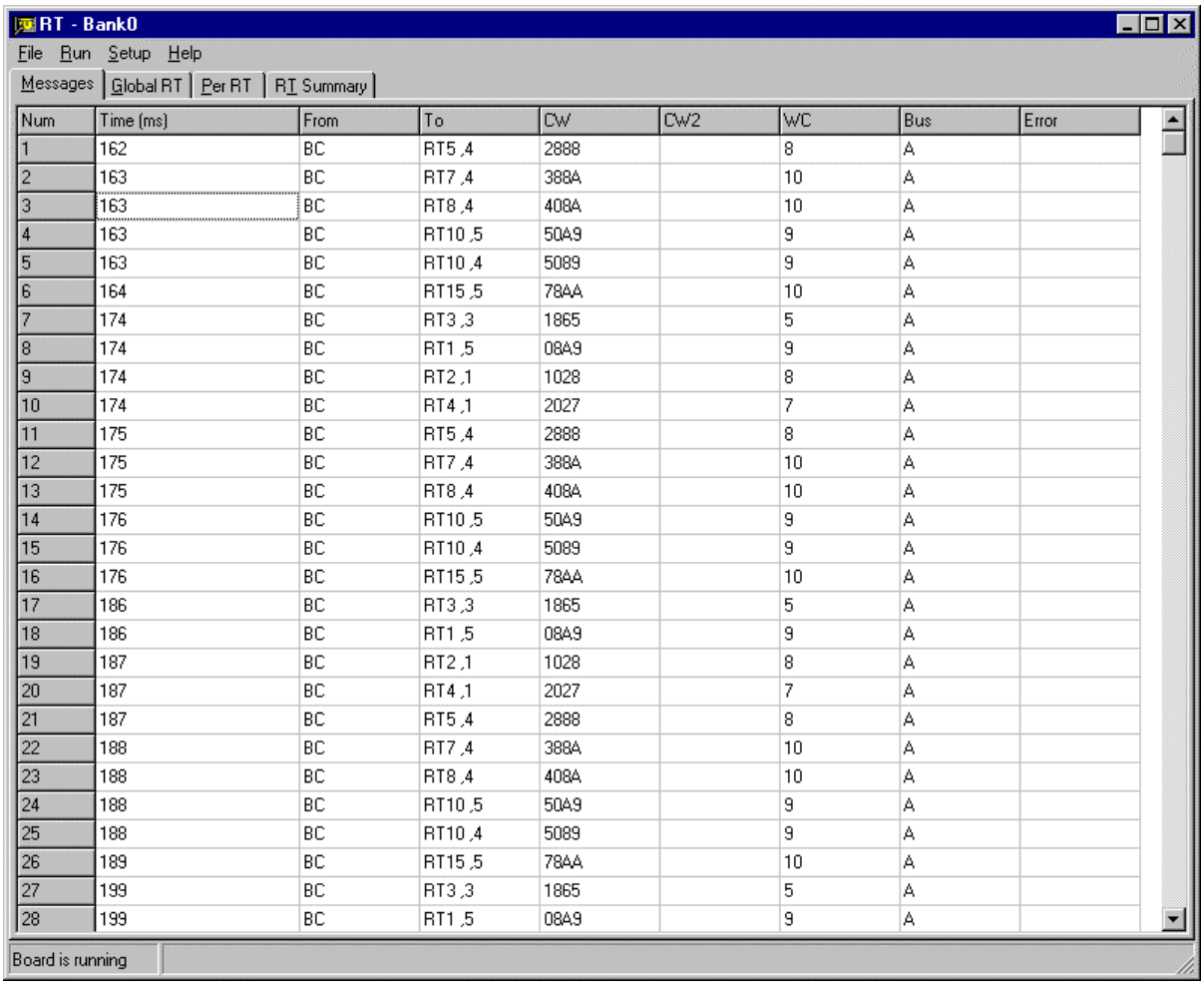
The define message screen is used to select the message parameter associated with any message and displayed on the run screen,. For message for which the data is to be transmitted by the board, the Data button will bring up the data edit screen.



RT Mode

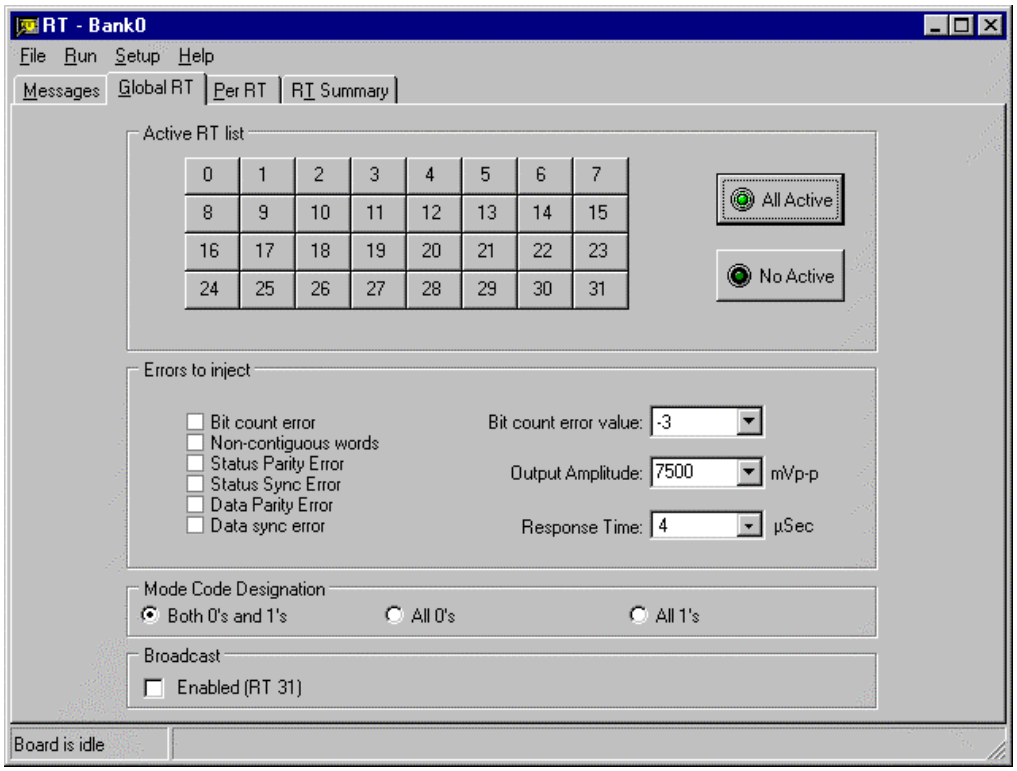
RT mode enables the user to select which RTs to simulate, what data and status words to transmit in response to commands. Error injection and error detection capabilities are also built in to the program. The main screen, shown below, shows a list of the messages that have been received in chronological order. Each line shows the message type, RT number, subaddress and word count associated with the message along with a time stamp, a primary/secondary bus indicator and an error status if applicable. Double clicking on any line will bring up a more detailed view of the clicked message.



Num	Time (ms)	From	To	CW	CW2	WC	Bus	Error
1	162	BC	RT5 ,4	2888		8	A	
2	163	BC	RT7 ,4	388A		10	A	
3	163	BC	RT8 ,4	408A		10	A	
4	163	BC	RT10 ,5	50A9		9	A	
5	163	BC	RT10 ,4	5089		9	A	
6	164	BC	RT15 ,5	78AA		10	A	
7	174	BC	RT3 ,3	1865		5	A	
8	174	BC	RT1 ,5	08A9		9	A	
9	174	BC	RT2 ,1	1028		8	A	
10	174	BC	RT4 ,1	2027		7	A	
11	175	BC	RT5 ,4	2888		8	A	
12	175	BC	RT7 ,4	388A		10	A	
13	175	BC	RT8 ,4	408A		10	A	
14	176	BC	RT10 ,5	50A9		9	A	
15	176	BC	RT10 ,4	5089		9	A	
16	176	BC	RT15 ,5	78AA		10	A	
17	186	BC	RT3 ,3	1865		5	A	
18	186	BC	RT1 ,5	08A9		9	A	
19	187	BC	RT2 ,1	1028		8	A	
20	187	BC	RT4 ,1	2027		7	A	
21	187	BC	RT5 ,4	2888		8	A	
22	188	BC	RT7 ,4	388A		10	A	
23	188	BC	RT8 ,4	408A		10	A	
24	188	BC	RT10 ,5	50A9		9	A	
25	188	BC	RT10 ,4	5089		9	A	
26	189	BC	RT15 ,5	78AA		10	A	
27	199	BC	RT3 ,3	1865		5	A	
28	199	BC	RT1 ,5	08A9		9	A	

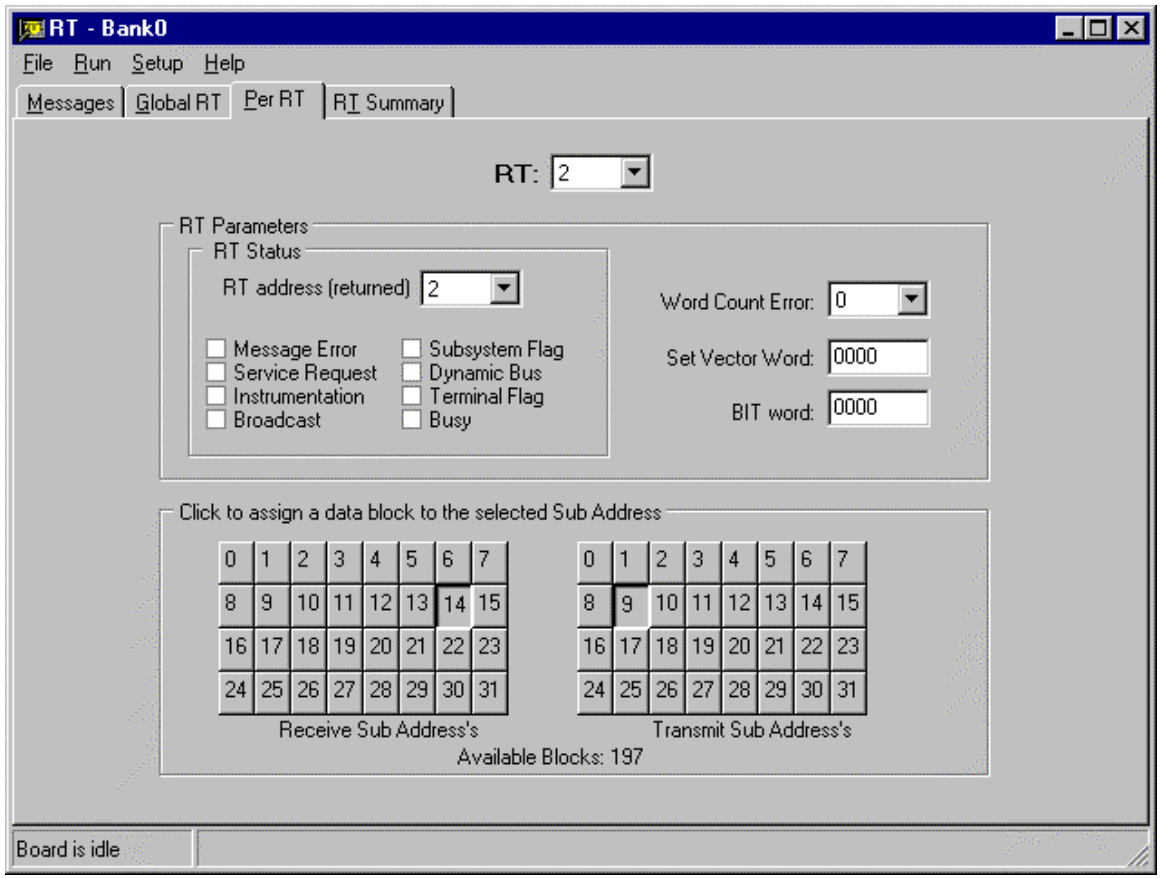
BOARD SETUP

Setting up the board is accomplished with two screen types. The Global RT screen allows the user to select which RTs to simulate, how quickly to respond to commands, which subaddress(es) should be interpreted as mode commands, is RT 31 a regular RT or a Broadcast RT, and certain error injection parameters. For boards supporting variable amplitude, the amplitude to transmit at is selected here as well.



PARAMETER SELECTION

A second setup screen is used to select parameters that may be changed on an RT by RT basis. This includes what status word to return, what to respond to a Get BIT or Get Vector mode command and how many words to send if a word count error is desired. Additionally, this screen is used to associate data blocks with specific subaddresses. For transmit subaddresses, a right clock on the selected subaddress will permit the user to select what data should be sent in response to an RT to BC command directed t that subaddress. For receive commands, it will show the last data received by that subaddress.



DATA ENTRY

This data entry screen is used in both BC and RT mode. Data may be keyed in by hand, by loading from a previously saved file, or by using one of the shortcut buttons supplied.