ARCDIAG

ARCNET DIAGNOSTIC PROGRAM

USER GUIDE

Version 2.2

For use with
Novell Netware/SM/RX Type Networks

INTRODUCTION

The ARCDIAG program is designed to be a service tool for network administrator personnel for a network that uses ARCNET type hardware (see specifications section for compliance).   The ARCDIAG program includes two diagnostic sections that will help during installation of an ARCNET network. The diagnostic software can be operated at any workstation during installation of the network or at any time while running the Novell Network Operating System.

> **NOTE**: The ARCDIAG program is not intended to isolate Novell Software problems except in those cases where the physical network hardware is the prime cause of the problem.

The program exercises the network card by testing all of its internal functions, RAM, RIM etc., and then displays a map of active nodes and packet counts. The latter also provides an indication of any reconfiguration that might be occurring.

THE DISTRIBUTION SET

The files contained in the distribution set are:

      ARCDIAG.EXE   The executable ARCDIAG file

      ARCDIAG.DOC   This documentation file

      ARCDIAG.WP5   Documentation file in Wordperfect 5.0 format

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START UP

The program can be run from the DOS prompt by typing:

ARCDIAG [-**m**xxxx] [-**i**xxxx] [-**f**file descriptor] [-**t**type] [-**b**]

Start Up Options:

> -**b**   Option for removing the preliminary board test.

> -**f**file   Option for specifying the location of the logical name file -
ARCDIAG.DAT. 40 characters maximum. (Unlimited version only)

> -**i**xxxx   Option for operating ARCDIAG at an I/O address of xxxx (hex).
> ARCDIAG defaults to 02E0 (hex). Must use all 4 digits. (Unlimited version
> only).

> -**m**xxxx   Option for operating ARCDIAG at a RAM memory
> location of xxxx (hex). ARCDIAG defaults to D000 (hex). Must use all 4 digits.
> (Unlimited version only).

> -**q**   Option allows board test only operation. Place [ARCDIAG
-q] in the AUTOEXEC.BAT file for automatic test of ARCNET card on power up. If an error
condition is detected, the nature of the error is displayed and the DOS error level is set to 1.
Otherwise, nothing is displayed, and the DOS error level is kept at 0. (Unlimited version only).

> -**t**type   Option for selecting different network interface cards. ARCDIAG
defaults to standard SMC type cards with memory mapped RAM and I/O mapped RIM
controllers. (Unlimited version only).

ArcDiag can be loaded and run in any file server or work station, providing there is a
floppy drive available.

The ARCDIAG.EXE file may be copied onto and executed from the network hard disk,
but keep in mind that board testing is disabled if the Novell Shell is loaded.

Type ARCDIAG at the DOS prompt of the drive containing ARCDIAG, whereupon, if
the Novell Shell is not loaded, the board test screen shown in Figure 1 will appear:

Network Board Test

PASSED: RAM test

No Network Boot PROM found

PASSED: Internal RIM test
PASSED: Physical node address is: 1
PASSED: ETS test
PASSED: POR test

Figure 1 - Board Test Screen

BOARD TESTS

Unless option [-b] is included in the startup command, the board test function automatically begins when entering [ARCDIAG] at the DOS prompt.

Board Types

ARCDIAG has been set to function on most Arcnet boards, with the exception of Nestar.

By including [-ttype] in the command line as a start up option, different board types may be selected, e.g. [-t1], [-t2], etc. Following is an example of the command line:

ARCDIAG [**-m**xxxx] [**-f**file descriptor] [**-t**type]

[-t1] is the default and is used for most Arcnet cards that use memory mapped RAM and I/O mapped RIM controllers such as SMC, Novell, Earth, etc.

[-t2] is used for memory mapped RIM controllers, such as Thomas Conrad, Arcmaster, etc. When the [-t2] option is used, the [-I] option is disabled. (Unlimited version only).

Note: To select an Arcmaster card that has RAM at E000 hex, enter the following command line: (Unlimited version only).

ARCDIAG -me000 -t2

The following tests are made during the board test phase:

**NOTE: When ARCDIAG is first executed, board testing is
disabled if the user has already loaded the Novell Shell.**

RAM Test.--ARCDIAG exercises the ARCNET board's RIM RAM. All 2K of RAM are tested for shorted and open bits. Also, the address lines are tested.

An error message is displayed if the RAM fails the test or if the DIP switch setting of the memory address set is incorrect.

A PASSED message is displayed if operation is verified.

Network Boot Prom Test.--This test indicates whether or not a network boot prom is installed.

RIM Test.--The token controller IC (9026) is tested in the RIM test. The network microprocessor (9026) can perform its own internal diagnostics. When the test is run, approximately 95% of the processor's operations are exercised. If this test fails, replacement of the network card is recommended if it is verified that the I/O address DIP switches are set correctly.

A PASSED message is displayed if operation is verified.

SID Test.--During the SID test, the Controller source ID is located and read. The returned value from this test is the station node address. The test will fail if it is at zero. If failed, make sure the address switches are set to an address greater than zero.

A PASSED message is displayed if operation is verified.

ETS Test.--The ETS test verifies the proper location of the (E)xtended (T)imeout (S)etting jumper. Newer ARCNET cards may not have a jumper. Therefore, the card needs to be replaced if an error occurs.

A PASSED message is displayed if operation is verified.

POR Test.--During this test, a power-up cycle is activated and verified. The 9026 RIM processor is reset and the ARCNET card is placed into an operational state.

After performing all of the above tests, the program will halt for approximately three seconds, then cycle into the Network Tests.
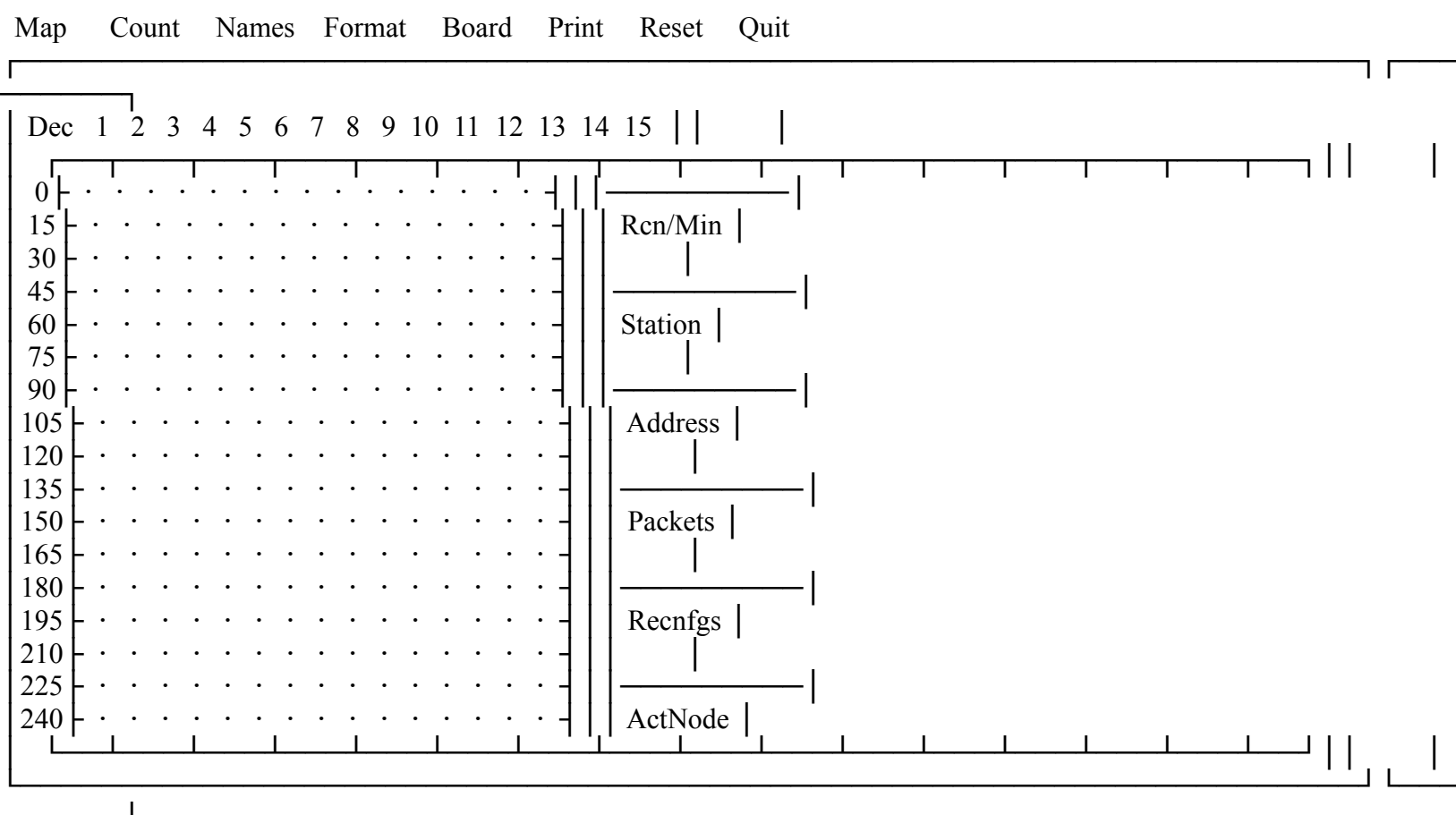
The Board Tests may be continued by selecting [Board] from the Lotus-type menu at the top of screen, or by merely pressing [B].

NETWORK TESTS

Network tests function both in and out of the Netware shell. However, the file server and workstations can be tested only if they are powered on.

The Network Test Grid shown in Figure 2 appears after ArcDiag has been started and the Board Tests are completed.

Map   Count   Names   Format   Board   Print   Reset   Quit

```
Dec  1  2  3  4  5  6  7  8  9 10 11 12 13 14 15  | |        |

  0 | .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  | | |  _____ |
 15 | .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  | | | Rcn/Min |
 30 | .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  | | |     |
 45 | .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  | | | _____ |
 60 | .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  | | | Station |
 75 | .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  | | |     |
 90 | .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  | | | _____ |
105 | .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  |   | Address |
120 | .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  |   |     |
135 | .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  |   | _____ |
150 | .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  |   | Packets |
165 | .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  |   |     |
180 | .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  |   | _____ |
195 | .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  |   | Recnfgs |
210 | .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  |   |     |
225 | .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  |   | _____ |
240 | .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  |   | ActNode |
```

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Figure 2 - Network Test Grid

Each dot on the grid represents a node. As noted by the cursor rapidly moving across the grid, the program polls all 255 nodes. When a file server or workstation is powered on, the node number or node name will be displayed in the place of the dot.

Information Windows Information from the network diagnostics is provided in the windows on the right side of the screen. The first window contains current date and time. Following is a description of the information contained in the other windows.

Rcn/Min Indicates the number of reconfiguration per minute, relative to (1) the number of stations being powered on or off of the network, and (2) any type of fault condition occurring on the network.

This information may be used as a gross indication of network fault conditions (see "Recnfgs" below).

Station If the Novell shell is running, the station number on which ARCDIAG is running is displayed in this window. This number may be referenced to the station number which appears on the file server monitor. If the shell is not loaded, the message "No Shell" is displayed.

Address The physical address, or the dip switch setting, on the network interface card.

Packets The number of packets that have occurred on the network since the last reset. This information indicates relative network activity.

Recnfgs Reconfiguration bursts are counted accumulatively and displayed in this window. Reconfiguration bursts increment whenever any of the following occur:

1. a workstation is powered onto the network.
2. a workstation is powered off of the network (intermittent).
3. a network card is faulty.
4. the network connecting cable is faulty.

A rapidly increasing reconfiguration count indicates a faulty network (refer to "Network Troubleshooting, Network Tests").

ActNode The number of nodes that have powered onto the network.

FUNCTION SELECTION

At the top of the Network Test screen is a "Lotus" type menu for selecting various functions, such as "Map," "Count," "Names," etc. To select a particular function, either move the cursor key to highlight the function and press [Enter], or merely type the first letter of the function label, e.g. [M] for the "Map" function.

Note that a "help" statement, corresponding to each function, appears at the bottom of the screen whenever a function is highlighted.

"Map" Function Selection of this function displays all nodes on a grid, each node being indicated by a dot. The number range is from 1 to 255. The display is arranged in a matrix form. Nodes are displayed 15 at a time along the horizontal. Therefore, nodes 1 through 15 are displayed on the first line, nodes 16 through 29 on the next line, etc.

Stations that are powered on are indicated by a node number or node name, in the place of a dot.

"Count" Function In this mode, packets from each station are monitored and displayed on the grid. Packet counts can be viewed as an indication of activity from each node. Those nodes that transfer packets most frequently will increment the packet count much more rapidly.

Although the program is not fast enough to catch all packets, relative packet increases are displayed. Therefore, the nodes that are assigned as fileservers should have packet counts increasing at a faster rate than workstations.

"Names" Function Any of the 255 nodes can be given an alpha-numeric designation which is useful for quick recognition of node locations. (Unlimited version only).

These logical names can be assigned to physical node numbers by using the "Names" function. For example, a file server that might be located on node 1 may be given the logical designation "FS1".

When selecting the "Names" function, the following message will appear at the bottom of the screen:

Enter node number (1 to 255):

At the blinking cursor, enter the number of the node to which you want to give a logical name, then press [Enter]. The following message will then appear:

Enter name (3 char max):

At the blinking cursor, enter a maximum of three characters and press [Enter]. You will then be asked:

Save (y/n) <return = yes>

If your entry is correct and you want to save it to the ARCDIAG.DAT file on the disk, press [Enter], since "Enter" or "Return" is the default. Otherwise, press [N] to ignore the entry.

The program uses the file ARCDIAG.DAT to store logical names for physical node numbers.

The ARCDIAG.DAT file can be located in either the default drive or when connected to a Novell network it can be located in the Z: (public) directory. Optionally a command line argument (-f) can be used to tell ARCDIAG where to locate and what name to use for the logical name file (see "Start Up Options").

"Format" Function Physical node numbers can be displayed on the node map as either decimal or hexidecimal numbers. The current mode of operation is displayed in the upper left hand corner of the display.

Pressing the [Enter] key more than once will toggle the display mode back and forth between decimal and hexidecimal.

"Board" Function This function runs diagnostics on network interface cards. In order for the board diagnostic test to operate, however, ARCDIAG cannot be running in conjunction with the Novell operating system.
When this test is initiated from the menu at the top of the screen, it will continue until the space bar is pressed or until an error is found.

"Print" Function If an IBM graphics compatible printer is available, use PrtSc to produce an exact copy of the map including graphic borders. (Unlimited version only).

If an IBM graphics compatible printer is not available, or if you want to label and date the node map, select the "Print" function on the menu, whereupon the following statement will appear at the bottom of the screen:

Enter map name:

Type a name for the map, then press [Enter]. A node map with time and date stamp will be sent to the printer. All borders are converted to characters that can be printed on any type of printer.

The printing program does not send a form feed character at the end of printing allowing two maps to be printed on one 8 1/2 by 11 inch piece of paper.

"Reset" Function Select this function to reset all counters to zero and reformat the grid.

"Exit" Function Select this function to exit the program.

SPECIFICATIONS

RIM RAM Base Address	D000 (hex) segment default configurable at runtime (Unlimited version only).
Board I/O Address	02E0(hex) default configurable at runtime (Unlimited version only)
Active Nodes Displayed	1 thru 255
RIM RAM size	2K bytes
Computer Compatibility	IBM PC/XT/AT or compatible Network Operating Systems Novell Netware 4.61 and above. Novell Advanced Netware 1.02 and above.
Network Interface Cards	SMC 8 bit and Novell RX 8 bit

NETWORK TROUBLESHOOTING

Board Tests

<u>Symptom</u>   <u>Corrective Action</u>

RAM Test Fails   Check network card memory address DIP switches for
proper settings.

                                        RAM defective, replace card.

RIM Test Fails   Check network card I/O address DIP switches for proper settings.

                                        9026 RIM controller defective, replace card

SID Test   The SID address should display the node address. **Note:
Do not allow two network cards to have the same physical address.**

ETS Test Fails   Newer network card does not have a jumper for extended timeout.
Therefore, if this test fails, the board needs to be replaced.

POR Test Fails   Before, continuing, remove the network cable and try
again. If the test still fails, the network card needs to be replaced. Disconnecting the cable
removes any type of external interference with the test.

Network Tests

<u>Symptom</u>   <u>Likely Cause</u>

Reconfiguration
counter increments
continuously   (1) no other nodes are connected to the local network card.
                                                (2) the cable network is defective from the local card to the
                                                rest of the network.
                                                (3) an active or passive hub port is defective.

Multiple "phantom" nodes
are displayed   (1) two nodes have been set to the same address.
                                                (2) a cable connection is not making solid contact.
                                                (3) the memory address DIP switches are set incorrectly.
                                                (4) -i or -m options have been set incorrectly.

When run with Novell
shell - local node is
not displayed   Nothing is wrong with the display. The Novell shell has not passed
the proper physical node address to ARCDIAG. Works correctly when not running with the
shell. Fixed in Novell Advanced Netware 2.0 and above.

ARCDIAG shows OK, but
cannot "find fileserver"
when shell is run   Make sure the interrupt jumper JP5 is used for all network
cards used with Advanced Netware 1.02 and above.

HOW TO REGISTER ARCDIAG

If you find the program useful, and continue to use it past a 30-day trial period, you are required to register it. You can register by completing the accompanying registration form and sending it, with a check or money order in the amount of $45.00 (if foreign funds, at current exchange rate) to Olympic Software Co. at the address shown on the registration form below.

Registration provides the following benefits:

       Elimination of the initial registration reminder screen.

       Enabling of the following features:
              Named nodes
              Map printing
              Command Line arguments

       Full Telephone support.

       Free major updates for a one year period, sharply discounted rates thereafter.

       Inclusion on our mailing list so that you may receive new product announcements and notification of new Olympic Software products.

       You will be in compliance with federal copyright law.

USER SUPPORT

Registered users are provided with automatic notification of major updates of ARCDIAG. Call (313) 429-7139, a call-back will normally occur no later than the next business day. Bug fixes or work-arounds will be mailed to the complainant, if a registered user, and will also be uploaded to CIS (IBMSW).   Non-registered users are welcome to call, and will be accommodated on a "time available" basis. Contact may, of course, always be made through CIS EMAIL (73227, 3326).

OTHER SHAREWARE PRODUCTS

       You may wish to try these other products of Olympic Software:

       ARCDIAG.C Source Code for ARCDIAG $150.00

ARCDIAG Registration & Comment Form

Name:_____

Company:_____

Address:_____

City:_____ State:_____ ZIP _____

Telephone:(_____) _____-_____   Date:_____

ARCDIAG Version:_____._____

Network Interface Card Types _____

Comments:

_____

_____

_____

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_____

_____

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_____

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_____

Payment:

Quantity   Cost Each

_____   ___$45.00___   sub-total ____.__
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