COMPEX
ANET-1A and ANET-1

Setup and Installation Guide

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Preface

This setup and installation guide provides information on the setup and installation of the ANET-1A (Rev.K) and the ANET-1 (Rev.K) 8-bit network adapter cards. The guide is organized as follows:

Chapter 1 briefly introduces both the adapters and lists its main features.

Chapter 2 gives a summary of the main parameters of the adapters.
This summary serves as a quick reference for the user.

Chapter 3 describes procedures for installing the remote reset PROM.

Chapter 4 provides information on the Dip Switch SW1 to enable the user to select the adapter's station address.

Chapter 5 describes procedures for configuring the adapters. This chapter also provides tables showing the Full Option Settings for IRQ, I/O and Memory addresses.

Chapter 6 provides the option tables for the adapters.

Chapter 7 provides information on the activity LED indications.

Chapter 8 describes the steps taken when installing the adapter card into the network station.

Appendix I explains the Jumpers Utility. This chapter provides procedures for executing the utility.

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An Important Note to the Reader

For simplicity, we wrote this manual as if for the ANET-1A only. This is not so; this manual is for users of the ANET-1 also. Any reference to ANET-1A throughout the manual refers to ANET-1 as well.

However, certain information contained inside is not applicable to ANET-1 users because the ANET-1 has no twisted pair (TP) port.

Please take note of the following:

- **Figure 1** on page 5
  The component layout for the ANET-1 is exactly the same is that for the ANET-1A but without jumper blocks J5, J6, J7 and the twisted pair (TP) port.

- **Section 5.5 and 5.6** on page 10 and 11 respectively
  Both these sections are not applicable to the ANET-1.

Chapter 1

Introduction

The ANET-1A (Rev.K) is an 8-bit network adapter which conforms to Datapoint's ARCnet Token Passing Protocol. It is the successor to the older ANET-1A (Rev.I2).
But unlike the ANET-1A (Rev.I2), the ANET-1A (Rev.K) makes use of the new high-performance ASIC controller chip, the COMPEX 91016.

Its half-card design allows the user to fit the card into any expansion slot of an IBM PC/AT, IBM PC/XT, 386 and all fully compatible systems.
As an "all-in-one" adapter, it can be configured in a bus or star topology while using either coaxial cable or unshielded twisted-pair wire as its transmission media. The default parameters of the adapter can be altered to support widely used network operating systems such as NetWare. Designed with only one controller and simple circuitry, the adapter is easy to configure and install.

With a boot PROM option installed, ANET-1A (Rev.K) makes it possible to connect diskless PCs to an ARCnet network.

Chapter 2

A First Look at the ANET-1A (Rev.K)

This chapter summarizes the main parameters of the ANET-1A (Rev.K) adapter for quick reference.

The jumper for setting a specified parameter is shown after the parameter, like this : J*n* (where "*n*" stands for the jumper number).

Configuration settings (Factory-Preset)

I/O address	2E0H	J3
Interrupt request	IRQ2	J4
Memory base address	D000:0H	J2
Extended Timeout	74.7us	J1
PROM state	Disable	J1
Remote Boot PROM	Not installed	

Chapter 3

Installing the Remote Reset PROM

The remote reset PROM or diskless boot PROM allows workstations without floppy disk drives to boot up on the network. The remote reset PROM must be installed into the empty socket of the ANET adapter used in a diskless station.

Locate the empty remote reset PROM socket on the ANET adapter.

Notice the notch on one end of the remote reset PROM, and also the circle (or notch) on one end of the PROM socket. Position the PROM over the PROM socket so that the notch on the PROM is aligned with the notch on the PROM socket.

Then, place the PROM on the socket and ensure that the pins on the PROM are aligned with the pin receptacles in the PROM socket. Gently push the PROM all the way down into the socket and be careful not to bend the pins on the PROM.

Chapter 4

Station Address Selection - Dip Switch SW1

A single 8-position Dip Switch (marked as SW1) is provided on the ANET-1A to allow the user to define the address of each network workstation in which a adapter is installed. As a general rule, the address selection for the address of each adapter within the same network has to be *non-zero* and *unique*, i.e. no two ANET adapters should have the same address setting.

The setting on switch SW1 is the station's address represented in *Binary* form. Position "1" represents the LSB (or Least Significant Bit) of the address while position "8" represents the MSB (Most Significant Bit). "*ON*" represents a binary "0" for the corresponding bit of the station address. "*OFF*" represents a binary "1".

The following example illustrates how an address of 31 **in hexadecimal** (base 16) notation is set.

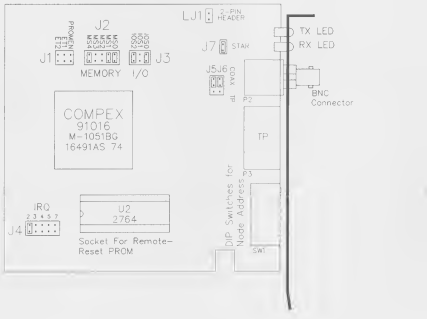
Chapter 5

Configuring ANET-1A

In this chapter, factory-preset defaults are asterisked (*). Specified jumpers can be located in Figure 1.

In the following text, to "short" a jumper means to place the jumper so that it covers both the pins, whilst to "open" a jumper means to place the jumper so that only one of the pins is covered.

Figure 1 : ANET-1A (Rev.K) Component Layout

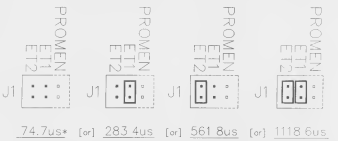


5.1 Timeout Configuration and Boot ROM Select : J1

Jumpers ET1 and ET2 of Jumpers Block J1 select the Timeout Configuration.
This refers to the maximum allowable "round-trip" propagation delay (i.e. the time required for the network signal to make a complete trip around the network cable, including the turnaround time for the network controller chip between the two network nodes farthest apart in cable length).

Selection	*Setting*
*74.7us	Open ET2, Open ET1
283.4us	Open ET2, Short ET1
561.8us	Short ET2, Open ET1
1118.6us	Short ET2, Short ET1

Figure 2 : Timeout Configuration Select



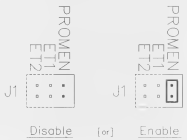
NOTE : Using a longer-than-necessary timeout for the network configuration will result in a degradation of the performance of the network.

* Factory-preset default

The jumper marked "PROMEN" is for either enabling or disabling the boot PROM.

Selection	*Setting*
*Disable	Open PROMEN
Enable	Short PROMEN

Figure 3 : Boot ROM Select



5.2 Memory Base Address Select (MEMORY) : J2

The Memory base address is jumper selectable in 16Kbyte segments within the range C000:0H to E000:0H by mounting shorting plugs on appropriate jumpers (MS0 to MS4) of the selecting jumper block marked "MEMORY". The default Memory base address is D000:0H and the default PROM base address is D200:0H.

Figure 4 : Memory Base Address Select (MEMORY)

For full Memory base address options refer to figure 11.

* Factory-preset default

5.3 I/O Base Address Select (I/O) : J3

The I/O base address is jumper selectable in 16-byte boundaries by mounting shorting plugs on appropriate jumpers (IOS0, IOS1 and IOS2) of the selecting block marked "I/O".
The I/O base address is selectable within the range 260H-3E0H. The default I/O base address is 2E0H.

Figure 5 : I/O Base Address Select (I/O)

For full I/O base address options refer to Figure 10.

* Factory-preset default

5.4 Interrupt Request Channel Select (IRQ) : J4

The jumper block marked "IRQ" (J4) is used to select the interrupt priority.
This is done by mounting a shorting plug onto **one** of the five (5) jumpers of the jumper block J4. Interrupt priority from *Level 2* to *Level 7* (Level 6 excepted) can be selected. The default IRQ is IRQ2.

Figure 6 : Interrupt Request Channel Select (IRQ)

For full IRQ channel select refer to figure 9.

* Factory-preset default

5.5 Transmission Media Select : J5, J6

Jumpers J5 and J6 are used to select one of two transmission media : Coaxial cable or Twisted-pair (TP) wiring.

Selection	*Setting*
*Coaxial cable	Short jumpers J5 and J6 to upper positions
TP wiring	Short jumpers J5 and J6 to lower positions

Figure 7 : Transmission Media Select

* Factory-preset default

5.6 Network Topology Select : J7

Jumper J7 is used to select one of two cable topologies : Star topology or Bus topology.

Selection	*Setting*
*Star	Short J7
Bus	Open J7

Figure 8 : Cable Topology Select

NOTE : Alternative function of jumper J7 in a Bus network topology

In a Bus network topology, the adapter cards of the *two end workstations* need to be connected to an external terminating resistor.
This external terminating resistor comes in the form of the Coaxial BNC terminator or the RJ-11 terminator when the transmission medium is Coaxial cable or Twisted-pair (TP) wiring respectively.

However external terminating resistors are **not** required when using the ANET-1A (Rev.K). This is because the ANET-1A (Rev.K) possesses an on-board terminator which is connected by shorting jumper J7.

* Factory-preset default

Hence for the **two ANET-1A adapter cards installed in the two end workstations of a Bus topology network,** short J7.

Figure 8a : Connecting on-board terminator

WARNING : Ensure that you have not connected an external terminating resistor in an end workstation which has its on-board terminator connected.

5.7 LED : LJ1

An on-board 2-pin header LJ1 allows an external LED to be connected to indicate network activities.
When the LED is lit, it indicates that network activities are taking place.

5.8 Full Option Settings

Figure 9 : Full IRQ Option Settings (IRQ)

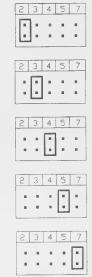


Figure 10 : Full I/O Base Address Option Settings (I/O, J3)

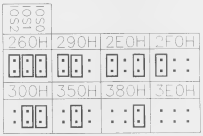
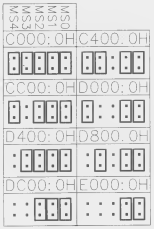


Figure 11 : Full Memory Base Address Options Settings (MEMORY, J2)



Chapter 6

Option Tables for ANET-1A (Rev.K)

This chapter provides the option tables for the ANET-1A (Rev.K).

NOTE : Supplementary information can be found in Appendix I, The Jumpers Utility.

6.1 Table 1 : Option Table for ANET-1A (Rev.K)

Option	*IRQ*	*I/O Addr*	*MEM Addr*
0	2	2E0H	D000:0H
1	3	280H	D800:0H
2	4	260H	C800:0H
3	5	360H	CC00:0H
4	11	2E0H	C000:0H
5	15	260H	D400:0H
6	DRIVER CONFIGURABLE BY JUMPERS UTILITY		

NOTE : For combinations of IRQ, I/O Addr and RAM Addr other than options 0 to 5, the Jumpers Utility must be used to change the settings of the software running with the ANET-1A. The software (i.e. the Driver), such as IPX.COM or NET$OS.EX1, must be set to match the ANET-1A conguration. Any unlisted combination of IRQ, I/O Addr and RAM Addr in the option table above may be set using the Jumpers Utility.

NOTE : When a Remote Boot ROM is installed, one of the following options **must** be used:-

6.2 Table 2 : Remote Boot PROM Option Table for ANET-1A (Rev.K)

Option	*IRQ*	*I/O Addr*	*MEM Addr*	*EPROM*
0	2	2E0H	C400:0H	C600:0H
1	2	2E0H	D000:0H	D200:0H
2	2	2E0H	C000:0H	C200:0H
3	2	2E0H	CC00:0H	CE00:0H
4	3	300H	DC00:0H	DE00:0H
5	4	260H	D400:0H	D600:0H
6	5	380H	D800:0H	DA00:0H

NOTE : Option 1 is the default setting.

Chapter 7

Activity LED Indications

Two activity LED indicators are mounted on the rear bracket of the ANET-1A (Rev.K) adapter. They are the RX(green) indicator and the TX(red) indicator. These indicators show the functional state of the adapter as follows :

RX(green) - Activated state indicates adapter receiving data from network.

TX(red) - Activated state indicates transceiver on the adapter is active.
- o Regular blinking indicates a LAN is disconnected or no other network node is active.
- o ON indicates a LAN cable is connected to an active ARCnet network, resulting in regular token passing.

Chapter 8

Installing the Adapter Card in the Network Station

After setting the dip-switch and the jumpers, the adapter card is ready to be installed into the appropriate network stations.

Steps to be taken when Installing the card

1. Turn off all the power to the station and any attached peripherals.
2. Remove the cover of each station according to the manufacturer's instructions.
3. Remove the dummy bracket from the back of the computer.
4. Slide the adapter card into the rear bracket slot and firmly press the adapter card down into the edge connector slot.
5. Fasten the mounting bracket of the adapter card by replacing the holding screw.
6. Finally, replace the cover of the computer.

Appendix I

The Jumpers Utility

The Jumpers Utility (JUMPERS.EXE) can be used to choose the various combinations of I/O base address, interrupt request (IRQ), and memory address (RAM ADDR) settings that are not listed in the Configuration Table (option table 6.1) during server and workstation configuration operations (for NetWare v2.1x, NETGEN and SHGEN; for NetWare v2.2, INSTALL and WSGEN). This is done by executing the JUMPERS.EXE file on the NET$OS.EXE(for v2.2) or NET$OS.EX1(for v2.1x) or IPX.COM file. However, this utility can be used only if the "Driver Configurable by Jumpers Utility" option is selected for LAN Driver Configuration during NETGEN or SHGEN. (Refer to the option table 6.1 for the various possible settings.)

EXECUTING JUMPERS.EXE

The following steps should be noted when executing JUMPERS.EXE.

1 Besides JUMPERS.EXE, the following files are required in order to execute the Jumpers Utillty:

- o JUMPERS.HLP
- o IBM$RUN.OVL
- o CMPQ$RUN.OVL
- o $RUN.OVL
- o SYS$MSG.DAT
- o SYS$ERR.DAT

The JUMPERS.EXE and JUMPERS.HLP files are found in the COMPEX driver diskette that comes with the adapter. The remaining files are found in the SHGEN-1 diskette (for v2.1x) or the WSGEN (for v2.2). Copy these files into a directory (e.g., JUMPERS) and set a path to this directory.

2 Executing Jumpers Utility on NET$OS.EX1 (Netware v2.1x)

To execute the Jumpers Utility on a NetWare v2.1 server file (i.e.,NET$OS.EX1), proceed with NETGEN -n. When selecting the "LAN Driver Configuration" option, choose the option "Driver Configurable by Jumpers Utility", and continue with the remaining selections. Exit NETGEN without executing "Installation".

The NET$OS.EX1 is created in the OSEXE-1 directory. Change directory ("cd") to OSEXE-1 and run JUMPERS.EXE (type "jumpers" and press <enter>). When prompted for the file, enter "NET$OS.EX1". Then select the adapter used (i.e., ANET-1A (Rev.K) or ANET16-1A) and also the IRQ#, I/O# and Memory# options. Save and then exit the jumpers utility. The NET$OS.EX1 file will then be patched with the selected IRQ, I/O and Memory settings.

You may then continue with the "NetWare Installation" process by running NETGEN -c, or begin executing OSEXE-1\NET$OS.EXE.

3 Executing Jumpers Utility on NET$OS.EXE (NetWare v2.2)

To execute the Jumpers Utility on a NetWare v2.2 server file (i.e. NET$OS.EXE), begin by running INSTALL-E. When asked "Will this machine be the server?", select "No". Under the Network Configuration option, select "Driver Configurable by Jumpers Utility". After completing all remaining selections, press <F10> to link NetWare v2.2 utilities and operating system. This first part of the installation should then exit to the DOS prompt.

Now create a path to the WSGEN directory. Change the current directory ("cd") to the OSEXE directory. Run JUMPERS.EXE from the OSEXE directory. When prompted for the file to modify, select NET$OS.EXE. Then select the adapter used (i.e., ANET-1A (Rev.K) or ANET16-1A) and proceed to select the IRQ#, I/O# and Memory# options. Save and then

exit the Jumpers Utility. The NET$OS.EXE file will then be patched with the selected IRQ, I/O and Memory settings.

You may continue with the "NetWare Installation" procedure by running INSTALL-L.

WARNING : Do not use the INSTALL-N and INSTALL-C options if you are going to use the Jumpers Utility settings.

4 Executing Jumpers Utility on IPX.COM

To execute the Jumpers Utility on IPX.COM, begin by generating IPX.COM in accordance with instructions given in the relevant NetWare manuals (i.e., use WSGEN for v2.2, or SHGEN FOR V2.1x). When selecting the "LAN Driver Configuration" option, choose the option "Driver Configurable by Jumpers Utility", then continue with the IPX.COM generation. When IPX.COM is successfully generated, it will be in SHGEN-2 (for v2.1x) or WSGEN (for v2.2). Change the current directory ("cd") to SHGEN-2 (for v2.1x) or WSGEN (for v2.2) and execute JUMPERS.EXE.

When prompted for the file to be modified, enter "IPX.COM" and proceed with the selection of IRQ#, I/O# and Memory# options. Save and exit the Jumpers Utility. The IPX.COM file will then be patched with the selected IRQ, I/O, and Memory settings.

You may then copy the IPX.COM file to the workstation diskette. ·

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