

# Atari 1080 Classnet, External Reference Specification

The document itself begins on the next page.

## Document source:

Original backup tapes owned by Dutchman2000, obtained by Atarimania.

Documentary research and PDF layout by Laurent Delsarte.

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## Document identification:

<b>Original file name:</b>	EMAIL extracted from CEO.01JUN84
<b>Title of document:</b>	Atari 1080 Classnet, External Reference Specification
<b>Author(s):</b>	John CURRAN (John R. CURRAN)
<b>Original file date:</b>	1983-06-03
<b>Type of document:</b>	Memo
<b>Target audience:</b>	Internal
<b>Status:</b>	Final
<b>Reference (Atari):</b>	(unknown)
<b>Reference (Laurent Delsarte):</b>	For any discussion, this PDF has been given the reference <b>BKUP-1983-06-03-MEMO-0005A-0</b> which should be quoted in any communication.
<b>Tags:</b>	#Atari #8bit #6502 #400 #800 #1200XL #600XL #800XL #1400XL #1450XLD #1600 #MECC #Network #Client #Server #OS #NOS #Education #ClassRoom

## Comments:

This document seems to me to be in a final state, as no sections are missing.

It describes the specifications of a classroom-level network, allowing a teacher to share floppy disk drives and a printer with his students.

This Atari 1080 Classnet network is based on an existing network product sold by MECC, most likely (but to be confirmed) the "Classroom Star Network". Initially developed for the Atari 800, this network has been updated to work with the most recent computers of the period, including the Atari 1400XL, 1450XLD and 1600 (combination of an Atari 800 & an IBM compatible PC).

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# Atari 1080 Classnet, External Reference Specification

John R. Curran  
June 3, 1983

<b>CONFIDENTIAL</b>
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APPROVED BY:

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Manager, Telecommunications Software Development	DATE
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Manager, Product Test	DATE
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Manager, Software Quality Assurance	DATE
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Manager, Publications and Packaging	DATE
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Product Marketing Manager	DATE
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Manager, 1080 Classnet Development Engineering	DATE
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# 1. Purpose

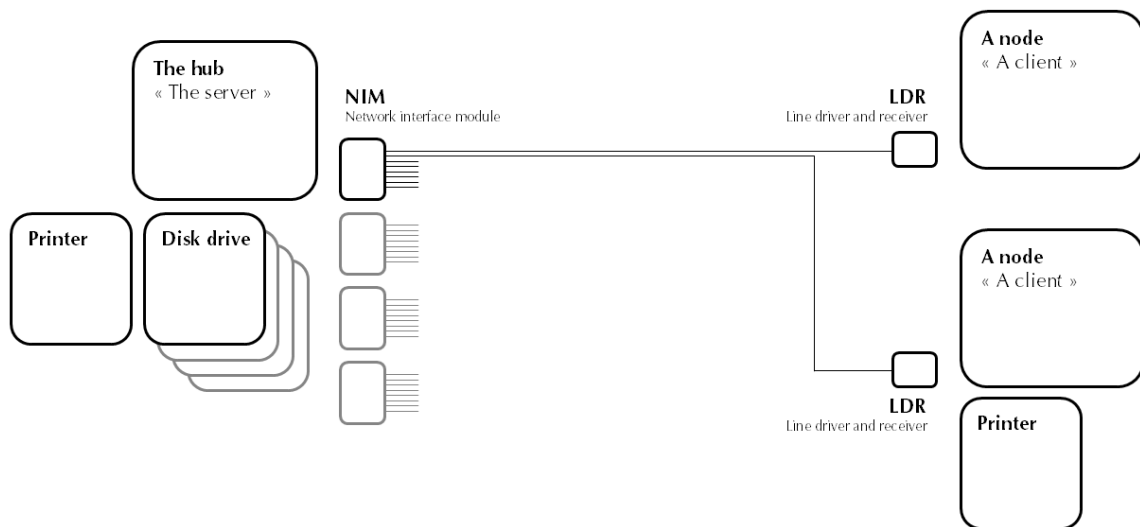
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## 1.1 Introduction and Product Description

This document is the reference specification for the software required for the 1080 Classnet.

The 1080 Classnet consists of the hardware and software to allow multiple student stations (nodes) ["the clients"] to share the system resources through a teacher station (hub) ["the server"].

System resources, at the hub ["the server"], may consist of a printer and 1 to 8 disk drives – current hardware only allows 4 disk drives on the system. The hub interacts with a node through a Network Interface Module (NIM), at the hub, and a Line Driver and Receiver (LDR) at each of the nodes ["the clients"].



The Network Operating System (NOS) consists of **hub-resident software**, **node-resident software** and the **Network Utility Package (NUP)**, downloaded to the node upon request:

- The **hub-resident software**, [[running on the server]], provides the interface between the nodes and the hub peripherals.
- The **node-resident software**, [[running on the clients]], is downloaded at initialization, and provides a limited DOS capability to the node user.
- The **Network Utility Package (NUP)**, [[optionally running on the clients]], downloaded to the node on request, provides the user with a reduced DOS utility capability (see paragraph 3.2.3).

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## 1.2 Consumer Profile

The typical user of the 1080 Classnet will be an educational institution wishing to provide disk and printer capabilities for students in the classroom without incurring the expense of multiple peripherals and copies of courseware.

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## 1.3 Interface to Other Products

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### 1.3.1 Applications

The 1080 Classnet will execute applications that:

1. Do not exceed the memory size of the node ["the client"] computer,
2. Use standard CIO device interfaces,
3. Do not require the use of the cassette drive.

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### 1.3.2 DOS 2.0S

Network Operating System (NOS) will be functionally compatible to DOS 2.0S at the CIO user command level.

NOS will appear identical to DOS 2.0S to the user, except some functions found in the DOS 2.0S Utility Programs will not be available to the user. (see paragraph 3.2.3, Network Utility Package (NUP)).

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### 1.3.3 Atari Computers

#### **[[Which computers can act as hub, the server?]]**

The 1080 Classnet may use the Atari 400, 800, 1200XL, 600XL, 800XL, 1400XL, 1450XLD, or 1600 as hub computers.

The 400 and the 600XL need to be expanded to at least 48K bytes of RAM to be used as hub computers.

#### **[[Which computers can act as nodes, the clients?]]**

Any of these computers may be used as a node computer, with the exception of the 1200XL, which cannot interface electrically to the node Line Driver and Receiver (LDR).

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### 1.3.4 Atari Peripherals

#### **[[Compatible peripherals]]**

The 1080 Classnet may use the Atari 810, 1050, 820, 822, 825, 1020, 1022, 1025, 1027 and/or 1029 as hub peripherals; however, only 1 printer may be connected at a time. In addition, one of the above printers may be used as a node peripheral (the network printer will be the default printer).

#### **[[Incompatible peripherals]]**

The Atari cassette drives (410 and 1010) and the Atari 850 interface module RS-232 handler may not be used as network peripherals at either the hub or the node.

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## 1.4 Family of Products

The 1080 Classnet belongs to the Institutional Education family of products.

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## 1.5 Definitions

**HUB** [[“the server”]] - The Atari computer, normally the teacher's station, which interfaces the network to the common peripherals.

**NETWORK INTERFACE MODULE (NIM)** – The hardware interface between the hub and the network.

Each NIM may interface 1 to 8 nodes to the hub.

The hub may connect to 1 to 4 NIMs.

**LINE DRIVER AND RECEIVER (LDR)** – The hardware interface between each node and the network.

**NETWORK OPERATING SYSTEM (NOS)** – A modified DOS 2.0S which supports most of the DOS 2.0S functions. NOS consists of the hub-resident software, the node-resident software and a modified DOS Utility Package (NUP).

**NODE** [[“the client”]] – The Atari computer, normally the students' station, which is used by the user.

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## 1.6 Distribution

The Network Operating System (NOS) will be distributed, on diskette, with each 1080 Classnet. Appropriate means of distributing future updates will be addressed by Sales and Marketing.

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## 2.0 Applicable documents

- Marketing Requirements Specification, Low-Cost Educational Network, Ref. #B-EN-01-82-1-0, 20-May-1982
- Marketing Requirements Specification, Low-Cost Educational Network, Ref. #B-EN-01-82-1-2, 20-Sep-1982
- Memorandum, John Curran, 8-Nov-1982, SUBJ: MECC Network Compared to Atari MRS
- Memorandum, Narayan Murthy, 24-Nov-1982, SUBJ: Exceptions of MECC Network and Hardware with 1080 MRS
- Functional Requirements Specification, Atari Educational Network, 17-Dec-1982
- Functional Requirements Specification, Atari Educational Network, 14-Apr-1983



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## 3.0 Requirements

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### 3.1 Interfaces

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#### 3.1.1 Physical

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##### 3.1.1.1 Hub [[“the server”]]

The minimum hub shall be an Atari computer with 48K RAM and a television set or monitor.

The Network Operating System (NOS) shall interface to CTIA, GTIA, OS REV A, OS REV B, 1200XL OS and SURELY OS.

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##### 3.1.1.2 Node [[“the client”]]

The minimum node shall be an Atari computer with 16K RAM and a television set or monitor.

The Network Operating System (NOS) will support a node of up to 64K RAM and shall interface to CTIA, GTIA, OS REV A, OS REV B, 1200XL OS and SURELY OS.

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##### 3.1.1.3 Hub Peripherals [[“the server’s peripherals”]]

The Network Operating System (NOS) requires one Atari, single density, disk drive (810 or 1050) and one Network Interface Module (NIM).

The NOS shall support up to 7 additional, single density disk drives (810 or 1050) and up to 3 additional NIMs.

In addition, the NOS shall support a single Atari printer (820, 822, 825, 1020, 1022, 1025, or 1027<sup>1</sup>).

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##### 3.1.1.4 Node Peripherals [[“the client’s peripherals”]]

The node requires one Line Driver and Receiver (LDR) at each node.

Optionally, the node shall support a local printer (820, 822, 825, 1020, 1022, 1025 or 1027<sup>2</sup>).

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1 [[What about the 1029, as listed in 1.3.4 Atari Peripherals?]]

2 Ibid.

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### 3.1.2 Logical

Network Operating System (NOS) shall be used as a standalone application or in conjunction with any application that needs disk or printer support.

NOS shall allow – but not require – a standard ROM cartridge at the node.

NOS shall not allow a ROM cartridge at the hub. If the hub computer has "built-in" Basic, the user must boot-up in the "disable Basic" mode.

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### 3.1.3 Man/Machine

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#### 3.1.3.1 Hub [["the server"]]

Man/machine interface shall be through the television set or monitor.

Network Operating System (NOS) shall allow no input from the hub keyboard, other than the START key.

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#### 3.1.3.2 Node [["the client"]]

Man/machine interface shall be through the console keyboard and the television set or monitor.

Applications programs shall access Network Operating System (NOS) through the CIO interface, using a subset of the DOS 2.0S command set (Format Disk command is disallowed).

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## 3.2 Functional Requirements

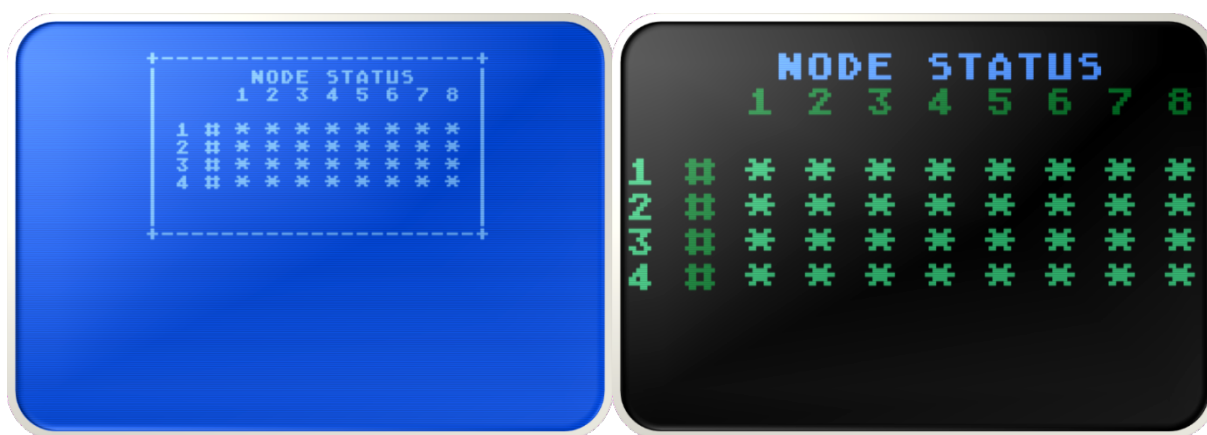
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### 3.2.1 Hub ["server"] Start-up and Initialization

Network Operating System (NOS) shall initialize automatically when the user performs a standard disk boot with the NOS diskette in disk drive 1.

NOS shall display an informational message consisting of the NOS title and copyright information and determine the number of Network Interface Modules (NIMs) connected to the system. Attract mode shall be disabled on the hub computer.

Following initialization, NOS shall display the Node Status Display (Figure 1), and shall direct the user to insert the applications diskette(s) in the disk drives and press START. Upon the user pressing START, NOS shall perform a startup procedure. During startup, NOS shall determine the number of disk drives connected to the system.



Node Status Display

[[Figure 1A & 1B, possible BASIC's Graphics 0 & 2 representation]]

NOTES: The number of lines in the status display is dependent upon the number of NIMs found by NOS at initialization. The number of status lines may vary from 1 to 4.

The asterisks (\*'s) in the above figure shall indicate possible node status indicators. Node status indicators shall be:

Value	Description
Blank	At initialization
-	No activity seen
B	Node boot request
I	Node executing DOSINI routine
R	Control passed to AUTORUN.SYS
U	Node executing NUP
1	Number of transmission tries/node (may vary from 1-8)
X	Node lost to hub (normally following excessive retransmissions). Recovery procedure consists of rebooting the node.

The color of the node status indicators shall indicate current activity:

- **Yellow** shall indicate idle mode,
- while **Blue** shall indicate transmission in progress.

The hashes (#'s) in the above display indicate possible NIM status indicators. NIM status indicators shall be:

Value	Description
Blank	Normal operation
X	NIM malfunctioning (either loss of power after initialization or malfunctioning hardware).

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### 3.2.2 Node [["client"]] Start-up and Initialization

The node shall start-up automatically when the user powers the system on while holding down the START key (similar to a cassette boot) and presses RETURN when the node "beeps".

Upon start-up, Network Operating System (NOS) shall download the node resident portion of NOS and, then, perform as any DOS 2.0S system.

For example, if the node contains a Basic cartridge (or built-in Basic), the system shall initialize Basic and display the "READY" prompt on the television screen.

If there is no autorun cartridge in the node, NOS shall download the NOS Utility Package (NUP) after the download of the Node resident portion of NOS.

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### 3.2.3 NOS Utility Package (NUP)

The NUP shall be the same as the DOS 2.0S Utility Package, except, the:

- "WRITE DOS FILES",
- "FORMAT DISK",
- "DUPLICATE DISK",
- "CREATE MEM.SAV",
- and "DUPLICATE FILE"

shall not be available to the user.



Atari DOS 2.0s

NOS Utility Package (NUP)

[[Figure 2A & 2B, possible BASIC's Graphics 0 representation]]

The NUP menu screen shall be the same as the menu screen for the DOS 2.0S Utility Package, except, the screen menu selections "H", "I", and "J", corresponding to non-available functions, shall be labeled, "NOT USED" and the menu selections "N" and "O", corresponding to non-available functions, shall not be displayed.

If the user attempts to select these non-available options, the message, "NO SUCH ITEM" shall appear on the screen (the same as DOS 2.0S).

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### 3.3 Performance Requirements

The time to download an application program to a node shall be dependent upon the size of the program, and the network configuration and activity; however, worst case download time for a 4K byte program shall not exceed:

- 0.5 minutes in an 8-node network
- 0.75 minutes in a 16-node network
- 1.5 minutes in a 32-node network

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### 3.4 Design Requirements

There shall be no requirement for the NOS to operate on PAL or 50 Hz systems.

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### 3.5 Packaging Requirements

The Network Operating System (NOS) shall be contained on a single density diskette and packaged with the 1080 Classnet hardware.

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### 3.6 Special Requirements

None.