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Falcon
AMOS Application Processor
Installation Instructions

PDI-00113-10, Rev. A01

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Falcon AMOS Application Processor Installation Instructions
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1.0 INTRODUCTION

The instructions in this document describe the procedure for installing the AM-113 board (DWB-00113-10) into your IBM-PC/AT® or compatible. The AM-113, also known as Falcon, allows you to create an AMOS application processing environment on the PC that is able to interact with your DOS and Microsoft® Windows™ environment. With a Motorola 68340 processor and two on-board serial ports, the Falcon provides a high powered, low cost solution for integrating AMOS into your PC.

This document focuses on the hardware installation. The *Falcon Owner's Manual*, DSO-00190-00, contains the instructions for creating and using the AMOS environment on your PC.

The Falcon board can be plugged into any ISA (Industry Standard Architecture) or EISA (Enhanced Industry Standard Architecture) slot in your computer. The PC/XT bus is not supported by the Falcon Hardware.

2.0 SPECIFICATIONS

Processor type:	Motorola MC68340
Clock speed:	16MHz
Serial ports:	Two on-board ports with hardware flow control and RS-232 support. RS-422 is not supported.
Memory expansion:	Falcon supports 256KB, 1MB, and 4MB SIMM memory modules. Two SIMM modules are required, providing total memory capacities of 512KB, 2MB, or 8MB.
Power Consumption:	900ma to 1.3A, depending on the amount of memory installed.
Peripheral support:	Falcon supports both IDE and SCSI configurations

See the *Falcon Owner's Manual* for detailed information on serial port configurations and support for various types of PC SCSI controllers.

3.0 RESTRICTIONS

- Falcon's AM-PC support software is based solely on AMOS 2.2D and later releases. Operating systems earlier than AMOS 2.2D and all AMOS 1.X operating systems are not Falcon compatible.

- STRSAV (and associated utilities) are not supported by Falcon.
- Falcon does not provide support for VCR backup and restore functions.
- The AM-114 serial board, which was supported in earlier versions of AM-PC, is not supported by the Falcon hardware.
- Falcon is not compatible with PC/XT computers.

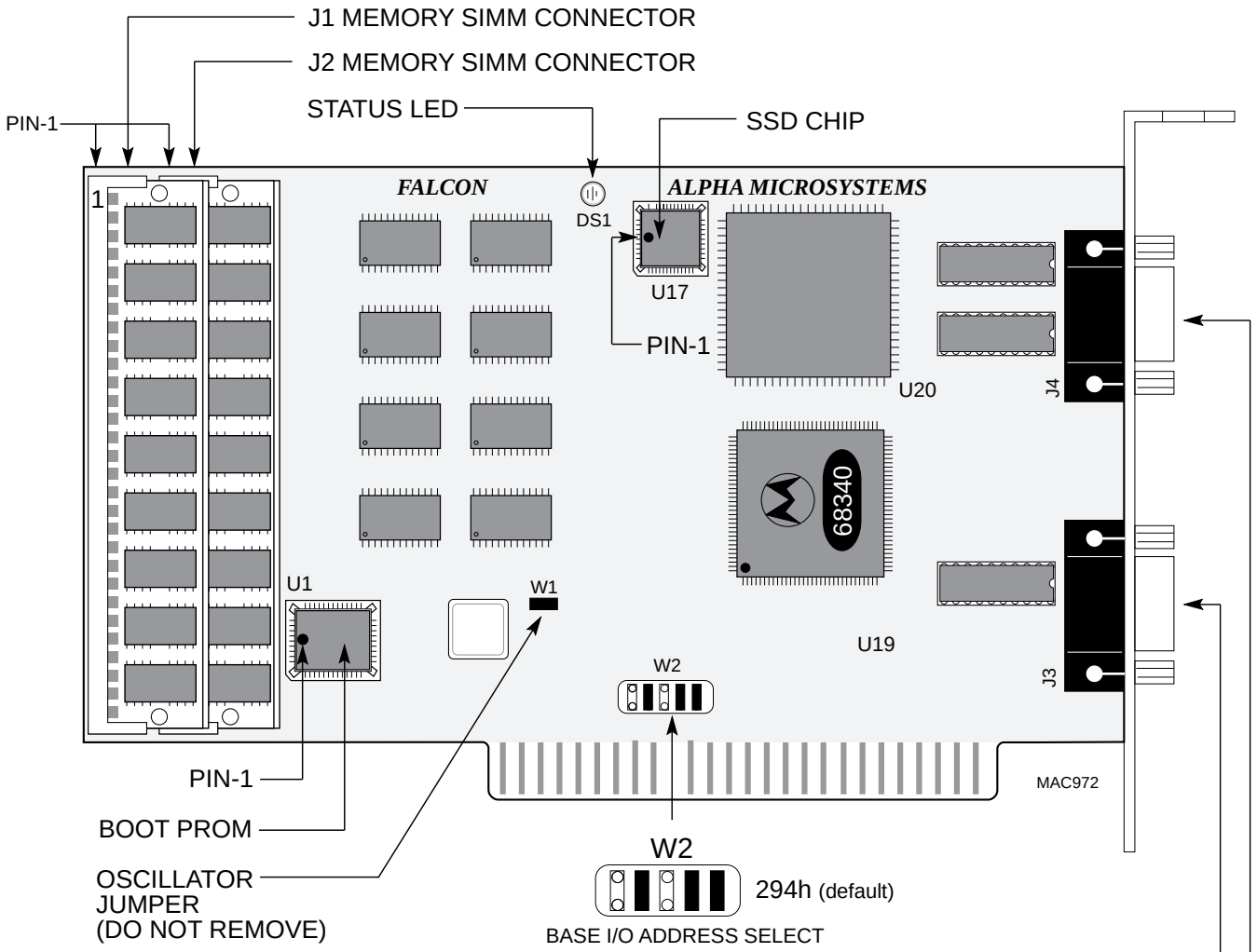
4.0 INSTALLATION

4.1 Configuring the Falcon Board

Prior to handling any computer hardware, GROUND YOURSELF. The best ground is the computer cabinet. Touch the cabinet prior to picking up, installing, or removing any electronic component. Do not unplug the AC power cord from the cabinet, but make sure the power switch is turned OFF. Unplugging the computer cabinet isolates it from common earth ground, leaving it vulnerable to static discharge.

There are only two jumper locations on the Falcon board; W1 and W2. The jumpers are shown in Figure 1 set in their default positions. W1 is an oscillator jumper and should never be removed. The jumpers at location W2 are used to configure the board's base I/O address. The Falcon board can be configured to any one of 32 possible base I/O addresses. The jumper configurations for each of the 32 base I/O addresses are shown in Table 1. Like any board you install in your PC, you must select a base I/O address that does **not** conflict with other boards already installed in your computer. The Falcon board is factory configured with a base I/O address of 294h. If 294h is appropriate for your configuration, the W2 jumpers do not need to be reconfigured. If 294h conflicts with another board already installed in your computer, you will need to select another base I/O address from Table 1 and configure the board accordingly.

Having two boards in your computer configured to the same base I/O address will cause problems and may result in your computer being unable to boot.



STATUS LED INFORMATION:

The status LED shown above will flash while the boot PROMs are active during the boot process. Once the Falcon has booted AMOS, the status LED will remain off during normal operation. If the computer experiences any of the following error conditions, the status LED will light up and will remain lit until the Falcon board is reset:

- Double bus fault (which indicates the CPU has halted)
- Memory error

Figure 1. Falcon Default Jumper Configuration

FALCON BASE I/O ADDRESSES

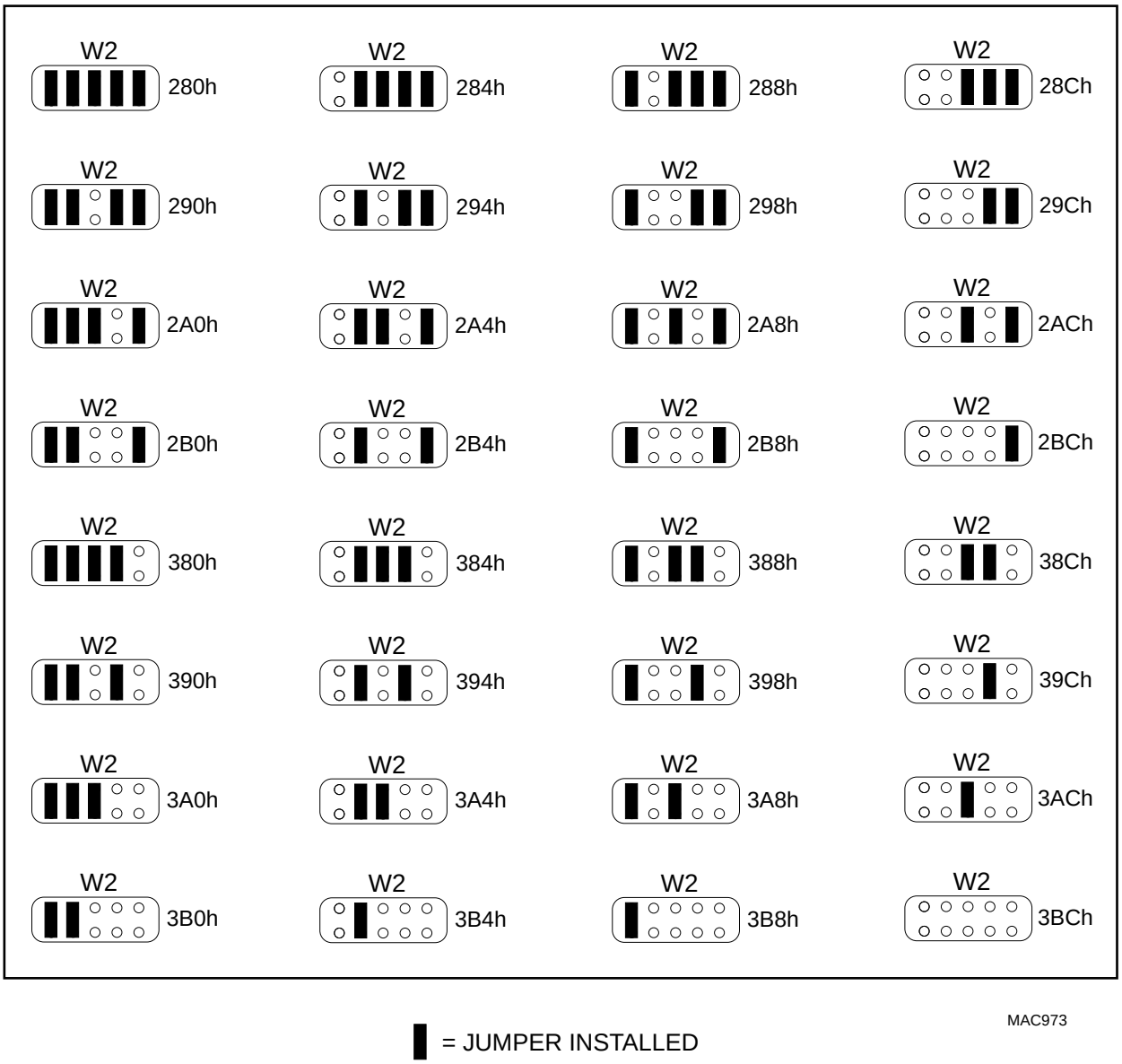


Table 1. Falcon Base I/O Address Configurations

4.2 Falcon Memory Expansion

The Falcon board requires two SIMM memory modules, which are installed at locations J1 and J2 (see Figure 1). Both memory modules must be the same capacity; i.e., you can't have a 4MB SIMM installed in J1 and a 1MB SIMM installed in J2. Based on the installation two 256KB SIMMs, two 1MB SIMMS, or two 4MB SIMMs, you can configure a Falcon board with 512KB, 2MB, or 8MB of memory respectively.

SIMM expansion memory is sold individually under the following part numbers:

Part Number	Capacity
PFB-00707-00	512KB
PFB-00707-02	2MB
PFB-00707-08	8MB

4.3 Installing Memory

Using Figure 1 as a reference, SIMM modules are plugged into the Falcon board at locations J1 and J2.

Special care must be taken when installing a SIMM module. Figure 2 shows how the curve in the SIMM module must align with pin-1 on the Falcon's SIMM connector. Pin-1 on the two Falcon SIMM connectors is shown in Figure 1.

The SIMM must be inserted into the connector at a slight angle and after you feel the SIMM module settle into the connector, you rotate the SIMM until it clicks into position.

The SIMM connectors used on the Falcon are at a 45 degree angle to the board. Because of this, the J2 SIMM must be installed first and the J1 SIMM installed second.

Very little force is required to install a SIMM module. If you're having problems getting the SIMM module installed in the socket, stop and take a moment to examine both the SIMM module and the socket.

To remove a SIMM from its connector, simply press out on the plastic retainer clips and gently tilt the top of the SIMM module so it is free of the plastic retainer clips.

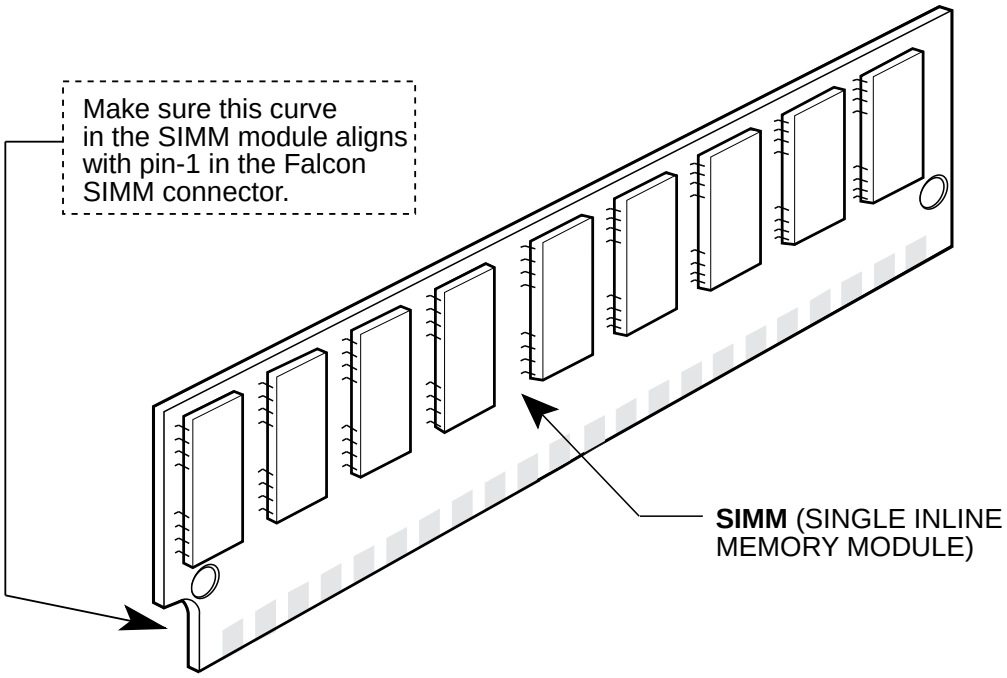


Figure 2. SIMM Module Pin-1

4.4 Install the Falcon Board

Once you have configured the base I/O address and installed the memory modules, the Falcon board is ready to install. Installing the board is simply a matter of plugging the Falcon into any available ISA or EISA slot in your computer. Your computer owner's manual will include instructions describing what must be done in order to access the computer's motherboard.

Insert the Falcon board into an available slot in your motherboard and make sure it is fully seated into the bus connector. The Falcon board is held in place with a single screw, just like all the other boards plugged into your computer.

5.0 AFTER THE HARDWARE IS INSTALLED

Once you have completed the hardware installation, you will need to perform the software portion of the installation, which is documented in the *Falcon Owner's Manual*. The remaining information in this document pertains to Falcon serial port cabling configurations.

6.0 FALCON SERIAL PORTS

Falcon has two on-board serial ports that support RS-232 protocol. Signal pinouts for these two ports are very similiar to the serial ports used on AM-355 I/O boards and other popular AMOS based computers. RS-422 is not supported. The sections that follow describe how to cable terminals, other PCs, and printers to the Falcon serial ports.

6.1 Falcon DB-9 RS-232 Pinouts

The following table shows the RS-232 signal-to-pin orientation applicable to both of the DB-9 serial ports on the Falcon:

Table 2. Falcon RS-232 Pinout and Signal Descriptions

PIN	DIRECTION	RS-232 SIGNAL NAME
1		N/C-No Connection
2	Input	RXD-Received Data
3	Output	TXD-Transmitted Data
4	Input	CTS-Clear to Send
5	Output	RTS-Request to Send
6		N/C-No Connection
7		GND-Signal Ground
8		N/C-No Connection
9	Output	DTR-DataTerminal Ready

NOTE: There is no support for RS-422.

6.2 Terminal Cables

The diagram on the following page shows a standard cabling configuration for creating an RS-232 connection between a Falcon serial port and a terminal. This configuration is supported by most Alpha Micro terminals (e.g, AM-62, AM62A, AM65, etc.).

Table 3. Pinouts for RS-232 Terminal-to-Computer Cables

Terminal End DB-25 Connector			Computer End DB-9 Connector	
SIGNAL	PIN#	DIRECTION	PIN#	SIGNAL
RXD	3	<----<	3	TXD
TXD	2	>---->	2	RXD
GND	7	<---->	7	GND
DTR	20	>---->	4	CTS

The DTR connection between pin-20 on the terminal and pin-4 on the computer serves as "READY/NOT BUSY" handshake line to prevent "overrunning" the terminal with data. This same protocol is also effective for several printers used by Alpha Micro.

6.3 Workstation PC/AT to Falcon Serial Port

RS-232 pin assignments for connecting an IBM PC/AT or compatible workstation to a Falcon serial port are listed on the following page.

Table 4. Pinouts for Workstation-to-Computer Cable

IBM PC/AT and Compatibles

Workstation Serial I/O Port			Computer End DB-9 Connector	
SIGNAL	PIN#	DIRECTION	PIN#	SIGNAL
TXD	3	>---->	2	RXD
RTS	7	>---->	4	CTS
RXD	2	<----<	3	TXD
GND	5	<---->	7	GND
CTS	8	<----<	5	RTS
DSR	6	<--|		
DCD	1	<--|		

∞Pins 1, 6 and 8 on the workstation connector are jumpered.

6.4∞Serial Printer Cable Pinouts

The diagram below shows a standard cabling configuration for creating an RS-232 connection between a Falcon serial port and a printer. This configuration is supported by most Alpha Micro printers (e.g, AM-301, AM-304, AM-306, etc.).

Table 5. Pinouts for RS-232 Printer-to-Computer Cable

Printer End DB-25 Connector			Computer End DB-9 Connector	
SIGNAL	PIN#	DIRECTION	PIN#	SIGNAL
RXD	∞3	<----<	3	RXD
TXD	∞2	>---->	2	TXD
GND	∞7	<---->	7	GND
DTR	20	>---->	4	CTS

APPENDIX A

Cabling Configurations for PC Compatible Serial and Parallel Ports

In addition to the two AMOS style serial ports on the Falcon board, you may also want to connect a terminal or printer to one (or more) of the PC compatible serial or parallel ports on your computer. The following tables show various cable configurations for connecting terminals, printers, and other PCs.

A.1 AM-6X TERMINALS TO IBM PC/AT SERIAL PORT

To connect an Alpha Micro AM-6X series terminal to an IBM PC/AT serial port, use a cable with the following pin configuration:

Table 1
AM-6X to IBM PC/AT Serial Port

AM-6X TERMINAL (DB-25)			**PC/AT SERIAL PORT (DB-9)**	
SIGNAL	**PIN#**	**SOURCE**	**PIN#**	**SIGNAL**
RX	3	<-------	3	TX
TX	2	------->	2	RX
GND	7	--------	5	GND
DTR	20	----+-->	6	DSR
		|-->	8	CTS
		+-->	1	DCD

A.2 IBM PC/AT TO HOST IBM PC/AT

This type of configuration is used when an IBM PC/AT is configured as a terminal and a second IBM PC/AT equipped with an AM-113(-10) board is the host system.

The cables are symmetrical in design and therefore they may be connected to the host or terminal using either end.

Table 2
Terminal IBM PC/AT to Host IBM PC/AT

/AT SERIAL/PARALLEL PORT (DB-9S)			**PC/AT Host**	
SIGNAL	**PIN#**	**SOURCE**	**PIN#**	**SIGNAL**
RX	2	<-------	3	TX
TX	3	------->	2	RX
GND	5	--------	5	GND
RTS	7	-----+->	6	DSR
DSR	6	<--+ |->	8	CTS
CTS	8	<--| +->	1	DCD
DCD	1	<--+----	7	RTS

A.3 SERIAL PRINTER CABLE TO IBM PC/AT

This section contains pin configurations for connecting a serial printer to an IBM PC/AT compatible PC.

Table 3
AM-304/AM-306 Printer Cabling to IBM PC/AT

SERIAL PRINTER (DB-25S)			**/AT SERIAL/PARALLEL ADAPTER (DB-9S)**	
SIGNAL	**PIN#**	**SOURCE**	**PIN#**	**SIGNAL**
RX	3	<-------	3	TX
TX	2	------->	2	RX
GND	7	--------	5	GND
DTR	20	----+-->	6	DSR
		|-->	8	CTS
		+-->	1	DCD