Owner's Manual

H C-100
HARD DISK CONTROLLER CARD

CONTENTS

1.0 INTRODUCTION

1.1 PURPOSE OF THIS MANUAL

The purpose of this manual is to guide the user through a successful installation of HC-100 hard disk controller card.

1.2 OVERVIEW OF HC-100

The HC-100 is a high performance hard disk controller card for IBM PC, XT or compatible computers.

It is fully hardware and software compatible with the IBM XT hard disk controller.

The HC-100 hard disk controller card has the following features:

* Half size, suitable for the rightmost short slot.
* The most reliable Digital Phase Lock Loop circuitry.
* CRC and ECC functions ensure data integrity.
* ON board TRANSTEQUE copyright BIOS.
* Default 3 to 1 interleave factor. It achieves the maximum rate of DMA transfers that the IBM PC bus can accept. Furthermore, this factor can be selectable from 1 to 9 by user.
* User-friendly on screen physical format, parameter settings.
* On-screen user selectable drive types, heads from 1 to 8 and cylinders from 1 to 1024.
* Shipdisk software included in the BIOS.
* Support 2 ST506-type drives. The drives can be in different types.
* By adapting the optional mounting frame with a 3½" hard disk drive, HC-100 can be used as a HARDCARD.

1.3 HARDWARE AND SOFTWARE REQUIREMENTS

The HC-100 can be installed in any IBM PC/XT or compatible computers with the following basic hardware and software configurations:

Hardware

* IBM PC/XT or compatible computer with one 5¼" floppy disk drive, one available system expansion slot and available room for one 5 ¼" or 3½" hard disk drive.
* 5¼" or 3½" hard disk drive(s) with industry standard ST506 interface.
* 135 watts switching power supply to support the power required by the hard disk drive(s).
* At least 128kb system memory.

Software

* IBM PC-DOS version 2.0 or newer versions.

1.4 CHECKLIST

Please check to see if the following items are included in your box, if anything missed, please call your dealer.

* HC-100 Card
* Manual
* One 34 pin and one 20 pin flat cables

2.0 HARDWARE INSTALLATION

2.1 PCB BLOCK DIAGRAM

J1 34 PIN CABLE CONNECTOR

J2 20 PIN DRIVE 0 CABLE CONNECTOR
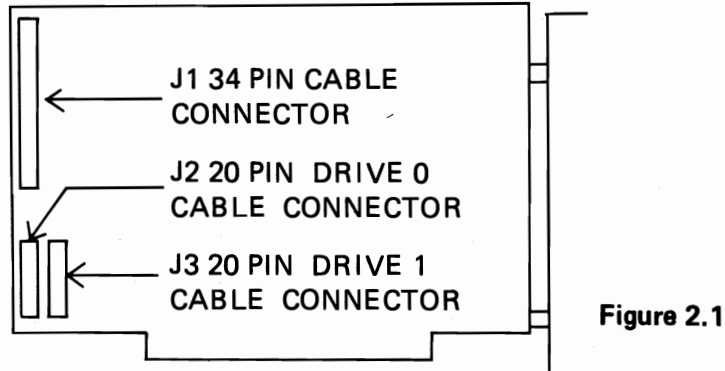
J3 20 PIN DRIVE 1 CABLE CONNECTOR

Figure 2.1

2.2 INTEGRATION INTO YOUR COMPUTER SYSTEM

To install the HC-100 card into your system you have to connect the drive cables. Please follow the steps below.

2.2.1 DRIVE AND CONTROLLER CABLING

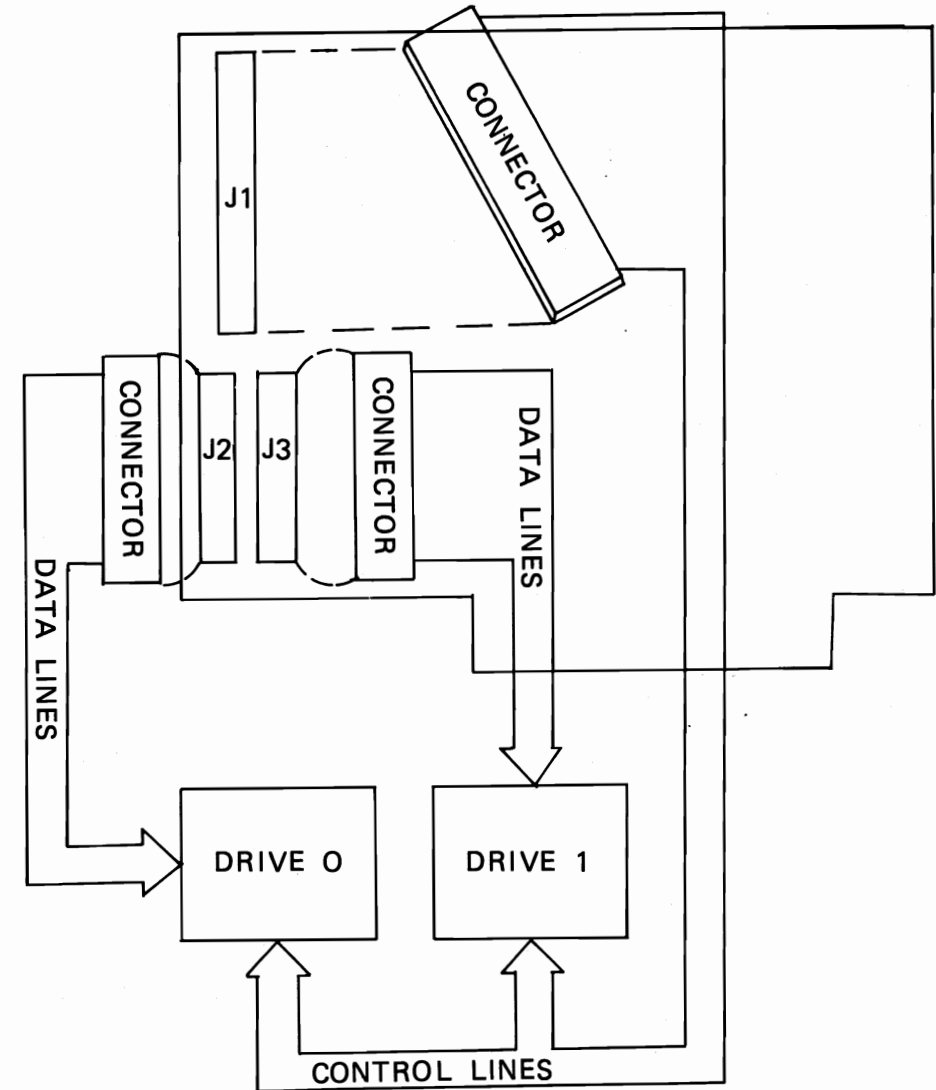The card has three cable connectors J1, J2 and J3. Their functions are described in Table 2.1.

TABLE 2.1 CARD CONNECTOR DEFINITIONS

Connector	Signals	Cable
J1	Control	34-pin flat ribbon cable connected to both drives 0 and 1
J2	Data	20-pin flat ribbon cable connected to drive 0 (first drive)
J3	Data	20-pin flat ribbon cable connected to drive 1 (second drive)

The connector locations and pin orientation for the HC-100 connectors are shown in Figure 2.1.

Connect the cables as shown in Figure 2.2.

Figure 2.2

Check the disk drive hardware reference manual to ground the drive. If proper grounding is not followed, random format, write and read errors may occur.

Next mount the HC-100 hard disk controller card and disk drive in your computer. BE SURE THE POWER IS SHUT OFF BEFORE YOU DO ANY INSTALLATION.

3.0 SOFTWARE INSTALLATION

The hardware has been installed, the computer can be powered on and the software installed.

3.1 PHYSICAL FORMAT

The hard disk drive has to be physically formatted to define address fields and data fields on each track of the disk. After this is completed, bad blocks can be flagged and a directory created by a DOS FORMAT command.

Please follow the following steps to perform the physical format:

3.1.1 YOUR FIRST DRIVE

1. Boot DOS.
2. The following display will appear:

   TRANSTEQUE HARD DISK CONTROLLER HC-100
   REV. A COPYRIGHT (C) 1986
   1701 FIRST HARD DISK ERROR
   DO YOU WANT TO PHYSICAL FORMAT HARD DISK? (Y/N)

NOTE: '1701 FIRST HARD DISK ERROR' will appear only when the hard disk is first time physically formatted with HC-100 card.

If your type y and press return key, the following display will appear:

1 — 4 HEADS 306 CYLINDERS
2 — 4 HEADS 612 CYLINDERS

ENTER 1 OR 2 FOR THE DRIVE TYPE (OR 0 IF DRIVE TYPE IS NOT LISTED)

Now you type in the drive type.

If you choose 1 or 2, following display will appear:

   PRESS ANY KEY TO START PHYSICAL FORMAT.

You press any key as suggested. The following display will appear:

   PHYSICAL FORMATTING, PLEASE WAIT . . . . . .

After 1 to 2 minutes, if the drive is physically formatted, following display will appear:

   DRIVE PHYSICAL FORMATTED
   NOW PRESS CTRL-ALT-DEL TO RE-BOOT.

You can reset the system and proceed FDISK and DOS format.

If the drive type can not match with 1 or 2 and you choose 0, the following display will appear:

NUMBER OF HEAD? (1 TO 8)

You type in the correct head number of your drive.

NUMBER OF CYLINDERS? (1 TO 1024)

You type in the correct cylinder number of your drive.

REDUCED WRITE CURRENT? (1 TO 1024)

You type in the correct number.

INTERLEAVE FACTOR? (1 TO 9, NORMALLY 3)

You may choose from 1 to 9, however, we suggest you to select 3 or the drive performance may be influenced.

After you have made the above selections, the following display will appear:

PRESS ANY KEY TO START PHYSICAL FORMAT.

You press any key and the display will be:

PHYSICAL FORMATTING, PLEASE WAIT . . . . . .

After 1 to 2 minutes, the following display will appear:

DRIVE PHYSICAL FORMATTED
PLEASE PROCEED FDISK AND DOS FORMAT

NOW PRESS CTRL-ALT-DEL TO RE-BOOT

Please do as display says.

3. You may physical format your hard disk by using debug.com file in your DOS SUPPLEMENTAL PRO-GRAMS diskette.

Insert DOS SUPPLEMENTAL PROGRAMS diskette in drive a: and type "debug" and press the "Enter" key. The computer will respond with a "—".

Type

   g=c800:6 [Enter]   [Enter] is to press the "Enter" key

The same display as mentioned in step 2 will appear and the formatting procedures are the same.

3.1.2. YOUR SECOND DRIVE

If you have second hard disk drive, it will be detected by this card automatically. When the first drive is physical for-matted successfully, you will be asked 'DO YOU WANT TO PHYSICAL FORMAT HARD DISK? (Y/N)' once more. Just select 'Y' and the procedures are the same as those in physical formatting your first drive.

3.2 PARTITION AND DOS FORMAT

The hard disk has to be partitioned for DOS format. Please follow the steps below.

1. Insert the DOS system diskette containing FDISK.COM AND FORMAT.COM in your drive A:.

2. Type FDISK and select option 1: Create a DOS partition (see DOS MANUAL CHAPTER 4.). It is to check the drive was physically formatted properly, display the partition data. The number of cylinders displayed has to be one less than the number of cylinders set in physical formatting procedures.

   NOTE: FOR SECOND HARD DISK, YOU HAVE TO SELECT '5 ALTERNATE FIXED DISK' AND OTHER PROCEDURES ARE THE SAME AS YOUR FIRST HARD DISK.
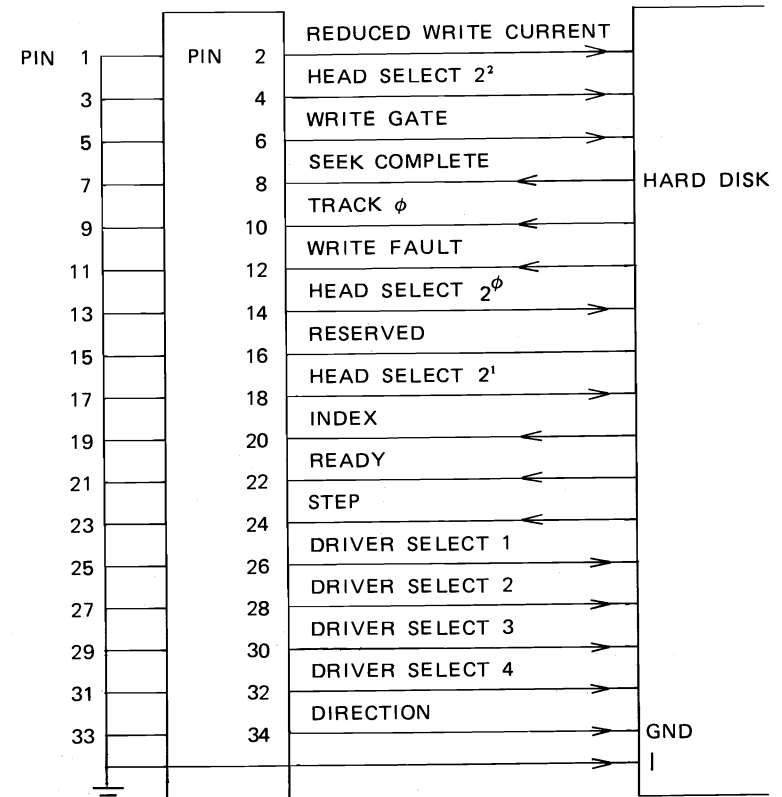
3. When complete, type "format c:/s" for your first hard disk and format d:/s" for your second hard disk.

This will create a DOS directory, verify the physical format and flag any bad sector.

From this point on, you can boot from the hard disk, copy files and operate your software applications.
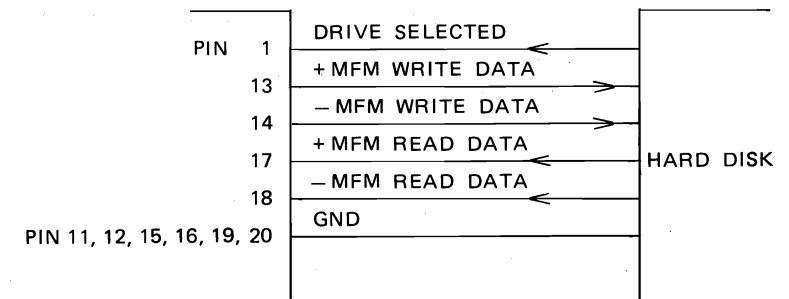
Appendix A. Connector Specifications

J1

PIN 1	PIN 2	REDUCED WRITE CURRENT
3	4	HEAD SELECT 2^2
5	6	WRITE GATE
7	8	SEEK COMPLETE
9	10	TRACK ϕ
11	12	WRITE FAULT
13	14	HEAD SELECT 2^ϕ
15	16	RESERVED
17	18	HEAD SELECT 2^1
19	20	INDEX
21	22	READY
23	24	STEP
25	26	DRIVER SELECT 1
27	28	DRIVER SELECT 2
29	30	DRIVER SELECT 3
31	32	DRIVER SELECT 4
33	34	DIRECTION

HARD DISK
GND

1 – 33 ODD PIN ALL GROUND

J2 or J3

PIN 1	DRIVE SELECTED
13	+ MFM WRITE DATA
14	– MFM WRITE DATA
17	+ MFM READ DATA
18	– MFM READ DATA
	GND

PIN 11, 12, 15, 16, 19, 20

HARD DISK

Appendix B. Shipdisk

When your computer or hard disk drive needs relocation, please follow the steps below to lock your hard disk or it may be damaged.

1. Boot DOS system.
2. Insert the diskette containing DEBUG.COM file into drive A:, type:

    debug [Enter]

3. When the debug cursor, ''—'', appears, type:

    g = c800:9 [Enter]

4. The following display will appear,

    TRANSTEQUE HC-100 SHIPDISK PROGRAM
    COPYRIGHT (C) 1986

    Enter Drive ID(0/1):

5. Type 0, for your first hard disk drive, or 1, for your second hard disk drive.

6. If the drive is locked correctly, the system cursor A > will appear and you can shutdown the power then relocate your system or hard disk.

7. If you have the second hard disk drive, please repeat procedures 1 to 6 except in procedure 4 you have to select 1, the drive ID of your second drive.