IBM Fixed Disk Adapter

This is a hard disk drive (HDD) controller of the 'MFM' type.

These controllers were made for IBM by the Xebec company, and they were supplied in the IBM 5160.
The code in the BIOS ROM is authored by IBM.

I sometimes refer to these controllers as 'IBM/Xebec' controllers.

The term "variation" used below is my terminology. I'm unaware of IBM nor Xebec using it to describe the variations in the controllers.

Variation #1

This is the earliest of the three controllers shown on this page. Circa 1983 (based on chip dates).

There are two ROM's, one Xebec and one IBM.
The IBM ROM is the BIOS, is 8 KB in size, and stamped with IBM part number "5000059". The ROM contains the string of, "*5000059 (C)COPYRIGHT IBM 1982*".
The IBM ROM is a Mostek MK36000 or equivalent.

This controller only supports a drive that has the following characteristics: cylinders = 306 / heads = 4 / WPC = 0 / step pulses per here are valid

IBM supplied with the controller, a Seagate ST-412 drive. Interestingly, the ST-412 matches the above characteristics except for WPC. The ST-412 has a WPC of 128. Either IBM did not consider WPC important (unlikely), or a mistake was made, or perhaps Seagate informed IBM that WP on all cylinders of the ST-412 is acceptable.

Click here to see IBM's technical document for this variation of the card (contains matching circuit diagram).
Click here for a cabling information.
Click here for information about low-level formatting.
Click here for information about the controller's power-on diagnostics (POD).
Click here for the code contained in the two ROM's.

Known Part Number Variations

1. Component side: "IBM 1501492"   (*The number 1501492 gets reused on a later variation of the controller.*)
2. Component side: "IBM 1816101"   (*Three potentiometers, not four.*)

IBM 1501492
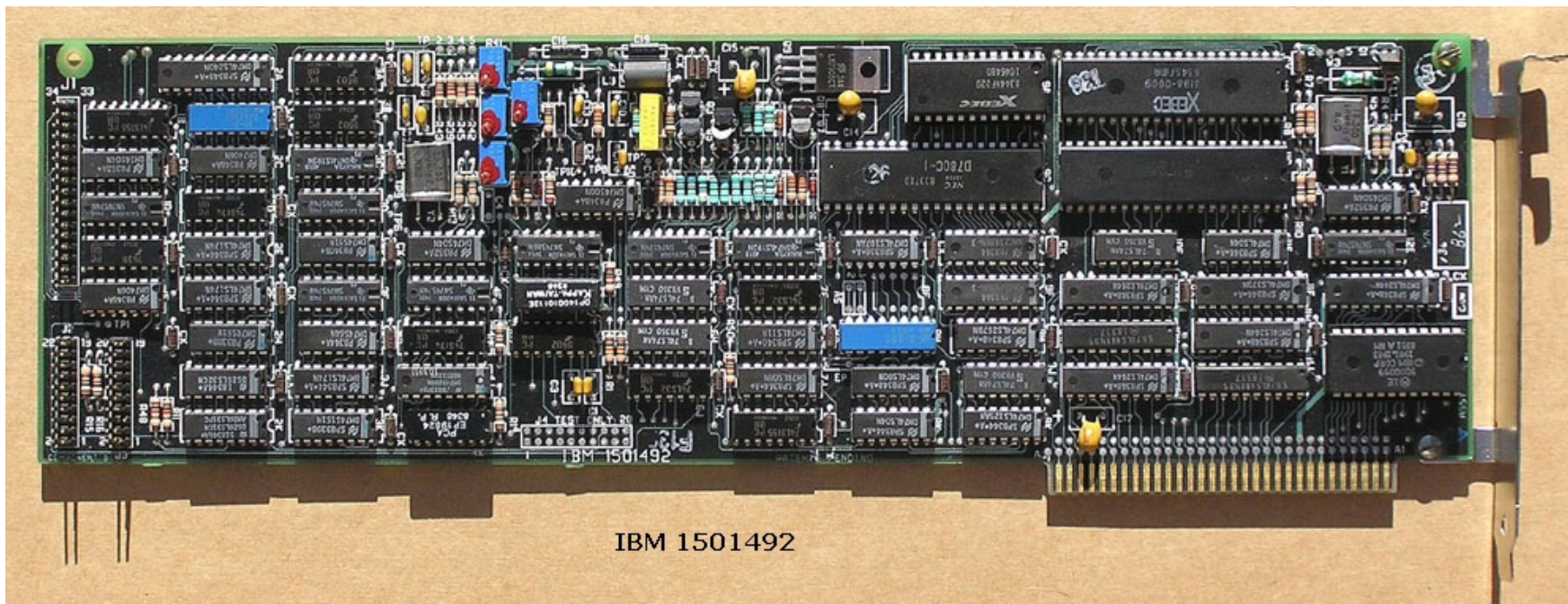
Variation #2

This is the next variation of the controller. Circa 1984 (based on chip dates).

From a user's perspective, variation #2 is simply a more modern version of variation #1. It offers no new or changed functionality.

There are two ROM's, one Xebec and one IBM.
The IBM ROM is the BIOS, is 8 KB in size, and stamped with IBM part number "6359121".
The IBM ROM is a Mostek MK36000 or equivalent.
Although the IBM ROM has a different IBM part number to that used in variation #1, the contents are identical.

It is important to note that this controller lacks the switch block that the later controller (variation #3) has.
It can be seen that there is a position for a switch block (S1, bottom-right corner, just above TP4), but no switch block has been soldered on.

As supplied, this controller (like variation #1) only supports a drive that has the following characteristics: cylinders = 306 / heads = 4 / WPC = 0 / step pulses per here are valid

The IBM ROM actually supports 4 different types of drives, but because of the lack of a switch block, the controller is limited to supporting the drive characteristics specified above.
If you were to add a switch block, the drive support would be as shown on this link.

Click here for a cabling information.
Click here for information about low-level formatting.
Click here for information about the controller's power-on diagnostics (POD).
Click here for the code contained in the two ROM's.

Known Part Number Variations

1. Component side: "IBM 6135983" / Solder side: "IBM 6135984"
2. Component side: "59X7192YF" on white sticker / Solder side: "IBM 6135984"
3. Component side: "59X7192YF" on white sticker / Solder side: "IBM 1501492"   (*The number 1501492 has been reused from the earlier variation of the controller.*)

IBM 59X7192YF
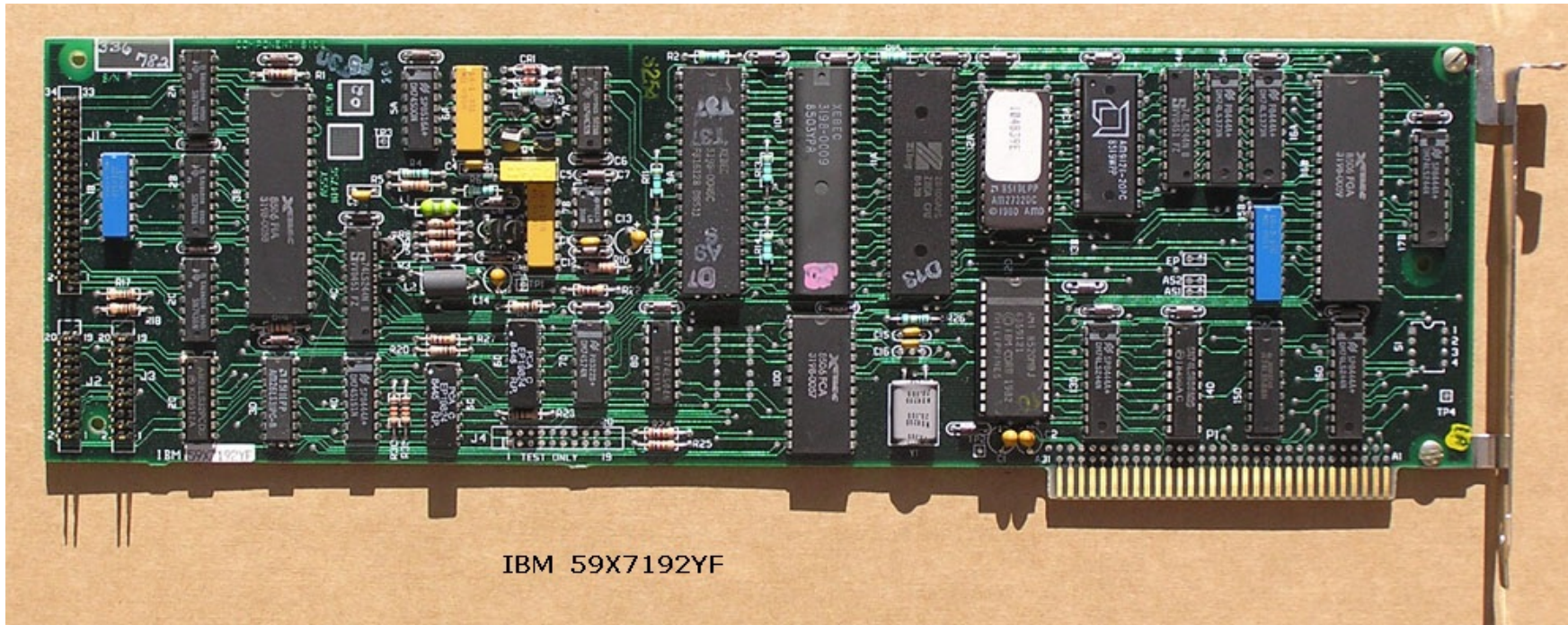
Variation #3

This is the next variation of the controller. Circa 1986 (based on chip dates).

Supported the particular 20 MB sized drives that were optionally fitted to the later model 5160s.
IBM referred to this controller as the "20MB Fixed Disk Drive Adapter" (box photo).

There are two ROM's, one Xebec and one IBM.
The IBM ROM is the BIOS, is 8 KB in size, and stamped with IBM part number "62X0822". The ROM contains the string of, "*59X7291 (C) COPYRIGHT IBM CORP.,1982 ,1985.*".
The IBM ROM content is different to the IBM ROM in the earlier variations.
The IBM ROM is a Mostek MK36000 or equivalent.

This controller has the switch block that the earlier controller (variation #2) lacks. The switches are set according to the drive/s attached.

Click here to see IBM's technical document for this variation of the card (contains matching circuit diagram).
Click here for a cabling information.
Click here for information about low-level formatting.

Click here for information about the controller's power-on diagnostics (POD).
Click here for the code contained in the two ROM's.

Switch Settings

Switches 1 and 2 configure drive 0.
Switches 3 and 4 configure drive 1.

The following table shows the settings for drive 0 (i.e. switches 1 and 2). The settings for drive 1 (i.e. switches 3 and 4) are the same.
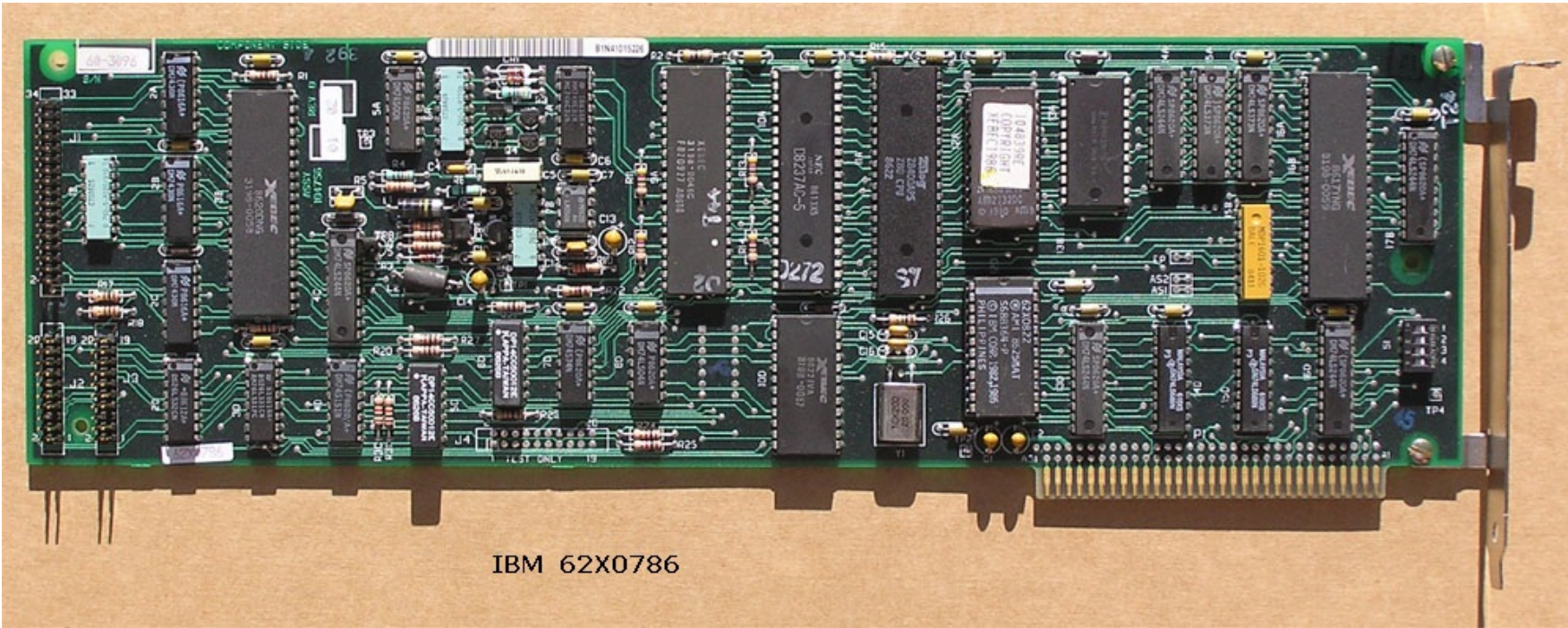
Table Address	Switch Settings for drive 0	Drive Characteristics	Example	Comment
0	1=on 2=on	Cylinders = 306 / Heads = 4 / SPT = 17 / WPC = 0 / step pulses per here are valid		Not IBM Type 1 - type 1 has a WPC of 128
1	1=on 2=off	Cylinders = 612 / Heads = 4 / SPT = 17 / WPC = 0 / step pulses per here are valid		In 1986, known as IBM Type 16
2	1=off 2=on	Cylinders = 615 / Heads = 4 / SPT = 17 / WPC = 300 / step pulses per here are valid	Seagate ST-225 *[20MB HH]*	In 1986, known as IBM Type 2
3	1=off 2=off	Cylinders = 306 / Heads = 8 / SPT = 17 / WPC = 128 / step pulses per here are valid	IBM WD25 *[20MB FH]*	In 1986, known as IBM Type 13

The information in the above table was sourced from the book: *Upgrading and Repairing PCs, Scott Mueller, 5th Edition, page 761/762/763   (or page 387 of 1st edition)*
That matches well with the list that SpeedStor software reports.

Known Part Number Variations

1. Component side: "62X0775" on white sticker / Solder side: "IBM 62X0776"
2. Component side: "62X0786" on white sticker / Solder side: "IBM 62X0776"

IBM 62X0786