

```

LDA    CTLPRT
ANI    0FFH-040H
STA    CTLPRT
OUT    HB8CTL
LHLD   HSTDPB

```

Old H37 Code:

```

JC      RST37
MVI     A,FD1TS
OUT     FD1INT
MOV     A,M
OUT     FD1TRK
RET

```

ONH37:

```

LXI     H,0
SHLD    DLYM37
LHLD    HSTDPB
MOV     A,M
ANI     DPEDD
JZ      ONH37A
MVI     A,CONMFM

```

ONH37A: INX

New H37 Code:

```

JC      RST37
MVI     A,FD1TS
OUT     FD1INT
MOV     A,M
OUT     FD1TRK
RET

```

ONH37:

```

IF      H17T          ;MOD TO RESET H17
CALL    RESH17        ;MOD TO RESET H17
ENDIF
IF      NOT H17T      ;MOD TO RESET H17
LXI     H,0           ;MOD TO RESET H17
ENDIF
SHLD    DLYM37
LHLD    HSTDPB
MOV     A,M
ANI     DPEDD
JZ      ONH37A
MVI     A,CONMFM
ONH37A: INX

```

Note that the LXI H,0 is replaced with the call.

Loose Ends

When booting from a soft sector disk, CONFIGUR does not find all hard sector disks. This is because it does not use this part of the BIOS code, but uses its own internal code. The equivalent code within CONFIGUR (and CONFIG80) must be found and patched to include this reset call. When that is done, CONFIGUR (and CONFIG80) will work properly.

In the meantime, it is suggested that the user run CONFIGUR on a hard sector disk and copy the BIOS modified to the soft sector disk. This procedure should be used until a patch is defined for CONFIGUR (and CONFIG80).

Disk Drive Identification

As we said previously, Heath/Zenith did not choose the same addressing logic for the hard sector controller as they did for the soft sector controller. In the hard sector controller, Data Select line 3 is defined to be Drive 0, Data Select line 2 is Drive 1, and Data Select line 1 is Drive 2. In the soft sector controller, Data Select line 1 is defined to be Drive 0, Data Select line 2 is defined to be Drive 1, and Data Select line 3 is defined to be Drive 2. The soft sector drive selection logic is in accordance with industry standard.

The following table should aid in determining how the drives are identified.

	Normal Boot on H-17				Normal Boot on H-37		
	DS1	DS2	DS3		DS1	DS2	DS3
HDOS							
H-17	SY2:	SY1:	SY0:		DK2:	DK1:	DK0:
H-37	DK0:	DK1:	DK2:		SY0:	SY1:	SY2:
CP/M							
H-17	C:	B:	A:		F:	E:	D:
H-37	D:	E:	F:		A:	B:	C:

When booting from other than the low order disk in either system, the drive designations rotate for the boot controller only. This can get tricky, so be careful of your drive designations until you get used to the way they change depending on how you boot.

Using Alternate Disk Drives

One of the questions which frequently arises when discussing the modification of disk drive hardware or software is the feasibility of changing disk drives. This is particularly relevant when considering the fact that the H-37 soft sector card and BIOS software will support both 40 and 80 track drives and both single and double sided drives.

As most of you know, Heath/Zenith selected 40 track, double sided drives for the H/Z-100 rather than 80 track, double sided drives. This reflects industry concern that the floppy disk media is not acceptably reliable in 80 track, drives due to thermal expansion properties and reduced error tolerances. This is also why I am using 40 track, double sided as my 5 inch soft sector format for mastering the public domain software disks, which I personally make available to the rest of the Heath community for a copying donation.

With the large number of disk drive manufacturers currently offering a large variety of full height and half height disk drives including both 40 and 80 track and both single and double sided models, you generally won't go wrong if you get a new tested unit from a reliable name manufacturer. You, however, must make the decision between 40 and 80 track formats. If your system is not moved around very much and is not subject to wide temperature variances, 80 track will probably be fine. I have chosen 80 track double sided for my 5 inch hard sector public domain software masters.

Most readers know, of course, that Heath/Zenith supports only 40 track single sided drives in hard sector format. Therefore, the user must go outside Heath/Zenith to get disk driver software to support 80 track and double sided formats. I personally recommend, and use, the Ultimeth SY: driver for HDOS and Livingston Logic Labs BIOS80 for CP/M. ED) HSY. DVD is also available from HUG on disk part #885-1121, this 2 disk set is supported by the Heath Users' Group. Henry Fale is also one of two master distributors for Ray Livingston's BIOS80, the other is Ray Massa of Studio Computers, in Birmingham, Michigan.

We at ETS are a dealer for BIOS80 (we buy from Henry Fale) and also offer a version of the HDOS SY: driver for those customers of ours which require the SY: driver to use the capabilities of our other products.

My system, which uses the modifications described in this article, consists of an H-89 with two 40 track, double sided Qume Model 142 drives and one 80 track, double sided Tandon Model 100-4 drive. George Deffendall, my business partner, uses two 80 track, double sided Tandon Model 100-4 drives and a 40 track, single sided Siemens Model 100-5 drive. Both systems work fine. (My other system, also an H-89, uses the hard sector controller with a 40 track, single sided Siemens Model 100-5b drive and two 80 track, double sided Tandon Model 100-4 drives, along with the H-47 controller with two Remex soft sector 8 inch drives.)

Epilog

This concludes the modifications and discussions necessary to use both hard and soft sector controllers with the same disk drives. As you can see, it's really not too hard and quite powerful once you get used to it.

Happy computing, Bob Todd.

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