

Equipment Required

1. Terminal utility program Hint3.exe and Hint.bat, loaded onto a Laptop (or equivalent) with serial com port.

1A, You can use windows hyperterminal with the ability to log your sessions and easier readout. Just configure it to your com port, 9600 baud, and 8-N-1 configuration Use Xon-Xoff for handshaking.

2. E77000596 Null Modem rs232 cable.
3. Calculator.

Procedure

1. To calculate the value of MPHASE (resolver zero position), use these commands with the terminal program Hint. (**Do not use the terminal function of Drive.exe**)
2. Start with the system in the flip up state.
3. Connect the serial cable from the com port on the Laptop (or equivalent) to X6, serial port on the amplifier.
4. Make sure Hint.bat and Hint3.exe are in the same directory. Double click on the Hint.bat Icon to start Hint with the baudrate preset to the required 9600, on com1. If your com port is different, edit the batch file and substitute the appropriate port number.
5. Hit enter on the keyboard, the prompt should be "-->"
6. Type VER and hit enter to verify that proper communication is made.
The response should be the firmware version, refer to "Figure 1" for an example of the entire procedure for this step and those to follow.
7. In hardware, disable the drive by Selecting [FLIP UP] on the [TEST AND SERVICE]/[WAFER HANDLER MOTORS]/[MID LEVEL] screen.
8. Set the following: (Note: typing a variable followed by a number changes the value, and typing the variable only, displays the value).

Command	Remark
DIS	Disables the drive in software.
MSG 2	Enable messages from drive.
MPOLES 0	Sets parameters for the test.
MPHASE 90	
OPMODE 2	

9. In hardware, enable the drive by selecting Error Clear on the Spin Motor Screen.
10. Do the following: (Note: typing a variable followed by a number changes the value, and typing the variable only, displays the value).

EN	Enables the drive in software.
T 35	For 35% (50amps) of rated peak (140amps) current value. Attention! The motor shaft most likely will move a little, and move back and forth around the nearest motor pole pair while locking into position. DO NOT Exceed the 50% (70amps) continuous rating of the amplifier.
PFB	Allow motor movement to settle out before typing this. This show a position value "X Y" Y = display of mechanical angle, Y = 0° ... 360°.
DIS	Disables the drive in software, do this quickly so the motor does not sit there drawing a stalled current for long periods of time.

11. In hardware, disable the drive by Selecting [FLIP UP] on the [TEST AND SERVICE]/[WAFER HANDLER MOTORS]/[MID LEVEL] screen.

12. Perform the following calculation:

Offset = $n/2 \times Y$ $n=24$ (number of motor poles (not pole pairs))

If the result is greater than 360, subtract multiples of 360 until Offset is between 0 and 360 (Modulo 360).

Example: 24 pole motor

PFB =

2347271 85.861

Offset = $24/2 \times 85.9$

Offset = $1030.8 - 360 - 360 = 310.8$

MPHASE = 311

Simplification of above

Offset= the following:

$((24/2) \times Y)/360$ discard the whole number and multiply the remaining decimal number by 360 this will be your Mphase number.

Example

$(24/2) \times 85.861 = 1030.3$

$1030.0/360 = 2.862$

Discarding the whole number multiply the decimal by 360 EG $.862 \times 360 = 310.32$.

This is simpler instead of having to subtract so often

13. Before you type in the following commands, switch the drive off and on again using the Scan Safety Interlock Keyswitch, to make sure the testing parameters are reset to original values: (This is an important step to reset the temporary test settings back to normal operating mode before saving the changes to EEPROM)

Command	Remark
MPHASE Offset	Sets parameter MPHASE to the calculated value.
MSG 0	
MNUMBER 0	Sets the motor number.
SAVE	Saves the parameters to the EEPROM.

14. Verify the stored parameters:

Type "MPHASE"

OFFSET number calculated above should display.

Type "MPOLES"

24 Should display.

Type "MSG"

0 should display.

Type "OPMODE"

3 Should display.

15. If all of the above variables agree, the alignment procedure is complete. If not change the values that are in error and "SAVE" them.

```
C:\E1000 spinamp\hint>hint3 com1 9600
HINT version 6.0. Copyright 1995, Hitachi Microsystems Inc.
Using COM1 at 9600 baud

-->UER
05.94 DRIVE Rev create.d Mar 23 16:34:28 2004
-->DIS
-->MSG 2
-->MPOLES 0
-->MPHASE 90
-->OPMODE 2
-->EN
-->T 35
-->PFB
2347271 85.861
-->DIS
-->
booting...
-->MPHASE 311
-->MSG 0
-->MNUMBER 0
-->SAVE
-->MPHASE
311
-->MPOLES
24
-->MSG
0
-->OPMODE
3
-->
```

Figure 1 (Example of complete Zeroing procedure)