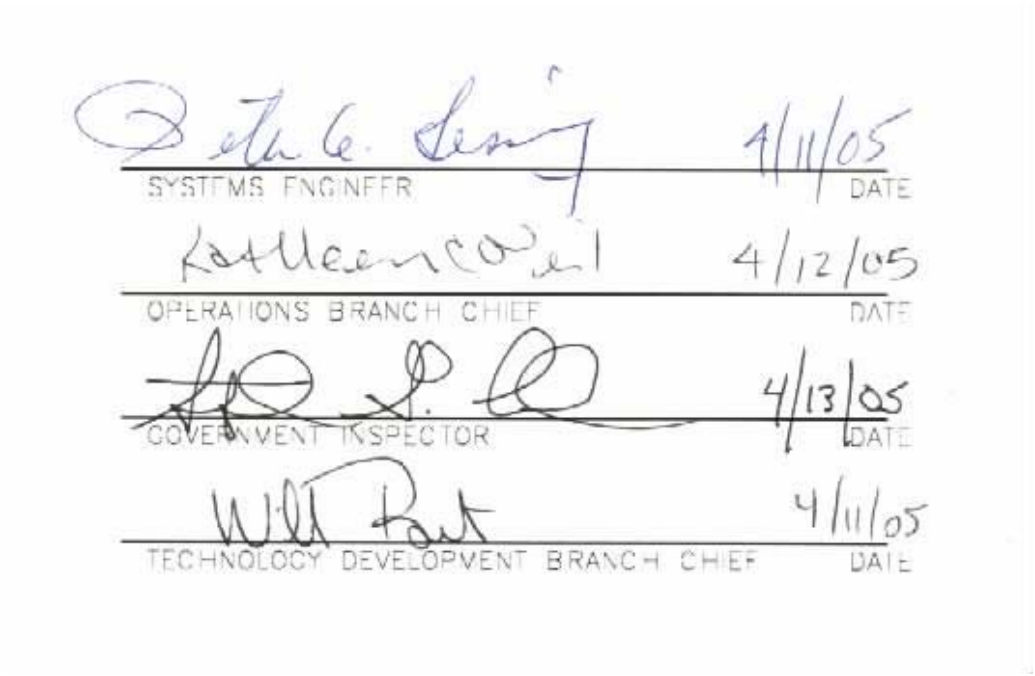
**Procedure: NDBC-1171**
**Date: 07/31/04 Rev -**

**CMO ORIGINAL**

# NDBC TEST PROCEDURE
# FOR
# DWPM BUOY SPIN




**NATIONAL DATA BUOY CENTER**
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| REVISIONS | | | |
|---|---|---|---|
| REV. | DESCRIPTION | DATE TO CMO | AUTHOR / REVIEWER |
| – | ECP, P04-0046 | 8/31/2004 | R. Cambre |
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## ACRONYMS AND ABBREVIATIONS

| | |
|---|---|
| **ASCII** | **American Standard Code for Information Interchange** |
| **CMO** | **configuration management office** |
| **DC** | **direct current** |
| **DWPM** | **directional wave processing module** |
| **HMC** | **hull magnetic coefficients** |
| **IWR** | **Internal Work Request** |
| **NDBC** | **National Data Buoy Center** |
| **NOAA** | **National Oceanic and Atmospheric Administration** |
| **PC** | **personal computer** |
| **P/F** | **pass / fail** |
| **PN** | **part number** |
| **QA** | **quality assurance** |
| **SAIC** | **Science Applications International Corporation** |
| **SN** | **serial number** |
| **V** | **volt** |
| **VDC** | **volts direct current** |

## 1.0 PURPOSE

The purpose of the Directional Wave Processing Module (DWPM) buoy spin procedure is to correct for magnetic variations of the magnetometer output caused by the buoy hull and/or LRUs.

## 2.0 APPLICATION

This procedure should be performed whenever a DWPM buoy is going to be deployed and anytime the type or placement of hardware or sensors aboard the buoy changes.

## 3.0 PREREQUISITES

3.1 The buoy must be in the deployment configuration per the applicable hull drawings and integration IWR.

3.2 All structural work, mechanical assembly, welding, grinding, etc. will be completed.

3.3 The buoy under test must be located as far away as possible from sources of magnetic influence such as other steel buoys, ships, concrete piers, etc.

3.4 The gyrocompass will be green tagged per NDBC-1110.

3.5 The gyrocompass will be mounted and setup per NDBC-8013.

3.6 The magnetometer should be operating correctly, and be currently green tagged per NDBC-8058.

## 4.0 DISCUSSION

This procedure is necessary because the magnetometer readings may not be correct due to the location of the magnetometer on or near any magnetic device or surface. These deviations change for different hulls and hardware configurations.

During this procedure the buoy will be spun at ~1°/sec for seven minutes while data is collected by the DWPM. With the help of a gyrocompass, the DWPM will calculate the hull magnetic constants for the buoy. These offsets can then be saved to the DWPM parameter table for use in correcting magnetometer readings used for determining wave direction.

## 5.0 MATERIALS REQUIRED

(1) Integrated DWPM buoy including the following:

(a) DWPM Electronics Unit with latest software and parameter load

(b) Set of Interconnecting Cables (see Figure 1)

(2) Laptop computer with a terminal emulation program installed

(3) Universal PC/Payload Interface Cable Assembly (NDBC-3070)

(4) Gyrocompass (with its gyrocompass to DWPM pigtail interconnecting cable, NDBC-3053)

(5) DWA Test Box

## 6.0 SAFETY

General safety procedures should be observed. Personnel performing this procedure shall comply with the safe electrical practices of NWSM 50-115, Occupational Safety and Health Manual, and shall follow accepted standards for safe electrical practices.

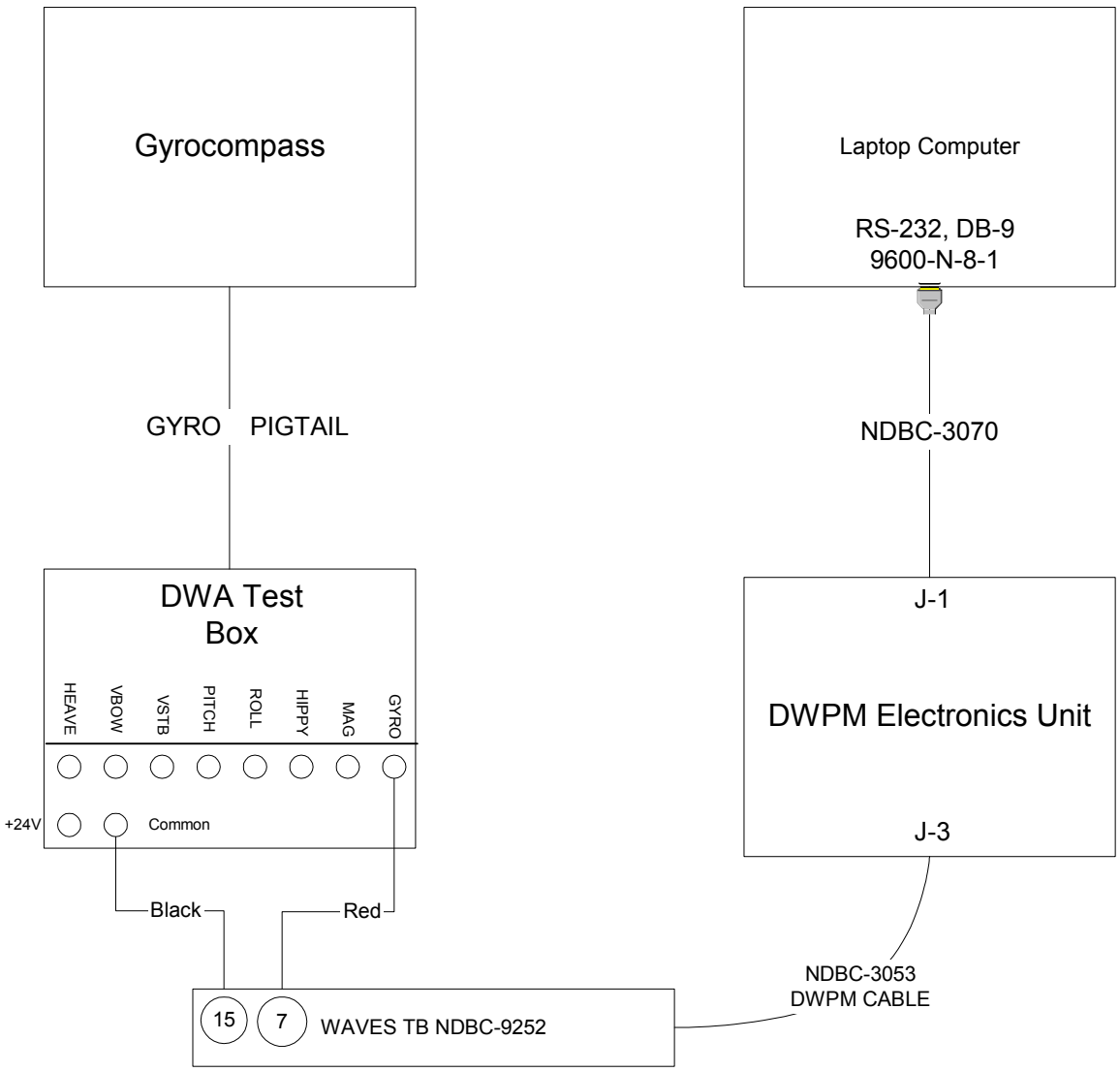


FIGURE 1
USER PC / DWPM / DWA TEST BOX / GYROCOMPASS
INTERFACE WIRING DIAGRAM

## 7.0 INSTRUCTIONS

### 7.1 ADMINISTRATIVE AND EQUIPMENT INFORMATION

7.1.1 Complete the administrative and equipment information on the first data sheet, and also include the buoy hull number at the top of each subsequent data sheet.

7.1.2.1 See data analysts for Bey, Bez, and VAR coefficients.

7.1.2.2 See Step 7.3.4.1 below for DWPM Electronics Unit software/parameter table information.

### 7.2 BUOY SPIN SETUP

7.2.1 Connect the gyrocompass, DWA Test Box, and DWPM as shown in Figure 1.

7.2.2 Connect the laptop's serial port to the DWPM electronics unit connector J1, using the Universal Payload Interface Cable (NDBC-3070), as shown in Figure 1.

### 7.3 COLLECTING SPIN DATA

7.3.1 Startup the terminal communications package on the laptop.

7.3.2 Set the terminal communications program serial protocol to 9600 baud, no parity, 8 data bits, 1 stop bit (9600-N-8-1) (unless specified otherwise in the parameter load file) and transfer data type to ASCII.

7.3.3 Start capturing/logging the incoming data stream to a file named **xxxxxSP.CAP** where xxxxx is the station name for the buoy being spun.

7.3.4 Press **<CTRL>U** to enter the user interface.

7.3.4.1 At this point you will get a prompt similar to the following:

```
DWPM USER INTERFACE
Software Version - 1.00
Parameter Table Version - v2.0
Parameters in parameter table - 208
Bytes in parameter table - 618
Parameter table checksum - 6D97

ENTER PASSWORD=>
```

7.3.4.2 Record the DWPM software/parameter table information on the data sheet.

7.3.5 Type **NDBO<ENTER>** as the password.

The following list of commands will be displayed:

```
OPERATOR Level Login Successful

BYE - Logout
CLE - Clear Errors
DIS - Display Parameter Table
DOW - Download Parameter Table
ERR - Display Errors
HEL - Help
LOG - Login
POW - Power Menu
RES - Reset the Tattletale 8
SPI - Buoy Spin Menu
TES - Test Menu
UPL - Upload Parameter Table
VER - Version

==>
```

7.3.6 Type **SPI<ENTER>**

The following menu will be displayed:

```
    SPIN BUOY MENU
 1. Collect Spin Data
 2. Test Spin Data
 3. Display Spin Data
 4. Process Spin Data
 5. Calculate Hull Magnetic Constants
 6. Fast Acquisition
 7. Store Hull Magnetic Constants
 8. Exit Spin Buoy Menu
```

```
Enter Selection >>>
```

7.3.7 Type **1<ENTER>**

7.3.7.1 The following information and prompt will be displayed:

```
Current BEY: 0.244880
Enter Spin Site BEY or <ENTER> for current:
```

Note: The current BEY may differ from the value displayed above based on the parameter table loaded.

7.3.7.2 Check current BEY value versus the Spin Site BEY listed on the data sheet. If it is the same press <ENTER> otherwise enter the data sheet value.

7.3.7.3 The following information and prompt will be displayed:

```
Current BEZ: -0.448600
Enter Spin Site BEZ or <ENTER> for current:
```

Note: The current BEZ may differ from the value displayed above based on the parameter table loaded.

7.3.7.4 Check current BEZ value versus the Spin Site BEZ listed on the data sheet. If it is the same press <ENTER> otherwise enter the data sheet value.

7.3.7.5 The following information and prompt will be displayed:

```
Current VAR: 0.000000
Enter Spin Site VAR or <ENTER> for current:
```

Note: The current VAR may differ from the value displayed above based on the parameter table loaded.

7.3.7.6 Check current VAR value versus the Spin Site VAR listed on the data sheet. If it is the same press <ENTER> otherwise enter the data sheet value.

7.3.7.6.1 The following message will be displayed:

```
Waiting 10 seconds for sensors to settle...
```

7.3.7.6.2 After the settling delay the following message will be displayed:

```
Data collection will take approximately 7 minutes...
```

7.3.7.7 Begin spinning the buoy at ~1°/sec and continue doing so until the following message is displayed:

```
Data collection complete.
```

7.3.7.8 The *SPIN BUOY MENU* shown in 7.3.6 is now displayed.

7.3.8 Type **3<ENTER>** if you wish to display the data collected. Otherwise, skip to Step 7.3.9.

Note: This step is not necessary to complete this procedure but is helpful to determine if the buoy was spun at a proper rate.

7.3.8.1 The following message will be displayed:

```
The maximum samples you can view are 8000
```

7.3.8.2 The data will be displayed in the following form until the <ESC> key is depressed or all 8000 samples have been displayed:

| SAMPLE | BBOW | BSTB | SINP | SINR | ATRUE |
|---|---|---|---|---|---|
| 1 | 0.24488 | 0.00000 | 0.00000 | 0.00000 | 0.00 |
| 2 | 0.24484 | -0.00427 | 0.00000 | 0.00000 | 1.00 |
| 3 | 0.24473 | -0.00855 | 0.00000 | 0.00000 | 2.00 |
| 4 | 0.24454 | -0.01282 | 0.00000 | 0.00000 | 3.00 |
| 5 | 0.24428 | -0.01708 | 0.00000 | 0.00000 | 4.00 |
| 6 | 0.24395 | -0.02134 | 0.00000 | 0.00000 | 5.00 |
| 7 | 0.24354 | -0.02560 | 0.00000 | 0.00000 | 6.00 |
| 8 | 0.24305 | -0.02984 | 0.00000 | 0.00000 | 7.00 |
| 9 | 0.24250 | -0.03408 | 0.00000 | 0.00000 | 8.00 |
| 10 | 0.24187 | -0.03831 | 0.00000 | 0.00000 | 9.00 |

```
11   0.24116   -0.04252   0.00000   0.00000    10.00
12   0.24038   -0.04673   0.00000   0.00000    11.00
13   0.23953   -0.05091   0.00000   0.00000    12.00
14   0.23860   -0.05509   0.00000   0.00000    13.00
15   0.23761   -0.05924   0.00000   0.00000    14.00
16   0.23654   -0.06338   0.00000   0.00000    15.00
17   0.23539   -0.06750   0.00000   0.00000    16.00
18   0.23418   -0.07160   0.00000   0.00000    17.00
19   0.23289   -0.07567   0.00000   0.00000    18.00
20   0.23154   -0.07973   0.00000   0.00000    19.00

Press the escape key to end view or any other key to continue...
```

7.3.8.3 The *SPIN BUOY MENU* shown in 7.3.6 is now displayed.

7.3.9 Type **4<ENTER>**

7.3.9.1 The following message will be displayed:

```
The number of good data values is 360.
```

7.3.9.2 Record the number of good data values on the Data Sheet.

Note: A good number of points is between 300 and 360.

7.3.9.3 The degree points containing good data will be displayed in the following form until the <ESC> key is pressed or all good points have been displayed:

```
SAMPLE    DEGREE       BB         BS         SP         SR
     1    00000.00  +0.24488 +0.00000 +0.00000 +0.00000
     2    00001.00  +0.24484 -0.00427 +0.00000 +0.00000
     3    00002.00  +0.24473 -0.00855 +0.00000 +0.00000
     4    00003.00  +0.24454 -0.01282 +0.00000 +0.00000
     5    00004.00  +0.24428 -0.01708 +0.00000 +0.00000
     6    00005.00  +0.24395 -0.02134 +0.00000 +0.00000
     7    00006.00  +0.24354 -0.02560 +0.00000 +0.00000
     8    00007.00  +0.24305 -0.02984 +0.00000 +0.00000
     9    00008.00  +0.24250 -0.03408 +0.00000 +0.00000
    10    00009.00  +0.24187 -0.03831 +0.00000 +0.00000
    11    00010.00  +0.24116 -0.04252 +0.00000 +0.00000
```

```
 12   00011.00  +0.24038 -0.04673 +0.00000 +0.00000
 13   00012.00  +0.23953 -0.05091 +0.00000 +0.00000
 14   00013.00  +0.23860 -0.05509 +0.00000 +0.00000
 15   00014.00  +0.23761 -0.05924 +0.00000 +0.00000
 16   00015.00  +0.23654 -0.06338 +0.00000 +0.00000
 17   00016.00  +0.23539 -0.06750 +0.00000 +0.00000
 18   00017.00  +0.23418 -0.07160 +0.00000 +0.00000
 19   00018.00  +0.23289 -0.07567 +0.00000 +0.00000
 20   00019.00  +0.23154 -0.07973 +0.00000 +0.00000

Press the escape key to end view or any other key to continue...
```

7.3.9.4 The *SPIN BUOY MENU* shown in 7.3.6 is now displayed.

7.3.10 Type **5<ENTER>**

7.3.10.1 The following message will be displayed:

```
The number of good data sets is 119.
```

7.3.10.2 Record the number of good data sets on the Data Sheet.

Note: A good number of sets is between 100 and 119.

7.3.10.3 The sets containing good data will be displayed in the following form until the <ESC> key is pressed or all good sets have been displayed:

```
SAMPLE    B10       B11       B12       B20       B21       B22
     1  0.007669 1.062623  0.001091  0.035750 0.291936 1.005095
     2 -0.000000 1.000000 -0.000003 -0.000000 0.000001 0.999999
     3 -0.000000 1.000001 -0.000003 -0.000000 0.000001 1.000000
     4 -0.000000 1.000000 -0.000003 -0.000000 0.000001 1.000000
     5 -0.000000 1.000000 -0.000003 -0.000000 0.000001 1.000000
     6 -0.000000 1.000000 -0.000003 -0.000000 0.000001 1.000000
     7 -0.000000 1.000000 -0.000003 -0.000000 0.000001 1.000000
     8 -0.000000 1.000000 -0.000003 -0.000000 0.000001 1.000000
     9 -0.000000 1.000000 -0.000003 -0.000000 0.000001 1.000000
    10 -0.000000 1.000000 -0.000003 -0.000000 0.000001 1.000000
    11 -0.000000 1.000000 -0.000003 -0.000000 0.000001 1.000000
```

```
12 -0.000000 1.000000 -0.000003 -0.000000 0.000001 1.000000
13 -0.000000 1.000000 -0.000003 -0.000000 0.000001 1.000000
14 -0.000000 1.000000 -0.000003 -0.000000 0.000001 1.000000
15 -0.000000 1.000000 -0.000003 -0.000000 0.000001 1.000000
16 -0.000000 1.000000 -0.000003 -0.000000 0.000001 1.000000
17 -0.000000 1.000000 -0.000003 -0.000000 0.000001 1.000000
18 -0.000000 1.000000 -0.000003 -0.000000 0.000001 1.000000
19 -0.000000 1.000000 -0.000003 -0.000000 0.000001 1.000000
20 -0.000000 1.000000 -0.000003 -0.000000 0.000001 1.000000

Press the escape key to end view or any other key to continue...
```

7.3.10.4 The measured azimuth, calculated azimuth, and the difference between the two will be displayed in the following form until <ESC> key is pressed or all points have been displayed:

```
     MEASURED A  CALCULATED A     DIFF
 1   +000.0000   +000.0000      +00.0000
 2   +001.0000   +001.2117      -00.2117
 3   +002.0000   +002.2123      -00.2123
 4   +003.0000   +003.2127      -00.2127
 5   +004.0000   +004.2131      -00.2131
 6   +005.0000   +005.2133      -00.2133
 7   +006.0000   +006.2135      -00.2135
 8   +007.0000   +007.2135      -00.2135
9    +008.0000   +008.2134      -00.2134
10   +009.0000   +009.2132      -00.2132
11   +010.0000   +010.2129      -00.2129
12   +011.0000   +011.2125      -00.2125
13   +012.0000   +012.2120      -00.2120
14   +013.0000   +013.2114      -00.2114
15   +014.0000   +014.2106      -00.2106
16   +015.0000   +015.2098      -00.2098
17   +016.0000   +016.2088      -00.2088
18   +017.0000   +017.2078      -00.2078
19   +018.0000   +018.2067      -00.2067
20   +019.0000   +019.2054      -00.2054

Press the escape key to end view or any other key to continue...
```

7.3.10.5 Finally the following messages are displayed:

```
*********************************************
*     FINAL RESULTS                         *
*********************************************
Running statistics on the difference from measured and calculated
      azimuth

                MEAN       MIN        MAX        STDEV
ADIF    =    -0.06941   -0.21350    0.01874    0.07159

HMC     MEAN
B10 +00.00006
B11 +01.00053
B12 +00.00001
B20 +00.00030
B21 +00.00246
B22 +01.00004

IF YOU ARE NOT SATISFIED WITH THE RESULTS, PLEASE SPIN AGAIN!

PRESS 'C' KEY TO CONTINUE
```

Note: The mean, min and max degree difference should be 0±1, 0±5, 0±5 respectively for acceptance.

7.3.10.6 Verify the mean, min, max degree difference are within the stated specifications and record on the data sheet. Verify that the magnetic coefficients(b10, b20, b11, b21, b12, and b22) are within the range given on the data sheet and record the magnetic coefficients b10, b20, b11, b21, b12, and b22 on the Data Sheet.

7.3.10.7 Press **'C'**

7.3.10.7.1 The *SPIN BUOY MENU* shown in 7.3.6 is now displayed.

7.3.10.7.2 If the mean, min, max degree differences were within the stated specifications continue to step 7.3.11 Otherwise, restart the procedure at step 7.3.7.

7.3.11 Type **6<ENTER>**

7.3.11.1 The following message will be displayed:

```
Test will begin in 10 seconds ...Press any key to terminate
```

7.3.11.2 The following messages will be displayed until a key is pressed:

```
Gyrocompass = 20.57   Azimuth = 21.53  Difference = -0.96

Gyrocompass = 20.65   Azimuth = 20.53  Difference =  0.12


Gyrocompass = 20.74   Azimuth = 21.05  Difference = -0.31

Gyrocompass = 20.46   Azimuth = 21.22  Difference = -0.76
```

7.3.12 Set the buoy to a specific heading.

7.3.12.1 Mark on the data sheet the gyrocompass, azimuth, and difference readings at that heading.

7.3.12.2 Verify that the difference between the gyrocompass and calculated azimuth is 0±5. If so, continue. Otherwise, press a key and restart the procedure at step 7.11.

7.3.12.4 Repeat steps 7.12 for two more headings 120 degrees apart.

7.3.12.5 Press any key.

7.3.12.6 The *SPIN BUOY MENU* shown in 7.3.6 is now displayed.

7.3.13 Type **7<ENTER>**

7.3.13.1 The following information and prompt will be displayed:

```
Current BEY: 0.244880

Enter Deployment Site BEY or <ENTER> for current:
```

Note: The current BEY may differ from the value displayed above based on the parameter table loaded.

7.3.13.2 Check current BEY value versus the Deployment Site BEY listed on the data sheet. If it is the same press <ENTER> otherwise enter the data sheet value.

7.3.13.3 The following information and prompt will be displayed:

```
Current BEZ: -0.448600

Enter Deployment Site BEZ or <ENTER> for current:
```

Note: The current BEZ may differ from the value displayed above based on the parameter table loaded.

7.3.13.3.1 Check current BEZ value versus the Deployment Site BEZ listed on the data sheet. If it is the same press <ENTER> otherwise enter the data sheet value.

7.3.13.3.2 The following information and prompt will be displayed:

```
Current VAR: 0.000000

Enter Deployment Site VAR or <ENTER> for current:
```

Note: The current VAR may differ from the value displayed above based on the parameter table loaded.

7.3.13.3.3 Check current VAR value versus the Deployment Site VAR listed on the data sheet. If it is the same press <ENTER> otherwise enter the data sheet value.

7.3.13.4 The following message will be displayed:

```
New Parameter table checksum - XXXX
```

Where XXXX is the new parameter table checksum.

7.3.13.4.1 Record the new parameter table checksum on the data sheet.

7.3.13.4.2 The following messages will display after the save is complete:

```
SUCCESSFUL SAVE

Prepare to receive new parameter load file...press 'D' when ready
```

7.3.13.5 Terminate the capture of **xxxxxSP.CAP**.

7.3.13.6 Start capturing/logging the incoming data stream to a file named **xxxxx.DAT** where xxxxx is the station name for the buoy being spun.

7.3.13.7 Press **'D'**

7.3.13.7.1 ASCII data will begin displaying on the screen. This is the new parameter table being downloaded.

7.3.13.7.2 When the transfer is complete the following messages will be displayed:

```
Completed sending parameter file

DWPM USER INTERFACE
Software Version - 1.00
Parameter Table Version - v2.0
Parameters in parameter table - 208
Bytes in parameter table - 618
Parameter table checksum – XXXX
```

7.3.13.7.3 Verify the checksum matches the new checksum written on the data sheet in step 7.3.13.4.1.

7.3.13.5 Terminate the capture of **xxxxx.DAT**.

## 7.4 AZIMUTH VERIFICATION

The purpose of this section is to verify the DWPM azimuth system accuracy using the HMCs obtained in the previous parts of this procedure. Begin filling out the heading of the data sheet.

7.4.1 Point the buoy to approximately zero degrees true, using the gyro as the north indication.

7.4.1.1 Stabilize the buoy during a complete DWPM and Met data acquisition interval.

7.4.1.2 After the data have been transmitted, examine the data from Time Tabulation Report. If Aoriginal falls between buoy azimuth + SDA max + 3 degrees and buoy azimuth - SDA min - 3 degrees and CCOMP1 and CCOMP2 falls between gyro ±5 degrees, then the test is successful for that azimuth.

7.4.2 Repeat 7.4.1 for seven additional buoy azimuths in approximately 45-degree increments.

7.4.3 After all data have been taken and the system has passed the azimuth verification, enter the deployment site BEY and BEZ and variation.

## 7.5 INSPECTION REQUIREMENTS

7.5.1 Complete the datasheet.

7.5.2 Submit to QA for inspection.

7.5.3 Disconnect gyrocompass, DWA test box, and laptop from the buoy.

7.5.4 Return both capture files to the data analysts.

## 8.0 DATA SHEETS

### DWPM Buoy Spin Procedure

| Step 7.1.1 | Administrative Section | | |
|---|---|---|---|
| **Test Conductor:** | | | **Test Date:** |
| **Buoy Hull:** | | | **Station:** |
| **Equipment** | | **Part Number** | **NDBC #** |
| DWPM Electronics Unit | | | |
| Magnetometer | | | |
| Gyrocompass | | | |
| **Data Analysts Provide: [Step 7.1.2.1]** | **Bey** | **Bez** | **VAR** |
| Spin Site | | | |
| Deployment Site | | | |

| User Interface Data Step 7.3.4.2 | Software Version | Parameter Table Version | Parameter Table Checksum |
|---|---|---|---|
| | | | |

| Step 7.3 | Collecting Spin Data | | | | | |
|---|---|---|---|---|---|---|
| **Step** | **Observed Values** | | | A good number is between: | | |
| **7.3.9.2** | | | | 300-360 | | |
| **7.3.10.2** | | | | 100 and 119 | | |
| | | | | | | |
| **7.3.10.6** | **b10** | **b20** | **b11** | **b21** | **b12** | **b22** |
| **HMC Values** | | | | | | |
| **----- Good Range** | **-.255 to +.255** | **-.255 to +.255** | **0.873 to 1.128** | **-.255 to +.255** | **-.255 to +.255** | **0.873 to 1.128** |

| Step | Heading | Gyrocompass | Azimuth | Difference (0±5.0) |
|---|---|---|---|---|
| 7.3.12 | Initial | | | |
| | Initial + 120 | | | |
| | Initial + 240 | | | |
| **Step** | **New Parameter Table Checksum** | | | |
| **7.3.13 .4.1** | | | | |
| **7.3.13 .7.3** | | | **7.3.13.4.1 matches 7.3.13.7.3** | **P / F** |

| 7.4 | Azimuth Verification | | | Buoy Hull: _____ | | |
|---|---|---|---|---|---|---|
| GYRO HEADING | A original Reported | A original Min / Max | CCOMP1 Reported | CCOMP2 Reported | CCOMP2 Min / Max | P/F |
| 0 | | Min / Max | | | Min / Max | |
| 45 | | Min / Max | | | Min / Max | |
| 90 | | Min / Max | | | Min / Max | |
| 135 | | Min / Max | | | Min / Max | |
| 180 | | Min / Max | | | Min / Max | |
| 225 | | Min / Max | | | Min / Max | |
| 270 | | Min / Max | | | Min / Max | |
| 315 | | Min / Max | | | Min / Max | |

$A_{ORIGINAL}$ REPORTED = From Time Tabulation Report

Min $A_{ORIGINAL}$ Reported = GYRO HEADING - 3.0 - SDA Min

MAX $A_{ORIGINAL}$ Reported = GYRO HEADING + 3.0 + SDA Max

SDA Max and SDA Min from Time Tabulation Report

CCOMP 1 and CCOMP2 are reported in Time Tabulation Report-

If ARES Payload is loaded with the deployment site compass variation correction-

**Correct the CCOMP data by removing the ARES Deployment Variation and adding the Local Variation to this data**.

MIN Compass = GYRO HEADING - 5

MAX Compass = GYRO HEADING + 5

Test Result is PASS if: $A_{ORIGINAL}$ Reported is between MIN and MAX $A_{ORIGINAL}$, AND CCOMP1 and CCOMP2 are between MIN and MAX COMPASS

Attach this sheet to computer printouts of spin data

| **7.5** | **Approval Section** | **Buoy Hull:** | _____ |
|---|---|---|---|
| | | **OVERALL EVALUATION:** | **PASS / FAIL** |
| **Test Conductor:** | | **Date:** | |
| **QA:** | | **Date:** | |
| **Government Inspector:** | | **Date:** | |

COMMENTS:_____
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