**Example: LTBMS sensor check sheet for Acoustic modem**

**Exp.380 C0006G LTBMS Sensor communication test via Acoustic Modem**

Date/Time:

Place:

Inspector:

Checked for:

**Check connection tool**

Connection □ UWTV □ Direct

**--**For UWTV connection**---------------------------------------------------------------------------------------**

UWTV and Transducer (prepared by CDEX/MQJ engineers) □(pr

J-FAST PC □ □ PC ( )

Acoustic Modem on CORK head 　　 □ OK

Three UMCs between Acoustic modem and LTBMS sensors □ OK

Communication cable (connected to communication port of UWTV @ Sonar room) □ OK

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**--**For Direct connection-**--------------------------------------------------------------------------------------**

Transducer unit for UWTV □ r

J-FAST PC □ OK PC ( )

Acoustic Modem on CORK head 　　 □ OK

Three UMCs between Acoustic modem and LTBMS sensors □ OK

Test communication cable (RS422-Transducer unit for UWTV) □ OK

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Tool, and connection confirmation o OK **Start time ( )**

Connect J-FAST PC to the communication cable at Sonar room □oom

(or test communication cable for direct connection mode)

Open “TermWin” placed on the Desktop of the JFAST-PC □ OK

Record an operation log. Click “記録” button at lower part of the Term Win window. The “記録” button turn into “記録中” □ OK

File name ( )

Press “Enter” key and check “BAD COMMAND” is returned □ OK

Boot an Acoustic Modem

Command: *“JC1101, SW, ON”*

Response: JCALL,1101,00001,SW=ON □ OK

***----The following procedure can be skipped if time stamp was already set up----***

Data and time setting of the Acoustic Modem □ OK

*JF1101, rd yymmdd* : set year, month, and day

Response: “JTFF,1101, Data set to yymmdd

*JF1101, jt hhmmss* : set hour, minute, second

Response: “JTFF,1101,REP time yy/mm/dd hh:mm:ss”

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**Acoustic modem self check**

Set status monitor mode at 1 second interval □ OK

Command: *“JF1101, r\_mon 1”*

Response: “JTFF,1101,REP moni 1”

Monitor REP rows from buffer function □ OK

Command: *“JB1101, RE”*

Response:

“JBUFF,1101,RE

RE

P 180117 111441,263, 27”

 (yymmdd hhmmss voltage (1digit=0.1V) current (mA))

　 Is the time stamp correct? □ OK

 \*If the time stamp is wrong, go back to time setting procedure

 Voltage is OK ? (normal: 25.5-27.0 VDC) □ OK

Stop status monitor output mode□

Command: “*JF1101, r\_mon 0”*

Response: “JTFF,1101,REP moni 0”

\* The word “Zonde” is used instead of “Sonde”

Boot sensor (sonde) power □ OK

Command: *“JF1101,r\_znp\_on”*

Response: “JTFF,1101,REP:Zonde Power ON”

Turn on power for relay control □ OK

Command: “*JF1101,r\_ctl\_on”*

Response: “JTFF,1101,REP:CONTROL ON”

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**Sensor health check**

□Start strainemter operation test, **Start time ( )**

Turn on port 1 (strainmeter) connection □ OK

Command: *“JF1101,r\_zon 1”*

Response: “JTFF,1101,REP:CONNECT 1”

Switch serial line to transmitter – Port#1 □ OK

Command: “JF1101,r\_sig\_z”

Response: ““JTFF,1101,Connect Zonde”

Send “g” command to boot the strainmeter, and confirm that the autoload of the program has started. 　□ OK

Command: *“JF1101,g”*

*Response: “JTFF, 1101,* autoload srec.”

Wait about 2 min to boot sensors automatically □ OK

Check pressure data and temperature data, and confirm that the pressure is corresponding to the strainmeter depth (1000m = 10MPa) □ OK

Command: *“JB1101,ST”*

Response: JBUFF,1101,ST

ST

RAIN 00:01:05 Mode 0 DT1 391.6 mV DT2 -2.8 mV V= 38238 mV (0) P 98183.5 Pa T 20.203 degC V: O S O O Man Motor: Not operating”

P ( )Pa, T ( )degC

Check AD output (strain data and accelerometer data) □ OK

Commando: “*JB1101,AD”*

Response “AD 2000/01/01 00:02:47.030 MUX 0 PGA 0 r 45 w 46 f 0 139108126 -172513344 294895262 439514310 11597214”

Strain data: ch1 ( ) ch2 ( )

Accelerometer data: ch3 ( ) ch4 ( ) ch5 ( )

Check Valve status, and confirm that the Valve 1, 3, 4 are all opened, that means the status is “O”. □ OK

Command: “*JB1101,F0”*

“Valves 1:O 136 2:S 991 3:O 140 4:O 141 M I= 0mA V=11203mV cnt=0”

Turn off each sensor inside the strainmeter

#DT2　□ OK

Command: *JF1101,dt2 off*

Response: DT2 disabled

#accelerometer　□ OK

*JF1101,ccw*

Response: JF1101,ccw

*JF1101,bk 100*

Response: JTFF,1101,BRAKE motor

#valve controller　□ OK

JF1101,a\_off

※after 10 seconds, send a command “JB1101, F0” twice. And confirm that the potensio values and Voltage value do not change.

“Valves 1:O 136 2:S 991 3:O 140 4:O 141 M I= 0mA V=11203mV cnt=0”

If the values change, turn off battery mode as following procedure.

*JF1101,a\_on*

*JF1101,cw*

*JF1101,yc 100*

*JF1101,F0*

After sending a last command, wait 10 seconds. Then, send a command *“JB1101,F0”* twice, again. And confirm that the valve controller was down.

#motor power □ OK

*JF1101,mpof*

#sensor power □ OK

*JF1101,spof*

Check that all sensors has down □ OK

*JB1101,AD*

Response: 2000/01/01 00:08:21.030 MUX 0 PGA 0 r 19 w 20 f 0 16615564 16681350 16093774 16391404 16593302

Strain data: ch1( ) ch2( )

Accelerometer: ch3( ) ch4( ) ch5( )

*JB1101,ST*

Response: STRAIN 00:20:36 Mode 0 DT1 -2.8 mV DT2 -2.8 mV V= 29823 mV (0) P 97400.7 Pa T 20.465 degC V: O S O O Man Motor: Not operating

※send command twice, and confirm that the pressure and temperature data do not change.

Exit operation test of the strainmeter □ OK

*JF1101,exit*

Switch serial line to transmitter – repeater CPU □ OK

*JF1101,r\_sig\_r*

Response: Connect REP

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□Start tiltlogger operation test, **Start time ( )**

Turn on port 2 (tiltlogger) connection □ OK

Command: *“JF1101,r\_zon 2”*

Response: JTFF,1101,REP:CONNECT 2

Switch serial line to transmitter – Port#1 □ OK

JF1101,r\_sig\_z

Response: Connect Zonde

Send “g” command to boot the tiltlogger, and confirm that the autoload of the program has started. □ OK

Command: *“JF1101,g”*

Response: “JTFF,1101,autoload srec.”

Check win\_ch\_base □ OK

Command: *“JB1101,wi”*

Response: JBUFF,1101,wi

wi

n\_ch\_base 2100

Wait 60 seconds to start acquisition

Check accelerometer and geophone data □ OK

Command: *“JB1101,AV”*

Response: JBUFF,1101,AV

AV

R2 14125 : -1.140e-01 +6.165e-02 +9.551e+00 -6.877e-06 +3.443e-06 -1.056e-05 T= 2475 Paro P,T= 0.00 0.0000 P,T=

Acceleration: Ch1: ( X ) Ch2: ( Y ) Ch3: ( Z ),

Geophone: Ch4: ( X ) Ch5: ( Y ) Ch6: ( Z ),

Wait 30 seconds to start acquisition

Check tiltmeter data □ OK

Command: *“JB1101,TI”*

Response: JBUFF,1101,TI

TI

LT 00:02:41 Stat 25 X 330000 Y 330000 MAG 40 TEMP 2076 Q w 58 r 58 s 1 DBUF w/r/c/ns 4/ 4/ 0/ 5 4/ 4/ 0/ 5 0/ 0/28/ 3 0/ 0/28/ 3 OVER x 76 y 178

X( ) Y( ) MAG ( ) TEMP ( )

Wait 30 seconds to start acquisition

Check SAHF data (thermistor cable) □ OK

Command: *“JB1101,SA”*

Response: JBUFF,1101,SA

SA

HF 00:04:01 Stat 19 Q w 4 r 4 s 1 Data 23824 23821 23679 23362 23288 19998 DBUF w/r/c/ns 0/ 0/ 0/29

Ch1( ) Ch2( ) Ch3( ) Ch4( ) Ch5( ) Ch6( )

Convert resistance values to physical values using Excel conversion sheet

Ch1( ) Ch2( ) Ch3( ) Ch4( ) Ch5( ) Ch6( )

※the resistance value is low at high temperature, and high at low temperature.

※the temperature is ch1 > ch5 in the sea water, and ch1 < ch5 in the borehole.

Wait 60 seconds to power down all sensors

Check all sensor power off

Command: *“JB1101,AV”*

Response: JBUFF,1101,AV

AV

R2 14125 : -6.877e-06 +3.443e-06 -1.056e-05 -6.877e-06 +3.443e-06 -1.056e-05 T= 2475 Paro P,T= 0.00 0.0000 P,T=

Ch1( ) Ch2( ) Ch3( ) Ch4( ) Ch5( ) Ch6( )

Check values of all data □

\* If value of ch3 is 9.5-9.8E0, accelerometer are still running, send “JF1101,spof” command.

Exit operation test of the tiltlogger □ OK

Command: *“JF1101,exit”*

Response: “JTFF,1101,it

Please enter '?' for help.

ready >”

Switch serial line to transmitter – repeater CPU □ OK

Command: “*JF1101,r\_sig\_r”*

Response: “Connect REP”

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□Start CMG operation test, **Start time ( )**

Turn on port 3 (CMG) connection □ OK

Command: *“JF1101,r\_zon 3”*

Response: “JTFF,1101,REP:CONNECT 3”

Switch serial line to transmitter – Port#3 □ OK

Command: *“JF1101,r\_sig\_z”*

Response: “Connect Zonde”

Change Baudrate to 38400 □ OK

Command: *“JC1101,B38400”*

Response: JCALL,1101,00002,B=38400

Switch recording mode to communication mode □ OK

Command: *JF1101, “[ctrl + s]”*

Response: “GSLA 197900 CMG-3TDCommand Mode”

Check mass position □ OK

JF1101, masses?

Response: -26589 27819 27801 ok\_1979

Outputs ( ), ( ), ( )

Switch communication mode to recording mode □ OK

Command: *“JF1101,go”*

Response: JTFF,1101,.・..・.・.・.・・...・....

Change Baudrate to 57600 □ OK

JC1101,B57600

Response: JCALL,1101,00003,B=57600

Switch serial line to transmitter – repeater CPU □ OK

*JF1101,r\_sig\_r*

Response: Connect REP

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All operation tests have finished. Return relay position to the initial position.

*JF1101,r\_exit*

Power down the repeater power supply. □ OK

JC1101,SW,OFF

Response: JCALL,1101,00002,SW=OFF □ OK

**Time ( )**

“prologue.txt” for tiltlogger#2

# prologue.txt for tiltcombo #2 for IODP C6 (line starting from # will be ignored)

# unitid 0

win\_ch\_base 2100

time reset

time sync

#set up ad coefficients

avrtype 1

pga 3

# ch att m/s2/V offset

# att 10/(510+10)=0.01923

# sensor 3mA/G \* 520 ohm =1.56 V/9.8m/s2=

adset 0 0.01923 6.282 16660930

adset 1 0.01923 6.282 16294820

adset 2 0.01923 6.282 16264049

# ch att m/s/V offset

adset 3 1 0.111 16563371

adset 4 1 0.111 15930659

adset 5 1 0.111 16662760

print -ad

ad\_settings

print avr

%30

#test geophone

add geophone

%10

geophone\_shunt 1

%10

avrtype 2

%5

sensor\_power\_on

%30

# start tiltmeter

print lily

add lily

tilt powerup

tilt start

%2

tilt powerdown

%1

tilt powerup

%30

# sahf thermometer start

print -lily

print sahf

add sahf

%1

sahf powerup

%1

sahf start

%70

print -sahf

# after check, disable and power down all sensors

file\_output 0

geophone\_shunt 1

sahf powerdown

tilt powerdown

motor\_power\_off

sensor\_power\_off

aux\_power\_off

# now you can exit

“prologue.txt” for strainmeter#3

# prologue.txt for strainmeter for IODP C06 (line starting from # will be ignored)

win\_ch\_base 2200

forward 0 9600 0

forward\_lineend 0 CRLF

sci\_adj 0 9300 0

time reset

time sync

print ad

print strain

file\_output 0

aux\_power\_off

# set ad coefficient

# ch.no att m/s2/V offset

# sensor strain 2V/mm DT2 1V/mm

# sensor ACC 3A/G\*500 ohm = 1.50V/9.8

adset 0 0.16666 0.5 16617214

adset 1 0.16666 1 16683625

adset 2 0.40000 6.57333 16097432

adset 3 0.40000 6.57333 16395259

adset 4 0.40000 6.57333 16597749

%10

sensor\_power\_on

add paro

# setting a paro coefficient

paro\_coef 117240 8B7000-2 5.823828 -3881.088 -10598.94 -42572.57 1342.731 153786.7 0.037958 30.05372 1.606596 67.30207 212.6822

%20

# connect valve controller

motor\_power\_on

a\_on

%30

# winoutput\_b

#win\_output b

#%10

#dt2\_on

dt2 on

%30

#ACC\_on

cw

brake 100

print avr

%10

avrtype 2

%30

Acoustic modem command list

*Command for acoustic modem CPU (Code: JC1101)*

*JC1101,SW,ON* – Turn on power of the acoustic modem

*JC1101,SW,OFF*– Turn off power of the acoustic modem

*JC1101,B57600* – Change the baudrate to 57600 baud

*JC1101,B38400* – Change the baudrate to 38400 baud

*Command for acoustic modem Buffer (Code: JB1101)*

*JB1101,ID* – Download and show buffer data which have “ID” as the first two characters.

 If you need SAHF data, send “JB1101,SA”

*Command for Repeater CPU (Code: JF1101)*

*JF1101,r\_zon n* – Connect #n port to UMC line. n=1-3, (1=STRAIN, 2=TILT, 3=CMG)

*JF1101,r\_zof n* – Disconnect #n port to UMC line. n=1-3, (1=STRAIN, 2=TILT, 3=CMG)

*JF1101,r\_znp\_on* – Turn on 30 VDC power supply to UMC lines

*JF1101,r\_znp\_of* – Turn off 30 VDC power supply to UMC lines

*JF1101,r\_cur* – Show the value of electrical current (main power line).

*JF1101,r\_volt* – Show the value of electrical voltage (main power line).

*JF1101,r\_ctl\_on* – Turn on power for controlling relays.

*JF1101,r\_ctl\_of* – Turn off power for controlling relays.

*JF1101,r\_sig\_r* – Connect communication line to repeater CPU

*JF1101,r\_sig\_r* – Connect communication line to UMC line (sensor line)

*JF1101,r\_mon n*– Monitor status, voltage, current, and outputs, with n second interval.

n=0 is used for stopping the monitoring.

*JF1101,r\_time*– Show current time

*JF1101,r\_exit*– Disconnect and turn off all connection and power.

Diagram of acoustic modem

