Overview of MR1 Data Processing Survey mv0101 The GENERAL menus contain general information regarding the data processing techniques used during this cruise. SUBJECT MENU NAME DOC FILE -------- --------- -------- 1. How to use DOC files USING DOC FILES $DOC/general/docfiles.doc 2. Operational/personnel info OPS LOG $DOC/general/opslog.doc 3. Info for the party chief PARTY CHIEF $DOC/general/party\_chief.doc 4. Delivered digital data DIGITAL DATA $DOC/general/dig\_data.doc 5. Ideas for improving things IDEAS $DOC/general/ideas.doc 6. Data processing aliases ALIASES $DP/aliases.doc 7. Organization of directories DIRECTORIES $DP/directories.doc 8. Using and making scripts SCRIPTS $DOC/general/scripts.doc 9. How to backup data BACKUPS $DOC/general/backups.doc

Using MR1 Data Processing Doc Files Survey mv0101 CONTENTS 1. Initializing the data processing environment 2. How to use the menus or doc files ######################################################################## 1. Initializing the data processing environment In order to access data processing directories and scripts, you must first configure your terminal by entering the name of the survey. Cruise names can be found in the file $ENV/.aliases For example: kaimana This command is an alias that execute the command source $ENV/kaimana.env which defines all the directory settings, scripts, and aliases that you'll need to process data from this survey. ######################################################################## 2. Using doc files from the desktop pull-down menus What's to learn? The doc files are accessible using desktop window pull-down menus, which are arranged in the order they need to be accessed. So data processing is as simple as pulling open the top menu, doing what it tells you to do, and moving down to the next menu. ######################################################################## 2. Using doc files without the desktop pull-down menus If you don't have access to the menu window system, the following list shows the order of the doc files. SUBJECT DOC FILE ------------------- ------------------------------------------- 1. GENERAL INFO overview $DAR/kaimana/doc/general/ovrvw.doc using DOC files $DAR/kaimana/doc/general/docfiles.doc ops log $DAR/kaimana/doc/general/opslog.doc party chief $DAR/kaimana/doc/general/party\_chief.doc digital data $DAR/kaimana/doc/general/dig\_data.docte ideas $DAR/kaimana/doc/general/ideas.doc aliases $DP/aliases.doc directories $DP/directories.doc scripts $DAR/kaimana/doc/general/scripts.doc backups $DAR/kaimana/doc/general/backups.doc 2. BTYP PROCESSING overview $DAR/kaimana/doc/btyp/ovrvw.doc method $DAR/kaimana/doc/btyp/method.doc btyp hotkeys $DAR/kaimana/doc/btyp/btyp\_hot.doc raw files $DAR/kaimana/doc/btyp/rawfiles.doc btyp gen $DAR/kaimana/doc/btyp/btyp\_gen.doc btyp clip $DAR/kaimana/doc/btyp/btyp\_clip.doc b detect $DAR/kaimana/doc/btyp/b\_detect.doc AA tables $DAR/kaimana/doc/btyp/aatable.doc attributes files $DAR/kaimana/doc/btyp/attr\_files.doc BD TUTOR BD editing $TUTOR/bd\_edit/bd\_edit.doc AA TUTOR make AA tables $TUTOR/aa\_make/aa\_make.doc 3. NAVIGATION overview $DAR/kaimana/doc/nav/ovrvw.doc ship nav $DAR/kaimana/doc/nav/ship\_nav.doc nav plot $DAR/kaimana/doc/nav/nav\_plot.doc wireout $DAR/kaimana/doc/nav/wireout.doc using geomag $DAR/kaimana/doc/nav/use\_geomag.doc layback calc $DAR/kaimana/doc/nav/layback\_calc.doc compass calib $DAR/kaimana/doc/compass/comp\_calib.doc 4. MR1 PROCESSING Overview $DAR/kaimana/doc/MR1proc/ovrvw.doc MR1 cat $DAR/kaimana/doc/MR1proc/MR1\_cat.doc MR1 nav $DAR/kaimana/doc/MR1proc/MR1\_nav.doc MR1 compass $DAR/kaimana/doc/MR1proc/MR1\_compass.doc SS filtering $DAR/kaimana/doc/MR1proc/ss\_filter.doc Apply SS AVG $DAR/kaimana/doc/MR1proc/apply\_AVG.doc Power settings $DAR/kaimana/doc/MR1proc/xmit\_power.doc SS power calib $DAR/kaimana/doc/MR1proc/ss\_power\_calib.doc Tableswitch $DAR/kaimana/doc/MR1proc/tableswitch.doc Make AVG $DAR/kaimana/doc/MR1proc/make\_AVG.doc 5. BATHYMETRY CHARTS overview $DAR/kaimana/doc/bty\_chart/ovrvw.doc MR1 to xyzw $DAR/kaimana/doc/bty\_chart/MR1\_to\_xyzw.doc bty gridding $DAR/kaimana/doc/bty\_chart/bty\_grid.doc page charts $DAR/kaimana/doc/bty\_chart/bty\_page\_charts.doc A0 charts $DAR/kaimana/doc/bty\_chart/bty\_A0\_charts.doc view & print $DAR/kaimana/doc/bty\_chart/bty\_view\_print.doc hourplots $DAR/kaimana/doc/bty\_chart/hourplot.doc 6. SIDESCAN CHARTS overview $DAR/kaimana/doc/ss\_chart/ovrvw.doc chart setup $DAR/kaimana/doc/ss\_chart/ss\_setup.doc ss linesplit $DAR/kaimana/doc/ss\_chart/ss\_linesplit.doc ss gridding $DAR/kaimana/doc/ss\_chart/ss\_grid.doc ss mosaic $DAR/kaimana/doc/ss\_chart/ss\_mosaic.doc A0 charts $DAR/kaimana/doc/ss\_chart/ss\_A0\_charts.doc page charts $DAR/kaimana/doc/ss\_chart/ss\_page\_charts.doc view & print $DAR/kaimana/doc/ss\_chart/ss\_view\_print.doc 7. CHART INFORMATION overview $DAR/kaimana/doc/chart\_info/ovrvw.doc chart box $DAR/kaimana/doc/chart\_info/chart\_box.doc chart labels $DAR/kaimana/doc/chart\_info/chart\_labels.doc RPLs $DAR/kaimana/doc/chart\_info/RPL.doc other data $DAR/kaimana/doc/chart\_info/other\_data.doc misc maps $DAR/kaimana/doc/chart\_info/misc\_maps.doc

Operations Log Survey mv0101 Contents 1 General Information 2 Summary of Survey Events 3 Summary of Delivered Products 4 Survey Objectives and Plan 5 MR1 Settings 6 Breakdown of HMRG crew duties 7 Mobilization 8 Underway Log ############################################################################ 1 General Information Client: US National Science Foundation Purpose: Map the Marianas backarc and forearc adjacent to the area surveyed aboard Moana Wave in 1997 (mw9719). Vessel: R/V Melville Owner: US Navy, Operated by Scripps Institution of Oceanography Master: Chris Curl First Mate: Murray Stein Second Mate: Eric Wakeman Third Mate: Roger Price Chief Eng: Paul Mauricio Electrician: Manny Elliot Cook: Bob Seeley ResTech: Mr. Bob Wilson Seabeam: Mark Silver HMRG Mobilization Team: Steven Tottori Roger Davis Nathan Becker Bruce Appelgate Client Mobilization Team: Bob Wilson (SIO ResTech) ----------------------------------- HMRG Personnel Party Chief: Bruce Appelgate Engineer: Steven Tottori Data Processor: Aisha Morris Data Processor: Nathan Becker Client Personnel Chief Scientist: Patricia Fryer Co-chief: Fernando Martinez Geophysicist: Jim Hawkins Geophysicist: Takemi Ishihara Watchstander: Jim Gharib Watchstander: Katherine Fryer Watchstander: Jan Craven Watchstander: Richard Chang Navigation system: P-Code GPS HMRG Equipment: Container: New (Chinese made) LRS: Green Deck Winch: Yellow Power Pack: Green ############################################################################ 2 Summary of Survey Events Times expressed in Universal Time Local UTC HST -------- -------- -------- 041/1600 041/0600 040/2000 Event Begin End Comment ---------------------- -------- -------- ------------- Mobilize Apia Harbor, Guam 038/0800 041/0600 Depart Apra 041/0600 Drogue away 041/0830 Deploy MR1 041/0830 041/1000 Surveying tow01.01 041/1000 042/0105 Time stamp prob Surveying tow01.01 042/0105 044/0633 Surveying tow01.01 042/0105 042/0216 Switch ACQ to kanoa Surveying tow01.01 042/0216 044/0633 MR1 offline - telemetry probs 044/0633 044/0644 Surveying tow01.02 042/0216 045/0328 MR1 onboard - telemetry probs 045/0328 045/0815 Surveying tow02.01 045/0815 047/0713 MR1 offline - telemetry probs 047/0713 047/1131 Surveying tow02.02 047/1131 053/2248 MR1 offline for Sea Beam survey 053/2248 054/0315 Surveying tow02.03 054/0315 054/1949 Recover MR1 054/1949 054/2130 Drogue aboard 054/2130 Dredging 054/2130 059/2200 Arrive Apra Harbor 059/2200 ############################################################################ 3 Summary of Delivered Products HMRG PF FM JH TI -------------------------------- ---- -- -- -- -- Raw data tapes 11580 - 11595 X X Raw data CDs (32 total) X X Processed data tapes (8 total) X X CD of page-sized charts X X X X X CD of digital photos X X X X X ############################################################################ 4 Survey Objectives and Plan MR1 coverage of the sourthern Mariana backarc, to merge with MR1 survey conducted aboard MW9719. Includes the spreading center, southern rifted boundary with West Mariana Ridge, and the southern Mariana trench at Challenger Deep. MR1 data will be used to guide dredge/wax core ops on the last 3 days of the cruise. ############################################################################ 5 MR1 Settings MR1 Settings used on this survey: Fish Pulse Ping Altitude Width Rate Power -------- ----- ---- ----- 1000 - 5500 5 Full 1500 - 3000 5 14 Full > 3000 m 10 15 Full REFERENCE SECTION: MR1 maximum power / rep rate settings Pulse Ping Width Rate Power ----- ---- ----- 5 4 5/8 \* Fastest you can ping @ 5/8 5ms 5 5 11/16 \* Fastest you can ping @ 11/16 5ms 5 6 3/4 \* Fastest you can ping @ 3/4 5ms 5 7 13/16 \* Fastest you can ping @ 13/16 5ms 5 8 Full \* Fastest you can ping @ Full 5ms 10 12 Full \* Fastest you can ping @ Full 10ms ############################################################################ 6 Breakdown of HMRG crew duties Bruce: Sonar ops; deck ops; sonar QA/QC Steven: Deck ops; engineering Aisha: Data tech (btyp) Nathan: Data tech (btyp) ############################################################################ 7 Mobilization Welding was the big hangup. No forklift during lift, so had to use crane to take HPU and winch out of van. Computers set up and ready by end of second day. Deck gear set up by end of 3rd day, although since we knew we had almost a full 4th day we futzed around fixing minor probs and making lines look pretty. ############################################################################ 8 Underway Log Sat 10 Feb 2001 - JD 041 Local time is GMT-10 Weather: Screaming from NNW @ 30 knots. Whitecaps in the harbor (200 m of fetch) before we left. Sunny though. Forecast: more of same for couple of days, but then settling down. Deployed ~ 2 hours after leaving port. No big problems, although we'll plan on rigging the drogue differently next time. This time we ran it out of a wire cage on the port side, around a capstan, thru a block, and then over the stern on the port side of the LRS. The problem came when the last bit of line went out, Bob Wilson (the SIO ResTech) threw the loops of line off the capstan. We had a strong following sea and the slowest the ship could go without us getting pooped was 3 knots, so there was a lot of tension on the line. It was a little hairy. Next time we'll put a chinese finger on the line and tie it off to a cleat with a quick release. So at the end of the line the chinese finger will take the tension, then we can easily take the line off the capstan and pop the quick release when we're ready. INITIAL FISH DEPTH: 26 meters (same as Kaimana) ACQUISITION TIME PROBLEM The acquisition computer (kaimi) was incorrectly configured for time. System time was set to HST, but the clock had been forced to be local time. The time conversion from BAD KAIMI to GOOD GMT is: BAD KAIMI CORRECT 041/1100 042/0100 Incorrect times were collected for the first 16 hours of the survey before the problem was corrected. ---------------------------------------------------------------------------- Sun 11 Feb 2001 - JD 042 Weather: NNW @ 25 knots. Sunny. Melville has a nice ride to her. Shifted acquisition to kanoa and fixed the time problem on kaimi by editing the /etc/TIMEZONE file, and then synching to the ship's time base by running rdate 199.105.20.13 This is a melville Sun computer that is hooked up to the ship's time server. We can't hook up to the time server automatically without client software that we don't have. Move raw files to have correct file names BAD TIMES mv MR10104019.38 MR10104109.38 mv MR10104020.00 MR10104110.00 mv MR10104021.00 MR10104111.00 mv MR10104022.00 MR10104112.00 mv MR10104023.00 MR10104113.00 mv MR10104100.00 MR10104114.00 mv MR10104101.00 MR10104115.00 mv MR10104102.00 MR10104116.00 mv MR10104103.00 MR10104117.00 mv MR10104104.00 MR10104118.00 mv MR10104105.00 MR10104119.00 mv MR10104106.00 MR10104120.00 mv MR10104107.00 MR10104121.00 mv MR10104108.00 MR10104122.00 mv MR10104109.00 MR10104123.00 mv MR10104110.00 MR10104200.00 mv MR10104111.00 MR10104201.00 GOOD TIMES MR10104201.06 MR10104201.16 . . . The timestamps of individual pings were changed as described in mr1\_cat.doc Got several bunches of telemetry errors, first while doing big turns for our 3-axis magnetometer calibration, then while doing a stbd turn between lines. So we thought maybe they're related to turns. Steve found a loose wire in the topside acquisition computer and fixed it, but we had a series of errors after that. Asked ship if transmitting HF, but they weren't. Sometimes telemetry errors go away by themselves after a couple pings, but Bruce had to stop/restart nmap in one case (just using STOP button on nmap, not exiting, and I didn't reload the fishcode either). ---------------------------------------------------------------------------- Mon 12 Feb 2001 - JD 043 Weather: NNW @ 30 knots. Sunny. Aisha, Nate and Bruce have caught up with processing. Still using provisional AA tables. Telemetry errors continue to be a problem. The system will operate fine for many hours and then suffer a bunch in a row, and the way to make them stop is to halt acquisition, re-download the fishcode, and resume acquisition. Today I fixed the incorrect time stamps recorded on the firsth 18 hours of data. The description of the fix is in MR1\_cat.doc. ---------------------------------------------------------------------------- Tue 13 Feb 2001 - JD 044 Weather: NNW @ 15 knots. Sunny. Continued telemetry errors. We test as many topside systems as we can but to no avail. We thought maybe it was a problem with the DSP board in kaimi, so we switched ACQ to kanoa. But we got telemetry errors there too. The timing of the errors doesn't happen at regular intervals, and doesn't seem to be correlated with any shipboard activity. Hmm maybe it'll go away. ---------------------------------------------------------------------------- Wed V-Day 2001 - JD 045 Weather: NNW @ 20 knots. Sunny with passing rain squalls. After Steve spends a partly sleepless night due to frequent wake-ups to deal with telemetry errors, we decide its time to pull the fish and have a look with the downstairs systems. Recovered at 1330 local and removed the stbd bottle. Once on the bench, of course, the dumb thing works just fine and we can't get it to fail. We tried running a test cable directly to the bottle, and also running the system over the towcable. So we pushed on all the connectors, buttoned it up and put it back in the fish. Re-deployed around 1630 local, and when we powered the fish up while the depressor was still in the LRS we immediately got a bunch of telemetry errors. Steve wondered if they had to do with the umbilical being under tension. We're using a termination that was just installed in Honolulu prior to shipping. Once thing that was easy to do was tape up the pigtail after we made the connection to the umbilical, so Steve took off the protective channel on the clevice, pulled the pigtail out, made sure it was securely mated, and then wound black tape around it. We didn't see any more telemetry errors, and the Chief Scientist said what the heck, deploy it and see what happens. So we did. ---------------------------------------------------------------------------- Thu 15 Feb 2001 - JD 046 Weather: NNW @ 25 knots, decreasing to 10 knots. Hazy, low clouds. Still getting telemetry errors, although less frequently than before, and so far they've occurred singly or in pairs. The Bruce strategy is to immediately reload fish code. Steve likes to simply hit the OK button on the error panel. We're maintaining a log to see if we can possibly relate these dang things to goings-on in the ship. One idea is that there's an appliance in the kitchen that's messing up the electrical when its turned on. Today we: 1. established tape backups 2. started CD backups of raw data 3. finished the azimuthal-dependent magnetic corrections 4. established the ssjob parameters 5. created chart areas 6. made bathy charts 001-006 ---------------------------------------------------------------------------- Fri 16 Feb 2001 - JD 047 Weather: NNW @ 35 knots, rainy, lumpy. A crappy day. Started getting telemetry errors around 1130 local, and they increased in frequency through the afternoon until 1715 local, when they became so bad the shut us down for 2 1/2 hours. We turned the ship around after the errors subsided and re-did that section of line. When the errors were going Steve did some troubleshooting with his scope on the topside telemetry box, but we couldn't ID any problems. We still have no clue why they occur, what starts em, or what stops em. We did a circle to get back on line to where the problems started, and with luck (because we don't think anything WE did was responsible) MR1 began working fine before we got back on line. ---------------------------------------------------------------------------- Sat 17 Feb 2001 - JD 048 Weather: NNW @ 20 knots, partly sunny, seas 3-5 feet. Initial sidescan gridding pau thru jd046. May need to find a better AVG. ---------------------------------------------------------------------------- Sat 18 Feb 2001 - JD 049 Weather: NNW @ 20 knots, partly sunny, seas 3-5 feet. ---------------------------------------------------------------------------- Sat 19 Feb 2001 - JD 050 Weather: NNW @ 20 knots, partly sunny, seas 3-5 feet. ---------------------------------------------------------------------------- Sat 20 Feb 2001 - JD 051 Weather: NNW @ 20 knots, partly sunny, seas 3-5 feet. ---------------------------------------------------------------------------- Sat 21 Feb 2001 - JD 052 Weather: NNW @ 20 knots, partly sunny, seas 3-5 feet. ---------------------------------------------------------------------------- Fri 22 Feb 2001 - 053 Weather: NNW @ 10 knots, sunny, seas 2-4 feet. 053/2248 - MR1 offline for Sea Beam survey of Challenger Deep ---------------------------------------------------------------------------- Fri 23 Feb 2001 - 054 Weather: NNW @ 10 knots, sunny, seas 2-4 feet. Challenger deep ceremony; through over a stainless steel placard that had the ships name welded on it, and all the crewmembers signed. During Sea Beam survey we ran some tests to obtain data to troubleshoot the external sync problem. Sea Beam rep rate was 26-29 seconds, so we couldn't set the MR1 rep rate higher than the sync. So Steve rigged a function generator to provide an input pulse that we could control. Ran tests with input rep rate set to 8 sec, and MR1 rep rate set at different rates, from 12 to 20 sec. Found that MR1 xmit cycles varied depending on what the MR1 rep rate was set to, and that the length of each ping varied. For a given MR1 rep rate, ping legnths varied in a regular pattern (eg., 7s,7s,7s,3s,7s,7s,7s,3s etc). Also that if you halt/restart MR1 at the same rep rate, the pattern you get will be different, we think depending on \*when\* in the external sync cycle you start nmap. MR1 hardware all checks out fine; looks like a problem with nmap. 054/0315 MR1 online again, surveying HMRG Power Pack / Melville Power Problem We've noticed that the power pack cuts out sometimes while its running. A few days ago Steve worked on this problem and found that the softstart controller card was fried, and he replaced it with the spare that he had luckily dug out of the CEROS van at Snug before we came out. Today we noticed that the HPU was \*still\* cutting out, and Steve determined that the Melville's power is noisy enough that the softstart loses phase lock and tries to shut the motor off. Then the line noise goes away, the soft start recognizes phase lock, and starts the motor again. The result: WEEEEE, rrrrrr, WEEEEE, rrrrrr, WEEEEE.... The power problem may have fried our original softstart controller. To get around this problem, Steve bypassed the soft start controller. The ship's breaker is set up to handle the big current at startup, so it should start/run fine now. Manny the electrician says that the Revelle has a separate bus from the ship's service, so doesn't have the noise problem, and our soft start should work OK on Revelle. 054/1949 Begin hauling wire for MR1 recovery 054/2005 Depressor aboard 054/2030 MR1 aboard 054/2130 Drogue aboard A nice recovery. ---------------------------------------------------------------------------- Sat 24 Feb 2001 - 055 Weather: NNW @ 5 knots, sunny, seas 1-2 feet. Dredge ops (0-for2) Went over advanced data processing with Aisha Began writing method to automatically scale MR1 sidescan data ---------------------------------------------------------------------------- Sun 25 Feb 2001 - 056 Weather: NNW @ 5 knots, sunny, seas 1-2 feet. Dredge ops Finished method to automatically scale MR1 sidescan data. Rescaled jd 050 onward ---------------------------------------------------------------------------- Mon 26 Feb 2001 - 057 Weather: NNW @ 5 knots, sunny, seas 1-2 feet. Dredge ops Created new, better AA tables and applied them to the bathy data. Finished upgrade to bathy noise suppression (bty2xyzw) and gridding (btygrid\_utm) ---------------------------------------------------------------------------- Tue 27 Feb 2001 - 058 Weather: NNW @ 20 knots, sunny, seas 4-6 feet. Dredge ops Applied new noise suppression and gridding to bathymetry. Started creating final deliverable page charts and digital images. ---------------------------------------------------------------------------- Wed 28 Feb 2001 - 059 Weather: NNW @ 15 knots, sunny, seas 3-5 feet. Waxing the glass off the seafloor Heading for the barn.

MR1 Data Processing Scripts Survey mv0101 CONTENTS 1. Location 2. ISO-9003 format ########################################################################## 1. Locations of scripts A complete scripts directory should be created for each survey. Usually a new scripts directory is created by copying the contents of the previous survey's scripts directory. The scripts directory is located beneath $CRUISE. To get there, you need to initialize your environmental variables like so ew9606 and then type the magic word thusly: scripts and there ya go. In this case (at HMRG), you go to /home/kaulu5h/hmrg\_dar/ew9606/scripts ALL the scripts that you use to do ANYTHING to ANY data from this cruise, EVER, go here. ########################################################################## 2. ISO-9003 format It is decreed that all scripts will be internally documented at a level to pass the Appelgate test. This test is easily performed: give the script to Bruce, and if he can figure it out you pass. At a minimum, all scripts should include: 1. a header that describes what the script does 2. a list of command-line arguements 3. a copyright 4. an example of how to invoke the script 5. a list of all other scripts and programs called within the script 6. an automatic help function 7. enough internal description of what's going on so as not to confuse Bruce Here's an example: #backup\_sschart odd\_even tape\_device # : :.........../dev/rmt/0n or /dev/rmt/1n # :.....................tape number # Copyright 1998 Hawaii Mapping Research Group. All rights reserved. # Daily backup script. Run this using different tapes on # alternate days. Tape labelling convention is "sschart 1" and # "sschart 2", with the odd numbered tape used on odd numbered # julian days. # Behavior: # 1. Creates a tar file for each of the subdirectories beneath $CHART/ss # 2. Does not backup individual files within the $CHART/ss directory # 3. Tar file 0 contains the TARME job used to create this backup # Automatic help function if( $#argv < 2 || $1 == "h" || $1 == "help" ) then echo " " head -16 $0 goto end endif # Set up... set tapenum = $1 set tape = $2 set bupdate = `date '+%y.%j'` set outfile = $ARCHIVE/$PROJ.$bupdate.sschart.$tapenum cd $CHART/ss # Check for valid tape device: if (($tape != "/dev/rmt/0n") && ($tape != "/dev/rmt/1n")) then echo " " echo "Invalid tape device. Use /dev/rmt/0n or /dev/rmt/1n" goto end endif # Write header of ARCHIVE file... echo Backup of seagoing files using backup\_sschart on `date` > $outfile echo GMT Julian Day `date '+%j'` >> $outfile echo host computer: `hostname` >> $outfile echo " " >> $outfile # Write header of TARME... mt -f $tape rewind echo "#TARME" > TARME echo "# Backup of seagoing files using backup\_sschart on "`date` >> TARME echo "# GMT Julian Day "`date '+%j'` >> TARME echo " " >> TARME # Write tar commands as first tar file on backup tape... echo "Constructing tar job..." set file = 0 echo "echo Tar file "$file >> TARME echo "tar -cvf $tape TARME" >> TARME echo "Tar file "$file": "TARME echo "Tar file "$file": "TARME >> $outfile # Write contents of control file as successive tar files... set file = 1 /usr/bin/ls -l | sed '/drwx/\!d' | awk '{print $9}' > tmp0 foreach dir (` cat tmp0 `) echo "Tar file "$file": "$dir echo "Tar file "$file": "$dir >> $outfile echo "echo Tar file "$file >> TARME echo "tar -cvf $tape "$dir >> TARME @ file++ end # Write the tar file using TARME... echo "Writing tar files..." echo " " >> $outfile echo "Files written to tape:" >> $outfile echo " " >> $outfile chmod +x TARME TARME >>& $outfile # Cleanup... if ($OSTYPE == "IRIX") then mt -f $tape rewind mt -f $tape unload else if ( $OSTYPE == "SunOS" ) then mt -f $tape rewind mt -f $tape offline else mt -f $tape rewind endif /bin/rm TARME tmp0 echo "Backup pau." # All pau end:

Backup Schedule for Shipboard Computers Survey mv0101 1. Philosophy 2. Cookbook ####################################################################### 1. Philosophy DAILY BACKUPS Once processing gets going, backups should be run daily. Use two sets of tapes, with one set used on odd days and the other set on even days. FINAL BACKUPS After shipboard data acquisition/processing is pau, make two complete sets of backup tapes so that the final shipboard data are all backed up. PROCEDURE Backups are written from scripts that use the tar command. For fastest transfer to tape, write the tapes on the same machine where the data reside. In the cookbook below, the preferred machine is indicated. As each backup tape is written, the contents of the tape are listed in log files in the $ARCHIVE directory. Log files are automatically created by the backup script, and use the following file name convention: cruisename.year.julian\_day.backup\_type.tapenumber For example: ODD days: EVEN days: backup\_misc 1 /dev/rmt/0n backup\_misc 2 /dev/rmt/0n creates: creates: $ARCHIVE/japanus.98.224.misc.1 japanus.98.224.misc.2 ALWAYS INSPECT THE LOG FILE FROM EACH BACKUP TO MAKE SURE THERE WERE NO TAPE ERRORS. ############################################################################ 2. COOKBOOK For fastest transfer to tape, execute the backup scripts on the same machine where the data reside (its perfectly OK to do backups on other machines as well, just not as fast). You can issue the backup commands from any working directory -- the scripts know where to find the data and where to write the log files. Usually done in this order, here they are: Data to backup Machine Command 1/2 device name -------------- ------- ------- --- ----------- Users directories MALEI backup\_users 2 /dev/rmt/0n Miscellaneous directories MALEI backup\_misc 2 /dev/rmt/0n Processed MR1 - raw MALEI backup\_praw 2 /dev/rmt/0n Processed MR1 - intermediate MALEI backup\_pint 2 /dev/rmt/0n Processed MR1 - final MALEI backup\_pint 2 /dev/rmt/0n XYZ directory MALEI backup\_btyxyz 2 /dev/rmt/0n Bathy chart directory MALEI backup\_btychart 2 /dev/rmt/0n Sidescan grid directory MALEI backup\_ssgrid 2 /dev/rmt/0n Sidescan chart directory MALEI backup\_sschart 2 /dev/rmt/0n IMPORTANT! After each backup is finished, check to make sure the files were written to tape correctly by looking at the backup log in the $ARCHIVE directory like so: more $ARCHIVE/japanus.98.299.btyxyz.2 or grep error $ARCHIVE/\* | grep tar If you see messages that look like this: tar: /dev/rmt/0n: I/O error or any other kind of error message, try re-running the backup job. If that fails, try using a new tape. If that fails, ...you get the picture. set col = red backup\_praw $col /dev/rmt/0n backup\_pint $col /dev/rmt/0n backup\_pfin $col /dev/rmt/0n backup\_btyxyz $col /dev/rmt/0n backup\_btychart $col /dev/rmt/0n backup\_sschart $col /dev/rmt/0n backup\_ssgrid $col /dev/rmt/0n backup\_users $col /dev/rmt/0n backup\_misc $col /dev/rmt/0n grep error $ARCHIVE/\* | grep tar For final backups: set col = blue.final set col = red.final

Information for the HMRG Party Chief Survey mv0101 Pre-Deployment stuff 1. Startup gpsrd to log GPS data onto malei's hard drive. See $DOC/nav/ Deployment stuff 1. When towfish is at surface, note the depth value indicated in the nmap window. If this is not zero, then you'll need to enter an offset value in mrd so that the correct depth is shown. For example, if the depth sensor in nmap is 25.0 (about usual for the depth sensor in MR1 during AJC), then enter a DC offset of -25.0 in mrd's bathy attributes window. ALSO, make sure that you use this offset in btyp -- put it in the attributes file. 2. Bring the transmit power up gradually -- have Mark show you how. 3. Make sure you know how many turns you have out. The counter is broken on AJC, so you've got to count turns manually. Once the survey gets going, if you need to haul or pay wire make sure the engineer records how many turns how many turns go in or out. Put it in wireout.doc. 4. Check to make sure the clock on the acquisition computer is in sync with the incoming GPS nav (use the GPS time stamp, not the clock on the nav PC). If they're not in synch, login as root on the acquisition computer and run the HMRG program tmskew to change the clock. Check this periodically throughout the survey. On AJC leg 1 the clock was adjusted the first day, and only drifted 2 seconds over the next 45 days. 5. Starting the MR1 acquisition program nmap: - Power up the system (blue power supply in black rack). When its working correctly, the voltage should read ~ 220 and the amperage ~ 0.26. - On the primary acquisition computer (kaimi), login as navmap (password is mr1ops). In the navmap home directory, type "more start\_stuff" to see how to start the three main programs: nmap, mrd and mrt. - Start nmap. The blue control panel will appear. Now do this: \* Select LOAD. A control panel will appear. Press PORT, and make sure that the fish code downloads properly (the MR1 log screen will say either "download complete" (good) or "download fail" (bad) ). Repeat for STBD. \* If download fails, exit from nmap, cycle the power, and try again. If it still fails, get Mark. \* If download works, then do this: Select PING RATE -> 10 Select INTERNAL TRIGGER Select PULSE WIDTH -> 5 ms Select ENABLED (port & stbd should be checked) Select TRANSMIT (port & stbd should be checked) Select POWER -> LOW Select GAIN -> 36db Select RUN (top left corner, looks like stop sign) \* The system will begin transmitting (green bar starts moving). - Start the display program mrd using the directions in start\_stuff. If you ever stop mrd, remember to first SAVE the current attributes. Name them after the current time, and save them in the ~hmrgsoft home directory. Edit the start\_stuff file to indicate the most recent mrd attributes file so that when you start it up again the display looks bueno. - Start the tape logger program mrt. It is currently set up to record 24 hours of data per tape, which works fine and saves tapes. 6. DANGER! When nmap is running on kaimi, do not use the mouse to click and drag windows. If you hold the mouse button down for "too long" (where "too long" equals about a second) then you get a buffer overflow that causes data to be lost. When I start mrd and mrt I'll quickly move a window where I want it on the screen, then wait a ping or two, and then move the next window. Once they're set up, don't mess with them. Quick clicks don't seem to be a problem. The Daily Grind: Steam some espresso Fortify yourself with a nice robust cup Follow the order of the pull-down menus: Do the previous day's ship navigation (20 minutes) Follow the instructions in the doc file; if you're setting up a scheme from scratch, refer to the different methods used on previouse surveys. Print the regional nav track chart, and check out where new charts need to go Create the .box files for any new charts Create the labels for any new charts Create regional nav track chart showing new charts Create page-size chart nav for each new chart Navigate the bathymetry files (10-20 minutes) Check for any changes in wire out, or deployments or recoveries that require you to break bathy files apart. If you've got 'em, break 'em as shown in the bty\_cat doc file Navigate the bathy files as per the bty\_nav doc file Make compass corrections on the bathy files (10 minutes) Follow the directions in bty\_compass Do some QA/AC (50 minutes) Before converting to XYZ, I like to inspect each bathy file to make sure they're trimmed the way I want, and to check for other problems. I run a for/each loop to view the bathy in btyp. If I trim a file, I save it out as a temp file that I later rename to the original .btywtnc name Make bathy charts (1 to 4 hours, depending on tables) Convert bathy to XYZ -- this is a batch job that takes long enough to make another cup of coffee Grid the bathy -- another restfull batch job that takes as long as you've got new charts to grid Make page size charts. The point of this is to use closely-spaced countours so you can easily see problems with tables, nav etc. I like to use a wrapping color table, with color changes at 1% of water depth. If the page size charts show along-track artifacts, find a flat looking spot and use MFE to make new tables. Switch the tables of the processed data folling the method in tableswitch.doc. Regrid and make new page-size plots to see if the tables worked. Repeat until they do. Make A0 size charts. The GMT script that makes the A0 charts also generates ASCII contour dump files that Racal uses to import into their charting program Transfer the bathy contours to ulua for Racal Use WS\_FTP on ulua, which has an alias to the AJC chart directory Transfer all new racal.cont chart files Transfer the $PARMS/chart/boxes file, which they use to grab the chart info Racal will put the contours into their ChartX program and print the charts on the hp755b plotter. Get distracted by Racal guys (90 minutes) Inspect, split and trim the sidescan files (60 minutes) Split files if necessary: Check for any changes in wire out, launch/recovery, or changes in transmit power settings. For power settings, look at the real-time Log file displayed on the acquisition computer. When found, you'll need to split the file so that each part is processed (or excluded) appropriately. All the file splitting is documented in ss\_cat.doc. As I do my splitting, I look at each file in btyp before doing anything to it, and after I've done the split. Trim swath edges if necessary: Files require manual edge trimming if they extend wider than the acoustic horizon, or if the multiple noise is so great that data beyond the multiple is unusable, or if the file contains a change in ping rate. In the latter case, I trim the wider part of the swath so that the change in swath width is gradual rather than abrubt. Manual edge trimming of sidescan can be done in btyp now. Process the sidescan files (30 minutes) Execute the sidescan image processing steps that you've set up for this survey using the ssjob\_ajc\_## script Navigate the ss files as per the ss\_nav doc file Run the compass correction on the sidescan files Make an AVG correction Follow the directions in make\_avg.doc. On some cruises I'll re-generate a new AVG every day, using all the previous data. Sometimes (like on AJC) I stop making new AVG tables after a few days, and only make new ones if the data require it. The important thing in making AVG tables is that when you make the tables, be sure to include data that contain the deep and shallow extremes of your data set. Also, if you use a bunch of data that contain strong specular reflections or strong multiples, you can introduce along- track striping in the corrected files. Apply the AVG correction Yeah. Apply amplitude corrections Its called "apply\_gain.doc", but that's a misnomer since we don't do gain in the traditional sense. The point of this step is to normalize your sidescan amplitudes to some level, which for AJC I defined as the echo you get from a 5 ms pulse at full power. To calculate the corrections I looked at AVG'd files where there were changes in power settings, and used the scale tool in SSP to normalize the parts of data on either side of the power change. Also, there appears to be a difference in amplitude between port & starboard when using a 5 ms pulse, but not when using a 10 ms pulse. This gets corrected here too. Add today's files to the control file ss\_proc -> power settings, and include the power and pulse width Run the loop in ss\_proc -> apply\_gain Finally, take one last look at each file in SSP using the loop at the end of apply\_gain.doc to make sure its all OK before you go to gridding. Grid the Sidescan (1 to 2 hours per chart) Figure out which hour files go in each of the charts you want to grid. To do this I use the navigation charts made in the nav\_plot step. Use the examples in the ss\_grid.doc file as a guide for doing this. Grid each new sidescan chart at 84 meters, which is pretty fast. Gridded data and .cf files will go to subdirectories beneath $SSGRID. Mosaic each of the 84 m grids. Again, this is fast and allows you to doink with the control file to get the overlay sequence you want without wasting too much time. If you run the mrovl script remotely on malei while you're in front of kanoa, you'll need to have the person on malei type in "xhost +" for mrovl to work. For an example of a nightmare chart to construct a control file for, check out AJC.100-004's .cf file. Once you're satisfied... Grid each chart at 16 meters. Note that there are different scripts to grid at 16 m, gridss\_ajc\_16m and gridss\_ajc\_16m\_kanoa. The first is for running on malei (where the SSGRID and SSCHART directories are). The difference is required in order to specify a temp file on kanoa if that's where you run the grid job. Otherwise its super slow. Use your 84m .cf file as a guide to modifying your 16m .cf file. After its ready, run the mrovl\_ajc\_16m or mrovl\_ajc\_16m\_kanoa script to moasic em. Visually inspect for goodness. Make sidescan charts (10 minutes your time ; 60 minutes computer time) Follow the directions in ss\_chart -> A0\_charts.doc to add the GMT frame to the sidescan raster, and prepare the final product for plotting on hp755a. Print the sidescan on mylar (hp755a). Backing up the data Remember your daily backups -- get a factotum to do the work for you The SSGRID backup will fail once there are more than ~50 directories (25 charts). So after you've got the first 25 finalized, create final backup tapes and remove them from SSGRID. I usually move them to SSGRID2 or SSGRID3 so I can still access them if I want. At the end of the survey, after all the data processing is pau, make dual backups of all the data, and label the tapes FINAL. Do the misc tape last. Giving data to the client Document everything you do, every day, in opslog.doc.

Ideas.doc Survey mv0101 The following are suggestions, questions, and bug reports from the seagoing party. ############################################################################ 01 BTYP BUG In btyp, with bd, bty and ss generated. Screen has bd and ss displayed. Use "n" to select a range of pings. In ss window, press "g" to regenerate that range of pings. In Cancel/Confirm dialog popup, press "Confirm" using the middle mouse button. Program crashes with the following message: X Error of failed request: BadValue (integer parameter out of range for operation) Major opcode of failed request: 91 (X\_QueryColors) Value in failed request: 0x68686c Serial number of failed request: 1561704 Current serial number in output stream: 1561704 ############################################################################ 02 New Boat Kilamoana needs: 1. Soda machine like on Melville 2. Espresso machine like on no other vessel 3. Rowing maching 4. Big flat panel displays in geophysical lab ############################################################################ 03 BTYP BUG When you use the "p" hotkey to flip a ping on the stbd side, the bathy values for the PORT side change too. Vice versa works the same way. This is wrong.

MR1 Data Processing Using BTYP Survey mv0101 The BTYP menus contain information on how to process MR1 data using the program btyp. SUBJECT MENU NAME DOC FILE -------- --------- -------- 1. How to be a data processor METHOD $DOC/btyp/method.doc 2. Using btyp's hotkeys BTYP HOTKEYS $DOC/btyp/btyp\_hot.doc 3. Ideas for improving things IDEAS $DOC/general/ideas.doc 4. Accessing raw MR1 files RAW FILES $DOC/btyp/rawfiles.doc 5. Log: btyp commands BTYP GEN $DOC/btyp/btyp\_gen.doc 6. Log: min/max bathy values BTYP CLIP $DOC/btyp/btyp\_clip.doc 7. Log: bottom-detect info B DETECT $DOC/btyp/b\_detect.doc 8. Creating AA tables AA TABLES $DOC/btyp/aatable.doc 9. Setting up attributes files ATTRIBUTES $DOC/btyp/attr\_files.doc 10 Primer: Edit bottom detects BD TUTOR $TUTOR/bd\_edit/bd\_edit.doc 11 Primer: Make an AA table AA TUTOR $TUTOR/aa\_make/aa\_make.doc #########################################################################

How To Process HAWAII MR1 Data using BTYP Survey mv0101 CONTENTS 1 Your mission as a data processor 2 Overview of BTYP and its products 3 Open a raw file in btyp..................................RECORD btyp command 4 Generate a bottom detect curve for bathymetry 5 Generate bathymetry......................................SAVE .bdb In $DOC/btyp/b\_detect....................................RECORD .bdb values 6 Flip/unflip bathymetry pings (if necessary) 7 Generate sidescan 8 Edit sidescan bottom detect (if necessary)...............SAVE .bds When satisfied...........................................SAVE .btyw In $DOC/btyp/b\_detect....................................RECORD .bds values 9 Regenerate bathymetry to clip max/min In $DOC/btyp/btyp\_clip...................................RECORD clip depths 10 Trim outer edge of bathymetry swath......................SAVE .btywt 11 ISO 2003 quality control 12 Move the processed files to JD directories ------------------------------------------------------------------------- 1 Your mission as a data processor As a data processor, your primary jobs are: A Copy each MR1 file from the logging computer onto the processing computer as soon as each MR1 file closes (after the hour). B Process the MR1 data file using btyp C Maintain documentation files for parameters that you will modify for each MR1 file This file will provide an overview of how to do the btyp processing. ------------------------------------------------------------------------- 2 Overview of BTYP and its products Raw MR1 data files contain data that are processed to create both bathymetry and sidescan. This conversion of raw acoustic data into bathymetry and sidescan is performed using the graphical program BTYP. There are several types of files that are output from BTYP processing. Output files from btyp will include: filename.bdb - bottom detect file used to generate bathymetry filename.bds - bottom detect file used to generate sidescan filename.btyw - Processed MR1 that contains bathymetry (with no edge trimming) and sidescan filename.btywt - Processed MR1 that contains bathymetry (with manually trimmed edges) and sidescan ------------------------------------------------------------------------- 3 Open a raw file in btyp All your data processing will take place in the $RAW directory, and the first thing you need to do is copy a raw MR1 file into this directory. For detailed instructions, see the file $DOC/btyp/rawfiles.doc Open the doc file $DOC/btyp/btyp\_gen. This is where every btyp command is saved (by you). Scroll to the bottom of the btyp\_gen doc file, and compose a btyp command line for this hour file, using the settings from the previous hour file. A btyp command line will look like this: btyp MR10011808.00 -attr $PARMS/proc/ajc.btyp.00.attr -bdg & In a terminal window, cd to the $RAW directory. Copy the btyp command line from the doc file and paste it into the terminal window to start btyp. RECORD your btyp command line in the $DOC/btyp\_gen.doc file by selecting File -> Save (needed) in the btyp\_gen text window. ------------------------------------------------------------------------- 4 Generate a bottom detect curve for bathymetry A look ahead: We'll maintain two sets of bottom detects, one for bathy and one for sidescan (see $TUTOR/bd\_edit/bd\_edit.doc for explanation). Different bottom detects are used because bathymetry and sidescan use the bottom detect information differently. Bathymetry is pretty insensitive to BD, as long as the BD occurs at or slightly before the true first return. This is because bathy only uses the BD to start processing phase data. In contrast, sidescan is very sensitive to the position of the BD. This is because sidescan uses a flat-bottom assumption to calculate cross-track pixel positions. If btyp was invoked using the -bdg option, the bottom detect will be automatically generated using the parameters stored in the specified attributes file, and you'll see the bottom detect in the top window. If not, then you need to generate a bottom detect manually. Select Bottom Detect => Attributes, and make sure that the relative threshold is equal (or similar) to the value used for the previous file (documented in $DOC/b\_detect.doc). Then generate the bottom detects by selecting Bottom Detect -> Generate. Use the graphical display to make sure the bottom detect curve is reasonable. A reasonable bottom detect has no outliers, and begins at the same depth that the last file ended. ------------------------------------------------------------------------- 5 Generate bathymetry Select Bathymetry => Attributes => Acoustic Ensure Bottom Detect Source is set to Dual. Calculate a cell width equal to 4% of the average bottom detect depth, and type it in the "Cell Width" box. Select -> Apply Select Bathymetry => Generate Inspect bathymetry for degradation indicative of changing properties (such as water depth) that require new processing parameters. If a new set of parameters is created, save the parameters according to the existing filename convention (look in the $PARMS/proc directory for examples), and move the new parameter file into $PARMS/proc. Evaluate the bottom-detect: for bathymetry, you want a bottom detect curve that follows the earliest observed return from the bottom and has no high or low spikes. Make sure the BD value for the first ping is consistent with the last BD value of the previous hour file (use $DOC/b\_detect.doc to check) RECORD the bottom detect values in $DOC/b\_detect.doc Bottom Detect => Data Bounds (while bathy is showing in lower window) SAVE the bottom detect for bathy with the suffix .bdb Bottom Detect => Save ------------------------------------------------------------------------- 6 Flip/unflip bathymetry pings (if necessary) Inspect bathymetry for pings that need to be manually flipped or unflipped. If you find such a ping, select Bathymetry -> Flip (or Unflip). Then position your cursor over the ping to be flipped and click the left button to flip the ping. To get out of ping flipping mode, click the right button. ------------------------------------------------------------------------- 7 Generate sidescan Select Sidescan => Generate, and when the image is displayed, check it for image effects attributable to incorrect bottom detect values. Use the near-nadir sidescan quality to guide further manual editing of the bottom detects. ------------------------------------------------------------------------- 8 Edit sidescan bottom detect (if necessary) Sidescan imagery near nadir is sensitive to the bottom detect used, and incorrect (early or late) bottom detect values produce predictable patterns. In rugged terrain, several iterations of editing and regenerating sidescan may be required to produce a satisfactory bottom detect. For detailed info on how to edit and evaluate bottom detects, see the file $TUTOR/bd\_edit/bd\_edit.doc. Remember to edit both port and starboard bottom detects if necessary, because each side uses its bottom detect independently of the other. When you are satisfied with the quality of the sidescan image, SAVE the ss bottom detect for sidescan with the suffix .bds Bottom Detect => Save SAVE the MR1 file with the suffix .btyw Select Output, make sure the suffix is .btyw, and hit Save RECORD the ss bottom detect values in $DOC/b\_detect.doc Bottom Detect => Data Bounds (while ss showing in the bottom window) ------------------------------------------------------------------------- 9 Remove speckle noise with histogram Sometimes there's speckle noise in the bathymetry (unrealistically deep and shallow points), which will screw up subsequent filtering and imaging. These points should be removed in btyp by setting the minimum and maximum depth values in the Bathymetry Histogram window using the Adjust function. Adjust these settings so that when you do a Bathymetry -> Clip in the bathymetry portion of the main btyp window the speckle goes away. Be careful! If you clip too much you can lose real data, so use the sidescan as your guide to see where features really exist. Rule of Thumb: Minimum depth There are ususally few to no unrealistically shallow points, so the minimum depth should be set to 500m for all files, unless the hour file crossed over a feature which was shallower than 500m. Rule of Thumb: Maximum depth Quite often there are noisy data that have depth values equal or greater than twice the nadir depth. This noise comes from the arrival of the acoustic multiple. Use the histogram tool to set max/min starboard and port depths. Then click 'c' in the BTYP window to execute the clipping. ------------------------------------------------------------------------- 10 Trim outer edge of bathymetry swath and save .btywt Frequently the outer part of the swath exhibits curl or scatter that needs to be removed for Best Results. You can interactively trim files within btyp by selecting the Bathymetry => Delete => Swath Edge option, and then trimming the file. It is often useful to use the sidescan to help constrain what to trim. By holding down the shift key and clicking with the left mouse button you can toggle between the bathymetry and sidescan. Rule of Thumb: For depths less than 3333 meters, the edited swath width should be at least three times water depth. At greater depths, three times water depth is often not attainable due to transmission losses, but you should shoot for at least a 10 km full swath width. When pau... SAVE the MR1 file with the suffix .btywt Select Output, make sure the suffix is .btywt, and hit Save Don't exit the program yet, its time for ISO 2003 quality control... ------------------------------------------------------------------------- 11 ISO 2003 quality control Make sure that you have - recorded the btyp command file in the $DOC/btyp\_gen file and SAVED THE $DOC/btyp\_gen FILE - recorded the beg/end values of the ss and bathy BDs in $DOC/b\_detect and SAVED THE $DOC/b\_detect FILE Now you can EXIT BTYP. ------------------------------------------------------------------------- 12 Move the processed files to JD directories Bottom-detect files go into the $BD directory: mv \*.bd\* $BD/bd--- (where --- is the julian day number) Processed MR1 bathy goes into the $BTYR directory, under the appropriate day subdirectory (it might be necessary to make a new directory before moving the files) : mv \*.bty\* $PRAW/praw--- (where --- is the julian day number) set jd = 054 if !( -d $BD/bd$jd ) mkdir $BD/bd$jd ; mv \*.bd\* $BD/bd$jd if !( -d $PRAW/praw$jd ) mkdir $PRAW/praw$jd ; mv \*.bty\* $PRAW/praw$jd That wraps up the initial data processing in btyp. Pek Wajah Baru!. Qing ni he yi ping pijou.

Getting and Using Raw MR1 Data Survey mv0101 ###################################################################### 1. Copying from acquisition computer to processing computer After each hour file is acquired, use FTP to transfer the data from the acquisition computer to the $RAW directory, like this: on malei... cd $RAW ftp kaimi ftp> name: navmap ftp> password: mr1ops ftp> cd /export/kaimi0h/navmap/raw ftp> binary ftp> ls ftp> get rawfile ftp> get Logfile ftp> bye Now move any Log files from $RAW to $RAWLOG... mv Log\* $RAWLOG ######################################################################

Bathymetry generation in BTYP Survey mv0101 This file records each hour file's btyp command line, showing the parameter files and angle-angle tables used to generate each processed hour file. Set up and save each hour file below -- you can copy the command line into a command window to execute it. ############################################################################ Attributes and tables... AA tables used for acquisition and initial shipboard processing. Note that all parameter files should be stored in the directory $PARMS/proc. Initial attributes file copied from rs9401r (most recent previous processing). INITIAL PROCESSING: Beg End Time Time Attributes Tables Comment -------- -------- ------------------------- ---------- --------------- 041/1000 044/2359 mv0101.255.2100.btyp.attr 24402.01 start w/ kaimana 041/1000 051/0400 mv0101.045.0000.btyp.attr 24402.01 new BD filt length 051/0400 044/2359 mv0101.051.0400.btyp.attr 24402.01 new phas %, filt angl ############################################################################ JD 041 btyp MR10104110.00 -attr $PARMS/proc/mv0101.041.1000.btyp.attr -bdg & btyp MR10104111.00 -attr $PARMS/proc/mv0101.041.1000.btyp.attr -bdg & btyp MR10104112.00 -attr $PARMS/proc/mv0101.041.1000.btyp.attr -bdg & btyp MR10104113.00 -attr $PARMS/proc/mv0101.041.1000.btyp.attr -bdg & btyp MR10104114.00 -attr $PARMS/proc/mv0101.041.1000.btyp.attr -bdg & btyp MR10104115.00 -attr $PARMS/proc/mv0101.041.1000.btyp.attr -bdg & btyp MR10104116.00 -attr $PARMS/proc/mv0101.041.1000.btyp.attr -bdg & btyp MR10104117.00 -attr $PARMS/proc/mv0101.041.1000.btyp.attr -bdg & btyp 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$PARMS/proc/mv0101.051.0400.btyp.attr -bdg & btyp MR10105419.00 -attr $PARMS/proc/mv0101.051.0400.btyp.attr -bdg &

Bottom-detect creation in BTYP Survey mv0101 This file is used to record data relevant to generating bottom detects in btyp. We use sidescan imagery to evaluate the acceptability of the bottom detects. Sidescan imagery near nadir is sensitive to the bottom detect used, and incorrect (early or late) bottom detect values produce predictable patterns. In rugged terrain, several iterations of editing and regenerating sidescan may be required to produce a satisfactory bottom detect. For a detailed description of how to edit and evaluate bottom detects, see the bd\_edit.doc file in $TUTOR/bd\_edit/bd\_edit.doc (or pull down menu under btyp -> BD\_tutor) Important Stuff: 1. Make sure that the beginning depth of the MR1 file you're working on is the same as the ending depth of the previous file, if they don't match... make them. 2. Remember to record the begin/end bottom detect values used for both bathymetry and sidescan, which may be different ################################################################################ Sidescan | Filtlen/ | Bathymetry | Depth file-name | Thrshval | pbeg pend sbeg send | pbeg pend sbeg send |Src ------------ | ---------- | ---- ---- ---- ---- | ---- ---- ---- ---- |--- MR10104110.00 10/.05/.08 3072 3697 3072 3619 3072 3617 3072 3619 D MR10104111.00 10/.05/.08 3695 3585 3612 3593 3695 3585 3612 3593 D MR10104112.00 10/.05/.08 3585 ---- 3593 ---- 3585 ---- 3593 ---- D MR10104113.00 10/.05/.08 3218 3509 3222 3511 3218 3509 3222 3511 D MR10104114.00 10/.05/.08 3504 3517 3506 3514 3504 3517 3506 3514 D MR10104115.00 10/.05/.08 3501 3464 3490 3465 3501 3464 3490 3465 D MR10104116.00 10/.05/.08 3469 3666 3465 3664 3469 3666 3465 3664 D MR10104117.00 10/.05/.08 3675 3883 3677 3909 3675 3883 3677 3909 D MR10104118.00 10/.05/.08 3909 4656 4007 4656 3909 4656 4007 4656 D MR10104119.00 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MR10105412.00 10/.05/.08 7725 7501 7723 7482 8012 7675 8075 7695 D MR10105413.00 10/.05/.08 7478 6910 7478 6910 7510 6978 7510 6978 D MR10105414.00 10/.05/.08 6607 6894 6607 6894 7510 6978 7510 6978 D MR10105415.00 10/.05/.08 5888 4150 5888 4150 5960 5260 5960 5260 D MR10105416.00 10/.05/.08 4157 3866 4157 3866 4181 3889 4181 3889 D MR10105416.00 10/.05/.08 3867 3829 3867 3829 3915 4041 3915 4077 D MR10105417.00 10/.05/.08 3829 3968 3829 3968 3834 4067 3834 4406 D MR10105418.00 10/.05/.08 3829 3968 3829 3969 3834 4067 3834 4067 D MR10105419.00 10/.05/.08 3981 4030 3981 4030 4003 4060 4003 4060 D

BTYP Hotkeys Survey mv0101 Some hotkeys have different functions for bottom detect editing and for swath data editting. You must have the pointer in the window you wish to edit in when you select the hotkey in order to activate the correct function. Universal --------- z zoom axis between two points, select with mouse (will not zoom along-track axes, use ping width) f return zoomed axis to full dataset range 1-9 change ping width u undo the last edit b display bottom detect value bounds (first/last/min/max) t restore a saved bottom detect file x exit btyp Bottom Detect Window -------------------- a acoustic attributes b display data bounds d display attributes s save g generate e edit mode (left button is port; middle button is stbd) r redraw (left button is port; middle button is stbd) Swath Data Window -------------------- Shift-hotkey will execute the function for the dataset that is not visible at the time. a acoustic attributes d display attributes s save g generate e edge trim r rectangluar trim p ping flipping toggle (click on ping) c clip bathymetry depths to min and max depth Depth Histogram -------------------- a,d attributes s set stbd min and max depths p set port min and max depths x exit btyp

Verifying Raw MR1 Data Tapes Survey mv0101 After the acquisition tapes eject (every 24 hours): 1. Write-protect each tape by sliding the red tab shut. 2. Insert the blue tape into malei's tape drive. Edit the following line to reflect the current tape number, and then paste it into a terminal window on malei: set num = 11595 # BLUE Tape ##################################### set last = `echo $num | nawk '{print $1-1}' ` ( tar tvf /dev/rmt/0 >& $VERIFY/$num.blue.ver ; mt -f /dev/rmt/0n rewoff ; repeat 3 echo 'b' | tr 'b' '\007' ) & # RED Tape ###################################### set last = `echo $num | nawk '{print $1-1}' ` ( tar tvf /dev/rmt/0 >& $VERIFY/$num.red.ver ; mt -f /dev/rmt/0n rewoff ; repeat 3 echo 'b' | tr 'b' '\007' ) & when each tape spits out, look at the .ver files and compare the beginning of the present tape with the end of the last tape written. tail $VERIFY/$last.blue.ver ; echo " " ; head $VERIFY/$num.blue.ver tail $VERIFY/$last.red.ver ; echo " " ; head $VERIFY/$num.red.ver Once both red and blue .ver files have been created, compare them: diff $VERIFY/$num.red.ver $VERIFY/$num.blue.ver If there is no difference between the tapes, you are in good shape. If there is a difference between the red and blue tapes, or if there are files missing between this tape number and the previous tape number, then figure out which one is good and which one is not. A good tape should have 24 hour files on it with some Log\* files too. You'll need to throw out the bad tape (but keep the label) and create a replacement manually. Label the tapes with their actual starting and ending times in minutes, for example 11:00 - 22:59

AA Tables Survey mv0101 Here's a description of how we created AA tables for this survey. See $DOC/bty\_gen.doc for a table showing how tables were applied. ######################################################################### Copy tables to acquisition computer cd $TABLES su hmrgsoft Password: kh6um. cp 271-1800.\*map /home/kaimi0h/hmrgsoft/tables Make new tables the active tables: su hmrgsoft Password: kh6um. cd /home/kaimi0h/hmrgsoft/tables cp 271-1800.portmap portmap cp 271-1800.stbdmap stbdmap ######################################################################### These tables were generated using the method documented in $TUTOR/aa\_make/aa\_make.doc. ------------------------------------------------------------------------- Initial tables from AJC01: ajc01.155-2300d.portmap ajc01.155-2300c.stbdmap -------------------------------------- 042/0600 cd /cdrom/mv0101\_raw002 set file = MR10104206.00 ; set jd = ` echo $file | cut -c6-8 ` mr12tts < $file > $RAW/$file.tts cd $RAW mfe $file.tts -pmf $TABLES/dummymap -smf $TABLES/dummymap \ -attr $PARMS/proc/04206.00.mfe.attr & save maps as 042-0600.portmap 042-0600.stbdmap Ping range: 10-60 bv $PRAW/praw$jd/$file.btywt & btyp-tts $RAW/$file.tts -attr $PARMS/proc/mv0101.041.1000.btyp.attr \ -bdf $BD/bd$jd/$file.bdb & set file = MR10104218.00 bv $PRAW/praw$jd/$file.btywt & btyp /cdrom/mv0101\_raw004/$file \ -attr $PARMS/proc/mv0101.041.1000.btyp.attr \ -bdf $BD/bd$jd/$file.bdb &

Creating and using bathymetry attributes files Survey mv0101 1. Creating attributes files for MR1: rules of thumb Boost: Enable Boost Factor: 30 Boost Breakpoint: 15,000 Bottom Detect Source: Port Ping Flipping: Automatic Swath Radius: 15,000 Cell Width: 4% of nadir depth Cell Overlap: 0.50 Coarse Bin Start: 1.75 Coarse Bin Size Ratio: 5.0 P/S Signal Threshold: 10000 Low Phase Discard: 33.0 High Phase Discard: 33.0 Acous. Phase Multiples: Enable Port Max Angle: 65 Stbd Max Angle: 65 Filter: Fixed Angle Width Angle Width: 1.00 Angle Overlap: 0.50 Min Depth: 0 Max Depth: ~1.8x nadir depth Depth Sensor: Enable Depth Sensor Offest: subtract value measured when MR1 was at surface (~26m) Roll Correction: Enable Notes 1. P/S Signal Threshold: Depends on water depth, transmit power and pulse length. More power = higher threshold Shallower water = higher threshold However, if you change the bathy cell width with depth, and vary the transmit power with depth as indicated in $DOC/general/opslog.doc, then a constant value of 50,000 seems to work well. 2. Bathy cell size / overlap Cell size should vary as 4% of WD, with an overlap of 0.5. This needs to be changed by the operator with every hour file. In shallow water (<1500 m) it is sometimes possible to go to 2% of WD with no overlap. 3. Coarse bin start / size Start at 2.0 with a size of 5. The description of CB Start in the man page is incorrect -- the value you enter just multiplies the sample number of the bottom detect. Because the multiple depends on both bottom detect (altitude) and fish depth, a value of 2 here defines not the first multiple, but a point slightly earlier (depending on fish depth). However, because the current btyp processing works in nadir angle instead of time, phase data from the multiple corrupt earlier data. Therefore a coarse bin start slightly earlier than the multiple is needed to smooth the data in the outer part of the swath (55-60 degrees). Definitely the cave-man approach, but any port in a storm. Love the one your with. Use the tools you've got. A coarse bin size of 5 to 10 times the normal cell size seems to work best.

Overview of Navigation Processing Survey mv0101 The NAV menus and doc files illustrate how to process and incorporate navigation data with MR 1 data. In order, the steps are: SUBJECT MENU NAME DOC FILE -------- --------- -------- 1 Process ship navigation SHIP NAV $DOC/nav/nav\_ship.doc 2 Plot the ship navigation NAV PLOT $DOC/nav/nav\_plot.doc 3 Log: Wire out WIREOUT $DOC/nav/wireout.doc 4 Primer: Using GEOMAG USING GEOMAG $DOC/nav/use\_geomag.doc 5 Primer: Calculating layback LAYBACK CALC $DOC/nav/layback\_calc.doc 6 Applying nav to sidescan --- $DOC/nav/ss\_nav.doc 7 Applying nav to bathymetry --- $DOC/nav/bty\_nav.doc

Navigation Data Processing Information Survey mv0101 GPS data aquired using: Contents 1. Logging nav onto the HMRG computers 2. Ship nav cookbook ############################################################################## 1. Logging nav onto the HMRG computers 1-second GPS fixes are being written over a serial line from the navigator's system to malei. To begin logging, do this: 1. make sure the serial line is NOT plugged in when malei boots. It seems that when a line is running into a serial port at boot time, the port becomes locked and can't be used by program gpsread. 2. plug the nav serial line in to port a. 2. login as user bruce 3. start gpsrd thusly: gpsrd -d /home/malei1d/ship\_dar/mv0101/nav/raw \ -s /dev/ttya -b 4800 & Check to make sure nav is being logged in directory /home/malei1d/ship\_dar/mv0101/nav/raw ...if not, try changing the serial line ports and running gpsrd -d /home/malei1d/ship\_dar/mv0101/nav/raw \ -s /dev/ttyb -b 4800 & ############################################################################## 2. Nav processing: the cookbook For mv0101, we brought nav files over once per day after 0100 of the next day. You need the next day's 0000 nav file in order to process today's 2300 MR1 file. ------------------------------------------------------------------------------ 2a. Select the nav files to process... cd $NAV/raw \ls \*gps |\ awk '{a1[NR] = $0}END{for (x=1;x<=NR-1;x++)print a1[x]}' > navfiles ------------------------------------------------------------------------------- 2b. Convert new gps data into a single STAG file, and move the processed gps data into the Processed directory so they don't get redundantly done. cd $NAV/raw foreach file (` cat navfiles `) echo "Converting "$file ; set f = $file:r gps2stag < $file |\ nawk '{printf "%4.4d %3.3d %2.2d %2.2d %2.2d 000 \*nav %8.5f %9.5f\n",$1,$2,$3,$4,$5,$8,$9}' > $f.tmp gzip $file ; mv $file.gz $NAV/gpsfiles end ------------------------------------------------------------------------------ 2c. Move the raw gps files into their day directories: cd $NAV/gpsfiles set jd = 059 if !( -d 2001$jd) mkdir 2001$jd mv 2001$jd-????.\* 2001$jd ------------------------------------------------------------------------------ 2d. Create composite intermediate navfile... cd $NAV/raw cat \*tmp > tempfile set zoinks = `head -1 tempfile | nawk '{print $2$3$4}'`.nav ; mv tempfile $zoinks rma \*.tmp ; echo " " ls \*.nav ; mv \*.nav ../stagfiles ------------------------------------------------------------------------------ 2e. Run nav\_ship on the intermediate navfile you just created... Here's what the nav\_ship script does: 1. write year as 1996 to get around y2k bug in fcheck 2. check the continuity of the nav file 3. write year as 2000 4. create a one-minute data file in $NAV/raw 5. backup the composite nav and 1-minute nav files in $NAV 6. append the incremental nav file to the $NAV/mbasa.nav file 7. append the incremental 1-minute nav file to the $NAV/mbasa.1min.nav file 8. backup the $NAV/segments file 9. append the incremental 1-minute nav file to the $NAV/segments file nav\_ship 0410000.nav nav\_ship 2552000.nav nav\_ship 0431000.nav nav\_ship 0441000.nav nav\_ship 0460200.nav nav\_ship 0470300.nav nav\_ship 0480500.nav nav\_ship 0490300.nav nav\_ship 0500200.nav nav\_ship 0510100.nav nav\_ship 0520400.nav nav\_ship 0531000.nav nav\_ship 0540100.nav nav\_ship 0540400.nav nav\_ship 0550100.nav nav\_ship 0561200.nav nav\_ship 0581300.nav nav\_ship 0590200.nav nav\_ship 0591200.nav : :....... nav file you're working on Be sure to keep the name to seven characters or less or else avgfix will spew. YOUR JOB: 1. Look at the voibage on the screen to check the beginning and ending times of the nav file and the 1-minute nav file. 2. If you see a TIME GAP or an OUT OF SEQUENCE message, you should exit from nav\_ship (by selecting "n" when it asks if you want to continue. Then open the intermediate nave file (located in $NAV/stagfiles) and search for the offending times. Fix the problem, save the intermediate nav file, and then re-run nav\_ship and it should be OK. Note: single duplicate times at hour file boundaries ARE acceptable -- they get filtered out in the avgfix step, which creates the 1-min nav file. Now you're done. Next step: $DOC/nav/nav\_plot.doc

Plotting ship navigation Survey mv0101 Ship's navigation can be quickly plotted using the script nplot (or its variants) or the script key\_maker. CONTENTS 1. General notes 2. Location maps with chart boxes 3. Page size nav charts 4. Convert charts to JPG format ###################################################################### 1. General notes The nav plotting routines require a nav fix at the hour in order to properly annotate the nav times. For large-area plots, you can use widely-spaced nav data to speed up plotting and optimize the size of your PostScript output file. Try decimating to 10 minute intervals. The script nplot (or its variants specific to each survey) requires the files $PARMS/chart/boxes and $PARMS/chart/chart.labels to annotate each survey box. These files are set up in $DOC/chart\_box.doc. The nplot script looks for navigation in the directory $NAV/segments, with the nav for each MR1 tow named survey.tow##.nav. ###################################################################### 2. Location maps with chart boxes set id = mv0101 cd $NAV/chart \cp $PARMS/chart/$PROJ/boxes $PARMS/chart nplot\_mv0101 L 140.00 145.25 10.50 14.50 0 notopo $id.nav.notopo.ps nplot\_mv0101 L 140.00 145.25 10.50 14.50 0 topo $id.nav.topo.ps ########################################################################## 3. Page size nav charts set id = mv0101 cd $NAV/chart chartnav\_page\_mv0101 $id $id-100-001 chartnav\_page\_mv0101 $id $id-100-002 chartnav\_page\_mv0101 $id $id-100-004 chartnav\_page\_mv0101 $id $id-100-005 chartnav\_page\_mv0101 $id $id-100-006 chartnav\_page\_mv0101 $id $id-100-007 chartnav\_page\_mv0101 $id $id-100-009 chartnav\_page\_mv0101 $id $id-100-010 chartnav\_page\_mv0101 $id $id-100-011 chartnav\_page\_mv0101 $id $id-100-012 chartnav\_page\_mv0101 $id $id-100-013 chartnav\_page\_mv0101 $id $id-100-014 chartnav\_page\_mv0101 $id $id-100-015 chartnav\_page\_mv0101 $id $id-100-016 chartnav\_page\_mv0101 $id $id-100-017 ########################################################################## 4. Convert charts to JPG format ...in bunches: foreach c ( 00{1,2,4,5,6,7,9} 01{0,1,2,3,4,5,6,7} ) cd $NAV/chart alchemy mv0101-100-$c.nav.page.ps -o -Zi 8.5 11.0 -Zd 300 300 -Zm 2 -24 -s tmp.ras rasttopnm tmp.ras | pnmflip -cw | pnmtorast > tmp1.ras alchemy tmp1.ras -j50 -o mv0101-100-$c.nav.page.jpg \rm tmp.ras tmp1.ras end

Wireout Survey mv0101 DATA: stern2GPSrcvr = 40.8 umbilical = 47.0 NOTE: make sure you've measured the stern2GPSrcvr distance and entered the correct value in the script $SCRIPTS/delaycalc. - Tow 1 ------------------------ 041/1000 - 042/0305 turns = 072 042/0305 - 042/0308 turns = 072 -> 094 042/0308 - 044/0759 turns = 094 044/0800 - 045/0328 turns = 095 - Tow 2 ------------------------ 045/0815 - 048/0559 turns = 089 048/0600 - 051/0559 turns = 090 051/0600 - 053/0916 turns = 091 053/0916 - 053/0919 turns = 091 -> 081 053/0919 - 054/0315 turns = 081 053/2248 - 054/0315 Sea Beam survey, MR1 offline 054/0315 - 054/1949 turns = 100 -> 000 054/1949 - 054/1959 end of survey

Magnetic Corrections Survey mv0101 CONTENTS 1. Cookbook for using GEOMAG scripts in HMRG processing 2. Using GEOMAG in stand-alone mode ############################################################################## 1. Cookbook for using GEOMAG In order to correctly navigate the towfish, the magnetic compass data from the fish needs to be corrected to account for variation in the Earth's magnetic field. Magnetic declination changes from place to place, and through time. Corrections to towfish heading are determined using scripts that incorporate the NGDC program GEOMAG. The corrections are calculated on an hour-by-hour basis and stored by Julian day in the directory $PARMS/geomag. The scripts get\_igrf or get\_igrf\_jd are used to calculate the IGRF correction for each chart. First they determine the central lat and lon for each chart, then use the time of the file to determine the IGRF correction from GEOMAG. The scripts output a file named $PARMS/geomag/jd$jd.lon.lat.igrf that looks like this: average average geomag IGRF hourfile longitude latitude date correction -------- --------- -------- ------- ---------- MR10026000 -131.122998 9.950164 2000.71 9.5633 MR10026001 -131.259763 9.950481 2000.71 9.5633 MR10026002 -131.394824 9.950686 2000.71 9.5633 MR10026003 -131.532086 9.950886 2000.71 9.5617 The IGRF corrections are then inserted into the "-magcorr" slot in the headers of each MR1 file, using the procedure outlined in $DOC/compass/ MR1\_compass.doc. When gridding sidescan or converting bathy to xyz, you need to remember to explicitly state to add the magcorr to the fish compass using the "-mca" option on the command line. ############################################################################## 2. Using GEOMAG in stand-alone mode Numbers derived from program geomag30 For info on geomag30 see $DAR/geomag/geomag30.txt Example: cd $DAR/geomag geomag31 igrf 2000.7 D K0.00 41.05 149.4 | | | | | |\_\_\_\_ Longitude (west is -) | | | | |\_\_\_\_\_\_\_\_\_\_ Latitude | | | |\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Kilometers above sea level | | |\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Datum is sea level | |\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date (decimal year) |\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Magnetic model Results: D I H X Y Z F (deg) (deg) (nt) (nt) (nt) (nt) (nt) -6d 43.1m 53d 49.9m 27483 27294 -3215 37594 46568 | |\_\_\_ This is the significant value to be entered below East is positive. Change East is positive, west is negative. dec deg = declination (degrees) var min = annual variation (minutes) The geomag30 program requires that the date be specified as a decimal year.

A Method for Calculating Horizontal Ship-To-Fish Distances (Layback) Survey mv0101 CONTENTS 1. General preface 2. Description of how layback is calculated ############################################ PREFACE The default MR1 technique involves using a standard offset in time between the ship and towfish (typically 90-180 seconds). Alternatively, a towfish offset that varies with ship speed, towfish depth and wire out can be estimated using the method below. The first time you navigate the fish, you need to make sure that the following variables are correctly set in the script $SCRIPTS/delaycalc: set umbil = 50 set stern2GPSrcvr = 0.00 The standard MR1 umbilical length is 50 m, but you'll have to measure the distance from your GPS antenna to the ship's stern (to be really accurate, you should measure from the antenna to the point where the depressor weight sits on the LRS when the H-links are attached. When you're deploying, you begin counting revolutions of the winch from zero at this point). On japanus, the FUGRO nav guys calculated the stern2GPSrcvr distance and incorporated that value into the nav they're giving us (that is, the position of each fix is the stern of the vessel), so the stern2GPSrcvr value is 0.0 HEY! Skip right to the cookbook to make this go. ############################################ THE METHOD The heart of the algorithm is within a script called delaycalc.northstar (in the $SCRIPTS directory). The algorithm has 2 parts: it first estimates the horizontal distance to the fish; and then it estimates the effect of towfish pitch on the location of the insonified seafloor. Here's how it works: hor\_dist = sqrt [(umb+wirout+gpsdist)^2 - (fishdepth)^2 ] + pitch\_offset where wireout = meters of wire out = turns\*5 gpsdist = distance from winch to gps receiver umb = umbilical length pitch\_offset = (sin (pitch\* -1.\* rad ) ) \* alt where pitch = fishpitch + fudge fudge = 0.0 [set to zero for first pass, assumming no pitch correction until proven] The distance is then converted to a time offset for use in mrnavm. Error is introduced in this method due to the assumption that the (umb+wirout+gpsdist) distance is a straight line from the gps antenna to the towfish, although in reality there are two horizontal segments (umb and gpsdist) and a catenary curve (wireout). However, we've measured the catenary curve on the Ewing and it's essentially a straight line. The efficacy of the pitch correction has not been documented, although it was empirically determined to improve data quality on mw9603 where a pitch "fudge" factor of 1.0 was used and the remaining pitch was about 1.2 degrees.

Compass Calibration survey mv0101 INTRO To do a proper compass calibration you need to collect MR1 data that have headings from 0-360 degrees. A good way to do this is to drive in a circle that has a large enough diameter so that the towfish and ship have approximately the same heading. On mv0101 we started the survey by conducting two circles in opposite directions at 8 knots using the standard turn rate of nine degrees per minute. By doing this early in the survey we could calculate a magnetic correction right off the bat. On kaimana and mbasa we calculated magnetic corrections late in the survey, based on all the data we'd collected at the time. PROCEDURE 1. Navigate your MR1 data 2. Run get\_igrf\_jd on your data ($DOC/MR1\_compass.doc) 3. Run magcor on each file ($DOC/MR1\_compass.doc) ############################################################################### 1. Create database from which to calculate azimuthal compass corrections, using towfish course, towfish compass, and IGRF magnetic correction foreach jd ( 041 042 043 044 045 ) cd $PINT/pint$jd foreach file (` ls MR\*.btywtnc `) set f = $file:r ; if ( -f $f.comp ) \rm $f.comp $f.crs $f.igrf echo -n $file":" ; echo -n " stripping course" mrstrp -tcourse < $file > $f.crs ; echo " " echo -n " stripping fish compass" mrstrp -compass < $file > $f.comp ; echo " " echo -n " stripping IGRF" mrstrp -magcorr < $file > $f.igrf ; echo " " echo -n " creating composite" paste $f.crs $f.comp $f.igrf > $f.crs.comp.igrf \rm $f.comp $f.crs $f.igrf; echo " " end echo "Towfish course and compass data for JD"$jd > $COMPASS/jd$jd.crs.comp.igrf echo " Corrected" >> $COMPASS/jd$jd.crs.comp.igrf echo "Course Compass IGRF Compass" >> $COMPASS/jd$jd.crs.comp.igrf echo "---------- ---------- -------- -------" >> $COMPASS/jd$jd.crs.comp.igrf foreach file (` ls MR\*.crs.comp.igrf `) nawk '{print $2" "$4" "$6" "$4+$6}' $file >> $COMPASS/jd$jd.crs.comp.igrf \rm $file end end ############################################################################### 2. Calculate difference between IGRF-corrected towfish course and towfish heading, and make a data file named jd\_all.crs.igrf.residual cd $COMPASS foreach file (` ls jd???.crs.comp.igrf `) set fil = $file:r ; set f = $fil:r \cp $file $file.orig nawk '{if (NR>4 && $2>($1+100)) print $1,$2-360,$3,$4-360; else print $0}' $file > tmp \mv tmp $file end if (-f jd\_all.crs.igrf.residual ) \rm jd\_all.crs.igrf.residual foreach file (` ls jd???.crs.comp.igrf `) set fil = $file:r ; set f = $fil:r nawk '{if (NR>4) print $1,$1-$4}' $file >> jd\_all.crs.igrf.residual end ############################################################################### 3. Take a quick look at the residual... xvgr jd\_all.crs.igrf.residual To see an approximate correction curve, run Arithmetic -> Regress -> 5th degree ############################################################################### 4. Calculate a smooth residual curve in a more rigorous way... if (-f temp ) \rm temp foreach file (` ls jd???.crs.comp.igrf `) set fil = $file:r ; set f = $fil:r nawk '{if (NR>4) print $1,$1-$4}' $file >> temp nawk '{if (NR>4) print $1-360,$1-$4}' $file >> temp nawk '{if (NR>4) print $1+360,$1-$4}' $file >> temp end sort -n temp > jd\_all.sorted ; \rm temp trend1d jd\_all.sorted -N20r -Fxm -V > jd\_all.N20r.trend cat jd\_all.N20r.trend |\ nawk 'BEG{x=-999}{if ($1!=x) print $0;x=$1}' |\ sample1d -A -I1 | nawk '{if ($1 > -1 && $1 <= 361 ) print $0}'> magcor.xy ########################################################################## 6. Impliment the new corrections... Print out lines to be pasted into magfix\_surveyname.awk: nawk '{print " else if ($2=="$1") print "$2"; \\"}' $COMPASS/magcor.xy Copy the last survey's magfix.awk, paste in the results of the previous line, and name the new file using your survey's name. Modify $SCRIPTS/magcor so that it calls your new magfix.awk script.

Overview of Advanced MR1 Processing Survey mv0101 The MR1PROC menus and doc files illustrate the steps required to prepare processed MR1 files for gridding/charting. These steps include navigating the towfish, filtering the sidescan compass data, and just heaps of other interesting steps. SUBJECT MENU NAME DOC FILE -------- --------- -------- 1. Remove unwanted survey data MR1 CAT $DOC/MR1proc/MR1\_cat.doc 2. Merge nav with MR1 file MR1 NAV $DOC/nav/MR1\_nav.doc 3. Filter compass and add IGRF MR1 COMPASS $DOC/compass/MR1\_compass.doc 4. Filter the sidescan data SS FILTER $DOC/MR1proc/ss\_filter.doc 5. Apply Angle Varying Gain APPLY SS AVG $DOC/MR1proc/apply\_AVG.doc 6. Power settings POWER SETTINGS $DOC/MR1proc/xmit\_power.doc 7. Apply gain SS POWER CALIB $DOC/MR1proc/apply\_gain.doc 8. Changing bathy AA tables TABLESWITCH $DOC/MR1\_proc/tableswitch.doc 9. Creating AVG corrections MAKE AVG $DOC/MR1proc/make\_AVG.doc

MR1 File Review Survey mv0101 Review the .btywt files before you do any further processing on them. Inspect each to insure that 1. The bathymetry swath edges were properly trimmed 2. The bathymetry depth windowing is appropriate 3. The sidescan swath edges are trimmed where rep rates change. To do this, trim the wider swath data (where the longer rep rate begins) so that the ss swath widens gradually (say, over 50 pings or so) rather than over one ping. Two reasons for this: a) the sidescan filtering in ssjob does ugly things to places where the swath width changes abruptly within a file; and b) the final sidescan mosaic looks better with gradual swath width changes rather than abrupt changes. 4. Sidescan bottom detects were done so that there are no near-nadir imaging artifacts Use the for/each loop at the bottom of this script to view all the files in a JD directory. ---------------------------------------------------------------------------- Additional Trimming (Items 1-3) The first three items can be immediately fixed while reviewing the .btywt files in BTYP. You can do edge trimming of sidescan and bathymetry, and histogram depth windowing, while viewing the processed files. Save the edited file using the .btywt file extension. ---------------------------------------------------------------------------- Fixing Sidescan Bottom Detects (Items 1-3) If improper sidescan bottom detects are found (Item 4), you'll need to: - regenerate the file with the raw data. - generate the bathymetry using the saved $BD/file.bdb bottom detect file - fix any flipped pings. - load the $BD/file.bds bottom detect - generate sidescan, and make your changes to the bottom detect curve. - save the new .bds file - save the new .btyw file - do any bathy trimming/windowing - save the new .btywt file. - move the new data to the appropriate $PRAW/praw$jd directory ---------------------------------------------------------------------------- The LOOP NOTE: Here's an easy way to save edited output files: - select Output - look in the terminal window where you executed the loop, and copy the filename, and paste it into the text box in btyp. No typing required! cd $PRAW/praw054 foreach proc ( ` ls \*btywt ` ) ls -l $proc btyp -mr $proc -attr $PARMS/proc/mira end

MR1 File Splitting Using MRCAT Survey mv0101 CONTENTS 0. What it is 1. Example 2. Fixing HST timestamps on early files (unique to mv0101) 3. Running mrcat ######################################################################### 0. What it is This file documents manual splitting of individual MR1 files that are necessary to A. remove noisy data during launch/recovery B. Remove large nav gaps C. Split files with changes in ping rate or power settings D. Split files that contain changing wire out E. Split files that contain turns How to find turn times: 1. run pltatt on a .bty file and view it like so: a. Figure out the ping number: cd $PRAW/praw318 pltatt MR19829701.09.bty 100 300 v MR19829701.09.bty.ps b. Figure out the times: btyp -mr MR19829701.09.bty ######################################################################### 1. Example: ------------------------ 255 20 46 00 Cut bad data from beginning of file set break = ` echo 255 20 46 00 ` set jd = $break[1] set hr = $break[2] set min = $break[3] ; if ($min == "00") set min = 01 set sec = $break[4] set suf = btywt set file = MR100$jd$hr.00.$suf cp $file $file.orig; set fi = $file:r; set f = $fi:r; chmod a-w $file.orig mrcat -et 00/$jd/$hr/$min/$sec $file.orig > $file mrcat -bt 00/$jd/$hr/$min/$sec $file.orig > $f.$min.$suf ######################################################################### 2. Fixing HST timestamps on early files The acquisition computer was configured on Hawaii Standard Time instead of Universal Time for the first ~18 hours of acquisition. The time shift required to convert from incorrect to correct times is 50400 seconds. Note that this difference isn't just (20 hours difference \* 3600), because although the ACQ computer was on HST time, it had been synched to local Guam time, mucking it up. The number 50400 comes from subtracting the known time of the first ping (known because we know what GMT time the system started) from the time written in the ping header. To fix the times, we add this difference to the observed ping header times to move the time ahead 14 hours to the correct Zulu time. Obsoiv: -- jd041 ----------------------------------------------------- cd $PRAW/praw041 mkdir orig\_HSTtimes foreach file (` ls MR101041??.??.btyw MR101041??.??.btywt `) echo $file... mrstrp -stime < $file |\ nawk '{printf "%s %16.6f\n", $1,$2+50400}' > $file.tim mrrepl -f $file.tim -stime < $file > $file.fixtime mv $file ./orig\_HSTtimes mv $file.fixtime $file end Check 'em: mr2asc -h < MR10104110.00.btyw | grep Time | head mr2asc -h < ./orig\_HSTtimes/MR10104110.00.btyw | grep Time | head -- jd042 ----------------------------------------------------- cd $PRAW/praw042 mkdir orig\_HSTtimes foreach file (` ls MR10104200.00\*.bt\* MR10104201.00\*.bt\* `) echo $file... mrstrp -stime < $file |\ nawk '{printf "%s %16.6f\n", $1,$2+50400}' > $file.tim mrrepl -f $file.tim -stime < $file > $file.fixtime mv $file ./orig\_HSTtimes mv $file.fixtime $file end Check 'em: mr2asc -h < MR10104200.00.btyw | grep Time | head mr2asc -h < MR10104200.00.btyw.fixtime | grep Time | head 267 17 27 30 End Tow 02 ######################################################################### 3. Running mrcat... 042 03 05 00 Change wire: 072 -> 094 set break = ` echo 042 03 05 00 ` set jd = $break[1] set hr = $break[2] set min = $break[3] ; if ($min == "00") set min = 01 set sec = $break[4] foreach suf ( btyw btywt ) set file = MR101$jd$hr.00.$suf cp $file $file.orig; set fi = $file:r; set f = $fi:r; chmod a-w $file.orig mrcat -et 01/$jd/$hr/$min/$sec $file.orig > $file mrcat -bt 01/$jd/$hr/$min/$sec $file.orig > $f.$min.$suf end ------------------------------ 042 03 05 00 Change wire: 094 set break = ` echo 042 03 08 00 ` set jd = $break[1] set hr = $break[2] set min = $break[3] ; if ($min == "00") set min = 01 set sec = $break[4] foreach suf ( btyw btywt ) set file = MR101$jd$hr.05.$suf cp $file $file.orig; set fi = $file:r; set f = $fi:r; chmod a-w $file.orig mrcat -et 01/$jd/$hr/$min/$sec $file.orig > $file mrcat -bt 01/$jd/$hr/$min/$sec $file.orig > $f.$min.$suf end ------------------------------ 047 11 31 30 Cut out bad data at beginning of file set break = ` echo 047 11 31 30 ` set jd = $break[1] set hr = $break[2] set min = $break[3] ; if ($min == "00") set min = 01 set sec = $break[4] foreach suf ( btyw btywt ) set file = MR101$jd$hr.00.$suf cp $file $file.orig; set fi = $file:r; set f = $fi:r; chmod a-w $file.orig mrcat -et 01/$jd/$hr/$min/$sec $file.orig > $file mrcat -bt 01/$jd/$hr/$min/$sec $file.orig > $f.$min.$suf end ------------------------------ 053 09 16 00 Change wire: 091 -> 081 set break = ` echo 053 09 16 00 ` set jd = $break[1] set hr = $break[2] set min = $break[3] ; if ($min == "00") set min = 01 set sec = $break[4] foreach suf ( btyw btywt ) set file = MR101$jd$hr.00.$suf cp $file $file.orig; set fi = $file:r; set f = $fi:r; chmod a-w $file.orig mrcat -et 01/$jd/$hr/$min/$sec $file.orig > $file mrcat -bt 01/$jd/$hr/$min/$sec $file.orig > $f.$min.$suf end ------------------------------ 053 09 19 00 Change wire: 081 set break = ` echo 053 09 19 00 ` set jd = $break[1] set hr = $break[2] set min = $break[3] ; if ($min == "00") set min = 01 set sec = $break[4] foreach suf ( btyw btywt ) set file = MR101$jd$hr.16.$suf cp $file $file.orig; set fi = $file:r; set f = $fi:r; chmod a-w $file.orig mrcat -et 01/$jd/$hr/$min/$sec $file.orig > $file mrcat -bt 01/$jd/$hr/$min/$sec $file.orig > $f.$min.$suf end ------------------------------ 053 22 48 00 Cut out noisy data from Sea Beam interference set break = ` echo 053 22 48 00 ` set jd = $break[1] set hr = $break[2] set min = $break[3] ; if ($min == "00") set min = 01 set sec = $break[4] foreach suf ( btyw btywt ) set file = MR101$jd$hr.00.$suf cp $file $file.orig; set fi = $file:r; set f = $fi:r; chmod a-w $file.orig mrcat -et 01/$jd/$hr/$min/$sec $file.orig > $file mrcat -bt 01/$jd/$hr/$min/$sec $file.orig > $f.$min.$suf end ######################################################################### foreach bit ( $file $f.$min.$suf ) btyp -mr $bit -attr $PARMS/proc/mira end foreach woowoo ( ` ls \*btywt ` ) btyp -mr $woowoo -attr $PARMS/proc/mira end

Applying scaling factors to sidescan data Survey mv0101 CONTENTS 1. Wadda scoops 2. Dirty Deeds ############################################################################ 1. Information on how this works We normalize the magnitude of MR1 sidescan data to a common reference level in order to account for changes in pulse length. Right now the method doesn't account for changes in power, so you should always run in FULL power if you want to use this method (or, figure out the corrections for different power settings and be a hero and impliment them in the following scripts). The technique used here works like so: 1. Write the MR1 file headers into a file named MR1file.hdr, which is stored in the $HDR directory 2. Read the .hdr files to determine the system's pulse length 3. Generate a script for each MR1 file to rescale the data using mrscale. 4. Run each file through its mrscale script, and write the new scaled data as MR1file.btywts Here are the pulse length values stored in the MR1 file headers: 10 ms: port = 10.89, stbd = 9.98 5 ms: port = 5.43, stbd = 4.98 2 ms: port = 2.16, stbd = 1.98 Scaling is normalized to a 5 ms, full power transmission, and the scaling factors were determined empirically based on data from MBASA, AJC, KAIMANA and MV0101. Here they are: 2 ms = 2.2x 5 ms = 1.0x 10 ms = 0.714x The above values are embedded in the script power\_scale, which does the real work here. ############################################################################ 2. Scale the MR1 files set jd = 050 cd $PRAW/praw$jd foreach file (` \ls \*.btywt `) echo "Scaling file "$file... power\_scale $file end postfix ----------------------- foreach jd ( 050 ) foreach jd ( 051 052 053 054 ) cd $PFIN/pfin$jd foreach file (` \ls \*.btywtnc-da `) echo "Scaling file "$file... set f = $file:r power\_scale $file \mv $f.btywts $f.btywtsnc-da \rm $file end end

Sidescan Image Processing Using the SSJOB Script Survey mv0101 The sidescan data processing Scheme that worked best is hard-wired into the script SCRIPTS/ssjob\_cruisename. The Scheme is determined early in the survey, using the interactive program SSP to try different modules and filters. Run this stuff on the .ss files located in $SSRAW. After you're done, the new files will have the suffix .ssd, and will stay in $SSRAW. ----------------- HISTORY Hey! document times of changes of ssjob parameters here. Beg End Time Time ssjob script Comments -------- -------- ------------------ -------------------------------- 118/0900 135/0000 ssjob\_kaimana\_01 Based on ssjob\_mbasa ########################################################################### Cookbook To process a day's worth of sidescan data, run the following: foreach jd ( 041 042 043 044 045 046 ) foreach jd ( 047 048 049 050 051 052 053) foreach jd ( 054 ) cd $PINT/pint$jd ls MR1\*.btywtsnc > ssjob.files ssjob\_mv0101 ssjob.files btywtsnc btywtsnc-d end Remove the .btywtsn and .btywtsnc files... cd $PINT/pint$jd foreach file (` ls \*.btywtsnc-d `) set f = $file:r if (-f $f.btywtsn) \rm $f.btywtsn if (-f $f.btywtsnc) \rm $f.btywtsnc end # All Pau! To process a single file, try cd $PRAW/praw262 ls MR10026216.??.btywtsnc > ssjob.files ssjob\_kaimana\_01 ssjob.files btywtsnc btywtsnc-d

Generating Angle Varying Gain (AVG) Corrections Survey mv0101 CONTENTS 1. Determine nadir amplitude threshold 2. Determine input data for AVG correction 3. Choose depth range and depth interval for multi-depth corrections 4. Cookbook ############################################################################# 1. Overview We use two steps to correct AVG. In the first step, we use a global angle varying gain (AVG) correction for the non-specular part of the swath. The second step focuses only on the nadir zone (usually 0 to 6 degrees), and calculates & applies a nadir correction for each file. This doc file describes how to generate the global AVG corrections. The next doc file ($DOC/mr1proc/appy\_avg.doc) describes how to apply this correction, and how to conduct the nadir correction. ############################################################################# 1. Determine nadir amplitude threshold The global AVG correction only affects data outside the nadir specular region. We identify these data using port and stbd thresholds that represent the highest amplitude values of non-specular data. You've got to figure out this threshold empirically using SSP. To do this, find a file that has a pronounced nadir reflection (a file over flat sediments works best). Open the file in SSP and select -> EDIT. Set the MAXIMUM VALUE so that pixels in the nadir specular region appear green, but pixels outboard of nadir have a gray value. Green means the value for that pixel is above your maximum value. Note that if there's a big fault scarp facing nadir, you may get some green pixels there as well. The MAXIMUM VALUE that fits these criteria becomes your global AVG threshold. Previous survey global thresholds: kaimana: 5,000,000 mv0101: 20,000,000 Plug the threshold value you determine into the avg\_gen command lines in the cookbook below. So far we've only needed one threshold value per survey, so you just do this step once. ############################################################################# 2. Determine input data for AVG correction When you calculate a global AVG, you need to choose input files that represent the extreme depth ranges (shallow and deep ) of the data set. If you don't, then AVG corrections for those depth ranges won't be calculated and you'll get along-track striping over those depths where improper AVG corrections were applied. On past surveys we've had good luck regenerating AVG corrections on a daily basis, with new AVG tables using all the data from preceding days. This method yielded good matches between hour files that were processed with different AVG corrections. For long surveys we limit the input data to the previous 7 days or so. So every day you'll make a new AVG correction. In the cookbook below, make sure you document how each AVG correction was created. ############################################################################# 3. Choose depth range and depth interval for multi-depth corrections We use multi-depth AVG corrections, which means that new AVG corrections are calculated for different depth intervals. This allows you to compensate the magnitude of your sidescan for proximity to the bottom (If you're close to the bottom you get a strong echo. If far, weak. Duh.) You need to specify on the avg\_gen command line: - minimum depth - maximum depth - depth window radius (DWR) The DWR is equal to 1/2 your desired depth interval. So if you want depth intervals of 3000 3500 4000 4500 5000 5500 6000 use a mindepth of 3000, a maxdepth of 6000, and a DWR of 250 ############################################################################# 4. Cookbook avg\_gen infile.lis angl\_bin DWR portthresh stbdthresh mindepth maxdepth EXAMPLE set tab = avg\_test if !( -d $AVG/$tab ) mkdir $AVG/$tab cd $AVG/$tab ls $PINT/pint041/\*.btywtsnc-d \ $PINT/pint042/\*.btywtsnc-d > $AVG/$tab/$tab.avglist set dwr = 250 set bin = 2 avg\_gen $AVG/$tab/$tab.avglist $bin $dwr 5000000 5000000 3000 6000 ----------------------------------------------------------------------------- set tab = avg045 if !( -d $AVG/$tab ) mkdir $AVG/$tab cd $AVG/$tab ls $PINT/pint041/\*.btywtsnc-d \ $PINT/pint042/\*.btywtsnc-d \ $PINT/pint043/\*.btywtsnc-d \ $PINT/pint044/\*.btywtsnc-d \ $PINT/pint045/\*.btywtsnc-d > $AVG/$tab/$tab.avglist set dwr = 250 set bin = 2 avg\_gen $AVG/$tab/$tab.avglist $bin $dwr 5000000 5000000 3000 6000 ----------------------------------------------------------------------------- set tab = avg047 if !( -d $AVG/$tab ) mkdir $AVG/$tab cd $AVG/$tab ls $PINT/pint041/\*.btywtsnc-d \ $PINT/pint042/\*.btywtsnc-d \ $PINT/pint043/\*.btywtsnc-d \ $PINT/pint044/\*.btywtsnc-d \ $PINT/pint045/\*.btywtsnc-d \ $PINT/pint046/\*.btywtsnc-d \ $PINT/pint047/\*.btywtsnc-d > $AVG/$tab/$tab.avglist set dwr = 250 set bin = 2 avg\_gen $AVG/$tab/$tab.avglist $bin $dwr 20000000 20000000 1000 12000 ----------------------------------------------------------------------------- set tab = avg048 if !( -d $AVG/$tab ) mkdir $AVG/$tab cd $AVG/$tab ls $PINT/pint041/\*.btywtsnc-d \ $PINT/pint042/\*.btywtsnc-d \ $PINT/pint043/\*.btywtsnc-d \ $PINT/pint044/\*.btywtsnc-d \ $PINT/pint045/\*.btywtsnc-d \ $PINT/pint046/\*.btywtsnc-d \ $PINT/pint047/\*.btywtsnc-d \ $PINT/pint048/\*.btywtsnc-d > $AVG/$tab/$tab.avglist set dwr = 250 set bin = 2 avg\_gen $AVG/$tab/$tab.avglist $bin $dwr 20000000 20000000 1000 12000 ----------------------------------------------------------------------------- set tab = avg049 if !( -d $AVG/$tab ) mkdir $AVG/$tab cd $AVG/$tab ls $PINT/pint041/\*.btywtsnc-d \ $PINT/pint042/\*.btywtsnc-d \ $PINT/pint043/\*.btywtsnc-d \ $PINT/pint044/\*.btywtsnc-d \ $PINT/pint045/\*.btywtsnc-d \ $PINT/pint046/\*.btywtsnc-d \ $PINT/pint047/\*.btywtsnc-d \ $PINT/pint048/\*.btywtsnc-d \ $PINT/pint049/\*.btywtsnc-d > $AVG/$tab/$tab.avglist set dwr = 250 set bin = 2 avg\_gen $AVG/$tab/$tab.avglist $bin $dwr 20000000 20000000 1000 12000 ----------------------------------------------------------------------------- set tab = avg050 if !( -d $AVG/$tab ) mkdir $AVG/$tab cd $AVG/$tab ls $PINT/pint041/\*.btywtsnc-d \ $PINT/pint042/\*.btywtsnc-d \ $PINT/pint043/\*.btywtsnc-d \ $PINT/pint044/\*.btywtsnc-d \ $PINT/pint045/\*.btywtsnc-d \ $PINT/pint046/\*.btywtsnc-d \ $PINT/pint047/\*.btywtsnc-d \ $PINT/pint048/\*.btywtsnc-d \ $PINT/pint049/\*.btywtsnc-d \ $PINT/pint050/\*.btywtsnc-d > $AVG/$tab/$tab.avglist set dwr = 250 set bin = 2 avg\_gen $AVG/$tab/$tab.avglist $bin $dwr 20000000 20000000 1000 12000 ----------------------------------------------------------------------------- set tab = avg051 if !( -d $AVG/$tab ) mkdir $AVG/$tab cd $AVG/$tab ls $PINT/pint041/\*.btywtsnc-d \ $PINT/pint042/\*.btywtsnc-d \ $PINT/pint043/\*.btywtsnc-d \ $PINT/pint044/\*.btywtsnc-d \ $PINT/pint045/\*.btywtsnc-d \ $PINT/pint046/\*.btywtsnc-d \ $PINT/pint047/\*.btywtsnc-d \ $PINT/pint048/\*.btywtsnc-d \ $PINT/pint049/\*.btywtsnc-d \ $PINT/pint050/\*.btywtsnc-d \ $PINT/pint051/\*.btywtsnc-d > $AVG/$tab/$tab.avglist set dwr = 250 set bin = 2 avg\_gen $AVG/$tab/$tab.avglist $bin $dwr 20000000 20000000 1000 12000 ----------------------------------------------------------------------------- set tab = avg052 if !( -d $AVG/$tab ) mkdir $AVG/$tab cd $AVG/$tab ls $PINT/pint041/\*.btywtsnc-d \ $PINT/pint042/\*.btywtsnc-d \ $PINT/pint043/\*.btywtsnc-d \ $PINT/pint044/\*.btywtsnc-d \ $PINT/pint045/\*.btywtsnc-d \ $PINT/pint046/\*.btywtsnc-d \ $PINT/pint047/\*.btywtsnc-d \ $PINT/pint048/\*.btywtsnc-d \ $PINT/pint049/\*.btywtsnc-d \ $PINT/pint050/\*.btywtsnc-d \ $PINT/pint051/\*.btywtsnc-d \ $PINT/pint052/\*.btywtsnc-d > $AVG/$tab/$tab.avglist set dwr = 250 set bin = 2 avg\_gen $AVG/$tab/$tab.avglist $bin $dwr 20000000 20000000 1000 12000 ----------------------------------------------------------------------------- set tab = avg053 if !( -d $AVG/$tab ) mkdir $AVG/$tab cd $AVG/$tab ls $PINT/pint041/\*.btywtsnc-d \ $PINT/pint042/\*.btywtsnc-d \ $PINT/pint043/\*.btywtsnc-d \ $PINT/pint044/\*.btywtsnc-d \ $PINT/pint045/\*.btywtsnc-d \ $PINT/pint046/\*.btywtsnc-d \ $PINT/pint047/\*.btywtsnc-d \ $PINT/pint048/\*.btywtsnc-d \ $PINT/pint049/\*.btywtsnc-d \ $PINT/pint050/\*.btywtsnc-d \ $PINT/pint051/\*.btywtsnc-d \ $PINT/pint052/\*.btywtsnc-d \ $PINT/pint053/\*.btywtsnc-d > $AVG/$tab/$tab.avglist set dwr = 250 set bin = 2 avg\_gen $AVG/$tab/$tab.avglist $bin $dwr 20000000 20000000 1000 20000 ----------------------------------------------------------------------------- set tab = avg054 if !( -d $AVG/$tab ) mkdir $AVG/$tab cd $AVG/$tab ls $PINT/pint041/\*.btywtsnc-d \ $PINT/pint042/\*.btywtsnc-d \ $PINT/pint043/\*.btywtsnc-d \ $PINT/pint044/\*.btywtsnc-d \ $PINT/pint045/\*.btywtsnc-d \ $PINT/pint046/\*.btywtsnc-d \ $PINT/pint047/\*.btywtsnc-d \ $PINT/pint048/\*.btywtsnc-d \ $PINT/pint049/\*.btywtsnc-d \ $PINT/pint050/\*.btywtsnc-d \ $PINT/pint051/\*.btywtsnc-d \ $PINT/pint052/\*.btywtsnc-d \ $PINT/pint053/\*.btywtsnc-d \ $PINT/pint054/\*.btywtsnc-d > $AVG/$tab/$tab.avglist set dwr = 250 set bin = 2 avg\_gen $AVG/$tab/$tab.avglist $bin $dwr 20000000 20000000 1000 20000

Applying Angle-Varying Gain (AVG) to sidescan data Survey mv0101 CONTENTS 1. Introduction 2. Log of AVG correction tables used for this survey 3. Cookbook ##################################################################### 1. Introduction This file shows you how to apply angle-varying gain (AVG) corrections to sidescan data. These steps should be done after the sidescan files have been navigated and compass-corrected. To see how the AVG corrections were generated, check out the file $DOC/ss\_proc/make\_AVG.doc. ##################################################################### 2. Log of AVG correction tables used for this survey: BEG END tab -------- -------- ------ 041/1100 047/2359 avg047 048/0000 048/2359 avg048 049/0000 049/2359 avg049 050/0000 050/2359 avg050 051/0000 051/2359 avg051 052/0000 052/2359 avg052 053/0000 053/2248 avg053 054/0300 054/1959 avg054 ##################################################################### 3. Cookbook set tab = avg054 set corr = $AVG/$tab/$tab.raw.avgcorrs foreach jd ( 041 042 043 044 045 ) foreach jd ( 046 047 048 049 050 ) foreach jd ( 051 052 053 ) foreach jd ( 054 ) cd $PINT/pint$jd if !( -d $PFIN/pfin$jd ) mkdir $PFIN/pfin$jd foreach file (` ls MR1\*btywtsnc-d `) echo "Correcting AVG on file: "$file set f = $file:r mravg $file -rcf $corr > tmp0 mravg tmp0 -gca -bs 0.5 -ma 6 -spec 2.0 -swp 6 > tmp1 mravg tmp1 -gca -bs 0.1 -ma 2 -spec 1.5 -swp 3 > $PFIN/pfin$jd/$f.btywtsnc-da \rm tmp0 tmp1 end end Now view the day's files... set jd = 054 cd $PFIN/pfin$jd foreach ss ( ` ls \*.btywtsnc-da ` ) echo $ss... ssp $ss -attr $PARMS/proc/ssp.avg.attr end

Compass Calibration survey mv0101 INTRO To do a proper compass calibration you need to collect MR1 data that have headings from 0-360 degrees. A good way to do this is to drive in a circle that has a large enough diameter so that the towfish and ship have approximately the same heading. On mv0101 we started the survey by conducting two circles in opposite directions at 8 knots using the standard turn rate of nine degrees per minute. By doing this early in the survey we could calculate a magnetic correction right off the bat. On kaimana and mbasa we calculated magnetic corrections late in the survey, based on all the data we'd collected at the time. PROCEDURE 1. Navigate your MR1 data 2. Run get\_igrf\_jd on your data ($DOC/MR1\_compass.doc) 3. Run magcor on each file ($DOC/MR1\_compass.doc) ############################################################################### 1. Create database from which to calculate azimuthal compass corrections, using towfish course, towfish compass, and IGRF magnetic correction foreach jd ( 041 042 043 044 045 ) cd $PINT/pint$jd foreach file (` ls MR\*.btywtnc `) set f = $file:r ; if ( -f $f.comp ) \rm $f.comp $f.crs $f.igrf echo -n $file":" ; echo -n " stripping course" mrstrp -tcourse < $file > $f.crs ; echo " " echo -n " stripping fish compass" mrstrp -compass < $file > $f.comp ; echo " " echo -n " stripping IGRF" mrstrp -magcorr < $file > $f.igrf ; echo " " echo -n " creating composite" paste $f.crs $f.comp $f.igrf > $f.crs.comp.igrf \rm $f.comp $f.crs $f.igrf; echo " " end echo "Towfish course and compass data for JD"$jd > $COMPASS/jd$jd.crs.comp.igrf echo " Corrected" >> $COMPASS/jd$jd.crs.comp.igrf echo "Course Compass IGRF Compass" >> $COMPASS/jd$jd.crs.comp.igrf echo "---------- ---------- -------- -------" >> $COMPASS/jd$jd.crs.comp.igrf foreach file (` ls MR\*.crs.comp.igrf `) nawk '{print $2" "$4" "$6" "$4+$6}' $file >> $COMPASS/jd$jd.crs.comp.igrf \rm $file end end ############################################################################### 2. Calculate difference between IGRF-corrected towfish course and towfish heading, and make a data file named jd\_all.crs.igrf.residual cd $COMPASS foreach file (` ls jd???.crs.comp.igrf `) set fil = $file:r ; set f = $fil:r \cp $file $file.orig nawk '{if (NR>4 && $2>($1+100)) print $1,$2-360,$3,$4-360; else print $0}' $file > tmp \mv tmp $file end if (-f jd\_all.crs.igrf.residual ) \rm jd\_all.crs.igrf.residual foreach file (` ls jd???.crs.comp.igrf `) set fil = $file:r ; set f = $fil:r nawk '{if (NR>4) print $1,$1-$4}' $file >> jd\_all.crs.igrf.residual end ############################################################################### 3. Take a quick look at the residual... xvgr jd\_all.crs.igrf.residual To see an approximate correction curve, run Arithmetic -> Regress -> 5th degree ############################################################################### 4. Calculate a smooth residual curve in a more rigorous way... if (-f temp ) \rm temp foreach file (` ls jd???.crs.comp.igrf `) set fil = $file:r ; set f = $fil:r nawk '{if (NR>4) print $1,$1-$4}' $file >> temp nawk '{if (NR>4) print $1-360,$1-$4}' $file >> temp nawk '{if (NR>4) print $1+360,$1-$4}' $file >> temp end sort -n temp > jd\_all.sorted ; \rm temp trend1d jd\_all.sorted -N20r -Fxm -V > jd\_all.N20r.trend cat jd\_all.N20r.trend |\ nawk 'BEG{x=-999}{if ($1!=x) print $0;x=$1}' |\ sample1d -A -I1 | nawk '{if ($1 > -1 && $1 <= 361 ) print $0}'> magcor.xy ########################################################################## 6. Impliment the new corrections... Print out lines to be pasted into magfix\_surveyname.awk: nawk '{print " else if ($2=="$1") print "$2"; \\"}' $COMPASS/magcor.xy Copy the last survey's magfix.awk, paste in the results of the previous line, and name the new file using your survey's name. Modify $SCRIPTS/magcor so that it calls your new magfix.awk script.

Switching AA tables with mrmfs Survey mv0101 This doc file contains the commands used to switch angle angle tables on processed bathymetry. The procedure is to create a data file named $DOC/btyp/tablelist.dat that contains all the hour files, their original tables, and the final tables used. Then we issue a loop that calls mrmfs and uses the tables listed in tablelist.dat. 1 Make the tablelist file 2 Do the table switching ############################################################################# 1 Make the tablelist file cd $PFIN foreach jd ( 041 ) foreach jd ( 04{2,3,4,5,6,7,8,9} 05{0,1,2,3,4} ) cd $PFIN/pfin$jd foreach file (` \ls \*da `) echo $file... ; set f = $file:r echo $file > tmp mr2asc -h < $file | grep PortMapFile: | nawk '{print $2}' >> tmp mr2asc -h < $file | grep StbdMapFile: | nawk '{print $2}' >> tmp nawk '{a[NR]=$1}END{print a[1],a[2],a[3]}' tmp > $f.tmp ; \rm tmp end cat MR\*.tmp | sed 's/.portmap//g' |\ sed 's/.stbdmap//g' |\ sed 's/.btywtsnc-da//g' > jd$jd.tables ; \rm \*.tmp end Now add each JD's table list to the master file $DOC/btyp/tablelist.dat, and edit this file to add the final tables used. ############################################################################# 2 Do the table switching # 5 nm line spacing ------------------------------------------------- foreach jd ( 041 042 ) foreach jd ( 043 044 045 046 ) cd $PFIN/pfin$jd foreach file (` ls \*da `) ls $file ; set f = $file:r set oldport = ` echo -n $TABLES ; nawk ' {if ($1 == "'$f'") print "/"$2".portmap" }' $DOC/btyp/tablelist.dat ` set oldstbd = ` echo -n $TABLES ; nawk ' {if ($1 == "'$f'") print "/"$3".stbdmap" }' $DOC/btyp/tablelist.dat ` set newport = ` echo -n $TABLES ; nawk ' {if ($1 == "'$f'") print "/"$4".portmap" }' $DOC/btyp/tablelist.dat ` set newstbd = ` echo -n $TABLES ; nawk ' {if ($1 == "'$f'") print "/"$5".stbdmap" }' $DOC/btyp/tablelist.dat ` mrmfs -pmf $oldport $newport -smf $oldstbd $newstbd < $file > $f.btywtsnc-dat mrfill -btypw 4630 -btysw 4630 $f.btywtsnc-dat > $f.btywtsnc-datt ; \rm $f.btywtsnc-dat end end foreach jd ( 047 ) cd $PFIN/pfin$jd foreach file (` ls MR1?????0\*da MR1?????1{0,1,2,3,4,5,6,7}\*da `) ls $file ; set f = $file:r set oldport = ` echo -n $TABLES ; nawk ' {if ($1 == "'$f'") print "/"$2".portmap" }' $DOC/btyp/tablelist.dat ` set oldstbd = ` echo -n $TABLES ; nawk ' {if ($1 == "'$f'") print "/"$3".stbdmap" }' $DOC/btyp/tablelist.dat ` set newport = ` echo -n $TABLES ; nawk ' {if ($1 == "'$f'") print "/"$4".portmap" }' $DOC/btyp/tablelist.dat ` set newstbd = ` echo -n $TABLES ; nawk ' {if ($1 == "'$f'") print "/"$5".stbdmap" }' $DOC/btyp/tablelist.dat ` mrmfs -pmf $oldport $newport -smf $oldstbd $newstbd < $file > $f.btywtsnc-dat mrfill -btypw 4630 -btysw 4630 $f.btywtsnc-dat > $f.btywtsnc-datt ; \rm $f.btywtsnc-dat end end # Boundary between 5 nm and 6 nm line spacing ----------------------- foreach jd ( 047 ) cd $PFIN/pfin$jd foreach file (` ls MR1?????1{8,9}\*da MR1?????2?\*da `) ls $file ; set f = $file:r set oldport = ` echo -n $TABLES ; nawk ' {if ($1 == "'$f'") print "/"$2".portmap" }' $DOC/btyp/tablelist.dat ` set oldstbd = ` echo -n $TABLES ; nawk ' {if ($1 == "'$f'") print "/"$3".stbdmap" }' $DOC/btyp/tablelist.dat ` set newport = ` echo -n $TABLES ; nawk ' {if ($1 == "'$f'") print "/"$4".portmap" }' $DOC/btyp/tablelist.dat ` set newstbd = ` echo -n $TABLES ; nawk ' {if ($1 == "'$f'") print "/"$5".stbdmap" }' $DOC/btyp/tablelist.dat ` mrmfs -pmf $oldport $newport -smf $oldstbd $newstbd < $file > $f.btywtsnc-dat mrfill -btypw 5556 -btysw 4630 $f.btywtsnc-dat > $f.btywtsnc-datt ; \rm $f.btywtsnc-dat end end foreach jd ( 048 ) cd $PFIN/pfin$jd foreach file (` ls MR1?????0?\*da MR1?????1{0,1}\*da `) ls $file ; set f = $file:r set oldport = ` echo -n $TABLES ; nawk ' {if ($1 == "'$f'") print "/"$2".portmap" }' $DOC/btyp/tablelist.dat ` set oldstbd = ` echo -n $TABLES ; nawk ' {if ($1 == "'$f'") print "/"$3".stbdmap" }' $DOC/btyp/tablelist.dat ` set newport = ` echo -n $TABLES ; nawk ' {if ($1 == "'$f'") print "/"$4".portmap" }' $DOC/btyp/tablelist.dat ` set newstbd = ` echo -n $TABLES ; nawk ' {if ($1 == "'$f'") print "/"$5".stbdmap" }' $DOC/btyp/tablelist.dat ` mrmfs -pmf $oldport $newport -smf $oldstbd $newstbd < $file > $f.btywtsnc-dat mrfill -btypw 5556 -btysw 4630 $f.btywtsnc-dat > $f.btywtsnc-datt ; \rm $f.btywtsnc-dat end end # 6 nm line spacing ------------------------------------------------- foreach jd ( 048 ) cd $PFIN/pfin$jd foreach file (` ls MR1?????1{2,3,4,5,6,7,8,9}\*da MR1?????2?\*da `) ls $file ; set f = $file:r set oldport = ` echo -n $TABLES ; nawk ' {if ($1 == "'$f'") print "/"$2".portmap" }' $DOC/btyp/tablelist.dat ` set oldstbd = ` echo -n $TABLES ; nawk ' {if ($1 == "'$f'") print "/"$3".stbdmap" }' $DOC/btyp/tablelist.dat ` set newport = ` echo -n $TABLES ; nawk ' {if ($1 == "'$f'") print "/"$4".portmap" }' $DOC/btyp/tablelist.dat ` set newstbd = ` echo -n $TABLES ; nawk ' {if ($1 == "'$f'") print "/"$5".stbdmap" }' $DOC/btyp/tablelist.dat ` mrmfs -pmf $oldport $newport -smf $oldstbd $newstbd < $file > $f.btywtsnc-dat mrfill -btypw 5556 -btysw 5556 $f.btywtsnc-dat > $f.btywtsnc-datt ; \rm $f.btywtsnc-dat end end foreach jd ( 049 ) cd $PFIN/pfin$jd foreach file (` ls MR1010490{0,1,2,3,4,5,6}\*da `) ls $file ; set f = $file:r set oldport = ` echo -n $TABLES ; nawk ' {if ($1 == "'$f'") print "/"$2".portmap" }' $DOC/btyp/tablelist.dat ` set oldstbd = ` echo -n $TABLES ; nawk ' {if ($1 == "'$f'") print "/"$3".stbdmap" }' $DOC/btyp/tablelist.dat ` set newport = ` echo -n $TABLES ; nawk ' {if ($1 == "'$f'") print "/"$4".portmap" }' $DOC/btyp/tablelist.dat ` set newstbd = ` echo -n $TABLES ; nawk ' {if ($1 == "'$f'") print "/"$5".stbdmap" }' $DOC/btyp/tablelist.dat ` mrmfs -pmf $oldport $newport -smf $oldstbd $newstbd < $file > $f.btywtsnc-dat mrfill -btypw 5556 -btysw 5556 $f.btywtsnc-dat > $f.btywtsnc-datt ; \rm $f.btywtsnc-dat end end # Boundary between 6 nm and 7 nm line spacing ----------------------- foreach jd ( 049 ) cd $PFIN/pfin$jd foreach file (` ls MR1010490{7,8,9}\*da MR1010491\*da MR1010492\*da `) ls $file ; set f = $file:r set oldport = ` echo -n $TABLES ; nawk ' {if ($1 == "'$f'") print "/"$2".portmap" }' $DOC/btyp/tablelist.dat ` set oldstbd = ` echo -n $TABLES ; nawk ' {if ($1 == "'$f'") print "/"$3".stbdmap" }' $DOC/btyp/tablelist.dat ` set newport = ` echo -n $TABLES ; nawk ' {if ($1 == "'$f'") print "/"$4".portmap" }' $DOC/btyp/tablelist.dat ` set newstbd = ` echo -n $TABLES ; nawk ' {if ($1 == "'$f'") print "/"$5".stbdmap" }' $DOC/btyp/tablelist.dat ` mrmfs -pmf $oldport $newport -smf $oldstbd $newstbd < $file > $f.btywtsnc-dat mrfill -btypw 5556 -btysw 6482 $f.btywtsnc-dat > $f.btywtsnc-datt ; \rm $f.btywtsnc-dat end end foreach jd ( 050 ) cd $PFIN/pfin$jd foreach file (` ls MR10105000\*da `) ls $file ; set f = $file:r set oldport = ` echo -n $TABLES ; nawk ' {if ($1 == "'$f'") print "/"$2".portmap" }' $DOC/btyp/tablelist.dat ` set oldstbd = ` echo -n $TABLES ; nawk ' {if ($1 == "'$f'") print "/"$3".stbdmap" }' $DOC/btyp/tablelist.dat ` set newport = ` echo -n $TABLES ; nawk ' {if ($1 == "'$f'") print "/"$4".portmap" }' $DOC/btyp/tablelist.dat ` set newstbd = ` echo -n $TABLES ; nawk ' {if ($1 == "'$f'") print "/"$5".stbdmap" }' $DOC/btyp/tablelist.dat ` mrmfs -pmf $oldport $newport -smf $oldstbd $newstbd < $file > $f.btywtsnc-dat mrfill -btypw 5556 -btysw 6482 $f.btywtsnc-dat > $f.btywtsnc-datt ; \rm $f.btywtsnc-dat end end # 7 nm line spacing ------------------------------------------------- foreach jd ( 050 ) cd $PFIN/pfin$jd foreach file (` ls MR1010500{1,2,3,4,5,6,7,8,9}\*da MR1010501\*da MR1010502\*da `) ls $file ; set f = $file:r set oldport = ` echo -n $TABLES ; nawk ' {if ($1 == "'$f'") print "/"$2".portmap" }' $DOC/btyp/tablelist.dat ` set oldstbd = ` echo -n $TABLES ; nawk ' {if ($1 == "'$f'") print "/"$3".stbdmap" }' $DOC/btyp/tablelist.dat ` set newport = ` echo -n $TABLES ; nawk ' {if ($1 == "'$f'") print "/"$4".portmap" }' $DOC/btyp/tablelist.dat ` set newstbd = ` echo -n $TABLES ; nawk ' {if ($1 == "'$f'") print "/"$5".stbdmap" }' $DOC/btyp/tablelist.dat ` mrmfs -pmf $oldport $newport -smf $oldstbd $newstbd < $file > $f.btywtsnc-dat mrfill -btypw 6482 -btysw 6482 $f.btywtsnc-dat > $f.btywtsnc-datt ; \rm $f.btywtsnc-dat end end foreach jd ( 051 052 053 054 ) cd $PFIN/pfin$jd foreach file (` ls MR1\*da `) ls $file ; set f = $file:r set oldport = ` echo -n $TABLES ; nawk ' {if ($1 == "'$f'") print "/"$2".portmap" }' $DOC/btyp/tablelist.dat ` set oldstbd = ` echo -n $TABLES ; nawk ' {if ($1 == "'$f'") print "/"$3".stbdmap" }' $DOC/btyp/tablelist.dat ` set newport = ` echo -n $TABLES ; nawk ' {if ($1 == "'$f'") print "/"$4".portmap" }' $DOC/btyp/tablelist.dat ` set newstbd = ` echo -n $TABLES ; nawk ' {if ($1 == "'$f'") print "/"$5".stbdmap" }' $DOC/btyp/tablelist.dat ` mrmfs -pmf $oldport $newport -smf $oldstbd $newstbd < $file > $f.btywtsnc-dat mrfill -btypw 6482 -btysw 6482 $f.btywtsnc-dat > $f.btywtsnc-datt ; \rm $f.btywtsnc-dat end end Compare before / after: set file = MR10104318.00.btywtsnc-da btyp -mr $file -attr $PARMS/proc/mv0101.041.1000.btyp.attr & btyp -mr $file"tt" -attr $PARMS/proc/mv0101.041.1000.btyp.attr & If happy, convert the table-switched data to XYZ and make a chart: see $DOC/bty\_chart/mr1\_to\_xyz.doc

Overview of Bathymetry Charting Survey mv0101 The BTY\_CHART menus and doc files document how to create bathymetry charts. SUBJECT MENU NAME DOC FILE -------- --------- -------- 1. Convert MR1 bathy to xyzw MR1 TO XYZW $DOC/bty\_chart/MR1\_to\_xyzw.doc 2. Grid the xyzw data BTY GRIDDING $DOC/bty\_chart/bty\_grid.doc 3. Make page-size charts PAGE CHARTS $DOC/bty\_chart/page\_charts.doc 4. Make A0-size charts A0 CHARTS $DOC/bty\_chart/A0\_charts.doc 5. View and print charts VIEW & PRINT $DOC/bty\_chart/view\_print.doc 6. Plot individual hour file HOURPLOTS $DOC/bty\_chart/hourplot.doc

Bathymetry Charting: MR1 to XYZW Conversion Survey mv0101 CONTENTS 1. What This Does 2. Daily Processing 3. Reprocessing Table Switched Files ############################################################################ 1. What This Does Although the mr1 software allows you to grid and display bathymetry data, many people want to generate xyz bathymetry for their own evil purposes. The programs mr2gmt and mr2xyzw allow you to do this. We'll use mr2xyzw to convert the data to values that are weighted such that points closest to nadir have the most significance. The MR -> XYZ conversion used here is modified from MBASA. The difference is that you now need to (get to?) specify the cell size that will be used for the noise suppression routine. For now the rule of thumb is to use a value that is about the same size as the desired chart grid cell size. So if you want a 100 m bathymetry grid, use a 100 m cell size here. Magnetic corrections are not incorporated in the bty2xyzw step. All magnetic corrections are included in the headers of individual MR1 hourfiles as documented in $DOC/compass/bty\_compass.doc. However, you need to specify a magcor of zero as input to bty2xyzw so that the conversion uses the towfish compass data, but adds no additional correction. For more info on magnetic corrections, see $DOC/compass/bty\_compass.doc ############################################################################ 2. Daily Processing Do this on a daily basis as part of the processing pipeline foreach jd ( 041 042 043 044 045 046 047 ) foreach jd ( 048 049 050 051 052 053 054 ) foreach jd ( 041 042 ) if !( -d $XYZ/xyz$jd ) mkdir $XYZ/xyz$jd cd $PINT/pint$jd ls \*.btywtsnc-d > files foreach file ( `cat files` ) if (-f $file\t) set file = $file\t set f = $file:r bty2xyzw $file 0 gzip $f.c.xyzw \mv $f.c.xyzw.gz $XYZ/xyz$jd end cd $XYZ/xyz$jd gunzip \*.gz echo "Combine .xyzw files..." cat \*.c.xyzw > jd$jd.xyzw gzip \*.c.xyzw end ##################################################################### 3. Reprocessing Table Switched Files Do this after you've switched the AA tables on an MR1 file. For more info on switching tables, see $DOC/mr1proc/tableswitch.doc foreach jd ( 051 052 053 054 ) if !( -d $XYZ/xyz$jd ) mkdir $XYZ/xyz$jd cd $PFIN/pfin$jd ls \*.btywtsnc-datt > files foreach file ( `cat files` ) if (-f $file\t) set file = $file\t set f = $file:r bty2xyzw $file 0 gzip $f.c.xyzw \mv $f.c.xyzw.gz $XYZ/xyz$jd end cd $XYZ/xyz$jd gunzip \*.gz echo "Combine .xyzw files..." cat \*.c.xyzw > jd$jd.xyzw gzip \*.c.xyzw end ##################################################################### 3. Reprocessing Specific Files Do this after you've edited an MR1 file, and need to replace the XYZ data. set file = MR10105322.00.btywtsnc-datt set f = $file:r set jd = ` echo $file | cut -c6-8 ` cd $PFIN/pfin$jd bty2xyzw $file 0 if (-f $XYZ/xyz$jd/$f.c.xyzw.gz ) \rm $XYZ/xyz$jd/$f.c.xyzw.gz \mv $f.c.xyzw $XYZ/xyz$jd cd $XYZ/xyz$jd gunzip \*.gz echo "Combine .xyzw files..." cat \*.c.xyzw > jd$jd.xyzw gzip \*.c.xyzw Pau!

Converting mw9719 MR1 bathy data Survey mv0101 We changed the way we do noise suppression between 1997 and 2001. The following commands bring the mw9719 data up to 2001 spec. ######################################################################## foreach jd ( 235 ) foreach jd ( 23{6,7,8,9} 24{0,1,2,3,4,5,6,7,8,9} 25{0,1} ) cd $XYZ/xyz$jd gunzip MR\*.xyzw.gz foreach file (` ls MR\*.blk25m.xyzw `) xyzwconvert\_mw9719 $file gzip $file end echo "Combine .xyzw files..." cat \*.c.xyzw > jd$jd.xyzw gzip \*.c.xyzw end foreach jd ( 23{5,6,7,8,9} 24{0,1,2,3,4,5,6,7,8,9} 25{0,1} ) cd $XYZ/xyz$jd if (-f jd$jd.xyzw ) \mv jd$jd.xyzw jd$jd.mw9719.xyzw end

Melville Sea Beam Data Survey mv0101 Everything you need to know: where the seabeam files are, how to get them, what's in them, and how to turn 'em into XYZ. CONTENTS 1. Copy Sea Beam Data to HMRG computer 2. Description of Sea Beam file types 3. Extract XYZ triplets from the bathymetry file ############################################################################# 1. Copy Melville Sea Beam 2000 Data to HMRG computers like so: set jd = 058 mkdir $PRAW/cbm$jd ; cd $PRAW/cbm$jd ftp melville ftp> cd /Work.Disk.02/sb2000/DATA/20010227 ftp> bin ftp> prompt ftp> mget \*.\* ftp> bye jd055 - /Work.Disk.02/sb2000/DATA/20010224 jd056 - /Work.Disk.02/sb2000/DATA/20010225 jd057 - /Work.Disk.02/sb2000/DATA/20010226 jd058 - /Work.Disk.02/sb2000/DATA/20010227 ############################################################################# 2. Description of Sea Beam file types File Name File Type -------------------------- ---------------------------- SBfixavg.2001feb14 Bathymetry, merged with nav, filtered (despike) SBmrg.2001feb14 Bathymetry, merged with nav SBmrg.2001feb14.inf Doc file for merged bathy SBraw.2001feb14 Bathymetry SSmed.2001feb14.Z 4-bit sidescan, merged with nav, filtered SSmrg.2001feb14.Z 4-bit sidescan, merged with nav SSraw.2001feb14.Z 4-bit sidescan sb2000\_ss.20010214-0400 12-bit sidescan sb2000.2001feb14.Z Bathy + 4-bit sidescan in vendor format Tsb2k\_convert.log.2001feb14 Documentation Tss\_merge.median.log.2001feb14 Documentation Tswath\_check.SSmed.2001feb14 Documentation sb.fixavg.files.summary.COOK06 Documentation sb.mrg.files.summary.COOK06MV Documentation sb.raw.files.summary.COOK06MV Documentation ss.med.files.summary.COOK06MV Documentation ############################################################################# Nathan's seabeam directory: cd /Work.Disk.03/nbecker/bathymetry/sb2000 ############################################################################# 3. Extract XYZ triplets from the bathymetry file Do this on melville (HMRG doesn't have MB-System installed). You need to have the mbsystem software in your path (try copying Nate's or Mark Silver's .cshrc file to yours). The loops below add a fourth column to the XYZ data. This is the weight value that we use to assign priority to bathy data when we grid. Here we give the seabeam data a weight of 0.5 so that it feathers nicely with the MR1 data. set jd = 041 echo /Work.Disk.02/sb2000/DATA/20010210/SBmrg.2001feb10 32 >! ~bruce/jd$jd.list cd ~bruce mblist -D2 -F-32 -Ijd$jd.list -V |\ nawk '{print $0,"0.5"}' >! ~bruce/jd$jd.xyzw set jd = 045 echo /Work.Disk.02/sb2000/DATA/20010214/SBmrg.2001feb14 32 >! ~bruce/jd$jd.list cd ~bruce mblist -D2 -F-32 -Ijd$jd.list -V |\ nawk '{print $0,"0.5"}' >! ~bruce/jd$jd.xyzw set jd = 047 echo /Work.Disk.02/sb2000/DATA/20010216/SBmrg.2001feb16 32 >! ~bruce/jd$jd.list cd ~bruce mblist -D2 -F-32 -Ijd$jd.list -V |\ nawk '{print $0,"0.5"}' >! ~bruce/jd$jd.xyzw set jd = 053 cd /Work.Disk.02/bruce echo /Work.Disk.02/sb2000/DATA/20010222/SBmrg.2001feb22 32 >! jd$jd.list mblist -D2 -F-32 -Ijd$jd.list -V |\ nawk '{print $0,"0.5"}' >! jd$jd.xyzw set jd = 054 cd /Work.Disk.02/bruce echo /Work.Disk.02/sb2000/DATA/20010223/SBmrg.2001feb23 32 >! jd$jd.list mblist -D2 -F-32 -Ijd$jd.list -V |\ nawk '{print $0,"0.5"}' >! jd$jd.xyzw set jd = 055 cd /Work.Disk.02/bruce echo /Work.Disk.02/sb2000/DATA/20010224/SBmrg.2001feb24 32 >! jd$jd.list mblist -D2 -F-32 -Ijd$jd.list -V |\ nawk '{print $0,"0.5"}' >! jd$jd.xyzw set jd = 056 cd /Work.Disk.02/bruce echo /Work.Disk.02/sb2000/DATA/20010225/SBmrg.2001feb25 32 >! jd$jd.list mblist -D2 -F-32 -Ijd$jd.list -V |\ nawk '{print $0,"0.5"}' >! jd$jd.xyzw set jd = 057 cd /Work.Disk.02/bruce echo /Work.Disk.02/sb2000/DATA/20010226/SBmrg.2001feb26 32 >! jd$jd.list mblist -D2 -F-32 -Ijd$jd.list -V |\ nawk '{print $0,"0.5"}' >! jd$jd.xyzw set jd = 058 cd /Work.Disk.02/bruce echo /Work.Disk.02/sb2000/DATA/20010227/SBmrg.2001feb27 32 >! jd$jd.list mblist -D2 -F-32 -Ijd$jd.list -V |\ nawk '{print $0,"0.5"}' >! jd$jd.xyzw ftp malei ftp > binary ftp > cd /home/malei2d/mv0101/xyz/cbm058 ftp > put jd058.xyzw ftp > bye rm /Work.Disk.02/bruce/\*xyzw

Gridding MR1 Bathymetry by Chart Survey mv0101 CONTENTS 1. How this works 2. Grid Sizes: Rules of Thumb 3. Doing it ############################################################################ 1. How this works It's easy. All the hard stuff is neatly entombed in the scripts btygrid\_utm\_100k, btygrid\_utm\_025k, and btygrid\_utm\_010k. If you want to see how they work, have a look at them in the $SCRIPTS directory. As currently configured, the gridding scripts: 1) Need an input file called $PARMS/chart/boxes that contains the boundaries for all the charts. 2) Require individual box definition files ($PARMS/chart/\*.box) 3) extend the gridded area 3 minutes beyond the plot edges defined in $PARMS/chart/boxes ############################################################################ Grid Sizes: Rules of Thumb 0 - 500 meters: 25 meter grids 500 - 4500 meters: 100 meter grids 4500 - 9500 meters: 200 meter grids ############################################################################ 3. Doing it cruise ID : chart number : : grid size : : : start day : : : : end day : : : : : btygrid\_utm AJC AJC.100-001 100 118 119 set c = 001 echo 041 235 236 > $PARMS/chart/$PROJ/$c.jdlist btygrid\_utm mv0101 mv0101-100-$c 100 $PARMS/chart/$PROJ/$c.jdlist set c = 002 echo 041 042 235 236 > $PARMS/chart/$PROJ/$c.jdlist btygrid\_utm mv0101 mv0101-100-$c 100 $PARMS/chart/$PROJ/$c.jdlist set c = 003 echo 236 237 238 239 > $PARMS/chart/$PROJ/$c.jdlist btygrid\_utm mv0101 mv0101-100-$c 100 $PARMS/chart/$PROJ/$c.jdlist set c = 004 echo 042 043 236 237 238 239 > $PARMS/chart/$PROJ/$c.jdlist btygrid\_utm mv0101 mv0101-100-$c 100 $PARMS/chart/$PROJ/$c.jdlist set c = 005 echo 042 043 238 > $PARMS/chart/$PROJ/$c.jdlist btygrid\_utm mv0101 mv0101-100-$c 100 $PARMS/chart/$PROJ/$c.jdlist set c = 006 echo 042 043 044 045 046 047 238 239 240 241 > $PARMS/chart/$PROJ/$c.jdlist btygrid\_utm mv0101 mv0101-100-$c 100 $PARMS/chart/$PROJ/$c.jdlist set c = 007 echo 042 043 044 045 046 047 > $PARMS/chart/$PROJ/$c.jdlist btygrid\_utm mv0101 mv0101-100-$c 100 $PARMS/chart/$PROJ/$c.jdlist set c = 008 echo 238 239 240 241 242 > $PARMS/chart/$PROJ/$c.jdlist btygrid\_utm mv0101 mv0101-100-$c 100 $PARMS/chart/$PROJ/$c.jdlist set c = 009 echo 044 046 047 049 239 240 241 242 > $PARMS/chart/$PROJ/$c.jdlist btygrid\_utm mv0101 mv0101-100-$c 100 $PARMS/chart/$PROJ/$c.jdlist set c = 010 echo 044 045 046 047 048 049 050 > $PARMS/chart/$PROJ/$c.jdlist btygrid\_utm mv0101 mv0101-100-$c 100 $PARMS/chart/$PROJ/$c.jdlist set c = 011 echo 044 045 046 047 048 049 050 > $PARMS/chart/$PROJ/$c.jdlist btygrid\_utm mv0101 mv0101-100-$c 100 $PARMS/chart/$PROJ/$c.jdlist set c = 012 echo 045 046 047 048 049 050 > $PARMS/chart/$PROJ/$c.jdlist btygrid\_utm mv0101 mv0101-100-$c 100 $PARMS/chart/$PROJ/$c.jdlist set c = 013 echo 051 052 242 > $PARMS/chart/$PROJ/$c.jdlist btygrid\_utm mv0101 mv0101-100-$c 200 $PARMS/chart/$PROJ/$c.jdlist set c = 014 echo 050 051 052 053 054 242 > $PARMS/chart/$PROJ/$c.jdlist btygrid\_utm mv0101 mv0101-100-$c 200 $PARMS/chart/$PROJ/$c.jdlist set c = 015 echo 050 051 052 053 054 > $PARMS/chart/$PROJ/$c.jdlist btygrid\_utm mv0101 mv0101-100-$c 200 $PARMS/chart/$PROJ/$c.jdlist set c = 016 echo 050 051 052 053 054 > $PARMS/chart/$PROJ/$c.jdlist btygrid\_utm mv0101 mv0101-100-$c 200 $PARMS/chart/$PROJ/$c.jdlist set c = 017 echo 050 051 052 053 054 > $PARMS/chart/$PROJ/$c.jdlist btygrid\_utm mv0101 mv0101-100-$c 100 $PARMS/chart/$PROJ/$c.jdlist

Bathymetry Charting: Create page-sized bathymetry charts Survey mv0101 1. The Plan 2. Executing The Plan ########################################################################### 1. The Plan The page-size imaging works the same way as the A0 imaging, except that we use a different script, called $SCRIPTS/btyimage\_japanus\_page The imaging scripts require the following files as input: $PARMS/chart/chartlabels.dat $PARMS/chart/boxes ########################################################################### 2. Executing The Plan ...one-by-one: page\_chart mv0101 mv0101-100-001 bty page\_chart mv0101 mv0101-100-002 bty page\_chart mv0101 mv0101-100-003 bty page\_chart mv0101 mv0101-100-004 bty page\_chart mv0101 mv0101-100-005 bty page\_chart mv0101 mv0101-100-006 bty page\_chart mv0101 mv0101-100-007 bty page\_chart mv0101 mv0101-100-008 bty page\_chart mv0101 mv0101-100-009 bty page\_chart mv0101 mv0101-100-010 bty page\_chart mv0101 mv0101-100-011 bty page\_chart mv0101 mv0101-100-012 bty page\_chart mv0101 mv0101-100-013 bty page\_chart mv0101 mv0101-100-014 bty page\_chart mv0101 mv0101-100-015 bty page\_chart mv0101 mv0101-100-016 bty page\_chart mv0101 mv0101-100-017 bty cd $BTYCHART/\*011 ; vr \*page.ps & ########################################################################### 3. Convert charts to JPG format ...in bunches: foreach c ( mv0101-100-00{1,2,4,5,6,7} mv0101-100-01{0,1,2,3,4,5,6,7} ) cd $BTYCHART/bty:$c alchemy $c.bty.page.ps -o -Zi 8.5 11.0 -Zd 300 300 -Zm 2 -24 -s tmp.ras rasttopnm tmp.ras | pnmflip -cw | pnmtorast > tmp1.ras alchemy tmp1.ras -j100 -o $c.bty.page.jpg \rm tmp.ras tmp1.ras end cd $NAV/chart alchemy mv0101.nav.notopo.ps -o -Zi 8.5 11.0 -Zd 300 300 -Zm 2 -24 -s tmp.ras rasttopnm tmp.ras | pnmflip -cw | pnmtorast > tmp1.ras alchemy tmp1.ras -j100 -o mv0101.nav.jpg \rm tmp.ras tmp1.ras

Bathymetry Charting - Imaging Charts Survey mv0101 CONTENTS 1. How this works 2. Make PostScript A0 charts for fun and profit 3. Generate 10 meter contours for 0-2000m for Racal ############################################################################ 1. How this works Again, easy. All the hard stuff is neatly entombed in the scripts btyimage\_utm\_100k, btyimage\_utm\_25k, and btyimage\_utm\_10k. If you want to see how they work, have a look at them in the $SCRIPTS directory. The imaging scripts require several files as input: $PARMS/chart/chartlabels.dat $PARMS/chart/project\_id/boxes ############################################################################ 2. Make PostScript A0 charts for fun and profit cd $BTYCHART A0\_chart 200000 $PROJ $PROJ.200-001 bty set c = 001 ; cd $BTYCHART/bty:$PROJ.200-$c pageview -aa -depth 24 -mcd 300 -w 47.0 -h 33.3 $PROJ.200-$c.bty.ps &

Viewing and Printing Bathymetry Charts Survey mv0101 set c = kaimana.200-001 To view a chart: cd $CHART/bty/bty:$c pageview -aa -depth 24 -mcd 300 -w 47.0 -h 33.3 $c.bty.ps & To print a chart: RLOGIN to MALEI cd $CHART/bty/bty:$c ps2hp650 -r 300 -X 33.3 -Y 47.0 -d 24 $c.bty.ps $c.bty.rtl lpr -Php755b $c.bty.rtl ------------------------------------------------------------------- To print a bunch of charts: Melville printer... cd $CHART/bty foreach c ( 00{1,2,4,5,6,7} 01{0,1,2,3,4,5,6,7} ) cd $CHART/bty/bty:mv0101-100-$c lpr -P hp1600 -s mv0101-100-$c.bty.page.ps echo "Sleeping while plotting..." sleep 240 end HMRG printer... cd $CHART/bty foreach c ( 00{1,2,4,5,6,7} 01{0,1,2,3,4,5,6,7} ) cd $CHART/bty/bty:mv0101-100-$c lpr -P hp1200pp -s mv0101-100-$c.bty.page.ps echo "Sleeping while plotting... " `date` sleep 300 end big printer... cd $CHART/bty foreach c ( 00{1,2,4,5,6,7} 01{1,2,3,4,5,6,7} ) cd $CHART/bty/bty:mv0101-100-$c alchemy mv0101-100-$c.bty.page.ps --r14 -o -Zi 11 8.5 -Zd 300 300 \ -Zm2 -Z\_0i 0i -24 -Zr90 mv0101-100-$c.bty.page.rtl lpr -Php755b -s mv0101-100-$c.bty.page.rtl sleep 240 end lpr -Php1200pp -s bty:kaimana.200-001/kaimana.200-001.bty.page.ps ------------------------------------------------------------------- To print A0 size charts: foreach c ( kaimana.200-00{1} ) cd $CHART/bty/bty:$c ps2hp650 -r 300 -X 33.3 -Y 47.0 -d 24 $c.bty.ps $c.bty.rtl lpr -P hp755a -s $c.bty.rtl echo "Sleeping while plotting..." sleep 1900 cd $CHART/bty end

Hourfile bathymetry plotting Survey mv0101 This method allows you to plot a gridded color contour bathymetry plot of an hour file in near-real time. Method ------ 1. Finish the processing of the hour file in btyp Transfer the .btync file to $BTYR/btyr### 2. Process the ship navigation as described in $DOC/nav\_ship.doc 3. Navigate the data as described in $DOC/nav\_bathy.doc 4. Filter the towfish compass data as described in $DOC/compass\_bathy.doc The final file should have the suffix .btywtnc, located in $BTYFIN/btyf### 5. Note: the mag correction (mc) should always be set to 0 as the correction is now applied durring the compassing. 6. Now do the following: For depths < 6000 use 100 m grid size For depths > 6000 use 200 m grid size Note: for more info on btyplot just type in "btyplot" set jd = 053 set hr = 22.00 set zone = 54 set mc = 0 cd $PFIN/pfin$jd btyplot MR1??$jd$hr.btywtsnc-datt 1.5 200 0 54 100000 25 100 btyplot test1 1 200 0 54 100000 25 100 btyplot MR1??$jd$hr.btywtsnc-datt 1 50 0 54 80000 cont Testing different WD% and output grid sizes... set file = MR10104318.00.btywtsnc-datt set f = $file:r foreach pct ( 1 2 3 4 ) foreach cell ( 25 50 100 ) btyplot MR1??$jd$hr.btywtsnc-datt $pct $cell 0 54 80000 cont \mv $f.bathy.ps $f.pct$pct.grd$cell.ps vr $f.pct$pct.grd$cell.ps & end end set file = MR10015721.19.bathy.ps ; set f = $file:r ps2rast -r 300 -X 14 -Y 11 -d 24 $file $f.ras foreach file ( ` ls \*ps `) set f = $file:r ps2hp650 -r 300 -X 14 -Y 11 -d 24 $file $f.rtl end

Overview of Sidescan Charting Survey mv0101 The SS\_CHART menus and doc files document how to create sidescan charts. SUBJECT MENU NAME DOC FILE -------- --------- -------- 1. Establish chart parameters CHART SETUP $DOC/ss\_chart/ss\_setup.doc 2. Grid the ss data by chart SS GRIDDING $DOC/ss\_chart/ss\_grid.doc 3. Create mosaics of imagery SS MOSAIC $DOC/ss\_chart/ss\_mosaic.doc 4. Make A0-size ss charts A0 CHARTS $DOC/ss\_chart/ss\_A0\_charts.doc 5. Make page-size ss charts PAGE CHARTS $DOC/ss\_chart/ss\_page\_charts.doc 6. View and print charts VIEW & PRINT $DOC/ss\_chart/ss\_view\_print.doc

Establishing common parameters for sidescan grids Survey mv0101 Results from the following 4 steps are incorporated into the script $SCRIPTS/gridss, which will be used to grid each chart. CONTENTS 1. Scale 2. Reference point 3. Graymap ######################################################################## 1. Scale Note that scaling for HMRG charts is buried deeply within the script gridss. The grid cell size controls the scale of the final output image, and is controlled by the output device resolution (dots per inch). For a 300 dpi output device (IRIS plotter, HP750, etc) scale 1:50,000 => cell size 4.233333 scale 1:100,000 => cell size 8.466666 scale 1:200,000 => cell size 16.933333 scale 1:400,000 => cell size 33.866666 scale 1:450,000 => cell size 38.099999 scale 1:800,000 => cell size 67.733333 scale 1:1,000,000 => cell size 84.666666 For a 203 dpi output device (Raytheon thermal printer) scale 1:100,000 => cell size 12.5123153 scale 1:200,000 => cell size 25.0246306 scale 1:400,000 => cell size 50.0492612 scale 1:800,000 => cell size 100.0985200 ######################################################################## 2. Reference point Easy Way: The easiest way is to just a value of 0 0. This is what the HMRG charting scripts do. Hard Way: Determine a common reference point for all sidescan charts by running mrgrid in Very Verbose mode, and killing it as soon as it echoes back the reference point: cd $SSFIN/ssf025 mrgrid MR10002512.00.ssdncap -v 2 -ss -putm -plon 57 -mc -22 -cs 8.466666 \ -cf junk.cf -mpcw 30 -isr 30 -mspd 100 -adct 1.9 -tt 3.00 -v 2 ######################################################################## 3. Graymap A common graymap needs to be generated to use on all the sidescan mosaics. When evaluating the graymap, bear in mind that the monitors and the printers don't reproduce images the same way. To find a graymap that will look good on the HP755 using matte film (mylar), display the mosaic on the monitor using a gamma shift of 0.3: xv -gamma .3 $SSCHART/test.$num.ras & -------------- From mw9719: set num = 07 set lh = "1000000 12000000000" -------------- From kaimana set num = KM01 set lh = "750000 120000000" -------------- Here's the trial and error: set file = $PFIN/pfin041/MR10104111.00.btywtsnc-da set num = 01 set lh = "1000000 12000000000" set num = 02 set lh = "750000 120000000" set num = 03 set lh = "500000 1200000000" set num = 04 set lh = "250000 1200000000" set num = 05 set lh = "250000 5000000000" set num = 06 set lh = "250000 7500000000" set num = 07 set lh = "250000 10000000000" set num = 08 set lh = "500000 10000000000" set num = 09 set lh = "400000 10000000000" set num = 10 set lh = "350000 10000000000" set num = 11 set lh = "350000 8000000000" set num = 12 set lh = "350000 6000000000" set lh = "250000 5000000000" mrgrm -lh $lh -log < $file > $PARMS/ss/graymap.$num.grm cd $PARMS/ss invgrm graymap.$num.grm > graymap.inv.$num.grm -------------- OK: set num = 10 set lh = "350000 10000000000" cp $PARMS/ss/graymap.inv.10.grm $PARMS/ss/$PROJ.grm Best so far: set num = 12 set lh = "350000 6000000000" set lh = "250000 5000000000" cp $PARMS/ss/graymap.inv.12.grm $PARMS/ss/$PROJ.grm -------------- test the graymap: First grid the test01 and test02 data as shown in $DOC/ss\_grid.doc Test01 cd $SSGRID/test01-16m mrovl test01.16m.cf -rf test.$num.ras -gmf $PARMS/ss/graymap.inv.$num.grm \ -mbg 75 75 75 -tmf $SSTEMP/temp0 -v 2 xv -gamma .15 test.$num.ras & Test02 cd $SSGRID/test02-16m mrovl test02.16m.cf -rf test.$num.ras -gmf $PARMS/ss/graymap.inv.$num.grm \ -mbg 75 75 75 -tmf $SSTEMP/temp0 -v 2 xv -gamma .15 test.$num.ras & NOTE: These GRMs are designed for printing on the HP755 on matte film (mylar). To see how they'll look, bring them up in xv and then apply a gamma of 0.3 (Sun CRT) or 0.15 (NEC flat panel) and it gives you an idea.

Defining Data Within Lines For Sidescan Mosaics Survey mv0101 Defining data within each line, for use with sidescan gridding CONTENTS 1. How to identify data within each line 2. Line definitions ######################################################################## 1. How to identify data within each line Use the page-sized navigation charts (produced in $DOC/navplot.doc) to figure out which hour files should be gridded in each chart. Remember to include all hourfiles that insonify areas within the chart (some MR1 hour files may extend beyond the chart boundaries). For simplicity, break lines at hour file boundaries so you don't have to use mrcat to divide MR1 files. So what if you don't end exactly on the turn. Who cares? ######################################################################## 2. Line definitions The names of the hourfiles are listed and written into a file named $SSGRID/parms/$chart.files. This file will be used in the gridding step (below) to control which files are gridded. set line = test01 \ls $PFIN/pfin042/MR1?????17\*datt \ $PFIN/pfin042/MR1?????2[1-3]\*datt > $PARMS/ss/$line.files set line = test02 \ls $PFIN/pfin044/MR1?????0[2-3]\*datt \ $PFIN/pfin044/MR1?????0[7-8]\*datt > $PARMS/ss/$line.files set line = line001 \ls $PFIN/pfin041/MR1?????1[1-8]\*datt > $PARMS/ss/$line.files set line = line002 \ls $PFIN/pfin041/MR1?????1[9]\*datt \ $PFIN/pfin041/MR1?????2[0-3]\*datt \ $PFIN/pfin042/MR1?????0[0]\*datt > $PARMS/ss/$line.files set line = line003 \ls $PFIN/pfin042/MR1?????0[1-5]\*datt > $PARMS/ss/$line.files set line = line004 \ls $PFIN/pfin042/MR1?????0[6-9]\*datt \ $PFIN/pfin042/MR1?????1[0-2]\*datt > $PARMS/ss/$line.files set line = line005 \ls $PFIN/pfin042/MR1?????1[3-9]\*datt > $PARMS/ss/$line.files set line = line006 \ls $PFIN/pfin042/MR1?????2[0-3]\*datt > $PARMS/ss/$line.files set line = line007 \ls $PFIN/pfin043/MR1?????0[0-8]\*datt > $PARMS/ss/$line.files set line = line008 \ls $PFIN/pfin043/MR1?????0[9]\*datt \ $PFIN/pfin043/MR1?????1[0-8]\*datt > $PARMS/ss/$line.files set line = line009 \ls $PFIN/pfin043/MR1?????1[9]\*datt \ $PFIN/pfin043/MR1?????2[0-3]\*datt \ $PFIN/pfin044/MR1?????0[0-4]\*datt > $PARMS/ss/$line.files set line = line010 \ls $PFIN/pfin044/MR1?????0[5-9]\*datt \ $PFIN/pfin044/MR1?????1[0-5]\*datt > $PARMS/ss/$line.files set line = line011 \ls $PFIN/pfin044/MR1?????1[6-9]\*datt \ $PFIN/pfin044/MR1?????2[0-3]\*datt \ $PFIN/pfin045/MR1?????0[0-3]\*datt > $PARMS/ss/$line.files set line = line012 \ls $PFIN/pfin045/MR1?????0[8-9]\*datt \ $PFIN/pfin045/MR1?????1[0-9]\*datt \ $PFIN/pfin045/MR1?????2[0-3]\*datt \ $PFIN/pfin046/MR1?????0[0-1]\*datt > $PARMS/ss/$line.files set line = line013 \ls $PFIN/pfin046/MR1?????0[2-9]\*datt \ $PFIN/pfin046/MR1?????1[0-8]\*datt > $PARMS/ss/$line.files set line = line014 \ls $PFIN/pfin046/MR1?????1[9]\*datt \ $PFIN/pfin046/MR1?????2[0-3]\*datt \ $PFIN/pfin047/MR1?????0[0-9]\*datt \ $PFIN/pfin047/MR1?????1[0-7]\*datt > $PARMS/ss/$line.files set line = line015 \ls $PFIN/pfin047/MR1?????1[7-9]\*datt \ $PFIN/pfin047/MR1?????2[0-3]\*datt \ $PFIN/pfin048/MR1?????0[0-9]\*datt \ $PFIN/pfin048/MR1?????1[0-1]\*datt > $PARMS/ss/$line.files set line = line016 \ls $PFIN/pfin048/MR1?????1[2-9]\*datt \ $PFIN/pfin048/MR1?????2[0-3]\*datt \ $PFIN/pfin049/MR1?????0[0-6]\*datt > $PARMS/ss/$line.files set line = line017 \ls $PFIN/pfin049/MR1?????0[7-9]\*datt \ $PFIN/pfin049/MR1?????1[0-9]\*datt \ $PFIN/pfin049/MR1?????2[0-3]\*datt \ $PFIN/pfin050/MR1?????0[0]\*datt > $PARMS/ss/$line.files set line = line018 \ls $PFIN/pfin050/MR1?????0[1-9]\*datt \ $PFIN/pfin050/MR1?????1[0-9]\*datt \ $PFIN/pfin050/MR1?????2[0-3]\*datt \ $PFIN/pfin051/MR1?????0[0-4]\*datt > $PARMS/ss/$line.files set line = line019 \ls $PFIN/pfin051/MR1?????0[5-9]\*datt \ $PFIN/pfin051/MR1?????1[0-9]\*datt \ $PFIN/pfin051/MR1?????2[0-3]\*datt \ $PFIN/pfin052/MR1?????0[0-4]\*datt > $PARMS/ss/$line.files set line = line020 \ls $PFIN/pfin052/MR1?????0[5-9]\*datt \ $PFIN/pfin052/MR1?????1[0-9]\*datt \ $PFIN/pfin052/MR1?????2[0-3]\*datt \ $PFIN/pfin053/MR1?????0[0-4]\*datt > $PARMS/ss/$line.files set line = line021 \ls $PFIN/pfin053/MR1?????0[5-9]\*datt \ $PFIN/pfin053/MR1?????1[0-6]\*datt > $PARMS/ss/$line.files set line = line022 \ls $PFIN/pfin053/MR1?????1[7-9]\*datt \ $PFIN/pfin053/MR1?????2[0-2]\*datt \ $PFIN/pfin054/MR1?????0[0-4]\*datt > $PARMS/ss/$line.files set line = line023 \ls $PFIN/pfin054/MR1?????0[5-9]\*datt \ $PFIN/pfin054/MR1?????1[0-9]\*datt > $PARMS/ss/$line.files

Gridding Sidescan Survey mv0101 GRIDDING BY CHART CONTENTS 1. Normal gridding 2. Adding new data 3. How the gridding loops work 4. Grid the data at 100 m for Nathan using a Mercator projection 5. Grid the data at 84 m - Fast and easy! 6. Grid the data at 16 m - Time and Money! ############################################################################# 1. Normal gridding Using line-by-line gridding allows you to keep up with sidescan gridding as you move through your survey. This allows you to evaluate each day's data, and cuts down on irritating end-of-survey work (because your gridding will be done by the time you get there). First you need to define the data that go into each survey line, which is outlined in $DOC/ss\_chart/ss\_line\_def.doc. Once you've got your lines defined, run the gridding loops below for different resolution output. If you use the UTM projection, remember to use the appropriate central meridian. There's a chart of UTM zones in the seagoing file box. The general procedure is to generate a 1:1,000,000 grid first (84 meter grid) first and have a look at the mosaic to make sure A) are there; and B) look OK. If there's a problem, fix it now. If its OK, grid at 1:200,000 (16 meter) and move on. ############################################################################# 2. Adding new data If you go back through an existing chart area, you can add the new data to a chart simply by creating a new line (in $DOC/ss\_chart/ss\_line\_def.doc), gridding it below, and adding it you your chart in the mosaic step. If you reprocess any of your MR1 files and need to re-incorporate them into a chart, the best thing to do is re-grid the entire line the data occur on. It doesn't take that long. Note that when you regrid a line, the gridding loops below first delete the contents of the grid directory you're working on, and then add the new gridded data in. That way you don't get mismatched .cf and .cswr files that would cause mrovl to abort during mosaicing. ############################################################################# 3. How the gridding loops work For each survey line you grid, you need to define - The machine you're gridding on (so the appropriate temp directory is used) - The grid cell size - Any static change to the towfish magnetic compass. Note that this is in addition to the IGRF correction and course-dependent correction you've already determined for the data (in $DOC/mr1proc/mr1\_compass.doc) - Projection - Central longitude of projection. You even need to specify this for Mercator projections, because mrgrid requires a central longitude for grids that use explicit reference positions (and we use explicit reference positions). - MR1 transmit rep rate (used to control along-track gridding parameters) - Ship speed (use a consistent, representative speed for you entire survey for Best Results). The gridding loop will automatically create a new subdirectory beneath $SSGRID (if necessary) to put the data. If the subdirectory exists, the loop first deletes existing data from the directory. This prevents incompatible .cswr and .cf files from existing which would mess up mosaicing in mrovl. Then the loop creates symbolic links within the subdirectory to the MR1 files defined for the line (in $DOC/ss\_chart/ss\_line\_def.doc). This way the .cswr files will be created in the subdirectory, and the definition of these .cswr files within the .cf file will be to the current working directory. An important detail when you go to combine lines into mosaics later. Then the loop executes gridding in the gridss script. You can read all about gridss by opening the script. Lastly, the loop deletes the symbolic links out of the subdirectory, which is done for clarity and to prevent problems when writing the $SSGRID directories to the daily backup tapes. ############################################################################# 4. Grid the data at 100 m for Nathan using a Mercator projection # UTM Zone 54 foreach chart ( line001 line002 line003 line004 ) foreach chart ( line005 line006 line007 line008 ) foreach chart ( line009 line010 line011 line012 ) foreach chart ( line013 line014 line015 line016 ) foreach chart ( line017 line018 line019 line020 ) foreach chart ( line021 ) foreach chart ( line018 line019 line020 line021 line022 line023 ) set machine = malei set grid = 100m ; set dec = 0 ; set clon = 141 set rate = 13 ; set spd = 8 ; set prj = merc echo "Gridding chart "$chart" " `date` if !( -d $SSGRID/$chart-$grid ) mkdir $SSGRID/$chart-$grid cd $SSGRID/$chart-$grid touch a.cswr tmp.a files foreach nuke (` \ls files tmp.\* \*.cswr `) \rm $nuke end ln -s ` cat $PARMS/ss/$chart.files ` . \ls MR1???????.??.\* > $chart.files gridss $machine $chart.files $grid $dec $prj $clon $rate $spd \rm ` cat $chart.files ` end ######################################################################## 5. Grid the data at 84 m - Fast and easy! Hey! This technique assumes that the magnetic corrections have been applied to individual hour files. The magnetic correction variable below is set to 0 so that mrgrid uses the fish compass headings (as opposed to the default course calculated from navigation), but doesn't impose any more change. How To Do It: - First, copy and paste into your terminal window the commands to set the appropriate grid, cell, and meridian values. If you move into a new UTM zone, change the value of the meridian before you grid! - create a new first line to the foreach loop below, which contains the charts that you want to grid. These lines serve to document what got gridded, and how. - copy the foreach loop in the doc file and paste it into the termanal window. # UTM Zone 54 foreach chart ( test01 test02 ) foreach chart ( line001 line002 line003 line004 ) foreach chart ( line005 line006 line007 line008 ) foreach chart ( line009 line010 line011 line012 ) foreach chart ( line013 line014 line015 line016 ) foreach chart ( line017 ) foreach chart ( line018 line019 line020 line021 line022 line023 ) set machine = kanoa set grid = 84m ; set dec = 0 ; set clon = 141 set rate = 13 ; set spd = 8 ; set prj = utm echo "Gridding chart "$chart" " `date` if !( -d $SSGRID/$chart-$grid ) mkdir $SSGRID/$chart-$grid cd $SSGRID/$chart-$grid touch a.cswr tmp.a files foreach nuke (` \ls files tmp.\* \*.cswr `) \rm $nuke end ln -s ` cat $PARMS/ss/$chart.files ` . \ls MR1???????.??.\* > $chart.files gridss $machine $chart.files $grid $dec $prj $clon $rate $spd \rm ` cat $chart.files ` end ######################################################################## 6. Grid the data at 16 m - Time and Money! Hey! This technique assumes that the magnetic corrections have been applied to individual hour files. The magnetic correction variable below is set to 0 so that mrgrid uses the fish compass headings (as opposed to the default course calculated from navigation), but doesn't impose any more change. # UTM Zone 54 ----------------- foreach chart ( test01 test02 ) foreach chart ( line001 line002 line003 line004 ) foreach chart ( line005 line006 line007 line008 line009 ) foreach chart ( line010 line011 line012 line013 line014 ) foreach chart ( line015 line016 line017 line018 ) foreach chart ( line018 line019 line020 line021 line022 line023 ) set machine = malei set grid = 16m ; set dec = 0 ; set clon = 141 set rate = 13 ; set spd = 8 ; set prj = utm echo "Gridding chart "$chart" " `date` if !( -d $SSGRID/$chart-$grid ) mkdir $SSGRID/$chart-$grid cd $SSGRID/$chart-$grid touch a.cswr tmp.a files foreach nuke (` \ls files tmp.\* \*.cswr `) \rm $nuke end ln -s ` cat $PARMS/ss/$chart.files ` . \ls MR1???????.??.\* > $chart.files gridss $machine $chart.files $grid $dec $prj $clon $rate $spd \rm ` cat $chart.files ` end gridss kaimi $chart.files 16m 0 141 12 6

Defining Data Within Sidescan Charts Survey mv0101 Identify which lines go in which charts, and set up the control files to do the mosaicing. CONTENTS 1. How this works 2. Cookbook ######################################################################### 1. How this works After you've finished gridding, use the loops below to set up subdirectories beneath $SSGRID for each chart. This step is necessary in order to create mosaics from data that were gridded at different times for different lines. The loops below first create a chart subdirectory if one doesn't already exist. If there's already one there, the loop removes all previous .cf and .cswr files. This prevents incompatible .cf and .cswr files from existing, which would mess up mrovl. Next, the loop makes a composite control file based on the control files from each line within the chart. Symbolic links are then created to the .cswr files required for this chart. YOUR ROLE AS A COGNATE ENTITY Besides mindlessly pointing and clicking, you need to modify the loop for each new chart so that the correct lines are specified. ######################################################################### 2. Cookbook --------- Chart 001 --------- foreach cell ( 84 16 ) set chart = mv0101-100-001-$cell"m" if !( -d $SSGRID/$chart ) mkdir $SSGRID/$chart cd $SSGRID/$chart if (-f files.list) \rm files.list touch tmp.cswr tmp.cf ; \rm \*.cswr \*.cf foreach line ( line001 ) \ls $SSGRID/$line-$cell"m"/$line.$cell"m".cf >> files.list ln -s ../$line-$cell"m"/\*cswr . end catcf files.list temp.cf cf\_renumber temp.cf $chart.cf end --------- Chart 002 --------- foreach cell ( 84 16 ) set chart = mv0101-100-002-$cell"m" if !( -d $SSGRID/$chart ) mkdir $SSGRID/$chart cd $SSGRID/$chart if (-f files.list) \rm files.list touch tmp.cswr tmp.cf ; \rm \*.cswr \*.cf foreach line ( line001 line002 line003 line004 ) \ls $SSGRID/$line-$cell"m"/$line.$cell"m".cf >> files.list ln -s ../$line-$cell"m"/\*cswr . end catcf files.list temp.cf cf\_renumber temp.cf $chart.cf end --------- Chart 004 --------- foreach cell ( 84 16 ) set chart = mv0101-100-004-$cell"m" if !( -d $SSGRID/$chart ) mkdir $SSGRID/$chart cd $SSGRID/$chart if (-f files.list) \rm files.list touch tmp.cswr tmp.cf ; \rm \*.cswr \*.cf foreach line ( line003 line004 line005 line006 line007 line008 line009 ) \ls $SSGRID/$line-$cell"m"/$line.$cell"m".cf >> files.list ln -s ../$line-$cell"m"/\*cswr . end catcf files.list temp.cf cf\_renumber temp.cf $chart.cf end --------- Chart 005 --------- foreach cell ( 84 16 ) set chart = mv0101-100-005-$cell"m" if !( -d $SSGRID/$chart ) mkdir $SSGRID/$chart cd $SSGRID/$chart if (-f files.list) \rm files.list touch tmp.cswr tmp.cf ; \rm \*.cswr \*.cf foreach line ( line00{4,5,6,7,8} ) \ls $SSGRID/$line-$cell"m"/$line.$cell"m".cf >> files.list ln -s ../$line-$cell"m"/\*cswr . end catcf files.list temp.cf cf\_renumber temp.cf $chart.cf end --------- Chart 006 --------- foreach cell ( 84 16 ) set chart = mv0101-100-006-$cell"m" if !( -d $SSGRID/$chart ) mkdir $SSGRID/$chart cd $SSGRID/$chart if (-f files.list) \rm files.list touch tmp.cswr tmp.cf ; \rm \*.cswr \*.cf foreach line ( line00{5,6,7,8,9} line01{0,1,2,3,4} ) \ls $SSGRID/$line-$cell"m"/$line.$cell"m".cf >> files.list ln -s ../$line-$cell"m"/\*cswr . end catcf files.list temp.cf cf\_renumber temp.cf $chart.cf end --------- Chart 007 --------- foreach cell ( 84 16 ) set chart = mv0101-100-007-$cell"m" if !( -d $SSGRID/$chart ) mkdir $SSGRID/$chart cd $SSGRID/$chart if (-f files.list) \rm files.list touch tmp.cswr tmp.cf ; \rm \*.cswr \*.cf foreach line ( line00{7,8,9} line01{0,1,2,3,4} ) \ls $SSGRID/$line-$cell"m"/$line.$cell"m".cf >> files.list ln -s ../$line-$cell"m"/\*cswr . end catcf files.list temp.cf cf\_renumber temp.cf $chart.cf end --------- Chart 010 --------- foreach cell ( 84 16 ) set chart = mv0101-100-010-$cell"m" if !( -d $SSGRID/$chart ) mkdir $SSGRID/$chart cd $SSGRID/$chart if (-f files.list) \rm files.list touch tmp.cswr tmp.cf ; \rm \*.cswr \*.cf foreach line ( line01{0,1,2,3,4,5,6,7,8} ) \ls $SSGRID/$line-$cell"m"/$line.$cell"m".cf >> files.list ln -s ../$line-$cell"m"/\*cswr . end catcf files.list temp.cf cf\_renumber temp.cf $chart.cf end --------- Chart 011 --------- foreach cell ( 84 16 ) set chart = mv0101-100-011-$cell"m" if !( -d $SSGRID/$chart ) mkdir $SSGRID/$chart cd $SSGRID/$chart if (-f files.list) \rm files.list touch tmp.cswr tmp.cf ; \rm \*.cswr \*.cf foreach line ( line01{0,1,2,3,4,5,6,7,8} ) \ls $SSGRID/$line-$cell"m"/$line.$cell"m".cf >> files.list ln -s ../$line-$cell"m"/\*cswr . end catcf files.list temp.cf cf\_renumber temp.cf $chart.cf end --------- Chart 012 --------- foreach cell ( 84 16 ) set chart = mv0101-100-012-$cell"m" if !( -d $SSGRID/$chart ) mkdir $SSGRID/$chart cd $SSGRID/$chart if (-f files.list) \rm files.list touch tmp.cswr tmp.cf ; \rm \*.cswr \*.cf foreach line ( line01{0,1,2,3,4,5,6,7,8} ) \ls $SSGRID/$line-$cell"m"/$line.$cell"m".cf >> files.list ln -s ../$line-$cell"m"/\*cswr . end catcf files.list temp.cf cf\_renumber temp.cf $chart.cf end --------- Chart 013 --------- foreach cell ( 84 16 ) set chart = mv0101-100-013-$cell"m" if !( -d $SSGRID/$chart ) mkdir $SSGRID/$chart cd $SSGRID/$chart if (-f files.list) \rm files.list touch tmp.cswr tmp.cf ; \rm \*.cswr \*.cf foreach line ( line01{8,9} line02{0} ) \ls $SSGRID/$line-$cell"m"/$line.$cell"m".cf >> files.list ln -s ../$line-$cell"m"/\*cswr . end catcf files.list temp.cf cf\_renumber temp.cf $chart.cf end --------- Chart 014 --------- foreach cell ( 84 16 ) set chart = mv0101-100-014-$cell"m" if !( -d $SSGRID/$chart ) mkdir $SSGRID/$chart cd $SSGRID/$chart if (-f files.list) \rm files.list touch tmp.cswr tmp.cf ; \rm \*.cswr \*.cf foreach line ( line01{8,9} line02{0,1,2,3} ) \ls $SSGRID/$line-$cell"m"/$line.$cell"m".cf >> files.list ln -s ../$line-$cell"m"/\*cswr . end catcf files.list temp.cf cf\_renumber temp.cf $chart.cf end --------- Chart 015 --------- foreach cell ( 84 16 ) set chart = mv0101-100-015-$cell"m" if !( -d $SSGRID/$chart ) mkdir $SSGRID/$chart cd $SSGRID/$chart if (-f files.list) \rm files.list touch tmp.cswr tmp.cf ; \rm \*.cswr \*.cf foreach line ( line01{8,9} line02{0,1,2,3} ) \ls $SSGRID/$line-$cell"m"/$line.$cell"m".cf >> files.list ln -s ../$line-$cell"m"/\*cswr . end catcf files.list temp.cf cf\_renumber temp.cf $chart.cf end --------- Chart 016 --------- foreach cell ( 84 16 ) set chart = mv0101-100-016-$cell"m" if !( -d $SSGRID/$chart ) mkdir $SSGRID/$chart cd $SSGRID/$chart if (-f files.list) \rm files.list touch tmp.cswr tmp.cf ; \rm \*.cswr \*.cf foreach line ( line01{8,9} line02{0,1,2,3} ) \ls $SSGRID/$line-$cell"m"/$line.$cell"m".cf >> files.list ln -s ../$line-$cell"m"/\*cswr . end catcf files.list temp.cf cf\_renumber temp.cf $chart.cf end --------- Chart 017 --------- foreach cell ( 84 16 ) set chart = mv0101-100-017-$cell"m" if !( -d $SSGRID/$chart ) mkdir $SSGRID/$chart cd $SSGRID/$chart if (-f files.list) \rm files.list touch tmp.cswr tmp.cf ; \rm \*.cswr \*.cf foreach line ( line01{8,9} line02{0,1,2,3} ) \ls $SSGRID/$line-$cell"m"/$line.$cell"m".cf >> files.list ln -s ../$line-$cell"m"/\*cswr . end catcf files.list temp.cf cf\_renumber temp.cf $chart.cf end

Generating Sidescan Mosaics Using 84 Meter Grids Survey mv0101 CONTENTS 1. Control files for 16 m grids 2. Mosaic commands for 16 m grids ######################################################################### 1. Control files for 100 m grids set cell = 100 set chart = mv0101-100-all-$cell"m" if !( -d $SSGRID/$chart ) mkdir $SSGRID/$chart cd $SSGRID/$chart if (-f files.list) \rm files.list touch tmp.cswr tmp.cf ; \rm \*.cswr \*.cf foreach line ( line00{1,2,3,4,5,6,7,8,9} line01{0,1,2,3,4,5,6,7,8,9} line02{0,1,2,3} ) echo $line... \ls $SSGRID/$line-$cell"m"/$line.$cell"m".cf >> files.list ln -s ../$line-$cell"m"/\*cswr . end catcf files.list temp.cf cf\_renumber temp.cf $chart.cf ------------------------------------------------- 2. Mosaic 'em for Nathan set cell = 100 set cellm = $cell"m" set chart = mv0101-all set tempfile = ` date '+%y.%j.%H.%M.%S'.tmp ` set graymap = $PARMS/ss/mv0101.grm if !( -d $CHART/ss/ss:$chart ) mkdir $CHART/ss/ss:$chart set outdir = $SSCHART/ss:$chart set logfile = $chart.$cellm.ss.log set infofile = $chart.$cellm.ss.info run\_on\_kanoa mrovl $SSGRID/mv0101-100-all-$cellm/mv0101-100-all-$cellm.cf \ -rf $outdir/$chart.$cellm.ss.ras \ -tmf /home/kanoa1e/mv0101/sstemp/$tempfile \ -gmf $graymap \ -mbg 255 255 255 \ -v 2 >& $outdir/$logfile head -11 $outdir/$logfile > $outdir/$infofile

Generating Sidescan Mosaics Using 84 Meter Grids Survey mv0101 CONTENTS 1. Generate command lines 2. Mosaic commands ######################################################################### 1. Generate command lines Execute the following loop to generate ssmosaic command lines. The loop reads the $PARMS/chart/$id/boxes file to find the correct lower left corner for the chart. The ssmosaic commands will be printed on your terminal window. Your job is to copy them from the terminal window and paste them into the bottom part of this doc file. set id = $PROJ awk '{if ( (NF>4) && ($5 <= 180.0)) \ printf("ssmosaic kanoa %s 100000 84 %s %s $graymap frame\n",$3, $5, $6); \ if ( (NF>4) && ($5 > 180.0)) \ printf("ssmosaic kanoa %s 100000 84 %.5f %s $graymap frame\n", $3, $5-360.0, $6)}' \ $PARMS/chart/$id/boxes | cat ######################################################################### 2. Mosaic commands set graymap = $PARMS/ss/mv0101.grm HEY! Remember to set the machine or it sucks! ||||| VVVVV ssmosaic kanoa mv0101-100-001 100000 84 143.85000 13.20000 $graymap noframe ssmosaic kanoa mv0101-100-002 100000 84 143.00000 13.20000 $graymap noframe ssmosaic kanoa mv0101-100-004 100000 84 143.00000 12.47800 $graymap noframe ssmosaic kanoa mv0101-100-005 100000 84 142.18000 12.68000 $graymap noframe ssmosaic kanoa mv0101-100-006 100000 84 142.18000 12.20000 $graymap noframe ssmosaic kanoa mv0101-100-007 100000 84 141.32000 12.20000 $graymap noframe ssmosaic kanoa mv0101-100-010 100000 84 141.91000 11.75000 $graymap noframe ssmosaic kanoa mv0101-100-011 100000 84 141.04000 11.75000 $graymap noframe ssmosaic malei mv0101-100-012 100000 84 140.17000 11.75000 $graymap noframe ssmosaic kanoa mv0101-100-013 100000 84 143.65000 11.03000 $graymap noframe ssmosaic kanoa mv0101-100-014 100000 84 142.78000 11.03000 $graymap noframe ssmosaic kanoa mv0101-100-015 100000 84 141.91000 11.03000 $graymap noframe ssmosaic kanoa mv0101-100-016 100000 84 141.04000 11.03000 $graymap noframe ssmosaic kanoa mv0101-100-017 100000 84 140.17000 11.03000 $graymap noframe cd $SSCHART/\*006 ; xv -gamma .15 \*84m\*ras & ######################################################################### 2. Plot the whole shebang # Control files... set cell = 84 set chart = mv0101-100-all-$cell"m" if !( -d $SSGRID/$chart ) mkdir $SSGRID/$chart cd $SSGRID/$chart if (-f files.list) \rm files.list touch tmp.cswr tmp.cf ; \rm \*.cswr \*.cf foreach line ( line00{1,2,3,4,5,6,7,8,9} line01{0,1,2,3,4,5,6,7,8,9} line02{0,1,2,3} ) echo $line... \ls $SSGRID/$line-$cell"m"/$line.$cell"m".cf >> files.list ln -s ../$line-$cell"m"/\*cswr . end catcf files.list temp.cf cf\_renumber temp.cf $chart.cf # Grid 'em.... set cell = 84 set cellm = $cell"m" set chart = mv0101-all set tempfile = ` date '+%y.%j.%H.%M.%S'.tmp ` set frm = "-mti 10m 10m -mtw 1 -mtl 7 -movl 0 0 0" set graymap = $PARMS/ss/mv0101.grm if !( -d $CHART/ss/ss:$chart ) mkdir $CHART/ss/ss:$chart set outdir = $SSCHART/ss:$chart set logfile = $chart.$cellm.ss.log set infofile = $chart.$cellm.ss.info run\_on\_kanoa mrovl $SSGRID/mv0101-100-all-$cellm/mv0101-100-all-$cellm.cf \ -rf $outdir/$chart.$cellm.ss.ras \ -tmf /home/kanoa1e/mv0101/sstemp/$tempfile \ -gmf $graymap \ -mbg 255 255 255 \ $frm \ -v 2 >& $outdir/$logfile head -11 $outdir/$logfile > $outdir/$infofile #-os 140.16 11.00 4740 2220 \

Generating Sidescan Mosaics Using 16 Meter Grids Survey mv0101 CONTENTS 1. Generate command lines 2. Mosaic commands ######################################################################### 1. Generate command lines Execute the following loop to generate ssmosaic command lines. The loop reads the $PARMS/chart/$id/boxes file to find the correct lower left corner for the chart. The ssmosaic commands will be printed on your terminal window. Your job is to copy them from the terminal window and paste them into the bottom part of this doc file. set id = $PROJ awk '{if ( (NF>4) && ($5 <= 180.0)) \ printf("ssmosaic kanoa %s 100000 16 %s %s $graymap noframe\n",$3, $5, $6); \ if ( (NF>4) && ($5 > 180.0)) \ printf("ssmosaic kanoa %s 100000 16 %.5f %s $graymap noframe\n", $3, $5-360.0, $6)}' \ $PARMS/chart/$id/boxes | cat ######################################################################### 2. Mosaic commands set graymap = $PARMS/ss/mv0101.grm HEY! Remember to set the machine or you suck. ||||| VVVVV ssmosaic malei mv0101-100-001 100000 16 143.85000 13.20000 $graymap noframe ssmosaic malei mv0101-100-002 100000 16 143.00000 13.20000 $graymap noframe ssmosaic malei mv0101-100-004 100000 16 143.00000 12.47800 $graymap noframe ssmosaic malei mv0101-100-005 100000 16 142.18000 12.68000 $graymap noframe ssmosaic malei mv0101-100-006 100000 16 142.18000 12.20000 $graymap noframe ssmosaic malei mv0101-100-007 100000 16 141.32000 12.20000 $graymap noframe ssmosaic malei mv0101-100-010 100000 16 141.91000 11.75000 $graymap noframe ssmosaic malei mv0101-100-011 100000 16 141.04000 11.75000 $graymap noframe ssmosaic malei mv0101-100-012 100000 16 140.17000 11.75000 $graymap noframe ssmosaic malei mv0101-100-013 100000 16 143.65000 11.03000 $graymap noframe ssmosaic malei mv0101-100-014 100000 16 142.78000 11.03000 $graymap noframe ssmosaic malei mv0101-100-015 100000 16 141.91000 11.03000 $graymap noframe ssmosaic malei mv0101-100-016 100000 16 141.04000 11.03000 $graymap noframe ssmosaic malei mv0101-100-017 100000 16 140.17000 11.03000 $graymap noframe cd $SSCHART/\*012 ; xv -gamma .15 \*16m\*ras &

Creating large-format A0 sidescan charts Survey mv0101 CONTENTS 1. Determine chart offset 2. Create GMT sidescan frames 3. Merge sidescan raster with GMT postscript ######################################################################## 1. Determine the chart offset. You need to find the (x,y) values of the GMT chart frame raster in order to properly position the sidescan raster within the frame. First you need to generate a GMT frame: ssframe\_utm\_100k JU:09:100-001 10 09 Now rasterize the frame: cd $CHART/ss/ssJU:09:100-001 ps2rast -r 300 -Y 47.5 -X 33.5 -d 24 ssJU:09:100-001.ps test.frame.ras Find the (x,y) value of the corner of a GMT frame raster named test.frame.ras using the program xv: xv test.frame.ras Place the tip of the mouse arrow over the NE corner of the lat/lon frame and hold down the center mouse button. XV will display the (x,y) values of the cursor. JUS: RESULT: X = 292 Y = 3370 AJC: RESULT: X = 246 Y = 2437 KAIMANA: X = 243 Y = 2434 These values will be used later (step 3 below), when you combine the GMT and MR1 rasters using the program rasmask. But here's an example now: rasmask -f $chart.frame.ras -x -292 -y -3370 < $chart.2x.ras > $chart.tmp.ras ######################################################################## 2. Create GMT sidescan frames a0\_chart 500000 $PROJ $PROJ.100-000 ss set chart = $PROJ.100-000 cd $SSCHART/ss:$chart pageview -aa -depth 24 -mcd 300 -w 47.0 -h 33.3 $chart.ss.ps & ######################################################################## 3. Merge sidescan raster with GMT postscript Now its time to combine the GMT frame with the MR1 sidescan raster. This step involves turning the GMT Postscript into a Sun raster file, processing the sidescan mosaic through pnm software, combining the two rasters using rasmask, reducing the size of the output raster (from ~450 mb to ~ 25 mb) using pnm software, and converting the final image into HP RTL format for printing on the HP755 plotter. It's a for/each loop (you need to indicate the chart number(s) to plot): foreach chart ( kaimana.200-007 ) echo "Rasterizing GMT frame..." cd $SSCHART/ss:$chart if (-f $chart.ss.ps.gz) gunzip $chart.ss.ps.gz ps2rast -r 300 -Y 47.5 -X 33.5 -d 24 $chart.ss.ps $chart.frame.ras echo "Rotate sidescan raster..." rasttopnm $chart.16m.ss.ras |\ pnmflip -ccw |\ pnmtorast > $chart.16m.ss.rot.ras echo "Overlay frame on sidescan..." rasmask -f $chart.frame.ras -x -243 -y -2434 < $chart.16m.ss.rot.ras > $chart.tmp.ras /bin/rm $chart.frame.ras $chart.16m.ss.rot.ras echo "Quantize final raster..." rasttopnm $chart.tmp.ras |\ ppmquant 256 |\ pnmtorast > $chart.16m.ss.final.ras \rm $chart.tmp.ras echo "Convert final raster to RTL..." alchemy $chart.16m.ss.final.ras --r14 -o -c256 -D 300 300 $chart.16m.ss.final.rtl gzip \*ps \*ras \*rtl & end # Check 'em xv -gamma .2 -rotate -90 kaimana.200-001.16m.ss.final.ras & # Print copies ########################################################## cd $SSCHART foreach c ( AJC.100-03{7,8,9} AJC.100-04{0,1} ) cd $SSCHART/ss:$c if ( -f $c.16m.ss.final.rtl.gz ) gunzip $c.16m.ss.final.rtl.gz if ( -f $c.16m.ss.final.rtl.Z ) uncompress $c.16m.ss.final.rtl.Z ls $c.16m.ss.final.rtl lpr -Php755a -s $c.16m.ss.final.rtl echo "Sleeping while printing..." ; sleep 1800 end

Creating page-size sidescan mosaics Survey mv0101 CONTENTS 1. Make page-sized GMT frame 2. Combine GMT frame with sidescan raster 3. Print the charts ######################################################################## 1. Make page-sized GMT frame page\_chart mv0101 mv0101-100-001 ss page\_chart mv0101 mv0101-100-002 ss page\_chart mv0101 mv0101-100-004 ss page\_chart mv0101 mv0101-100-005 ss page\_chart mv0101 mv0101-100-006 ss page\_chart mv0101 mv0101-100-007 ss page\_chart mv0101 mv0101-100-010 ss page\_chart mv0101 mv0101-100-011 ss page\_chart mv0101 mv0101-100-012 ss page\_chart mv0101 mv0101-100-013 ss page\_chart mv0101 mv0101-100-014 ss page\_chart mv0101 mv0101-100-015 ss page\_chart mv0101 mv0101-100-016 ss page\_chart mv0101 mv0101-100-017 ss ######################################################################## 2. Combine GMT frame with sidescan raster The ssimage script required as input: 1. The PostScript GMT frame you produced above 2. The 84m sidescan mosaic you made in $DOC/ss\_chart/84m\_mosaic.doc The outputs will be a final Sun raster file, a JPG image, and an HP-RTL file you can send to the HP755 ssimage mv0101-100-001 ssimage mv0101-100-002 ssimage mv0101-100-004 ssimage mv0101-100-005 ssimage mv0101-100-006 ssimage mv0101-100-007 ssimage mv0101-100-010 ssimage mv0101-100-011 ssimage mv0101-100-012 ssimage mv0101-100-013 ssimage mv0101-100-014 ssimage mv0101-100-015 ssimage mv0101-100-016 ssimage mv0101-100-017 ############################################################################ 3. Print the charts foreach chart ( mv0101-100-00{1,2,4,5,6,7} mv0101-100-01{0,1,2,3,4,5,6,7} ) cd $CHART/ss/ss:$chart lpr -s -Php755b $chart.ss.page.final.rtl end lpr -Php755b -s mv0101-100-006.ss.page.final.rtl xv -gamma .5 -rotate 180 $chart.ss.page.final.rot.ras &

Viewing and Printing Sidescan Charts Survey mv0101 CONTENTS 1. Print page-sized charts ######################################################################## 1. Print page-sized charts foreach chart ( mv0101-100-00{1,2,4,5,6,7} mv0101-100-01{0,1,2,3,4,5,6,7} ) cd $CHART/ss/ss:$chart lpr -s -Php755b $chart.ss.page.final.rtl end lpr -Php755b -s mv0101-100-006.ss.page.final.rtl ########################################################################

Setting appropriate parameters for MRGRID survey mv0101 Original tests performed during KAIMANA (TBA, Sept 2000) This is tricky stuff. TT: Turn Threshold (units = degrees) TT defines when turns begin and end, which allows you to separate your survey data into different swath rasters. Swath rasters serve as the tiles that you can overlay, underlay, compare or suppress when you assemble your sidescan mosaic. If the difference in orientation of successive pings is less than than TT degrees, the pings will be gridded as part of the same swath raster. If the difference is more than TT, then a new swath raster is started beginning with the new ping. This value should be changed as a function of rep rate. For a given rate of turn, fast rep rates yield a small ping-to-ping change in fish heading, whereas slow rates result in big ping-to-ping heading changes. ADCT: Angular Discordance Control Threshold (units = degrees) Controls whether adjacent pings are continuous or not. This is significant because adjacent pings must be continuous in order for the gaps between them to be interpolated. Interpolation only occurs between adjacent, continuous pings. If the orientations of adjacent pings differ by less than ADCT degrees, then the pings are considered to be continuous. Its usually best to set ADCT fractionally less than TT. This way, when a discontinuous ping is encountered a new swath raster will begin. This gives you, the user, more control on how this ping will be displayed. For example, if TT is 2.25, then ADCJ should be 2.24. Remember that with long rep rates the towfish can turn farther than during the short period at fast rep rates. So different ADCT values are necessary for slow and fast rep rates. MSPD: Maximum Sequential Ping Distance (units = meters) Controls whether adjacent pings are continuous or not. See ADCT above to learn the significance of continuous pings. If two adjacent pings are farther apart than MSPD meters, then the pings are considered discontinuous and the gap between them will NOT be interpolated. When you pick a value for MSPD, keep in mind the ship speed and ping rate. If you're pinging every 16 seconds and going 8 knots, then your along-track ping distance is 64 meters. For insurance, I usually set MSPD to more than double the along-track ping distance. MPCW: Minimum Ping Cell Width (units = cells) Defines the minimum number of cells used to grid discontinuous pings in the along-track direction. Discontinuous pings most often occur in turns, and MPCW can be used to control whether the gaps between pings in turns contain interpoloated data or not. So you can make your turn imagery continuous (and maybe smeary) or discontinuous (discrete individual pings that fan out from nadir). ISR: Interpolative Search Radius (units = cells) When a cell is gridded, a search is performed over this distance to find other cells that contain data, and then these values are interpolated to yield the final value of the cell. The ISR value defines the radius (one-way distance outward from the cell) of the search. If your grid size is small relative to the distance between adjacent pings, ISR is used to interpolate across the gap between adjacent pings. # ---------------------------------------------------------------------------- Testing the various parameters Note: The following examples were navigated using smooth DGPS data, and then the towfish compass time series was filtered using a gaussian filter 7 pings wide, which also removed any outliers. # ---------------------------------------------------------------------------- # Testing interpolation consequences of continuous and discontinuous pings # 01 - Every ping is discontinuous. # - Discontinuous pings are 1 cell wide # - Very fast: Time 0:08 # - Good way to quickly see data distribution set num = 01 ; cd $SSGRID/test-16m ; \rm \*.cswr time mrgrid MR10025601.00.btywtnc-dap -cf test.16m.cf -tfd $SSTEMP -dti 0 \ -ss -putm -rp 0 0 -plon -135 -ewgs84 -cs 16.933333 \ -mca 0 -mspd 30 -mpcw 1 -isr 1 -adct .1 -tt 3 -v 2 # 02 - Every ping is discontinuous. # - Discontinuous pings are 10 cell wide # - Slow: Time 11:51 # - No significant improvement over 01 set num = 02 ; cd $SSGRID/test-16m ; \rm \*.cswr time mrgrid MR10025601.00.btywtnc-dap -cf test.16m.cf -tfd $SSTEMP -dti 0 \ -ss -putm -rp 0 0 -plon -135 -ewgs84 -cs 16.933333 \ -mca 0 -mspd 30 -mpcw 10 -isr 1 -adct .1 -tt 3 -v 2 # 03 - Pings along straight sections continuous (most pings in this example) # - Interpretive search radius is 1 cell in diameter # - Slow: Time 7:17 set num = 03 ; cd $SSGRID/test-16m ; \rm \*.cswr time mrgrid MR10025601.00.btywtnc-dap -cf test.16m.cf -tfd $SSTEMP -dti 0 \ -ss -putm -rp 0 0 -plon -135 -ewgs84 -cs 16.933333 \ -mca 0 -mspd 192 -mpcw 1 -isr 1 -adct 2.9 -tt 3 -v 2 # 04 - Pings along straight sections continuous (most pings in this example) # - Interpretive search radius is 10 cells in diameter # - Slow: Time 7:18 set num = 04 ; cd $SSGRID/test-16m ; \rm \*.cswr time mrgrid MR10025601.00.btywtnc-dap -cf test.16m.cf -tfd $SSTEMP -dti 0 \ -ss -putm -rp 0 0 -plon -135 -ewgs84 -cs 16.933333 \ -mca 0 -mspd 192 -mpcw 1 -isr 10 -adct 2.9 -tt 3 -v 2 # 05 - Pings along straight sections continuous (all pings in this example) # - Interpretive search radius is 20 cells in diameter # - Slow: Time 7:20 set num = 05 ; cd $SSGRID/test-16m ; \rm \*.cswr time mrgrid MR10025601.00.btywtnc-dap -cf test.16m.cf -tfd $SSTEMP -dti 0 \ -ss -putm -rp 0 0 -plon -135 -ewgs84 -cs 16.933333 \ -mca 0 -mspd 192 -mpcw 1 -isr 20 -adct 2.9 -tt 3 -v 2 mrovl test.16m.cf -rf $CHART/ss/ss:test/test.$num.ras \ -gmf $PARMS/ss/kaimana.grm -mbg 0 0 0 -tmf $SSTEMP/temp \ -os -135.926 10.7054 1610 1590 -v 2 # ---------------------------------------------------------------------------- # Testing turn thresholds # 06 - Pings along straight sections continuous # - Inter-ping turn of 3 degrees starts a new swath raster # - New swath raster begins with each discontinuous ping # - Interpretive search radius is 20 cells in diameter # - Slow: Time 2:58 set num = 06 ; cd $SSGRID/test-16m ; \rm \*.cswr time mrgrid MR1002560[2-3].00.btywtnc-dap -cf test.16m.cf -tfd $SSTEMP -dti 0 \ -ss -putm -rp 0 0 -plon -135 -ewgs84 -cs 33.86667 \ -mca 0 -mspd 192 -mpcw 1 -isr 20 -adct 2.9 -tt 3 -v 2 # 07 - All pings discontinuous # - Inter-ping turn of 3 degrees starts a new swath raster # - New swath raster begins with each discontinuous ping # - Slow: Time set num = 07 ; cd $SSGRID/test-16m ; \rm \*.cswr time mrgrid MR1002560[2-3].00.btywtnc-dap -cf test.16m.cf -tfd $SSTEMP -dti 0 \ -ss -putm -rp 0 0 -plon -135 -ewgs84 -cs 33.86667 \ -mca 0 -mspd 192 -mpcw 1 -isr 1 -adct .1 -tt 3 -v 2 # 08 - Some pings discontinuous # - Inter-ping turn of 3 degrees starts a new swath raster # - Slow: Time set num = 08 ; cd $SSGRID/test-16m ; \rm \*.cswr time mrgrid MR1002560[2-3].00.btywtnc-dap -cf test.16m.cf -tfd $SSTEMP -dti 0 \ -ss -putm -rp 0 0 -plon -135 -ewgs84 -cs 33.86667 \ -mca 0 -mspd 192 -mpcw 1 -isr 1 -adct 1 -tt 3 -v 2 # 09 - Creates LOTS of swath rasters # - Inter-ping turn of 1 degrees starts a new swath raster # - Slow: Time 4:02 set num = 09 ; cd $SSGRID/test-16m ; \rm \*.cswr time mrgrid MR1002560[2-3].00.btywtnc-dap -cf test.16m.cf -tfd $SSTEMP -dti 0 \ -ss -putm -rp 0 0 -plon -135 -ewgs84 -cs 33.86667 \ -mca 0 -mspd 192 -mpcw 1 -isr 1 -adct .9 -tt 1 -v 2 # 10 - Creates fewer swath rasters (44) # - Inter-ping turn of 1.5 degrees starts a new swath raster # - Time 3:53 set num = 10 ; cd $SSGRID/test-16m ; \rm \*.cswr time mrgrid MR1002560[2-3].00.btywtnc-dap -cf test.16m.cf -tfd $SSTEMP -dti 0 \ -ss -putm -rp 0 0 -plon -135 -ewgs84 -cs 33.86667 \ -mca 0 -mspd 192 -mpcw 1 -isr 1 -adct 1.49 -tt 1.5 -v 2 # 11 - Creates fewer swath rasters (34) # - Inter-ping turn of 3 degrees starts a new swath raster # - Time 3:43 set num = 11 ; cd $SSGRID/test-16m ; \rm \*.cswr time mrgrid MR1002560[2-3].00.btywtnc-dap -cf test.16m.cf -tfd $SSTEMP -dti 0 \ -ss -putm -rp 0 0 -plon -135 -ewgs84 -cs 33.86667 \ -mca 0 -mspd 192 -mpcw 1 -isr 1 -adct 1.9 -tt 2 -v 2 # 12 - Try to create even fewer swath rasters (34) # - Inter-ping turn of 2 degrees starts a new swath raster # - Time 3:45 set num = 12 ; cd $SSGRID/test-16m ; \rm \*.cswr time mrgrid MR1002560[2-3].00.btywtnc-dap -cf test.16m.cf -tfd $SSTEMP -dti 0 \ -ss -putm -rp 0 0 -plon -135 -ewgs84 -cs 33.86667 \ -mca 0 -mspd 192 -mpcw 1 -isr 1 -adct 1.99 -tt 2.0 -v 2 # 13 - Try to create even fewer swath rasters (12) # - Inter-ping turn of 2.5 degrees starts a new swath raster # - Time set num = 13 ; cd $SSGRID/test-16m ; \rm \*.cswr time mrgrid MR1002560[2-3].00.btywtnc-dap -cf test.16m.cf -tfd $SSTEMP -dti 0 \ -ss -putm -rp 0 0 -plon -135 -ewgs84 -cs 33.86667 \ -mca 0 -mspd 192 -mpcw 1 -isr 1 -adct 2.49 -tt 2.5 -v 2 # 14 - Creates only 2 swath rasters, one port and one stbd (2) # - Inter-ping turn of 3 degrees starts a new swath raster # - Time 2:57 set num = 14 ; cd $SSGRID/test-16m ; \rm \*.cswr time mrgrid MR1002560[2-3].00.btywtnc-dap -cf test.16m.cf -tfd $SSTEMP -dti 0 \ -ss -putm -rp 0 0 -plon -135 -ewgs84 -cs 33.86667 \ -mca 0 -mspd 192 -mpcw 1 -isr 1 -adct 2.99 -tt 3.0 -v 2 # 15 - Create just enough swath rasters to define the turn (28) # - Inter-ping turn of 2.25 degrees starts a new swath raster # - Interpolate between continuous pings # - Interpretive search radius is 20 cells in diameter # - Time 3:40 set num = 15 ; cd $SSGRID/test-16m ; \rm \*.cswr time mrgrid MR1002560[2-3].00.btywtnc-dap -cf test.$num.16m.cf -tfd $SSTEMP \ -dti 0 -ss -putm -rp 0 0 -plon -135 -ewgs84 -cs 33.86667 \ -mca 0 -mspd 192 -mpcw 1 -isr 20 -adct 2.24 -tt 2.25 -v 2 mrovl test.$num.16m.cf -rf $CHART/ss/ss:test/test.$num.ras \ -gmf $PARMS/ss/kaimana.grm -mbg 0 0 0 -tmf $SSTEMP/temp \ -os -136.0955 10.4915 986 1174 -v 2 xv -gamma .3 $CHART/ss/ss:test/test.$num.ras & # ---------------------------------------------------------------------------- # - Test ISR on 33 m grids # - Create just enough swath rasters to define the turn (28) # - Inter-ping turn of 2.25 degrees starts a new swath raster # - Interpolate between continuous pings # - Interpretive search radius is 20 cells in diameter # - Time 3:40 set num = isr01 ; cd $SSGRID/test-16m ; \rm \*.cswr time mrgrid MR1002560[2-3].00.btywtnc-dap -cf test.$num.16m.cf -tfd $SSTEMP \ -dti 0 -ss -putm -rp 0 0 -plon -135 -ewgs84 -cs 33.86667 \ -mca 0 -mspd 192 -mpcw 1 -isr 1 -adct 2.24 -tt 2.25 -v 2 mrovl test.$num.16m.cf -rf $CHART/ss/ss:test/test.$num.ras \ -gmf $PARMS/ss/kaimana.grm -mbg 0 0 0 -tmf $SSTEMP/temp \ -os -136.0955 10.4915 986 1174 -v 2 xv -gamma .3 $CHART/ss/ss:test/test.$num.ras & set num = isr02 ; cd $SSGRID/test-16m ; \rm \*.cswr time mrgrid MR1002560[2-3].00.btywtnc-dap -cf test.$num.16m.cf -tfd $SSTEMP \ -dti 0 \ -ss -putm -rp 0 0 -plon -135 -ewgs84 -cs 33.86667 \ -mca 0 -mspd 192 -mpcw 1 -isr 2 -adct 2.24 -tt 2.25 -v 2 mrovl test.$num.16m.cf -rf $CHART/ss/ss:test/test.$num.ras \ -gmf $PARMS/ss/kaimana.grm -mbg 0 0 0 -tmf $SSTEMP/temp \ -os -136.0955 10.4915 986 1174 -v 2 xv -gamma .3 $CHART/ss/ss:test/test.$num.ras & set num = isr04 ; cd $SSGRID/test-16m ; \rm \*.cswr time mrgrid MR1002560[2-3].00.btywtnc-dap -cf test.$num.16m.cf -tfd $SSTEMP \ -dti 0 \ -ss -putm -rp 0 0 -plon -135 -ewgs84 -cs 33.86667 \ -mca 0 -mspd 192 -mpcw 1 -isr 4 -adct 2.24 -tt 2.25 -v 2 mrovl test.$num.16m.cf -rf $CHART/ss/ss:test/test.$num.ras \ -gmf $PARMS/ss/kaimana.grm -mbg 0 0 0 -tmf $SSTEMP/temp \ -os -136.0955 10.4915 986 1174 -v 2 xv -gamma .3 $CHART/ss/ss:test/test.$num.ras & set num = isr08 ; cd $SSGRID/test-16m ; \rm \*.cswr time mrgrid MR1002560[2-3].00.btywtnc-dap -cf test.$num.16m.cf -tfd $SSTEMP \ -dti 0 \ -ss -putm -rp 0 0 -plon -135 -ewgs84 -cs 33.86667 \ -mca 0 -mspd 192 -mpcw 1 -isr 8 -adct 2.24 -tt 2.25 -v 2 mrovl test.$num.16m.cf -rf $CHART/ss/ss:test/test.$num.ras \ -gmf $PARMS/ss/kaimana.grm -mbg 0 0 0 -tmf $SSTEMP/temp \ -os -136.0955 10.4915 986 1174 -v 2 xv -gamma .3 $CHART/ss/ss:test/test.$num.ras & set num = isr16 ; cd $SSGRID/test-16m ; \rm \*.cswr time mrgrid MR1002560[2-3].00.btywtnc-dap -cf test.$num.16m.cf -tfd $SSTEMP \ -dti 0 \ -ss -putm -rp 0 0 -plon -135 -ewgs84 -cs 33.86667 \ -mca 0 -mspd 192 -mpcw 1 -isr 16 -adct 2.24 -tt 2.25 -v 2 mrovl test.$num.16m.cf -rf $CHART/ss/ss:test/test.$num.ras \ -gmf $PARMS/ss/kaimana.grm -mbg 0 0 0 -tmf $SSTEMP/temp \ -os -136.0955 10.4915 986 1174 -v 2 xv -gamma .3 $CHART/ss/ss:test/test.$num.ras & # ---------------------------------------------------------------------------- Test ISR on 16 m grids... # Time: 14:11 set num = 16m.isr01 ; cd $SSGRID/test-16m ; \rm \*.cswr time mrgrid MR1002560[2-3].00.btywtnc-dap -cf test.$num.16m.cf -tfd $SSTEMP \ -dti 0 \ -ss -putm -rp 0 0 -plon -135 -ewgs84 -cs 16.933333 \ -mca 0 -mspd 192 -mpcw 1 -isr 1 -adct 2.24 -tt 2.25 -v 2 mrovl test.$num.16m.cf -rf $CHART/ss/ss:test/test.$num.ras \ -gmf $PARMS/ss/kaimana.grm -mbg 0 0 0 -tmf $SSTEMP/temp \ -os -136.0955 10.4915 1972 2348 -v 2 xv -gamma .3 $CHART/ss/ss:test/test.$num.ras & # Time: 14:02 set num = 16m.isr02 ; cd $SSGRID/test-16m ; \rm \*.cswr time mrgrid MR1002560[2-3].00.btywtnc-dap -cf test.$num.16m.cf -tfd $SSTEMP \ -dti 0 \ -ss -putm -rp 0 0 -plon -135 -ewgs84 -cs 16.933333 \ -mca 0 -mspd 192 -mpcw 1 -isr 2 -adct 2.24 -tt 2.25 -v 2 mrovl test.$num.16m.cf -rf $CHART/ss/ss:test/test.$num.ras \ -gmf $PARMS/ss/kaimana.grm -mbg 0 0 0 -tmf $SSTEMP/temp \ -os -136.0955 10.4915 1972 2348 -v 2 xv -gamma .3 $CHART/ss/ss:test/test.$num.ras & # Time: 14:05 set num = 16m.isr04 ; cd $SSGRID/test-16m ; \rm \*.cswr time mrgrid MR1002560[2-3].00.btywtnc-dap -cf test.$num.16m.cf -tfd $SSTEMP \ -dti 0 \ -ss -putm -rp 0 0 -plon -135 -ewgs84 -cs 16.933333 \ -mca 0 -mspd 192 -mpcw 1 -isr 4 -adct 2.24 -tt 2.25 -v 2 mrovl test.$num.16m.cf -rf $CHART/ss/ss:test/test.$num.ras \ -gmf $PARMS/ss/kaimana.grm -mbg 0 0 0 -tmf $SSTEMP/temp \ -os -136.0955 10.4915 1972 2348 -v 2 xv -gamma .3 $CHART/ss/ss:test/test.$num.ras & # Time: 14:04 set num = 16m.isr08 ; cd $SSGRID/test-16m ; \rm \*.cswr time mrgrid MR1002560[2-3].00.btywtnc-dap -cf test.$num.16m.cf -tfd $SSTEMP \ -dti 0 \ -ss -putm -rp 0 0 -plon -135 -ewgs84 -cs 16.933333 \ -mca 0 -mspd 192 -mpcw 1 -isr 8 -adct 2.24 -tt 2.25 -v 2 mrovl test.$num.16m.cf -rf $CHART/ss/ss:test/test.$num.ras \ -gmf $PARMS/ss/kaimana.grm -mbg 0 0 0 -tmf $SSTEMP/temp \ -os -136.0955 10.4915 1972 2348 -v 2 xv -gamma .3 $CHART/ss/ss:test/test.$num.ras & # Time: 14:03 set num = 16m.isr12 ; cd $SSGRID/test-16m ; \rm \*.cswr time mrgrid MR1002560[2-3].00.btywtnc-dap -cf test.$num.16m.cf -tfd $SSTEMP \ -dti 0 \ -ss -putm -rp 0 0 -plon -135 -ewgs84 -cs 16.933333 \ -mca 0 -mspd 192 -mpcw 1 -isr 12 -adct 2.24 -tt 2.25 -v 2 mrovl test.$num.16m.cf -rf $CHART/ss/ss:test/test.$num.ras \ -gmf $PARMS/ss/kaimana.grm -mbg 0 0 0 -tmf $SSTEMP/temp \ -os -136.0955 10.4915 1972 2348 -v 2 xv -gamma .3 $CHART/ss/ss:test/test.$num.ras & # Time: 14:04 set num = 16m.isr16 ; cd $SSGRID/test-16m ; \rm \*.cswr time mrgrid MR1002560[2-3].00.btywtnc-dap -cf test.$num.16m.cf -tfd $SSTEMP \ -dti 0 \ -ss -putm -rp 0 0 -plon -135 -ewgs84 -cs 16.933333 \ -mca 0 -mspd 192 -mpcw 1 -isr 16 -adct 2.24 -tt 2.25 -v 2 mrovl test.$num.16m.cf -rf $CHART/ss/ss:test/test.$num.ras \ -gmf $PARMS/ss/kaimana.grm -mbg 0 0 0 -tmf $SSTEMP/temp \ -os -136.0955 10.4915 1972 2348 -v 2 xv -gamma .3 $CHART/ss/ss:test/test.$num.ras & # Time 14:02 set num = 16m.isr20 ; cd $SSGRID/test-16m ; \rm \*.cswr time mrgrid MR1002560[2-3].00.btywtnc-dap -cf test.$num.16m.cf -tfd $SSTEMP \ -dti 0 \ -ss -putm -rp 0 0 -plon -135 -ewgs84 -cs 16.933333 \ -mca 0 -mspd 192 -mpcw 1 -isr 20 -adct 2.24 -tt 2.25 -v 2 mrovl test.$num.16m.cf -rf $CHART/ss/ss:test/test.$num.ras \ -gmf $PARMS/ss/kaimana.grm -mbg 0 0 0 -tmf $SSTEMP/temp \ -os -136.0955 10.4915 1972 2348 -v 2 xv -gamma .3 $CHART/ss/ss:test/test.$num.ras & # Time: 14:02 set num = 16m.isr24 ; cd $SSGRID/test-16m ; \rm \*.cswr time mrgrid MR1002560[2-3].00.btywtnc-dap -cf test.$num.16m.cf -tfd $SSTEMP \ -dti 0 \ -ss -putm -rp 0 0 -plon -135 -ewgs84 -cs 16.933333 \ -mca 0 -mspd 192 -mpcw 1 -isr 24 -adct 2.24 -tt 2.25 -v 2 mrovl test.$num.16m.cf -rf $CHART/ss/ss:test/test.$num.ras \ -gmf $PARMS/ss/kaimana.grm -mbg 0 0 0 -tmf $SSTEMP/temp \ -os -136.0955 10.4915 1972 2348 -v 2 xv -gamma .3 $CHART/ss/ss:test/test.$num.ras & # Time: 14:02 set num = 16m.isr28 ; cd $SSGRID/test-16m ; \rm \*.cswr time mrgrid MR1002560[2-3].00.btywtnc-dap -cf test.$num.16m.cf -tfd $SSTEMP \ -dti 0 \ -ss -putm -rp 0 0 -plon -135 -ewgs84 -cs 16.933333 \ -mca 0 -mspd 192 -mpcw 1 -isr 28 -adct 2.24 -tt 2.25 -v 2 mrovl test.$num.16m.cf -rf $CHART/ss/ss:test/test.$num.ras \ -gmf $PARMS/ss/kaimana.grm -mbg 0 0 0 -tmf $SSTEMP/temp \ -os -136.0955 10.4915 1972 2348 -v 2 xv -gamma .3 $CHART/ss/ss:test/test.$num.ras & # Time: 14:02 set num = 16m.isr32 ; cd $SSGRID/test-16m ; \rm \*.cswr time mrgrid MR1002560[2-3].00.btywtnc-dap -cf test.$num.16m.cf -tfd $SSTEMP \ -dti 0 \ -ss -putm -rp 0 0 -plon -135 -ewgs84 -cs 16.933333 \ -mca 0 -mspd 192 -mpcw 1 -isr 32 -adct 2.24 -tt 2.25 -v 2 mrovl test.$num.16m.cf -rf $CHART/ss/ss:test/test.$num.ras \ -gmf $PARMS/ss/kaimana.grm -mbg 0 0 0 -tmf $SSTEMP/temp \ -os -136.0955 10.4915 1972 2348 -v 2 xv -gamma .3 $CHART/ss/ss:test/test.$num.ras & --------- Test compass using GMT (to see if along-track smears that appear to be due to interpolation can be gotten rid of w/GMT) /home/malei2e/kaimana/ssgrid/test-16m ssplot test.dap 16 4 8 ssplot test.dap 8 4 8 ssplot MR10025601.00.btywtnc-dap 16 4 8 ...the answer is YES -> because interpolation works the way it should.

Overview of Chart Information Survey mv0101 The CHART\_INFO menus and doc files illustrate how to create chart boxes, how to label them, and how to prepare non-MR1 data for inclusion on the charts. Any other maps that are created to support the survey (like regional Geosat imagery or whatever) are documented in MISC MAPS. SUBJECT MENU NAME DOC FILE -------- --------- -------- 1. Establish chart boundaries CHART BOX $DOC/chart\_info/chart\_box.doc 2. Create chart labels CHART LABELS $DOC/chart\_info/chart\_labels.doc 3. Route Position List data RPL $DOC/chart\_info/RPL.doc 4. Other data to plot on charts OTHER DATA $DOC/chart\_info/other\_data.doc 1. Other survey-related maps MISC MAPS $DOC/chart\_info/misc\_maps.doc

Chart\_box.doc Survey mv0101 CONTENTS 1. Overview of the technique 2. Your Mission 3. The make\_boundbox script 4. Create .box files for this survey ############################################################################ 1. Overview of the technique The scripts that construct the bathymetry and sidescan charts require a chart definition file, which we call a "box" file. The cookbook below shows you how to create these box files. Box files should be located in the directory $PARMS/chart (or, for complex surveys, in subdirectories beneath $PARMS/chart) and have the suffix ".box". In addition, all the .box files should be concatinated into a single file ($PARMS/chart/boxes) that contains all the boxes. The geographic area imaged within each chart is determined by figuring out how big a space (in inches) is available for printing within the chart format. The A0-size chart format we've developed allows you to plot an area that is 31.49610" wide by 23.42520" tall. To determine the lat/lon bounds for each chart that conform to these measurements, you'll use the script make\_boundbox (Step 4 below). ############################################################################ 2. Your Mission Your mission is to create adjacent charts that have enough overlap so that you capture all the swath data without creating too many charts. Here's how: 1. Create a chart box by specifying the lower-left corner of the chart on the make\_boundbox command line. 2. Make a page-sized nav chart to check the degree of overlap with adjacent charts. Use the method shown in $DOC/nav/nav\_plot.doc. The boundaries of other charts are plotted as dashed lines, which allows you to determine whether there's enough overlap to accommodate the full sidescan swath. 3. Make a page-sized regional trackline plot, which automatically plots the positions of each chart. 4. If the chart area is OK, move on. If its not, go directly to Step 1 above. ############################################################################ 3. The make\_boundbox script The script make\_boundbox calculates the four corners of each chart, based on info that you provide on the command line. The output from make\_boundbox is formatted such that it can be input directly into other HMRG scripts and GMT programs. The general form of the command is like this: make\_boundbox chart\_ID minlon minlat x\_inches y\_inches dpi proj scale make\_boundbox JU:01:100-002 237.06929 34.8667 37.73 32.09 300 u10 100000 : : :........:.....Adjust these number to move the chart's lower left corner For a given survey you probably won't change the values for x\_inches or y\_inches. ############################################################################ 4. Create .box files for this survey set id = $PROJ set n = 000 ;make\_boundbox $id-100-$n 140.050 10.550 37.73 32.09 300 u54 500000 > $PARMS/chart/$id/$id-100-$n.box set n = 001 ;make\_boundbox $id-100-$n 143.850 13.200 37.73 32.09 300 u54 100000 > $PARMS/chart/$id/$id-100-$n.box set n = 002 ;make\_boundbox $id-100-$n 143.000 13.200 37.73 32.09 300 u54 100000 > $PARMS/chart/$id/$id-100-$n.box set n = 003 ;make\_boundbox $id-100-$n 143.820 12.478 37.73 32.09 300 u54 100000 > $PARMS/chart/$id/$id-100-$n.box set n = 004 ;make\_boundbox $id-100-$n 143.000 12.478 37.73 32.09 300 u54 100000 > $PARMS/chart/$id/$id-100-$n.box set n = 005 ;make\_boundbox $id-100-$n 142.180 12.680 37.73 32.09 300 u54 100000 > $PARMS/chart/$id/$id-100-$n.box set n = 006 ;make\_boundbox $id-100-$n 142.180 12.200 37.73 32.09 300 u54 100000 > $PARMS/chart/$id/$id-100-$n.box set n = 007 ;make\_boundbox $id-100-$n 141.320 12.200 37.73 32.09 300 u54 100000 > $PARMS/chart/$id/$id-100-$n.box set n = 008 ;make\_boundbox $id-100-$n 143.650 11.750 37.73 32.09 300 u54 100000 > $PARMS/chart/$id/$id-100-$n.box set n = 009 ;make\_boundbox $id-100-$n 142.780 11.750 37.73 32.09 300 u54 100000 > $PARMS/chart/$id/$id-100-$n.box set n = 010 ;make\_boundbox $id-100-$n 141.910 11.750 37.73 32.09 300 u54 100000 > $PARMS/chart/$id/$id-100-$n.box set n = 011 ;make\_boundbox $id-100-$n 141.040 11.750 37.73 32.09 300 u54 100000 > $PARMS/chart/$id/$id-100-$n.box set n = 012 ;make\_boundbox $id-100-$n 140.170 11.750 37.73 32.09 300 u54 100000 > $PARMS/chart/$id/$id-100-$n.box set n = 013 ;make\_boundbox $id-100-$n 143.650 11.030 37.73 32.09 300 u54 100000 > $PARMS/chart/$id/$id-100-$n.box set n = 014 ;make\_boundbox $id-100-$n 142.780 11.030 37.73 32.09 300 u54 100000 > $PARMS/chart/$id/$id-100-$n.box set n = 015 ;make\_boundbox $id-100-$n 141.910 11.030 37.73 32.09 300 u54 100000 > $PARMS/chart/$id/$id-100-$n.box set n = 016 ;make\_boundbox $id-100-$n 141.040 11.030 37.73 32.09 300 u54 100000 > $PARMS/chart/$id/$id-100-$n.box set n = 017 ;make\_boundbox $id-100-$n 140.170 11.030 37.73 32.09 300 u54 100000 > $PARMS/chart/$id/$id-100-$n.box cat $PARMS/chart/$id/\*.box > $PARMS/chart/$id/boxes \cp $PARMS/chart/$id/boxes $PARMS/chart/boxes

chart\_labels.doc Survey mv0101 CONTENTS 1. How this works 2. The make\_labels script 3. The cookbook ######################################################################### 1. How this works You need to create ID labels for each chart. These labels will identify the charts when they're plotted on chart keys, legends, or regional trackline plots. The make\_labels script requires the file $PARMS/chart/boxes, which contains the boundary information for each chart. Output from make\_labels is in a format that can be read by the GMT program pstext, written in a file named chartlabels.dat located in the directory $PARMS/chart ######################################################################### 2. The make\_labels script The general form of the command is like this: make\_labels chart\_ID offset posn fontsize font label\_text make\_labels SMW:100-001 $off br $size $font 001 - Offset is in inches (a good value is .03) - Fontsize is in points - Font numbers are identified in the GMTDEFAULTS man page - label\_text is the text string that actually gets printed - Position categories: tl = top left rt = right top br = bottom right lb = left bottom tc = top center rc = right center bc = bottom center lc = left center tr = top right rb = right bottom bl = bottom left lt = left top c = center of box ######################################################################### 3. The cookbook set id = $PROJ set off = .18 ; set size = 12 ; set font = 1 \cp $PARMS/chart/$id/boxes $PARMS/chart set n = 001 ;make\_labels $id-100-$n $off c $size $font $n > $PARMS/chart/$id/100-$n.lab set n = 002 ;make\_labels $id-100-$n $off c $size $font $n > $PARMS/chart/$id/100-$n.lab set n = 003 ;make\_labels $id-100-$n $off c $size $font $n > $PARMS/chart/$id/100-$n.lab set n = 004 ;make\_labels $id-100-$n $off c $size $font $n > $PARMS/chart/$id/100-$n.lab set n = 005 ;make\_labels $id-100-$n $off c $size $font $n > $PARMS/chart/$id/100-$n.lab set n = 006 ;make\_labels $id-100-$n $off c $size $font $n > $PARMS/chart/$id/100-$n.lab set n = 007 ;make\_labels $id-100-$n $off c $size $font $n > $PARMS/chart/$id/100-$n.lab set n = 008 ;make\_labels $id-100-$n $off c $size $font $n > $PARMS/chart/$id/100-$n.lab set n = 009 ;make\_labels $id-100-$n $off c $size $font $n > $PARMS/chart/$id/100-$n.lab set n = 010 ;make\_labels $id-100-$n $off c $size $font $n > $PARMS/chart/$id/100-$n.lab set n = 011 ;make\_labels $id-100-$n $off c $size $font $n > $PARMS/chart/$id/100-$n.lab set n = 012 ;make\_labels $id-100-$n $off c $size $font $n > $PARMS/chart/$id/100-$n.lab set n = 013 ;make\_labels $id-100-$n $off c $size $font $n > $PARMS/chart/$id/100-$n.lab set n = 014 ;make\_labels $id-100-$n $off c $size $font $n > $PARMS/chart/$id/100-$n.lab set n = 015 ;make\_labels $id-100-$n $off c $size $font $n > $PARMS/chart/$id/100-$n.lab set n = 016 ;make\_labels $id-100-$n $off c $size $font $n > $PARMS/chart/$id/100-$n.lab set n = 017 ;make\_labels $id-100-$n $off c $size $font $n > $PARMS/chart/$id/100-$n.lab cat $PARMS/chart/$id/\*.lab > $PARMS/chart/$id/chartlabels.dat \cp $PARMS/chart/$id/chartlabels.dat $PARMS/chart

RPLs to be plotted on charts Survey mv0101 1. Importing RPLs 2. Example: Tanguisson Point (Guam) - BU3 (Guam) ############################################################################# 1. Importing RPLs Get an RPL file from the cable guys in an Excel spreadsheet. On our PC, open the file in Excel and make sure it has the format: lon.dec lat.dec event eg 140.7416667 36.7741167 AC4 Next, break the master RPL list into two lists used in plotting: 1. $id.$ver.ac.txt ........... Draw cable route line on charts 2. $id.$ver.event.txt ........ Draw symbols for other points of interest Save each of the above as tab-delimited text files, and FTP them to $PARMS/chart/$project\_id Next, convert the ac.txt and event.txt files to an xy files that can be used by psxy. To do this, use an awk command (see cookbook below) Note that, in order to properly draw the cable route, you need to create two files from the $id.$ver.ac.txt file: one used for drawing the cable route, and one for drawing the AC symbols. The two different files are needed to get around a GMT bug: if you try to put a line on a chart but there are no vertices that fall within the limits of the chart, the line doesn't plot. So you need to interpolate Intermediate Points (IPs) between the ACs. One IP every 50 km works OK. Use the script rpl\_interp, which interpolates points along the line every 50 km. Here ya go: rpl\_interp $id.$ver.ac.txt ; \mv interp.xy $id.$ver.rpl.xy ############################################################################# 2. Example: Tanguisson Point (Guam) - BU3 (Guam) Latest RPL versions: set id = AJC-06 cd $PARMS/chart/$id set ver = v0602 Edit each .txt file so it only includes the data its supposed to: te $id.$ver.ac.txt :...........Edit to include only AC points te $id.$ver.event.txt :...........Edit to include events other than ACs cat $id.$ver.ac.txt |\ awk '{if ($1==">")print $1,$2,$3,$4; else if ($1<0) printf "%14.7f %14.7f\n",360+$1,$2;else printf "%14.7f %14.7f\n",$1,$2}' > $id.$ver.ac.xy cat $id.$ver.event.txt |\ awk '{if ($1==">")print $1,$2,$3,$4; else if ($1<0) printf "%14.7f %14.7f\n",360+$1,$2;else printf "%14.7f %14.7f\n",$1,$2}' > $id.$ver.event.xy rpl\_interp $id.$ver.ac.txt ; \mv interp.xy $id.$ver.rpl.xy \cp $id.$ver.rpl.xy $id.rpl.xy \cp $id.$ver.ac.xy $id.ac.xy \cp $id.$ver.event.xy $id.event.xy \cp $id.$ver.ac.txt $id.ac.txt

Documentation for other charts made to support the survey Survey mv0101 foreach jd ( 23{5,6,7,8,9} 24{0,1,2,3,4,5,6,7,8,9} 25{0,1} ) cd $XYZ/xyz$jd if (-f jd$jd.xyzw ) \mv jd$jd.xyzw jd$jd.mw9719.xyzw end NW corner at (140.163153837341, 13.872839443600) NE corner at (144.184346253740, 13.853543877884) SW corner at (140.172011656984, 11.103030062858) SE corner at (144.150704256419, 11.087693139812) mscxorigin = -90424.003560 mscyorigin = 1227497.381660 mscdwidth = 5134 mscdheight = 3618 gmtset GRID\_CROSS\_SIZE .04 psbasemap -R140.17/11.1/144.19/13.86r \ -Ju54/1:500000 -B30mg10m -P > test.ps pageview -aa -depth 24 -mcd 300 -w 47.0 -h 33.3 test.ps &

Testing Image Alchemy Options With HP755 Plotter Survey mv0101 Testing alchemy -> RTL ripping. Input and output files are stored in mv0101/doc/chart\_info/AlchemyTests # -------------------------------------------------------------------------- Bottom Line Use RTL Format 2 (--r2) for page size plots (allows nesting) Use RTL Format 7 (--r7) for A0 plots (prints immediately) For sidescan, use undercolor removal. This handles the conversion from RGB to CMYK more better, and results in a print with WAY more dynamic range. Use the undercolor map in ALCHEMY/samples/gray.ucr (-Cgray.ucr) When using undercolor removal, you'll need to apply a gamma correction using -Gi3.5 -Go1.0 The JJN dithering pattern (-d3) seems to look best # -------------------------------------------------------------------------- Default outputs The RTL format 14 results in 24-bit compressed output that immediately streams to the plotter (as opposed to being stored in the plotters buffer until it fills up). So it plots quickly. The RTL format 7 is a TIFF compressed (1-bit CMYK) output that immediately streams to the plotter. Alchemy says that format 7 is the best to use on DesignJets. # 05 The default RTL format 14 image -- not much contrast alchemy mv0101-100-012.ss.page.final.ras --r14 -o \ -D 300 300 test.r14.rtl # 21 The default RTL format 7 image alchemy mv0101-100-012.ss.page.final.ras --r7 -o \ -D 300 300 test.r7.rtl Note that RTL Format 2 is the same as Format 7, except 2 is not on-the-fly. That means that if you use Format 2 you can nest plots on the printer, which is a good thing if you're printing lots of page-sized plots. A0 size plots should probably be Format 7 so they print as soon as the data streams to the plotter. # -------------------------------------------------------------------------- Dithering options Hey! The dithering option -d doesn't work in 24-bit mode, so if you specify a dither when you're using the RTL format 14 it doesn't have any effect # 01 This is 24-bit, so dithering doesn't work alchemy mv0101-100-012.ss.page.final.ras --r14 -o -ds3 10 \ -D 300 300 test.r14.ds3-10.rtl # 11 No dithering - results in no image! alchemy mv0101-100-012.ss.page.final.ras --r7 -o -b -d0 \ -D 300 300 test.r7.b.d0.rtl # 12 Floyd-Steinberg dithering. OK. alchemy mv0101-100-012.ss.page.final.ras --r7 -o -b -d1 \ -D 300 300 test.r7.b.d1.rtl # 16 Stucki dithering. Pretty good. alchemy mv0101-100-012.ss.page.final.ras --r7 -o -b -d2 \ -D 300 300 test.r7.b.d2.rtl # 17 Jarvis, Judice & Ninke dithering. Best. alchemy mv0101-100-012.ss.page.final.ras --r7 -o -b -d3 \ -D 300 300 test.r7.b.d3.rtl # 18 Stevenson & Arce dithering. Eh. alchemy mv0101-100-012.ss.page.final.ras --r7 -o -b -d4 \ -D 300 300 test.r7.b.d4.rtl # 19 Sierra Lite dithering. OK. alchemy mv0101-100-012.ss.page.final.ras --r7 -o -b -d5 \ -D 300 300 test.r7.b.d5.rtl # 20 Halftone (clustered dot) dither. Crap. alchemy mv0101-100-012.ss.page.final.ras --r7 -o -b -d20 \ -D 300 300 test.r7.b.d20.rtl # 10 Halftone2 (clustered dot) dither. More crap. alchemy mv0101-100-012.ss.page.final.ras --r7 -o -b -d22 \ -D 300 300 test.r7.b.d22.rtl # 09 Shows effect of adding a lot of dither noise. Nogood. alchemy mv0101-100-012.ss.page.final.ras --r7 -o -b -ds3 100 \ -D 300 300 test.r7.b.ds3-100.rtl # -------------------------------------------------------------------------- Undercolor Removal \*\* WE HAVE A WINNER \*\* This doesn't work in 24 bit mode -- all you get is a black image. So make sure you use RTL format 7 (or another 1-bit output format) # 03a This has an effect, but is way too light: alchemy mv0101-100-012.ss.page.final.ras --r7 -o -d3 \ -D 300 300 -Cgray.ucr test.r7.d3.ucr.rtl # 03b This makes it a little darker... alchemy mv0101-100-012.ss.page.final.ras --r7 -o -d3 \ -Gi1.333 -Go1.0 -D 300 300 -Cgray.ucr test.r7.d3.ucr.Gi1p3-Go1p0.rtl # 03c BEST BEST BEST. Wow, you really GOTTA use undercolor removal to get a good grayscale image outta the 755 alchemy mv0101-100-012.ss.page.final.ras --r7 -o -d3 \ -Gi3.5 -Go1.0 -D 300 300 -Cgray.ucr test.r7.d3.ucr.Gi3p5-Go1p0.rtl set ucr = /home/malei1d/bruce/alchemy/samples/gray.ucr alchemy mv0101-100-012.ss.page.final.ras --r7 -o -d3 \ -Gi3.5 -Go1.0 -D 300 300 -C$ucr test.r7.d3.ucr.Gi3p5-Go1p0.rtl # -------------------------------------------------------------------------- Gamma Shift 24-bit output (RTL format 14) can have a nonzero gamma shift For 1-bit output (RTL format 7) the output gamma must be 1.0, so to get gamma shifts you need to change the input gamma. # 04 This makes the plot a little bit lighter... alchemy mv0101-100-012.ss.page.final.ras --r14 -o -ds3 10 \ -D 300 300 -Gi1.0 -Go1.8 test.r14.ds3-10.Gi1-Go1p8.rtl # -------------------------------------------------------------------------- 600 DPI Alchemy Imaging Doesn't do any good 13 alchemy mv0101-100-012.ss.page.final.ras --r7 -o -b -d1 \ -D 600 600 -+ -Xb11i test.r7.dpi600.b.d1.rtl 14 alchemy mv0101-100-012.ss.page.final.ras --r7 -o -b -d1 \ -Gi0.55 -Go1.0 -D 600 600 -+ -Xb11i test.r7.dpi600.b.d1.Gi0p55-Go1.rtl 15 alchemy mv0101-100-012.ss.page.final.ras --r7 -o -b -d1 \ -Gi0.15 -Go1.0 -D 600 600 -+ -Xb11i test.r7.dpi600.b.d1.Gi0p15-Go1.rtl # #8 #alchemy mv0101-100-012.ss.page.final.ras --r1 -o -ds3 10 \ # -D 300 300 test.r1.ds3-10.rtl # 9