CRIBSHEET FOR DSPL DigiSeaCam
D. Fornari - August 21, 2002

DSPL DigiSeaCam Specifications
Camera System:
Nikon Coolpix 995
Image sizes (user settable): 2048 X 1536 (FULL), 1600 X 1200 (UXGA), 1280 X 960 (SXGA),
      1024 X 768 (XGA), 640 X 480 (VGA) 2048 X 1360 (3:2).
Optical Zoom: 4:1
Lens: Nikkor, f 2.8 – 5.1, 10 elements, 8 – 32 mm.
Viewfinder: NTSC or PAL monitor video available on test video output connector
Storage/ File System: Design rule for Camera File systems, Digital Print-Order Format (DPOF)
      compliant.
Storage, Compression: JPEG-based-compliant, FINE (~ ¼), NORMAL (~1/8), BASIC (~1/16),
      HI (uncompressed: RGB – TIFF).
Storage, Media: 1 GB CompactFlash Card (Type 2)
Sensitivity: ISO 100 equivalent (selectable Auto, ISO 100, 200, 400, 800)
Shutter: 8 sec to 1/2000 sec

Optics
Port: 80mm diameter, hemispherical, tempered, BK-7 dome port.
Corrective optics: Multi element, pseudo-telecentric corrector, A/R coated.
Field of View:
Vertical: 46°
Horizontal: 74°

SubSea Field of View
        The DSPL DigiSeaCam has been calibrated in seawater using measured poles with
accurate 1m markings on them. The table below provides the results of image size for three
common altitudes.

Table 1. Field of view in seawater for DSPL DigiSeaCam.

Altitude above Bottom	3 meters	5 meters	7 meters
Field of View in Seawater	3.49m x 2.62m	6.06x4.54m	8.03mx6.02m
Pixels/Meter	586	338	255

Electrical
Power requirement: 10 – 34VDC, 1A max (nominal ~ .1A)
Camera Control Port: EIA, RS-232 Compliant
Camera Data (image upload) Port: USB compliant
Strobe interface: X-sync
Video output: Slow scan, 15 frames/sec, NTSC or PAL compliant
Control: External switch closures may be used to: START, or STOP time lapse, as well as snap a
      single photo.

Housing and Maintenance
1) Be sure to clean all seals and service all O-rings and purge housing with N2 prior to use.
2) When reinstalling the camera in housing, check that the lens is clean and check that the housing optics are clean- use only precision wipes and alcohol to clean housing optics.
3) When reinstalling the camera BE SURE NOT TO MOVE THE TOP SWITCH ON THE CAMERA- IT MUST BE SET TO "M" FOR THE CAMERA TO FUNCTION PROPERLY.
4) Check the zincs (located under the mounting bracket, if they are gone please replace them. The housing is mostly anodized aluminum but the endcap is titanium, so galvanic action may occur. Check the housing and seal surfaces often for signs of corrosion.
5) When sealing the camera, use a spanner wrench to tighten the black retaining ring to ensure that the sealing surfaces are snug and properly mated.
6) Use a small spanner wrench to tighten the 16 pin Impulse brass-shelled connector- CHECK THE FACE O-RING IN THE CABLE CONNECTOR TO ENSURE THAT IT IS PROPERLY SEATED. USE THE NEW O-RINGS SUPPLIED AND THE O-RING INSERTION TOOL PROVIDED BY IMPULSE.

Setting Repetition Rate on the Camera
1) For Jason2 or Alvin use, setting the repetition rate on the camera involves connecting the camera to the Deck Box and the Deck Box to a PC laptop running Hyperterminal or an equivalent terminal emulation program. The settings for the terminal control should be
     ANSI, autodetect, baud=19200, 8-N-1
2) The serial cable from the deck box should be plugged into the laptop. The camera should be plugged into the deck box with both the 5 pin rubber connector and the Impulse 16pin connector. (NB the 5 pin rubber connector give you access to the start cycle, stop cycle, and single snap functions on the Deck Box).
3) Put the "run/load" toggle switch on the Deck Box to "load".
4) Turn the power to the Deck Box on using the button on the GFI plug that provides power to the Deck Box (green light goes on)
5) The camera will turn on and the Digisnap Controller Board will be recognized and the start-up menu for making changes will scroll down the laptop screen.
6) THE ONLY THING YOU NEED TO DO HERE IS CHANGE THE REP. RATE OF THE CAMERA.
7) Changing the rep. rate is done by: typing "t" (for simple time lapse mode), then type:
     "0" (zero) "return" (when asked for delay)
     "0" (zero)   "return" (when asked for hours)
     "0" (zero)   "return" (when asked for minutes)
     "15"   "return" (this sets the rep. rate at 15 seconds)
     "q"   "return" (this stores the settings in the Digisnap and shuts it off
8) Turn the power to the Deck Box 'OFF'.
The camera will now have in its memory to take as many pictures as the 1 GB CF card will hold and take a picture every 15 seconds.

Taking Photos and Verifying GMT time and Camera Settings
1) Remember to dump all the images from the preceeding tow prior to launching the vehicle so that you have the maximum storage available for taking images. Set the camera time/date to GMT (see section below on setting time and presets).
2) Remember that the camera takes ~20-30 sec to start up. Then you'll see the screen display in the video feed that shows the various settings that the camera has retained (see example below).
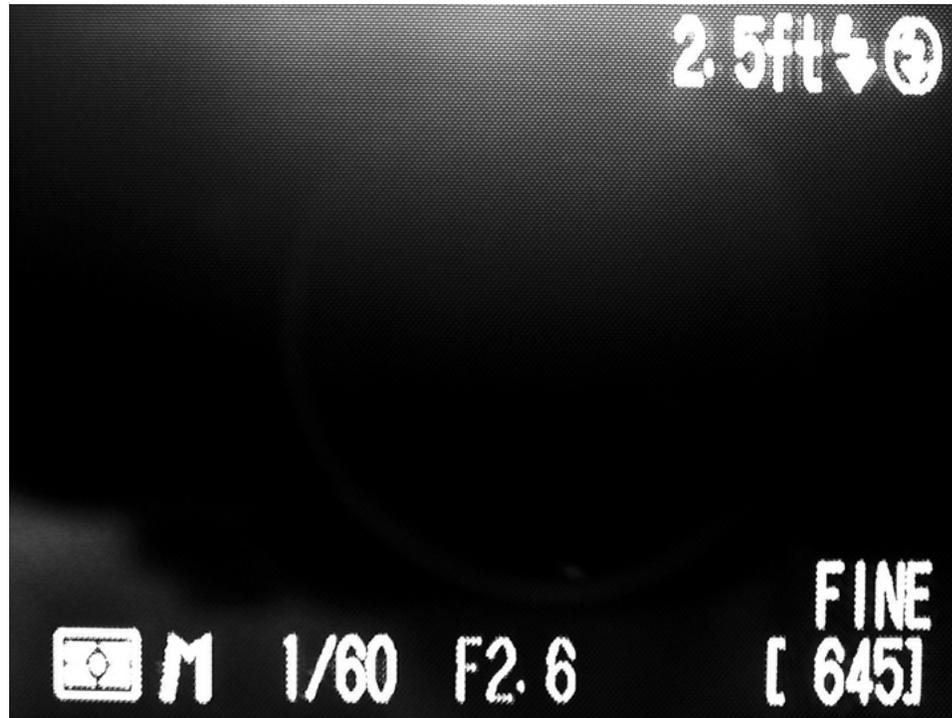

Figure above shows an exact replica of the monitor display for the S/N 6003 Jason DSPL DigiseaCam camera. Remember that the lower right numbers in brackets "[645]"are the # of images left to shoot (ie available memory in the CF card), <u>BUT they are not correct when using the 1 GB CF card</u>, as the Nikon995 does not know how to count images left when using that card. When you are close to 10-20 images left, you only have about 30-40 images remaining. When the card is full you, the screen will display an "Out of Memory" message.

The info on the screen refers to:
2.5ft = present focal distance for camera s/n 6003 (Jason camera)
lighting bolt and lighting bolt w/bar through it =external flash ON, internal flash OFF (respectively)
lower left corner box & "M" = manual mode
1/60 = shutter speed
F2.6 = aperature
Fine = lowest JPG compression setting
[645] = # of images left to take (not correct when using 1 GB CF card, there are more than the number indicated)

Downloading and Processing Images
To download images do the following steps:
1)   Disconnect blue cable from Jason2 to camera.
2)   Connect Deck Box 16 pin cable to camera and power to deck box
3)   Flip the toggle switch to "load"
4)   Turn on Deck Box (green light goes on)
5)   Laptop should be on and a folder created to dump the lowering's images into
6)   Wait 1 minute and then connect the USB cable to the laptop (NB for long lengths of USB cable- over 15' use Active USB cables only)
7)   The camera's CF card should appear as a "hard-drive" icon called "untitled" on the desktop of the laptop.
8)   Open the camera's "untitled" icon and inside will be a Nikon folder, open that folder and there should be several folders numbered "100", "101" etc. inside those folders are the images, number sequentially.
9)   Copy all the images to the laptop and back up on CD or hard drive
10)   Erase all the images in the camera once you have them backed up. This will clear the CF card so it has room for the next lowering.
11)   Drag the 'untitled' icon into the trash (Mac) or dismount it using Windows utilities, this will properly disconnect the camera from the laptop.
12)   Turn power off to the Deck Box and disconnect the cables.
13)   Reconnect the blue cable from the vehicle to the camera- MAKE SURE THAT THE O-RING IS PROPERLY SEATED AND THE SEALS CLEAN.

Processing the Images and Date/Time Stamping Them
1)   The Win95 program called "RenameasDateinTime.exe" is provided. This program converts the images from native Nikon file names to the date/time that the image was acquired and the JPG format suffix.
2)   Take all the raw images as copied from the camera's CF card and put them in one or more folders.
3)   Drag the "RenameasDateinTime.exe" script into the folder and double-click on it.
4)   The screen will go black and the renamed file list will start scrolling down the window and finally the renamed files will all appear in the window.
5)   The files have all now been renamed with their acquisition times/dates
6)   To optimize the images, it is suggested to auto-contrast them and sharpen them, and auto-color them in Photoshop. This can be done using Batch processing steps found in Photoshop. An equivalent image processing using other means can also be done, but especially in low light levels, processing the images helps bring out the primary subject matter.

Resetting Time and Date and Presets for DSPL DigiSeaCam – Nikon 995
This must be done directly on the camera and requires opening the pressure housing. Operating the camera will require connecting external power or inserting a battery into the camera.

1) To use external power, remove the camera from the housing and connect it to the Deck Box using all cables provided. Turn on Deck Box with toggle switch in "run" position. The camera will start up and start taking photos. After one of the photos has been saved, press the "stop cycle" button. This will allow you to manipulate the camera controls on the back of the Nikon 995.
2) Turn the camera mode dial to M.
3) Press the menu button and scroll down to the last tab "S" using the button with the four arrows next to the LCD. This is 'Set-Up 1'
4) Scroll down using the arrow button to Zoom Options and then right click the arrow button.
    a. Select Start Up position and click the arrow button to the right again.
    b. Select the desired start up positions…(Wide) then click the button to the right again.
5) Scroll to Auto Off to select the desired time for the camera to automatically turn off when not in use and right click the arrow button.
    a. Use the arrow button to select the desired shut off time, typically 20 sec.
6) Scroll past the last item and this will take you to the next page called 'Set-Up 2'.
    a. Scroll to Speedlight Option. Now go to INT Flash Off. To enable this, select "ON". Selecting ON will enable the internal flash to be off (Nikon's equivalent of RPN).
7) Scroll to Date to set the date and time.
    a. Set Date and Time by using the arrow button (up-down to adjust value/ right-left to select field).
    b. Be sure to set time to GMT at the top of a minute accurately and then save the settings by immediately right clicking in the last field to set time/date and going to the main menu.
8) **Press Menu button to save menu settings**
9) To set focus to the distance indicated on the end cap of the camera:
    a. Hold down the M-Focus button located below the left side of the LDC display while simultaneously rotating the thumb wheel on top of the camera. Do this until the desired distance is achieved.
10) To manually set aperture and shutter speed.
    a. Hold down the *'MODE" button* (FUNC. 1) on top of the camera while simultaneously rotating the thumb wheel until the letter "M" appears on the LCD. Letters S, P, or A will appear as you scroll through.
    b. To set aperture & shutter speed, release the 'MODE' button and either aperture or shutter speed displayed on the LCD will be highlighted. Just rotate the thumb wheel to change the setting. Press the 'MODE' button again to toggle between the aperture and the shutter speed so the other can be set.
11) To enable External Strobe Sync:
    a. Press the 'ISO' button below the LCD until the lighting bolt icon appears.
12) Changing image compression/resolution:
    a. Press the "QUAL" button below the right side of the LCD until desired compression appears. The options are BASIC, NORMAL, FINE, and HI. Set the quality to "Fine", hold down the "QUAL" button while rotating the thumbwheel to obtain the image resolution.