Pre-Departure Equipment Checklist

I. Scanning Equipment

1. Humminbird control head (900 or 1100 series)
    a. Extra SD Memory Cards (must be blank/empty)
2. GPS (Garmin GPS Map 76 or other)
    a. Extra AA Batteries (unit requires 2)
3. Stopwatch (Seiko SO57-4000)
    a. Time adjustment chart (Table 1)
4. Transducer mount and wiring harness
5. "All weather" field notebook and pencil
6. Field data sheets
6. Digital GPS camera
    a. DC charging station
7. Trimble Recon (QA/QC only)

II. Boat Equipment

1. Fuel (non-ethanol if possible)
    a. tank full
    b. spare 5 gal per boat
2. Spare charged 12v deep cycle marine battery
3. Ballast
    a. Cooler
    b. Cement blocks/defunct batteries
4. Boat cushions
5. Toolbox
6. Anchor
7. Lifejackets (1 per person)
8. Paddles (2)
9. Fire Extinguisher
10. Bucket
11. Survival Kit

IV. Post-Survey Data Download Equipment

1. Laptop computer
2. DVD burner drive
3. DVD's
4. External hard drive
5. Memory card USB reader
6. GPS USB connector

Launch/survey start checklist:

I. Boat

1. Propeller condition - good
2. Lower unit condition - good
3. Engine oil – good
4. Boat plug in

II. Control Head

1. <Active side> set to <**Both**>
2. <Sharpness> set to <**Off**>
3. <Sensitivity> set to approx. <**8**>*
4. <Contrast> set to approx. <**11** to 13>*
5. <Chart speed> set to <4>* or <**5**>*
6. <Beam select> set to <**200 kHz**>
7. <Side view frequency> set to <**455 kHz**>
8. <Screen snapshot> to <**On**>
9. <NMEA Output> to <**On**>.

*These settings are dependent upon individual site conditions, and should be adjusted to maximize image quality. Settings used should be noted in the field data sheet. **Bolded** values are GDNR standard for river surveys.

III. GPS unit

1. Track Log is turned on
2. Previous tracklog is cleared
3. <Interface> <Serial Data Format> set to <NMEA In/NMEA Out>

Table 1: Time to clear (seconds) for scroll rates 4 and 5 at range settings of 75-205 feet using an 1197c controller head. These numbers represent absolute clear time, so allow for a 2-3 second buffer when setting an interval time from the chart below. For example, for a scroll rate of 5 and a range of 105, the interval timer would be set to 18 or 19 seconds to ensure images overlap. It is good practice to track objects on the screen to ensure that an object identified at the very top of the screen during image capture, is still visible at the bottom of the screen when capturing the next image.

Range Setting (ft)	Scroll rate 4 (sec)	Scroll rate 5 (sec)
75	N/A	15.4
85	21.7	17.2
95	24.0	19.4
105	26.6	21.3
115	29.2	23.4
125	31.7	25.3
135	34.1	27.1
145	36.7	29.0
155	39.1	30.9
165	41.6	33.1
175	43.2	35.0
185	46.0	37.3
195	48.6	39.2
205	51.9	41.1

Stopwatch Setup and Humminbird Memory Full Procedures

I. Stopwatch operation:

a. Use the timing chart (Table 1) to identify how long of an interval is required between image captures. This depends on your range settings and scroll rate, and 3 seconds should be added to provide room for error.
b. Press any button to turn on the stopwatch
c. Press the <Mode> button on the bottom right corner of the stop watch until the screen displays <TIMER> in the top row.
d. Press and hold the middle <RECALL> button until the first set of numbers begins to flash. *You may have to press the left most button (LAP/SPLIT RESET) once before you hold down <RECALL> to get the numbers to flash, as the time needs to be reset to start in order for adjustments to be made.
e. Press the right most <START/STOP> button twice or until the small right most number set begins to flash.
f. Press the left most <LAP/SPLIT RESET> button to set the correct number of seconds required for your determined interval (plus about 3 seconds).
g. When you reach the desired seconds, press the <RECALL> button once so the numbers stop flashing
h. The top column of the display should read: 000/--- in order for the interval to automatically restarted after the alarm. If there are numbers in the right side of the hash mark instead of dashes, you must change this. Hold down the <RECALL> button to make the numbers flash. Navigate to the area that needs to be changed with the right most <START/STOP> button. Once you have the desired field flashing, use the <LAP/SPLIT RESET> button to change the field. The right side of the hash (/---) in the upper column will display the dashes after 099 and before 001.
i. Test the timer. Once it ticks down to 3 seconds, a short series of 3 consecutive beeps will sound before the 0 second alarm, and the seconds should automatically reset and begin to count down again immediately and before the alarm is finished sounding.

II. Humminbird Memory Full

a. Export all NAV data to the SD card.
    1. Press <MENU> twice and navigate to the diamond shape <NAV> tab.
    2. Press the down arrow until you reach <Export NAV data> and push the right arrow to export. Once prompted o save the data, hit the right arrow button again to confirm the export.

b. Delete all NAV data
    1. Navigate to the <NAV> tab and select <Delete all NAV data> and press the right arrow to select. Since you just exported all the data, it is okay to delete the waypoints on the controller head. Press the right arrow button to confirm.

c. Insert new blank SD card and resume survey.