

**IOP:002.13**

January 6, 2017

U.S. Fish and Wildlife Service  
Marquette Biological Station  
3090 Wright Street  
Marquette, Michigan 49855  
U.S.A.

and

U.S. Fish and Wildlife Service  
Ludington Biological Station  
229 South Jebavy Drive  
Ludington, Michigan 49431  
U.S.A.

and

Fisheries and Oceans Canada  
Sea Lamprey Control Centre  
1219 Queen Street East  
Sault Ste. Marie, Ontario P6A 2E5  
Canada

**INSTRUMENT OPERATING PROCEDURE**

**INSTRUMENT:**

Automatic Water Sampler

**MODEL:**

Model 2900, 6700, 6712, 3700

**MANUFACTURER:**

ISCO

**PRECAUTIONS:**

**POTENTIAL INTERFERENCES**

Ambient air temperatures below 0<sup>0</sup> C will cause freezing in the suction hose if the hose is left exposed. If an intake is not suspended above stream bottom, silt and other debris will obstruct the hose. If two units are set next to each other electromagnetic interference may occur.

**SAFETY**

When all glass sample bottles are filled a unit weighs in excess of 80 pounds. To avoid injury two persons should carry a full water sampler.

## PROCEDURES:

- I. Preparation of unit
  - A. Remove top cover of unit and attach 12 volt battery to 12 VDC connector.
    1. Prior to attaching battery to unit assure that battery is fully charged by use of a OHM meter or other voltage measuring device. AFTER ANY USE BATTERIES SHOULD BE CHARGED FOR 18 TO 24 HOURS.
  - B. Remove bottom section of the unit and assure that all plastic bottles are empty and the lids have been removed.
- II. Deploying the unit (TOP:022.x)
  - A. Situate the unit at a secluded site, so it cannot be readily seen.
  - B. Suspend the probes off the stream bottom in an area of low flow velocity.
  - C. Secure the unit to a tree or other sturdy permanent object with the attached cable.
  - D. The intake line must be straight to prevent water from collecting in loops and low spots.
- III. Programming the Unit (variations exist among the models; see manuals)
  - A. ISCO model 2900
    1. Press "ON"
    2. Press "Program/Step"  
Response: Step #1=Mode
      - a. Set basic operating mode to be used (Mode 1 or Mode 3 for the ISCO Model 2900)
        - (1) Mode 1: 24 bottle sequential time
        - (2) Mode 3: 12 bottle sequential time
      - b. Press "Enter Value"
    3. Press "Program/Step"  
Response: Step #2= Set time interval between samples.
      - a. Generally this will be set value @ 60 mins (interval between samples)
      - b. For some samples this may be set to 30 mins (for some dye studies).
      - c. Press "Enter Value"
    4. Press "Program/Step"  
Response: Step #3= Set delay time for starting the first sample.
      - a. Determine the number of minutes until the desired starting time and enter this number for Step #3.
      - b. Press "Enter Value"
    5. Press "Program/Step"  
Response: Step #4= Set nominal sample volume
      - a. Number is in 10's of mLs (i.e. 25=250 mL).
      - b. Press "Enter Value"

6. Press "Program/Step"  
Response: Step #5= Set Type of suction line
  - a. #4= 3/8" diameter X 25 ft.
  - b. #2= 1/4" diameter X 25 ft.
  - c. Press "Enter Value"
  
7. Press "Program/Step"  
Response: Step #6= Set Suction head
  - a. Estimate in feet the height the sampling unit is above the surface of the water (20ft maximum head) and enter value (from 1 to 20).
  - b. Press "Enter Value"
  
8. Press "Program/Step"  
Response: At this point the machine skips a step and goes to Step #8= Set multiplex mode
  - a. Enter "1" = This turns the multiplex mode off.
  - b. Press "Enter Value"
  
9. Press "Program/Step"  
Response: At this point the machine skips steps #9 and #10 and returns to the starting point (#1).
  
10. Press "Start Sampling"
  - a. To Reset: Press "Program/Step" Enter Number (on "NUMERIC KEYPAD") any program changes to Steps 3 through 9 as listed above in Programming Unit).
  - b. Press "ENTER VALUE" Key.
  - c. Press "PROGRAM/STEP" Key.
  - d. Repeat instructions 3 thru 5 for any changes to program steps.
  - e. Press "START SAMPLING" Key to initiate sampling

B. ISCO model 6700

1. Press the POWER button
  
2. Select "Program"
  
3. Press "Enter"
  - a. Site Description
    - (1) Select "No"
    - (2) Press "Enter"
  - b. Select units for length
    - (1) Select "ft/m"
    - (2) Press "Enter"
  - c. Number of bottles
    - (1) Select "24"
    - (2) Press "Enter"
  - d. Bottle volume is
    - (1) Select "1000 mL"
    - (2) Press "Enter"
  - e. Suction line length is\_\_
    - (1) Select desired length
    - (2) Press "Enter"

- f. Time paced/flow paced
  - (1) Select "Time paced"
  - (2) Press "Enter"
- g. Time between sample events
  - (1) Select "\_\_hrs, "Enter", \_\_minutes"
  - (2) Press "Enter"
- h. Sequential/bottles sample/samples bottle
  - (1) Select "Sequential"
  - (2) Press "Enter"
- i. Run continuously
  - (1) Select "No"
  - (2) Press "Enter"
- j. Sample volume \_\_ mL (10-1000)
  - (1) Input volume
  - (2) Press "Enter"
- k. No delay to start/Delay to start/Enter clock time
  - (1) Select "No delay to start"
  - (2) Press "Enter"
- or (1) Select "Delay to start"
- (2) First sample after a \_\_ minute delay (1-999)
- (3) Select time
- (4) Press "Enter"
- or (1) Select "Enter clock time"
- (2) First sample @\_\_ hr
- (3) Select day
- (4) Press "Enter"
- (5) Select "Done"

- 4. Programming complete, run this program now?
  - (1) Select "Yes"
  - (2) Press "Enter"

C. ISCO model 6712

- 1. Press "On"
- 2. Press "Enter"  
Response: Select "Program"
- 3. Press "Enter"  
Response: Site description will be displayed and can be designated.
- 4. Press "Enter"  
Response: Sample bottle # and size
  - a. Use the arrow keys to select the appropriate # and size.
  - b. The standard entry of twenty-four 300 mL bottles need not be re-entered.
- 5. Press "Enter"  
Response: Sample pacing time
  - a. Input sample time period
  - b. The standard entry is 1 hour 0 minutes.
- 6. Press "Enter"  
Response: Sample distribution
  - a. Select "Sequential" to assure that samples will be collected in order.
  - b. Then respond "No" to "Run continuously?"

7. Press "Enter"  
Response: Sample size
  - a. Select a sample size of 250 mLs.
  
8. Press "Enter"  
Response: Time of first sample
  - a. Select "Clock time"
  - b. Enter the time for the first sample.
  - c. Select the day for the first sample, and select (to cancel) the day already displayed.
  - d. Toggle to "Done" and press "Enter".
  
9. Press "Enter"  
Response: "Programming complete, Run this program now?"
  - a. Toggle to "Yes" and press "Enter".
  - b. The next display is the program start time and date, and current time and date.

D. ISCO model 3700

1. Press "ON"  
Response: "PROGRAM HALTED" and the current time and date.  
(Note: parameters such as the clock and date setting, bottle number and size, intake tubing diameter and length, number of tubing rinses and retries, calibrating sample size, and turning the liquid detector on/off are done through the "CONFIGURE" selection and are set at the beginning of the season and generally do not need to be reset each time.)
  
2. Press "ENTER/PROGRAM"  
Response: "(PROGRAM, CONFIGURE) SAMPLER"  
(To accept the blinking selection press "ENTER/PROGRAM", to change the selection use the left or right arrow button, to change numerals use the numeric keys then press "ENTER/PROGRAM"  
Select "PROGRAM"
  
3. Press "ENTER/PROGRAM"  
Response: "(TIME, FLOW) PACED SAMPLING"  
Select "TIME" paced sampling
  
4. Press "ENTER/PROGRAM"  
Response: "SAMPLE EVERY --HOURS --MINUTES"  
Generally "1" HOUR, "0" minutes  
Select existing value or change to desired value.
  
5. Press "ENTER/PROGRAM"  
Response: "MULTIPLEX SAMPLES (YES, NO)"  
Select "NO"
  
6. Press "ENTER/PROGRAM"  
Response: "SAMPLE VOLUMES OF \_\_\_mL"  
Generally, 250 mL  
Enter desired volume or accept existing value

7. Press "ENTER/PROGRAM"  
Response: "ENTER START TIME? (YES, NO)"  
Select "YES"  
Enter numeric values for Hour and Minutes, and for Day and Month  
(Note: Sampler uses Military Time)
8. Press "ENTER/PROGRAM"  
Response: Display shows "PROGRAMMING SEQUENCE COMPLETE" then "STANDBY" and current time and date
9. Press "START SAMPLING"  
Response: "(START, RESUME) SAMPLING PROGRAM"  
Select "START"
10. Press "START SAMPLING"  
Response: "START SAMPLING AT BOTTLE \_\_\_"  
Normally start at bottle 1 - select 1 or change to bottle desired
11. Press "ENTER PROGRAM"  
Response: Display will read bottle number at the sampling time and display the current time.

**MAINTENANCE:**

A number of maintenance, repair, and troubleshooting procedures are described in the Instructional Manual. The upper and lower unit can be cleaned with warm soapy water or sprayed with a hose. The center section also may be cleaned in a similar manner provided that the electrical connector is tightly capped and the fuse holder is tightly screwed in place. For further maintenance refer to the manual.

**REFERENCE:**

Model 2900, 6700, 3700 and 6712 Sampler Instructional Manuals, ISCO Inc.

This procedure has been reviewed and approved by the undersigned representatives of the U.S. Fish and Wildlife Service and Fisheries and Oceans Canada.

REVIEWED/APPROVED \_\_\_\_\_ DATE \_\_\_\_\_  
Field Supervisor (U.S.)

REVIEWED/APPROVED \_\_\_\_\_ DATE \_\_\_\_\_  
Division Manager (Canada)