



PIT Tag Information Systems  
Columbia Basin

# Newsletter

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The PTAGIS Newsletter is published periodically by Pacific States Marine Fisheries Commission.

We welcome input from the PTAGIS community, so email, or write us with your story ideas.

Questions regarding the contents of this publication, or about the PTAGIS program, please contact Carter Stein, PTAGIS Program Manager.

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A Fisheries Data Project of the  
Pacific States Marine Fisheries  
Commission

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**MOBILE MONITOR**  
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for PIT Tag Detection



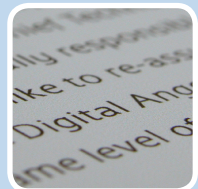
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## CALLING ALL TAGGERS

The PTAGIS project is soliciting experienced ptagis users that would like to participate in beta-testing the new ptagis web site. If you are interested, please send an e-mail to [carters@psmfc.org](mailto:carters@psmfc.org) with your contact information.

# MOBILE MONITOR

## A Low Power Solution for PIT Tag Detection in Small Streams

BY JOHN TENNEY

Over the past year or so, our project has received several requests from the PTAGIS community to provide an automated, unattended monitoring solution for small-stream sites with low power requirements. In response to these requests, the PTAGIS project has developed an application similar in functionality to MiniMon, but which will operate on any hand-held Pocket PC device. This new application from PTAGIS is called MobileMonitor and a beta version is already deployed at a small-stream site.

### FEATURES AT A GLANCE

In addition to standard monitoring functions, MobileMonitor supports these additional features:

### SUPPORTED SYSTEMS AND DEVICES

The MobileMonitor application will run on any Windows Pocket PC and can simultaneously monitor one or more of these types of devices:

DEVICE	DESCRIPTION
FS-2001	Destron portable transceiver versions 1.5, 2.1 and 3.8 (ISO)
FS-1001M	Destron multiplexing transceiver
FS-1001A	Destron Adult transceiver version 3.11
FS-1001	Destron Juvenile transceiver version 2.11
GPS*	Internal or external global positioning devices
Allflex ISO Reader*	Allflex ISO reader version 1.26+

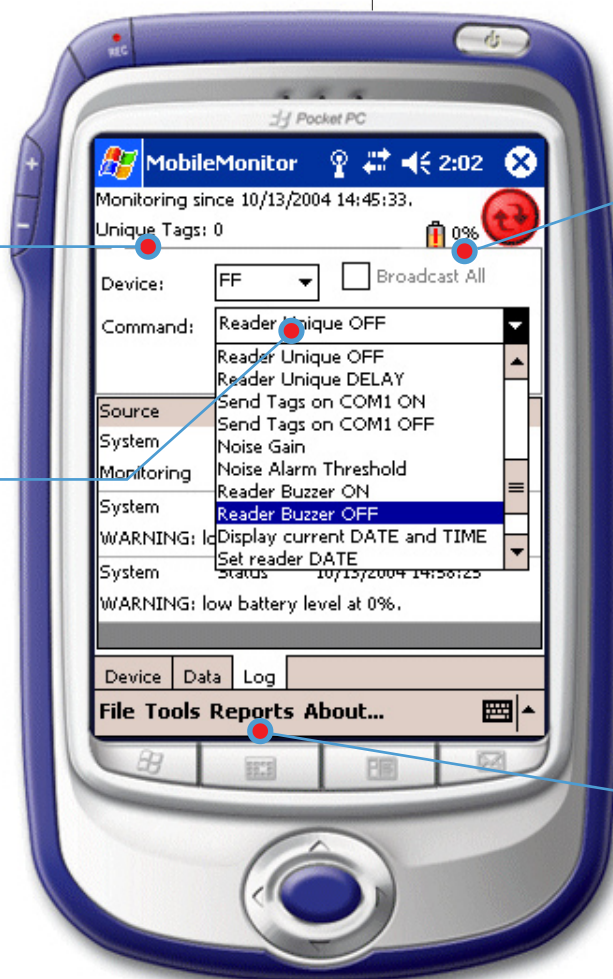
\* Scheduled for a second phase production release early next year.

Monitor number of unique tags detected at a site

Send remote commands to transceivers

Real-time monitoring of critical system resources (e.g. battery status)

Robust reporting

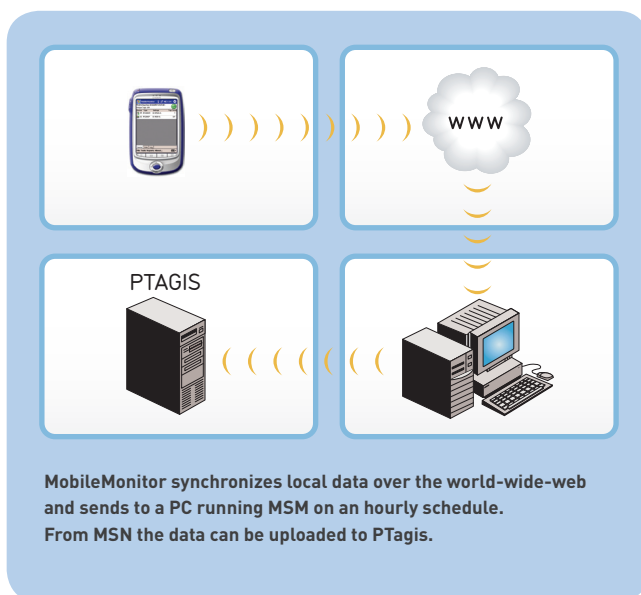


Device	FF
View	StatusReport
Reported On	
+ 10/13/2004 14:40:51	
+ 10/13/2004 14:35:51	
- 10/13/2004 14:33:51	
Reader info:	Version: MUX1230.1.0
Reader ID#	FF Unique: ON
Beep:	ON Send to comm: ON
Buffer active:	ON Tag count: 83
Memory used:	1% Store test tag: ON
Diagnostics for FF:	
Temperature:	34C Exciter power: 16.0V
Current gain:	100% Current alarm: 1000m
Noise scaling:	100% Noise alarm: 25%

MOBILE MONITOR continued**DUDE, WHERE'S MY DATA?**

*MobileMonitor* stores all data into a local database on the Pocket PC. This data must eventually be transferred from the local database to a standard PC or laptop running a sister application called *MobileSync Manager (MSM)*. *MSM* provides a hub for collecting data from one or more *MobileMonitor* sites and provides features to create and upload PTAGIS data files as well as exporting portions of the data to other applications. *MSM* will also provide standard reporting and other data management features.

*MobileMonitor* provides two ways of transferring the data to *MSM*. If you're lucky and have an Internet connection at your data collection site, *MobileMonitor* can synchronize local data over the world-wide-web with a PC running *MSM* on an hourly schedule. Word on the street is saying that remote wireless/radio network technology is getting cheaper, more reliable, and has low power requirements.

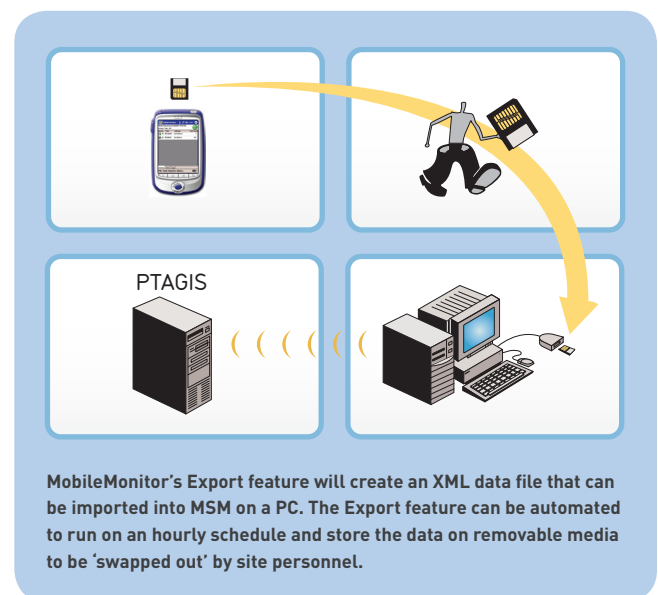
**1 SYNCHRONIZED DATA TRANSFER**

The other mechanism for transferring data from *MobileMonitor* is to use the manual file transfer process known as 'sneaker-net' (for small-stream sites this might be better called 'rubber-boot-net'). *MobileMonitor's* Export feature will create an XML data file that can be imported into *MSM* on a PC. The Export feature can be automated to run on an hourly schedule and store the data on removable media to be 'swapped out' by site personnel.

**AVAILABILITY**

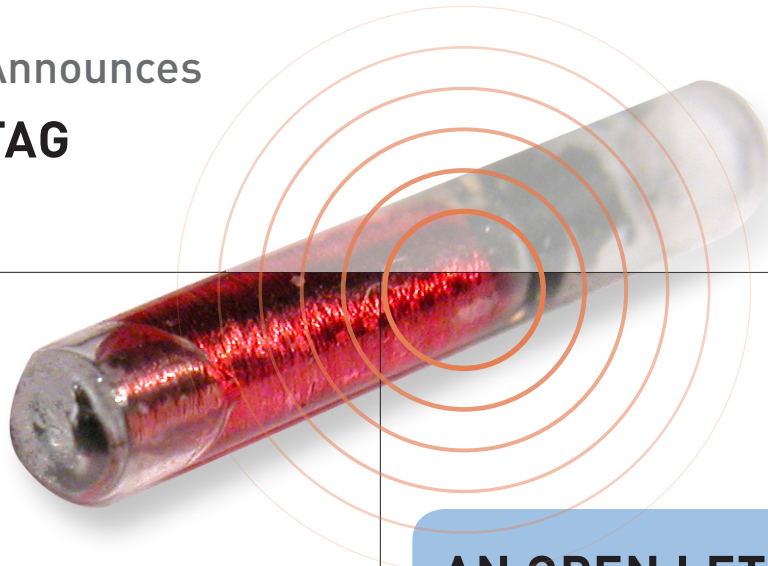
Currently, *MobileMonitor* and *MobileSync Manager* are scheduled for a production release sometime in December. We will send a release announcement to the PTAGIS community.

**If you are interested in obtaining a beta version or have questions about this new technology, send me email at [john@psmfc.org](mailto:john@psmfc.org).**

**2 SNEAKER-NET DATA TRANSFER**

# Digital Angel Announces IMPROVED TAG

BY ZEKE MEJIA



Digital Angel has developed a new tag as one component of the High-Q PIT Tag Detection project. This tag has superior reading performance over the standard "ST" tags that are used throughout the Columbia Basin. Users should be aware, that this tag weighs more than the ST tag, and is slightly thicker in diameter and so requires the use of "Thin Wall" needles for marking.

If you are interested in using these tags for your study, please send an e-mail to [pittagdist@psmfc.org](mailto:pittagdist@psmfc.org) and indicate your project number and the quantity of SGL tags you would like to receive.

The PIT Tag Steering Committee is engaged in a process to qualify these tags for use in Columbia Basin Fish and Wildlife Program Projects.

## Comparison of the current "ST" tag to the new "SGL" tag

	ST TAG	SGL TAG
Length	11.5 mm+-1mm	11.5mm plus 1.2mm, minus 1mm
Diameter (OD)	2.07 mm max	2.20 mm max
Weight	1.05 g Average	1.25 g average
Thin Needle Required	No	Yes
Read Range	N	N plus 20% in a shielded room with a 6' by 7' antenna

## AN OPEN LETTER to the PTAGIS User Community from Digital Angel

Last year we had a management change at Digital Angel by the departure of our President and Chief Executive Officer, Mr. Randolph K. Geissler. In my position of Chief Technology Officer of the company, being totally responsible for the fisheries business, I would like to re-assure to the PTAGIS User Community that Digital Angel remains committed in providing the same level of quality service and support as in the past.

With regards to new developments we would like to inform you that field tests of the new multiplexer show that the performance is well within the range needed for the application. The new developed tag called interim or SGL is in production and is presently available in stock.

For the new reader development called GEN 2, we are in the final stages of software and hardware integration with very good results. This phase completion is scheduled for this December.

**ZEKE MEJIA**

*Chief Technology Officer Digital Angel Corp.*

## CONTACTS

Tags and readers purchases:

**Colleen Sexton** 651 552-6317

Applications and technical support:

1-800-328-0118

# Development of a **PIT TAG DETECTION SYSTEM** at Bonneville Dam Corner Collector

BY SANDRA L. DOWNING (NOAA-Fisheries) and KIMBERLY A. FODREA (BPA)

In 2004, the U.S. Army Corps of Engineers (Corps) completed a surface flow bypass system that passes juveniles via the entrance of the old ice and trash sluiceway at the Second Powerhouse at Bonneville Dam. The fish are then diverted into a large, half-mile long exit flume before being released downstream of the dam (Fig. 1). This corner-collector bypass system (B2CC) is estimated to attract large numbers of the migrating salmonids. Consequently, it is critical that the B2CC system include a PIT-tag interrogation system in order to continue to provide the PIT-tag data required for research, monitoring, and evaluation efforts.

## B2CC

For most of the models used by fish managers, their predictions would be significantly weakened if data were not collected in the B2CC. Statistical analyses based on these models have determined that an overall detection rate of 60% is needed for the corner-collector interrogation system to replace the detections that were being detected at Bonneville Dam before the operation of the B2CC. Digital Angel Corp. (DA), formerly Destron Fearing, began working in early 2003 on an improved transceiver and tag so that an interrogation



**FIGURE 1.** Aerial photo of Bonneville Dam taken by the U.S. Army Corps of Engineers. The arrow points to the straight section of the exit flume for the new corner-collector bypass system where the PIT-tag antennas will be installed.



**FIGURE 2.** Sean Casey standing in front of the final test antenna (16' by 16') located in the temporary building erected at the Digital Angel headquarters in Minnesota

system would work with the large antennas that would be necessary for this application. The exit flume measures 23' high by 15' wide and thus will require PIT-tag antennas that far exceed the size of the largest single antenna that is currently being used for fisheries applications (2' wide by 10' high) with the 12-mm PIT tag.

The effort to develop and evaluate a PIT-tag interrogation system for the corner collector was a project sponsored jointly by the Corps and Bonneville Power Administration (BPA). For this system, the Corps is funding the antenna fabrication and system installation, and BPA is funding the electronic work for the antenna, tag, and transceiver development. DA, NOAA Fisheries, and PSMFC are the main BPA contractors for the project. The original goal was to have the system ready for the 2005 juvenile-salmon outmigration or one year after the B2CC began operation, which made for a very tight development schedule.

To aid them in their development efforts, DA built a temporary building in Minnesota that would allow them to develop and test large antennas measuring up to 23' high by 16' wide (Fig. 2). Their testing in early 2004 demonstrated a large undetectable area in the center of an 18' high by 16' wide antenna and a smaller undetectable area in the center of a 16' by 16' antenna.

PIT TAG DETECTION SYSTEM *continued*

**FIGURE 3.** The finished prototype production antenna during its delivery to Bonneville Dam.

Therefore during the spring of 2004, the Fish Facility Design Review Work Group (FFDRWG) decided to limit the antenna size to 16' high by 16' wide.

Since March 2004, DA has finished designing two transceiver systems specifically for the B2CC project that worked well with a 16' high by 16' wide antenna as tested at their headquarters. They also made progress on developing an improved tag (SGL model). By combining these two development efforts, they produced a system that eliminated any non-readable area within the large antenna. On a site visit in July 2004, Carter Stein (PSMFC) was able to throw tags through the center of the large antenna and see that they were detected.

At the same time that DA was working on the transceiver and tag developments, the Corps and BPA contractors were designing the prototype antenna. The Corps was responsible for the antenna's structural integrity and fabrication while BPA was responsible for the antenna's electronic design. The performance of the mammoth antenna was assessed using a number of electronic tests during fabrication and before it was delivered to Bonneville Dam in July (*Fig. 3*). The shield

was then attached to the antenna before it was installed into the test facility that the Corps had designed and constructed.

Based on the tests conducted in Minnesota, DA was ready to test the two transceiver systems with the prototype production antenna in the large tank at the Bonneville test facility. Unfortunately, before they could complete the initial set of electronic tests to determine how well the antenna with the shield performed, the test tank was filled with water (approximately 5-7 feet deep) to determine if the sheet piles lining the chamber were leaking. When DA tested the antenna again after the water was removed, the readings on their equipment had changed dramatically; they were no longer able to produce the electromagnetic field necessary for them to detect tags within the antenna. Consequently, installation was delayed and the 2005 operational goal will not be met.

Many tests have since been conducted to identify the problem and determine if there is any way to make the antenna work. Based on a similar electronic test conducted at Anacortes where the antenna was fabricated and at Bonneville, the results demonstrate that the antenna parameters have changed since June (*Table 1*) – most likely because moisture is now in contact with the antenna wires. DA has indicated that the prototype antenna will allow them to complete the testing needed for the transceiver and tag developments; however, it will be necessary to develop a new antenna design for installation into the B2CC.

FREQUENCY (HZ)		CURRENT (AMPS)	
Anacortes	Bonneville	Anacortes	Bonneville
134000	134000	13.3	3.9
128000	128000	20.5	4.6
122000	122000	28.9	6.3
100000	N/A	N/A	13.3
61000	N/A	N/A	16.0

**TABLE 1.** Data collected by Digital Angel at Anacortes on 18 June 2004 and at Bonneville Dam on 7 October 2004.