PAMGUARD Maintenance and support Activities
January 2011 to February 2012

While no invoices were sent to JIP during 2011 for PAMGUARD maintenance activities, considerable PAMGUARD work continued, funded from other sources. The last release of PAMGUARD was Beta version 1_10_00 on 15 December 2010. During the last 15 months, there have been a total of 1,157 downloads of this version.

During 2011, significant new features were added to PAMGUARD and a number of bugs in existing modules were repaired. We are now preparing a new PAMGUARD release incorporating many of these bug fixes and features (see below).

As discussed, we are also preparing a completely new pamguard.org website, which will make it easier to keep this important resource up to date. In particular, the new website will:
- Be based around a modern Content Management System (CMS) enabling the PAMGUARD tam to rapidly update news and other information
- Contain an extensive download area both for the software and for configuration files, including configuration files for the recently added ROCCA module.
- Contain up to date information on bugs lists and current work areas from the PAMGUARD team.
- Collect diagnostic information as to which parts of the world people are visiting the site from

SMRU Ltd have now taken on an additional employee, Graham Weatherup, to work alongside Doug Gillespie to provide PAMGUARD maintenance and support. Graham is a recent graduate of the Maths department in St Andrews. Prior to joining SMRU Ltd, Graham spent a year working within the university and with private companies as a PAM operator and PAM software developer. He is therefore ideally placed to assist Gillespie in meeting future maintenance and support needs. We expect to cover 50% of Grahams salary initially through JIP support and then through the PAMGUARD Levy.

Much credit for new PAMGUARD features (such as Markov Chain Monte Carlo tracking) should go to Jamie MacAulay. Jamie is a recent graduate from the physics department and has since been working as a research assistant in the university on a number of projects related to fine scale acoustic monitoring of cetaceans. While we will not be seeking direct support for Jamie's time, we do consider him an integral part of our development team.

New PAMGUARD Features
Click Detector Offline Event Tracking

A target motion tracking and analysis system has been built into PAMGUARD. This takes consecutive calls from a sperm whale (or porpoise) and calculates the most likely position for the animal based bearings from multiple detections. A number of localisation models are available: Least Squares, 2 dimensional Simplex optimisation, 3 dimensional Simplex optimisation and Markov Chain Monte Carlo. Details of these methods are given in an updated help file. The availability of these tracking algorithms is essential when PAMGUARD is used during line transect surveys for abundance since it enables us to calculate perpendicular distances to animals from the vessels trackline.

Click Detector Click Species Templates
A system for generating, loading and storing spectral templates for different cetacean species has been implemented. While not fully automatically identifying click to species, it can be a useful tool, particularly when trying to tell apart dolphin species. We hope in the future to further develop this functionality so that it can fully automatically identify to species.

Noise Monitor
A noise monitor module ahs been added which can generate noise measurements in1/3 octave, or other user defined, frequency bands.

ROCCA
The ROCCA Whistle classifier developed by Julie Oswald is now fully integrated into PAMGUARD. An area for ROCCA configuration files will be set up in the downloads area for the new website.

Logger Forms
We have implemented a system for data entry forms similar to that in the IFAW Logger software. This work is on-going, but we hope to include this in the next Beta release in the hope that we get useful feedback from users.

Multi Element Tracking
The way in which bearings from detected whistles and clicks has been upgraded in order to better handle more complex hydrophone arrays. In particular, we have been testing this with small rectangular and tetrahedral arrays which can provide unambiguous bearings to detections.

C series NI cards
The National Instruments interface has been upgraded to recognise a wider range of devices from National Instruments

Important Bug Fixes
Heading Information
Hydrophone localisation system shave been updated to better use information from true and magnetic heading sensors.

FFT Data Source

The FFT module has been updated to ensure it finds it's correct data source, even if that data source is loaded after the FFT module is created.

The PAMGUARD Website
The website is being developed by mtcmedia in Dundee. Sample pages can be viewed at (links removed – see official web site at www.pamguard.org)
We intend that the new site will be complete and launched by the end of March.

We have also set up a PAMGUARD Facebook page in the hope that it will become a useful forum, primarily for PAMGUARD users. http://www.facebook.com/pamguard.

Levy (Voluntary Contribution)
We have prepared information on the PAMGUARD Levy for the new website. We are waiting for Dave Hedgeland to put in place a mechanism for informing us about Levy tests which took place last year. We have still not been officially notified about these and cannot proceed with collecting that money until this happens.

Work Done / Invoice Justification
The cumulative new features which we are about to release in a new PAMGUARD version represent many months of work, which has largely been covered by other sponsors. Within existing Maintenance and Support we are invoicing for the following costs associated with developing the new website and preparing the new release. It should be noted that these tasks run back into 2011. In the future, we expect our average work load to be 9-10 days per month for GW and 1-2 days per month for DG[1].

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[1] In reality both DG and GW will be spending considerably more time than this on PAMGUARD development, but those other costs are covered by other projects.