The PetRos EiKon News

News from PetRos EiKon Incorporated

VH Plate Development:

VH Plate is the latest version of a modelling program which grew out of Peter Walker's Doctoral thesis. This program allows the user to model a single conducting plate in a layered host medium in the frequency domain. The strength of the program is that although the geometry of the target is limited it allows the user to model accurately both low and high contrast targets.

VH Plate development began in mid-June after confirmation of three supporters for the project. In the meantime, two more companies have joined the supporting group. The project is proceeding well, with some hitches related largely to development under MicroSoft's PowerStation Fortran Environment (see below). VH is now running for dipole-dipole frequency domain systems for a vertical plate only. Much of July's development of the code was spent merging EMIGMA and VH library functions, and upgrading both. Thus future improvements made to VH should be quickly available in EMIGMA and vice-versa. VH now also has a much improved user interface, with many of the user inputs sharing common library routines with EMIGMA. This commonality will mean that learning to operate one program will effectively render the other obvious, and will eliminate much of the work when both are plugged into Graphical User Interfaces.

We are presently working with Microsoft PowerStation and WatCom F77^{32} as well as the older Microsoft Fortran 5.1 allowing us to provide the user a full choice of executables (DOS, Windows or OS/2). Of course, we have a SUN Unix version of VH also available.

The development will continue with the inclusion of extended sources and dipping plates. The next version of VH with these attributes included should be available by approximately October 30, 1994.

A preliminary or Beta version of the Time Domain implementation is now available (see below).

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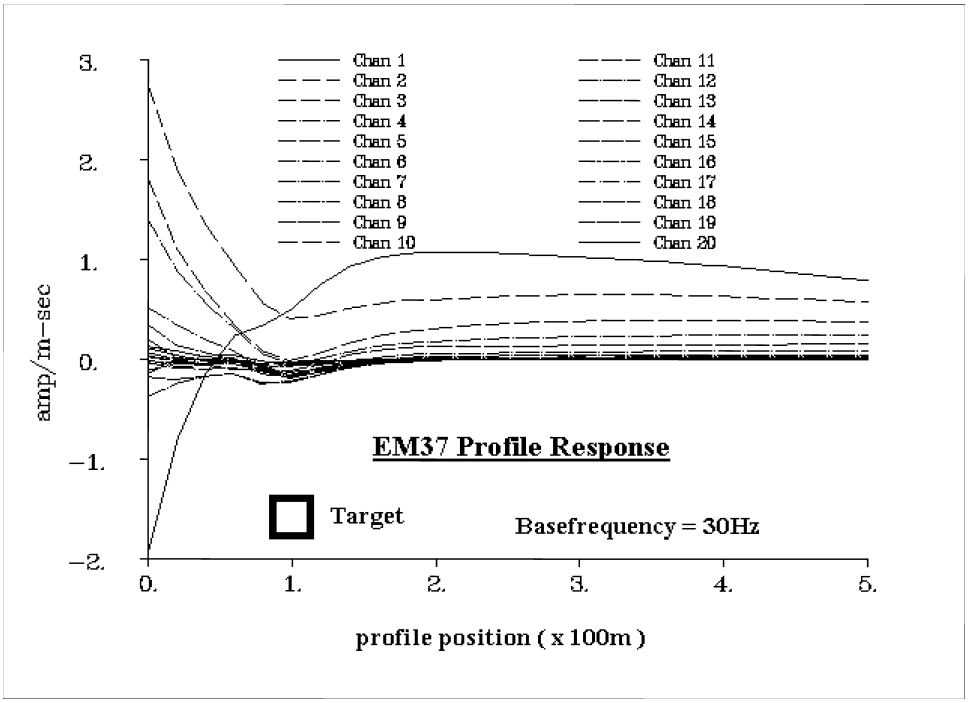
Time Domain Development:

The first release of PetRos EiKon's Frequency To Time Domain software (**FSEMTRS V.1.0**) is now available with a manual. The program is designed to accept frequency domain input from any of our simulation programs or in the correct format from any other software you may wish to use.

Four rather general waveforms have been included to this stage. These waveforms are suitable for simulating UTEM, Crone Pulse EM and Geonics EM37 and INPUT waveforms. Baseperiods, off-times, time constants and ramp off-times are all switchable along with gate times.



The above figure illustrates the application of FSEMTRS to simulate the EM37 response of a target.

We expect that there will be significant changes to FSEMTRS over the next few months with the addition of other waveforms and the detailing and updating of the waveforms now included. Although the program is designed to be very flexible with regard to waveform specification, data sampling, etc.; we expect that there will be many changes over the next few months as users' requests come in. However, this will ensure a well developed module for the January 1, 1995 release of the extended source module of EMIGMA and the November, 1994 release of VH plate with extended sources.

Several extensions to this software are intended over the next 3-6 months. These include the use of an interactive data interpolater to reduce the number of sampled frequencies and the ability to include receiver and transmitter response functions.

More Modelling:

We have begun our first significant interpretation study. This is a small study which will

attempt to rank possible targets in a specific geological environment. In this study, we will be utilizing the PetRos EiKon products EMIGMA, VH Plate and FSEMTRS. If our clients are agreeable, we will report on this project in September's issue.

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Graphics Development:

PetRos EiKon has been working with other companies towards developing GUI interfaces for our software products. Since this will take some time, we are developing some plotting programs for use with our applications, to help provide for the users through that transition phase. The above plot is an example of our DOS based plotting program which dumps a *.bmp* or a postscript file for printing. Contour and x-y plotting will be available for both the PC and UNIX workstations. These programs will be available at the same time as the October 1 release of EMIGMA. Should you desire them please contact us and we will provide them to you at no charge.

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Compiler Reports:

MicroSoft PowerStation: Mixed Reviews

MicroSoft's PowerStation for Fortran is a 32 bit programming development environment for Fortran programmers which includes some Fortran 90 upgrades. One of its aims is to provide the programmer with a link between Fortran 77 with extension and Fortran 90 compilers. The package is Windows based but produces a 32 bit DOS executable for 386/486 Intel chips. It provides these executables through Phar Lap products. These products provide the Dos Extender capabilities as well as the DPMI service and the virtual memory management. As a licensed user of PowerStation, we may distribute these products with our executables. Thus, PetRos EiKon, in principle, can provide you with 32 bit DOS executables which are larger than the actual size of your memory. Note, the use of "in principle". We are presently working on a DOS version of VH plate using this compiler and DOS Extender package.

Time Requirements:

On a 16 Mbyte DX2-66, we have a 7 mbyte executable with 51 source files and 22 include files. To load this into the debugger to get it running takes approximately 2.5 minutes on the DX2-66 system. However, computation times for non-debug executables seem acceptable.

Memory errors:

Occasionally messages occur related to errors in system code. These errors are not related to development code but are attributable to incorrect memory allocation and deallocation routines within Windows due to the PowerStation application.

When PowerStation fails the DOS execution window can be left behind and not deleted. This can lead to General Protection Faults when the program is restarted.

We have also experienced a total halting of the system occasionally, but have not yet managed to determine why.

Intrinsic functions:

MicroSoft complex exponential arithmetic remains poorly implemented, and we have built our own custom routines for this purpose.

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CONTACTING US:

WE HAVE OFFICIALLY MOVED INTO OUR NEW OFFICES:

Our Address is: ***PetRos EiKon Incorporated***
6515-A Mississauga Rd.
Mississauga, Ontario
Canada L5N 1A6

Our Telephone Number is: **(905) 567-8277**

Our FAX Number is **(905) 567-6745**

Our EMAIL Number is **ross.groom@canrem.com**

The PetRos EiKon News is a research bulletin directed to users of PetRos EiKon software and services. If you are neither, but would like to receive the NEWS, please let us know.

TOPICS NEXT MONTH:

MITEC's first release of EMIGMA
VH Plate Releases
Interpretation Studies
FSEMTRS upgrades
WatCom Report