

The SASW system provides:

Cost-effective compared with alternative methods ✓

Easy to use: ✓

- set up in 5 minutes
- user-friendly software
- portable equipment
- non-invasive testing

USB connection to users Laptop for control and acquisition of data ✓

Stiffness v depth available immediately in field ✓

Time domain output ✓

On-line Fast Fourier Transform (FFT) ✓

## Spectral Analysis of Surface Waves (SASW)



### What is it?

The Spectral Analysis of Surface Waves (SASW) system provides compact, lightweight and easy-to-use equipment for the analysis of surface waves. It allows fast, non-invasive testing for all soil types, including residual soils and fractured soft rock. Typically used in site investigations for foundation engineering design and settlement prediction, SASW is also suited for the rapid sub-grade evaluation for roads, tracks and runways.

The system performs an on-line Fast Fourier Transform (FFT) on the acquired data with automatic stacking and trigger arming allowing for as many as 15 separate records per minute to be acquired for a single test. The stacked data can be manually or automatically 'picked' to create an on-line stiffness v depth plot.

The GDS SASW system uses impulse or transient energy sources to measure the seismic wave velocity. A variety of energy sources may be used, for example.

- Hammers or drop weights using the accurate remote triggering facility.
- Non-user controlled energy sources (eg dynamic compaction rig) may be triggered manually from the control unit.

The GDS SASW system is based on the GDS Surface Wave Control Unit which is also configured for use as the main control unit for the GDS Continuous Surface Wave System (CSWS). The CSWS uses a vibrating energy source run at single frequencies under the control of the unit.

### New for version III

- Simultaneous sampling of all channels
- Designed to be more ruggedised/robust
- Smaller and lighter (version III weighs only 5.5kg).
- Greater power efficiency therefore a smaller battery required

### Technical specification

- **Resolution of measurement:** 16 bit data capture
- **Frequency of measurement:** Hardware capable of up to 225,000 samples per channel per second
- **Connection:** USB connection to users laptop for control and acquisition
- **Sensor number:** Standard system for 2-6 geophones, upgradeable to a maximum of 12
- **Sampling type:** Each channel sampled simultaneously (*NEW feature for version III*)
- **Size of control unit:** 400mmx380mmx150mm (Nominal size including outer padded bag)
- **Weight of control unit:** 5.5kg (approximate weight)
- **Power:** 12-24V DC
- **Runs continuously for up to 8 hours with user supplied 12V battery**
- **Padded transport case with built in laptop weather hood**
- **Integral geophone amplification and signal conditioning**
- **Upgradeable to full continuous surface wave system (CSWS) with the addition of a ground vibrator and power drive amplifier**

## SASW control software

- Remote (hardware) or local (software) triggering capabilities:
  - hardware triggering via switch contact on source of impulse (e.g. hammer)
  - manual triggering through software, i.e. the system can be triggered by the user touching the trigger button on screen.
  - time domain stacking or frequency domain stacking with automatic trigger re-arm
- On-line coherence calculation
- Instantaneous Fast Fourier Transform (FFT) after each data acquisition set
- Extremely simple 'wizard style' graphical user interface for test setup (see screen shots in Fig. 1)

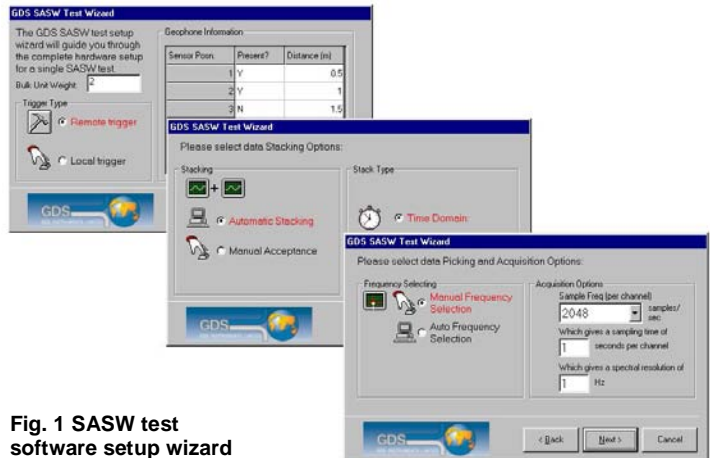


Fig. 1 SASW test software setup wizard

## On-line test data stacking options

**Time domain stacking.** This means that multiple records can be added together in the time domain. This gives averaging of repeated pulses and effectively reduces random noise. This technique should only be used with automatic triggering.

**Frequency domain stacking.** Each set of time domain data is converted to frequency domain by means of the on-board FFT conversion. This data can then be averaged over a number of pulses to give signal enhancement.

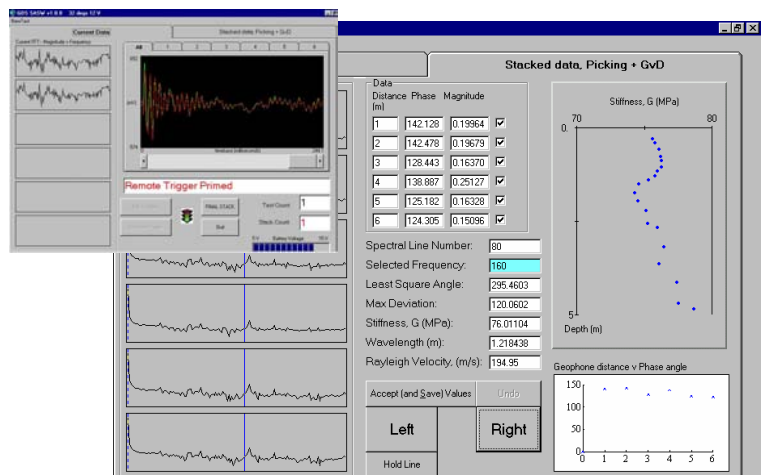


Fig. 2 Example of stacked data/final results screen

## SASW portability



### SASW system elements

- 1) Surface Wave System Control unit with padded transport case
- 2) Geophone Cable
- 3) 4.5 Hz Geophones or 2 Hz Geophones
- 4) Hammer and strike plate
- 5) Laptop controlling PC



## Why buy GDS SASW?

- User friendly, easy-to-use software interface.
- Flexible data output which can be imported directly into Microsoft® Excel.
- Data output includes full time domain history, frequency domain (magnitude and phase), coherence and stiffness v depth using the Lambda/3 method.
- Easy upgrade path to CSWS system with addition of ground vibrator and CSWS software.

Due to continued development, specifications may change without notice.