STANLAY™

STREAM-EM

STREAM EM represents the most advanced technology sub-surface tomographic radar equipment worldwide for EXTENSIVE 2D/3D ASSET MAPPING based on massive arrays of multifrequency, multi-polarized antennas setting unprecedented standards for accuracy and productivity in sub surface mapping.

STREAM-EM is years ahead of the market in technology & make possible what was only a dream until now.
STREAM is designed for mapping of underground utilities in **massive areas of tens to hundreds of sq kilometers while providing very high resolution mapping**. Traditional single-frequency or manually operated GPRs simply don't permit this, while other existing vehicle towed GPRs do not assure an acceptable level of utilities detection.
STREAM- EM has been conceived to cover tens of hectares/day.
This is possible on account of :

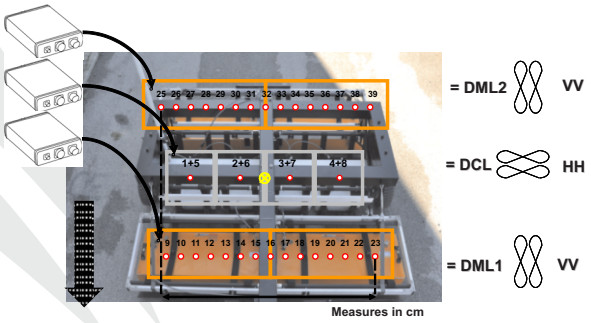
- **Highly Configurable** : A massive array of 40 antennas ensuring an unsurpassed sampling density (Max up to **48 Antennaes** possible).
- **High Acquisition Speed** : A collection speed of 15 km/h requiring only longitudinal scans .
- **Multi Polarization** : Usage of both **(Bipolar) antenna polarizations** for optimal detection of both **main pipes and junctions** at the same time. **Data collection** to be performed **ONLY in longitudinal direction (without the need of moving the array in the transversal directions). The DML - DCL VV HH configuration performs both longitudinal and transversal scans in one go** allowing coverage of vast areas without any need to cover the same spaces again.

- **GPS positioning :** equipment integrates with **RTK GPS** for accurate navigation & positioning of utility data.

- Antenna technology:
  (a) Antenna **"cascade"** multiplexing.
  (b) Compact antennas enabling the construction of very **dense arrays**.
  (c) **40 Antennas** at different frequencies & polarizations.

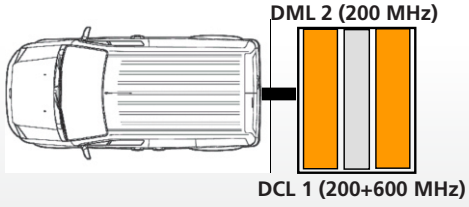
- New **DAD Fastwave Unique Features** :
  Fastest control unit on the market :
  (a) **4760 Scan/Sec** @ 128 samples.
  (b) **2 Channels acquired simultaneously**.
  (C) **Network of 3 DAD's** working quasi-simultaneously to manage data for each of the modules.

- GPR towed by a vehicle **(speed > 15 Km/h).**
- **Extreme productivity**.
- Highly modular structure.
- Possibility of different kind of towing frames.
- **Low and intermediate frequency antennaes to detect deep and shallow pipes & cables.**



DML1 & **DML2**, each antenna array collecting 16 data channels.

- **Frequency : 200 MHz**
- **Data spacing in transversal direction : 12cms DCL : 4 dual frequency channels operating at 200 and 600 MHz frequency.**



STREAM with 2X DML array and 1X DCL array for complete buried pipe & cable network mapping

STREAM-EM

Vehicle Towed GPR Solution For Extensive 3D Utilities Mapping

MODULARITY AND ARRAY ARCHITECTURES :

GPS or Total Station

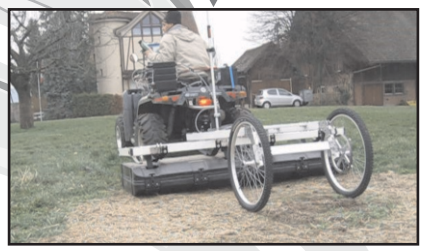
4 dual frequency 200-600 MHz antennas (DCL array) for the detection of shallow and deep junctions (HH polarization)

2x200 MHz DML array for detecting main pipes along the road (6 cm transversal sampling; VV polarization)

MF Hi-Mod: the DCL array can be extracted from the Stream-EM to be used in the MF Hi-Mod configuration for mapping sidewalks and areas with difficult accessibility.

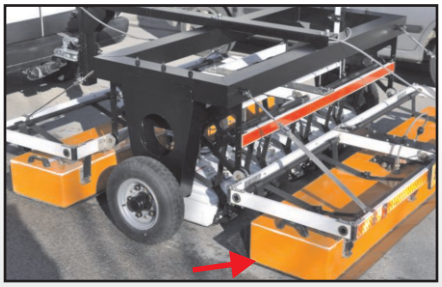
Stream X: the DML array can be extracted from the Stream-EM to be used in the Stream-X configuration for environment surveys, archeology etc.

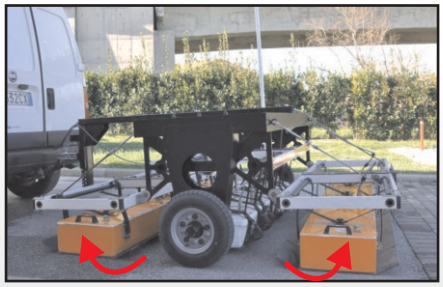
Modular composition easily extractable & easily reassembled



CONFIGURABLE :

- Stream-EM trolley permits to adjust the distance of each array module from the soil.
- DML 1 and DML 2 antennas can be collapsed up to 90° to reduce the overall dimension of the trolley.
- Stream-EM trolley can be connected to any car or van with drag-hook.
- The collapsed trolley can be easily stored in the van for transportation.





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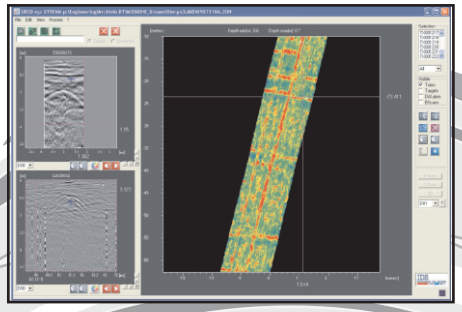
Vehicle Towed GPR Solution For Extensive 3D Utilities Mapping

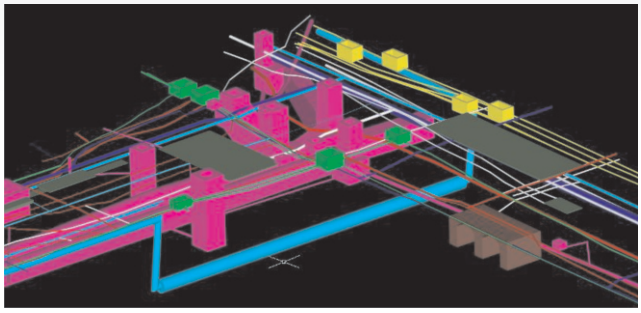
WORK FLOW :

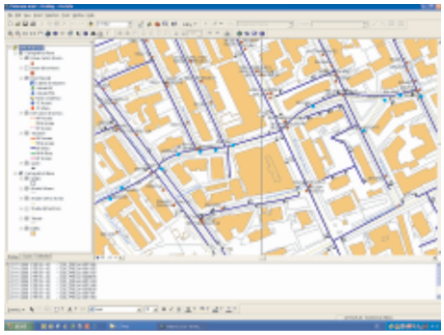
1. DATA ACQUISITION :

2. DATA PROCESSING (OFFICE).



3. 3D VIEW OF THE UTILITY NETWORK IN CAD/GIS ENVIRONMENT USING GRED HD^3





* Using the sections **(time slices & radar maps)** in conjunction with the plan views, linear features can be accurately determined & co-ordinated in x, y & z before being exported into Auto CAD. The **GRED HD^3** delivers :

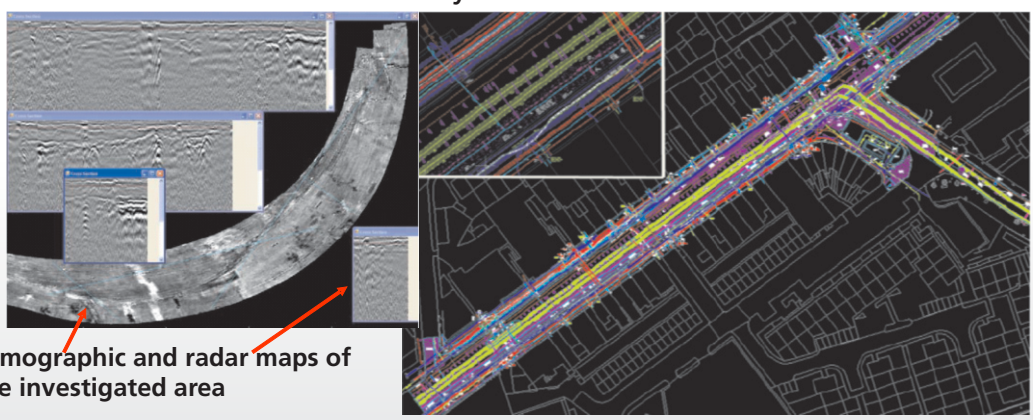
- Management of huge amounts of data collected **(402.5MB/1000m^2)**.
- Providing graphical module representing **multicut visualisation** of whole data volume.
- Management of **3D positioning of data set**.

GRED 3D is an advanced post processing software specifically designed for the easy and efficient interpretation of Stream-EM data. It's Key Features are:

- **Automatic target recognition:** an automatic tools help the operator locate pipes and cables.
- **2D and 3D tomography** for an immediate visualization of pipes and cables.
- **Automated transfer to CAD/GIS:** the pipes and cables can be automatically transferred to CAD or GIS maps.

* Built in geographical module for UTM projection of GPS co-ordinate & creation of geo referenced dataset.

Cartographic map of the utilities obtained by automatic transfer to CAD



Tomographic and radar maps of the investigated area

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Vehicle Towed GPR Solution For Extensive 3D Utilities Mapping

CONFIGURATION :

Parameters	N°1 DML (200 MHz)	N°2 DML (200 MHz)	N°2 DML (200 MHz) + N°1 DCL (200-600 MHz)
Number of antenna box	2	4	8
Number of antenna dipoles	16	32	48
Scan width (cm)	172	172	172
Polarization	VV	VV	VV + HH
Data spacing in transversal direction (cm)	12	6	6
Antenna Weight (Kg)	36	72	90
Antenna trolley dimension (m)	Length: 2.02, Width: 2.10		
Trolley Weight (Kg)	100		
Typical Data collection speed Km/h	15		

TECHNICAL SPECIFICATIONS :

Data Logger	Panasonic CF30 PC or similar
Radar Control Unit	3 DAD MCH FastWave synchronized
Number Of Channels	40
Antenna Frequency	200 and 600 MHz
Antenna Polarization	Horizontal (HH) and Vertical (VV)
Transversal Sampling	Full configuration (2 DML + 1 DCL): 6 cm
Positioning	Survey wheel
	GPS or Total Station (not included)
Collection Speed	Up to 15 Km/h in full configuration
Power Consumption	100 Watt
Battery Operating Time	> 8.0 h
DAD - Connection to Data Logger	Ethernet LAN
Size On Ground Length	2.02 m Width: 2.10 m
Weight Full Configuration	228 Kg
Survey Path Width	1.84 meter
Environment	Rain proof
Item Code	STREAM-EM

SOFTWARE SPECIFICATIONS :

Processing Software	GRED 3D Utilities Stream, including:
	Automatic and Manual Data Processing
	Propagation Velocity Estimation (hyperbola fitting)
	2D/3D Representation
	Data Fusion for different frequency
	Interactive 2D Data Inspector
	GPS Location
	Irregular volume representation
	B-scan view C-scan view
	Colors scale/palette
	GPS Markers View
	Insert targets function
OUTPUT DATA	Automatic data transfer into CAD maps