

Terms of Endearment

This *Deeds* is a follow-up to July/August's *Deeds* column that questioned the existence of a comprehensive and universal listing of damage prevention terms. Below, we are providing an incomplete list of pipe and cable locating terms. It's incomplete because the list of more than 100 words, terms and phrases deals only with electromagnetic pipe and cable locating instruments. Entries for ground penetrating radar and vacuum excavation are missing.

To further illustrate the incompleteness of this list, pipe and cable locating is but a part of damage prevention. So how many words, terms and phrases would be needed to represent a complete list for damage prevention, a glossary referenced by industry professionals? Our guess is nearly 2,000. With the assistance of others (many, many others), we intend to build that glossary. We won't print it until we're done. But, we'll keep you abreast of our progress on our website, www.underspace.com. It should function a little like damage prevention Wikipedia.

But wait. This *Deeds* is also a follow-up to the last issue where you were promised more detail to our three-question damage report. Well, here's your detail—the initial list of more than 100 words, terms and phrases dealing with electromagnetic pipe and cable locating instruments. For review purposes, here's our three question damage report:

- 1) Could the damaged line have been located accurately from the surface?
- 2) If yes, why was the line damaged?
- 3) If no, what can be done to keep this line from being hit again?

It's our position that it's tough to answer the first question from our damage report if you are not familiar with the instruments that can be used for detection of underground utilities. Glance through the list. You might feel a little squeamish. That's OK, though. Saying you "don't know" if it could have been located accurately from the surface means that you are in the right frame of mind to learn. Success in damage prevention is actually determined by what you do about the answers to the last two questions on our report.

Electromagnetic pipe and cable locating: the detection of magnetic fields produced by current flow on metallic pipes and cables.

60-cycle: alternating current whose frequency is 60 hertz.

Access point: a bare metal spot on a pipe or cable whereby one end of the conductive transmitting antenna is attached.

Active: a receiver response to a magnetic field generated by the transmitter.

Air lock: any receiver reading created by the transmitter's energy leaving the transmitting antenna and not the pipe or cable.

Alternating current: the type of energy produced both by an electric power plant and the transmitter; energy that flows in two directions.

Apex: the topmost part of a signal circle.

Attracting field: a magnetic field whose energy moves toward another field; this field is not circular.

Audio frequency: another name for low frequency.

Bad current: with the receiver held stationary, a peak response that fluctuates considerably.

Bottom receiving antenna: the lower half of stacked peak antennas.

Circuit: when discussing electromagnetic theory, the name for current flowing on a conductor and through earth.

Close-end: the end of a line leg where the transmitter is located.

Close-end ground: a metal making con-

tact with earth at the end of a line leg where the transmitter is deployed.

Coil: wire, usually copper, wrapped around a core in a spool-of-thread-type fashion.

Coil orientation: the positioning of coil windings within a magnetic field.

Common ground: a shared metallic grounding connection amongst cable systems.

Concentric signal circles: the transmitter's energy that orbits the pipe or cable at all distances from the pipe or cable.

Conductive: transferring the transmitter's energy onto a pipe or cable by employing a metal-to-metal connection between the transmitter and the pipe or cable.

Conductive transmitting antenna: a wire with two ends which connects the transmitter to 1) the pipe or cable and, 2) the earth.

Conductor: a name for a metallic pipe or cable when discussing electromagnetic theory.

Cross: a potential signal split on a piping system where the transmitter's energy encounters three new line legs.

Current: the flow of the transmitter's energy on a pipe or cable.

Current flow reading: a measurement on the transmitter of the amount of energy leaving the transmitter.

Current level: an assessment of the amount of the transmitter's energy at any point along the pipe or cable.

Current measurement: a receiver reading, usually displayed in milliamps, that is produced by stacked-peak antennas and estimates how much of the transmitter's energy is located at the point of the reading.

Depth validation: the raising of the receiver a known amount to see if a new digital depth reading has increased by that known amount.

Digital depth: a pipe or cable depth estimation utilizing at least two stacked peak antennas situated a fixed distance apart.

Direct current: the type of energy produced by batteries; energy that flows in one direction.

Earth: soil.

Electronic null: a receiver response whereby two symmetrically and horizontally positioned peak antennas record identical signal strengths.

Energize: to transfer the transmitter's energy to a pipe or cable.

Far-end: the end of a line leg opposite of the transmitter location.

Far-end ground: a pipe or cable's metal component making contact with earth at the opposite end of a line leg from where the transmitter is deployed.

Frequency: the transmitter's energy as measured in hertz or kilohertz.

Good current: with the receiver held stationary, a peak response that does not fluctuate. **Ground:** where an insulated metallic utility makes contact with earth.

Ground rod: a copper or aluminum rod

ranging in length up to 16 feet that serves to ground a cable system.

Grounding device: a piece of metal driven into earth so that the conductive transmitting antenna may be attached.

Hertz: the number of times current on a pipe or cable changes directions in one second.

High frequency: any transmitting frequency 10 kilohertz and above up to 480 kilohertz.

High-high frequency: any transmitting frequency from 200 kilohertz or greater

High-low frequency: any transmitting frequency greater than 1 kilohertz up to 10 kilohertz.

Horizontal inspection of field: receiver readings that are obtained perpendicular to the pipe or cable location.

Horizontally-positioned peak antennas: on a multiple antenna receiver, a pair of tire coils used to produce an electronic null response.

Inductive: transferring the transmitter's energy onto a pipe or cable without employing a metal-to-metal connection between the transmitter and the pipe or cable.

Inductive coupler: a type of inductive transmitting antenna that is not located in the transmitter but rather in the clamp that encompasses a cable.

Inductive transmitting antenna: a coil located in the transmitter whose purpose is to energize the pipe or cable without using a metal-to-metal connection.

Insulation: coating on a pipe or cable that separates the metal from earth.

Insulator: a break in a pipe's metallic continuity.

Isolate: the ability to keep the transmitter's energy away from non-target lines.

Kilohertz: 1000 hertz.

Line leg: a single-direction section of a pipe or cable which has metallic continuity.

Logical or visual termination point: a trace that leads to an above-ground, utility-related structure.

Low frequency: any transmitting frequency below 10 kilohertz.

Low-high frequency: any transmitting frequency less than 200 kilohertz but greater than 10 kilohertz.

Low-low frequency: any transmitting frequency 1 kilohertz or below

Magnetic field: the product of alternating current flowing on a pipe or cable.

Metallic continuity: a line leg that has no insulators or unarmored splices.

Metallic path: the route on a pipe or cable which the transmitter's energy follows.

Metallic utility: a pipe or cable with me-

tallic content.

Metal-to-metal: another term for the use of a conductive transmitting antenna.

Multiple antenna receiver: a receiver that employs two or more receiving antennas.

Multiple-frequency transmitter: a transmitter that generates two or more frequencies.

Neutral: a cable that provides metallic continuity between ground rods.

Non-metallic utility: a pipe or cable with no metallic content.

Nonmetal-to-metal: another term for the use of an inductive transmitting antenna.

Non-target line: any pipe or cable not intended to be detected.

Not-round field: a magnetic field that is either an attracting or repelling field.

Null: a receiver response taken at the apex whereby the coil orientation is horizontal, like a tornado.

OK current: with the receiver held stationary, a peak response that fluctuates slightly.

Open end: a pipe or cable's metal component not making contact with earth where a line leg terminates.

Parallel conductor: a conductor that has

an optimum chance of being induced.

Passive: a receiver response to a magnetic field generated by something other than the transmitter.

Path of least resistance: the route the transmitter's energy follows in order to return to the transmitter.

Peak: a receiver response taken at the apex whereby the coil orientation is vertical, like a tornado.

Perpendicular conductor: a conductor that has no chance of being induced.

Pumpkin-shaped field: the field that is produced by an inductive transmitting antenna.

Radio frequency: another name for low frequency.

Receiver: a handheld antenna or series of antennas used to determine the strength and location of a magnetic field.

Receiver reading: signal strength, a peak or a null response, a digital depth reading or a current measurement.

Receiving antenna: a symmetric metallic winding induced upon by a magnetic field.

Repelling field: a magnetic field whose

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EASYLOCATOR
The Underground Puzzle
 Let us help you fill in the missing pieces.
 Locate professionals know that when it comes to non-metallic utilities, conventional locating tools leave you a few pieces short.
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Predicting the Future of Contract Locating

This column is the last in a series of nine focusing on the contract locating industry. For many of my columns, I relied on two friends to challenge my thinking on what material needed to be presented. The few personal opinions I voiced were based on intimate knowledge of the subject at hand. When it came to outside opinions, though, I came to count on my two friends—one from the contract locating side and one from the utility side—to give me their comments after each column. Let me give you a sample: “With regards to ‘On the Mark’ (October/November issue), you and I know that this was no rogue technician. I’m sure that many highly respected locating company field supervisors squirmed when they read the comments because they know them to be true. My field observations have confirmed it time and again as well. I have audited thousands of tickets over the last ten years. Unless the utilities were un-

equivocally buried in separate trenches, I will always see the red electric mark in the center flanked on either side by telephone and cable TV. Were these marks verified by attaching to each utility? I highly doubt it.” Which one of my friends wrote this—utility or contract locator? I’ll let you guess. But without my friends’ support, I am certain that the columns would have been much more difficult to write. I should also mention that I received quite a bit of feedback from others this past year. While you might have not seen your input in print, I can only tell you that Underground Focus is not done covering the contract locating industry. Your input is part of the reason why we will expand our coverage of the business. In fact, when it comes to contract locating, I believe that the future holds a lot of surprises for readers of our magazine. I bet that the future holds a lot of surprises for contract locating companies, too.

What allows one contract locating company to perish and another to flourish is not something I can always put my finger on. Sometimes if you just wait a few years, the companies that were doing well stop and the ones you left for dead perk up again. Another problem I have—and maybe you do, too—centers around the notion that this is a profitable business. No doubt it has been profitable for some. We read about investors who buy for \$40M and sell for \$80M. But I wonder about the underlying business, don’t you? It seems to me that it’s pretty easy to have more expenses than income. What if there comes a time when there are no more buyers?

But a lack of buyers is not the case for now. The phone rings daily in some offices until a deal is struck or a deal blows up. Does it matter how well the contract locating company is serving the needs of excavators? We’ll see. **UF**

Terms of Endearment *continued*

energy moves away from another field; this field is not circular.

Resistance: anything that reduces current flow.

Round field: a magnetic field that is not an attracting or repelling field.

Signal: the part of a magnetic field that intersects a receiving antenna.

Signal circle: the transmitter’s energy that orbits the pipe or cable at a particular distance from the pipe or cable.

Signal decay rate: the diminishing strength of the magnetic field as the field travels away from the pipe or cable.

Signal shape: a magnetic field that is either a round or not-round.

Signal splits: a location along the pipe or cable where the transmitter’s energy can begin to travel on two or more new line legs.

Signal strength: measurement of the magnetic field with a tire coil orientation.

Single antenna receiver: a receiver that only employs one antenna.

Single frequency transmitter: a transmitter which generates only a single frequency.

Splice: a potential signal split on a cable system where the transmitter’s energy encounters multiple new line legs and the potential of going to earth.

Stacked-peak antennas: two coils—a bottom receiving antenna and a top receiving antenna—which are both situated at the apex of two concentric signal circles.

Target line: the pipe or cable intended to be detected.

Tee: a potential signal split on a piping system where the transmitter’s energy encounters two new line legs.

The path of least resistance: the metallic path which provides the transmitter’s energy the greatest opportunity to return to the transmitter.

Tire: a vertical coil winding that provides a peak response; windings that are orientated to the pipe or cable like a “tire to the road.”

Top receiving antenna: the upper half of stacked-peak antennas.

Tornado: a horizontal coil winding that provides a null response; windings that are orientated to the pipe or cable like a “tornado

traveling down the road.”

Trace: the entire section of a pipe or cable being located.

Transmitter: a generator of alternating current, or energy; a miniature power plant.

Transmitting antenna: a metallic device used to transfer the transmitter’s energy from the transmitter to the pipe or cable.

Triangulation: a method for depth determination utilizing a single null antenna or a pair of horizontally-positioned peak antennas held at a 45-degree angle.

Unarmored splice: a break in a cable’s metallic continuity.

Un-bond: the physical detachment of one line leg from other line legs or a ground.

Vertical inspection of field: receiver readings that are obtained on top of the pipe or cable location.

Voltage: the amount of pressure behind the transmitter’s energy

Windings: the wire in a coil which is wrapped around the core. **UF**