

THE PHOENIX



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MORE CURRENT, HIGHER VOLTAGE IMPROVES TRANSMITTERS

Phoenix clients will benefit from faster data acquisition time, thanks to the recent improvements made to our T15 and T30 transmitters.

This good news applies to our clients using CSAMT, IP, Resistivity and Time Domain or Frequency Domain EM.

The benefits of more current and higher output voltage are faster data acquisition time and better data in the "controlled source" geophysical techniques – those using a man-made signal.

Just as in ordinary radio communication, a better receiver provides a better signal, and so does a stronger transmitter.

There is a limit to the improvement which can be obtained by the receiver alone. Although clever filtering and data acquisition algorithms and low-noise circuits in the receiver section help, the basic technique of improving the S/N (signal to noise) ratio is the simple stacking and averaging of many cycles of the measured waveform.

The Phoenix T30 now outputs maximum 70 amperes, nearly double the previous 40 amperes limit.



The problem with stacking (in the presence of random noise) is that data quality improves only as the square root of the number of cycles stacked. Thus, 25 percent improvement in S/N ratio requires approximately 50 percent longer data acquisition time; 50 percent better S/N requires that data acquisition time is more than doubled, and so on.

However, increasing output current



Tim Butt conducts an acceptance test for a T15 transmitter purchased by the Ministry of Railways, Second Design Institute. The picture was taken in Chengdu in Sichuan Province, China.

provides a directly proportional (linear) increase in "source moment" and thus in S/N ratio. Doubling the transmitter current doubles the S/N ratio at the receiver, and so on.

This is especially critical for the LowTEM technique in which each cycle may be up to 32 or even 64 seconds long.

Where the surface material is conductive, it is not too difficult to inject electric current into the earth, even with relatively low transmitter output voltages. But where earth resistivity increases (such as in sandy or dry areas), output voltage must also increase to achieve satisfactory output current levels. So current and voltage increases are both required.

Thus it is welcome news that the Phoenix T15 transmitter now has maxi-

imum output current of 50 amperes (a 25% increase over the previous 40 amp maximum). The Phoenix T30 now outputs maximum 70 amperes, nearly double the previous 40 amperes limit. Output voltages of all units delivered after October, 1996 will be raised from 800 Volts to 1,000 Volts.

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