# SPECIFICATIONS FOR TRP-45C TIMER RELEASE PROGRAMMER:

Description: The TRP-45C is a programmer for the TR-45 underwater timer release units. First the time-until-release is manually entered into the programmer. Second, the time-until-release is transferred from the programmer to theTR-45 underwater release unit by direct contact of two electrical contacts between the two units.

Example programmable times: Shortest = 0 days, 0 hours, 0 minutes (useful in checkout). Longest = 170 days, 15 hours, 52.5 minutes. Increment size = 7.5 minute.

Re-programmability: Can re-program at any time.

Start of timing: Timing starts at the moment of programming (or re-programming).

Data transfer time: 1 second. (After select 'Transfer time…' and make dual contact between programmer and release.)

Reliability of programming: Virtually certain when user checks the message displayed just after programming a unit. As part of the programming the time-until-release is returned to the programmer for verification. Further, batteries are checked under load and their voltage displayed.

Display: LCD display having two lines each with 16 characters.

User Input: Three SPDT momentary switches.

Contacts: Stainless steel protrusions designed for making temporary connection to the link and coil contacts on the TR-45 unit being programmed.

Programmer Battery Life: Approximately 50 hours of active use time (5 mA average). Unit automatically shuts off if not in use providing one year or more of battery life for typical use. (Suggest the removal of batteries for long term storage to protect against possible battery "acid" leak).

Batteries: Two common 9.0 volt alkaline batteries (access by removing four screws to open box).

Size: 7.0 inch x 4.8 inch x 2.3 inch (17.8 cm x 12.2 cm x 53.8 cm) without contact protrusions. Add 1.0 inch (2.5 cm) to the long dimension for contact protrusions.

Weight: 1.4 pound (650 gram) with batteries.

Water resistance: Splash resistant but not water tight. Do not submerge.

# SPECIFICATIONS FOR TR-45 UNDERWATER TIMER RELEASE:

Description: Unit performs a release action underwater after being programmed before deployment for the desired amount of time-until-release (TUR).

Environment: Must be used in salt water (ocean or bay water). System will not work in fresh water (e. g. will not work in a fresh water river or lake).

Coil contact: Serves the dual function being a contact first used for programming and second being used as the negative water contact necessary to complete the circuit so that the accelerated erosion can occur. This contact does not erode.

Link contact: Serves the dual function being a contact first used for programming and second being used as the two points of erosion. After deployment when the release action starts this water contact is connected to the positive side of the internal battery and the accelerated erosion of it occurs.

Link retaining cap: A modified ½ inch threaded PVC cap holds the LK-xx erosion link in place.

Batteries: Three L91 lithium AA size batteries made by Energizer are wired in series for 4.5+ volts. These are sealed inside by gluing on a ¾ inch slip cap after inserting new batteries. Access to replace the batteries is only by cutting the cap off. (See 'Instructions' above for battery replacement suggestions).

Battery Life (LK-xx): Less than 100 micro Amps is the drain on the three AA lithium batteries while in timing mode. This is the equivalent to using 30% of the battery energy over one year in timing mode. (Note: No drain exists when unit is not in use.) About 100 micro Amps plus whatever the link draws is the drain when in release mode. In release mode an LK-xx link can draw 100 mA during the first high current part of the erosion phase.

Battery life vs. Link Paint: The yellow paint on the hoop of the release link focuses the erosion to two small points on the metal wire hoop. By having the paint in place the battery drain is reduced. If it is found that the paint is not getting scraped off then the above number of releases expected per set of batteries could be increases up to double.

Battery life in storage: Same as shelf life of batteries. (i.e. there is no battery drain when unit is not in use). At this time Energizer is marking these L91 lithium AA batteries with a "best if used by" date 14 years into the future. The possibility of a single cell going bad increases with time. For critical applications the batteries should be replaced a least every 5 years.

Time-until-release (TUR): Transferred from a programmer (TRP-45C) to a release unit (TR-45) by the two units being hand held in contact with each other. This time-until-release can be set to anytime between zero and 170 days in 7.5 minute steps. A setting of zero time-until-release is useful for testing. When programmed for zero time the release unit skips the timing mode and starts immediately in the release mode.

Start of timing: Timing starts at the moment of programming (or re-programming). Units can be reprogrammed over-and-over as many times as desired.

Duration of release mode (battery voltage applied to link): Exactly 4.00 hours or until reprogrammed, which ever occurs first.

Operating Depth: Zero to 600 feet (183 meters).

Size: 1.35 inch max diameter x 15.0 inches long.

Weight in air: 0.65 pound (295 gram). Includes internal lithium batteries.

Weight in sea water: 0.10 pound (45 gram). Includes internal lithium batteries.