INSTALLATION PROCEDURE
1/4 & 1/8 MILE PERMANENT TRACK

1) Unpack all of the equipment and immediately inspect for shipping damage. Damages should be immediately reported to the carrier and noted on the carriers receipt. Hidden damage should be documented and shown to the carrier's representative. Check the contents and match up to the invoice and packing list.

2) The first track function is to layout the track. The starting line should be selected and temporarily marked. The starting line will consist of a pre-stage and stage infrared emitter/receiver pair in both lanes. The pre-stage is 7 inches before the stage beam and whether or not a guard beam is used, it is marked at 15 inches in front of the stage beam line. The guard beam location is the starting line and all down track detector locations should be measured from the guard beam line.

3) The 60 foot mark and detector location should be measured from the guard beam mark - - 60 feet -- or 61 feet 3 inches from the stage beam location. After laying out a temporary line at the 60 foot location, you should square up the starting line and 60 foot location by measuring the diagonals.

4) When the starting line is permanently marked, you can then permanently mark the 60 foot location and by measuring down each side of the track with the same measuring device, mark the 594 and 660 foot locations and the 1254 and 1320 foot locations. All measurements are from the guard beam imaginary location or 15 inches in front of the stage beam location. We use roofing nails to permanently mark the track surface.

5) After the entire track is permanently marked, you can begin locating the detectors, the yellow banner emitter/receiver pairs will be used at the starting line - - pre-stage and stage. The reflector type emitter/receiver in the same unit – SBL1) will be used at the 60 foot, mph, and finish locations.

6) All mounting stands and brackets should be made of very rigid material so as to resist vibration and flexing. The starting line detectors will be mounted back to back with plenty of adjustment for moving the detector up/down and left/right. The emitters and receivers on the outside of the track should also have the same amount of adjustment.

7) The 60 foot banner SBL1 units must be mounted 6 inches off of the track surface as recommended by the NHRA. If the track is hard hooking and you have a lot of vehicles that carry the front tires past the 60 foot mark, the NHRA recommends 8 inches up to 12 inches off of the track.

8) The 60 foot detectors should be mounted at the edge of the track surface behind the guard rail if you have one. Run a pull line tight across the track. The pull line should be 6 inches off of the track surface all the way across the track surface. The center of the detection beam should be located on the center of the pull line.

9) Perform the same beam location technique at all other down track locations. After all detectors and mounts have been located, it is best to cement the bracket bases so that they do not move in the ground.

10) The wiring of the track can now begin. There are two main cables that go to the starting line

and tree. They are completely pre-wired and connect to the interface box and junction box on the starting line. Locate the interface box in the tower and run the main wire out to the center of the track. The junction box has cables going to the respective pre-stage and stage emitters and receivers. All connections are all labeled and can be routed to their respective detector and emitter location. The Christmas tree can be moved at any desired location. It should be out at least 30 feet and many tracks are now out 35 to 40 feet.

**Temporary Track – in lieu of a start line junction box, on temporary systems, we install additional cable for start line infrareds and put a convolute plastic protection tube over the cables.

11) Next locate the mph junction boxes. These junction boxes should be located at the 1320 foot locations and have enough wire to move them off the edge of the track. We have a 12 position terminal strip inside which contains the wires for the mph and finish line detectors as well as the win light and stop light for that lane.

Steps 12, 13, & 14 are prewired & precut on all temporary tracks.

12) There are two lengths of wire that will be used to reach the finish line on both sides of the track. One length is (1550 on ¼ mile track or 850 on 1/8 mile track) for the far lane of the track. The other cable (1450 feet on ¼ track or 750 on 1/8 mile track) is for the tower lane or near side of the track. Use cable appropriately. Start with long run.

****Temporary Setups –**Your cables have connectors with 2 pieces 1330 feet each on ¼ mile tracks or 2 pieces 665 feet each on 1/8 mile tracks. The remaining cable goes into your tower extension.

13) The junction box has a wiring schematic under the cover. The wires should be bared back about ¾ inch twisted and folded over and twisted again and then soldered. Make the solder joint small enough to get into the terminal strip and then fasten with the screw. The drain wire (bare wire) must be attached to a separate terminal. At the finish line, you will need a relay to power your win lights and stop light. It should not draw more than 40 milliamps at 12 volts. We have solid state relays that are low powered. Run a wire out of the 1320 foot junction box to the relay where the win light is located. Do not mount relay in the junction box.

****Temporary Tracks – Cabling is pre-wired****

14) The other end of each of these wires is to be terminated in the tower inside of the interface box. Wiring is as follows:

Red and Blue Wire -- Positive 12 Volts D.C.
Black and White Wire -- Ground
Brown and Green Wire -- Signals – To Terminal Strip
Brown is MPH -- Green is Finish
Yellow Wire -- Negative 12 Volts D.C.
Orange Wire -- Win Light -- Terminal Strip

Note: The 60 foot wires require only 3 conductors. Red is positive, Black is ground, and the green wire is the signal wire. It is probably prewired.

15) The Timeslip Printer can be located up to 8000 feet away and requires a 9 PIN SUB D connector at each end . We usually prewire-or call Portatree for pinout specifications.

Note: Unless ordered, only a 6 foot cable is included with the printer.

16) Before connecting the computer, power up the interface box by connecting the red wire to

Positive and the brown wire to ground 12 Volts D.C., an AC to DC Converter can be used but it must have a minimum of 2 amps of supply current. We recommend a well charged well maintained automotive battery.

Note: 1) Do not power up the Portatree Professional Computer until all tree and track connections are properly attached to the SUB D connectors.

2) Do not use the small transformer to power up the Portatree Professional in conjunction with the interface box. The interface box will power up the Portatree Professional.

After powering up the interface box, you will have power to all of your detectors but the pre-stage and stage lights on the Christmas Tree will not work until the computer is connected. You can align all of the detectors by sweeping left/right and up/down. The Red L.E.D. will illuminate when the detector is aligned. Read the literature on the banner units to efficiently align them. They may require sensitivity adjustment. All reflector type banner units should be aligned on center of the target so that they will be perfectly aligned. Half of the target should be able to be covered before the L.E.D. on the top of the unit goes out. If the target has to fully be covered to make the L.E.D. go out then it is set too sensitive. It must go out when half or a little more than half of the target is blocked. Adjustment can be made by removing the adjustment access plug and turning the adjustment screw with a very small screwdriver.

18) The computer can be connected after the detectors are all working. Disconnect the 12 Volt power to the interface box and then plug the two 25 PIN SUB D Connectors into their respective positions. Power up the interface box. Read the manual and watch the video on the Portatree Professional Computer operation. Set the computer accordingly. Press "C" for competition and the stage lights on the tree will work.

19) Now the Starting Line can be set up using the pre-stage and stage lights on the Christmas tree. Use the Portatree video to understand how rollout is set and build a rollout wheel to set the rollout. After the rollout is set and the detectors are securely fastened, we must limit the field of vision of at least the stage detectors so that unwanted reflections will not affect their performance. This is done by locating 1 inch steel pipes - - 24 inches long between the stage detector and the emitter at the edge of the track. Position the pipe so that the Red L.E.D. on back of the banner receiver stays on and is unaffected by the pipe. Only the receivers need this protection. A bracket must be made to fix the pipe in position. You can do the same to the pre-stage, but it is not necessary. In any event, you must keep the detectors out of the direct sunlight and you must keep them out of heavy moisture conditions.

20) All detectors must have covers over them to keep them out of the weather and to keep the sun from directly contacting them. The starting line takes a lot of time to set up correctly so you may want to permanently fix them and place a rigid steel cover over them.

PLEASE BE VERY CAREFUL DURING INSTALLATION TO AVOID
LENGTHY TROUBLE SHOOTING.
IF YOU HAVE ANY QUESTIONS:
TEL# 508-278-2199 or FAX# 508-278-5887
Email: tech@portatree.com

INSTRUCTIONS FOR OPERATING THE ELIMINATOR 2000
WHILE IN THE "COMPETITION" TRACK MODE

1. The Eliminator 2000 must be used with a Track Interface Box when used for competition. The track interface box is 8" x 8" x 4" gray painted metal. This is where all of the track photo cell cables are terminated and connected to the Eliminator. This box must be powered with 12 volts D.C. and we recommend an automotive battery. A charger can be connected to the battery while the system is being operated. All of the input and output features may not be operational at the time of purchase, so you must contact Portatree if you are not sure of the model you have.

2. The DB 25 Female connector from the Track Interface Box must be plugged into the left side of the Eliminator 2000. Power from the interface box will enter through this connection so that separate power to the Eliminator 2000 is not necessary

3. Turn on the ELIMINATOR 2000 – Left Side TOP Rocker Switch.

4. The Lights will count down -- And then a Menu will appear. Use the DOWN arrow key to highlight "Competition" and then depress the STAGE/Enter Key at the Right bottom side of the Eliminator top select.

5. You will enter the Data Entry Screen of the Competition program. This is where you can depress the "stats" key to enter car numbers or the "dial" key to enter dial-ins or both. You can edit numbers in this screen by using the arrow keys and then depressing the number that you wish to enter. Depress the Stage/Enter Key to save the information and advance to the next edit box of return to the screen. Be careful not to depress the Stage/Enter Key too many times or you will enter the race screen (Stage Up Stage Up).

6. While you are in the data entry screen, you can depress Pref Key to change settings
You can also depress the Tree Key to change Tree Type and Speed.

7. Depress the Stage/Enter Key one more time to enter the race screen. You will see "Stage Up" on both sides of the screen. In order to start the race, you must either depress the start button on the side of the track interface box or the optional external starter switch on the starting line. If you are running a "BYE" run (single vehicle), just start the race and the empty lane will red light.

8. A race will Finish when either both vehicles reach the finish line, or the reset switch on the side of the track interface box is depressed. The reset button will terminate the race and is mainly used in case one vehicle breaks and can not make it to the end of the track.

9. When the race is over, the Eliminator will turn on the Win Light (Top Amber Lamp on the Christmas Tree) in the lane that won the race. The Win Light will illuminate in the lane that finished first (TRUE Win (OFF)) or the lane that did not Breakout (TRUE Win (ON)). In the case of a double Breakout, the worst offender loses. True Win is a menu item under Preferences.

10. The Eliminator 2000 also has 2 serial ports so that you can operate a Time Slip Printer and a large external L.E.D. Display at the same time.

PORTATREE TIMING SYSTEMS

GUIDE TO SETTING UP AN ACCURATE DRAG RACING STARTING LINE

A Drag Track Starting Line must be setup accurately so that left and right lanes have the same performance level. When a race vehicle leaves the starting line, it must leave from the same position every time and both lanes must have the same starting beam locations. The vehicle starts the timing clocks when the front tire rolls out of the stage beam (stage light on the tree goes out). The vehicle's tire must rollout of the stage photo cell beam in the same manner and position for both lanes every time.

In order to setup an accurate starting line, you must measure how far the vehicle's tire rolls out of the staging beams and you must set the photo cells and light sources so that the rollout is equal in both lanes. This guide will give you insight into how rollout can be changed to meet the accuracy required for any drag track layout.

Rollout is affected by the height of the photo cell beam off of the track surface. The photo cell beam should have a consistent height off of the track surface all the way across the track. Photo cell beam height can be measured by finding the beam center and sliding a triangle (30 – 60 degree) under the beam and marking the point where the beam is blocked. The starting line beam height should be 2 inches off of the track surface. Diagram 1 will show you how a triangle is used to determine the beam height.

Measuring the rollout of a wheel through the beam should be tested with a rollout wheel. The rollout wheel should be 24 inches in diameter and of solid construction. A trailing arm should be attached to the axis of the wheel and should have a marking block on the opposite end for placing on the track surface and marking beam position. Diagram 2 shows the construction of a rollout wheel and Diagram 3 shows a rollout wheel in use.

In order to simplify the procedure and finish your job with accurate results, only work on one beam at a time. We recommend starting with the stage beam first. The rollout should be tested in the racing groove on the track surface. We like to test the rollout in several locations but rely only on the results taken in the groove. The rollout wheel should be rolled into the beam in the direction of travel of the vehicle. When the beam is blocked, a mark should be placed on the track surface. The wheel should be rolled in again until the beam is unblocked and again the track surface should be marked. The distance between the two marks should be 12 inches but can vary either way be ¼ inch. It is always best to get the best accuracy possible, but the last little bit can take many hours of work..

In order to adjust the beams for rollout, you must raise or lower the light source and or photo detector. You may also have to limit the light source or detector viewing area. This can be done with light shades or screens or even duct tape. We do recommend that the manner in which the light source is blocked off be a permanent block.

After the stage beam has been positioned and the rollout has been measured and adjusted, the prestage beam can be tested. Position the prestage beam 7 inches before the stage beam. Measure the

beam height using a triangle as performed on the stage beam. When you are working on the prestage beam height, it is best to block or shut off the stage beam light source or reflector. You must now establish the prestage beam height and test the rollout with a rollout wheel. When you have the rollout set at 12 inches, you can now test the distance between the prestage and stage beams.

Unblock the stage beam light source and make sure that there is no crosstalk between the prestage and stage photo detectors. This is done by going over near the light sources or reflectors and blocking each light source separately to make sure neither light source has an effect on the other. We usually take a 4 inch square object and move it through the beams at the light sources or reflectors. This will immediately tell if there is any crosstalk.

The rollout wheel should now be placed in the racing groove and should be rolled into the prestage and stage beams. Each time a prestage light or stage light goes on or off on the christmas tree, make a mark on the track surface with chalk. Roll in - - prestage on - - mark track - - roll in - - stage on - - mark track - - roll in - - prestage off - - mark track - - roll in - - stage off - - mark track. Take your ruler and measure the distance between marks and you should have 7 inches - - 5 inches - - 7 inches. If you have done your previous work correctly, then these measurements should be obtained.

The layout of your entire track can now begin. The starting line is the most difficult to setup and must be square and true with the rest of the track and photo cell layout. If you know where your stage beam line is located due to past surveying, then the rest of your track can be measured per our track layout drawing.