Engineering Specification
AUTOMATED TRAFFIC RECORDER TESTER
MODEL ATRT 1150

1. General Description

The Automated Traffic Recorder Tester (hereinafter: "Tester") shall be capable of testing the primary functions of a pneumatic Automated Traffic Recorder (ATR). The "pneumatic" ATR is the type that senses the characteristics of highway vehicles via standard on-pavement road tube sensors. The Tester shall perform the test by simulating the signal patterns and sequences (signatures) that would be received by the ATR when it is installed at a typical installation. These signatures should be interpreted by the ATR as vehicles passing over a sensor array, and counted and classified according to the setup and programming of the ATR. At the conclusion of the test period, the census of vehicles recorded by the ATR may be compared to the output vehicle census of the Tester to determine the accuracy and repeatability of the ATR under test conditions.

2. ATR Compatibility

The Tester shall provide signatures that are made up of precisely timed sequences of signals that should be recognized by the input sensors of a properly working, compatible ATR. A compatible ATR must include input sensors that conform to industry standards for on-pavement Road Tube Axle Sensors. The ATR must be able to count multiple axle vehicles that pass over sensor arrays that utilize these sensor types and allow the test operator to determine the ATR count for the test period.

3. Tester Description

3.1. The Tester shall consist of a physical device that produces the timed signals and a software application that is run on a personal computer utilizing the Microsoft Windows 95/98/2000 operating system. The software application shall provide the user interface for the test session setup, monitoring of the test in progress, collecting and organizing all the test data, and generating and reviewing reports. The personal computer shall send and receive data with the Tester hardware during the test execution. The Tester shall transmit pulsed air pressure transients to the ATR via short sections of road tube supplied by the user. The tester shall include an Operating Manual that provides an introduction to the setup and use of the Tester. The Tester software shall include Help files that provide context-sensitive help that the user can access during the setup and operation of the Tester.

The testing process shall proceed automatically after the initial test setup and starting of the test by the user. During automatic testing, the testing shall be controlled by the controlling PC. The test report shall be stored automatically on disk as a standard ASCII file at the conclusion of the test sequence.

3.2. The Tester shall have 4 Road Tube simulator outputs, which can be used singly or in combination to make up sensor arrays. The peak output level shall be adjustable with a control knob on the tester top panel. The user interface software shall display a reading to the user to indicate the output level.

3.3. The Tester shall allow the user to design the simulated sensor array that affects the timing and origin of the vehicle signature output. The sensor array may consist of one or two sensors per lane of traffic of the type listed in Section 3.1. The Tester shall simulate up to 4 lanes of traffic during one test session, depending on sensor usage. Standard sensor array types shall be supported, which include: Axle-Axle, Long/Short axle for two lanes, and Single Sensor arrays. The User shall be able to define the sensor spacings within reasonable limits, in metric or customary (foot/inch/mile) units.

3.4. The Tester shall allow the user to define the test session duration in two modes: Time Intervals or Vehicle Counts.

3.4.1. The Time Interval mode shall allow the user to establish the length and number of time intervals during which the Tester shall transmit vehicles to the ATR. The Tester shall record the number, type, lane, and speed of the vehicle signatures by interval so they can be easily compared to the data collected by the ATR. The Tester shall include a system of manually co-coordinating the start time of the ATR with the start time of the Tester for the test session.

3.4.2. The Vehicle Counts mode shall allow the user to define a fixed number of vehicles to be transmitted to the ATR for each lane and type of vehicle selected for each speed bin used in the test session. In this mode, the vehicle counts shall be grouped into one time interval for reporting purposes.

3.5. The Tester shall allow the user to define groups of vehicle signatures to be used for a given test session, and recall one of the groups previously defined from a menu. The various groups could be used to simulate different traffic situations such as passenger and light truck traffic around a retail mall, or light and heavy trucks around an industrial park.

3.6. The Tester shall allow the user to select vehicle signatures from a pre-defined set that is provided by the manufacturer (designed to represent FHWA Scheme F) or edit and save new vehicle signatures of the users design. These user vehicles may be included in groupings as described in Section 3.4 along with any of the pre-defined vehicles.

3.7. The Tester shall allow the user to define speed bins that determine the speeds at which the signatures simulate the vehicle passing over the sensor array. The speed bins will also determine the speed groups for counting the transmitted vehicle signatures, so that these counts can be easily compared to the vehicle counts recorded by the ATR.

3.8. The Tester shall allow the user to add general information to the test record file to identify the agency and operator performing the test; the manufacturer, model number, ID number, and serial number of the ATR under test; the location of the test, and allow the addition of text notes.

3.9. The Tester shall allow the operator to output one vehicle signature at a time for purposes of diagnosis, confirmation, and/or repairs of a connected ATR. The user shall be able to direct the signature output to any of the established lanes, and set the vehicle speed and type. The Tester shall also allow the user to "toggle" the state of any of the outputs, one at a time, to test cable connections and/or diagnose the connected ATR.

3.10. The Tester shall automatically create report files and store these files to the hard disk of the controlling PC. These files shall be ASCII text files with tab-delimited data, to allow maximum compatibility with the user's existing database or other data handling software. The Tester shall include a Report Viewer utility to quickly and easily review the results of tests performed by the Tester.

4. Physical Characteristics

4.1. The Tester shall require 120 VAC, 60 Hz, 250 mAmp input power.

4.2. The Tester shall require a controlling PC (supplied by the user) that utilizes the Microsoft Windows 95/98/2000 operating system. The PC must be at minimum: Pentium-class, 100 Mhz processor, 16 MB RAM, 200 MB Free Disk Space, with one free RS232C serial port.

4.3. The Tester shall be housed in a rugged, rigid, portable enclosure that allows for storage, protection, and transportation of the Tester hardware and all required cabling.

4.4. The Tester shall be designed for use in an interior office or shop environment. The Tester shall operate properly at temperatures ranging from 50 to 95 degrees F. and up to 90% humidity (non-condensing).

4.5. The Tester weight (not including the controlling PC) shall not exceed 8 pounds.

5. Manufacturer Support

5.1. The purchaser's interest in the Tester shall be protected by a one-year limited warranty on parts and labor. The continuing utility of the Tester shall be further protected by the availability of repair, update, recalibration, and extended warranty services from the manufacturer.

5.2. The manufacturer shall provide unlimited telephone technical support to the purchaser and user of the Tester for use of the Tester and operation of the Tester software. This support may not cover the operation of the user's ATR or the use of Microsoft Windows operating systems.