# Glossary T

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## Tag strip

Point-to-point construction uses terminal strips (also called 'tag boards' of 'tag strips'). A terminal strip is a stamped strip of tin-plated loops of copper. It is mounted in a way that electrically insulates it. The metal loops are mounted on a cheap, heat-resistant material, usually synthetic-resin bonded paper (FR-2), or bakelite reinforced with cotton, or sometimes paxolin. The insulator has an integral mounting bracket, sometimes shorted to the stamped loops to ground them to the chassis.
Tag boards are usually in the form of two rows of tags mounted at each edge of the insulating board to allow axial components to be mounted between them, and wires to be easily attached. Before 1960 or so most electronic equipment was wired with this type of assembly.
Tag Strip is usually a single row of solder tags mounted on a narrow insulating strip, designed with mounting feet so that it stands a right angles from the base(board). These are commonly used in model railway layouts to keep cabling tidy and neatly terminated.

## TB

Technical Bulletin,an entire catalog of MERG publications,having the objective to disseminate techincal information to the membership. Access is through the 'members only' section of the website:

## TCC

Train Control Centre/Center, strictly spelled Tcc, is a program written by MERG member Howard Amos (HA) to assist in the running of model railway layouts, with considerable emphasis on automation. It is written in the Java language so as to be usable on many different types of computer. It can connect to model railway hardware such as train controllers, train detectors, switchgear, signals, turnouts and control panels via a number of interfaces (eg Howard's own QTU (Quad Throttle Unit) modules, the RPC range of modules by Gordon Hopkins, NCE DCC systems, etc.). In operation, it continiously runs a script, written in Tcc's Train Control Language (TCL) which is derived from, but not compatible with, the scripting language of the same name developed by CTI Electronics for their Train Brain program. Writing your own TCL script is one option, but it is also possible to generate a script for an automated layout from Tcc's Track Defintion Language (TDL). You simply describe the elements and topology of your layout in TDL statements and a complete TCL script is the result, no understanding of TCL being required. An option allows simulation running in order to test a TDL configuration without actually connecting with any hardware.

Further information on Tcc, other HA software and hardware and information on layout automation can be found on Howard's own website: http://www.qtutrains.com

For the latest Tcc download plus new and to interact with Howard, you need to join the special-interest MERG Yahoo Group devoted to Tcc etc: http://groups.yahoo.com/group/mergtcc

Note that this resource page on the MERG website has not been updated for a very long time.
https://www.merg.org.uk/merg_resources/tcc.php

## Technical Data

This is a generic term used in Electronics to describe 'data sheets' for electronic parts or components, or to describe the engineering oriented detailed description of a product. It may include absolute maximum limiting factors, typical performance, operating limits, power consumption etc.
Technical Data for a real steam locomotive might include working boiler pressure, weights, tractive effort, specific coal consumption, physical dimensions etc.

## Throttle/handset

The Throttle controls the power output of an internal combustion engine, in model railways it represents the, usually electrical, controller that is used to adjust the speed of the train being driven. The physical form of the 'throttle' can be a knob or buttons mounted directly on the model railway controller, or they may be mounted independently in a small box, usually called a Handset, which is attached to the main controller by a thin wire, radio link or infra red link.

## Timers

The basic timer is the Kitchen Timer, consisting of some sort of clock and alarm that can be set as required.
In electronics timers exist in various forms and may be intended for setting a time or delay, for measuring a time or time interval. They can be implemented digitally typically by counting a 'clock' or oscillator (as in a PIC implementation) or using an analog timer, such as the well known '555' timer device.

## Toggle

A 'Toggle' is a combination of an operating lever and spring loading which causes the lever to be 'locked' at one or other extreme position. It is extensively used in mechanical assemblies, in which the extremes may be 'locked' by the 'toggle spring'. Another example is the 'Mole' self locking wrench in which the toggle action also gives strong mechanical advantage.
The Electronic version is also a device that can be 'latched in one position or another, indeed sometimes called a 'latch'.

# TORR

**T**rain **O**perated **R**oute **R**elease.
A feature of prototype interlockings when routes are cancelled by passage of the train without need for the Signaller to take any action. Prior to the introduction of TORR the Signaller had to pull the entrance button or the equivalent action on the VDU panel.

# Tortoise motor

The commercial name given to a model of turnout actuator or motor manufactured by Circuitron in the USA. This device features a high torque low-speed motor which is geared down to provide the drive to move the throwbars of model railway turnouts. A MERG Technical Bulletin A6/3 shows the data sheet for this device

# ToTI

Train-on-Track Indicator. A device or electronic circuit designed to interwork with, or form part of a track circuit which provides an output suitable for connecting to signalling, an indicator panel or other electronic component such as a computer, when a piece of track or block section is occupied by a train or item of rolling stock. There are a number of MERG designs featuring amongst the Technical Bulletins, three of which have been offered as kits. See kits nos.56 (DCC only), 62/63 (DC and DCC) and the RPC FTC module.

There are many methods to implement Toti, and what method is appropriate depends the purpose for which it is required, and on which traction system is used (DC, DCC, or else) – note: not all methods work with all traction methods. Detectors can use: mechanical switches; current detection (e.g. diode drop or coil); the transmission, reflection or interruption of light; magnetism; radio; ultrasound, or video. The method might give simple occupancy information, or more extended information including train identification (e.g. RFID, RailCom, Transponding, barcodes, Lissy, video etc.). See: Train Detection

# TOU

**T**urnout **O**perating **U**nit A mechanical device fitted below a point or turnout used to transmit the movement of the motor or manual system to the switch blades of the point/turnout. The Point Actuating and Locking Mechanism (PALM), a product of Ambis Engineering, is an example which may be seen toward the bottom of this webpage.

# Track circuit

A method of isolating a section of track so that an electric current flows when that section is occupied by a train or item of rolling stock. MERG Technical Bulletin T9/1 deals with 2-rail track circuits

# Track cleaner

A device for cleaning track so that dirt or other deposits do not impede the flow of electric current. A number of methods exist to accomplish this. MERG Technical Bulletin A4/1 features the Relco Track Cleaner which superimposes a high frequency, high voltage signal over the traction current. This burns through track deposits when traction is interrupted. Mechanical abrasive rubber-type products are also available such as the Peco PL41 Rail Cleaner and the MERG kit 83, PCB and Track Cleaner. These must be rubbed over the track to clean it. A variety of solvents applied with a clean cloth are also suitable as are a number of wagon-mounted abrasive blocks. A popular MERG method is to polish the rail tops with the rough surface of common hardboard.

# Train detection

A means of generating a signal when a train or item of rolling stock is present. Quite commonly accomplished by means of a track circuit and ToTI, FTC or DTC module which detects an object for the whole of its traverse through a track section but also possible using spot detectors such as infra-red devices (see MERG Hector kit 72), Hall effect switches (see MERG kits 101, 102 and 103) and magnetically-operated reed switches (see MERG kits 97 and 104 - 109). ToTi

# Transducer

A collective term used to describe devices that convert one form of energy into another, generally for the purpose of detection, measurement, actuation or information transfer. Most often of electrical or electronic nature, the most common forms of transducer are either sensors or actuators and thus find common usage in model railway systems. Such examples can be found in a number of MERG kits for train detection and turnout actuation and are either the device that physically detects the presence of rolling stock such as a Hall effect switch or infrared sensor or the coil that drives a turnout throwbar.

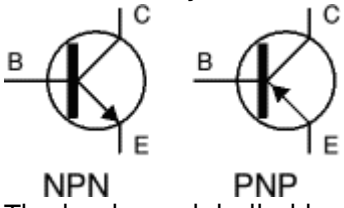
# Transformer

A electrical device consisting of two or more coils of insulated wire wound round an iron core to allow a focussed and fluctuating magnetic field generated by the alternating current in one coil to induce an alternating current in the other coil(s). Most frequently used to change the voltage of a power distribution or electronic signal from a high value to a lower value or vice versa. Commonly found in the mains power distribution network between power station and consumer and usually found in the power supplies of most appliances used in the home.

# Transistor

A triple-layered semiconductor assembly made from doped silicon or germanium arranged so that potential differences between the layers allow this device to be used as an amplifier, switch, voltage stabiliser, signal modulator and many other uses. Positive-doped layers are termed P and negative-

doped layers are termed N so that transistors can be NPN or PNP, operation of one being the inverse of the other. Control is achieved by allowing a small current to flow into the centre layer, called the Base, and this invokes a larger current to flow between the outer layers, the Emitter and the Collector. Transistors feature either as individual components or packed in many thousands into Integrated Circuits and form the basis of modern electronic technology. First patents were filed for a transistor as early as 1928 and again in 1934 but the first successful device is believed to have been constructed by Bell Labs in 1947.




The leads are labelled base (B), collector (C) and emitter (E). These terms refer to the internal operation of a transistor but they are not much help in understanding how a transistor is used, so just treat them as labels!

## TriState

tri-state or three-state logic allows an output port to assume a high impedance state in addition to the 0 and 1 logic levels, effectively removing the output from the circuit.

## Turnout actuator

A collective term that refers to the device that switches turnouts by means of a mechanical linkage, so that trains can be diverted from one track to another. A common example is the twin solenoid arrangement that, when pulsed with an electric current, cause the turnout throwbar to switch from one side of the track to the other. Actuators can also consist of high torque motors or servos that change the turnout direction in response to an applied control signal.

## TVS

Transient Voltage Suppressor

## Twinkling

The description given to the fast, frequent and random change of brightness of a light source. The most common example is to be found in the appearance of stars in the night-time sky which twinkle in response to random fluctuations of water vapour density in the Earth's atmosphere affecting the path of the stars' light. A MERG kit is available (kit 61, Gas Lamp Twinkler) which applies random variations of current to a connected LED thus simulating a twinkling gas lamp.