

# Microtech

The MICROTECH T1 is an advanced electronic control system which has been developed to satisfy the specific needs of turbocharged engines. It incorporates a fully featured turbo timer, auxiliary injector driver, and two outputs which can be programmed to activate at set boost levels to operate such devices as water/methanol injection, or switching nitrous oxide on or off.

## • SPECIFICATIONS

Compatibility:	for turbocharged 4-stroke or rotary engines
Voltage:	6.25 to 26 V
Amps:	100 mA (not including injectors)
MAP sensor:	0 to 22 psi
Injectors:	max. 2 x 2.4 ohm injectors in parallel max. 8 x 15 to 17 ohm injectors in parallel
Turbo Timer:	-adjustable idle-down 1 to 3 minutes -on board turbo timer off switch -output for remote turbo timer off switch -optional "turbo timer on" buzzer
Outputs:	-2 x negative trigger programmable channels -optional "channel on" buzzer for channel 2
Dimensions:	83mm(L) x 131mm(W) x 20mm(D) anodised aluminium case with mounting brackets

## • INSTALLATION

\*To prevent injury or damage, disconnect the negative terminal of the vehicles battery before commencing installation.

1. Find a suitable mounting position for the T1, allowing enough clearance to be able to read the indicators and access the adjustment trimpots and turbo timer off switch.

2. Mark the screw locations and drill the holes with a 1/8" drill bit. Screw the T1 into position using short self-tapping screws.

3. Find a good earth point on the vehicle chassis, and connect an earth wire to "gnd" terminal on the screw-in connector strip. DO NOT over-tighten screws, as this may break the wires.

4. Connect the "12v" terminal to an ignition (switched) power source.

5. Connect the "inp" terminal to the (-) side of the coil.

6. Find a suitable mounting position for the turbo timer relay, mount a standard 4-pin automotive relay, and connect up as follows (refer DIAG. 1);

## ● OPERATION

The MICROTECH T1 operates by collecting information on engine revs and turbo boost pressure, and using this information to switch on auxiliary injectors and/or accessories under certain engine conditions. Since the T1 can be used on any turbocharged engine, it first needs to be set for the type of engine it is fitted to. Refer to DIAG 2., and set the 4-way "CYL SET" dipswitch (refer DIAG 3.) to the appropriate setting for your engine: 4, 6, 8, or 12 cylinder. Rotary engines should be set to 4 cylinder position.

The T1 is now ready to be programmed.

### 1. TURBO TIMER

A turbocharger is a precision piece of engineering which is capable of spinning at speeds up to 100,000 rpm, and may reach temperatures as high as 750 C. In order to sustain operation under these extreme conditions, a constant supply of fresh oil is necessary for the bearings and to aid in heat dissipation. When the engine is shut off, supply of lubricant to the turbocharger instantly ceases, and if conditions are still too harsh this can result in seized bearings or thermal distortion.

By using a turbo timer, the engine is kept running for a short while after the key has been turned off, allowing the turbocharger time to normalise with a flow of fresh lubricant to the bearings until a safe temperature has been reached. A driver may forget to idle the turbo down, but a turbo timer never will!

The T1 turbo timer allows you to set the duration of the idle down period anywhere in the range of 1 to 3 minutes. Using a screwdriver, adjust the trimpot labelled "IDLE TIME" (refer DIAG 3.), turning:

- anti-clockwise for shorter period (fully anti-clockwise = 1 min.)
- clockwise for longer period (fully clockwise = 3 min.)

When the key is turned off, the "TIMER ON" light (refer DIAG 3.) will come on, and the engine will continue to run for the period you have set. The TIMER ON light and the optional buzzer if fitted will be on for the duration of the period. Pushing the "TIMER STOP" switch (refer DIAG 3.) will stop the engine in case of emergency. (NOTE: the remote turbo timer off switch is exactly the same as the on-board switch.) If you wish to drive again while the engine is still idling down, simply turn the key back on and press the turbo timer off switch to reset the turbo timer.

### 2. AUXILIARY INJECTOR / CHANNEL 1

The T1 senses the ignition pulse from the vehicle's coil, and sets the auxiliary injector to fire in sequence with the engine revs at the rate of 1 pulse / rev. The switch-on point of the auxiliary injector is set by Channel 1, which means that any device set on Ch1 will switch on at the same time as the auxiliary injector (ideal for such features as water/methanol injection).

To set the switch-on point, use a screwdriver to adjust the trimpot labelled "CHANNEL 1" (refer DIAG 3.), turning:

- anti-clockwise to switch on at lower boost
- clockwise to switch on at higher boost

Adjust the trimpot up or down until the "CHANNEL 1 ON" light comes on as you reach the desired boost pressure.

Once the switch-on point has been set, the auxiliary injector and/or device on Ch1 will switch on when boost reaches the set level, stay on above that level, and switch off

-pin 30: connect to (+) side of the coil or ignition power wire at the back of the ignition switch

-pin 85 & 87: connect with 20A fuse to (+) terminal of the battery

-pin 86: connect to "tim" terminal on the T1

7.The T1 has an option which will sound a buzzer while the turbo timer is in "on" mode. To utilise this feature, install a buzzer in a suitable location, connect the (+) side to an ignition power source, and the (-) side to the "buzT" terminal on the T1.

8.The T1 also allows you to install a remote turbo timer off switch in a more convenient location. Any normally open moment switch may be used. Mount the switch, and connect to the two "rem" terminals.

9.The T1 will drive one or two 2.4 ohm fuel injectors in parallel, or up to eight 15 to 17 ohm fuel injectors in parallel.

If an auxiliary injector(s) is to be installed, it should be placed so that it injects a fuel mist into a position of high air flow. This will aid in the atomisation of the fuel, and help to ensure that all cylinders receive an even amount of extra fuel, thus preventing any cylinder from "leaning out".

The best (easiest) position for an auxiliary injector is in the boost pipe between the turbocharger and the throttle body. NOTE that if the system is intercooled, it must be a position AFTER the intercooler.

Mounting of the auxiliary injector is probably best left to a mechanic, and if you plan to perform the installation yourself, seek advice first on the best location.

Fuel supply for the auxiliary injector can now be fed by installing a T-junction into the regulated fuel supply rail.

Finally, connect the auxiliary injector wires to the two "inj" terminals on the T1.

10.The "out1" and "out2" terminals are the switching lines for devices to be driven off the two channels of the T1, ch1 and ch2. These are earth switches and should be used to switch relays. NOTE: READ "OPERATION...2. AUXILIARY INJECTOR / CHANNEL 1" BELOW BEFORE CONNECTING TO "out1"

Connect the relays as follows;-pin 85 & 87: to (+) terminal of the battery

-pin 86: to the required output terminal on the T1 ("out1" or "out2")

-pin 30: supplies 12v to the device

Connect the device as per manufacturers instructions, using pin 30 of the relay as your power source.

11.The T1 also has an optional buzzer feature on channel 2, which will sound a buzzer while ever the channel is in "on" mode. To utilise this feature, install a buzzer in a suitable location, connect the (+) side to an ignition power source, and the (-) side to the "buz2" terminal on the T1.

12.If the vehicle already has a boost pressure line fitted (eg. to a turbo boost gauge or EFI computer), cut this line at a convenient point, and install a T-piece into the line. Using 5/32" vacuum hose, connect the line to the MAP (manifold absolute pressure) sensor mounted on the opposite side of the T1 to the wiring harness.

The majority of turbocharged engines will already have a manifold pressure pick-up available, but if not, seek the help or advice of a mechanic to install one into the boost pipe or plenum chamber.

NOTE: the T1 uses MAP to operate all functions except the turbo timer, and therefore requires an accurate reading to function efficiently.

13.Check all connections, and reconnect the negative terminal of the battery. Your T1 is now installed!

again as boost drops back below it. The CHANNEL 1 ON light and the optional buzzer if fitted will both be on while ever Ch1 is switched on.

The "GAIN" trimpot (refer DIAG 3.) allows you to control the rate of the fuel being supplied by the auxiliary injector. To adjust the trimpot, turn:

- anti-clockwise for less fuel
- clockwise for more fuel (Left is Lean, Right is Rich)

### 3. CHANNEL 2

The second programmable channel on the T1 allows you to switch on a device at a different boost level to the auxiliary injector and/or Ch1. It acts completely independently of Ch1, and has no control over the auxiliary injector.

Using the "CHANNEL 2" trimpot and "CHANNEL 2 ON" light (refer DIAG 3.), follow the instructions above for Ch1 to set the switch-on point at the desired boost level for the device on Ch2. Once this is done, the T1 is fully programmed.

#### • HINTS AND TIPS

-The turbo timer buzzer output could also be used to switch a small lamp which could be mounted near the remote turbo timer off switch. Remember that this is an earth switch. Likewise, the Ch1 buzzer could switch an injector/device on indicator lamp in an easily visible position.

NOTE: any globe or buzzer used should draw LESS THAN 500mA.

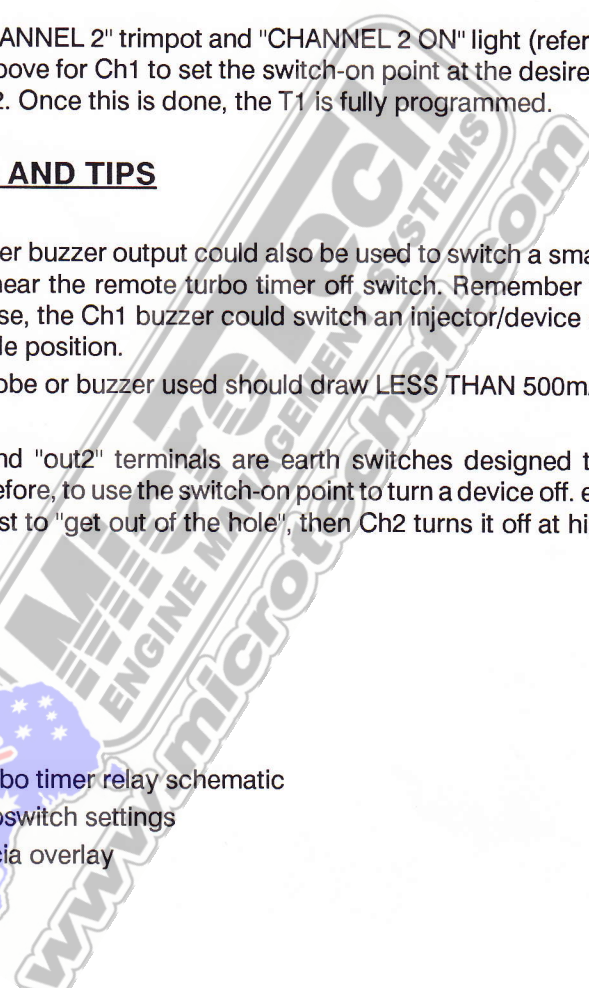
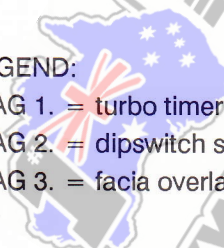
-The "out1" and "out2" terminals are earth switches designed to drive relays. It is possible, therefore, to use the switch-on point to turn a device off. eg: Ch1 turns nitrous on at low boost to "get out of the hole", then Ch2 turns it off at high boost to prevent detonation.

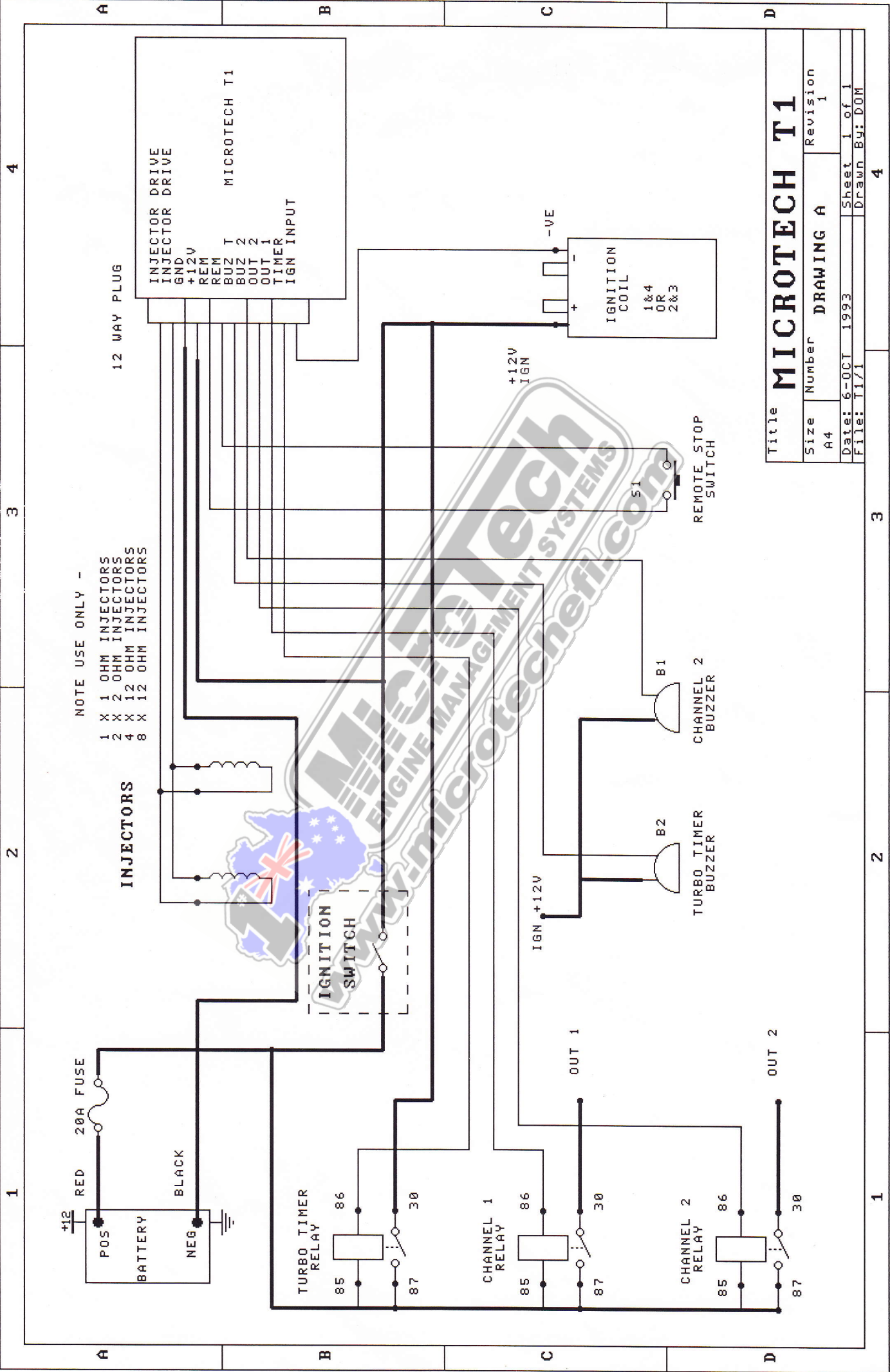
#### LEGEND:

DIAG 1. = turbo timer relay schematic

DIAG 2. = dipswitch settings

DIAG 3. = facia overlay





NOTE USE ONLY -  
 1 X 1 OHM INJECTORS  
 2 X 2 OHM INJECTORS  
 4 X 12 OHM INJECTORS

INJECTORS

12 WAY PLUG

MICROTECH T1  
 INJECTOR DRIVE  
 INJECTOR DRIVE  
 GND  
 +12V  
 REM  
 REM T  
 BUZ 2  
 BUZ 2  
 OUT 1  
 OUT 1  
 TIMER  
 IGN INPUT

TURBO TIMER RELAY

CHANNEL 1 RELAY

CHANNEL 2 RELAY

IGNITION COIL  
 1&4 OR 2&3

REMOTE STOP SWITCH

CHANNEL 2 BUZZER

TURBO TIMER BUZZER

Title		<b>MICROTECH T1</b>	
Size	Number	Revision	
A4	DRAWING A	1	
Date:	6-OCT 1993	Sheet	1 of 1
File:	TI/1	Drawn By:	DOM

4

3

2

1

A

B

C

D

A

B

C

D

4

3

2

1