

- **WARN** – If the 5 second warning period (prior to firing) has been selected in SET UP, this relay will operate during that period.
- **LASER** - This provides a short pulse (70mS), suitable for energising a laser module, for each operation of the FIRING relay
- The relay contacts will switch up to 5A at up to 250VAC. Any wiring of ancillary equipment involving voltages over 50VDC, or 35 VAC should be effected made by a qualified electrician.

LCD Display

A large character back-lit LCD display shows the status of the **CRYSTAL IT** at all times. **Note:** The back-light can be turned off via section 5 of DIPswitch 1, allowing the **IT** to be less obvious to players.

Setting Up

The first thing to do is to set whether the **CRYSTAL IT** will operate in team or solo mode. There is a DIP switch at the left of the board, just above the LCD display. Sections 3 and 4 are for selecting Red and Green respectively. A Red **IT** will hit green players and vice-versa. If both DIP switches are set to ON then the **IT** will interact with any player. **Note:** For the same reason that the LCD backlight can be switched off, DIPswitch 1 section 6 allows the Red and Green selection LEDs to be switched off.

With the LCD backlight and the Red+Green selection LEDs off, the **IT** shows no light until it starts a *Warning* or *Active* period.

All other setting up is done using the push buttons at the bottom of the board and the LCD display. To enter **Set Up** Mode hold down the > button and press/release **RST** (Reset). On releasing the button you will be presented with the first of several levels of parameter which you may edit. You may scroll through these parameters using the up and down buttons. Where the parameter is a sound, the currently programmed sound will be played. You can change any setting with the left and right buttons. Any change is automatically saved. When you reach the end of the menu, or the end of options, the LCD will start again at the beginning, vice versa if scrolling backwards. In order of appearance, the parameters are:

Unit Mode	- use the OPMODE switch to select the IT 's task
Sound	- played during the period between firing (and warning).
Warning Sound	- played during the 5 second warning period.
Active Sound	- played while the unit is outputting IR (firing).
Unit Hit	- played when the unit is hit by a player.

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Dwell Time	- the IT's inactive period – max. 250 s in 10s steps.
Active Time	- the period the unit is outputting IR (firing) – 5s max.
Player Hits	- whether or not a player may successfully fire on the unit.
Warn Period	- whether a 5 second warning is given before hostile fire.
External Trigger	- cancels cyclic activity and waits for an external trigger.
Factory Set	- initialises the IT to the factory settings (see below)
Sound Groups	- allows one of ten groups of sounds to be quickly loaded.

Factory Set Parameters

- Recharge Station
- Dwell Time = 30 seconds
- Active Time = 5 seconds
- 5 second Warn Time
- External Trigger Off
- Players may hit the **IT**.
- Sounds, although inactive in recharge mode, are set to Dwell= 13
Warn=42 Hit=31. Please refer to the list in the Sounds section below

Unit Modes (use the **OPCODE** switch to set the Unit Mode:

0 - Recharger	- Replenishes lives and shots to 'dead' players.
1 - Time Bomb	- Players in range will hear a warning on their speakers. If they have not taken cover in 5 seconds they will be 'blown up'.
2 - Wildcard	- A single life is taken from the player. Their packs is out of action for the <i>Down Time</i> period set in AtriumSL .
3 - Grenade	- Simulates a grenade – the number of lives taken depends on the setting in AtriumSL so may or may not 'kill' the player.
4 - Mine	- Always 'kills' the player, requiring a trip to <i>Recharge</i> .
5 - Invisible	- If the player hits the IT while it is active, a period of invisibility (pack lights are switched off) is received. The length of the period is variable, set in AtriumSL .
6 - Quarantine	- If a player is 'sent to jail' by a Marshall for rowdy behaviour, then he/she must stay within range of the IT until a release message is heard. The quarantine time is variable.
8 - Base Hit	- maintains compatibility with earlier systems – takes a single life.
9 - Dead By Base	- also maintains compatibility with earlier systems – strips all lives, requiring player to visit a recharge station.
A - + 50 shots	- Players hitting this target while active receive 50 extra shots.
B - + 100 shots	- Players hitting this target while active receive 100 extra shots.
C - + 10 lives	- Players hitting this target while active receive 10 extra lives.

- D - + 20 lives** - Players hitting this target while active receive 20 extra lives.
- E - Invincible** - If the player hits the IT while it is active, a period of invincibility (player cannot be hit) follows. The length of the period is variable, set in **AtriumSL**.
- F - Target only** - The **IT** does not output code, but players may hit it.
- The **CRYSTAL IT** can be supplied with or without a radio link. If the **IT** is radio-linked, then hits on the target (if allowed), will feature in the Player's score.
 - Players can only hit targets that are 'enemies' (ie red players can hit green targets) unless the target is set to global us (Red and Green DIP switches ON).

Notes:

- Dwell, Warn and Active timings are ignored when the **CRYSTAL IT** is in Recharge or Quarantine mode – the unit operates continuously.
- Player Hits (On/Off) is ignored in modes where the player is required to hit the **CRYSTAL IT**, such as **Add Shots**.
- After any editing of Set Up, restart the **IT** by pressing RST.

Operation

CRYSTAL IT has three stages of operation. During the programmable **Dwell** period it will stay dormant. If the **Warning** period is activated then the row(s) of large LEDs will pulse for 5 seconds, before the **IT** proceeds to become active. During the programmable **Active** period the **IT** will flash the row(s) of large LEDs, and if hit, the rate of flashing will increase. The current status of the **IT** is shown on the LCD.

Testing the CRYSTAL IT

To enter Test Mode hold down the < button and press/release RST (Reset). The **IT** will pulse the row(s) of large LEDs and will energise each of the relays in turn, and finally flash the Laser output. While doing this the **IT** outputs IR code, which can be monitored using a **LaserVenture Test Monitor**. After the hardware test you are prompted to zap the **IT**. If you do then the received code will be displayed and then you will be prompted < More Done >. To repeat the test press <, to quit press > or RST. If you want to quit the test at the 'Zap with Code' point simply press RST.

The Crystal IT Sound Library

50 sounds are stored in the **Crystal IT**. Any of these can be used at any stage in operation. The sounds are listed here along with group options that can easily be loaded in from *Set Up*. Where significant numbers of **ITs** are being used, to save the time involved in programming four sounds per **IT**, use the groups below the list.

- 1 Breathing
- 2 FireDweeb
- 3 FireMine
- 4 FireRoar1
- 5 Gargling
- 6 LongExplode
- 7 MonsterAttack
- 8 MonsterFeet2
- 9 RoarAndLaser
- 10 Yadda2
- 11 Birds
- 12 Computer
- 13 Footsteps
- 14 Machine
- 15 MonkMonster
- 16 RadioNoise
- 17 Rumble
- 18 Sparrow
- 19 Spooky
- 20 Spooky2
- 21 BoingUp
- 22 ClangBoing
- 23 CrashGlass
- 24 CrashLand
- 25 DaftLaugh
- 26 Heartbeat
- 27 HitHeron
- 28 Moan3
- 29 Roar1
- 30 Squeal1
- 31 Vibra
- 32 JaddaHitNoise
- 33 LaserDown
- 34 MultiBoing
- 35 TwangHit
- 36 Twitter
- 37 Alarm
- 38 WarnCycling
- 39 WarnGrowl
- 40 WarnGrowlHi
- 41 WarnHorn

- 42 WarningA
- 43 Bombwhistle
- 44 FunnyMonster
- 45 Monsterfeet
- 46 MonsterWake2
- 47 MonsterWake3
- 48 MonsterWaking
- 49 Weathersignal
- 50 WickedLaugh

Audio Program Mode

This is entered by holding down the V button and pressing/releasing RST (Reset). This is not a utility that users should ever require. If by accident you enter the Audio program mode, press RST to return to normal operation.

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