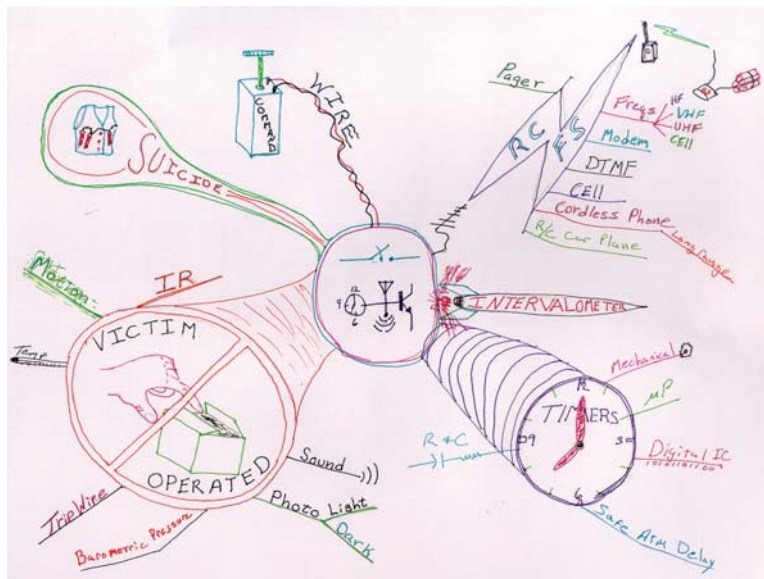


IED TRIGGER RECOGNITION GUIDE



IED Trigger Recognition Guide

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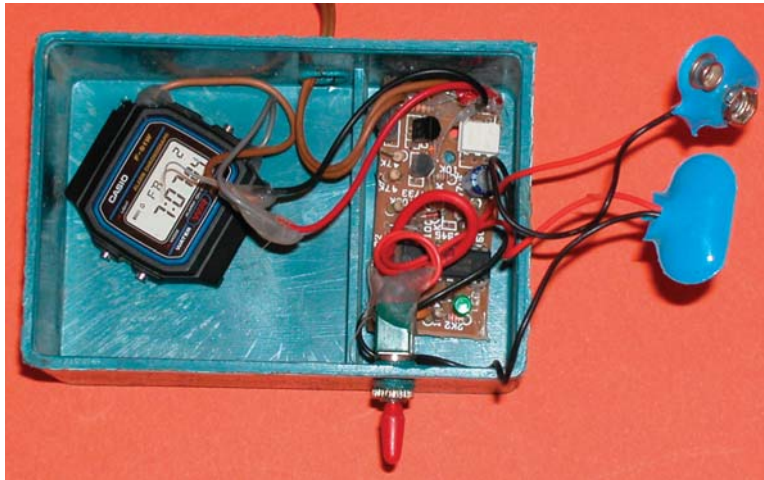
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Iraqi Devices

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Al Qa'ida Casio Watch Timer with Opto-Isolator

Recovered since mid-2002 in Afghanistan and Pakistan, this device uses an opto-isolator to interface with the Casio digital watch alarm and a safe-arm delay timer. This is a much safer circuit to use than other versions of the Casio Watch Timer (Sheets 05706 & 84071).

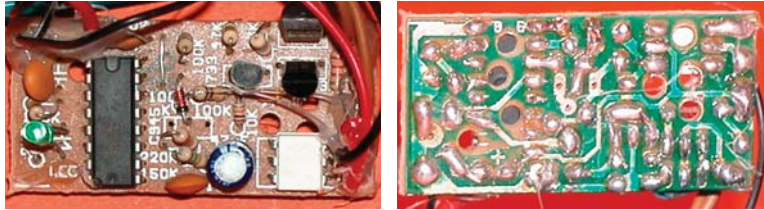


- **Time Delay:** User programmable up to 23 hours, 59 minutes in one minute increments.
- **Power Source:** Two standard 9-Volt batteries in parallel (9 Vdc) with no isolation.
- **Anti-Tamper Features:** None.
- **Watch Type:** Casio F-91W, but other digital alarm watches could be utilized.

Al Qa'ida Casio Watch Timer with Opto-Isolator
03340

Al Qa'ida Casio Watch Timer with Opto-Isolator

03340



- **Size:** The blue plastic case measures 101 mm x 67 mm x 39 mm (4.0" x 2.6" x 1.5"). The circuit board measures 52 mm x 26 mm x 1.6 mm thick (2.0" x 1.0" x 0.063" thick).
- **Circuit Base:** Type 4060 Oscillator/Divider IC for the safe arm delay timer; Type 4N25 opto-isolator for the watch interface.
- **Circuit Board Substrate:** Brown single-sided with silk screen legends.
- **Variations:** Concealed in electrical outlet boxes with toggle or key switch.



Al Qa'ida Interrupted IR Trigger

This circuit, recovered in Afghanistan in early 2002 requires modulated Infra-red (IR) to hold the output off. When the IR is interrupted, the output triggers. Construction is similar to the Al Qa'ida Light/Breakwire Trigger (Sheet 27155).



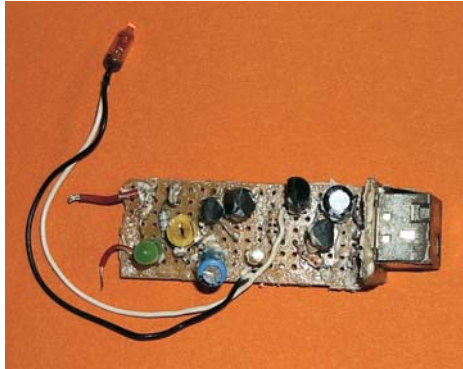
- **Trigger:** Loss of an infra-red (IR) beam with digital modulation in the 40-60 kHz range.
- **Safe-Arm Delay:** Variable, but with a maximum of only about ten seconds.
- **Power Source:** No power source was recovered. A standard 9-volt battery would be suitable to operate the circuit for about one day.

- **Size:** The overall package measures 67 mm x 20 mm x 21 mm thick (2.64" x 0.79" x 0.83" thick).

Al Qa'ida Interrupted IR Trigger

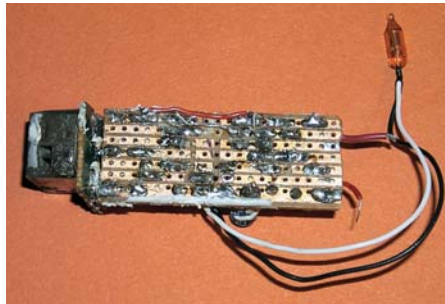
05250

Al Qa'ida Interrupted IR Trigger



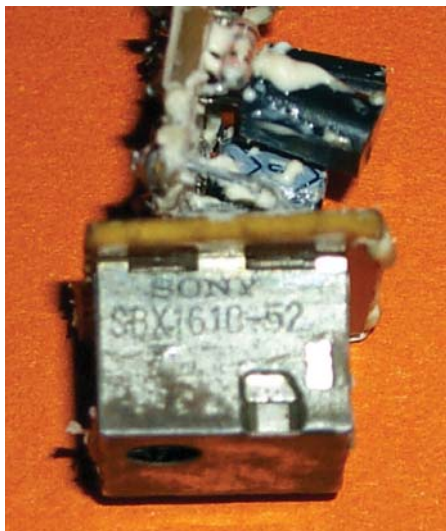
- **Anti-Tamper features:** None.
- **Concealment:** None.
- **PC Board Substrate:** The trigger circuit is assembled on 1.6 mm (0.063")

thick epoxy-fiber-glass experimenter board with parallel strips of copper conductors over holes on 2.5 mm (0.100") centers.



- **Circuit Base:** Sony IR receiver module, model SBX1610-52.

Note: This circuit could be easily configured to trigger on the presence of an IR signal, rather than the loss of signal.



05250

Al Qa'ida Casio Watch Timer

Timers built using a Casio watch were first seen in early 2000. The device detects the watch alarm output to trigger the device. Several varieties of alarm detector circuitry have been seen (Sheets 03340 & 84071) with this being the simplest. Time delays up to 23:59 can be achieved.

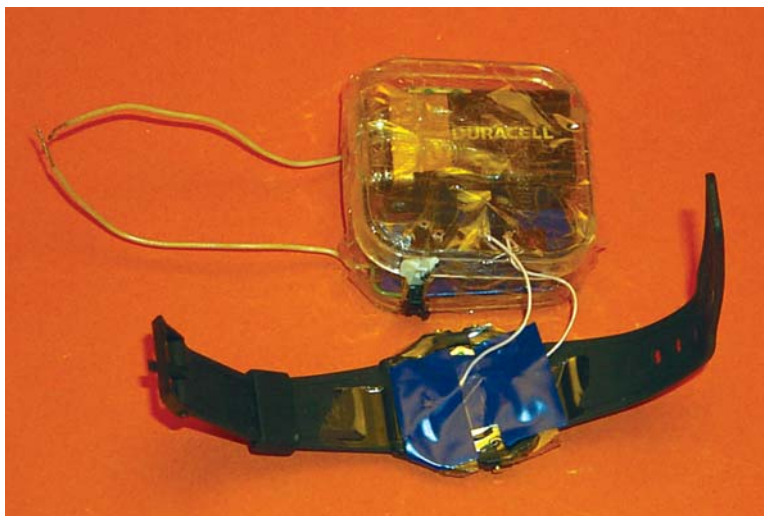


- **Time Delay:** User programmable up to 23 hours, 59 minutes in one minute increments.
- **Power Source:** Standard 9-Volt battery, connected through a slide switch on the side of the case, is used to power the detector circuit and detonator. The watch operates on its internal battery.
- **Anti-Tamper Features:** None.

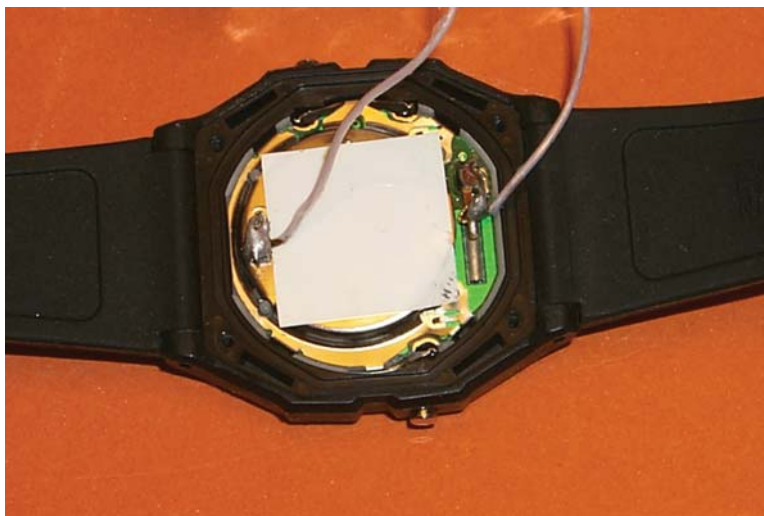
Al Qa'ida Casio Watch Timer

05706

Al Qa'ida Casio Watch Timer

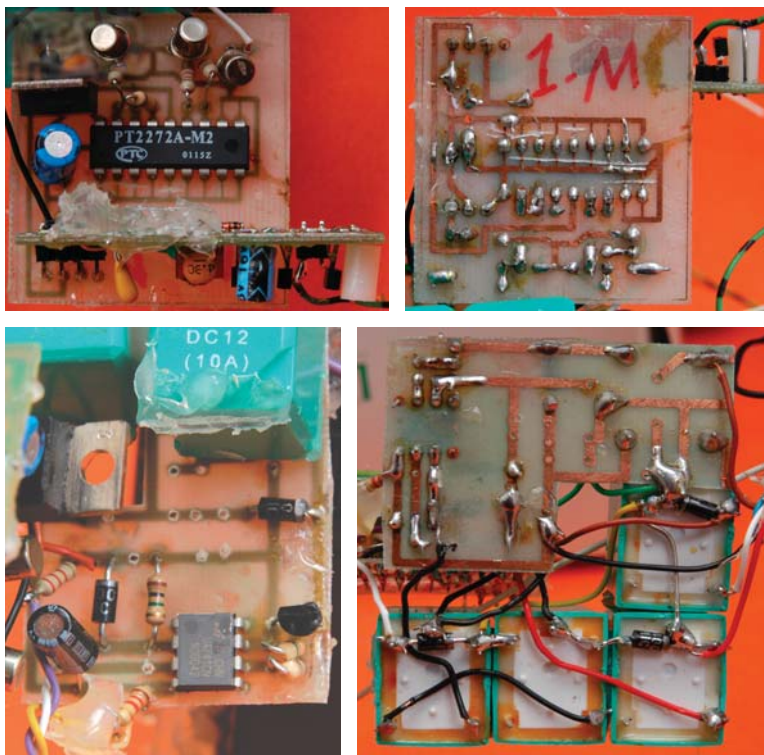


- **Watch Type:** This device used a Casio F-91W, but other digital alarm watches could be utilized.
- **Size:** The plastic case containing the battery and detector components measures 57 mm square x 16 mm thick (2.25" square x 0.63" thick).



05706

Iraqi Car Alarm R/CFS



- **Battery Life:** The batteries shown will operate the receiver for about 14 days.
- **Size:** RF receiver circuit board is 50 mm x 18 mm x 1.6 mm (2.0" x 0.70" x 0.063"); address decoder board is 45 mm x 41 mm x 0.5 mm (1.8" x 1.6" x 0.020"); ell-shaped relay board is 60 mm x 50 mm x 0.6 mm overall (2.4" x 2.0" x 0.024")

06920



Iraqi R/CFS Receiver with Ten Addressable Outputs

Recovered in Iraq in mid-2003, This system consists of two assemblies, a model RX46 receiver and a model M461 sequencer. It uses a modified commercial pager as the RF receiver with additional circuits to decode the received non-standard DTMF codes. The unit is capable of independent control of ten outputs. All markings on both assemblies are in English.

- **Safe-Arm Delay:** None.
- **RF Frequency:** 156.500 MHz with narrowband FM modulation.
- **Operating Range:** No transmitter was recovered with the receiver system.

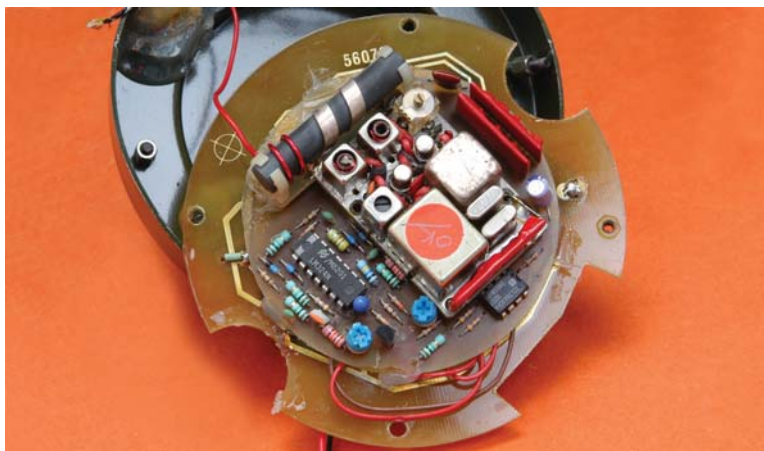


Iraqi R/CFS Receiver with Addressable Outputs
07863

Iraqi R/CFS Receiver with Addressable Outputs

07863

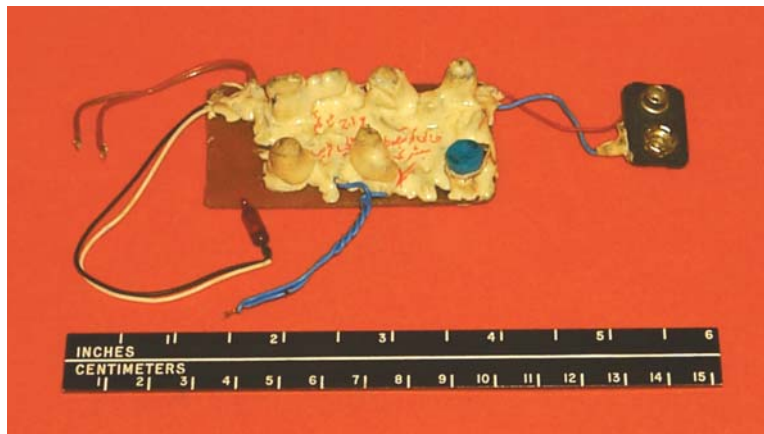
- **Command Signal:** Single non-standard DTMF tone pair for each of the ten outputs. Ten of sixteen possible codes are used. The battery saver cycle in the receiver assembly requires the DTMF code to be received for at least two seconds.
- **Anti-Tamper Features:** None.
- **Size:** Each of the two cylindrical assemblies is about 11 cm diameter by 6 cm thick (4.3" diameter x 2.4" thick). The system weighs about 900 grams (2 pounds.).
- **Power Source:** The receiver is powered at 6.0 Vdc by an internal pack of four AA cells. The sequencer is powered at 18.0 Vdc by two 9-Vdc batteries wired in series. The 0.8-meter (31") cable must be connected between the two assemblies for the system to operate.
- **Battery Life:** The system will operate for about 500 hours, limited by the four AA cells in the receiver assembly.



Al Qa'ida Digital Watch and Breakwire Trigger

This device was recovered in Afghanistan in 2002. It will trigger when the digital watch alarm functions or when the breakwire is opened. Construction techniques of this device are similar to a number of other Al Qa'ida devices.

- **Trigger:** Alarm from a digital watch (red leads), or immediately upon opening the breakwire (twisted blue leads).
- **Concealment:** None. Both sides of the circuit are covered with hot-melt glue.
- **Safe-Arm Delay:** Variable, two minutes maximum.
- **Anti-Tamper Features:** The breakwire trigger mechanism could be utilized with a lift switch.

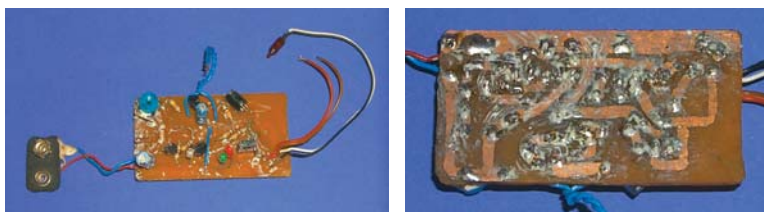


Al Qa'ida Digital Watch/Breakwire Trigger

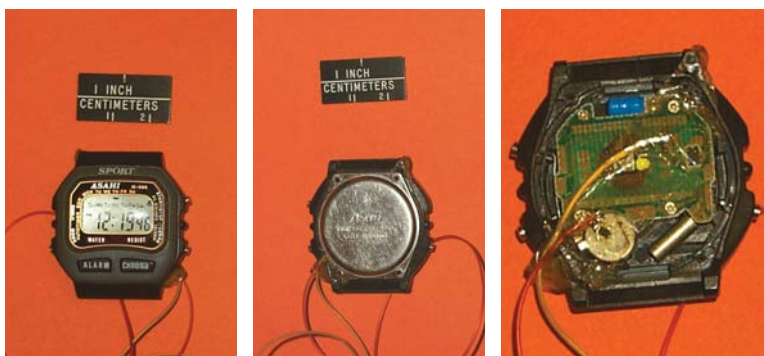
10013

Al Qa'ida Digital Watch/Breakwire Trigger

- **Power Source:** Standard 9-Volt battery assumed to power the circuit. The watch is powered by its internal SR-41 silver oxide button cell.
- **Size:** The PC board measures 70 mm x 39 mm (2.8" x 1.5").
- **PC Board Substrate:** Brown phenolic, 1.5 mm (0.060") thick, with circuit traces on one side. There are no markings on the board.



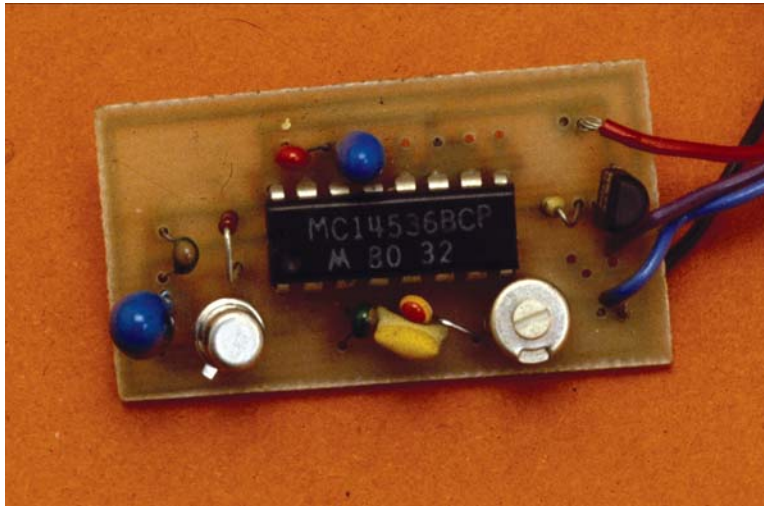
- **Digital Watch:** The digital wrist watch provided with the circuit is marked *Asahi Sport Alarm Chrono*, model number M-686. The watch measures 39 mm x 37 mm x 11 mm thick (1.54" x 1.46" x 0.43" thick).



10013

Iraqi Fixed-Delay Timer

At time of manufacture, this fixed-delay timer can be set for delays of several minutes to several hours. It was first seen in 1988 and used extensively in the 1991 Gulf War. The timer circuit has been seen in a number of different external packages.

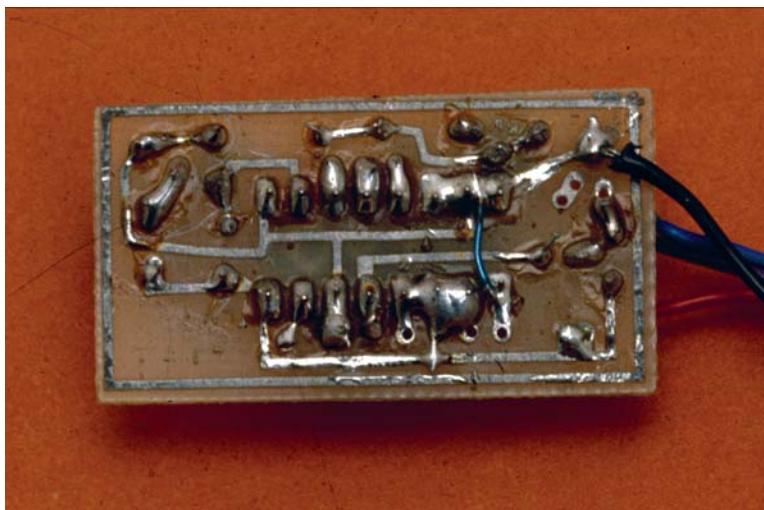


- **Time Delay:** Minutes to a few days delay possible. Generally in the range of a few hours, fixed at time of assembly.
- **Power Source:** Generally 9-Volt battery.
- **Size:** The circuit board measures 38 mm x 25 mm x 1.3 mm thick (1.5" x 1" x 0.05" thick).

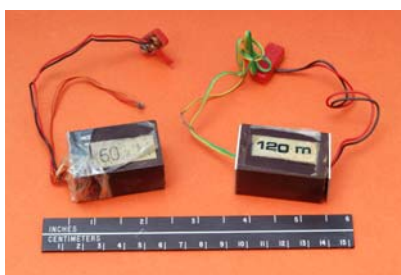
Iraqi Fixed-Delay Timer

12989

Iraqi Fixed-Delay Timer



- **Anti-Tamper Features:** None
- **PC Board Substrate:** Epoxy-fiberglass.
- **Circuit Base:** Type 4536 Oscillator/Divider IC.



- **Concealments:** None, plastic box, cylinder, etc.

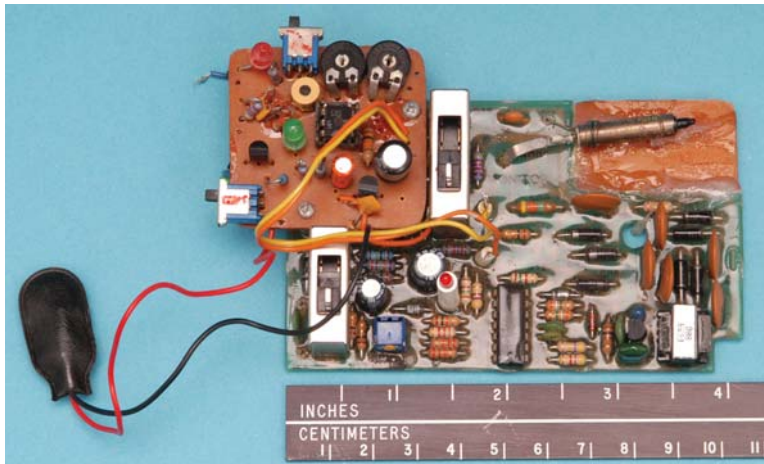


12989

Iraqi Radiation Trigger

Obtained in a Baghdad “terrorist training facility” in early 2003, this circuit triggers when the radiation source is separated from this device. The detector portion is a commercial radiation monitor. The meter signal is processed on an additional circuit board. The green LED glows when radiation is present. When the radiation source is removed, the red LED glows instead and triggers an SCR output to fire the detonator.

Iraqi Radiation Trigger



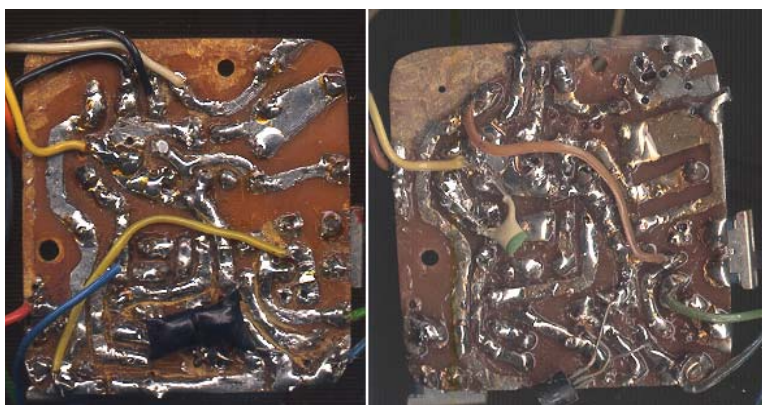
- **Safe-Arm Delay:** None.
- **Anti-Tamper Features:** The design suggests use as an anti-tamper device on a radiation source.

14536

Iraqi Radiation Trigger



- **Radiation Detector:** Monitor 4 from S.E. International, Inc.
- **Size:** The commercial radiation monitor circuit board measures 105 mm x 64 mm x 1.8 mm thick (4.1" x 2.5" x 0.07" thick). The added circuit board measures 46 mm x 42 mm (1.8" x 1.7").
- **Variations:** The added boards are electrically equivalent but vary in physical layout. One unit used the LND 714 geiger tube, while another used the LND712, which is similar but larger.

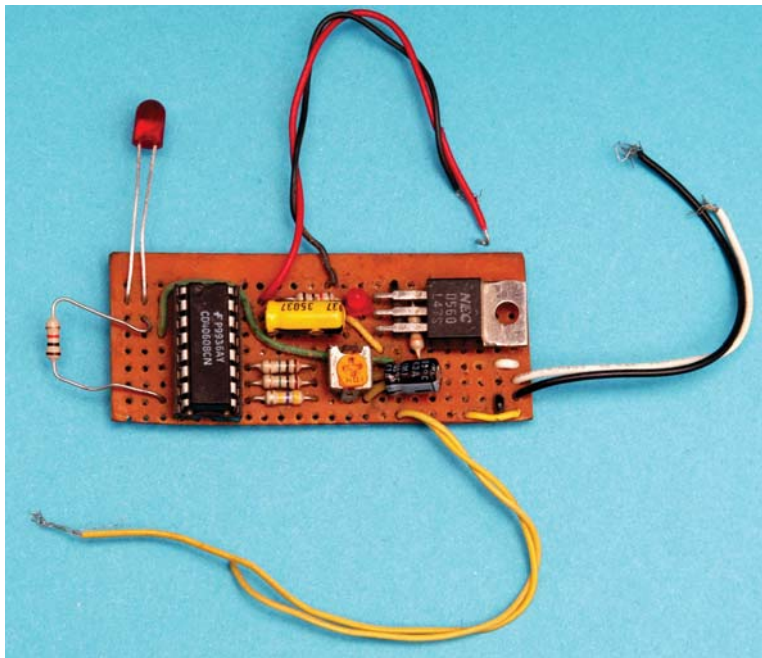


- **Power Source:** 10 to 15 Vdc.

14536

Al Qa'ida Fixed Delay Timer

These circuits were recovered in Afghanistan in late 2002. They provide a fixed time delay that can be set at time of assembly over a broad range.



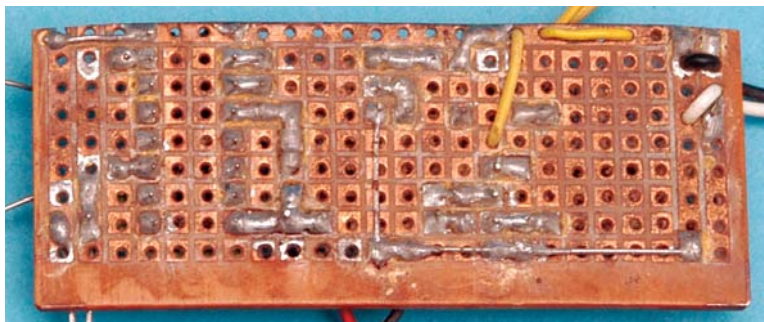
- **Safe-Arm Delay:** One minute (the counter is held at zero during this time, so the safe-arm delay is added to the timer delay).
- **Anti-Tamper Features:** None.
- **Size:** The assembly measures 63.5 mm x 25 mm x 11 mm overall (2.5" x 1.0" x 0.4" overall).

Al Qa'ida Fixed Delay Timer

16446

Al Qa'ida Fixed Delay Timer

- **Time Delay:** This circuit was set for a delay of 27 hours 10 minutes. There are ten divider output stages available from the IC, and a variable resistor in the oscillator, so a jumper can be moved to provide delays between one minute and 29 hours.
- **Circuit Base:** Type 4060 Oscillator/Divider IC.
- **PC Board Substrate:** The circuits were assembled on 1.6-mm (0.063") thick brown phenolic Veroboard with patterns of holes and conductors. This is the same substrate used for single-tone detector and DTM detector circuits (Sheets 18356 and 55493).



- **Power Source:** The circuit will operate from 3-16 Vdc. Separate power sources may be used for the timer and the detonator. A standard 9-Volt battery would operate the timer for delays of up to a week - far in excess of the maximum delay of this design.
- **Concealment:** None.

16446

Iraqi Modified Travel Alarm Clock

This modified alarm clock was obtained in Iraq in 1991. The clock uses mechanical contact closure to sound the alarm. The modification is simply to solder two black wires across those contacts as shown. This applies battery power to the load when the contacts close. The alarm on/off mechanism was immobilized in the ON position.

- **Safe-Arm Delay:** None.
- **Anti-Tamper Features:** None
- **Delay Time:** Mechanically set up to 11 hours.
- **Host:** Casio Alarm Quartz TQ-110 Travel Clock.

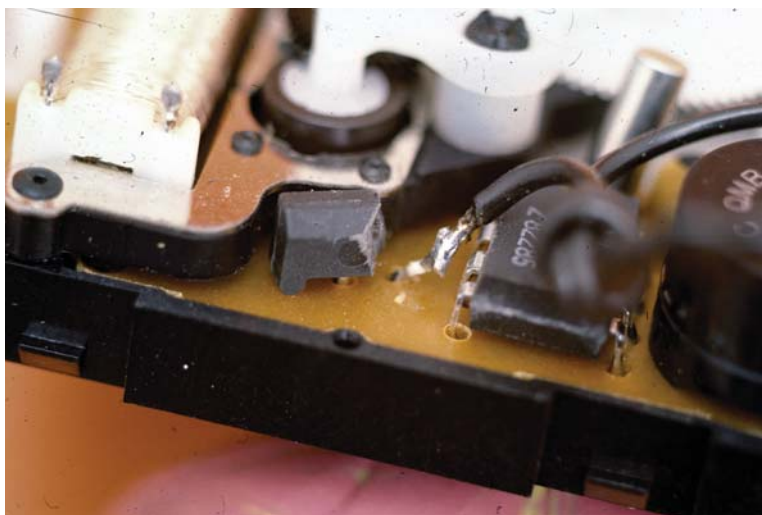
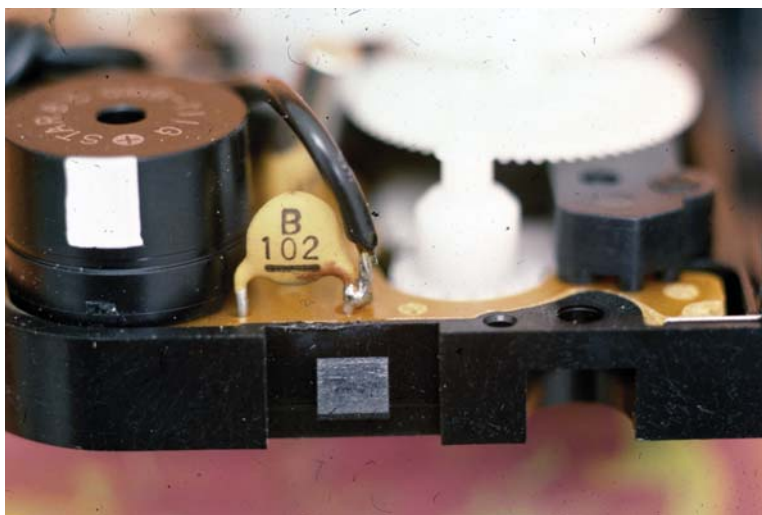


Iraqi Modified Travel Alarm Clock

18239

Iraqi Modified Travel Alarm Clock

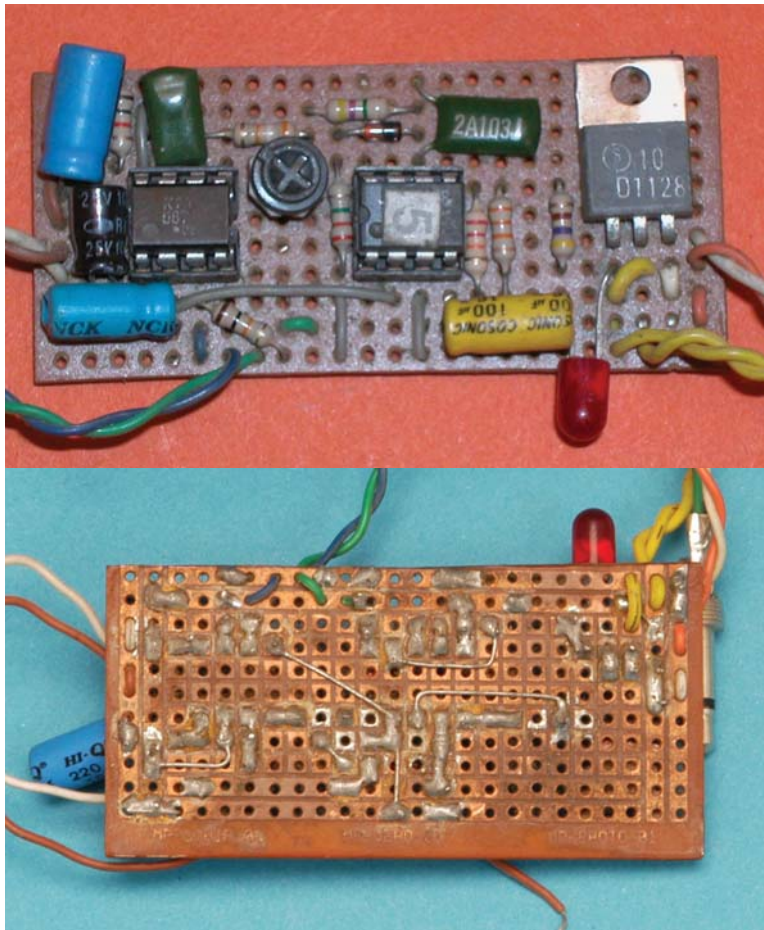
- **Power Source:** A single AA battery powers the clock and is switched across the load at the alarm set time.
- **Size:** The clock measures 60 mm square x 25 mm thick (2.4" square x 1.0" thick).



18239

Al Qa'ida Tone Detector for R/CFS

These tone detector circuits were recovered from a cache in Afghanistan in late 2002. For use with an R/CFS, all detect a single tone at about 2.2 kHz.



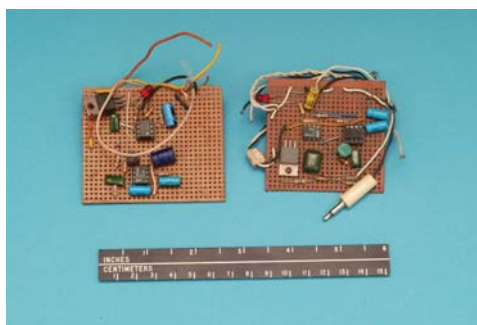
AlQa'ida Tone Detector

18356

AlQa'ida Tone Detector

- **Tone Frequency:** 2.2 kHz (corresponds to “9” in standard ZVEI code set). The tone must be transmitted for at least 80 ms.
- **Anti-Tamper Features:** None.
- **Safe-Arm Delay:** Six minutes.
- **Power Source:** Best performance at 9 Vdc.
- **Battery Life:** 48 hrs. from standard 9-Volt battery.
- **Size:** Circuits are assembled on 63.5 mm-wide brown phenolic Veroboard with a pattern of holes and conductors. Production models use about a 30 mm length of this 1.6 mm thick board (2.5” x 1.2” x 0.063” thick).

- **Variations:** Some circuits were found assembled with different physical layouts and on larger pieces of the 63.5 mm-wide Veroboard.



18356

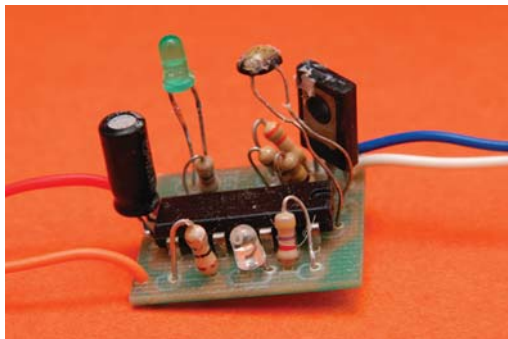
Concealed Al Qa'ida Light Trigger

Light sensitive trigger circuits concealed in fluorescent starters and telephone wall blocks were recovered in Afghanistan in 2003. The circuit is similar to light triggers on circuit boards or potted in epoxy (Sheet 80251).



- **Trigger:** Low light levels.
- **Safe Arm Delay:** In the range of 10-15 minutes.
- **Size:** The circuit board measures 25 mm x 24 mm x 1.0 mm thick (1.0" x 0.95" x 0.04" thick).
- **Anti-Tamper Features:** None.

- **Power Source:** Generally a standard 9-Volt battery. Operation from 3-20 Volts is possible.



Concealed Al Qa'ida Light Trigger

23119

Concealed Al Qa'ida Light Trigger

- **Concealments:** InstaLite fluorescent starter measuring 37 mm diameter x 34 mm high (1.5" diameter x 1.0" high); single telephone wall jack measuring 57 mm x 50 mm x 21 mm high (2.2" x 2.0" x 0.8" high); double telephone wall jack measuring 69 mm x 51 mm x 23 mm high (2.7" x 2.0" x 0.9" high).

- **Circuit Base:** Type 4001 Quad 2-Input NOR gate.

- **PC Board Substrate:** Single-clad fiberglass with green solder mask, marked *TEEPU*.



23119

Al Qa'ida Light/Breakwire Trigger with Safe-Arm Delay

These circuits were recovered in Afghanistan in early 2002. After the safe-arm delay, light will trigger the device. Two wires from the device must be shorted to prevent immediate detonation - opening these wires, even while dark, will trigger the device. This short could take the form of a breakwire or switch, and could be intended as a booby trap.



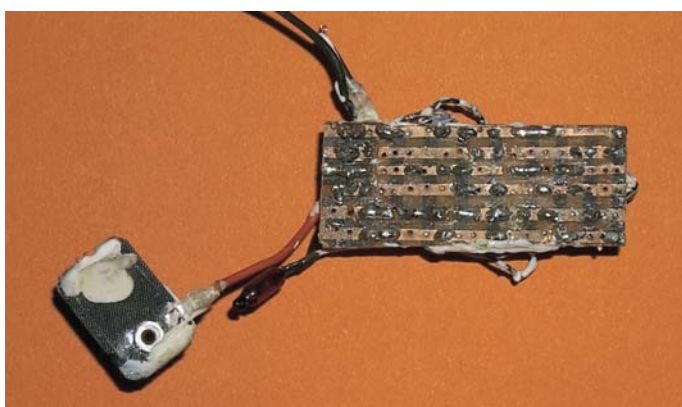
- **Trigger:** Variable sensitivity to light, or breakwire.
- **Concealment:** None. Both sides of the circuit are covered with hot-melt glue.

Al Qa'ida Light/Breakwire Trigger

27155

Al Qa'ida Light/Breakwire Trigger

- **Safe-Arm Delay:** Variable, 45 seconds maximum.
- **Size:** The PC board measures 56 mm x 24 mm (2.20" x 0.95").
- **Anti-Tamper Features:** The breakwire trigger mechanism could be utilized with a lift switch.
- **Power Source:** Standard 9-Volt battery assumed.
- **PC Board Substrate:** Phenolic "strip style" experimenter board, 1.6 mm (0.063") thick. The PC board has an array of holes on 0.1" centers with strips of copper connecting rows of holes.



27155

Al Qa'ida Alarm Clock Timer

This modified commercial alarm clock was recovered in Afghanistan in late 2002. It uses the mechanical contact closure of the alarm to initiate a device.

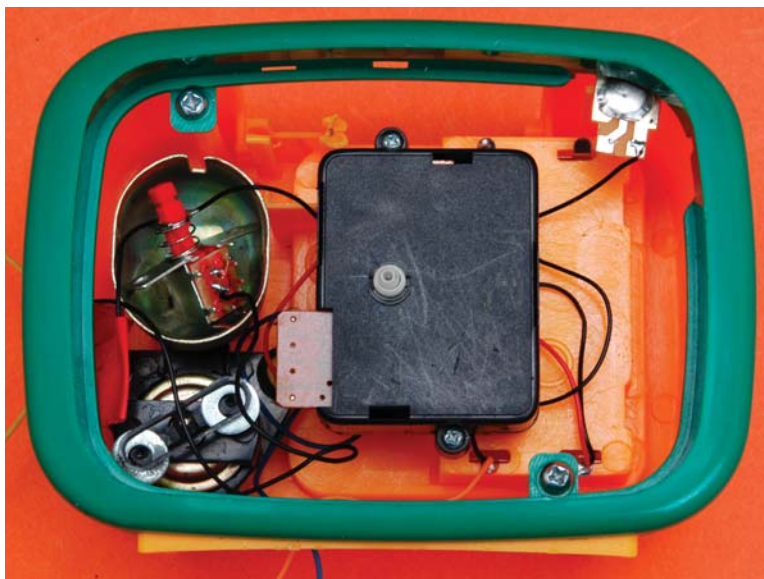


- **Time Delay:** Up to 12 hours.
- **Size:** The clock measures 115 mm x 85 mm x 60 mm (4.5" x 3.3" x 2.4").
- **Anti-Tamper Features:** None was present on this clock, but there is a switch under the clock face which activates when the clock is disassembled. This could be connected to cause initiation when the clock is disassembled
- **Variations:** This technique could be applied to a wide range of commercial alarm clocks with mechanical switch closure.

Al Qa'ida Alarm Clock Timer

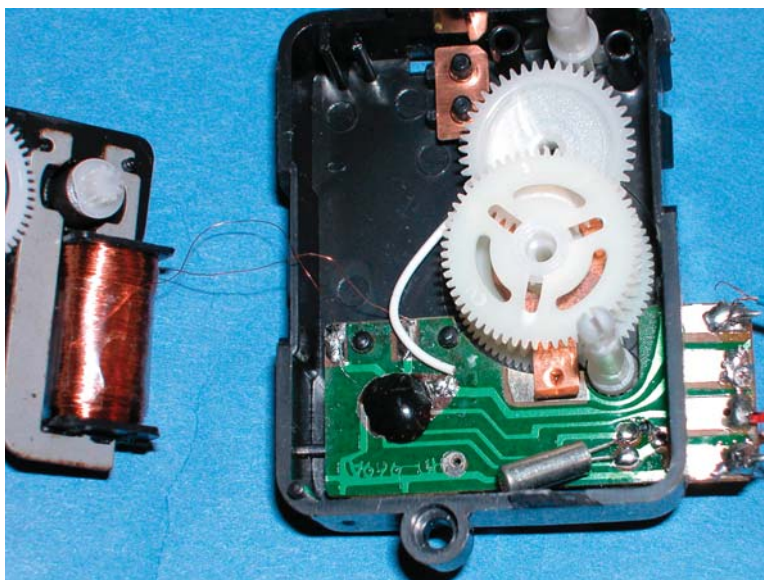
30735

Al Qa'ida Alarm Clock Timer



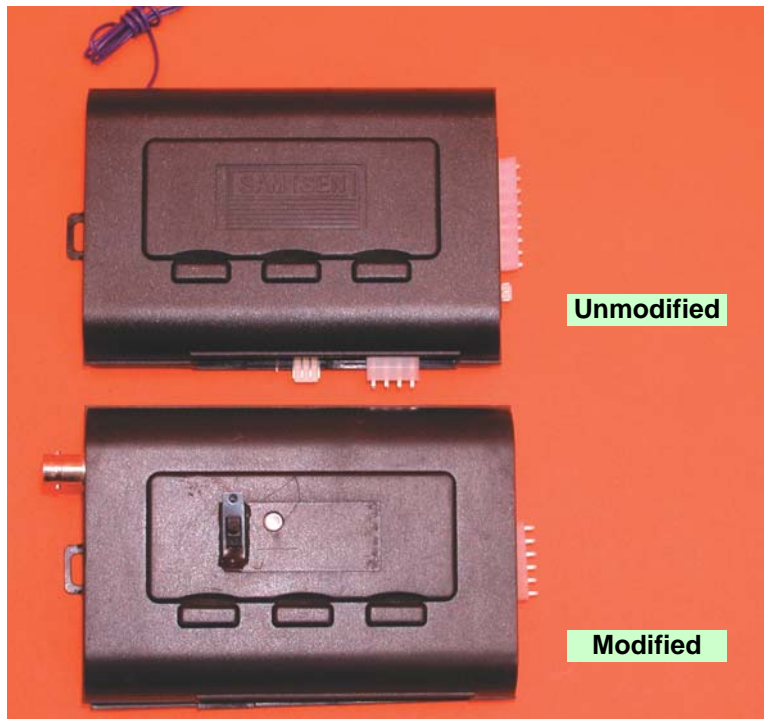
Damage to the clock housing prevented reinstallation of the alarm on/off switch (red push button DPDT switch at left).

30735



Al Qa'ida Modified Car Alarm R/CFS Receiver

This commercial car alarm receiver, recovered in Afghanistan in 2002, was modified to include an added slide switch, LED indicator, and BNC connector for the antenna. Three multi-pin connectors were replaced with a single connector.



- Safe Arm Delay: None.
- RF Frequency: 330-340 MHz.

Al Qa'ida Modified Car Alarm R/CFS Receiver

44297

AI Qa'ida Modified Car Alarm R/CFS Receiver

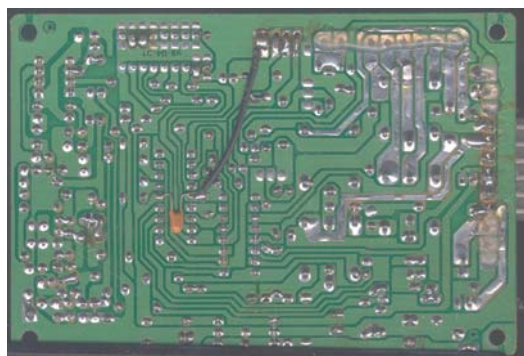
44297

- **Control Code:** 12-Bit digital.
- **Operating Range:** No transmitter was provided. A typical key-fob transmitter, generally provided with such security systems, would be very short range, possibly within the lethal radius of an IED.
- **Power Source:** Designed to operate in standard 12-Volt automobile electrical system. No power source was recovered with the receiver.
- **Size:** The case measures 125 mm x 88 mm x 32 mm thick (4.9" x 3.5" x 1.25" thick). The circuit board measures 121 mm x 81 mm (4.8" x 3.20")

- **PC Board Substrate:** Single-clad 1.6 mm (0.063") thick tan epoxy-fiberglass with green solder masking and white silk-screen markings.

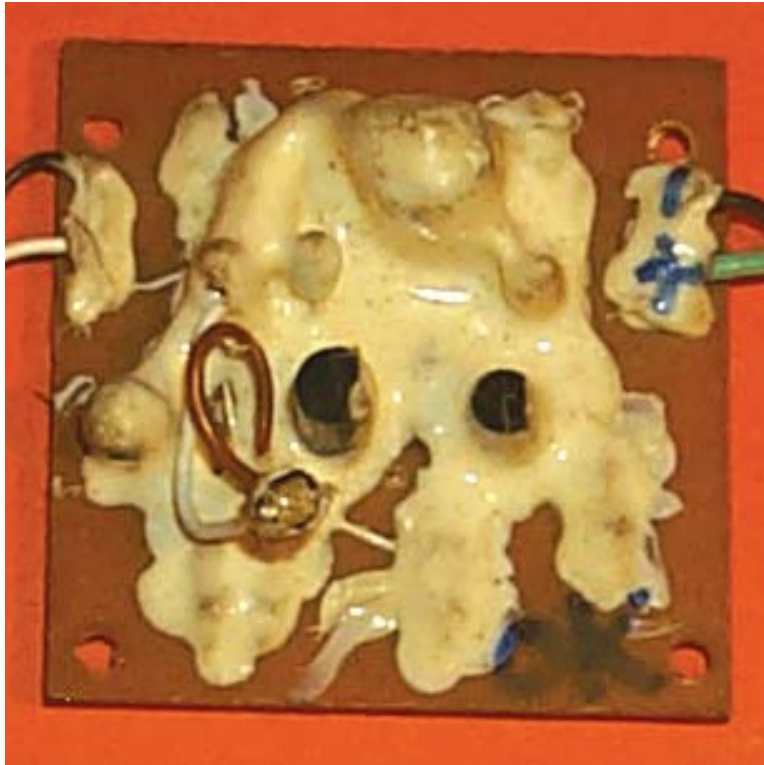


- **Concealment:** None.
- **Anti-Tamper Features:** None.



Al Qa'ida Dark Trigger with Safe-Arm Delay

Recovered in Kabul in 2002, this circuit is held off by light hitting the sensor. When the light is removed the output is triggered. The circuit board is identical to that used for a light trigger circuit (Sheet 88107).



- **Trigger:** Nearly total absence of light.
- **Safe Arm Delay:** 5 minutes.

Al Qa'ida Dark Trigger

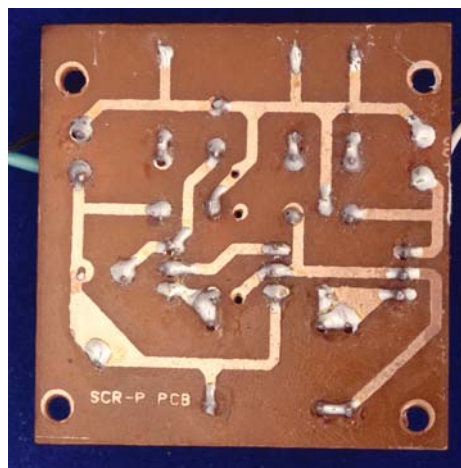
49060

Al Qa'ida Dark Trigger

- **Size:** 51 mm x 50 mm x 17 mm overall height, including components (2.0" x 2.0" x 0.7").
- **Concealment:** None. Both sides of the circuit board are covered with hot-melt glue.
- **Anti-Tamper Features:** None.
- **Power Source:** Standard 9-Volt battery assumed. Battery life is about 15 hours.



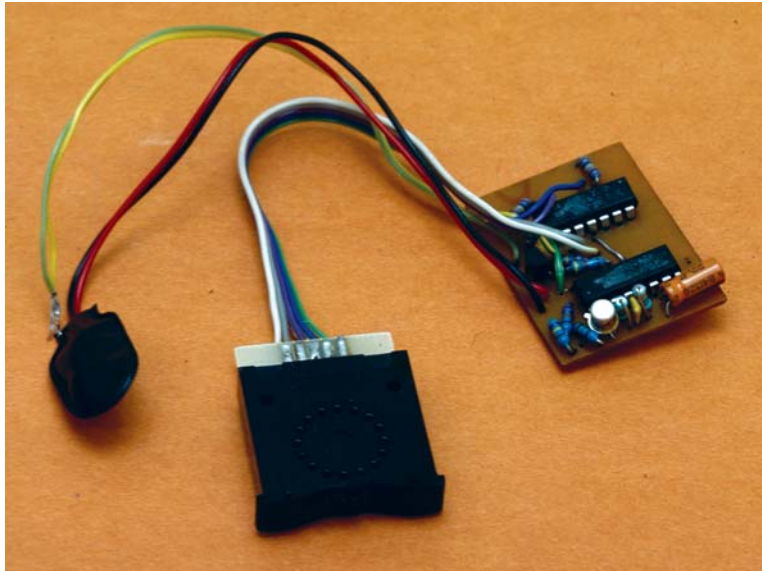
- **PC Board Substrate:** Single-clad phenolic, 1.5 mm (0.060") thick. Marked SCR-P PCB.



49060

Iraqi Programmable Timer

This timer was first recovered during the Gulf War in 1991. It is controlled by a sixteen-position thumbwheel switch to select the number of divider stages used in establishing the time delay. Delay times can be set by the user over a range of 30 seconds to nearly two weeks.



- **Time Delay:** Minutes to several days delay, selected by sixteen-position thumbwheel switch. With the switch set to "0", the base time delay is generally set in the range of 30-45 seconds. Each click of the switch doubles the delay, to a maximum, at "F", on the order of 11-17 days.
- **Anti-Tamper Features:** None

Iraqi Programmable Timer

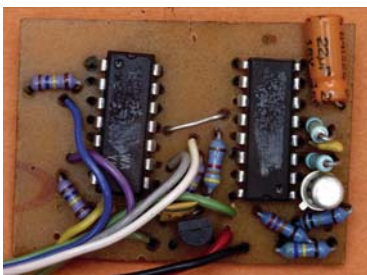
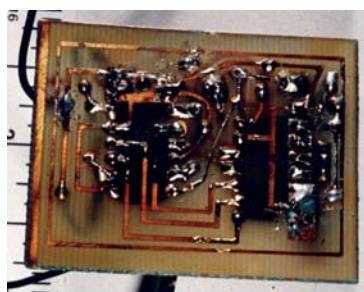
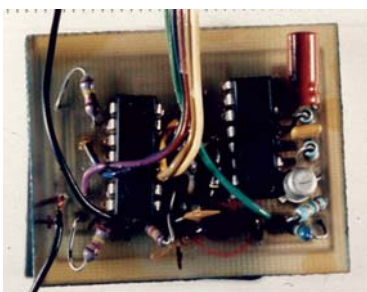
54433

Iraqi Programmable Timer

- **Power Source:** Generally 9-Volt battery.
- **Size:** The circuit board measures 53 mm x 42 mm x 1.3 mm thick (2.1" x 1.7" x 0.050" thick).
- **PC Board Substrate:** Epoxy-fiberglass or phenolic.
- **Circuit Base:** Type 4536 Oscillator/Divider IC.
- **Concealments:** None, though some are wrapped in masking tape.



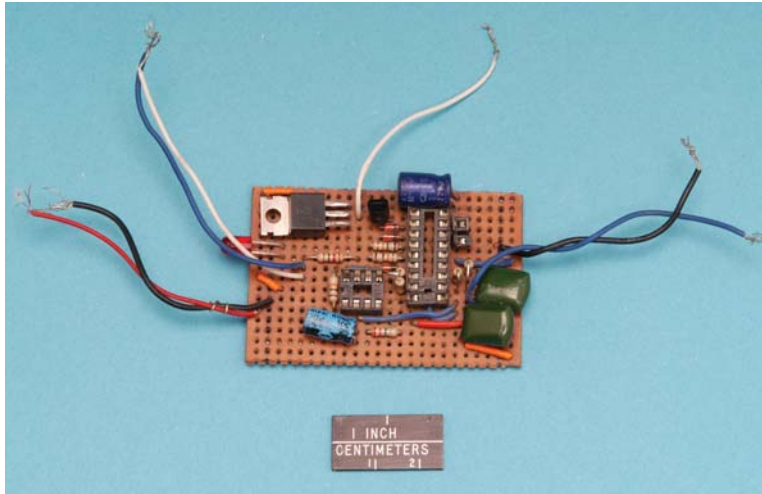
The circuit layout is comparable to the fixed-delay timer (Sheet 12989), except that the number of divider stages is controlled by the sixteen-position (hexadecimal - base 16) thumbwheel switch, marked 0-9, A-F.



54433

Al Qa'ida Single DTMF Decoder for R/CFS

These circuits were recovered from a cache in Afghanistan in late 2002. The integrated circuits had not yet been installed in the devices. Fully populated, the circuit will perform as a DTMF ("touch tone") decoder for use in an R/CFS. They will activate on a single DTMF code.



- **Safe-Arm Delay:** Three minutes.
- **Activation Code:** Single DTMF code.
- **Anti-Tamper Features:** None.
- **Size:** The assembly measures 63 mm x 43 mm x 11 mm overall (2.5" x 1.7" x 0.4" overall).

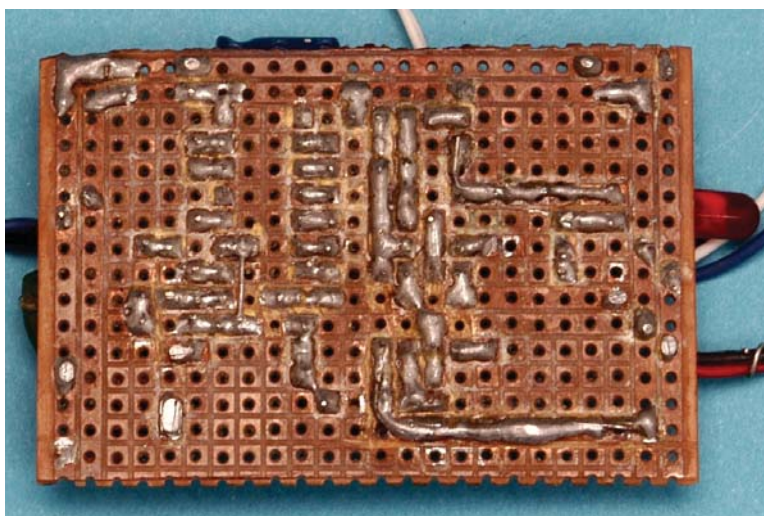
Al Qa'ida Single DTMF Decoder for R/CFS

55493

AI Qa'ida Single DTMF Decoder for R/CFS

55493

- **Circuit Base:** Type MT8870 DTMF Decoder.
- **PC Board Substrate:** The circuits were assembled on 1.6-mm thick brown phenolic Veroboard with patterns of holes and conductors. This is the same substrate used for single-tone detector circuits (Sheet 18356).

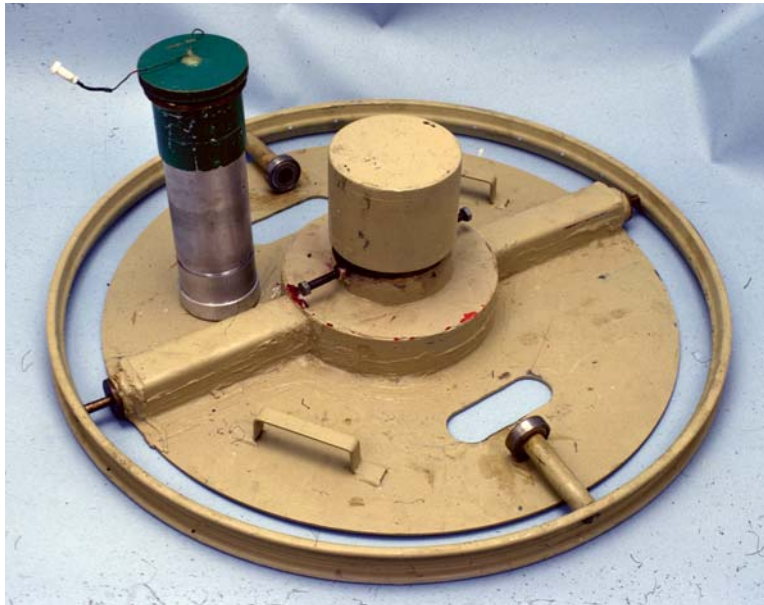


- **Variations:** Since the circuits are assembled on experimenter board, there may be slight differences in the physical layout of each.
- **Power Source:** 5-7 Volts limited by MT8870 IC. A separate power source is used for the detonator.
- **Battery Life:** A 6 Vdc battery pack consisting of four "AA" alkaline cells will provide one week of operational life.
- **Concealment:** None.

Iraqi Improvised Sea Mine

Several of these devices were recovered in Iraq in 1991. It is designed to fit into a 55-gallon drum with a TNT charge. The safe-arm delay is an Iraqi fixed delay timer with C-D output (Sheet 88717). The large timer, designed for SAS by a British firm, is used to destroy the mine at end of mission.

- **Trigger:** Shock on the horizontal axis. Spring-loaded plungers operate one of two microswitches to complete the detonator circuit.
- **Anti-Tamper Features:** None.



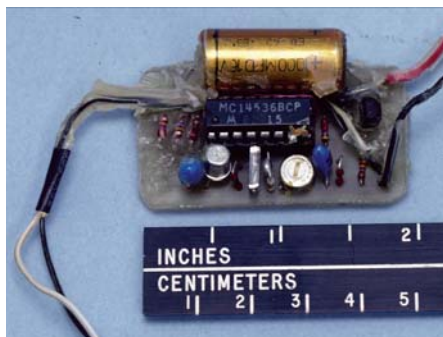
Iraqi Improvised Sea Mine

57286

Iraqi Improvised Sea Mine

- **Safe-Arm Delay:**

Adjustable at assembly from minutes to days (see Sheet 88717). Recovered devices had safe-arm delays of one to two hours.



- **Size:** The bicycle wheel is 65 cm (25.6") outside diameter. The safe-arm timer measures 61 mm x 32 mm x 16 mm (2.4" x 1.2" x 0.6") overall in the heatshrink tubing. The end-of-mission timer measures 134 mm long x 56 mm diameter (5.3" x 2.2" diameter).

- **End of Mission Timer:** Delays may be set with thumbwheel switches between a minimum of one minute and a maximum of 99 days, 99 hours, and 99 minutes, in one minute increments.

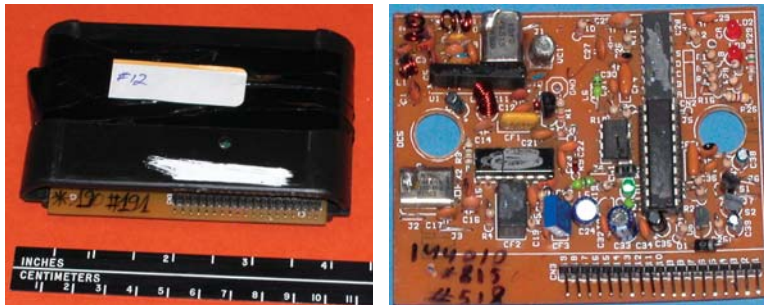
- **Power Source:** The safe-arm delay timer operates from a standard 9-Volt battery. The end-of-mission timer has an internal 6-Volt battery pack consisting of four AA cells.

57286



Al Qa'ida R/CFS Receiver in SEGA Game Cartridge

The receiver portion of the R/CFS is concealed in a SEGA game cartridge. First recovered in Pakistan in September 2002, there are several versions of this receiver. The device can be readily recognized by the 19-pin header connector, rather than the card edge connector used with a game cartridge.



- **Concealment:** SEGA game cartridge.
- **Safe Arm Delay:** 5 minutes (green light flashes during delay).
- **RF Frequency:** 143.940 to 144.090 MHz.
- **Control Code:** Sequential standard DTMF codes (independent control of two detonator outputs). The RF frequency and control codes are written on the edge of the circuit board beside the connector.
- **Anti-Tamper Features:** None.

Al Qa'ida R/CFS Receiver in SEGA

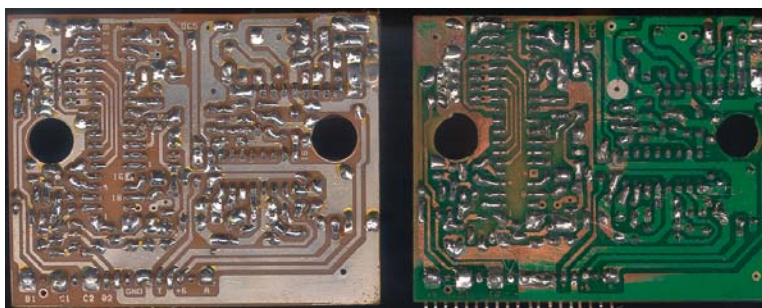
59133

AI Qa'ida R/CFS Receiver in SEGA



- **Power Source:** 9-12 Vdc.
- **Size:** The game cartridge measures 107 mm x 70 mm x 18 mm thick (4.2" x 2.8" x 0.7" thick). the printed circuit board measures 88 mm x 70 mm x 1.6 mm thick (3.5" x 2.8" x 0.063" thick).
- **Anti-Tamper Features:** None.
- **Circuit Board Variations:** Boards are single-clad of brown phenolic or green epoxy-fiberglass. The boards are specifically designed to fit into the SEGA game cartridge concealment, with holes to clear the screw bosses on the housing. Boards have been seen with black silk screen markings for component placement, as well as the more common white. Some boards have green solder masking applied to the trace side.

59133



Al Qa'ida two-DTMF Decoder for R/CFS

These decoder circuits, designed to plug into the audio jack of a standard handheld transceiver activate upon the receipt of two sequential DTMF codes, were recovered in Afghanistan in late 2002.

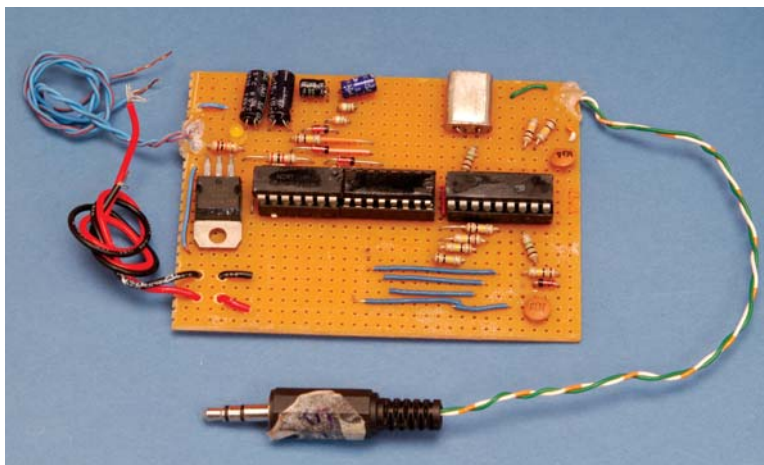


- **Safe-Arm Delay:** None.
- **Activation Code:** Two sequential DTMF codes.
- **Anti-Tamper Features:** None.
- **Size:** The assembly measures 86.5 mm x 63.5 mm x 12 mm overall (3.4" x 2.5" x 0.5").
- **PC Board Substrate:** Brown phenolic Veroboard with a pattern of holes and traces.

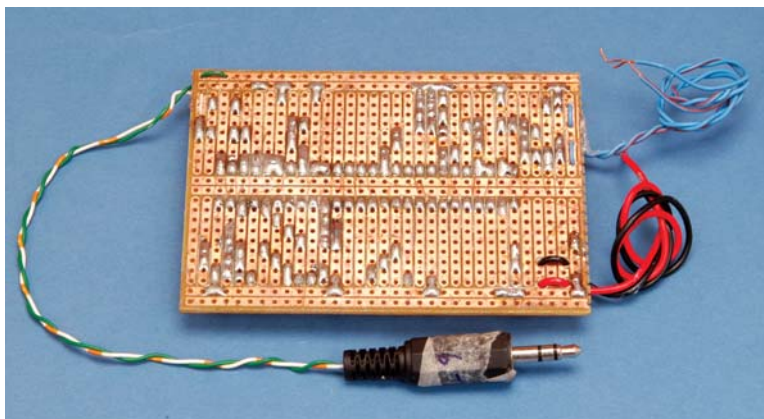
Al Qa'ida Two-DTMF Decoder for R/CFS

62166

AI Qa'ida Two-DTMF Decoder for R/CFS



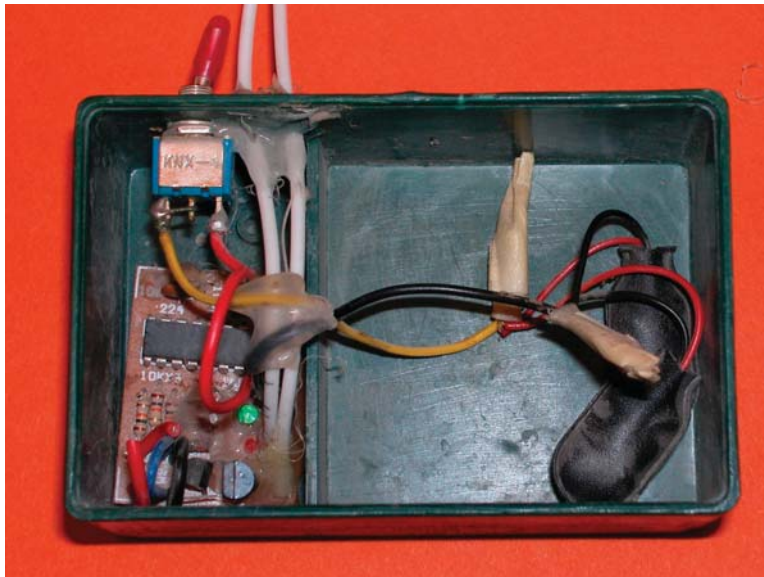
- **Circuit Base:** MT 8870 DTMF tone decoder IC.
- **Variations:** Similar circuits have been seen controlling two separate SCR latching outputs with unique codes.
- **Power Source:** 5-7 Vdc limited by the MT8870 IC.
- **Battery Life:** About 10 days with a battery pack of four series "AA" cells.
- **Concealment:** Wrapped in white bandage tape.



62166

Al Qa'ida Jumper Select Timer

Housed in an electrical switch box, this timer was recovered in Pakistan in 2002. Jumper wires on the circuit board permit the timer to be set by the user for delays of 3, 6, or 12 minutes.

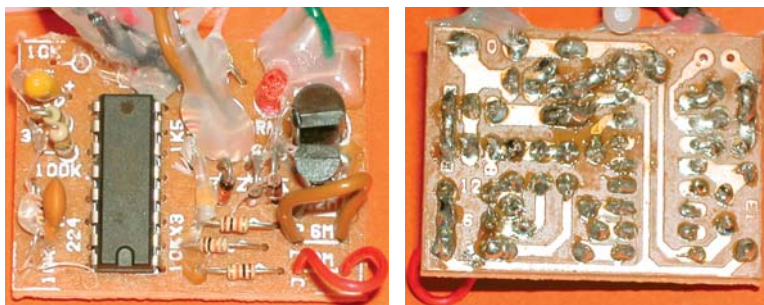


- **Safe-Arm Delay:** None.
- **Time Delay:** 3, 6, or 12 minutes, jumper selected.
- **Circuit Base:** CMOS type 4060 Oscillator/24-Stage Divider IC.
- **Power Source:** The clip for a standard 9-Volt battery is included.
- **Anti-Tamper Features:** None.

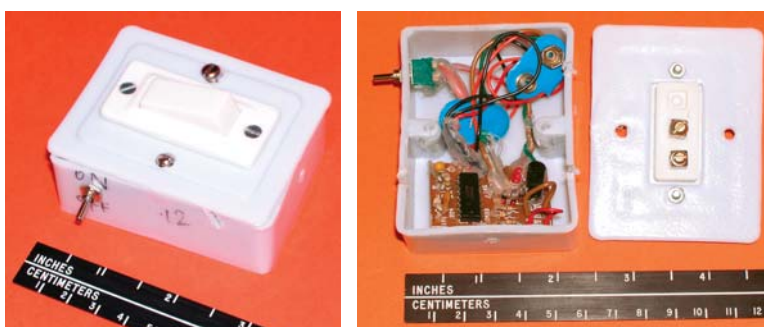
Al Qa'ida Jumper Select Delay Timer

64292

Al Qa'ida Jumper Select Delay Timer



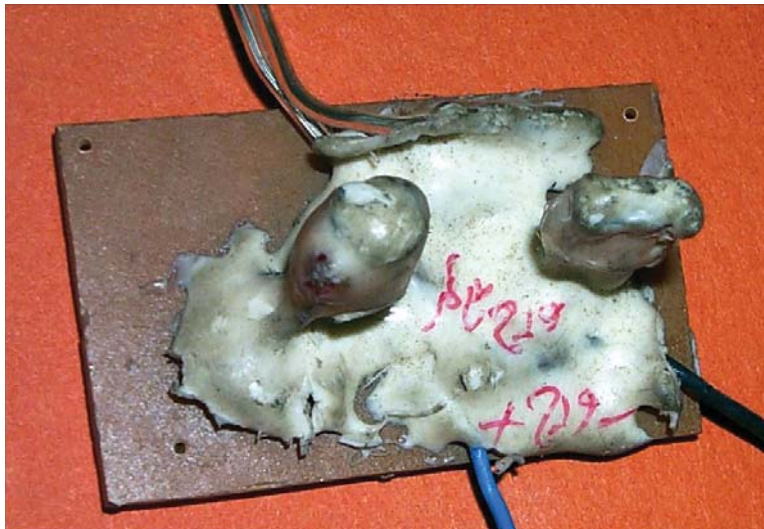
- **Size:** The dark green plastic box measures 99 mm x 66 mm x 38 mm (3.9" x 2.6" x 1.5"). The circuit board measures 40 mm x 30 mm (1.6" x 1.2").
- **PC Board Substrate:** Single-sided brown phenolic circuit board is 1.6-mm (0.063") thick with white silk screen markings.
- **Variations:** Slight variations in the physical layout of this board have been seen, with and without silk screen designations. The circuit board has also been used with other component values and no jumpers to produce a fixed 24-minute delay timer.
- **Concealments:** The circuit has also been found concealed in a light blue AC mains power switch box measuring 75 mm x 58 mm x 26 mm (3.0" x 2.3" x 1.0").



64292

Al Qa'ida Trigger Circuit

Recovered in Afghanistan, this circuit could be used to sense the output from a number of devices and fire a detonator. A watch alarm trigger is assumed. Voltage from a watch, commercial timer, etc. will fire the SCR and result in battery voltage being applied to the output leads.

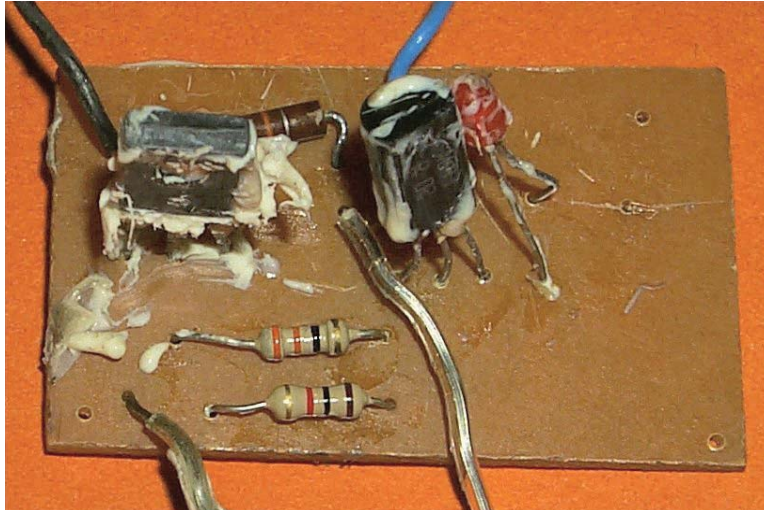


- **Safe-Arm Delay:** None.
- **Anti-Tamper Features:** None.
- **Power Source:** None supplied. Source must be sufficient to fire the detonator.
- **Size:** The trigger assembly measures 45 mm x 27 mm x 1.6 mm (1.77" x 1.06" x 0.063").

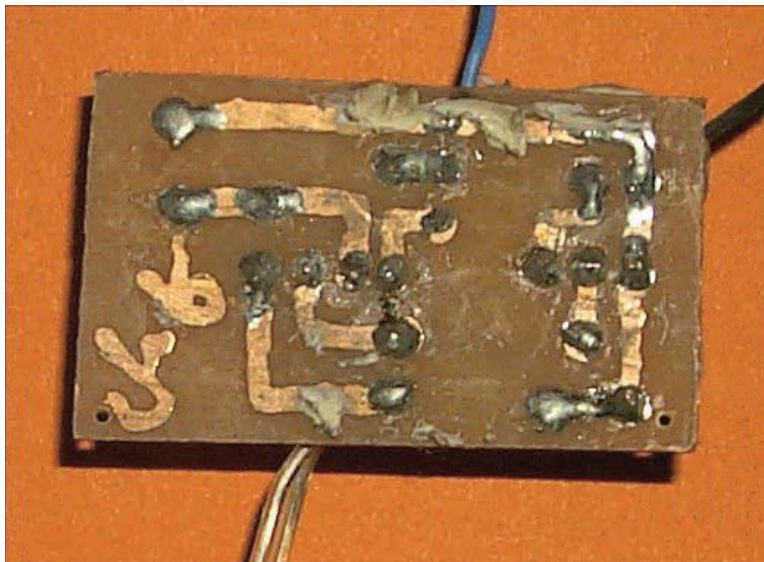
Al Qa'ida Trigger Circuit

66202

Al Qa'ida Trigger Circuit



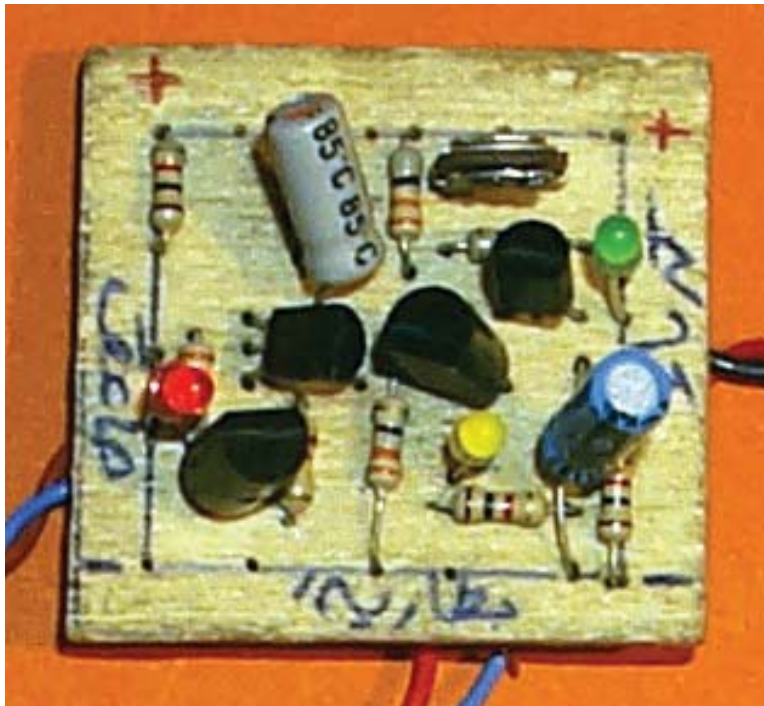
- **PC Board Substrate:** Single-sided brown phenolic.
- **Concealment:** None.



66202

Al Qa'ida Breakwire Trigger

Recovered in Afghanistan in early 2002, this crudely made circuit is assembled on a piece of plywood. Two wires from the device must be shorted together to prevent immediate detonation when the safe-arm delay expires.



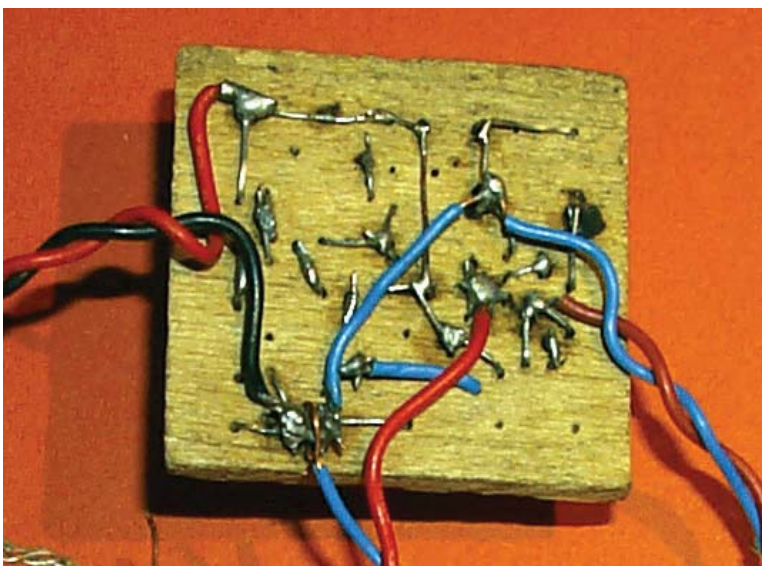
- **Power Source:** A standard 9-Volt battery is assumed. The green LED glows when power is properly applied.

Al Qa'ida Breakwire Trigger

70965

Al Qa'ida Breakwire Trigger

- **Safe-Arm Delay:** Variable to 130 seconds maximum. The yellow LED glows when the safe-arm delay has expired and the trigger is active.
- **Trigger:** Breakwire or opening of switch contacts. The red LED glows to indicate battery voltage is applied across the output leads.
- **Anti-Tamper Features:** The breakwire trigger mechanism could be utilized with a lift switch to configure a booby trap.
- **PC Board Substrate:** Plywood, 4 mm (0.16") thick, with holes drilled for component leads.
- **Size:** The PC Board measures 40 mm x 38.5 mm (1.57" x 1.52").
- **Concealment:** None.

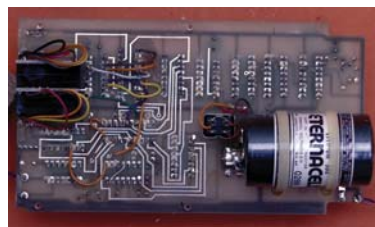
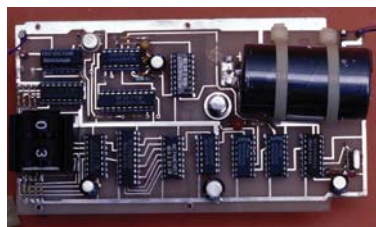


70965

Iraqi Shaped Charge Timer

This device was recovered in the Mideast in 1991. The shape of the charge suggests its intended use on oil pipelines of 122-137 cm (48"-54"). The charge is triggered by a 0-39 day timer assembled in a section of pipe. Design errors prevents the timer from functioning in many of its delay settings. The shape of the timer assembly has earned it the nickname Mushroom.

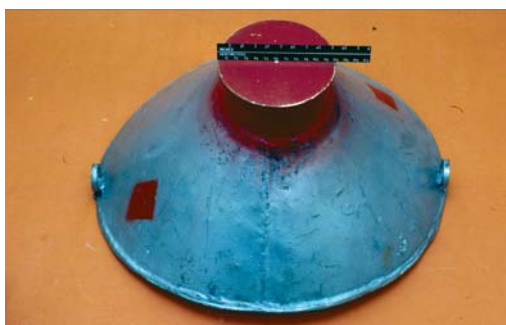
Iraqi Shaped Charge Timer



71575

Iraqi Shaped Charge Timer

- **Safe-Arm Delay:** 45 seconds.
- **Anti-Tamper Features:** None.
- **Control Key:** A magnetic plug must be installed at the end of the timer assembly for power to be applied and the timer to function. Removing this plug disconnects power from the timer and the detonator.
- **Time Delay:** Program from 1-39 days, in one day increments, before assembly on the charge.
- **Power Source:** 5.8 Vdc from two LiSO₂ D cells, connected in series, as part of the timer assembly.
- **Size:** The Timer assembly is about 280 mm long x 140 mm maximum diameter (11" x 5.5" diameter). The shape charge is about 36 cm (14") diameter with a capacity of 8 kilograms (18 pounds) of explosive.



71575

Iraqi Single-Tone R/CFS

Recovered in Iraq in 1995, this system was targeted against the Kurds in the north. It uses modified ICOM IC-2GE transceivers for the actuator and target receiver. The system uses a single audio tone as the command signal.

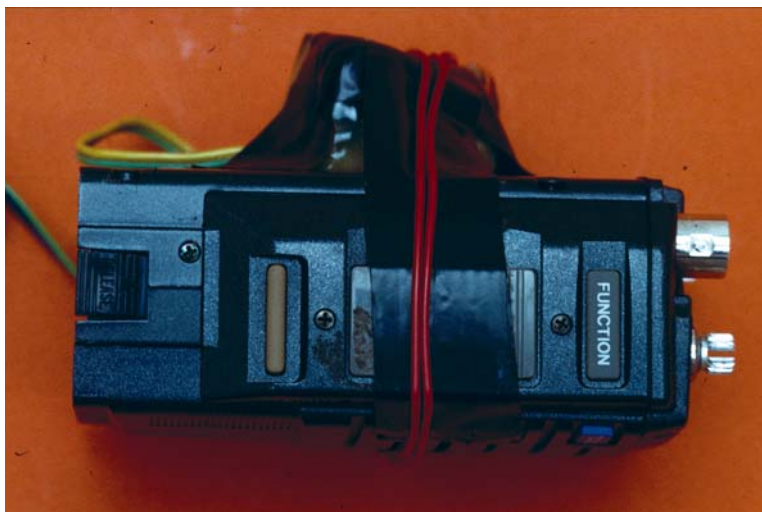
- **Safe-Arm Delay:** None.
- **RF Frequency:** ~145 MHz determined by ICOM.
- **Control Code:** 2800 Hz tone (ZVEI tone A).
- **Operating Range:** Up to 2 kilometers (1.2 miles).



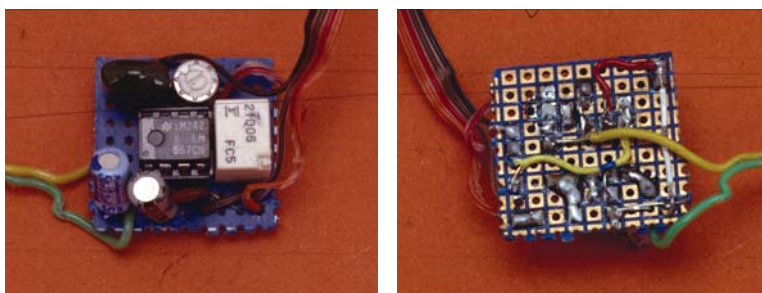
Iraqi ICOM-based Single-Tone R/CFS

75426

Iraqi ICOM-based Single-Tone R/CFS



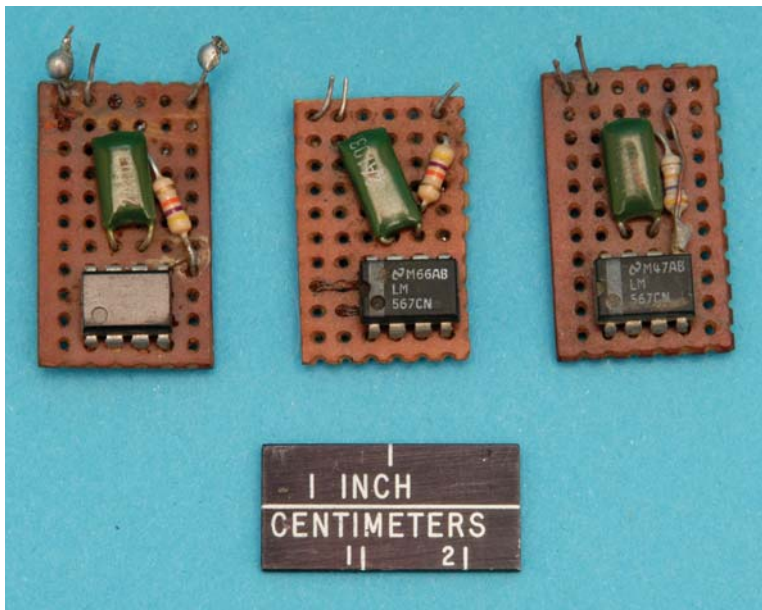
- **Size:** The ICOM radio measures 90 mm x 70 mm x 35 mm (3.5" x 2.8" x 1.4"). The tone generator circuit board is inside the transceiver case. The receiver tone detector circuit measures 25 mm (1.0") square, mounted external to the transceiver.
- **Anti-Tamper Features:** None.
- **Power Source:** The transmitter is powered by the internal ICOM rechargeable battery pack. The receiver has two 9-Volt battery clips in parallel through a switch. Two standard 9-Volt batteries would power the unit for less than one day.



75426

Al Qa'ida Singe Tone Encoder

Recovered in Afghanistan in late 2002, these circuits generate a single tone that can be used to modulate a standard hand-held transceiver to actuate the receiver of an R/CFS. These encoders match the fequency of al Qa'ida single-tone decoders (Sheet 18356).



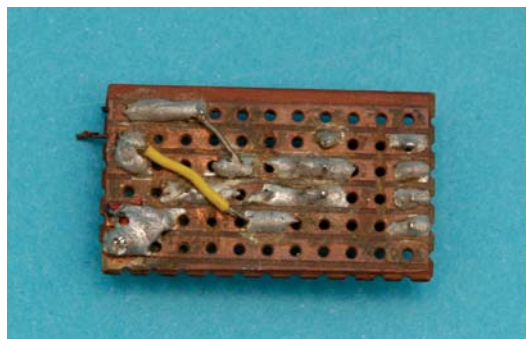
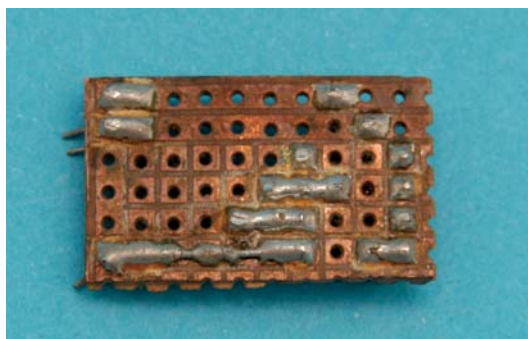
- **Tone Frequency:** Nominal 2.2 kHz.
- **Anti-Tamper Features:** None.
- **Size:** On average the cicuit boards measure 28 mm x 17 mm (1.1" x 0.7").

Al Qa'ida Single Tone Encoder

77398

Al Qa'ida Single Tone Encoder

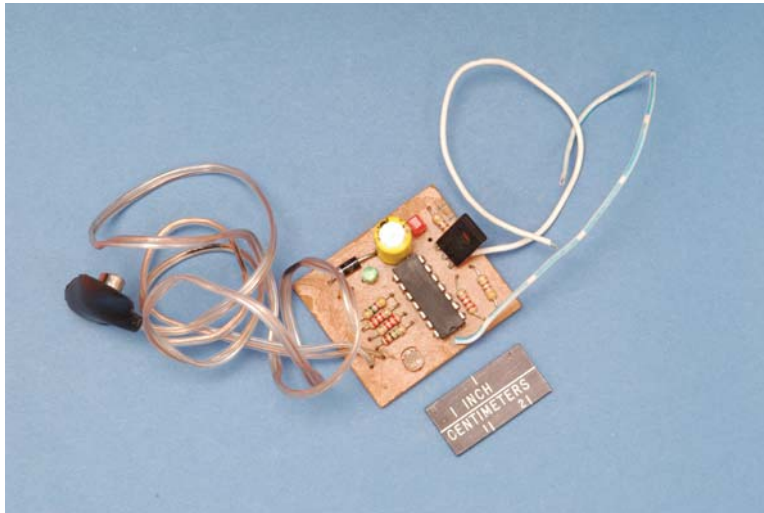
- **Safe-Arm Delay:** None required.
- **Circuit Board Substrate:** 1.6 mm (0.063") thick perforated experimenter board.
- **Variations:** These samples differ in size and physical layout, but the electrical circuits are the same.



77398

Al Qa'ida Light Trigger

This light sensitive trigger was recovered in Afghanistan in 2002. The circuit board has also been seen potted in epoxy. The circuit is similar to light triggers concealed in fluorescent starters and telephone wall blocks (Sheet 23119).



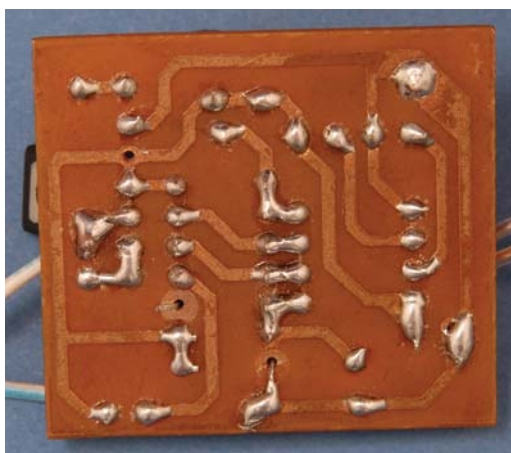
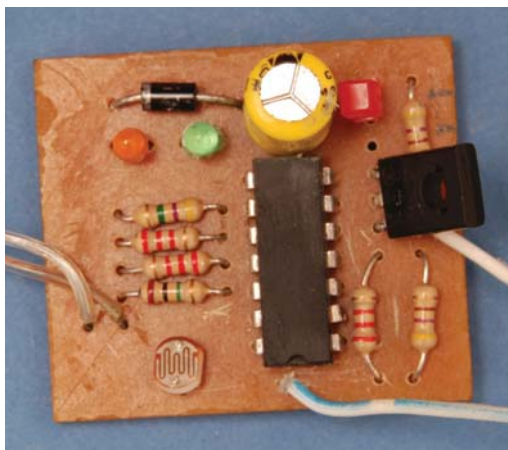
- **Trigger:** low light levels.
- **Safe Arm Delay:** Six minutes.
- **Size:** The circuit board measures 38 mm x 34 mm x 1.6 mm thick (1.5" x 1.3" x 0.063" thick).
- **Concealments:** Epoxy Block (pink) measuring 48 mm x 34 mm x 21 mm (1.9" x 1.3" x 0.8").
- **Anti-Tamper Features:** None.

Al Qa'ida Light Trigger

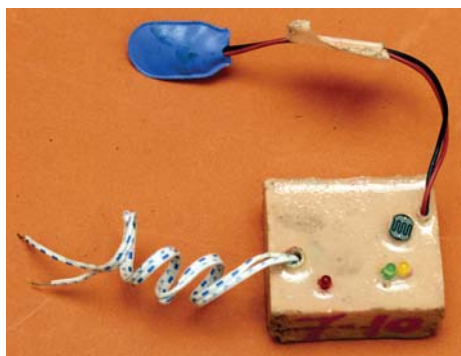
80251

Al Qa'ida Light Trigger

- **Power Source:** Standard 9-volt battery through clip.
- **Circuit Base:** Type 4001 Quad 2-Input NOR gate.



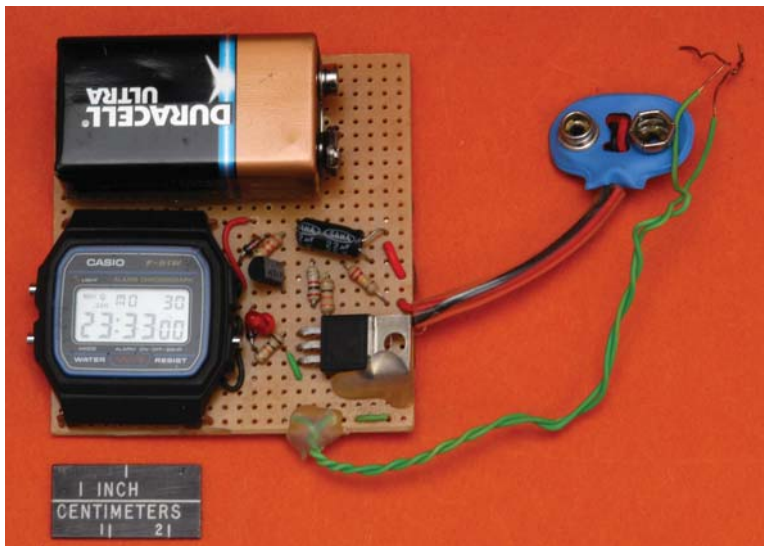
- **PC Board Substrate:** Single-clad Phenolic.



80251

Al Qa'ida Casio Watch Timer on Perf Board

Recovered in late 2002, this timer has a more complex interface than the simple Casio Watch Timer (Sheet 05706), but will not activate on the hourly chime. It has no safe-arm delay timer, as the opto-isolated detector circuit (Sheet 03340).



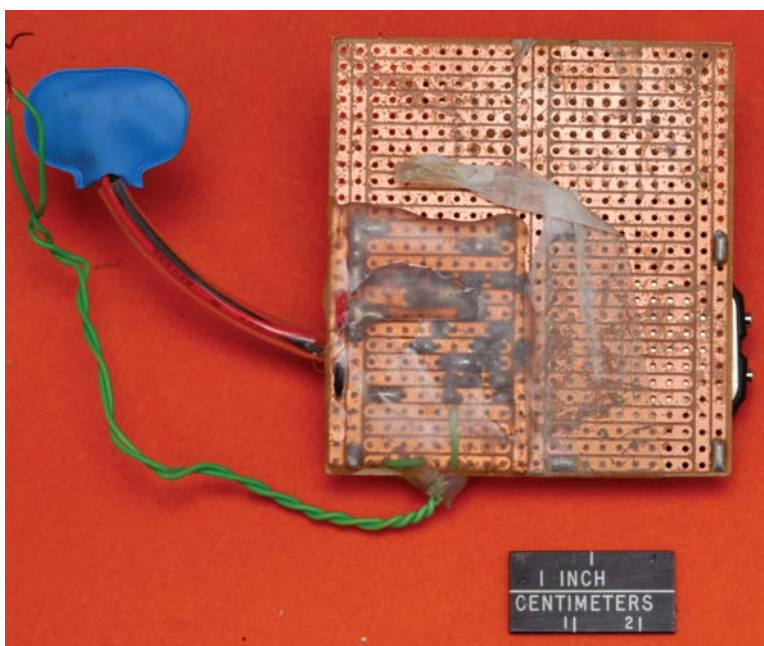
- **Time Delay:** User programmable up to 23 hours, 59 minutes in one minute increments.
- **Power Source:** Standard 9-Volt battery for the detector circuit and detonator. The watch operates on its internal battery.
- **Anti-Tamper Features:** None.

Al Qa'ida Casio Watch Timer on Perf Board

84071

Al Qa'ida Casio Watch Timer on Perf Board

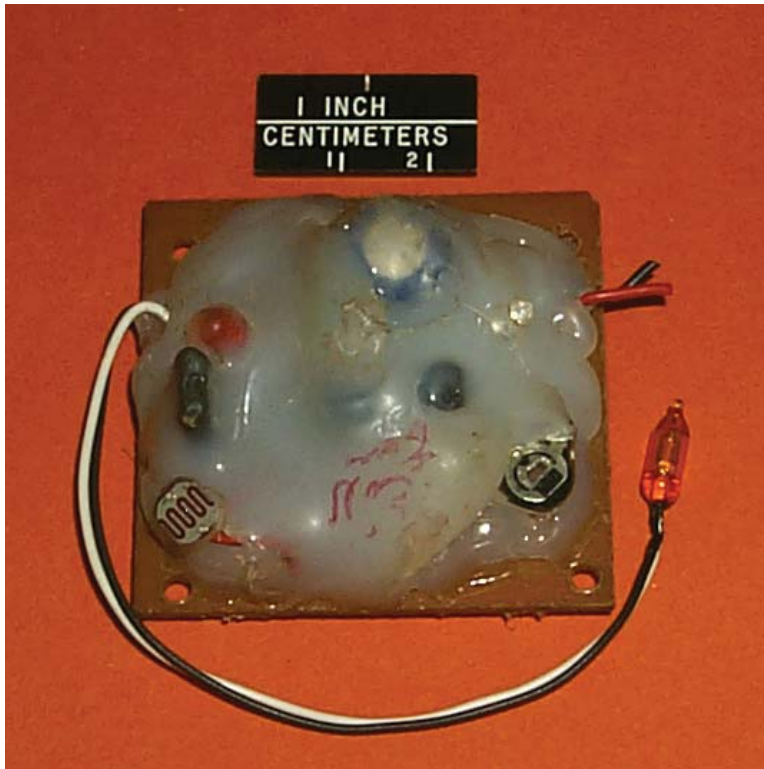
- **Watch Type:** Casio F-91W, but other digital alarm watches could be utilized,
- **Size:** The printed circuit board measures 67 mm x 62 mm (2.6" x 2.4") with a maximum assembly thickness of 19.5 mm (0.8").
- **PC Board Substrate:** Perforated, single-sided epoxy-fiber-glass experimenter board.



84071

Al Qa'ida Light Trigger with Safe-Arm Delay

Recovered in Kabul in 2002, this circuit is triggered by light hitting the sensor. The circuit board is identical to that used for a dark trigger circuit (Sheet 49060).



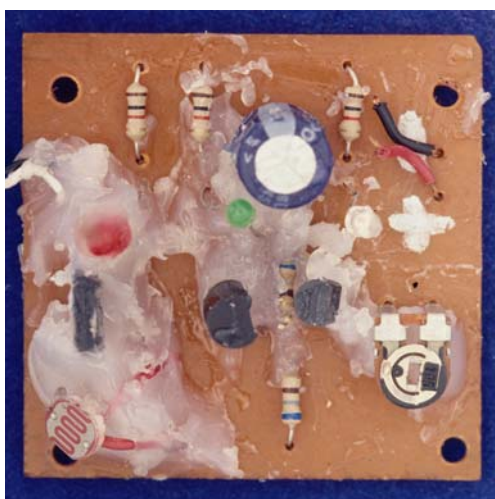
- **Trigger:** Low levels of light.
- **Concealment:** None. Both sides of the circuit board are covered with hot-melt glue.

Al Qa'ida Light Trigger

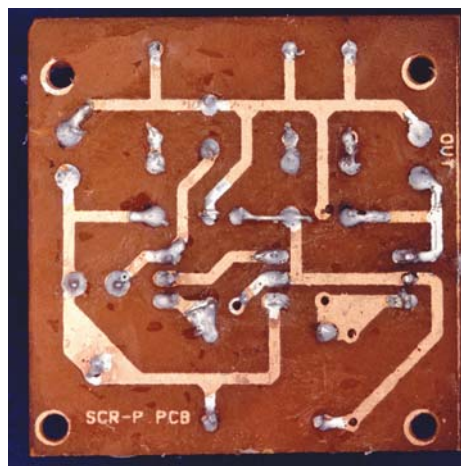
88107

Al Qa'ida Light Trigger

- **Safe Arm Delay:** 5 minutes.
- **Size:** 51 mm x 50 mm x 17 mm overall height, including components (2.0" x 2.0" x 0.7").
- **Anti-Tamper Features:** None.
- **Power Source:** Standard 9-Volt battery assumed. Battery life is about 23 hours.



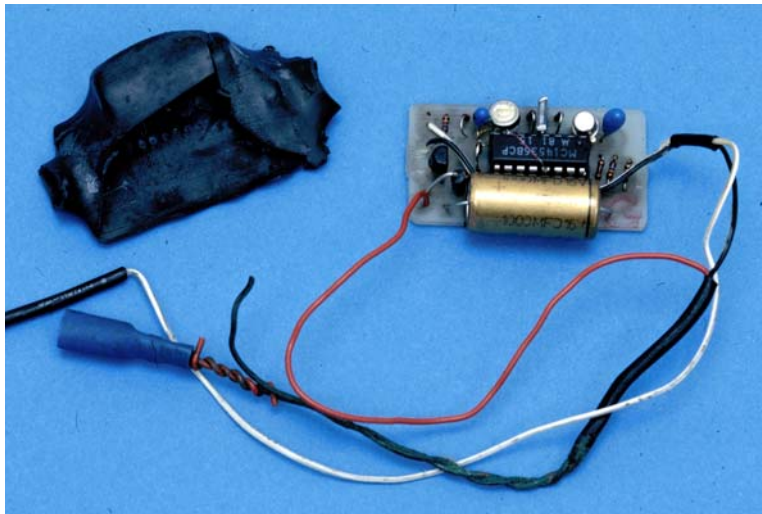
- **PC Board Substrate:** Single-clad phenolic, 1.5 mm (0.060") thick. Marked SCR-P PCB.



88107

Iraqi Fixed-Delay Timer with C-D Output

Similar to the original Iraqi Fixed-Delay Timer (Sheet 12989), this timer can be set for delays of several minutes to several hours. It was first seen in the 1991 Gulf War. It features a new circuit board layout and capacitor-discharge output to insure firing after long delays.



- **Time Delay:** Minutes to days delay possible, but generally a few hours, fixed at time of assembly.
- **Power Source:** Generally 9-Volt battery.
- **Anti-Tamper Features:** None
- **PC Board Substrate:** Epoxy-fiberglass.

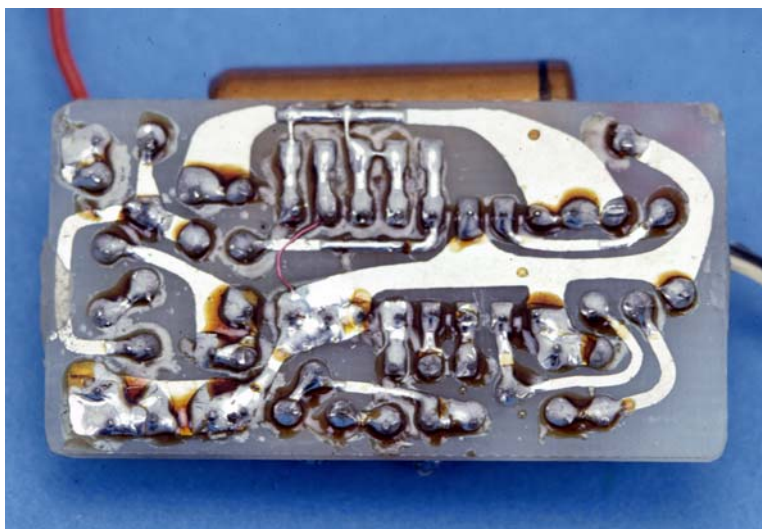
Iraqi Fixed-Delay Timer (C-D Output)

88717

Iraqi Fixed-Delay Timer (C-D Output)



- **Size:** The circuit board measures 48 mm x 25 mm x 1.3 mm thick (1.9" x 1" x 0.05" thick).
- **Circuit Base:** Type 4536 Oscillator/Divider IC.
- **Concealments:** None.



88717

Al Qa'ida "Spider" R/CFS Receiver in Lamp Ballast

The RF receiver and DTMF decoder assemblies of the R/CFS are concealed in a Japan InstaLite lamp ballast case. First recovered in Afghanistan in 2002, there are several variations of this receiver.

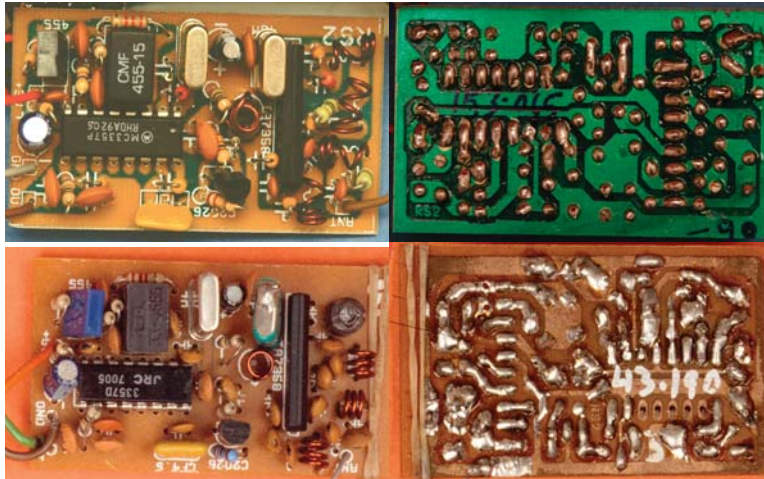


- **Concealment:** Japan InstaLite fluorescent ballast case.
- **Safe Arm Delay:** None.
- **RF Frequency:** 143.190 to 153.045 MHz.
- **Control Code:** Three sequential standard DTMF codes (fourth code for second output control).
- **Anti-Tamper Features:** None.
- **Power Source:** 9-12 Vdc.
- **Size:** The receiver circuit board measures 59 mm x 34 mm x 1.0 mm thick (2.3" x 1.3" x 0.040" thick). The DTMF decoder circuit board measures 67 mm x 41 mm x 1.0 mm thick (2.6" x 1.6" x 0.040" thick).
- **Anti-Tamper Features:** None.

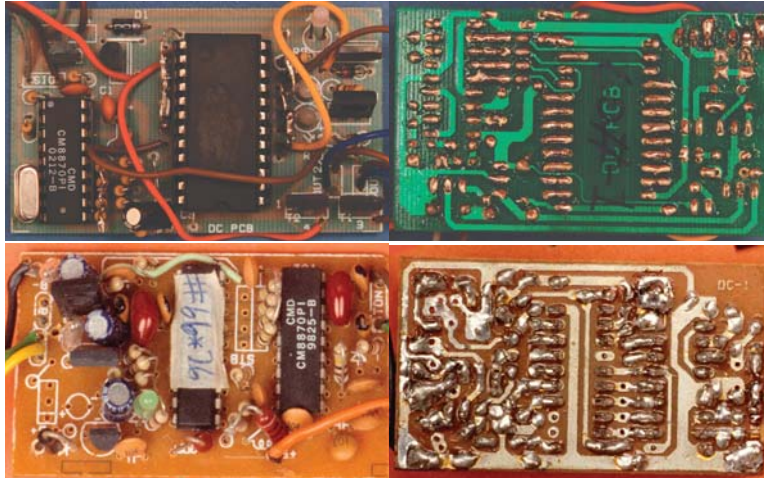
91687 Al Qa'ida "Spider" R/CFS Receiver in Lamp Ballast

91687 Al Qa'ida "Spider" R/CFS Receiver in Lamp Ballast

- **Circuit Board Variations:** Boards are single-clad of brown phenolic or green epoxy-fiberglass. Boards have white silk screen markings for component placement. Some boards have green solder masking applied to the trace side.



Variations in receiver (above) and DTMF decoder (below).



Iraqi R/C Firing System

This remote control detonation system has been recovered since 1991. The systems analyzed have operated at 173.5 MHz with a single DTMF tone pair as the control signal. The system is capable of operating over ranges greater than 1 kilometer, dependent on terrain.

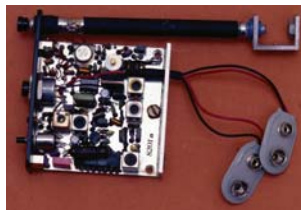
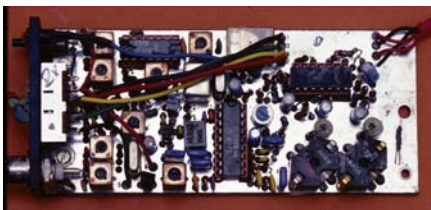
- **Safe Arm Delay:** None. Fixed-delay timer usually added for this function.
- **Control Code:** One standard DTMF tone pair.
- **Frequency:** 173.35 MHz.
- **Transmitter Output Power:** 1 Watt (+30 dBm).
- **Receiver Sensitivity:** -120 dBm.
- **Power Sources:** Clips for standard 9-Volt batteries are attached to both the transmitter (series - 18 Vdc) and the receiver (9 Vdc receiver and 9 Vdc detonator).



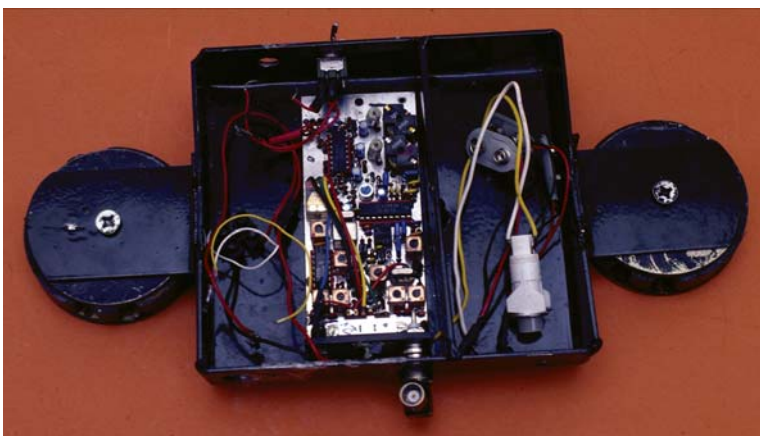
Iraqi Radio-Controlled Firing System

93480

Iraqi Radio-Controlled Firing System



- **Range:** In excess of one kilometer over open ground. The range will be highly dependent on the concealment, the type of receiver antenna, and intervening structures.
- **Size:** The transmitter measures 120 mm x 70 mm x 20 mm (4.7" x 2.8" x 0.8"). The receiver measures 200 mm x 60 mm x 30 mm (7.9" x 2.4" x 1.2") overall. The unpackaged receiver measures 121 mm x 53 mm x 22 mm (4.8" x 2.1" x 0.9").
- **Anti-Tamper Features:** None.
- **Concealment:** Above the glove compartment in vehicle bombs, or in a case with magnets as a limpet device.
- **Source:** Unidentified commercial manufacture.



93480