

Images SI Inc.



See Page 4, Robotic Arm

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Featured Item:

Speech Controlled Robotic Arm

The SCRA-01 incorporates three kits; the OWI Robotic Arm, SR-06 Speech Recognition Circuit and the SRI-01 OWI speech interface circuit. By connecting these kits together you create a powerful speech control system capable of controlling the OWI-Robotic Arm Trainer using voice commands.

The SR-06 speech recognition circuit allows you to train any word(s) in any language to control the robotic arm.

You can purchase the kits separately and build your system slowly or purchase them bundled together. Kits may be purchased as kits needing assembly or assembled and tested. see prices below.



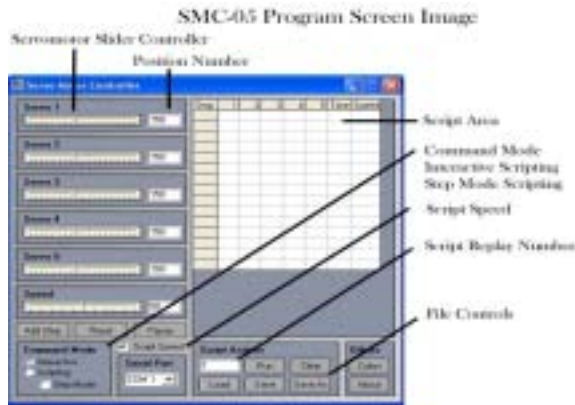
| | | |
|-----------------|---------------------------------------------------------------|-----------------|
| SCRA-01 | Speech Controlled Robotic Arm (unassembled) | \$299.95 |
| SCRA-01A | Speech Controlled Robotic Arm (assembled & tested) | \$474.95 |

Robotic Arm Kit (Manual & PC Windows Control)



The RA-01 kit includes all components necessary to build the robotic arm shown at left. The robotic arm kit also includes the 5-position servomotor controller kit. The servomotor kit includes the pcb and all components necessary to build the servomotor controller (soldering is required). Using the 5-position servomotor controller see picture below one can control the robotic arm using the onboard three position switches to manually to grab, lift, lower, wrist rotate and pivot. In addition, the Windows (98/XP) control software allows PC control through one of your PC's serial port or USB* port using adapter. The windows program has a script writing feature that allows one to program the robotic arm with thousands of movements with full, precise and repeatable control of each movement. Scripts may hold a maximum of 10,000 movements (including pauses).

Five Axis of motion:
 Base Rotation -- 180 degrees
 Shoulder moving range -- 180 degrees
 Elbow moving range -- 180 degrees
 Wrist rotation range -- 180 degrees
 Gripper Open and Close -- 32mm (1.25")
 Lifting capacity -- 3.0 oz.
 Height -- 10"



Five Servomotor Robotic Arm Kit includes:
 5 Servomotors
 Servomotor Brackets
 Robotic Arm Base
 Servomotor Gripper
 Servomotor Controller Kit
 includes: PCB and components
 Instruction Manual
 CD with Windows Programs

*USB Port Compatible using USB to Serial Adapter The standard RS-232 port on the servomotor board may be connected to a USB port using a serial USB to Serial port adapter. This allows normal program operation and functions through USB port. See Page 36 for USB-01

| | | |
|---------------|---------------------------------------------|-----------------|
| RA-01 | Robotic Arm (requires soldering) | \$349.95 |
| RA-01A | Robotic Arm (assembled & tested) | \$449.95 |



OWI 007 Robotic Arm Trainer

The OWI 007 Robotic Arm Trainer teaches basic robotic sensing and locomotion principles while testing motor skills as you build and control the arm. Using the wired control one can control the arm grab, release, lift, lower rotate wrist and pivot sideways 350 degrees. After assembly, one can observe the gear mechanisms through the transparent arm's plastic. Five motors and five joints allow for good flexibility. Educators will

find the robotic arm a useful tool. It's usefulness as an education tool can be extended to explore other robotic technologies like speech recognition, speech control, automation and animatronics using our OWI-007 Robotic Arm Trainer accessories.

Robotic Arm Trainer Accessories:

- Five Axis of motion:
- Base can rotate left and right -350 degrees.
- Shoulder moving range - 120 degrees.
- Elbow moving range - 135 degrees.
- Wrist rotate CW and CCW - 340 degrees.
- Gripper open and close- 55 mm (2.2 inches) - 0.
- Product Dimensions- Maximum length outwards - 360 mm (14.2 inches).
- Maximum heights upwards- 510 mm (20.1 inches).
- Lifting Capacity- Maximum 130g (4.6 oz.) Power.
- Power Source: 4 "D" batteries (not included)

| | | |
|-----------------|-----------------------------------------------------|-----------------|
| OWI-007 | Robotic Arm Trainer (assembly required) | \$84.95 |
| OWI-007A | Robotic Arm Trainer (assembled & tested) | \$149.95 |
| | * Extra shipping charge applies for size and bulk. | |

PC Windows Serial Interface for OWI Robotic Arm

The robotic arm interface kit connects OWI's 007 Robotic Arm Trainer (tm) to a personal computer, (IBM PC or compatible). The interface connects to the PC's serial port. The software for the interface permits real time control and contains a built-in interactive script writer. A user may write a script that contains up to 99 individual robotic arm functions (including pauses) into a single script file. Script files may be saved and loaded from disk just like any other standard computer file.

Script files may be replayed automatically up to 99 times for demonstrating computer controlled automation and animatronics. The Robotic Arm PC Interface creates a fun way of learning and experimenting with computer automation and animatronics.



The Interface Kit Includes: *Windows 95/98/ME/2000/XP program

*Printed Circuit Board for easy construction *All components *DB9 M/F cable

| | | |
|------------------|------------------------------------------------------------------|----------------|
| RAI-007SA | OWI Serial Robotic Arm Interface (assembled & tested) | \$87.95 |
| RAI-007S | OWI Serial Robotic Arm Interface (Kit-requires soldering) | \$65.95 |

Servo Motors

| Servos | 5V Power Torque (inch-ounces) | 6.0V Power (inch-ounces) | 5V Speed (to 60 deg.) | 6.0V Speed (to 60 deg.) | Price |
|--------------------------------|----------------------------------|-----------------------------|--------------------------|----------------------------|---------|
| Standard Servos | | | | | |
| HS-77BB | 61 | 76 | .18 sec. | .14 sec. | \$25.95 |
| HS-81 | 36 | 42 | .11 sec. | .09 sec. | \$17.50 |
| HS-85MG | 42 | 49 | .16 sec. | .14 sec. | \$30.95 |
| HS-311 | 42 | 49 | .19 sec. | .15 sec. | \$8.95 |
| HS-322HD | 42 | 49 | .19 sec. | .15 sec. | \$9.95 |
| HS-325HB | 42 | 51 | .19 sec. | .15 sec. | \$12.95 |
| HS-422 | 46 | 57 | .21 sec. | .16 sec. | \$12.50 |
| HS-425BB | 46 | 57 | .21 sec. | .16 sec. | \$14.95 |
| HS-475HB | 61 | 76 | .23 sec. | .18 sec. | \$17.95 |
| Micro and Mini Servos | | | | | |
| HS-50 | 8 | N/A | 0.9 | .18 sec. | \$22.95 |
| HS-55 | 15 | 18 | .17 sec. | .14 sec. | \$16.50 |
| HS-56HB | 14 | 16 | .12 sec. | .10 sec. | \$24.95 |
| HS-65HB | 25 | 31 | .16 sec. | .13 sec. | \$25.95 |
| HS-65MG | 25 | 31 | .16 sec. | .13 sec. | \$25.95 |
| HS-81 | 36 | 42 | .11 sec. | .09 sec. | \$17.50 |
| HS-81MG | 36 | 42 | .11 sec. | .09 sec. | \$23.50 |
| HS-85BB | 42 | 49 | .16 sec. | .14 sec. | \$23.50 |
| HS-85MG | 42 | 49 | .16 sec. | .14 sec. | \$30.95 |
| HS125MG | 42 | 49 | .17 sec. | .13 sec. | \$34.95 |
| HS225BB | 54 | 67 | .14 sec. | .11 sec. | \$20.95 |
| HS225MG | 54 | 67 | .14 sec. | .11 sec. | \$27.95 |
| Giant Scale Servos | | | | | |
| HS-715BB | 161 | 189 | .27 sec. | .22 sec. | \$67.95 |
| HS-755HB | 153 | 183 | .28 sec. | .23 sec. | \$27.95 |
| HS-805BB | 275 | 343 | .19 sec. | .14 sec. | \$36.95 |
| High Performance Servos | | | | | |
| HS-525BB | 46 | 57 | .17 sec. | .13 sec. | \$29.50 |
| HS-525MG | 46 | 57 | .17 sec. | .12 sec. | \$35.50 |

| | | | | | |
|---------------------------|-----|-----|----------|----------|----------|
| HS-545BB | 61 | 76 | .23 sec. | .17 sec. | \$29.50 |
| HS-625MG | 76 | 94 | .18 sec. | .13 sec. | \$39.95 |
| HS-635HB | 69 | 83 | .18 sec. | .15 sec. | \$29.95 |
| HS-645MG | 107 | 133 | .24 sec. | .20 sec. | \$39.95 |
| HS-925MG | 85 | 107 | .11 sec. | .08 sec. | \$72.95 |
| HS-945MG | 122 | 153 | .16 sec. | .12 sec. | \$72.95 |
| Specialty Servos | | | | | |
| Hs-75BB | 92 | 114 | .45 sec. | .34 sec. | \$29.50 |
| HS-765HB | 161 | 201 | .26 sec. | .20 sec. | \$39.95 |
| HS-815BB | 275 | 343 | .45 sec. | .38 sec. | \$44.95 |
| Digital Servos | | | | | |
| HS-5125MG | 42 | 49 | .17 sec. | .13 sec. | \$61.95 |
| HS-5245MG | 61 | 76 | .15 sec. | .12 sec. | \$47.95 |
| HS-5475HB | 61 | 76 | .23 sec. | .18 sec. | \$34.95 |
| HS-5625MG | 110 | 131 | .17 sec. | .14 sec. | \$54.95 |
| HS-5645MG | 143 | 168 | .23 sec. | .18 sec. | \$54.95 |
| HS-5745MG | 208 | 250 | .18 sec. | .15 sec. | \$69.95 |
| HS-5925MG | 103 | 128 | .10 sec. | .08 sec. | \$89.95 |
| HS-5945MG | 153 | 181 | .16 sec. | .13 sec. | \$89.95 |
| HS-5955TG | 250 | 333 | .19 sec. | .15 sec. | \$114.95 |
| HS-6635HB | 69 | 83 | .18 sec. | .15 sec. | \$47.95 |
| HS-6965HB | 92 | 111 | .10 sec. | .08 sec. | \$84.95 |
| HS-6975HB | 119 | 144 | .13 sec. | .10 sec. | \$84.95 |
| HS-6985HB | 144 | 172 | .16 sec. | .13 sec. | \$84.95 |
| Digital Car Servos | | | | | |
| HSC-5996TG | 89 | 111 | .13 sec. | .10 sec. | \$114.95 |

| Servos | 5V Power Torque (inch-ounces) | 6.0V Power (inch-ounces) | 5V Speed (to 60 deg.) | 6.0V Speed (to 60 deg.) | Price |
|---------------------------------------|----------------------------------|-----------------------------|--------------------------|----------------------------|----------|
| HSC-5997TG | 136 | 181 | .17 sec. | .14 sec. | \$114.95 |
| HSC-5998TG | 200 | 250 | .23 sec. | .19 sec. | \$114.95 |
| Digital Robot Servos | | | | | |
| HSR-5995TG | 333 | 416 | .15 sec. | .12 sec. | \$114.95 |
| Continuous Rotation Servos | | | | | |
| HS-425BB | 46 | 57 | .21 sec. | .16 sec. | \$47.95 |
| S-148 | N/A | 60 | N/A | | \$15.95 |

Servomotor Controllers Robotics and Animatronics

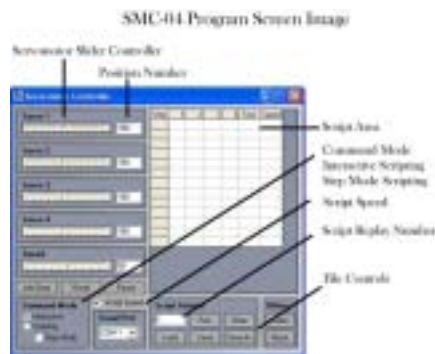
Four and Five Servomotor Controller Boards

Incorporates Both Manual and PC Control through Serial Port (USB Adapter available)



Manual and PC Control

Servomotor Controller Boards allow Manual & PC control of four or five hobby servomotors respectively (Hitec/Futaba). Boards are available assembled or as kits. Servomotors, using our servomotor controller boards, may be controlled manually, via on-board switches, or by a Windows program through a serial communication port (RS232) on a Windows 98/XP PC. Universal three position headers make it easy to connect servomotors--just plug them into the



Typical image using Model SMC-04

Easy to Supply Power

Power can be supplied by either a 9 volt battery (low torque applications) or an AC adaptor. The on-board rectifier, voltage regulator, filter capacitors, and plug adaptor makes it easy to use a wide range of AC adaptors for power (7-12 VDC or 7-

Manual Control

Each servomotor is controlled using a three-position switch on the servomotor board. Each switch position controls the servomotor in the following manner: UP = clockwise, DOWN = counterclockwise, and CENTER = stop. It is

The off position. SMC-05 has two additional features: 1) The Controller board has two pre-set speeds (fast and slow) that is jumper controlled. 2) The board also has a "save" function that saves the servomotor's current position in its memory. This allows the servomotors to go to the "saved" position on startup.

Windows PC Control

Windows 98 and Windows XP programs (see screen image above), use the PC serial port or USB* port to communicate to the servomotor board. Each program incorporates an adjustable servomotor speed control. Each servomotor is controlled by an individual slider. In the scriptwriting mode every servomotor movement is automatically recorded and written into the onscreen script area. The onscreen script may be saved, loaded, played, and looped. Updated Windows PC programs are always available for download at our website.

CD Rom with programs is included, and Windows PC program updates are always available for download on our website.

| | | |
|-----------------|--------------------------------------------------------|-----------------|
| SMC-04 | Servo Motor Controller (kit) | \$67.95 |
| SMC-04A | Servo Motor Controller (assembled & tested) | \$124.95 |
| SMC-05 | Servo Motor Controller (kit) | \$81.95 |
| SMC-05A | Servo Motor Controller (assembled & tested) | \$138.95 |
| ACA-7VAC | AC Adapter | \$9.95 |

*USB Port Compatible using USB to Serial Adapter. The standard RS-232 port on the servomotor board may be connected to a USB port using a serial USB to Serial port adapter. This allows normal program operation and functions through USB port. See page 36 for USB-01.

Eight Servomotor Controller Board

PC Control through Serial Port (USB Adapter available)



PC Control

Images Company's SMC-08 and SMC-08A Servomotor Controller Boards allow the PC control of eight hobby servomotors (Hitec/Futaba). Boards are available assembled or as kits. Servomotors, using our servomotor controller boards, are controlled by a Windows program through a serial communication port (RS232) on a Win-

dows 98/XP PC. Universal three position headers make it easy to connect servomotors--just plug them into the board.

Easy to Supply Power

Power can be supplied by either a 9 volt battery (low torque applications) or an AC adaptor. The on-board rectifier, voltage regulator, filter capacitors, and plug adaptor makes it easy to use a wide range of AC adaptors for power (7-12 VDC or 7-12 VAC).

Windows PC Control

Windows 98 and Windows XP programs (see screen image left), use the PC serial port or USB* port to communicate to the servomotor board. Each program incorporates an adjustable servomotor speed control. Each servomotor is controlled by an individual slider. In the scriptwriting mode every servomotor movement is automatically recorded and written into the onscreen script area.

SMC-05 Program Screen Image



The onscreen script may be saved, loaded, played, and looped. Updated Windows PC programs are always available for download at our website. CD Rom with programs is included, and Windows PC program updates are always available for download on our website.

SMC-08 8-Servo Motor Controller (kit) \$53.95

SMC-08A 4-Servo Motor Controller (assembled & tested) \$108.95

*USB Port Compatible using USB to Serial

Adapter. The standard RS-232 port on the servo-motor board may be connected to a USB port using a serial USB to Serial port adapter. This allows normal program operation and functions through USB port. See page 36 for USB-01.

Parallax Continuous Rotation Servomotor

The Parallax Continuous Rotation Servo is now a Futaba S148 servo. It's recommended for robotics projects and includes an adjustable potentiometer to center the servo. Servos may be controlled directly from a BASIC Stamp I/O pin by using the PULSOUT command. Servo has been modified for continuous rotation.

Operating Speed: 60 rpm at 6.0V
 Output Torque: 3.4 kg/cm (47 oz/in) at 6.0V
 Weight: 45g (1.6 oz)
 Size: 41 x 20 x 38 mm (1.6 x 0.8 x 1.5 in)
S-148 \$15.95



Modified HS-425BB Servomotor for Continuous Rotation

HS-425BB servomotors, custom modified for continuous rotation. Pulsewidth modulation frequencies for forward, reverse, and stop rotation are provided.

Operating Speed: 0.16 sec/60° at 6.0V
 Output Torque: 4.1 kg/cm (57 oz/in) at 6.0V
 Weight: 45g (1.6 oz)
 Size: 41 x 20 x 37 mm (1.6 x 0.8 x 1.4 in)

HS-425BB Continuous Rotation Servomotor \$37.95



Servomotor Accessories

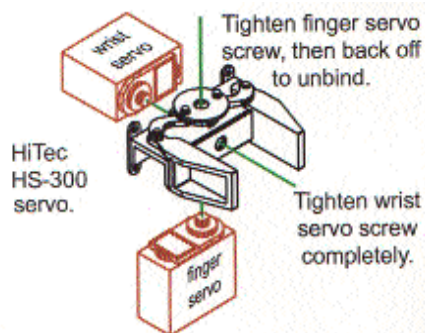
Servo-Gripper

Gripper Assembly mates easily with two servos, one to open and close the fingers, and a second servo which acts as the gripper's "wrist". Perfect for creating your own robotic arm. The gripper can accommodate objects up to about .9" (23 mm). Compatible with many Futaba and HiTec servomotors, like HS-322, HS-325, HS-422, HS-425, and more. For use with HiTec HS-322 servos. See Next Page.

Continued from previous page



SG-01 Servo Gripper \$12.95



Servo to Servo X-Y Axis Mount



SM-01 \$ 9.95 Allows two servos to rotate about the X and Y axis. Excellent for camera pan and tilt control.

90 Degree Servomotor Mounts



For mounting servomotors to flat surfaces. Eight 6-32 x 3/8" machine screws and nuts included.

SM-02 90 degree mounts (pair) \$4.00



Servomotor Reverser



Images SI Inc.'s servomotor reverser with a standard "J" connector. Fits inline between your servomotor and AM, FM (receiver) or PCM systems. Includes Y-Connector for use with two servomotors. When installed in line with any two servomotors, one servomotor will move in the opposite direction of the other servomotor. (compatible with HS-300, HS-322, HS-325, HS-425, HS-475).

SMR-01 Servomotor Reverser \$18.50

Servomotor Wheel

Wooden wheel, 2 3/4" diameter. Designed for use with a modified servomotor. Comes with 4 mounting screws and servomotor horn (compatible with HS-300, HS-322, HS-325, HS-425, HS-475).

RW-06 Servomotor Wheel \$4.50



Universal Servomotor U-Bracket Assembly

ServoMotor Brackets: Building Blocks for Creating Robots



Use to create your own robotic projects; arms, snakes, walkers, pan and tilt platforms, etc.

Bracket assembly makes it easy to connect multiple servomotors to one another to create servomotor robotics and projects. Each aluminum bracket has multiple holes for connecting; plates, holders, servomotor horns as well as holes for connecting brackets to one another. Each assembly consists of the following components: two aluminum brackets, (1) binding head post screw, (4) small sheet metal screws, (4) 6-32 plastic screws with nuts and instructions. The SUB-01 Servomotor Bracket assembly has additional holes in the bottom portion of the bracket. Fits many HiTec and Futaba servomotors see compatibility chart below.



Each assembly consists of the following components: two aluminum brackets, (1) binding head post screw, (4) small sheet metal screws, (4) 6-32 plastic screws with nuts and instructions. The SUB-01 Servomotor Bracket assembly has additional holes in the bottom portion of the bracket. Fits many HiTec and Futaba servomotors see compatibility chart below.

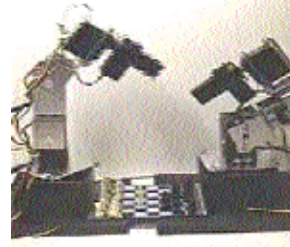
You can make different exciting robots with these servomotor brackets!

Create different robots that use between 3 to 8 servomotor brackets. They're easy to build, come with default motions, and are fully customizable. Robots you can build can be the snake, the inchworm, the golf bot, the 4 legged spider, the 4 legged animal, the drawing robot, the chemistry robot, the chess-playing robot, and more! The possibilities are endless -- you can build your own, completely original robot with our easy to use brackets!

Golfer Bot



Chess-Playing Bots



InchWorm Bot

Five Leg Spider Bot



Compatible with the following HiTec servomotors:

HS-311, HS-322, HS-325, HS-422, HS-425BB, HS-475, HS-525BB, HS-525MG, HS-545BB, HS-625MG, HS-635HB, HS-645MG, HS-925MG, HS-945MG, HS-5475HB, HS-5625, HS-5925MG, HS-5945MG, HS5955TG, HSR-5995TG, HSC-5996TG, HSC-5997TG, HSC-5998TG, HS-6635HB, HS-6965HB, HS-6975HB, HS-6985HB

Compatible with the following Futaba servomotors:

S-148, S-3001, S-3003, S-3004, S-3005, S-3010, S-9001, S-9202, S-9206, S-9402, S-9405

SUB-01 Servomotor Bracket Assembly \$22.95

Omni-Directional Robot Wheel

- * Omni-directional rotation
- * Outer Diameter: 52 mm / 2.0"
- * Hub: 37 mm / 1.4"
- * Axle Bore: 8 mm

RW-04 Omni-Directional Robot Wheel (2.0" OD) \$14.95



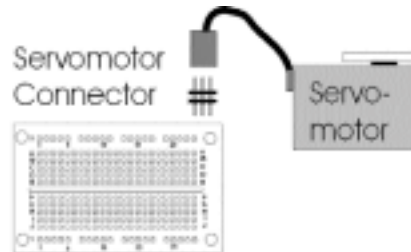
Servomotor Breadboard Connector



These three pin, male-to-male headers are also useful for joining any other type of three pin socket into each other or prototyping boards.

SBC-01 Servomotor Breadboard Connector \$0.75

The servomotor breadboard connector makes it easy to connect servomotors to components on a solderless breadboard or PC boards. Plug the connector into the solderless breadboard. Connections are then made laterally to the connector terminals. The female 3-connector socket from a servomotor plugs into the topside of the connector.



Solderless Breadboard



SXT-6 Servomotor Extension (6") \$1.25
SXT-12 Servomotor Extension (12") \$1.75
SXT-24 Servomotor Extension (24") \$4.50
 (note: (2) 12" ext. together)

Servo Extensions

Servo extensions can be used anywhere in a radio system -- between the receiver and servo, the battery and switch harness, the switch harness and receiver or the charger and switch harness -- allowing you to space components farther apart with more flexibility.



Servomotor Horn (HiTec HS-322)

Standard Hi-Tec servo motor horn. Used to connects to top and bottom brackets of SUB-01 and top bracket of the SUB-02.

HORN-W Servomotor Horn \$0.95
HORN-R (round) Servomotor Horn \$1.45

718-966-3694 orders

<http://www.imagesco.com>

page 13

PIC Basic Pro Compiler



The PIC Basic Pro Compiler makes it even easier for you to program the fast and powerful Microchip Technology PIC microcontrollers. PIC Basic Pro converts your BASIC programs into machine language files that can be programmed directly into a PIC micro.

The PIC Basic Pro Compiler features: BASIC Stamp II commands, direct and library routine access to pins on PORTA, C, D, E, as well as PORTB, arrays, real IF..THEN..ELSE and interrupt processing in BASIC.

It also provides direct access to all of the PIC micro registers - I/O ports, A/D converters, hardware serial ports, etc. - easily and in BASIC. It automatically takes care of the page boundaries and RAM banks. It even includes built-in commands to control intelligent LCD modules. The instruction set is upward compatible with the BASIC Stamp II and Pro uses BS2 syntax. Programs can be compiled and programmed directly into a PIC micro, eliminating the need for a BASIC Stamp module. These programs execute much faster and may be longer than their Stamp equivalents. They may also be protected so no one can copy your code.

| | | |
|-----------------|----------------------------------------------------------------------------------|-----------------|
| PBC-02 | PIC Basic Pro Compiler | \$249.95 |
| PBC-02P | PIC Basic Pro Compiler with Epic Programmer | \$299.95 |
| PBC-02S | PIC Basic Pro Compiler & Epic Serial Port Programmer | \$329.95 |
| PBC-02SA | Serial Epic Program & Pro Compiler w/ 8/18 PIN, Z if & AC Adapter | \$358.95 |
| PBC-02U | Basic Compiler & Epic USB | \$358.95 |

PIC Basic Compiler



The low-cost PicBasic Compiler (PBC) makes it easy to write programs for Microchips series of PIC microcontrollers. The PicBasic compiler converts easy to write basic language programs in machine language files that are programmed directly into a PIC microcontroller. The PicBasic programs execute 20-100X faster than tokenized basic programs used in other microcontrollers like Parallax's BS-1 and BS-2 Stamps. Other benefits include substantial cost savings, approximately 25% the cost of equivalent Basic Stamps.

| | | |
|-----------------|---------------------------------------------------------------------------------|-----------------|
| PBC-01 | PIC Basic Compiler | \$99.95 |
| PBC-01P | PIC Basic Compiler with EPIC Programmer (Assembled) | \$149.95 |
| PBC-01S | PIC Basic Compiler & Epic Serial Port Programmer | \$179.95 |
| PBC-01SA | Serial Epic Program & Pro Compiler w/ 8/18 PIN, Zif & AC Adapter | \$208.95 |
| PBC-01U | Pro Compiler & Epic USB Port | \$219.95 |

CodeDesigner IDE for PICBasic and PICBasic Pro



CodeDesigner™ PicBasic Edition is an advanced Windows 95/98/NT/2000/XP based integrated development environment (IDE) for the PicBasic and PicBasic Pro compilers from microEngineering Labs, Inc. CodeDesigner has many of the advanced editor features found in Visual Basic. Features like Auto Code Completion, pop-up statement syntax, and PicBasic statement sensitive help will speed project development. Reduce time spent hunting down errors with CodeDesigner's ability to quickly navigate error lines, highlight errors, and display error descriptions.

Free trial version available for download at:
<http://www.imagesco.com/catalog/pic/codedesigner.html>

CD-01 CodeDesigner for PICBasic (Hobby) \$45.00

Tutorial & C Compiler For PIC Microcontrollers



Screen image shows IDE and C compiler

The C for PICmicro® microcontrollers CD ROM is designed for students and professionals who need to learn how to program embedded microcontrollers in C. The CD contains a course as well as all the software tools needed to create Hex code for a wide range of PICmicro devices - including a full C compiler for a wide range of PICmicro devices.



Screen image shows Virtual C PICmicro

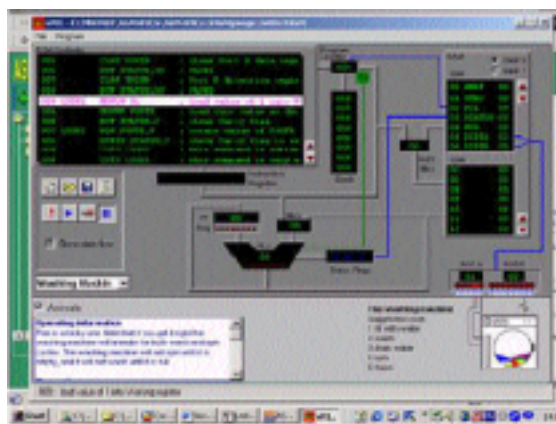
Although the course focuses on the use of the PICmicro microcontrollers this CD ROM will provide a good grounding in C programming for any microcontroller

- * Complete course in C as well as C programming for PICmicro microcontrollers
- * Highly interactive course
- * Virtual C PICmicro improves understanding
- * Includes a C compiler for a wide range of PICmicro devices
- * Includes full Integrated Development Environment
- * Includes MPLAB software
- * Compatible with most PICmicro programmers

PCC-01 C Compiler for PIC Microcontrollers \$89.95

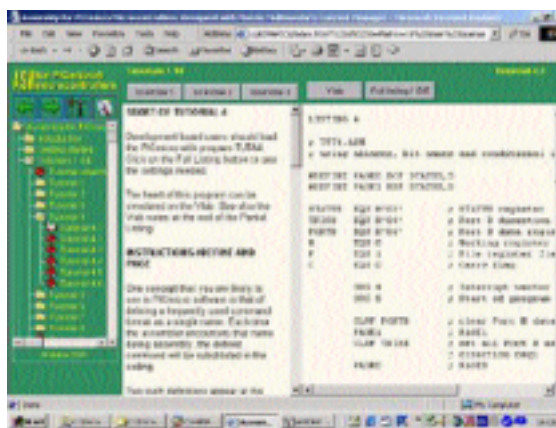
Assembly Tutorial & Compiler For PIC Microcontrollers

Assembly for PICmicro microcontrollers V2.0 (previously known as PICtutor) contains a complete course in programming the PICmicro microcontroller from Arizona Microchip. It starts with fundamental concepts and extends up to complex programs including watchdog timers, interrupts and sleep modes.



The Virtual PICmicro microcontroller

The CD makes use of the latest simulation techniques which provide a superb tool for learning: the Virtual PICmicro microcontroller. This is a simulation tool that allows users to write and execute assembly code for the PIC16F84 microcontroller on-screen. Using this students can actually see what happens inside the PICmicro microcontroller as each instruction is executed. This enhances understanding and retains student interest.



Typical tutorial screen

* Comprehensive instruction through 39 tutorial sections

* Includes a Virtual PICmicro microcontroller: a fully functioning simulator

* Tests, exercises and projects covering a wide range of PICmicro applications

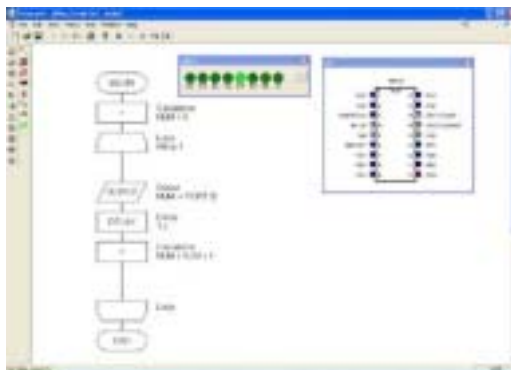
* Includes MPLAB assembler

PASM-01

Assembly Compiler for PIC Microcontrollers

\$89.95

Flowcode Tutorial & Compiler for PIC Microcontrollers



Flowcode is a very high level language programming system for PICmicro microcontrollers based on flowcharts.

Flowcode allows newcomers to programming to design and simulate complex robotics and control systems in a matter of minutes.

Flowcode is a powerful language that uses macros to facilitate the control of complex devices like 7-segment displays, motor controllers, and LCD displays.

The use of macros allows students to control highly complex electronic devices without getting bogged down in understanding the programming involved. Flowcode is a powerful rapid development tool and is also useful as a means of introducing the need for C and assembly programming.

New features in version 2 include: arrays, improved LCD handling, improved macro handling, and a wider range of supported PICmicro microcontrollers. Pro versions include RS232 comms, IDRA comms, Keypad control, multiple servo control, on-board EEPROM routines.

Requires no programming experience



Uses international standard flow chart symbols

Full on-screen simulation

Full set of tutorials

Can be used with a wide range of PICmicros

- Comprehensive instruction through tutorial sections
- Includes a fully functioning virtual simulator
- Tests, exercises and projects covering a wide range of PICmicro applications
- Includes MPLAB assembler

CD ROM contents

CD ROM includes almost 30 example files containing examples from how to get an output on a single LED through, how to create a 24 hour clock. Secondly each CD ROM is shipped with Flowcourse: a complete web based tutorial system for using Flowcode, which includes hundreds of photographs, diagrams, and further worked examples on using the PICmicro microcontroller and Flowcode.

FIOW-01

Flowcode for PIC Microcontrollers

\$89.95

718-966-3694 orders

<http://www.imagesco.com>

page 17

PIC Microchip Programmers



EPIC USB Port Programmer with Accessories

Our latest PIC® Programmer is driven and powered from a single USB port on your computer. No additional AC power adapter is needed.

The programmer consists of two parts. The programmer board is specifically designed for In-Circuit Serial Programming (ICSP). An adapter is included to allow the programming of DIP-packaged PICs from 8 to 40 pins.

The new design is small and compact and measures only 1.5" x 2.3". A dual color LED indicates programmer status. The connection to the computer is via a standard USB cable (Type-A male to Type-B male).

Included in the USB Programmer package:

- * Melabs USB Programmer
- * ZIF Adapter for 8 through 40-pin, DIP packaged PICs
- * Melabs Programmer Software
- * 6-foot USB Cable

The programmer includes software for Windows 98/Me/NT/2000/XP. This software allows you to control the programmer and set the configuration bits on the PIC. The software may be run as a standalone application or launched from most program editor/IDE packages like CodeDesigner.

The Melabs programmer software is compatible with the standard Microchip HEX format files. Any assembler or compiler for PICmicros can be used to create the program, including MPASM, "C", PicBasic Compiler, or PicBasic Pro Compiler.

A right-click gives you the choice of viewing ASCII, Decimal, or Hexadecimal.



The programmer's firmware can be upgraded electronically with the click of the mouse. Any required firmware changes will be included in the purchased upgrade.

USB Programmer Features:

- * Powered from USB port
- * Fast FULL SPEED USB data transfer
- * HID interface
- * Dual-color indicator shows ready/busy states
- * In-Circuit Serial Programming (ICSP) connector for interface to project board
- * Full featured software included with support for all ICSP-capable PICmicro® MCUs
- * Flash firmware easily upgradeable to add support for future devices
- * Compatible with Microchip HEX format files
- * Compatible with all Programming Adapters

| | | |
|-------------------------|--------------------------------------------------|-----------------|
| EPIC- USB | USB EPIC Programmer (with 6' cable) | \$89.95 |
| EPIC- USB Bundle | USB Programmer, ZIF Adapter and USB Cable | \$119.95 |
| | 8-40 PIN ZIF Adapter (ZIF-03) | |

EPIC Serial Port Programmer

The programmer board is specifically designed for In-Circuit Serial Programming (ICSP). An ZIF adapter is available to allow the programming of DIP-packaged PICs from 8 to 40 pins. See ZIF-01 and ZIF-02 adapters at the bottom of page. The programmer is compatible with the complete line of Programming Adapters. The programmer board measures only 1.8" x 2.3". Power is supplied by a 16VDC, 500mA, AC adapter (center-pin positive). A dual color LED indicates pro-



grammer status. The connection to the computer is via a standard 9-pin serial cable.

The programmer includes software for Windows 98/Me/NT/2000/XP. This software allows you to control the programmer and set the configuration bits on the PIC. The software may be run as a standalone application or launched from most program editor/IDE packages like MicroCode Studio. The Melabs programmer software is compatible with the standard Microchip HEX format files. Any assembler or compiler for PICmicros can be used to create the program, including MPASM, "C", PicBasic Compiler, or PicBasic Pro Compiler. Each configuration option is selectable in a drop-down list. Configuration data may be read from a hex file or from a PIC. The consolidated view-memory window lets you view each section of memory in the PIC with a click. A right-click gives you the choice of viewing ASCII, Decimal, or Hexadecimal. A formidable list of options allow you to customize the way you interact with the software. You control what areas of the device are erased, programmed, and verified. Save mouse clicks with options like "Disable completion messages" and "Erase before programming".

| | | |
|----------------|------------------------------------------------------------|-----------------|
| EPIC-S | Serial EPIC Programmer | \$89.95 |
| EPIC-SA | Serial EPIC Programmer w/ 8/18 ZIF Adapter (ZIF-01) | \$119.95 |

EPIC Plus Parallel Port Programmer

The EPIC Plus Programmer programs all mid-range PICmicros. The EPIC software is upgradeable for future PICmicros. The package includes DOS and Windows 95/98/Me/NT/2000/XP programming software. There is also a macro assembler that works with both the Microchip mnemonics and "8051" style mnemonics. Or you may use it with MPASM, "C", the PicBasic Compiler or the PicBasic Pro Compiler. Programs: PIC16C55x, 6xx, 7xx, 84, 9xx, PIC16CE62x, PIC16F8xx, PIC14Cxxx, the 8-pin PIC12Cxxx, PIC12CExxx and the 14-pin 16C505 microcontrollers. The basic programmer includes an 18-pin socket for programming 8-, 14- and 18-pin PICmicros. ZIF adapters are available to program 28- and 40-pin as well as surface mount and PLCC packaged PICmicros. The programmer runs off two 9-volt batteries or an optional AC adapter (16VDC, 450ma). It plugs into the PC parallel printer port using a 25-pin male to 25-pin female parallel printer extension cable.



| | | |
|------------------|-------------------------------------------------|----------------|
| EPIC-P | EPIC Programmer (Assembled & Tested) | \$59.95 |
| ACA-16VDC | AC Adapter (16VDC, 450ma) | \$9.95 |

PIC Microcontroller's Experimenter's Prototyping Board



The PIC Experimenter's Board is a complete prototyping platform for the 16F8X, 16C55X, 16C62X, 16C7X and 16C8X family of 18-pin PIC microcontrollers. Its 168-point solderless connection area allows for quick and easy access to all Port A (RA0-RA4) and Port B (RB0-RB7) I/O lines. It includes an integrated 16x2 serial backlit LCD display, which can be easily connected with one wire to any I/O line, or external serial source. Serial communication with LCD can take place at 300, 1200, 2400

and 9600 Baud (true or Inverted).

Features:

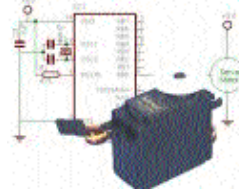
- * 16 x 2 character high-contrast backlit LCD super twist display
- * 4.0 Xtal oscillator
- * Regulated 5-volt power supply
- * Reset circuit:
- * Complete Plug-In Proto-typing Area
- * Size: 5.0" L x 3.5" W

PICX-01

\$89.95

PIC Experimenters' Kits

Servo Motor Kit: Tutorial on servo motors. (2) 42 oz. torque servo motors, (2) SPDT switches, (4) 10K, 1/4W resistors, (2) 3 pin headers, booklet.



PIC-SERVO-01 Without standard parts package \$41.95
PIC-SERVO-02 With standard parts package \$59.95

PIC Experimenters' Kits

Standard parts package — (1) PIC16F84-04, (1) 4MHz crystal, (2) 22pF caps, (1) 4.7K 1/4 watt resistor, 7805 Voltage Regulator, (1) Solderless bread board (2.1" x 3.6" 270 tie points).



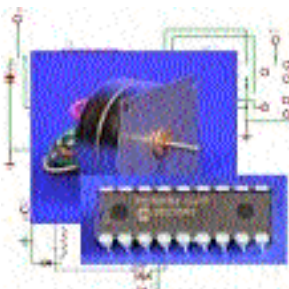
PIC-STD-01 Standard Parts Package \$19.95

PIC LED Kit — Tutorial on binary number system, logic and I/O of ports A & B. (8) 470 ohm resistors, (1) 10K ohm resistor, (8) subminiature LED, (1) push button switch, booklet.



PIC-LED-01 Without standard parts package \$9.95
PIC-LED-02 With standard parts package \$25.50

PIC Stepper Motor Kit



Tutorial on stepper motors. (1) 16F84/ 16F628, (1) unipolar stepper motor, (4) TIP120 transistor, (1) UCN5804, (4) 10K 1/4 watt resistor (2) SPDT switches, (1) 7805 voltage regulator (1) 4050 hex buffer, (1) 100 uF capacitor, (1) .01 uF capacitor, (1) 50K potentiometer, booklet.

PIC-STEP-01 Without Standard Parts Package \$32.95
PIC-STEP-02 With Standards Parts Package \$50.95

Serial LCD Modules



- * 16 characters x 2 lines
- * High-contrast super twist display
- * LED Backlight
- * Accepts RS232, inverted or true TTL / CMOS at 300, 1200, 2400 and 9600 bps.
- * Self-testing mode (pictured at left) to check proper function and jumper settings.
- * Power Requirement: 4.8 - 5.2 VDC, approx. 40 mA.
- * Size: 3.1" L x 1.4" W
- * Weight: 0.1 lbs

LCD-02 Serial LCD Display \$48.95

16x2 LCD Module



LCD-01
16x2 LCD Module (w/ backlight) \$9.95

- *16 characters x 2 lines
- *High-contrast super twist display
- *LED Backlight
- *Standard HD44780 operation
- *Self-testing mode (pictured below) to check proper function and jumper settings
- *Power Requirement: 4.8 - 5.2 VDC, approximate. 4 mA *
- *Size: 3.1" L x 1.4" W
- *Weight: 0.1 lbs

ZIF IC Adapters

These adapters connect to the EPIC Programmer's 10-pin expansion header to allow programming of 28 and 40 pin PICmicros in DIP, PLCC and surface mount packages.

ZIF-01 ZIF Adapter - 8/18/20 PIN \$34.95
ZIF-02 ZIF Adapter - 40/28 PIN \$34.95
ZIF-03 ZIF Adapter - 8/40 PIN \$39.95



18 PIN PIC Prototyping Board

- * High Quality double sided PC board
- * Solder mask both sides
- * 9 volt battery terminals
- * ON-off switch
- * Approx. dimensions 2.50" x 1.75"



Compatible with following microcontrollers: U1-PIC 16C52, 54, 56, 58, 554, 558, 61, 620, 621, 622, 71, 710, 711, 712, 715, 716, 717, 84, 16CE623, 624, 625, 16F54, 627, 628, 648A, 716, 818, 819, 83, 84, 87, 88, 16hv540, 18f1220, 1230, 1320, or 1330

| | | |
|-----------------|-------------------------------------|----------------|
| PCB-28 | Prototyping Board | \$6.95 |
| PP28-B | Parts | \$12.95 |
| PCB-28WP | Prototyping Board with Parts | \$18.95 |

*Overall dimensions 1.25" x 2.5"

*Compatiblity same as PCB-27

| | | |
|-----------------|-------------------------------------|----------------|
| PCB-27 | Prototyping Board | \$5.95 |
| PP27-A | Parts | \$9.95 |
| PCB-27WP | Prototyping Board with Parts | \$14.95 |



PIC Microcontrollers

| Item No. | Configuration | Memory Size | I/O Lines | Frequency | Price |
|-----------------|---------------|--------------|-----------|---------------|---------------|
| 16F84-4 | Flash | 1Kx14 | 13 | 4 MHz | \$7.50 |
| 16F84-10 | Flash | 1Kx14 | 13 | 10 MHz | \$8.00 |
| 16F84-20 | Flash | 1Kx14 | 13 | 20 MHz | \$6.55 |
| 16F628 | | | | 20 MHz | \$3.98 |
| 16F628A | | | 16 | 20 MHz | \$3.30 |
| 16F873A | Flash | 4Kx14 | 22 | 20 MHz | \$7.10 |
| 16C61 | OTP | | | 4 MHz | \$4.10 |
| 16C62A | OTP | 2Kx14 | 22 | 4 MHz | \$4.20 |
| 16F877A | | | | 20 MHz | \$8.10 |
| 18F2455 | | | | 48 MHz | \$9.40 |

I2C Bus EEPROM

| Item No. | Description | Price |
|------------------|---------------------------------------------------------|---------------|
| EEP-24C01 | I²C Bus EEPROM (1024-bit, 128x8) | \$.55 |
| EEP-24C02 | I²C Bus EEPROM (2048-bit, 256x8) | \$.70 |
| EEP-24C04 | I²C Bus EEPROM (4096-bit, 2x 256 x8) | \$1.00 |
| EEP-24C08 | I²C Bus EEPROM (8192-bit, 4x 256 x8) | \$1.19 |
| EEP-24C16 | I²C Bus EEPROM (16384-bit, 8x 256 x8) | \$1.50 |

Crystals

| | | |
|------------------|----------------------------------|---------------|
| XTAL-3.57 | 3.57 MHz Crystal | \$2.50 |
| XTAL-4 | 4.00 MHz Crystal | \$2.50 |
| XTAL-10 | 10.0 MHz Crystal | \$2.50 |
| XTAL-16 | 16.0 MHz Crystal | \$2.50 |
| XTAL-20 | 20.0 MHz Crystal | \$2.50 |
| CER-01 | 4.0 MHz Ceramic Resonator | \$1.25 |

Geiger Counter Section

Digital Geiger Counters with Serial (RS-232) Output
Three Radiological Instruments in One



GCA-04

GCA-04W

Survey Meter

Takes real time radiation readings and displays the count/second and equivalent radiation level in either mR/hr or mSv/hr.

Background Radiation Monitor

Take 1 minute or 5 minute readings. Displays accumulated count and equivalent background radiation in either uR/hr or uSv/hr.

Scientific Instrument & Industrial Tool

Perfect for schools and industry. In the laboratory the Digital Geiger Counter may be used to conduct nuclear experiments and measurements. Free Windows 98 and XP graphing programs, see below. Graphic Files may be exported to Excel spreadsheets.

In industry the Digital Geiger Counter may be used for HAZMAT, Emergency Services, compliance, screening etc.

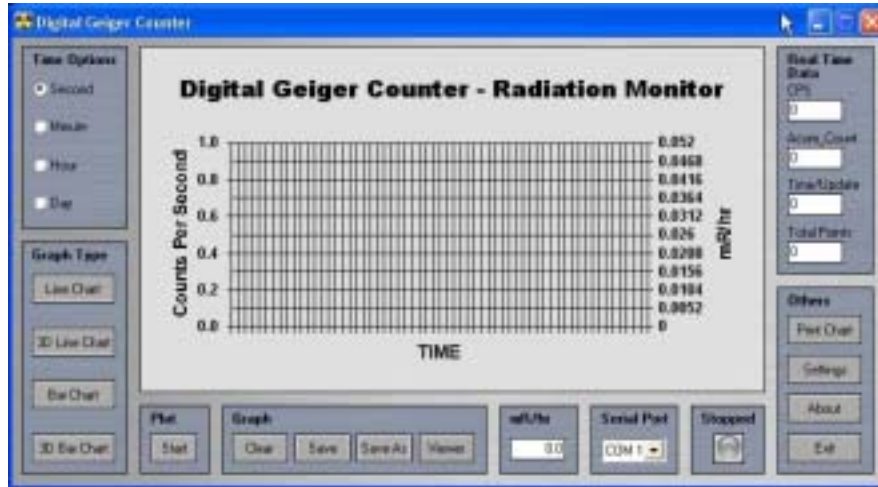
Applications:

- *Education - Classroom demonstrations and experiments
- * Emergency Services and Domestic Preparedness
- * HAZMAT and Compliance Verification
- *Dirty Bomb Screening and EMT's

Secondary indicators; audio (clicks) and visual LED (Blink) each time a radioactive particle is detected. Also includes a headphone jack and a power jack for external power.

Both Digital Geiger Counters GCA-04 and CGA-04W outputs serially via RS-232 or USB* the counts per second to our Windows PC program for charting and recording the measured radiation over time. Saved graphic data files may be imported into Microsoft Excel.

Continued Next page



Digital Geiger Counter Technical Data

Radiation Detected Alpha, Beta, Gamma and X-Rays.

Detector Geiger-Muller tube Ne + Halogen filled with a .38" effective diameter 1.5-2.0 mg/cm² mica end window.



Detector Sensitivity ·

*Alpha above 3.0 MeV ·

*Beta above 50 KeV ·

*Gamma above 7 KeV

Countable Pulse Resolution & Range 1 Count Per Minute (CPM) - 9,360 Counts Per Second (CPS)

Radiation Resolution & Range 1.0 uR/hr - 655 mR/hr (Conventional)
.01 uSv/hr - 6.5 mSv/hr (Systems International SI)

LCD Display 16 character by 2 line LCD (liquid crystal display) with back light provides easy to read output. Secondary indicators; audio (clicks) and visual (LED) included. Also includes a headphone jack.

RS-232 Standard RS-232 output for PC available via DB-9 serial. USB* adapter available

Power 9 volt battery Or AC Adaptor for extended operation

Case Size 7.5" x 4.1" x 1.2"

| | | |
|----------------|------------------------------------------------------------------|-----------------|
| GCA-04 | Digital Geiger Counter with PC Output | \$399.95 |
| GCA-04W | Digital Geiger Counter with Wand & PC Output | \$449.95 |
| Cert-01 | Certification for Digital Geiger Counter GCA-04 & 04W | \$125.00 |

*USB Port Compatible using USB to Serial Adapter. The standard RS-232 port on the servomotor board may be connected to a USB port using a serial USB to Serial port adapter. This allows normal program operation and functions through USB port. See page 36 for USB-01.

Analog Meter Geiger Counters



GCA-03

GCA-03A

Images SI Inc.'s Analog Meter Geiger Counters are useful for detecting and measuring radioactivity and performing nuclear experiments.

Applications:

- * Education - Classroom demonstrations and experiments
- * Emergency Services and Domestic Preparedness
- * HAZMAT and Compliance Verification
- * Dirty Bomb Screening and EMT's

The analog meter is calibrated in mR/hr that is useful for approximating radiation levels of 0-10 mR/hr (Range switch set to 1X) and 0-20 mR/hr (Range switch set to 2X). These Geiger counters also have secondary indicators; an audio click and LED blink each time a radioactive particle is detected. Model GCA-03 has an internal Geiger-Mueller (GM) tube. The GM tube is Ne + Halogen filled with a .38" effective diameter mg/cm² mica end window.

- Detects the following radiation:**
- *Alpha above 3.0 MeV
 - * Beta above 50 Ke
 - *Gamma above 7 Ke

The GCA-03 and GCA-03W Geiger Counters have the following features:

Headphone / Analog Meter Jack

Digital Output -- The digital output jack provides a TTL logic high pulse each time a radioactive particle is detected. The digital output may be interfaced to a Personal computer (PC) or a microprocessor.

Compatible with:

GCAD-01 & GCAD-02 RS-232 PC Adaptors, DMAD-01 & DMAD-02 Digital Meter Adapter, RNGAD-01 & RNGAD-02 Random Number Generators.

External Power Jack

Case Size 5.6" x 3.2" x 1.5"

| | | |
|----------------|----------------------------------------------|-----------------|
| GCA-03 | Analog Meter Geiger Counter | \$312.95 |
| GCA-03W | Analog Meter Geiger Counter with Wand | \$354.95 |

Geiger Counter Kits



GCK-01



GCK-02

Analog Geiger Counters are useful for detecting radioactivity and performing nuclear experiments. The models GCK-01 and GCK-02 are offered as kits as well as assembled. The assembled and tested Geiger counters have the "A" suffix. These Geiger Counters primary indicators are an audio click and an LED blink each time a radioactive particle is detected. Count Rate VS Dose Rate chart on front of counter provides an indication of radiation based on clicks per second.

The Model GCK-02 has an internal Geiger-Mueller tube. The model GCK-01 has an external wand that houses Geiger-Mueller tube (GMT-01) and provides a easy to use probe for checking radioactivity. The GM Tube is a Ne + Halogen filled, with a .38" effective diameter 1.5-2.0 mg/cm² mica end window.

- * Detects alpha above 3.0 MeV.
- * Detects beta above 50 KeV.
- * Detects gamma above 7 KeV.

The CGK-01 and GCK-02 Geiger Counters have the following features:

Headphone / Analog Meter Jack

Digital Output -- The digital output jack provides a TTL logic high pulse each time a radioactive particle is detected. The digital output may be interfaced to a Personal computer (PC) or a microprocessor.

Compatible with: GCAD-01 & GCAD-02 RS-232 PC Adaptors, DMAD-01 & DMAD-02 Digital Meter Adapter, RNGAD-01 & RNGAD-02 Random Number Generators.

External Power Jack

Geiger Counter Kit GCK-01 & CGK-02 includes:

- * Printed Circuit Board (PCB-06)
- * Printed and drilled enclosure case
- * Assembled Wand (* GCK-01 only)
- * GM Tube (* GCK-02 ONLY)
- * All electronic components

Case size 5.6"x 3.2"x 1.5"

| | | |
|----------------|--------------------------------------------------------------------|-----------------|
| GCK-01 | Geiger Counter Kit -- Unassembled | \$249.95 |
| GCK-01A | Geiger Counter Kit -- Assembled & Tested | \$319.95 |
| GCK-02 | Geiger Counter Kit (internal tube)-- Unassembled | \$194.95 |
| GCK-02A | Geiger Counter Kit (internal tube)-- Assembled & Tested | \$267.95 |

Geiger Counter Kits (pc board and components)



Analog Geiger Counters are useful for detecting radioactivity and performing nuclear experiments. These Geiger Counter kits primary indicators are an audio click and an LED blink each time a radioactive particle is detected. The GCK-05 and GCK-06 use an internal Geiger-Mueller tube.

The CGK-05 and GCK-06 Geiger Counters have the following features:

Headphone / Analog Meter Jack

Digital Output -- The digital output jack provides a TTL logic high pulse each time a radioactive particle is detected. The digital output may be interfaced to a Personal computer (PC) or a microprocessor.

Compatible with: GCAD-01 & GCAD-02 RS-232 adaptors, DMAD-01 & DMAD-02 Digital Meter Adapter, RNGAD-01 & RNGAD-02 Random Number Generators.
External Power Jack

Geiger Counter Kit GCK-05 & CGK-06 includes:

- * Printed Circuit Board
- * GM Tube
- * All electronic components

| | | |
|----------------|--------------------------------------------------------------------|-----------------|
| GCK-05 | Geiger Counter Kit -- Unassembled | \$148.95 |
| GCK-05A | Geiger Counter Kit -- Assembled & Tested | \$199.95 |
| GCK-06 | Geiger Counter Kit (internal tube)-- Unassembled | \$188.95 |
| GCK-06A | Geiger Counter Kit (internal tube)-- Assembled & Tested | \$224.95 |

Geiger Counter Wand

The Geiger Counter wand has a thin mica window that allows the detection of alpha, beta, and gamma radiation. Operating range is 450-600 volts, the recommended voltage is 500 volts. The physical dimensions of the wand are approximately .85" diameter and 5.75" long. Approximately five feet of shielded cable connects the wand and a standard three pin mini din connector plug.

Recommended anode resistor: 10 mega-ohm resistor built into wand, see website for schematic. Gas filling on GM tube is neon and halogen.



GCW-01 Geiger Counter Wand \$124.95

Radiation Shields for Wands

These radiation shields friction fit on the open end of the Geiger Counter wand. Each shield helps to block radiation from reaching the internal GM tube inside the wand. The shields are useful in performing nuclear tests and experiments. The Screen shield is an open mesh nylon screen that allows all radiation including alpha to pass through. The paper shield blocks alpha radiation, while permitting beta and gamma radiation. The aluminum shield attenuates beta radiation and the lead shield attenuates gamma radiation.

Shields may be purchased separately or in a set.



| | | |
|---------------|-----------------------------------------------------|----------------|
| SHD-01 | Open Screen Radiation Shield | \$9.95 |
| SHD-02 | Paper Radiation Shield | \$9.95 |
| SHD-03 | Aluminum Radiation Shield | \$9.95 |
| SHD-04 | Lead Radiation Shield | \$9.95 |
| SHD-05 | Radiation Shield Set (Screen, Paper, Al, Pb) | \$36.95 |



Digital RS-232 Adapter for Analog Geiger Counters

This Digital Adapter plugs into the digital out of the analog Geiger Counters and provides an RS-232 computer output for use with Images Company Geiger Counter Graphing program. The adapter is compatible with analog meter Geiger Counters that use either an internal tube or a wand with shielded cable.

May be purchased as a kit or assembled and tested.

Continued on next page.

Continued from previous page

USB Compatible--Use USB to Serial (RS232) Adapter--See Page 36 for USB-01

The Windows Geiger Counter program is free to download here:

http://www.imagesco.com/catalog/geiger/counter_accessories.html

| | | |
|----------------|----------------------------------------------|----------------|
| GCAD-01 | RS-232 Adapter Kit | \$45.95 |
| GCAD-02 | RS-232 Adapter (assembled and tested) | \$79.95 |

Analog Radiation Meter

The Radiation Meter may be incorporated into a standard analog Geiger Counter to provide a visual readout of the approximate radiation level. Complete unit plugs into the headphone jack using a 3.5 mm plug. Compatible with the CGK-01 and GCK-02 Geiger Counters.



Analog Radiation Meter is available alone, as a kit, or assembled and tested.

| | | |
|-------------------|----------------------------------|----------------|
| R-Meter-01 | Radiation Meter | \$12.95 |
| R-Meter-02 | Radiation Meter Kit | N/A |
| R-Meter-03 | Radiation Meter Assembled | N/A |

Digital Meter Adapter for Analog Geiger Counters



This Digital Meter Adapter plugs into the digital out of the analog Geiger counters and displays a Count Per Second (CPS) or a Count Per Minute (CPM) and the equivalent radiation level. CPS or CPM mode is user selectable. Radiation level is provided in mR/hr or mSv/hr in CPS mode (user selectable). In CPM mode radiation level is provided in uR/hr or uSv/hr (user selectable). The adapter is compatible with analog meter Geiger counters that use either an internal tube or a wand with shielded cable.

Countable Pulse Resolution & Range

1 Count Per Minute (CPM) - 9,360 Counts Per Second (CPS)

| | |
|-----------------------------------------|-------------------------|
| Radiation Resolution & Range | 1.0 uR/hr - 655 mR/hr |
| (Metric) | .01 uSv/hr - 6.5 mSv/hr |

LCD Display 16 character by 2 line LCD (liquid crystal display) with back light provides easy to read output.

May be Purchased as a kit or assembled and tested

| | | |
|----------------|-----------------------------------------------------|----------------|
| DMAD-01 | Digital Meter Adapter Kit | \$59.95 |
| DMAD-02 | Digital Meter Adapter (assembled and tested) | \$89.95 |

Random Number Generator for Analog Geiger Counters



This Random Number Generator plugs into the digital out of the analog Geiger counters and provides a random number each time a radioactive particle is detected. The Geiger counter is set to read background radiation. The random numbers generated are truly random since they are based naturally occurring radioactivity.

The random number generate may be set to the following ranges:

- Binary (1-2) Heads or Tails
- Decimal (1-10)
- 1 Byte (1 - 255)
- 2 Byte (1 -65535)

The random number generator is compatible with analog meter Geiger counters that use either an internal tube or a wand with shielded cable.

Typically, depending upon location, the generator will generate 20-40 random numbers per minute.

TTL Serial Output Random numbers are sent out via a TTL serial port that may be interfaced to a microcontroller or PC.

LCD Display 16 character by 2 line LCD (liquid crystal display) with back light provides easy to read output. May be purchased as a kit or assembled and tested.

| | | |
|-----------------|-----------------------------------------------------------|----------------|
| RNGAD-01 | Random Number Generator Kit | \$59.95 |
| RNGAD-02 | Random Number Generator Kit (assembled and tested) | \$89.95 |

Radioactive Isotopes

All our radioactive isotopes and uranium ore samples we sell are legal to purchase and own by the general public. However, we do not accept any international orders of any radioactive material. We only accept and supply orders from within the United States. No NRC license required to purchase or own the radioisotopes listed below.



Radioactive isotopes are drop shipped from an NRC licensed facility. The drop shipping cost is already included in the price of the radioactive isotope listed below.

Sample radioactive sources are useful for experimenting and testing the functionality of a Geiger Counter. Safe, uncalibrated solid sealed sources are fabricated by depositing a license exempt quantity of activity in the well of a 1-inch diameter (25mm) by 1/4-inch thick (6mm) plastic disk.

After drying, the well is filled with an epoxy material; sealing the radioactivity inside the source. Contains $\pm 20\%$ of the stated activity and are routinely compared to calibrated reference standards. Each disk is identified by radionuclide, amount of activity, serial number and calibration date. The words "Caution - Radioactive Material" appear on the label of each source.

All radioactive isotopes are encased in a 1" x 1/4" thick plastic disk. All prices include drop shipping cost from licensed NRC facility.

| Description | Activity | Half Life | Item # | Price |
|-----------------------------------------------------------------------------------------------------------------|----------|------------|------------------|-----------------|
| Sodium-22 | 1uCi | 2.6 years | NA-22-S | \$79.95 |
| Cobalt-57 | 1uCi | 271 days | CO-57-S | \$79.95 |
| Barium-133 | 1uCi | 10.5 years | BA-133-S | \$79.95 |
| Manganese-54 | 1uCi | 312 days | MN-54-S | \$79.95 |
| Cesium-137 | 1uCi | 30.2 years | CS-137-1 | \$80.00 |
| Cesium-137 | 5uCi | 30.2 years | CS-137-5 | \$80.00 |
| Cesium-137 | 10uCi | 30.2 years | CS-137-10 | \$100.00 |
| Cobalt-60 | 1uCi | 5.27 years | CO-60-S | \$79.95 |
| Cadmium-109 | 1uCi | 465 days | CD-109-S | \$79.95 |
| Polonium-210 | 1uCi | 138 years | PO-210-S | \$79.95 |
| Zinc-65 | 1uCi | 245 days | ZN-65-S | \$79.95 |
| Strontium-90 | 1uCi | 29.1 years | SR-90-S | \$79.95 |
| Thallium-204 | 1uCi | 3.8 years | TL-204S | \$79.95 |
| S-7 Set of three Radioactive Sources Po-210, .1 uC (alpha); Sr-90, .1 uC (beta); Co-60, 1 uC (gamma) | | | | |
| S-7 | | | | \$182.00 |

Uranium Ore

Radioactive sample of uranium ore. Useful for testing Geiger Counters. License exempt. Uranium ore sample sizes vary. Shipped in labeled metal container as shown on right.

Shipping Information: We are always in compliance with Section 13 from part 40 of the NRC Nuclear Regulatory Commission rules and regulations and Postal Service regulations specified in 49 CFR 173.421 for activity limits of low level radioactive materials. Item will be shipped in accordance with Postal Service activity limits specified in Publication 52. Radioactive minerals are for educational and scientific use only.



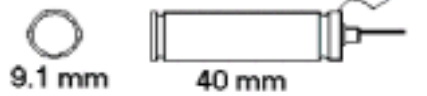
UR-01

Uranium Ore

\$24.95

Geiger-Mueller Tubes

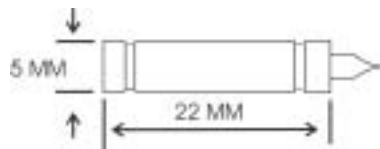
Thin mica window detects alpha, beta, and gamma radiation. Operating range is 450-600 volts (recommended: 500 volts). Recommended anode resistor: 10 mega ohms. Gas filling: Neon and halogen. Measures .36" (9.1 mm) wide, 1.6" (40 mm) long.



DS-GMT-01 Geiger Mueller Tube

\$74.95

Small Geiger- Mueller Tube detects gamma radiation. Operating range is 450-650 volts (recommended: 500). Recommended anode resistor: 3.3 mega ohms. Gas filling neon and halogen. Measures 5.2 mm wide, 22 mm long



DS-GMT-03 Geiger Mueller Tube

\$74.95

Speech Recognition Technology



The SR-06 Speech Recognition Kit is a complete easy to build trainable speech recognition circuit. Trainable in the sense that you train the words (or vocal utterances) you want the circuit to recognize. This kit allows you to experiment with many facets of speech recognition technology. Speech recognition will become the method of choice for controlling appliances, toys, tools and computers.

SR-06 Speech Recognition Kit (unassembled)

When a trained word is recognized, the circuit outputs a digital number corresponding to the word recognized. This binary output may be interfaced to control external circuits and appliances. See our Speech Interface Products; SRI-01, SRI-02 and SRI-03. The SRI-01 is for controlling the OWI robotic arm using voice commands. The SRI-02 and SRI-03 are general purpose interfaces. The SR-06 is always in the listening mode. The modular circuit boards allows the main circuit board to be embedded or interfaced to external circuits.



Features of the kit include:

- * Self-contained stand alone speech recognition circuit.
- * Modular circuit design for easy embedding of base circuit into other designs
- * User programmable.
- * 20 or 40 word vocabulary.
- * Multi-lingual.
- * Non-volatile memory back up (*requires 2032 button battery not included).
- * Easily interfaced to control external circuits & appliances.

| | | |
|--------------|------------------------------------------------------------|-----------------|
| SR-06 | Speech Recognition Kit (unassembled) | \$95.95 |
| SR-07 | Speech Recognition Circuit (assembled & tested) | \$149.95 |

* Individual speech recognition components are available - see semiconductor pages:

SRI-02 Speech Recognition Interface Kit



The SRI-02 incorporates ten relay switches corresponding to the first ten recognized words by the SR-07 Speech Recognition Circuit. Each numbered relay has a single-pole double-throw (SPDT) switch rated at 125 VAC at 0.5 amps or 24 VDC at 1.0

amps. Using this interface easily allows the speech recognition kit to activate or deactivate 10 electrical circuits or devices. The SRI-02 plugs into the display port of the Speech Recognition Kit (SR-07)



SR-02

SR-07

| | | |
|----------------|---------------------------------------------------------------------|-----------------|
| SRI-02 | Speech Recognition Interface Kit w/relays (unassembled) | \$109.95 |
| SRI-02A | Speech Recognition Interface Kit, “ (assembled & tested) | \$149.95 |

SRI-03 Speech Recognition Interface Kit



The SRI-03 Speech Recognition Interface Kit incorporates ten logic outputs corresponding to the first ten recognized words by the SR-07 Speech Recognition Circuit. Each numbered output provides a +5V signal when that corresponding word is recognized. Using this interface allows the speech recognition kit to activate 10



SRI-03

SR-07

electrical circuits or devices using the TTL logic signal. The SRI-03 plugs into the display port of the Speech Recognition Kit.

| | | |
|----------------|----------------------------------------------------------------|----------------|
| SRI-03 | Speech Recognition Interface Kit (unassembled) | \$69.95 |
| SRI-03A | Speech Recognition Interface Kit (assembled and tested) | \$99.95 |

Speech Recognition Components

| | | |
|------------------|------------------------------------------------------------------|----------------|
| PCB-03 | PCBs (3 Printed Circuit Boards; Main, Display and Keypad) | \$30.00 |
| HM2007 | HM-2007 IC | \$10.00 |
| 6264 | SRAM | \$8.00 |
| HD-01 | Microphone Headset | \$6.95 |
| DS-HM2007 | HM-2007 Data Booklet | \$5.00 |

Speech Recognition Interface for OWI's 007 Robotic Arm Trainer



The Speech Interface Kit Connects the SR-06 (or SR-07) to the OWI Robotic Arm to allow complete control of the robotic arm using voice commands. Each robotic function is controlled by a spoken word. The user trains the speech recognition circuit to recognize their voice and commands. Users can select their own words to control robotic arm function.

See Page 5 for OWI's 007 Robotic Arm Trainer

| | | |
|----------------|-------------------------------------------------------|-----------------|
| SRI-01 | Speech Interface Kit for OWI-007 (unassembled) | \$72.95 |
| SRI-01A | Speech Interface Kit for OWI-007 (assembled & tested) | \$112.95 |

*Requires both the SR-07 Speech Recognition Circuit and OWI 007 Robotic Arm Trainer

PC Control through Serial Port for OWI's Robotic Arm Interface Kit



RAI-007SA Interface

The robotic arm interface kit connects OWI's 007 Robotic Arm Trainer (tm) to a personal computer, (IBM PC or compatible). The interface connects to the PC's serial port or USB* port using adapter. The software for the interface permits real time control and contains a

built-in interactive script writer. A user may write a script that contains up to 99 individual robotic arm functions (including pauses) into a single script file. Script files may be saved and loaded from disk just like any other standard computer file. Script files may be replayed automatically up to 99 times for demonstrating computer controlled automation and animatronics. The Robotic Arm PC Interface creates a fun way of learning and experimenting with computer automation and animatronics.



Program Screen Image

The Interface Kit Includes:

- * Windows 95/98/ME/2000/XP program
- *Linux program
- *Printed Circuit Board for easy construction * All components * DB9 M/F cable

| | | |
|------------------|---------------------------------------------------------------|----------------|
| RAI-007S | Serial Robotic Arm Interface for OWI-007 (unassembled) | \$65.95 |
| RAI-007SA | Serial Robotic Arm Interface for OWI-007 (assembled & tested) | \$87.95 |

*USB Port Compatible using USB to Serial Adapter. The standard RS-232 port on the servomotor board may be connected to a USB port using a serial USB to Serial port adapter. This allows normal program operation and functions through USB port. See Page 36 for USB-01.

USB to Serial Adapter

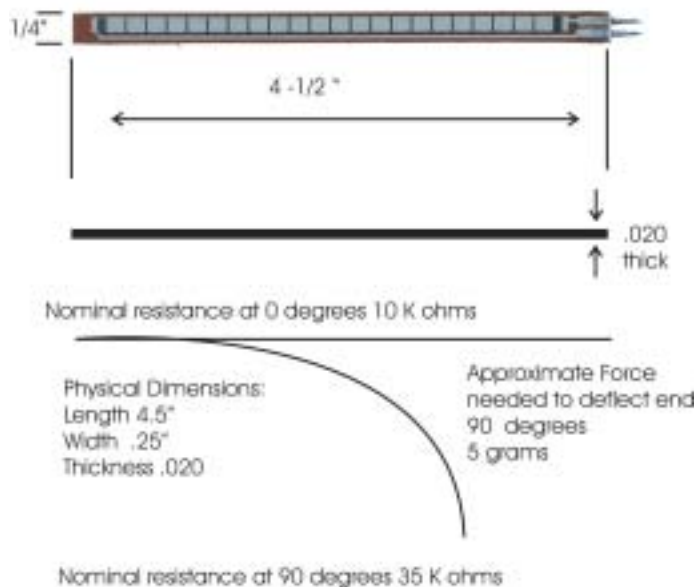
USB Adapter for Digital Geiger Counters and RS-232 Adapter.

This adapter allows you to connect the serial port of the digital Geiger counters to a standard USB port



USB-01 USB to Serial Adapter \$31.95

Flex Sensor



The Flex Sensor is a unique component that changes resistance when bent. An unflexed sensor has a nominal resistance of 10,000 ohms (10 K). As the flex sensor is bent the resistance gradually increases. When the sensor is bent at 90 degrees its resistance will range between 30-40 K ohms.

The flex sensor may be bent greater than 360 degrees depending upon the radius of the curve. The sensor measures 1/4 inch wide, 4 1/2 inches long and only .019 inches thick!


Some applications for the Flex Sensor are:

- *Collision detection on mobile robots
- *VR Gloves and VR suits
- *Physics applications and experiments


FLX-01 Flexible Bend Sensor \$10.00

Force Sensing Resistors


Force Sensing Resistors (FSR) are a polymer thick film (PTF) device which exhibits a decrease in resistance with an increase in the force applied to the active surface. Its force sensitivity is optimized for use in human touch control of electronic devices. FSRs are not a load cell or strain gauge, though they have similar properties. FSRs are not suitable for precision measurements.



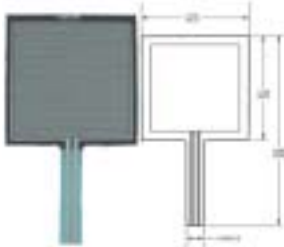
Part No. 400
(0.2" circle)



Part No. 402
(0.5" circle)



Part No. 408



Part No. 406
(1.5" square)

| Part Number: | | |
|--------------|--------------------|---------|
| FSR-400 | Force Sensing Res. | \$6.00 |
| FSR-402 | " | \$6.60 |
| FSR-406 | " | \$8.75 |
| FSR-408 | " | \$18.00 |

Stretch Sensors

The Stretch Sensor is a unique component that changes resistance when stretched. An unstretched sensor has a nominal resistance of 700 ohms per linear inch. As the stretch sensor is stretched the resistance gradually increases. When the sensor is stretched 100 % its resistance will approximately double to 1.4K ohms per inch.

The stretch sensor is a new way to measure stretch, displacement and force. The sensor is a flexible cylindrical cord .070 in diameter, with spade or ring electrical terminals at each end.



The sensor above measures 4 inches long, not including the electrical terminals and only .070 inches diameter!

Some applications for the Stretch Sensor are:

- Robotics
- Biometric displacement reading
- VR Gloves and VR suits
- Physics applications and experiments
- Feedback sensor for air muscles

Flexible Stretch Sensors are sold with standard electrical terminals.

Cont. next pg.

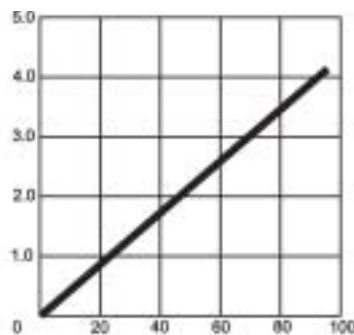
Stretch Sensor Pricing:

| | | | | | |
|----------------|------------------------------------|------------------------------------|----------------|------------------------------------|----------------|
| STRX-02 | 2" Flexible Stretch Sensor | \$14.95 | STRX-04 | 4" Flexible Stretch Sensor | \$14.95 |
| STRX-06 | 6" Flexible Stretch Sensor | \$22.95 | STRX-08 | 8" Flexible Stretch Sensor | \$22.95 |
| STRX-10 | 10" Flexible Stretch Sensor | \$28.95 | STRX-12 | 12" Flexible Stretch Sensor | \$28.95 |
| | STRX-14 | 14" Flexible Stretch Sensor | | \$30.95 | |

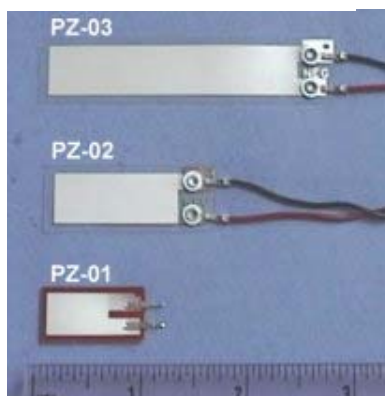
Flexiforce Pressure Sensors

These sensors are ideal for measuring forces without disturbing the dynamics of a test. They can be used to measure both static and dynamic forces. They are thin enough to enable non-intrusive measurement. The resistance of the sensor decreases as force is applied.

| | |
|-------------------------------------------------|----------------|
| PS-01 Pressure Sensor: 0 - 1 lb. force | \$19.95 |
| PS-02 Pressure Sensor: 0 - 25 lb. force | \$19.95 |
| PS-03 Pressure Sensor: 0 - 100 lb. force | \$19.95 |



Piezoelectric Film



The piezo film element produces more than 10 millivolts per microstrain, about 60 dB higher than the voltage output of a foil strain gage. The capacitance is proportional to the area and inversely proportional to the thickness of the element.

These sensors are the simplest form of piezo film sensors, used primarily as dynamic strain gauges and contact microphones for vibration or impact detection. They can be readily adhered to a surface with double-sided tape or epoxy.

The PZ-01 comes without any leads for those applications where the application suits a custom lead attachment. Lead attachment can be achieved by compressive clamping, crimps, eyelets, conductive epoxy or low temperature solders. The PZ-02 and

PZ-03 have wires attached to the film with rivets.

The elements are supplied with a thin urethane coating over the active sensor area; the lead attachment legs are free of the insulating urethane coating.

The capacitance is proportional to the area and inversely proportional to the thickness of the element.

| | |
|-----------------------------------------------------------------------------|-------------------|
| PZ-01 Piezoelectric Film 13 mm X 24 mm X .2 mm (.51" X .95" X .008") | \$2.50 |
| PZ-02 Piezoelectric Film 6 mm X 41 mm X .2 mm (.63" X 1.6" X .008") | \$6.00 |
| PZ-03 Piezoelectric Film 16 mm X 73 mm X .2 mm (.63" X 2.9" X .008") | \$8.00 |
| PZ-04 Piezo Speaker 152 mm X 76 mm X .06 mm (6" X 3" X .002") | \$30.00 |
| PZ-05 Piezo Switch | \$20.00 |
| PZ-05-R Piezoelectric Switch - Reverse action | \$20.00 |
| PZ-07 20 AWG Piezo Cable | \$14.00/ft |

PZ-05/ PZ-05R



PZ-08/ PZ-09

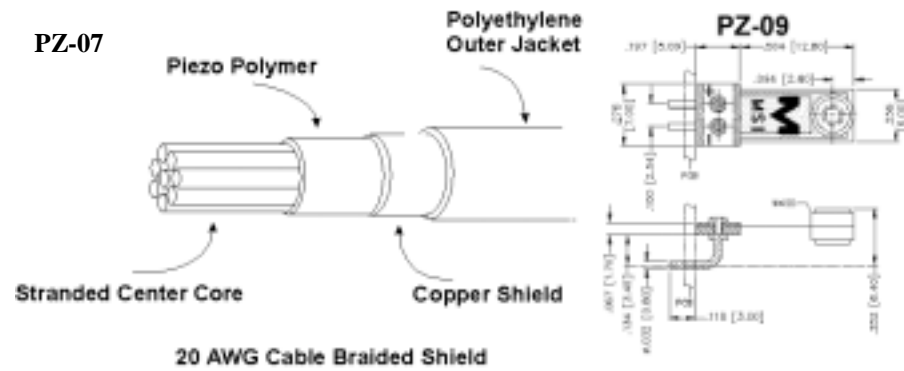


**PZ-08 Piezo Film: 6mm x 12.8mm x .2mm
(.236" x .504" x .008")
(horizontal PC mount)**

\$5.00

**PZ-09 Piezo Film: 6mm x 12.8mm x .2mm (.236" x .504" x .008")
(vertical PC mount)**

\$5.00



Electronic Compasses

1490 Digital Compass



The **1490 Digital Compass** is a solid state device capable of detecting the earth's weak magnetic field. It can distinguish between the four cardinal points and also the intermediate directions (NE, NW, SE, SW). The sensor is damped to approximate the speed of a liquid filled compass. It takes 2.5 seconds for it to respond to a 90 degree displacement. The device is sensitive to tilt, and any tilt greater than 12 degrees will create directional errors. Our Navigation pcb allows you to build three different digital compasses using the 1490 digital compass.

1490 Digital Compass w/ Datasheet \$15.95

1525 Analog Compass

The **1525 Analog Compass** measures the direction of the horizontal component of the earth's field. For practical purposes up to a 12 degree tilt, as with any compass is acceptable. The output closely resembles a sine-cosine set of curves which cross at approximately 2.5 volts and peak at around 2.88 volts and floor at 2.12 volts. Each output will drive up to 4 mA.

This sensor is also damped so that if the reading is displaced 90 degrees, it will return to proper indication in 2.5 to 3.5 seconds with no over swing. The input should be polarity protected, as reversing Vcc and Ground will destroy the sensor.



1525 Analog Compass w/Datasheet \$39.00

Mercury/Glass Tilt Switch



SW-04 Mercury/glass tilt switch ,
SPST \$2.50

Photoresistors

Light dependent resistor. Cadmium Sulfide type.
Changes resistance with light.



| <u>Item No.</u> | <u>Description - Transition @ 100° C</u> | <u>Price</u> |
|-----------------|---------------------------------------------------------|--------------|
| PR-01 | 2M ohm max. dark resistance, 25K ohm light resistance | \$2.00 |
| PR-02 | 1M ohm max. dark resistance, 12K ohm light resistance | \$2.00 |
| PR-03 | 500K ohm max. dark resistance, 15K ohm light resistance | \$2.00 |
| PR-04 | 100K ohm max. dark resistance, 10K ohm light resistance | \$2.00 |

Solar Cells

The SC-01 glass thin-film solar cell is of the same type that are used on solar powered calculators. They provide good charging or direct power under low light and indoor lighting conditions.

When a solar cell is rated for current output in "uA" (microamps). The "uA" rating is usually given for solar cells that are used "inside", typically under florescent, very low light conditions, therefore the small ("uA") current output. These solar cells can be used on "outdoor" products also exposed to a full-spectrum, high intensity light source (the Sun), the current will be much higher and in the milliamp (mA) range.

The SC-02 solar cell, that is made for full spectrum sunlight, will output a greater current in sunlight, per square centimeter, than the SC-01.



| | | |
|-------|--------------------------------------|--------|
| SC-01 | Solar Cell (55 mm x 20 mm-3.0 Volts, | \$2.50 |
| SC-02 | Solar Cell (55 mm x 29 mm-3.0 Volts | \$3.95 |

Toxic Gas Sensor



This toxic gas sensor responds to a large number of airborne toxic compounds. It is designed to operate with a stabilized 5V heater supply and a circuit voltage not exceeding 24V. Its most suitable application is for a gas leak alarm or automatic ventilator control.

| | | |
|---------------|------------------------------------|----------------|
| TGS-01 | Toxic Gas Sensor | \$19.95 |
| TGS-02 | Socket for Toxic Gas Sensor | \$2.50 |
| TGS-DS | Datasheet | \$5.00 |

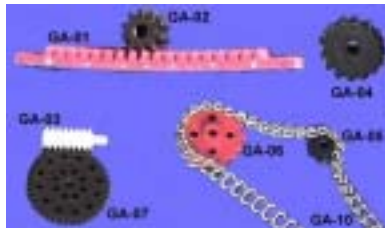
Gearbox Motor



Great for Robotics Projects! Provides 6 different ratios and 18 speeds. Rugged compact design and construction. Ideal for models, CDT and R&D projects. Operates from 1.5, 3.0 and 4.5 VDC sources. Extensive range of available accessories. Shaft Size: 3 mm

| | | |
|-------------|----------------------------------|----------------|
| 917D | 4000:1 Gearbox With Motor | \$21.50 |
|-------------|----------------------------------|----------------|

Gearbox Accessories



| | | |
|--------------|-----------------------------------------------|----------------|
| GA-01 | Rack | \$2.70 |
| GA-02 | Pinion | \$2.30 |
| GA-03 | Worm Drive | \$1.60 |
| GA-04 | Crown Gear | \$1.85 |
| GA-05 | Chain Sprocket (8 tooth, 2.9 mm bore) | \$1.35 |
| GA-06 | Chain Sprocket (16 tooth, 2.9 mm bore) | \$1.60 |
| GA-07 | Gear (40 tooth, 2.9 mm bore) | \$2.40 |
| GA-08 | Gear (10 tooth, 2.9 mm bore) | \$1.35 |
| GA-09 | Gear (20 tooth, 2.9 mm bore) - | \$1.60 |
| GA-10 | Drive Chain (39 inches) | \$17.95 |

Miniature Gearbox

1" diameter motor with 100:1 precision metal gearbox gives about 80 RPM with 3 volts and huge torque of about 180 inch/oz. Weight of the entire unit is about 1-1/2 oz. Length overall is 2-1/4", output shaft is 2 mm. No part of the gearbox extends outside the diameter of the motor.

| | | |
|-------------|---------------------------------|----------------|
| 918D | 100:1 Gearbox With Motor | \$28.50 |
|-------------|---------------------------------|----------------|



75:1 SANYO Micro Gearbox Motor

This Sanyo NA1S 75.7:1 reduction gear motor is only 29mm (1.14") long (overall), 10mm (0.39") thick, and 12mm (0.47") wide and it's made with metal gears. These 8.2 gram (0.29oz) motors are rated for 246 RPM, drawing 120mA @ 5V, producing 800gf*cm torque (11 in*oz) and stalling out at 580mA. The 3mm diameter output shaft mates pretty well with any 1/8" hole output device.

Includes 2 Metric Screws for Faceplate, to mount motor to your project.

On our website gearbox specifications are available, see NA1S PDF file (100K)

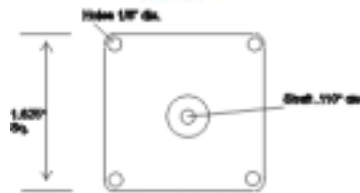
| | |
|-------------|----------------|
| NA1S | \$24.95 |
|-------------|----------------|



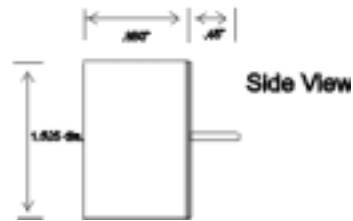
5V & 12V Stepper Motors



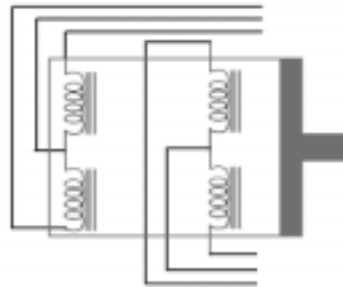
ST-02:
 Rated Voltage: 5 VDC
 Rated Current: .1 amps (100 mA)
 Phase Resistance: 50 ohms
 Weight: 135 g
 Unipolar 6 wire
 5 Degrees per step
 Shaft Size: 1/8 dia. X 9/16 length



Front View



Side View



ST-02
 ST-03

5V Stepper Motor
 12V Stepper Motor

\$10.00
 \$10.00

Curie Point Magnetic Heat Engine

The heat engine uses a principle of magnetism discovered by Pierre Curie. Pierre Curie discovered that ferromagnetic materials have a critical temperature at which the material loses their ferromagnetic behavior. This is known as its Curie Point. We can use this property to construct a small swinger type heat engine. The heat engine uses a nickel alloy wire that has a low Curie Point.

HE-01 **\$24.95**

Heat Engine comes with all parts but components can be purchased separately to build your own.

6" Low Curie Point Wire **\$4.95**
1" dia. Neodymium Disc Magnet **\$3.95**



Nitinol Wire and Products

Nitinol wire properties:

Nitinol's physical function resembles biological muscle; when activated it contracts. To activate Nitinol it is heated above its transition temperature (typically 70C). An electric current may be passed through the wire to heat it electrically. When the material cools it can be stretched back to its original length.

The contraction movement may be applied to any task requiring physical movement with low to moderate cycling speeds. The small size, light weight, ease of use and silent operation allow it to replace small motors or solenoids. For additional information read our online Nitinol article.

We offer nitinol/flexinol wire in a variety of diameters, from .006 to .015. Nitinol wire is also available cut to length and precrimped, see picture on right.



| Diameter Size (in.) | Resistance (Ohms/In.) | Maximum Pull Force (gms.) | Approximate Current at Room Temp (mA) | Contraction Time (sec.) | Off Time 70 C Wire (sec.) |
|---------------------|-----------------------|---------------------------|---------------------------------------|-------------------------|---------------------------|
| 0.006 | 1.3 | 330 | 400 | 1 | 2.0 |
| 0.008 | 0.8 | 590 | 610 | 1 | 3.5 |
| 0.010 | 0.5 | 930 | 1000 | 1 | 5.5 |
| 0.012 | 0.33 | 1250 | 1750 | 1 | 8.0 |
| 0.015 | 0.2 | 2000 | 2750 | 1 | 13.0 |

| Diameter Size (in.) | Maximum Pull Force (gms.) | Unit Price |
|---------------------|---------------------------|-------------|
| 0.006 | 330 | \$5.00/ft. |
| 0.008 | 590 | \$5.00/ft. |
| 0.010 | 930 | \$5.00/ft. |
| 0.012 | 1250 | \$7.50/ft. |
| 0.015 | 2000 | \$12.50/ft. |

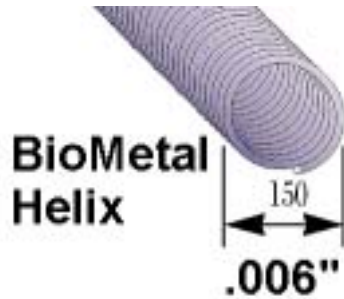
There are two kinds of crimps available: ring terminals and barrel crimps (see diagram next page). There is a \$30.00 setup fee with each crimping order. When calculating your assembly costs remember to add the cost of the Nitinol wire used (see wire price list above). **Note: Crimps cannot be sold as stand alone units.**

1 - 100
\$0.75 / each

101 - 2,500
\$0.25 / each

2,501 - 10,000
\$0.20 / each

Please note contraction time is directly related to electric current imposed. The guidelines are only approximations, since other factors like ambient temperature, air currents, and heat sinking will vary with specific devices.



**BioMetal
Helix**

BioMetal Helix

\$29.95

BioMetal Helix Dimensions (.006 x .70) inches. The advantage of the BioMetal Helix over standard Nitinol wire is that it may be stretched and contracted to twice its length. In this case a .75 inch length may be stretch to 1.5 inches.

Weight liftable on recover: 30 grams

Total resistance: 7.5 ohms

Typical activation current at 20°C: 150mA

Typical cycle rate at 20°C: per minute.

Includes one SMA coil spring 20 mm long (in contracted state), 4 spectacle terminals, 4 eyelet terminals, instructions.

Nitinol Expansion Spring

When cool, spring can be extended to 14 cm (5-1/2").

Heated, contracts to 29 mm (1-1/8") overall. With 350

gram hanging mass shrinks from 60 mm (2-1/4") long

coil (cool) to 30 mm (1-1/8") long (heated) with 2 Amps. 6 mm (1/4") coil, 750 μm (.03")

wire, activates at 45-55° C equivalent to (131-149° F). Use several in series for greater distance, or in parallel for greater force.



Niti-ES

\$11.95

Nitinol Compression Spring

Compression Spring - When cool, can be pressed down to 16 mm (5/8"). Heated with 3

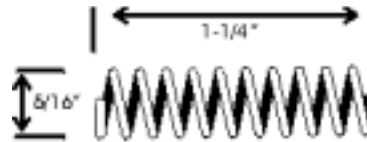
Amps, it extends to 30 mm (1-1/4") with over 4 Newtons of force! 8 mm (5/16") coil, 950 μm

(.04") wire, activates at 55-65° C equivalent to (131-149° F).



Niti-CS

\$11.95



Length after unrestricted heating



Nitinol Butterfly

Nitinol demonstration of long life and

durability, butterfly gently flaps its

wings, beautiful lifelike motion makes it

a great gift as well. Uses wall transformer

for power (included).

Niti-BF

\$34.95

Live Wire

Fun and educational! You can bend it while cold, then heat it in hot

water, and it will straighten quite forcefully. You can modify the

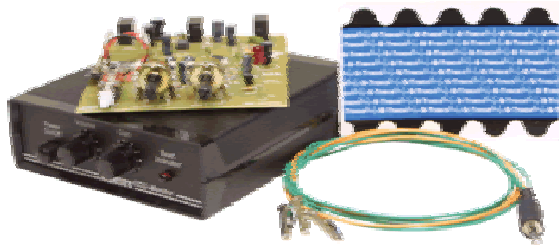
remembered shape by annealing the wire.

Live Wire

\$7.00



ECG Electrocardiogram Heart Monitor



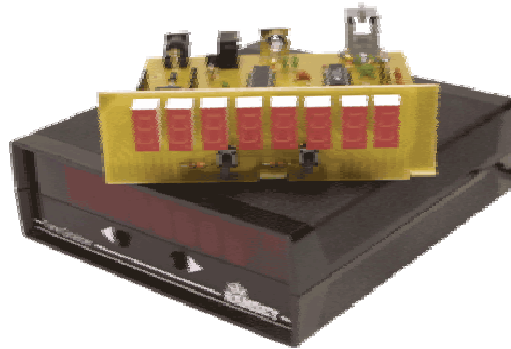
Enjoy learning about the inner workings of the heart while at the same time covering the stage-by-stage electronic circuit theory used in the kit to monitor it. The three probe wire pick-ups allow for easy application and experimentation. The documentation covers circuit descriptions and heart function. Multiple beat

indicators include a bright front panel LED that flashes with the actions of the heart, an adjustable level audio speaker output and a monitor output to view the traditional style ECG/EKG waveforms on an oscilloscope. Uses 9V battery (not included) This is NOT a medical device, it is intended for hobbyist usage only.

| | | |
|---------------|-----------------------------------------------------|----------------|
| ECG1 | Electrocardiogram Heart Monitor Kit | \$44.95 |
| CECG | Matching Case & Knob Set For ECG1 | \$14.95 |
| ECG1WT | Factory Assembled & Tested ECG1 | \$89.95 |
| ECGP10 | Set Of 10 Replacement Reusable Probe Patches | \$7.95 |

Touch Tone (DTMF) Reader

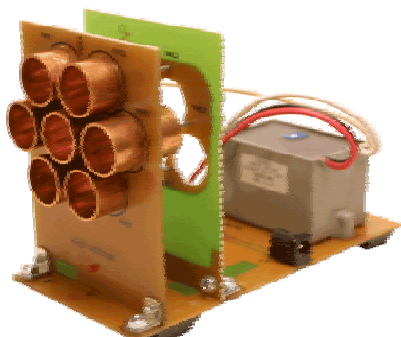
- *Built in RJ11 phone jack for easy hook-up and line monitoring
- *Super fast capturing numbers off the radio, repeater, phone line, etc.
- *Big bold 8 digit display with automatic insertion of dashes between the number groups
- * Large memory holds over 600 numbers



Dialed phone numbers, repeater codes, control codes, anywhere touch tones are used your TG2 will decode and store any DTMF tone it hears. A simple hook-up to any radio speaker or phone line is all that is required. The Flash storage capacity of the built-in micro controller allows the circuit to store 640-digit numbers for 10 years, even with the power turned off. The bright 8-digit display lets you scroll through the stored numbers at your leisure. To make it easy to pick out numbers or codes, a dash is inserted between any group or set of numbers that were decoded more than 3 seconds apart. Added features include an onboard RJ11 phone jack for easier phone line interfacing and an output latch jack offering an external trigger source when a user specified number (1 to 60 digits) matches the monitor input. The TG2 runs on any 8 to 15 volt DC power source and is both regulated and crystal controlled for the ultimate in stability.

| | | |
|--------------|-----------------------------------------------------------------|-----------------|
| TG2 | Tone Grabber Touch Tone Reader Kit | \$64.95 |
| CTG2 | Matching Case and Knob Set for TG2 | \$14.95 |
| TG2WT | Assembled & Tested TG2 with case & power adapter | \$119.95 |

Negative Ion Generator



High voltage negative ion generator generates “ion wind” without a fan or moving parts. Wind is generated by force of ion repulsion. Similar in principle to the ion propulsion systems used by NASA in modern spacecraft. Generate negative ions for health and airborne pollution removal in small areas. Kit includes 7.5kV DC negative power supply at 400 uA, 7 ion wind tubes and mounting hardware for the ion wind generator.

#IG7 \$64.95
AC125 110VAC Power Adapter \$9.95

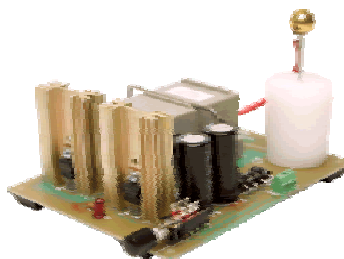
High Voltage Plasma Generator

Solid state high voltage power supply is perfect for high voltage experiments, like Kirlian photography. The high voltage at the terminal won't electrocute you, so its relatively safe, but it can burn you, so use caution. Can be run from 5-24 VDC so the output voltage can be directly adjustable.

**Generates 2” sparks to handheld screwdriver
Light fluorescent tubes without wires**

Build your own Plasma Balls

Generates up to 25kV @ 20 KHz from solid state circuit



PG13 \$64.95
PS21 16VAC \$19.95

High Voltage Power Supply Kit

Universal high voltage power supply kit. This HV power source may be used in a variety of different high voltage applications, like:

Kirlian photography

HeNe Laser tube power supply

x-ray tubes

plasma tubes

negative ion generators, etc.



Features variable frequency using a potentiometer. Also has a High-Low frequency range switch.

In addition this circuit to be either be battery powered 9-15 VDC, or powered from a wall transformer also 9-15V with either an AC or DC output.

When powered from batteries provides the advantage of portability for fieldwork.

High Voltage Power Supply

\$64.95

718-966-3694 orders

<http://www.imagesco.com>

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Wimshurst Machine

This machine produces large static electric sparks for a terrific classroom demonstration. No assembly required, simply attach the hand crank, begin cranking, and watch in wonder as the sparks fly. Instruction guide and helpful hints are included with each unit.

Unit consists of two high resistance 25cm plastic discs, with equally spaced metal sectors. The discs are supported in two rigid upright supports, rotating in opposite directions with a hand crank. Provided with a system of induced charge collecting brushes, adjustable ball-ended electrodes, and cylindrical Leyden jar capacitors for obtaining higher potentials. Produces substantial opposite charges, which are deposited in the capacitors and on the metal spheres. A rapid sequence of sparks can be generated by lowering the system capacitance (moving the metal spheres closer together). Mounted on an insulated wooden base.



Wimhurst Machine

\$64.95

VHF TV Transmitter Kit

Transmit your VCR or camera signal to any near by TV set with excellent audio and video quality. You can be the program manager of your own Mini-TV station!

The transmitter features:

- *Runs on 12 to 15 volts DC
- *On-board whip antenna
- *Stable output adjustable to channels 3-6
- *Video and audio inputs compatible with any VCR or TV camera

TV6

\$34.95



Gas Tube Sign Power Supply

Originally designed to power neon displays, this high-voltage supply can power gas discharge tubes up to eight feet. It's rated at 2,000 Vac @ 10 mA. Input is 12 Vdc @ 1 Amp. Ideal for all kinds of high-voltage experiments, plasma generation, etching, high-voltage dc generators. 2.36" x 1.47" x 1.15" shielded case. Mounting flanges with holes on 3" centers. 18" silicon rubber insulated output leads. 6" color coded input leads. UL. See our web site for a schematic for a voltage multiplier that raises the voltage to 25KV.



Specifications: Input: 12 Vdc @ 1 Amp (Suggested power source CAT# DCTX-1215). Output: 2,000 Vac @ 10 mA. Open circuit voltage: 3,000 Vac 30Khz. Short circuit current: 15 mA. UL.

HVS-1

\$12.95

Kirlian Equipment & Supplies

Kirlian Photography Device



The Model 4 has all photography functions on the front panel. These include the on/off power switch, discharge switch, Hi-Low frequency switch and variable frequency control. The discharge plate is located on the left hand side of the device. The terms discharge plate and film plate mean one and the same. The on/off switch provides main power to the circuit. Discharge switch is a momentary contact switch that applies the electrical power to the discharge plate. The frequency control varies the frequency of the electrical power going to the discharge plate. This device is designed to work with

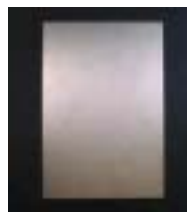
all 4"x 5" color, b/w 4"x 5" sheet film and paper. In addition polaroid film may also be used with this device.

| | | |
|-----------------------|----------------------------------------------------------|-----------------|
| KP-01 | Kirlian Photography Device | \$295.95 |
| | (Custom Order 4-8 weeks delivery -- Disclaimer Required) | |
| BK-01 | Hands-On Guide to Kirlian Photography | \$24.95 |
| TE-01 | Transparent Electrode Material 4x5 Sheet | \$25.00 |
| TFRM-01 | High Voltage Autotransformer (car ignition coil) | \$29.95 |
| PCB-19 | 4" x 5" Copper Board With 3/8" Etched Border | \$8.00 |
| PCB-01 | 4" x 6" Copper Clad Board (Single Sided) | \$5.00 |
| TPS-01 | 5" x 7" Transparent Plastic | \$1.00 |
| SW-17 | Momentary Contact DPST Switch | \$4.00 |
| WR-01 | Alligator Clip Wire | \$1.00 |
| KCAP-2.2uf-250 | 2 uF 250 Volt Capacitor | \$5.00 |
| BAT-01 | 9 Volt Battery Cap | \$0.60 |
| BAT-02V | Battery Clip | \$0.50 |
| HVW-01 | High Voltage Wire (12") | \$2.00 |

Leaf



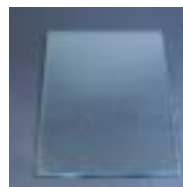
Copper Clad Board



Etched Copper Board



High Voltage Autotransformer



Transparent Electrode Material

Holography Supplies and Accessories

| <u>Item No.</u> | <u>Description</u> | |
|-----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|
| LD-KIT | Laser Diode Holography Kit includes everything you need to produce first rate holograms. (white light viewable & transmission). Kit includes: 5 mW diode laser, radius mirror, 18" sqr. 1/8" thick steel table top, inner tube, film holder, (2) holographic film plates, JD-2 Developing Kit, developing trays, tongs, gloves, safelight, sea shell model, 4 sorbathane pads, shutter card, white card, glass. | \$395.00 |

| <u>Item No.</u> | <u>Description</u> | |
|-----------------|---------------------------------------------------------------------------------------------------------------------------------|-----------------|
| DLAS-05 | Diode Laser 650 nanometers 5 milliwatts suitable for shooting holograms. Includes power supply. Estimate lifetime 20,000 hours. | \$74.95 |
| LAS-01 | Helium Neon Laser (surplus) (117VAC) 1.25 milliwatts power output, 632 nanometers, TEM00 mode | \$120.00 |
| LAS-02 | Laser Tube, 1-2 milliwatts power output (surplus pull) | \$25.00 |
| LAS-03 | Surplus Laser Power Supply | \$25.00 |
| FL-02 | 2 pcs Holographic Film Glass Plates, 2.5" x 2.5" | \$18.00 |

FH-01 Film Holder (for acetate film & glass plate)
Consists of two 3.5" transparent square plastic plates, two metal binding clips and two bar magnets. Used to support acetate film on metal table. Binding clips and magnets may be used.

SL-01 Safe Light Green Electroluminescent Light. For use with red sensitive film.
\$45.00

TR-01 Developing Trays Small plastic trays suitable for developing chemistry and holographic film listed above. Stippled bottom prevents film from sticking to bottom of tray.

Spreading Optics

| | | |
|---------------|----------------------------------------------|----------------|
| RAD-01 | Radius Mirror - 9mm dia. Focal Length -4 mm | \$35.20 |
| BAL-01 | Ball Lens -- 3 mm Diameter | \$32.00 |
| DCV-01 | DCV Lens -- 6 mm Diameter Focal Length -6 mm | \$22.00 |
| SPH-01 | Spherical Mirror -- 6 mm Diameter | \$8.00 |

Front Surface Mirrors (FSM)

| | | |
|--------------|-----------------|----------------|
| FS-01 | 5/8" x 3/4" FSM | \$4.00 |
| FS-02 | 3" x 3" FSM | \$8.00 |
| FS-03 | 6" x 7" FSM | \$12.00 |

Beam Splitters

| | | |
|--------------|-----------|----------------|
| BS-01 | Ratio 1:1 | \$19.95 |
|--------------|-----------|----------------|

Continued next page

Beam Splitters Cont.

| | | |
|--------------|-----------|----------------|
| BS-02 | Ratio 2:1 | \$19.95 |
| BS-03 | Ratio 3:1 | \$19.95 |

Magnets

| | | |
|----------------|------------------|---------------|
| Rect-01 | 1" x 1" x .5" | \$5.00 |
| Bar-01 | 3/8" x 3/8" x 1" | \$2.50 |

Miscellaneous Supplies

| | | |
|---------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|
| STL-01 | Steel Plate 1" x 5" x 1/16" thk | \$1.50 |
| TB-01 | Isolation Table Steel Table 24" x 24" x 1/8 thk (2 sheets) (30 lbs, UPS shipping is additional) | \$70.00 |
| SMI-01 | Small Inner Tube | \$14.95 |
| SB-01 | Sorbathane Pads 1" x 1" x .25" | \$2.50 |
| TGH-01 | Tungsten Halogen Lamp point light source for reflection holograms 75 watts | \$12.00 |
| JD-2 | Holography Film Processing Kit: This formula is excellent for both reflection and transmission holograms. The solution has a tray life of one day. Processes 20 4"x5" plates. | \$30.50 |



Superconductor Experiment Kits

Levitation Kit

Demonstrate the Meissner Effect and low friction magnetic bearing.

Includes:

- *A rugged 1" $YBa_2Cu_3O_7$ superconductor disk
- *Rare earth magnet
- *Non-magnetic tweezers
- *36 page experiment guide with historical and scientific data and complete experimental instructions & safety directions.

K1

\$40.00



718-966-3694 orders

<http://www.imagesco.com>

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Bismuth Levitation Kit

This companion to the $\text{YBa}_2\text{Cu}_3\text{O}_7$ levitation kit demonstrates the astonishingly superior Meissner effect of this $\text{Bi}_2\text{Sr}_2\text{CaCu}_2\text{O}_9$ bismuth material.

***Includes:**

- *A rugged 1" $\text{Bi}_2\text{Sr}_2\text{CaCu}_2\text{O}_9$ superconductor disk
- *Rare earth magnet
- *Non-magnetic tweezers
- * 36 page experiment guide with historical and scientific data and complete experimental instructions & safety directions.

K1-B **\$55.00**

Superconducting Levitation and Suspension Kit

Demonstrate the Meissner Effect and Flux Pinning suspension.

***Includes:**

- *1" diameter $\text{YBa}_2\text{Cu}_3\text{O}_7$ superconductor disk (90K)
- * A flux pinning enhanced $\text{YBa}_2\text{Cu}_3\text{O}_7$ superconductor
- * Two rare earth magnets
- * Non-magnetic tweezers
- * An experiment guide

K6 **\$63.00**

Yttrium & Bismuth 4 Point Probe Comparison

Compares the Meissner Effect, critical temperature, critical current density, critical magnet fields, resistance vs. temperature and the reverse AC Josephson effect.

***Includes:**

- * Four point probes containing $\text{YBa}_2\text{Cu}_3\text{O}_7$ and $\text{Bi}_2\text{Sr}_2\text{CaCu}_2\text{O}_9$ superconductors, respectively
- * 1" diameter $\text{YBa}_2\text{Cu}_3\text{O}_7$ and $\text{Bi}_2\text{Sr}_2\text{CaCu}_2\text{O}_9$ superconductor disks
- * Two rare earth magnets
- * Non-magnetic tweezers * An experiment guide

K15 **\$255.00**

Superconducting Energy Storage Device

Store an electric current in a superconducting toroid.

Explore the physics of this battery of the future. This unique flux-melted $\text{YBa}_2\text{Cu}_3\text{O}_7$ toroid-based kit stores a persistent electric current and magnetic field with a decay lifetime of 10^{23} years! This kit mimics the basic function of the U.S. Navy's advanced Superconducting Magnetic Energy Storage (SMES) device planned for applications in space-based lasers. These storage rings are expected to find use in electric utilities for 'load leveling' and also in medical diagnostics.

Includes:

- * A flux melted $\text{YBa}_2\text{Cu}_3\text{O}_7$ toroidal superconductor
- * Two powerful rare earth magnets
- * A $\text{YBa}_2\text{Cu}_3\text{O}_7$ disk
- * A detector needle
- * Non-magnetic tweezers
- * An experiment guide

K18 **\$228.00**

Complete Exploration Kit

The most complete superconductor kit available. The Grand Compendium Kit contains every superconductor device from all the other kits.

***Includes:**

- *Two Four-Point Probes (one of each material)
- *Two one-inch diameter superconductor disks (one of each material)
- *An Enhanced Flux-Pinning disk for suspension demonstrations
- *A flux-melted toroid superconductor and magnetic needle detector for persistent current experiments
- *Four rare-earth magnets
- *Non-magnetic tweezers
- *Comprehensive experiment guide.

K17

\$468.00

Liquid Nitrogen Required For Kits But Not Included

Dewar Flask

Our Dewar is constructed out of borosilicate glass, specially designed to hold liquid nitrogen.

Model 8645: Standard base, aluminum sides, and exterior mesh covering for a firm grip while pouring, cushioning against bumping, and increased protection. 14 inches high x 3.5 inch diameter.

DEW-1L

\$139.95

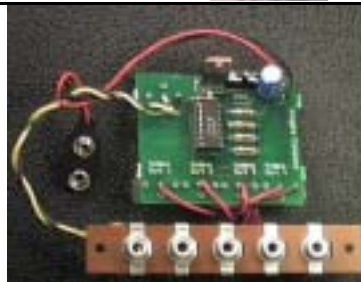


4 Channel Video Splitter Kit

The Video Multiplier kit takes a standard video signal (color or B/W) from a video camera or VCR and multiplies the video output four times. Used for showing multiple displays of video signals, surveillance equipment, video equipment, special effects, etc. Click on photograph for more information.

VM4X

\$14.95



Solar Engine Kit

The Solar engine kit stores electrical power from the sun. When enough power is stored the circuit dumps the stored electrical power through circuit load, in this case a motor. This kit may also be used with BEAM style robots or a solar roller.

SLE-01

\$29.95

SolarSpeeder 1.1

The SolarSpeeder 1.1 Kit is a very quick Solaroller that can cover 3 meters (10 feet) in under 40 seconds in direct sunlight. These little speed-demons utilize the same updated Solarengine technology. Simple to construct and a blast to watch in the sunlight!

SE-04

\$29.95



Magbot SunDancer Kit Magbot "SunDancer" BEAM Butterfly. Works on almost the same circuit as the SolarSpeeder Kit, but instead of dumping the power through a motor, it dumps it through a coil. Since the Magbot is balanced on a stand above a high-intensity magnet, it rocks on its own self-induced "electromagnetic wind".

The silver/gold wings then shine and reflect the embossed wing patterns all over the ceiling. It's a kit that is only slightly more complex than the SolarSpeeder kit, and comes with an oak stand, silver/gold mylar wing material (you choose the final color and wing pattern), all components, and one of our very well documented instruction sets.



SE-05

\$38.95

Sym1381 - Parts Bundle

These aren't kits, as much as they are an inexpensive bag of components so you can build yourself a Symet along the lines of the PMK Trimet. Basic instructions included on how to free-form (solder without using a circuit board) a 1381-based Solarengine, and how to assemble the mechanics. The Symet parts bundle includes:



- * 3904 & 3906 transistors
- * 2.2k resistor
- * 4 1000 μ F capacitors
- * SC2422 Solarcell
- * RM-1a Motor
- * 3 large paperclips
- * 1381J trigger & diode
- * Print-outs of free-forming instructions

SE-03

\$14.95

Note: The 1381 version is a bit harder to build, but more power-efficient.

Sym1381 - Parts Bundle Plus

This kit, contains the same inexpensive bag of components as the standard SE-03 kit, plus a printed circuit board. You still receive the basic instructions on how to free-form a 1381-based Solar engine, along with the directions to install the parts on an easy to build printed circuit board. The Symet parts bundle includes:



- * 3904 & 3906 transistors
- * 2.2k resistor
- * 4 1000 μ F capacitors
- * SC2422 Solar cell
- * RM-1a Motor
- * 3 large paperclips
- * 1381J trigger & diode
- * Print-outs of free-forming instructions
- * Printed Circuit Board (pcb)

SE-03+

\$17.95

SunSwinger Pendulum Kit

The SunSwinger uses a unique BEAM "force-coil" circuit to make a magnet swing under the arms of an attractive triangular frame. It's designed to work primarily from solar energy, but can be powered by practically any household battery or DC power supply.

The SunSwinger is very flexible in how you can put it together. Solar cells can be mounted in several places; the pendulum length can be as long as you desire; you can make the magnet stationary and swing the circuit if you wish!

It's worth noting that this original run of kits has gold plating on the solder pads. Gold and black look surprisingly good together!



SE-02

\$34.95

Ecospheres - Self Contained Ecosystem



The Perfect Balance of Science and Art

The EcoSphere is the world's first totally enclosed ecosystem - a completely self-contained and self-sustaining miniature world encased in glass. Be technology that's shaping the future of space exploration.

But an Ecosphere is much more than a scientific breakthrough - it is a work of art. A living treasure to own or give to

someone special. Each EcoSphere is carefully crafted to achieve an aesthetic, meditative beauty that can soothe any environment, including home, classroom or office.

The Inside Story

Inside each EcoSphere are active micro-organisms, bright red shrimp and algae, each existing in a clear "soup" of filtered sea water. Because the ecosphere is a self-sustaining ecosystem, you never have to feed the life within. Simply provide your EcoSphere with a source of indirect natural or artificial light and enjoy this aesthetic blend of art and science, beauty and balance. Because the living resources within the EcoSphere utilize their resources without overpopulating or contaminating their environment, the EcoSphere requires no cleaning and only minimal care. EcoSpheres have an average life expectancy of two years. However, it is not uncommon for shrimp populations to be thriving in systems as old as 7 years. EcoSpheres are available in either pod or spherical shapes.



A Glimpse Into the Future

The EcoSphere is the result of technology developed by scientists at NASA's Jet Propulsion Laboratory. NASA was researching self-contained communities for space explorers to live in during long-term space flights. Out of this research came the EcoSphere - an ecosystem of animal and plant life in perfect balance. Similar in concept to the biosphere and beach world we sold previously.

All EcoSpheres are drop-shipped via FedEx Priority Overnight at an additional shipping charge (see below). Shipping charge is added to the Ecosphere price when placing item in the shopping cart. For instance $ECO-01 = \$70.00 + \$23.00 = \$93.00$

| | | |
|-----------------------------------------|-----------------|----------------|
| ECO-01 Ecosphere, 3.25" dia. | \$70.00 | \$23.00 |
| ECO-02 Ecosphere, 5.25" tall pod | \$70.00 | \$23.00 |
| ECO-03 Ecosphere, 5.25" diameter | \$190.00 | \$28.00 |
| ECO-04 Ecosphere, 7.5" tall pod | \$190.00 | \$28.00 |
| ECO-05 Ecosphere, 6.5" diameter | \$260.00 | \$45.00 |

FUEL CELL CAR & EXPERIMENT

BUILD A CAR THAT RUNS ON WATER!



The Thames & Kosmos Fuel Cell Car & Experiment Kit provides a playful introduction to one of the most significant technologies of the 21st Century.

With this kit you can build a model car that actually runs on water! Pour in the water and watch it separate into hydrogen and oxygen, forming a gas to power your vehicle across the floor. Now that we have your attention, roll up your sleeves and find out more through experiments and demonstrations you can do on your own, in a class-



room or with friends. ! Fuel cells are one of the most promising means of producing energy in the future. Some fuel cells, such as this one, do not consume fossil fuels and therefore are considered environmentally friendly. Automobile manufacturers are already experimenting successfully with this technology and it is widely believed that fuel cells will power automobiles and many electronic devices, including laptops and cell phones, in the near future.

Topics and Experiments:

The 96-page, full color Experiment Manual offers over 30 experiments, including: How to build a solar-powered car. Effects of direct and indirect radiation. Characteristics of a solar module. Electrolysis and its effect on water. Oxy-hydrogen test. How to construct and load a reversible fuel cell. Decomposition of water in the fuel cell. Qualitative and quantitative analysis of gas in a fuel cell. How efficient is electrolysis? How light influences electrolysis. Solar electrolysis. Fuel cell-powered car.



Contents

The kit includes these parts: Complete reversible fuel cell (hydrocycle system) • Wire • Motor • Chassis • Axle • Gas collector • 4 Wheels • Solar panel with support • Syringe • Tube • Digital multimeter • Test tube • Protective goggles • Labels • Bag of small parts for fuel cell • Bag of small electronic parts • Experiment Manual Additionally required: 1 quart of distilled water.

MFC-01

Fuel Cell Car Kit

\$149.95

Intelligent Fuel Cell Car automatically turns when the car hits a barrier.



The Car Kit Manual includes experiments and background information to help you explore the history and future of emerging fuel cell technology. Use the Reversible Fuel Cell to safely produce hydrogen. Then watch your car run on energy from water.

MFC-02

\$99.95

UFO Products



UFO Detector 1

Over the years many UFO sightings have reported magnetic and electromagnetic disturbances. The UFO Detector is designed to sense these disturbances and will signal their presence by flashing an LED and beeping.

The elegantly designed transparent plastic case is a handsome sculptured conversation piece that's allows one to see the electronics inside the case. Suitable for display on a desk, shelf or bedroom dresser.

Size is approximately 3.0" dia. by 2.50" tall. Uses 9V lithium battery (not included)

| | | |
|----------------|-----------------------------------------------------------|----------------|
| UFO-01 | UFO Detector Kit (Requires assembly and soldering) | \$64.95 |
| UFO-01A | UFO Detector Assembled & Tested | \$94.95 |



UFO Detector 2

The elegantly designed transparent plastic case is a handsome sculptured conversation piece that's allows one to see the electronics inside the case. Suitable for display on a desk, shelf or bedroom dresser. Size is approximately 3.25" dia. by 5.75" tall. Uses 9V lithium battery (not included)

Item #UFO-02 Detector Kit (Requires assembly and soldering)

| | |
|----------------------------|----------------|
| UFO-02 | \$64.95 |
| UFO-02A (Assembled) | \$94.95 |

UFO Detector 3

The elegantly designed brass base and translucent green acrylic top is a handsome sculptured conversation piece that's suitable for display on a desk, shelf or bedroom dresser.

Size is approximately 1.75" dia. by 6" tall. Uses 9V lithium battery (not included)

| | | |
|---------------|-----------------|-----------------|
| UFO-03 | Detector | \$249.95 |
|---------------|-----------------|-----------------|



9V Lithium Battery

BATT9V



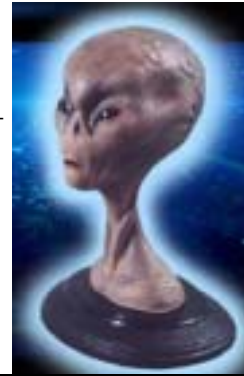
\$9.95

The Ultralife lithium 9-volt battery lasts up to 4 times longer than ordinary alkaline 9V batteries and 10 times longer than carbon-zinc batteries. This primary battery has the highest energy density, flat discharge voltage curve, longest shelf life, widest operating temperature range, and lightest weight of any comparable 9-volt battery.

UFO Products Continued

Real Alien Head Bust

This alien head sculpture was created after years of research studying hundreds of sketches & descriptions of what is commonly referred to as the gray Alien. Our model is 13.5" Hand painted Poly resin Alien Bust.



Shipping charge of \$15.00 applies to this item.

Alien Head **\$139.99**



Area 51 UFO Model with Bonus Gray Figure

A 1/48 scale model kit of the alien craft allegedly hidden in Nevada by the U.S. Government. As described by eyewitness and former government physicist, Bob Lazar.

Our model is a 1/48 scale representation based on Lazar's research. Kit also includes a 1/6 scale Gray Figure, which reportedly is a facsimile of the species that flew the Area 51 UFO from the far reaches of the universe of the Earth.

AREA51 **\$45.00**

Roswell UFO Model

What really happened in Roswell New Mexico in 1947? Extraterrestrial Spacecraft that allegedly crashed at 11:59 on July 4 1947. This 1/42 scale model is based on drawings forensically composite by William Louis McDonald from interviews with witnesses and from the case files of authors Captain Kevin D. Randle, USAF Reserve, and Donald R. Schmitt.



ROSWELL **\$25.00**

Audio, Video and Books signed by Stanton Freidman

| | | |
|-----------------------------------------------|-----------------|----------------|
| UFO's...The Real Story | CD-UFO | \$9.95 |
| Flying Saucers Are Real Vol. 1 & 2 | VHS1-UFO | \$9.95 |
| | VHS2-UFO | \$9.95 |
| Crash At Corona | BK-27 | \$13.95 |
| Top Secret/Majic | BK-28 | \$22.95 |

Electronic Components and Semiconductors

Transformers:

| | | |
|---------|-------------------------------------------|---------|
| TFRM-01 | High Voltage Auto-Transformer (24V/8000V) | \$29.95 |
| TFRM-02 | Mini-Stepup Transformer | \$15.00 |

Speech Generators:

| | | |
|------------|-----------------------|---------|
| SPO-256 | Speech Generator | \$33.95 |
| SPO-256-DS | Datasheet for SPO-256 | \$5.00 |

Transistors:

| | | |
|---------|--------------------------------|--------|
| TIP120 | Tip 120 NPN Darlington | \$1.25 |
| TIP125 | Tip 125 PNP Darlington | \$1.25 |
| UJT6401 | UJT NTE 6401 | \$8.00 |
| 2N2646 | Silicon Unijunction Transistor | \$5.00 |
| IRF830 | MOSFET IRF 830 | \$5.00 |
| 2N5060 | 2N5060 SCR | \$1.00 |

Diodes:

| | | |
|---------|--------------------------|--------|
| IN751 | IN751 Zenar Diode 5.1V | \$0.50 |
| IN4764 | IN4764 Zenar Diode 100V | \$1.00 |
| IN5388B | IN5388B Zenar Diode 200V | \$1.25 |
| DI-10K | Standard HV Diode 10KV | \$2.50 |

Optoelectronics:

| | | |
|-------|-----------------------------------------------------------|--------|
| PR-01 | 2 M ohm max. dark resistance, 25K ohm light resistance | \$2.00 |
| PR-02 | 1 M ohm max. dark resistance, 12K ohm light resistance | \$2.00 |
| PR-03 | 500K M ohm max. dark resistance, 15K ohm light resistance | \$2.00 |
| PR-04 | 100K M ohm max. dark resistance, 25K ohm light resistance | \$2.50 |

CMOS:

| | | |
|------------|------------------------------|---------|
| TLC-549 | TLC-549 Serial A/D Converter | \$12.00 |
| DS-1620 | Digital Thermometer | \$13.80 |
| TLC-549-DS | Datasheet for TLC-549 | \$3.00 |
| DS-1620DS | Datasheet for DS-1620 | \$3.00 |

Voltage Regulators/Rectifiers:

| | | |
|----------|---------------------------------------------------------|--------|
| 7805 | +5V voltage regulator (TO-220) | \$0.70 |
| 7806 | +6V voltage regulator (TO-220) | \$0.60 |
| 7812 | +12V voltage regulator (TO-220) | \$0.60 |
| LM317 | 1.5 A adjustable positive regulator (1.2V-37V) (TO-220) | \$0.90 |
| LM2940CT | 1 A 5V positive regulator 0.5V dropout (TO-220) | \$2.60 |
| W01M | Diode bridge: 1.5V 100 PIV (WOM case) | \$0.98 |
| DF01M | Full wave bridge rectifier, 100 PIV @ 1.5A (4 DIP) | \$0.80 |

Electronic Components and Semiconductors Continued:

Operational Amplifiers (Op Amps):

| | | |
|----------|---------------------------------------------------------------------------|--------|
| CA3240 | Dual 4.5MHz BiMos Operational Amplifier w/ MOSFET Input/Bipolar Output | \$6.49 |
| CA3140 | BioMos Operational Amplifier (8 DIP) | \$1.84 |
| CA3304 | Quad 13 Bit, 2.7V A/D Converter (16 DIP) | \$6.58 |
| TLC277CP | Dual Precision Op Amp (8 DIP) | \$3.36 |

Telephone Components:

| | | |
|------|------------------------------------|--------|
| 8870 | DTMF Receiver Chip | \$5.00 |
| 8871 | DTMF Transmitter (Equiv. NTE 1690) | \$5.00 |

Step Motor Controllers:

| | | |
|---------|-----------------------------|---------|
| UCN5804 | Stepper Motor Controller IC | \$10.00 |
| UCN5804 | Datasheet for UCN5804 | \$2.00 |

Light Emitting Diodes (LEDs):

| | | |
|---------|-----------------------------------------------------------------|--------|
| LED-UB1 | Ultra Bright LED (Red 630 nm, 12° view angle, 4000-7200 med) | \$1.00 |
| LED-UB2 | Ultra Bright LED (Blue 470 nm, 15° view angle, 2000 med) | \$4.00 |
| LED-UB3 | Ultra Bright LED (Yellow 588 nm, 12° view angle, 3000-5000 med) | \$1.00 |
| LED-UB4 | Ultra Bright LED (Green 525 nm, 15° view angle, 6000 med) | \$4.00 |

CMU Robot Vision Camera

The CMU cam developed at Carnegie Mellon University provides real time object tracking vision system that is easy to interface to microcontrollers and personal computers. The CMUcam performs onboard real time image processing for object and color recognition. It uses a SX28 microcontroller interfaced to an Omnivision OV6620 CMOS camera chip. The SX28 microcontroller does much of the image processing. Communication with the camera is done via a standard RS-232 or TTL serial port. Features of the CMU cam include:

- * Track user define color objects at 17 frames per second.
- * Find the center of the object
- * Gather mean color and variance data
- * 80 x 143 pixel resolution
- * Serial communication at 115,200 / 38,400 / 19,200/ 9600 Baud
- * Demo Mode - Automatically lock onto and drive a servomotor to track an object.



CMU-01 CMU Camera (assembled, with cable) \$109.95

718-966-3694 orders

<http://www.imagesco.com>

page 60

CMU 02 Robot Vision Cam

Real Time Image Recognition and Tracking.

The CMUcam2 consists of a SX52 microcontroller interfaced with an OV6620 or OV7620 Omnivision CMOS camera on a chip that allows simple high level data to be extracted from the camera's streaming video. The board communicates via a RS-232 or a TTL serial port and has the following functionality:



- Track user defined color blobs at up to 50 Frames Per Second*
- Track motion using frame differencing at 26 Frames Per Second
- Find the centroid of any tracking data
- Gather mean color and variance data
- Gather a 28 bin histogram of each color channel
- Manipulate Horizontally Pixel Differenced Images
- Transfer a real-time binary bitmap of the tracked pixels in an image
- Arbitrary image windowing
- Adjust the camera's image properties
- Dump a raw image (single or multiple channels)
- Up to 160 x 255 Resolution**
- Supports Multiple Baudrates: 115,200 57,600 38,400 19,200 9,600 4,800 2,400 1,200
- Control 5 servo outputs
- Slave parallel image processing mode off of a single camera bus
- Automatically use servos to do two axis color tracking
- B/W Analog video output (PAL or NTSC)**
- Flexible output packet customization
- Multiple pass image processing on a buffered image
- Works with the OV7620 or OV6620 module

CMU-02

CMU Camera (assembled, with cable)

\$179.95

Morphing Software

Powerful Morphing & Effects Editors

Video Craft is advanced morphing software for Windows 95/98/XP. Includes many pre-production and post-production features that make this software suitable for professional broadcast quality video.

In addition to doing standard morphing it has the added ability to morph two .AVI movie files, includes filters for special effects, masking, blue screen, chroma key and luminance key.

For easy access, any effect in Video Craft can be found in one of seven editors. For maximum flexibility, three effects can be applied simultaneously to any clip, in any order.

Continued on next page.



Whole movies are created by chaining multiple clips together with the Storyboard.

Instant Overlays

Fabricates superimpositions of image and video objects with the Overlay Editor. Film an object against a blue backdrop, then place it against any background. Use alpha channels to create dynamic areas of variable transparencies. Type text directly onto video in any font. Even use the texture of an object to create imprints.

Fabulous Distortions

Awesome blends, twirls and other mind bending effects are simple with VideoCraft's Distortion Editor. Just choose the desired effect from those on the list to create intense video productions.

Advanced Morphing Options

You've seen morphing in the movies and on TV; one object seamlessly changing into something else. Video Craft provides all the tools needed to create spectacular video metamorphoses. Image to image morphing is east with our point system. Plus, VideoCraft employs a revolutionary system of automatic point placement in video clips. "Smart Points" streamline the motion morphing process by calculating where the points should fall.

Professional Quality Output

Video Craft is compatible with all PC video production systems. Although no special hardware is needed to make digital video with Video Craft, a scanner and/or a video capture card is required to import original source material.



Create millions of spectacular video effects with 32-bit power tools.



Create superimpositions of video, images, and textures in the Overlays Editor.



VidCraft3

Video craft 3.0

\$29.95

Books



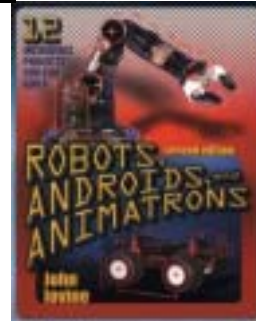
Robotics

Dramatic improvements in technologies and significant cost reductions in 8-bit microprocessors have spawned a renaissance in robot building. *PIC Robotics*, from popular electronics author John Iovine, shows amateur (and professional) electronics enthusiasts how to get in on the fun, using the power of Microchip's versatile 8-bit PIC microprocessor family to build sophisticated robots more cheaply and easily than you thought possible.

BK-11 PIC Robotics by John Iovine \$19.95

Put together high tech robots in your own workshop! Make a life-like robotic hand that performs repetitive tasks. Use an expert system and a neural network to get intelligent behavior. Create a telepresence robot! Build a robot insect! Learn about sensing systems! Build a computer controlled robotic arm!

BK-07 Robots, Androids, and Animatrons (2nd Edition) By John Iovine \$23.95



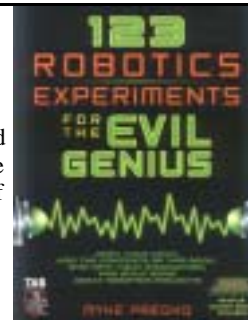
This unique guide to sophisticated robotics projects brings humanoid robot construction home to the hobbyist. Written by a well-known figure in the robotics community, *Build Your Own Humanoid Robots*, provides step-by-step directions for 6 exciting projects, each costing less than \$300. Together, they form the essential ingredients for making your own humanoid robot.

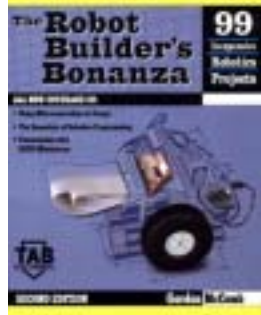
BK-21 Build Your Own Humanoid Robots \$19.95 by Karl Williams

If you enjoy tinkering in your workshop and have a fascination for robotics, you'll have hours of fun working through the 123 experiments found in this innovative project book.

More than just an enjoyable way to spend time, these exciting experiments also provide a solid grounding in robotics, electronics, and programming. Each experiment builds on the skills acquired in those before it so you develop a hands-on, nuts-and-bolts understanding of robotics - from the ground up.

BK-22 123 Robotic Experiments for the Evil Genius \$19.95 by Myke Predko





Robots that walk, see, feel, listen, and think. Remote-controlled robots and robots that find their own way. A robotic arm and a robotic bug. Robots made from toys, and robots controlled by computers. Robots with "brains." This updated edition of Gordon McComb's best-selling Robot Builder's Bonanza features fascinating science tidbits, field-tested projects, and modular organization to make it easy to invent and build your own designs. Full appendices provide suggestions for further reading, Internet information sources, names and addresses for mail order supply companies, and help with interfacing logic families. This heavily illustrated "bible" of amateur robotics is the best you can ever find. Take it home and start building robots today.

BK-23

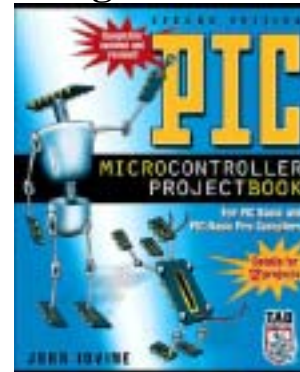
Robots Builder's Bonanza by Gordon McComb

\$19.95

Computers and Programming

What can you do with PIC microcontrollers? Practically anything: from creating "photovore" robots that hunt light to feed their solar cells to making toasters announce, "Your toast is ready!" These low-cost (around \$5.00) computers-on-a-chip can hold upto 1K programs and operate up to 20 MHz. Newer microcontrollers like the PIC 16F87 can hold up to 4 K programs.

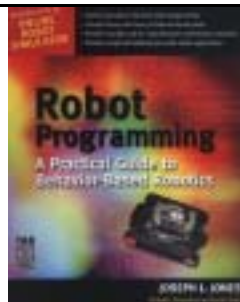
PIC Microcontroller Project Book gives you hands-on directions for putting these chips to work. Starting with simple projects and experiments, this book leads you gradually into sophisticated programming techniques. No previous programming experience is necessary. John Iovine coaches you through every single step.



BK-14

PIC Microcontroller Project Book (2nd Edition) By John Iovine

\$19.95



Robot Programming: A Practical Guide to Behavior-Based Robotics by **Joseph L. Jones**, an ingenious book/web site partnership teaches the skills you need to program a robot - and gives you a virtual robot waiting online to perform your commands and test your programming expertise. You don't need to know either robotics or programming to get started!

Using an intuitive method, Robot Programming deconstructs robot control into simple and distinct behaviors that are easy to program and debug for inexpensive microcontrollers with little memory. Once you've mastered programming your online 'bot, you can easily adapt your programs for use in physical robots. Though Robot Programming smoothes the path to acquiring skills in this arcane art, it does not reduce it to simplistics. With this resource, you can open the door to all the complexity, sophistication, versatility, and robustness that is possible for robot behavior to exhibit.

BK-24 Robot Programming: A Practical Guide to Behavior-Based Robotics \$19.95 by Joseph L. Jones

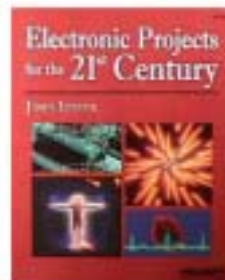
Electronics Books

Electronic

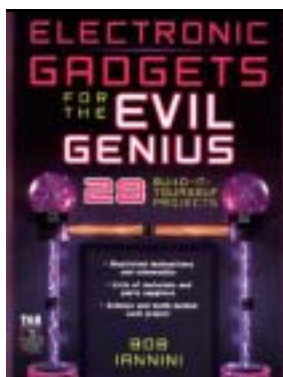
Projects for the 21st Century by John Iovine

Filled with nearly two dozen projects, this book is essential to the modern electronics hobbyist. Projects include:

- Biofeedback/Lie detector device
- ELF monitor
- Geiger counter
- Air pollution monitor
- Recombinant DNA experiments



BK-06 Electronic Projects for the 21st Century by John Iovine \$19.95



Electronic Gadgets for the Evil Genius by Bob Iannini

28 build it yourself projects

- Illustrated instructions and plans for amazing pre-tested projects advanced enough for sophisticated electronics enthusiasts but described in sufficient detail to be built easily by newcomers
- Explanations of the science and math behind each project (e.g., you can explore different methods of achieving acceleration)
- Frustration-free plans - needed parts are listed, along with sources - and most of these projects can be built for \$100 or less

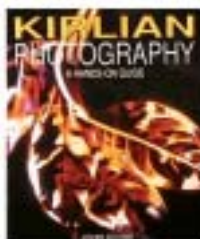
BK-25 Electronic Gadgets for the Evil Genius \$19.95
by Bob Iannini

Practical Electronics for Inventors by Paul Scherz, gives you information you need, in a format you can work with. Packed with hand-drawn illustrations, this crystal-clear, learn-as-you-go guide, shows you what a particular device does, what it looks like, how it compares with similar devices, and how it is used in applications. Written by Paul Scherz, an inventor and electrical hobbyist, this important reference provides beginning hobbyists and inventors with an intuitive grasp of the theoretical and practical aspects of electronics - just the kind of insight you need to get your projects up and running.

BK-26 Practical Electronics for Inventors \$19.95
by Paul Scherz

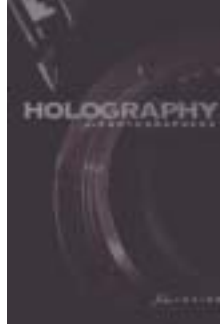


Science Books



Kirlian Photography by John Iovine, gives you all the hands-on guidance you need to produce Kirlian photographs using standard 35mm or video cameras. You'll also learn about the history of electro-photography and may of its possible applications in medicine, industry, and the military. Especially illuminating is his discussion of the "phantom leaf" aura that continues to baffle scientists.

BK-01 Kirlian Photography by John Iovine \$24.95



Holography For Photographers by John Iovine

Using simple processes and inexpensive equipment, Holography for Photographers illustrates the techniques that allow photographers -- novice or experienced -- to explore and experiment with new areas of photography. Whereas many other methods of holography are complicated and require expensive equipment and a background in mathematics and optics, John Iovine provides readers with a portable, simplified system that requires a minimum of expense (around \$200) and very little math, yet produces a variety of quality holograms. The construction of all projects is kept simple and well-detailed, showing how to create and produce basic and increasingly complex high quality holograms.

BK-08

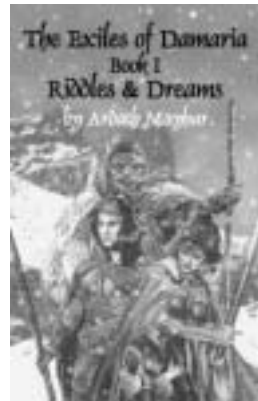
Holography For Photographers by John Iovine

\$14.95

Fiction: Images Publishing

The Exiles of Damaria - Book One - Riddles & Dreams by Ardath Mayhar

The Ancient Race has ruled in Damaria for three thousand years, since arriving there from their old homeland in the south. Long-lived, yet not very prolific, the Kings of Damaria have brought several animal species to a point at which they are nearly human. A son, by one of these people, of the present King, Armor, was sent south for his education. On his return he foments a revolution against the Ancient Race, resulting in the deaths of all of that family except Riddle the Poet and his very young nephew Lute, as well as the theft of the Orb, an instrument that made possible manipulations of the different species in Damaria.



BK-20

The Exiles of Damaria - Book One - Riddles & Dreams \$19.95 by Ardath Mayhar

Centauri III by George L Griggs

When a meteor strike wipes out their new-born research station on the recently discovered planet of Centauri III, Dr. Jefferson Trask is left with little more than five critically injured survivors, no supplies, and a long six-month wait for the return of Pegasus, the mother ship. Centauri III is a wild and primitive world that challenges Trask's ability to survive at every step, and threatens to take his friends from him with each labored breath they draw. The native food, the water, and the very air he breathes, combine to change him, and by the time Pegasus does return, Jefferson Trask has mutated into an entirely different being. He is a new creature, not human, not alien; totally different. And that difference will deal him the cruelest betrayal of all.



BK-27

Centauri III by George L. Griggs \$14.95

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Classification: Science Fiction (short stories)
Time: Approximately 80 minutes per issue.
Formats Available: Audio Tape (cassette), Compact Disc

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 - by Jamie Wild
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Volume 1 Issue 3

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