

Electronic Kits of the 20TH
Century:
A Bygone Era

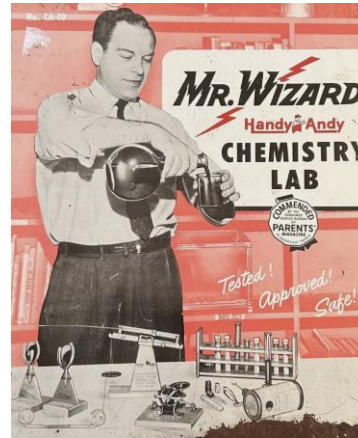
David M. Pepper, Ph.D., WA6TWA

*OK, let's go back to the
'50s & '60s!!*

Buckle your belts!!



If Chemistry is Your Cup of Tea ...



And, for the young *Nuclear-Physicist-to-be...*

MOST MODERN SCIENTIFIC SET EVER CREATED!

Atomic Energy Lab

NUCLEAR PHYSICS

✓ Watch Atomic Disintegration of Radioactive Material... Right Before your Eyes!



✓ See Paths Taken by Alpha Particles Travelling at more than 12,000 Miles-Per-SECOND!

✓ Measure Atomic Radiation... Accurately, Safely!

✓ Actually Prospect for Uranium with Geiger-Mueller Counter!

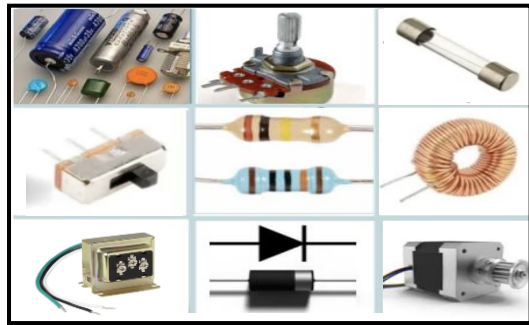
Completely Safe And Harmless!

GILBERT HALL OF SCIENCE PRODUCT

circa
1950

My personal journey in the '50s & '60s:

*The JOY of building gadgets,
one component at a time!*



Components



The '70s and Beyond:

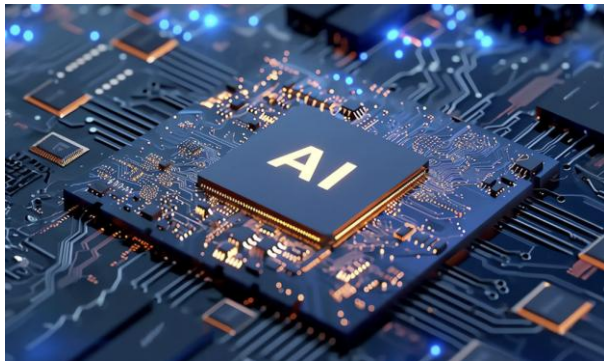
Chips, Systems, Networks, Computers-in-the-loop



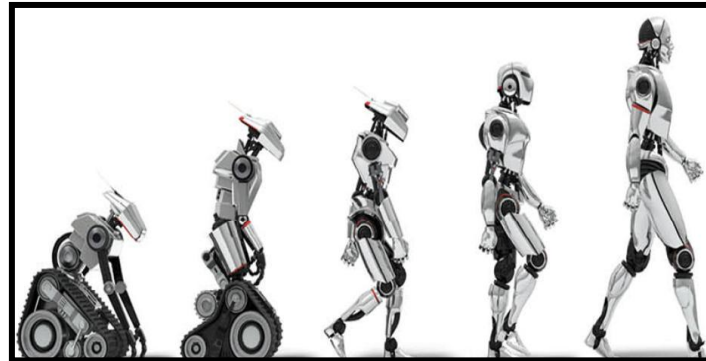
IC's



LSI's



Systems/Computers



Robotics



Biotech

The JOY of building gadgets, one component at a time! (1)



Uses the same circuitry developed by Marconi



Buy now at Sears!



Raytheon Education Co. Waltham, MA

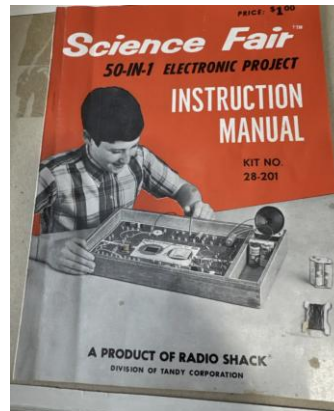
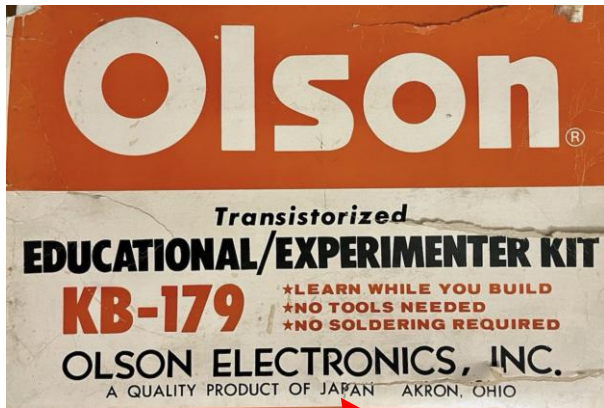


Sends & receives voice & code up to a half mile

The JOY of building gadgets, one component at a time! (2)



TUBES !!



BECOME A RADIO TECHNICIAN For Only \$22.95

BUILD 16 RADIO

CIRCUITS AT HOME

All Guaranteed to Work!

Progressive Radio "Edu-Kit" **only \$22.95**

PRACTICAL HOME RADIO COURSE

NOW INCLUDES

- ★ 12 RECEIVERS
- ★ TRANSMITTER
- ★ SIGNAL TRACER
- ★ SIGNAL INJECTOR
- ★ CODE OSCILLATOR

No Knowledge of Radio Necessary
No Additional Parts or Tools Needed

Unconditional Money-Back Guarantee

If it is understood and agreed that should the Progressive Radio "Edu-Kit" be returned to Progressive Radio "Edu-Kit" Inc. for any reason whatsoever, the purchase price will be refunded in full, without question or reservation, and without delay.

The high reputation which Progressive Radio "Edu-Kit" Inc. has earned through its many years of service to the public is due to its unconditional guarantee upon the highest work of precision engineering, the highest instructional standards, and 100% adherence to its Unconditional Money-Back Guarantee. As a result, we do not have a single dissatisfied customer throughout the entire world.

FREE EXTRAS

- ★ SET OF TOOLS
- ★ SOLDERING IRON
- ★ ELECTRONICS TESTER
- ★ ALIGNMENT TOOL

Reg. U. S. Pat. Off.

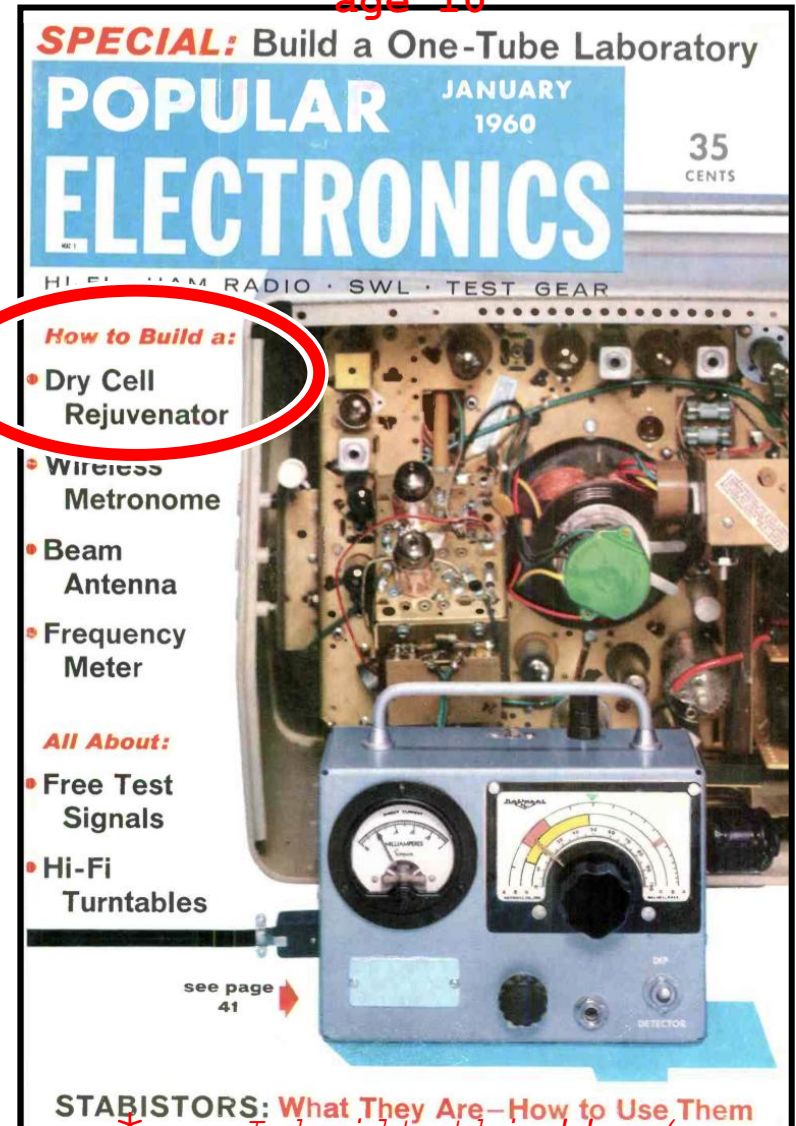
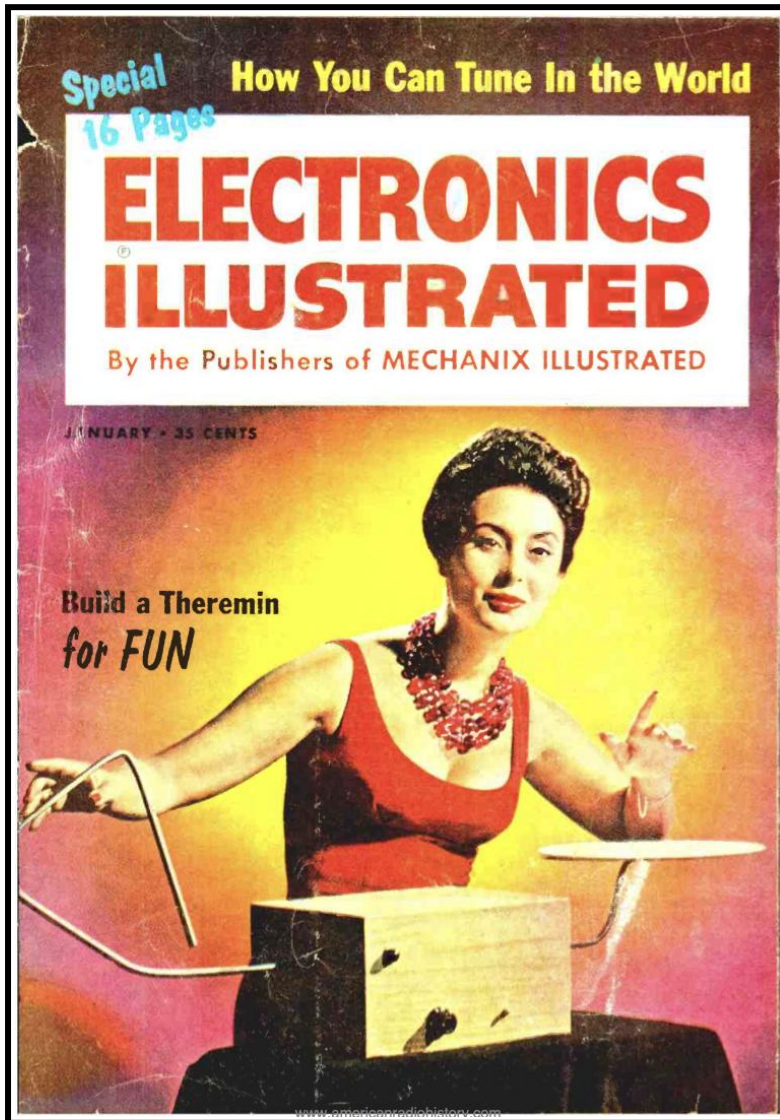
YOU DON'T HAVE TO SPEND HUNDREDS OF DOLLARS FOR A RADIO COURSE

I got my start at an early age...
A GENUINE NERD!!



Get a Magazine and, with your parts,
HAVE FUN!!

My first subscription;
age 10



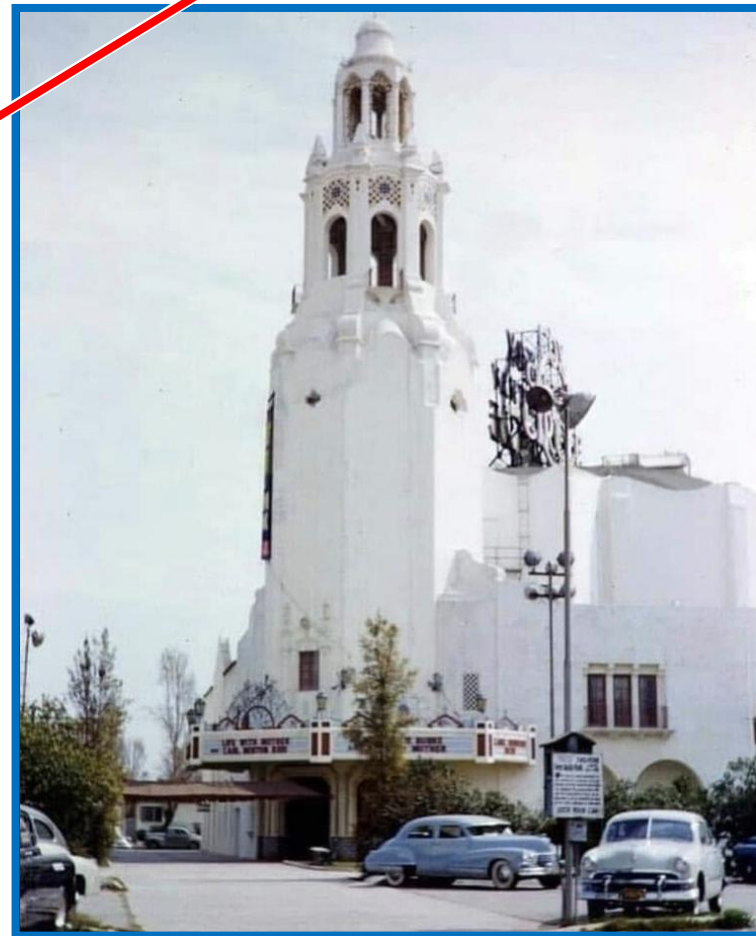
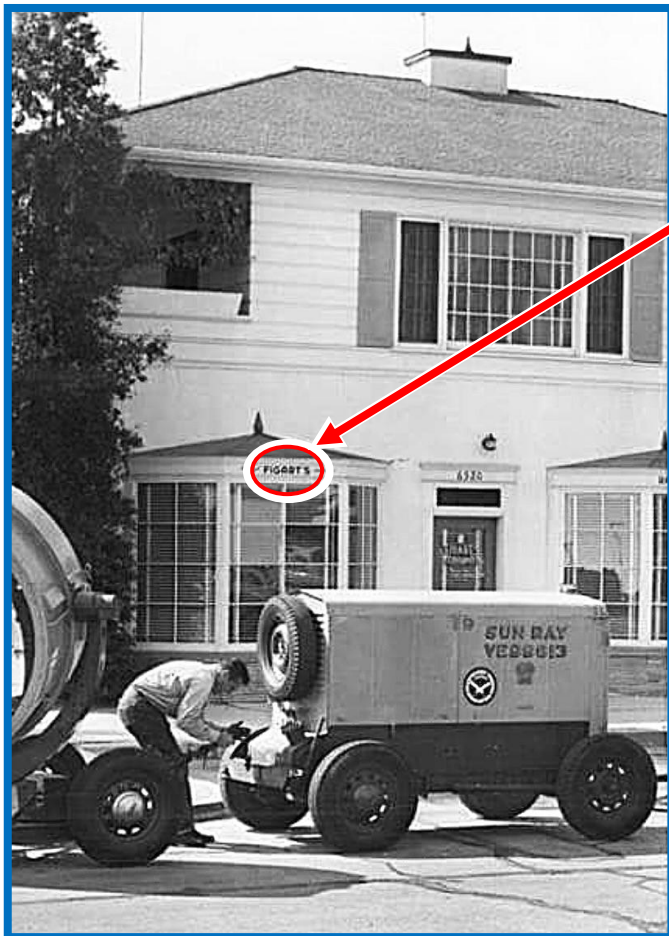
* I built this!! (see later in this talk)

*

Parts and rigs at the **War** Surplus Store..



Hop on your bike and get parts @
Figarts!!



Tubes and Tube Testers Galore!!

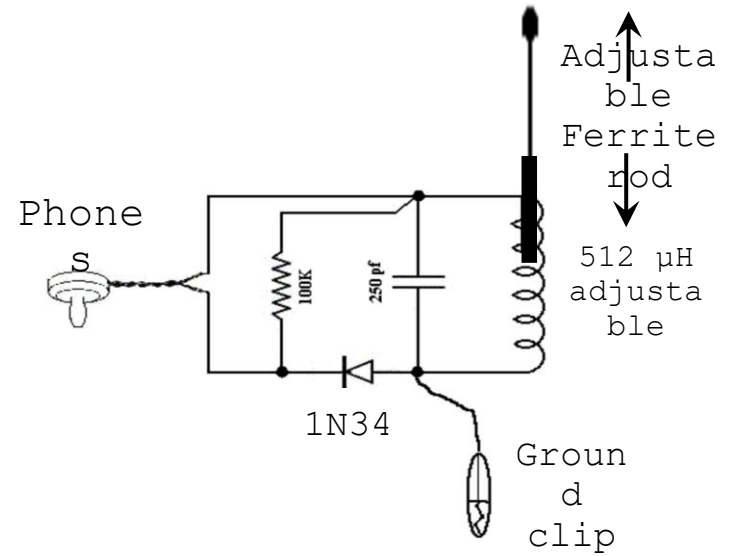
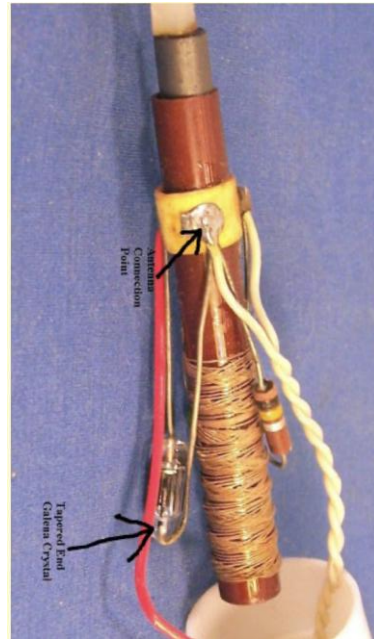


My crystal set buddy from JB Jr. High:
Jerome Ussery!



Jerome, David, Nila, Denise (Jerome's 76th
Birthday! Dec. 2024)

"Rocket" crystal set (Japan)



The Crystal



"Galena" (PbS) & wire

1901: Jagadish Chandra Bose

Xmtr: Sparkgap @ 12-60 GHz,
mmWave



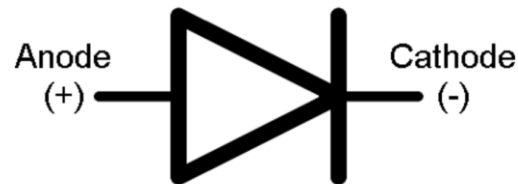
A Compact "Galena"

n-Ge: cathode & wire
(W): anode

Si: Doped regions form p-n
junction

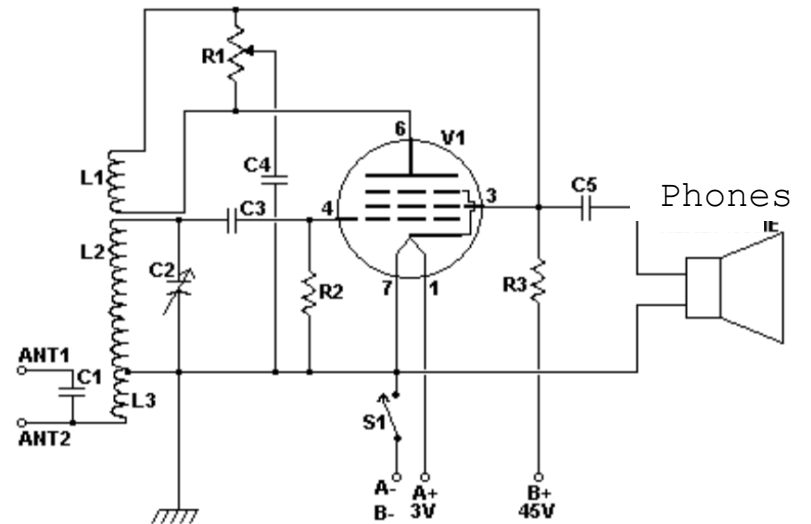
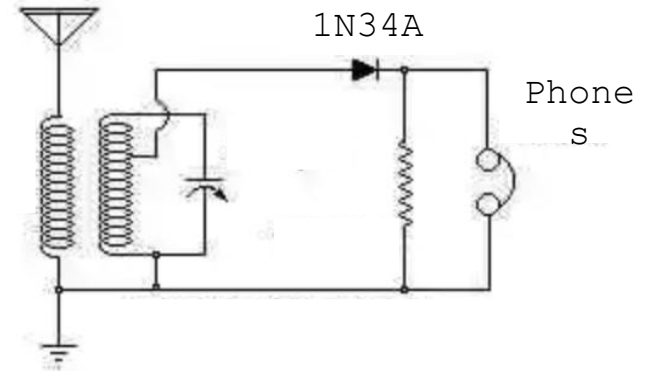


1N21CR



1N34A

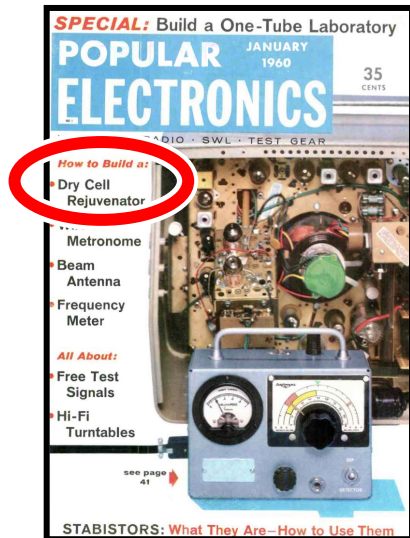
Crystal sets and 1-tube radios



Homebrew Gadgets (1)



Battery tester and
charger In a cigar
box
(w/kitchen-shelf
paper)



Dry Cell Tester and Rejuvenator

Simple circuit functions as
Fountain of Youth for run-down 1½-volt dry cells

By JAMES E. MURPHY

Small 1½-volt dry cells, originally developed for flashlight service, are finding increasing use in children's toys, transistor radios, and all sorts of electronic gadgets. Since the life of these units is limited, a simple recharging or rejuvenating method can result in real savings.

Rejuvenation circuits of the simpler variety include a small transformer, a rectifier, and a fixed resistor. More complicated circuits have a means of varying the charging rate, and a meter to read the charging current. In some cases, a small amount of unrectified a.c. is passed through the cell, since this appears to improve performance, probably by providing a sort of mixing or stirring action within the cell during charging. The unit described here includes all these features.

One problem immediately presents itself to anyone who tries to rejuvenate cells: there is no way to determine how weak a cell may be, other than by trying it out in a flashlight or other apparatus.

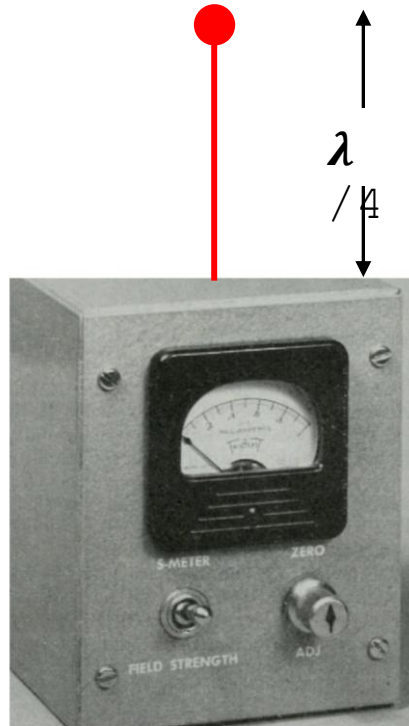
During the rejuvenation period, the same problem arises: there is no simple method for determining just when the cell has been brought back to its original condition.

With this rejuvenator, a flick of the switch indicates on the meter the exact condition of the cell. If the cell is below par, but not too far gone, the switch can be flicked to another position, and the rejuvenation process started. The charging rate, which is adjustable, is read from the same meter. The condition of the cell during the rejuvenation can be checked at any time by merely moving the switch to the test position. If more charging is needed, the switch is moved to the rejuvenation position. All this can be done without removing the cell from the holder.

Construction is quite simple. Almost any type of cabinet, even a cigar box, can be used. Holes for the meter (*M1*) and function switch (*S1*) are drilled and all parts are soldered in place except *S1* and the callibrated control (*VR*). The meter should be checked before

Popular Electronics
Jan. 1960

Homebrew Gadgets (2)



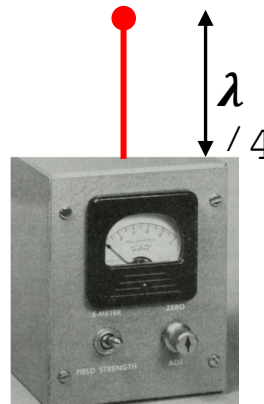
2-meter "sniffer"

Tuned circuit to a tunnel diode (1N21), a surplus amplifier, speaker & 100 μ Amp surplus meter

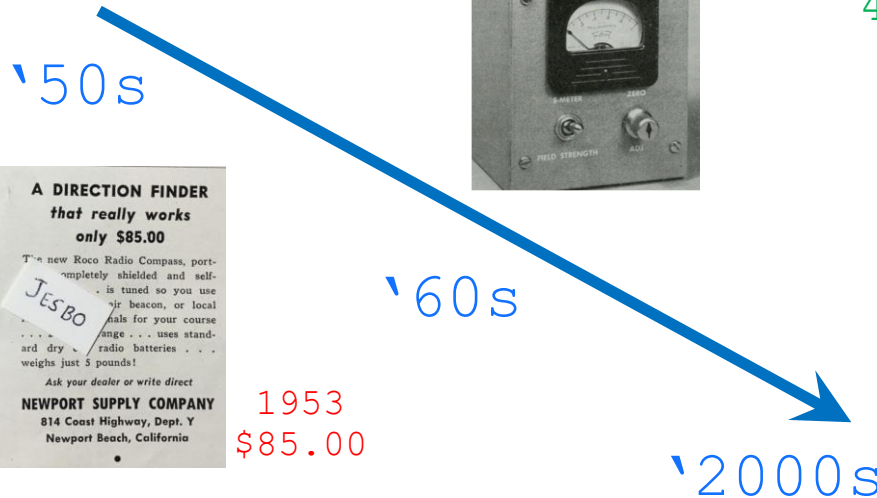
Sidebar... Evolution of the Sniffer



AM & 80
meters
6 lbs.
6" x 5" x
8"



2 meters
2 lbs.
6" x 5" x
4"



**A DIRECTION FINDER
that really works
only \$85.00**

The new Roco Radio Compass, port-
completely shielded and self-
is tuned so you use
your beacon, or local
als for your course
... . uses stand-
ard dry radio batteries . . .
weighs just 5 pounds!

Ask your dealer or write direct
NEWPORT SUPPLY COMPANY
814 Coast Highway, Dept. Y
Newport Beach, California

JESBO

1953
\$85.00



'2000s

Eico audio equipment
 Electronics Illustrated, 1961



Listen to the EICO Hour, WABC, NY, 95.5 Mc,
 M-F, 7:15-8 PM

Listen to the EICO Hour. WABC-FM. N.Y. 95.5 MC. Mon.-Fri., 7:15-8 PM

the experts say
your BEST BUY
 is **EICO** ...

EICO, 3300 N. Blvd., L.I.C. 1, N. Y. E1-1

Show me HOW TO SAVE 50% on top-quality:
 HI-FI TEST INSTRUMENTS "HAM"
 GEAR. Send FREE Short Course for Novice
 License. Send FREE Catalog & name of
 neighborhood EICO dealer. Send Stereo
 Hi-Fi Guidebook. 25¢ enclosed for postage and
 handling.

Name
 Address
 City..... Zone..... State.....

ADD 5% IN THE WEST

...in
STEREO and MONO HI-FI



New Transistor
 Stereo/Mono 4-Track
 Tape Deck RP100
 Semi-Kit (record &
 playback preamplifiers
 & control electronics
 in kit form) \$289.95
 Wired \$395.00



STEREO Dual
 Preamp HF85
 Kit \$39.95.
 Wired \$64.95.
 "Extreme
 flexibility ...
 a bargain"—HI-FI REVIEW



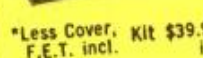
STEREO Dual
 Power
 Amplifiers: New
 100W HF89:
 Kit \$99.50
 Wired \$139.50.
 70W HF87: Kit \$74.95. Wired \$114.95.
 28W HF86: Kit \$43.95. Wired \$74.95.



New FM/AM
 Stereo Tuner
 ST96
 Kit \$89.95
 Wired \$129.95
 Incl. Metal Cover
 & FET



FM Tuner HFT90
 Kit \$39.95*.
 Wired \$65.95*.
 Cover \$3.95.
 "One of the best
 buys" AUDIOCRAFT



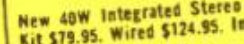
AM Tuner HFT94
 "Less Cover, Kit \$39.95. Wired \$65.95,
 F.E.T. incl. incl. Cover & F.E.T.



NEW!
 STEREO-Mono
 Player/Automatic
 Changer complete
 with dual stereo
 cartridge and
 "Magnadaptor."
 \$49.75 incl. F.E.T.



New 70W Integrated
 Stereo
 Amplifier ST70
 Kit \$94.95
 Wired \$144.95
 Incl. Metal Cover



New 40W Integrated Stereo Amplifier ST40
 Kit \$79.95. Wired \$124.95. Incl. Metal Cover



28W Integrated
 Stereo Amplifier
 HF81
 Kit \$89.95
 Wired \$109.95
 "Excellent"—
 SATURDAY
 REVIEW

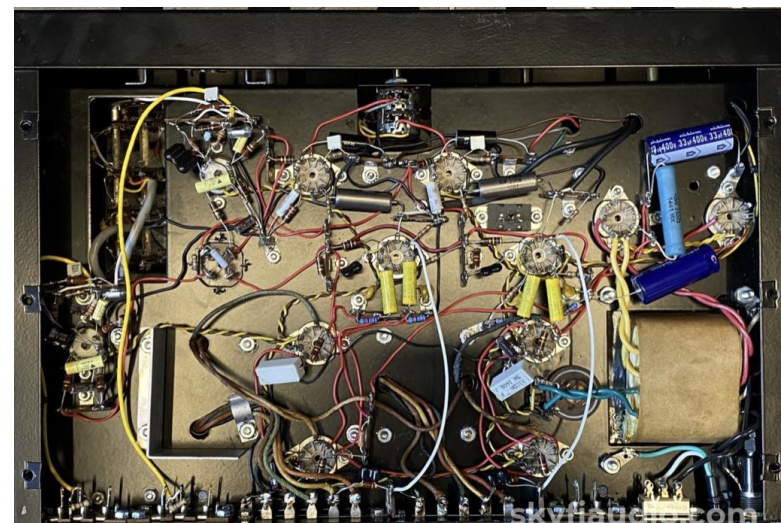


2-Way Bookshelf
 Speaker
 System HFS1
 complete with
 factory-built
 cabinet:
 Kit \$39.95
 Wired \$47.95



Eico HF-81 Stereo Amplifier

Built at age 12; Myriad cold-solder joints!



Eico test equipment Electronics Illustrated, 1961

70W HF87: Kit \$74.95. Wired \$74.95.
28W HF86: Kit \$43.95. Wired \$74.95.

... and in TEST INSTRUMENTS



New Power & Bias Supply for Transistorized Eqpt. #1020*
Kit \$19.95
Wired \$27.95
* Patent Pending



New TUBE & CRT FIL. Tester #612
Kit \$3.95.
Wired \$5.95.
Fast-checks radio/TV tubes, pilot lamps, etc.



RF Signal Generator #324
Kit \$26.95.
Wired \$39.95.



Miniaturized Multi-Signal Tracer #145A
Kit \$19.95.
Wired \$28.95.



1000 Ohms/Volt V-O-M. #536
Kit \$12.90.
Wired \$14.90.



Series/Parallel R-C Combination Box #1140
Kit \$13.95. Wired \$19.95
1350 Combinations!
*U. S. Patent No. 2,954,518



Vacuum Tube Voltmeter #221
Kit \$25.95.
Wired \$39.95.



5" Push-Pull Scope #425
Kit \$44.95
Wired \$79.95.



DC-5 MC 5" Scope #460
Kit \$79.95.
Wired \$129.50.



6V & 12V Battery Eliminator & Charger #1050
Kit \$29.95. Wired \$38.95.
Extra-filtered for transistor eqpt. #1060
Kit \$38.95. Wired \$47.95



Peak-to-Peak VTVM #232 & "Uni-Probe"
Kit \$29.95.
Wired \$49.95.
*U. S. Pat. No. 2,790,051



Tube Tester #625
Kit \$34.95.
Wired \$49.95.



R-C Bridge & R-C-L Comparator #950B
Kit \$19.95.
Wired \$29.95.

Most EICO dealers offer budget terms.

IN STOCK! Compare, take them home — right "off the shelf" — from 2000 neighborhood dealers. Over 2 MILLION EICO instruments in use throughout the world.

© 1961 ELECTRONIC INSTRUMENT CO., INC., 23-00 N. BLVD., L.I.C. 1, N.Y.

← See Page 24 for the BEST BUYS in CITIZENS TRANSCEIVERS, "HAM" GEAR and TRANSISTOR RADIOS.

Eico #710 Grid Dip Meter



Eico #147-A Signal Tracer



Heathkit 1961

Leader in its field . . . V-7A, world's largest selling VTVM

No basic service instrument has contributed more to the field of electronics than the world-famous Heathkit V-7A. Its quality and performance at low cost have made it a favorite for years. Functions include AC volts (RMS), AC volts (peak to peak), DC volts, resistance, and db. Front panel controls include a rotary function switch (with DC polarity reversing positions to eliminate lead switching), rotary range selector, zero adjustment, and ohms adjustment controls. Has 11 megohm DC input resistance for reduced circuit loading. Circuit board makes assembly easy. Manual includes application notes. Styled in two-tone grey with high definition white lettering. 6 lbs.

Kit V-7A . . . \$2.60 dn., \$5 mo. **\$25.95**
Assembled VW-7A . . . \$3.60 dn., \$5 mo. **\$35.95**

- Easy-to-read 4½" 200 ua meter
- 7 ac, 7 dc & 7 ohms ranges
- 1% precision resistors

SPECIFICATIONS—**Meter scales:** DC & AC (RMS): 0-1.5, 5, 15, 50, 150, 500, 1500 volts full scale. **AC peak-to-peak:** 0-4, 14, 40, 140, 400, 1400, 4000. **Resistance:** 10 ohm center scale x1, x10, x100, x1000, x10K, x100K, x1 meg. Measures .1 ohm to 1000 megohms with internal battery. **Meter:** 4½" 200 ua movement. **Multipliers:** 1% precision type. **Input resistance DC:** 11 megohms (1 megohm in probe) on all ranges. **Circuit:** Balanced bridge (push-pull) using twin triode. **Accuracy:** DC ±3%, AC ±5% of full scale. **Frequency response:** ±1 db 42 cps to 7.2 mc (600 ohm source). **Tubes:** 12AU7, 6AL5. **Battery:** 1.5 volt, size "C" flashlight cell. **Power requirements:** 105-125 volt 50/60 cycle AC 10 watts. **Dimensions:** 7¾" H x 4-11/16" W x 4¼" D.

Kit Form
or
Factory
Assembled



Heathkit V-7A VTVM



Our rig in 1961
Gary, 10 (WV6WBA); David, 12 (WV6TWA)



And why did we build test equipment?



A TV Repairman ...
"Take 2 !!!"





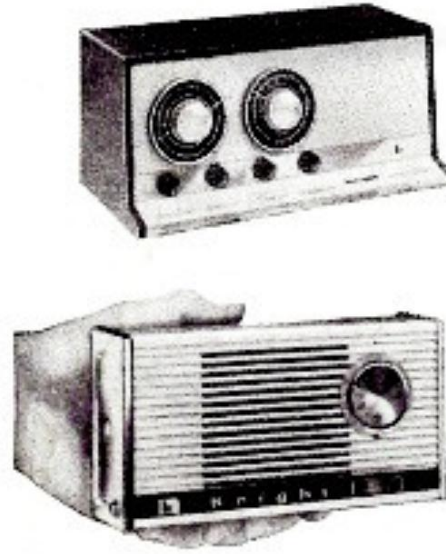
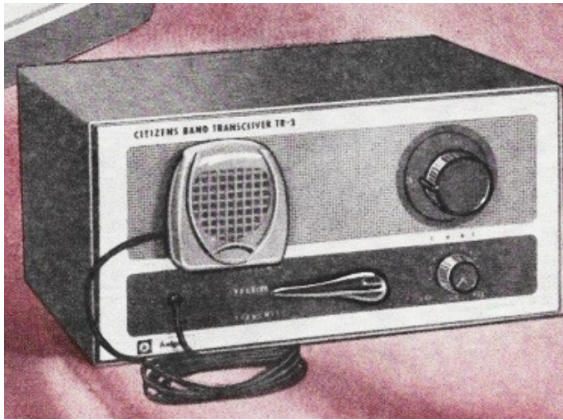
'40s - late '70s; prop. mgt. till '99

Peak in 1956 (1M units)
Test equipment, Audio,
HAM, Geiger counter (!)
SSB transceiver:

Demise - #753: "7

Drifty 3"



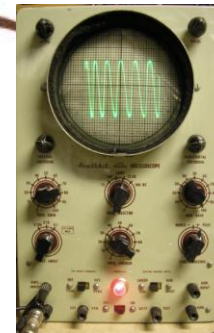
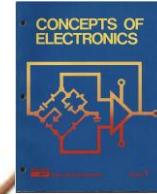


'55 - '65
by Allied Radio
Audio, Test,
Radios, HAM



newest **knight-kits**[®]
A PRODUCT OF ALLIED RADIO

Knight T-60
Knight R-55



Kits: '46 -
93'



Test-Audio-HAM to
Consumer Elect. to
Computers-Education

Heathkit HW-30
"Two-er"



Heathkit 2-Meter
Pawnee



Heathkit: A journey over 50+ years...

HEATH OCTOBER FLYER - ELECTRONIC SPECIALS

Our Best Buy of the month, a Brand New General Electric 150 watt transmitter BC375, for less than a ten dollar bill! \$9.95. The three meters alone, a O-BRF Ammeter, 0-500 Milliamp, and a 0-500 Voltmeter, are usually supplied in a kit, but at this price, they are appointed, its \$9.95.

• FLASH—see back cover for details on FM Multiplex.

HEATHKIT—the value name

Many have requested to use as a main into the end, excellent and

1. Remove cond field wires to wire (E), 5, 0
2. Remove bolt off housing (1) 57 degree cld



HEATHKIT® 1966

CATALOG-810/60A

FALL 1977

Dear Heathkit Pro: We wanted you to be the first to know... We want you to join this exciting, ever helped make us we because we are co help us achieve o its addition to cha we have expanded computers, accessories and softw be remodeling most of our stores display our wide selection of com kits and educational products. Please accept my personal invita new store at the earliest opportun do, be sure to bring along the LOG PCN on the back page... Good for a store.

Sincerely, Joseph M. President, Heathkit Corporation



Heathkit®

FALL 1977

Dear Heathkit Pro: We wanted you to be the first to know... We want you to join this exciting, ever helped make us we because we are co help us achieve o its addition to cha we have expanded computers, accessories and softw be remodeling most of our stores display our wide selection of com kits and educational products. Please accept my personal invita new store at the earliest opportun do, be sure to bring along the LOG PCN on the back page... Good for a store.

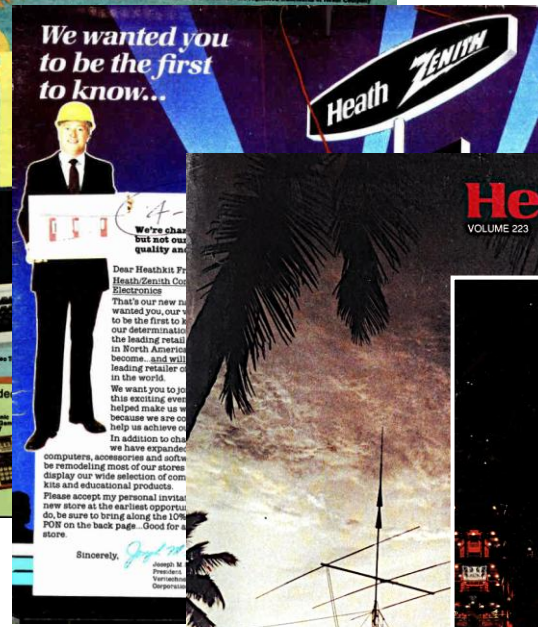
Sincerely, Joseph M. President, Heathkit Corporation



We wanted you to be the first to know...


Dear Heathkit Pro: We wanted you to be the first to know... We want you to join this exciting, ever helped make us we because we are co help us achieve o its addition to cha we have expanded computers, accessories and softw be remodeling most of our stores display our wide selection of com kits and educational products. Please accept my personal invita new store at the earliest opportun do, be sure to bring along the LOG PCN on the back page... Good for a store.

Sincerely, Joseph M. President, Heathkit Corporation



Heathkit

VOLUME 223 WINTER 1991



Heathkit

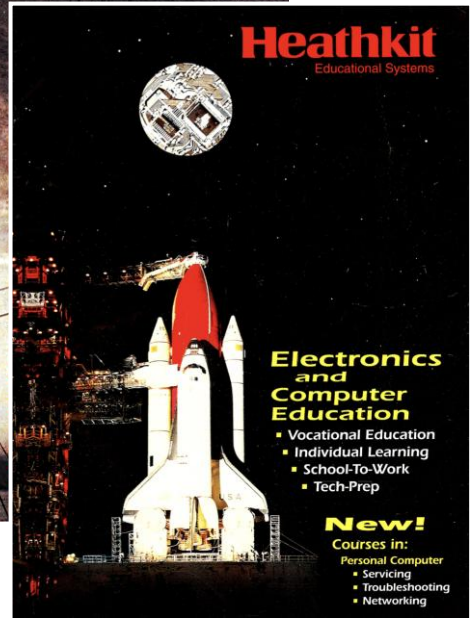
Educational Systems

Electronics and Computer Education

- Vocational Education
- Individual Learning
- School-To-Work
- Tech-Prep

New!
Courses in:
Personal Computer

- Servicing
- Troubleshooting
- Networking



Heathkit 1946 (1)

Heathkit Oscilloscope Kit \$39.50

We are now able to make prompt deliveries on our most popular kit - a 5" oscilloscope kit, complete with every part, including beautifully lettered two color panel, gray crackle finish cabinet, punched chassis, and every other part, down to the bolts and hook-up wire. Clear instructions and blueprints make this one of the most pleasant and profitable ways to spend the winter evenings, and after it is built you will find hundreds of interesting experiments to conduct (your wife should give you this for Christmas - it will keep you home for months). It contains the best of parts, GE Pyranol filters, Ratheon cased power transformer. Five tubes included, 5BPl, two 5Y3's, 2-6SJ7's, and one 884. The vertical amplifier is choke compensated to extend the frequency range and the 884 sweep generator supplies a sweep of 15 to 30,000 cycles. It has external or internal synchronization, test voltage post, blanking, etc. We couldn't supply it for anywhere near this price if it were not for surplus. Complete, every part, with diagrams and instructions.....\$39.50

Don't Forget - Our Kits are Best

Several of you have asked the manufacturer of the very beautiful gold band resistors in our kit. These are made by Allen-Bradley, and are the best commercial resistors available. The kit contains 100 assorted $\frac{1}{2}$ - 1 - 2 watt insulated color coded modern resistors for.....\$1.95

Our BATHTUB BYPASS CONDENSER KIT contains 20 single and multiple units ranging from .1 to 1 MFD and 120 volts to 600 volts. Three of the condensers in our kit are on sale by a well known firm at 45¢ each, making our kit of 20 a best buy for \$1.00.

MICA CONDENSER KIT. When surplus is gone, you will never see micas and silver micas at our price of less than 5¢, so order now. 25 color coded or marked.....\$1.00

SOCKET KIT. Nearly every socket in this kit is low loss yellow bakelite, and the miniatures are VHP cinch selling for around 38¢. You can't go wrong at 20 for....\$1.00.

Heathkit 1946 (2)

Pocket Tester

For those of you who wish to build an inexpensive multirange DC voltmeter or pocket tester, we have Weston and Simpson meters with an 0-3 volt basic range, which we are supplying with 2 multiplying resistors, giving additional ranges of 0-30 and 0-300 volts DC. The meter is 2 1/2" in diameter and is a 0-8 MA movement. The meter complete with 2 resistors and tester diagram.....\$1.95

BC 223 Owners

We have obtained a quantity of the power supply PE 125 for the BC 223. Brand new, it operates from 12 or 24 volts, and supplies 500 volts at 160 MA. It is an excellent unit, using two tube rectifiers, contains relays, fuses, etc., to match and operate with the BC223. This is the easiest and fastest way of getting your set working. PE125 Power Unit.....\$9.95

PM Speakers for Military Sets

A 5" PM speaker with a 4000 ohm output transformer
the output on many of the military sets, allowing them to be used
without change. 5# military set speaker.....\$2.80

Like to play with Radar? We have a small quantity of the RT-7/APNL radio receiver transmitters only, which we are told are being used as small boat radar sets by beaming them horizontally and sweeping them manually, giving an indication in feet to the nearest object. It contains two 955's, 2 9004's, 4 12 SJ7's, 3 12SH7's, 2 12H6's, 1 VR150. It operates from 27 VDC and includes a dynamotor, several relays and precision resistors. These sets are in used condition and the cases don't look too good, but for \$9.95 you can have a lot of fun.

Heathkit 1961 (1)

• *FLASH*—see back cover for details on FM Multiplex.

HEATHKIT®—the value name in electronic kits

- top quality • low price • easy to build
- guaranteed performance • over 200 kits



HEATH COMPANY BENTON HARBOR, MICHIGAN
Plant Location: St. Joseph, Michigan

a subsidiary of
DAYSTROM, INCORPORATED

COPYRIGHT 1961, HEATH COMPANY

Heathkit 1961 (2)

*For the SWL . . . portable convenience!
"MOHICAN" general coverage
receiver kit*



Kit Form
or
Factory
Assembled

- Ten transistor, six diode circuit
- Covers 550 kc to 32 mc in five bands
- Flashlight battery power supply

The avid short wave listener will find this five-band communications receiver ideal for all 'round use. The "Mohican" with its self-contained flashlight battery power supply offers complete portability . . . operates anywhere! . . . and features high sensitivity, selectivity and stability through its many "firsts" in receiver design. The fixed-aligned ceramic IF "Transfilters" used in the "Mohican," which were developed primarily for military use, operate much the same as crystal lattice filters to shape the IF bandpass, and offer superior stability and selectivity. Other features include: 10 transistor circuit, Zener diode voltage regulation, built-in telescoping 50" whip antenna, flywheel tuning, panel tuning meter and large slide-rule tuning dial for easy station selection. Convenient panel controls include: on/off volume control, BFO pitch with on/off switch, RF gain, antenna tuning, electrical bandspread, ANL on/off, AVC on/off and Bandswitch. The GC-1A quickly converts from battery power to 117 VAC household current using the plug-in power supply XP-2. The experienced kit builder can assemble and align this compact kit within 30 hours. Handsome styling features a one-piece cabinet with convenient carrying handle, die-cast metal knobs and green, gray-green color combination. 18 lbs.

Heathkit 1961 (3)

Get on the 2, 6 and 10 METER AMATEUR BANDS with these outstanding transceiver values!



- Crystal controlled transmitters
- Tunable, super-regenerative receiver with RF stage
- Ideal for emergency work—easy to build

These low cost transceiver kits provide excellent performance in emergency work or local net operations. All models have *crystal-controlled* transmitters and *tunable* super-regenerative receivers with RF preamplifiers. The high sensitivity receivers pull in signals as low as 1 uv! Both 6 & 2 meter models multiply to straight-through finals from an oscillator using a fundamental crystal in the 8 mc range. Features include a front-panel transmit-receive switch with transmit-hold position, metering jack, ceramic element microphone, and two power cords (one for built-in AC supply and one for DC). Less crystal. 8 lbs. each.

Kit HW-19 (10 meter) . . . \$4 dn., \$5 mo.	\$39.95
Kit HW-29A (6 meter) . . . \$4.50 dn., \$5 mo.	\$44.95
Kit HW-30 (2 meter) . . . \$4.50 dn., \$5 mo.	\$44.95

SPECIFICATIONS—Receiver type: Superregenerative detector with RF amplifier stage. **Sensitivity:** Usable with signals as low as 1 microvolt at antenna terminals. **Speaker size:** 3½" (round). **Audio power output:** Approximately 1 watt (undistorted). **Transmitter power input to final RF amplifier:** Approx. 5 watts. **Frequency control:** Quartz crystal; 3rd overtone, 10 meter; 8 mc fundamental 6 & 2 meter, (not supplied). **Power requirements:** With built-in supply; 105-125V AC, 50-60 cycle, 35 watts (10 meter), 45 watts (6 & 2 meter); with external power supply; Plate requirements; 260V DC @ 60 ma (10 meter), 90 ma (6 & 2 meter). **Filament requirements:** 6V @ 1.8 amps or 12V @ 0.9 amps (10 meter), 6V @ 2.35 emps or 12V @ 1.2 amps (6 & 2 meter). **Cabinet dimensions:** 8" H. x 6" D. x 9¾" W.

Heathkit 1961 (4)



EUW-19A Operational Amplifier

- Four high-gain operational amplifiers plus booster amplifier
- Standard 5-pin amplifier terminals accessible on front panel
- Completely self-contained with built-in power supplies
- Amplifier balance controls on front panel
- Fully assembled and tested

FEATURES HIGH GAIN, LOW DRIFT, RAPID RESPONSE, AND WIDE FLEXIBILITY. This operational amplifier system represents an outstanding value in lab facilities. It can be connected as a constant current source, a controlled potential source, a linear sweep generator, or as a servo-system simulator. Addition, subtraction, integration and differentiation problems can also be programmed for countless applications in measurement, computation and control work.

SOLVES A GREAT RANGE OF PRECISION ELECTRICAL MEASUREMENT AND CONTROL PROBLEMS. See chapter eight of the Malmstadt/Enke text, "Electronics for Scientists," EUP-11, for a full description of the capabilities of operational amplifiers.

COMPLETE INSTRUMENT MANUAL INCLUDED. Discusses the circuitry, theory and operation of the EUW-19A in detail.

- EUW-19A, 22 lbs. no money dn., \$135.00
- EUA-19-1, Single 5-Amplifier Adapter Chassis, 3 lbs. \$9.00
- EUA-19-3, 5 Individual Adapter Chassis, 4 lbs. \$10.00

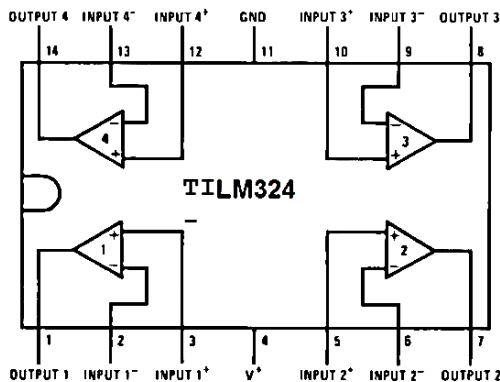
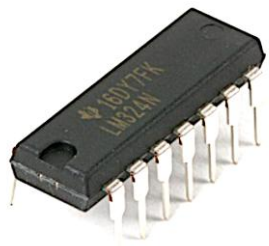


EUW-19A
\$135.00

450
87 dB
kg

EUW-19A SPECIFICATIONS—OPERATIONAL AMPLIFIERS: DC Gain, open loop: 21,000 (87 ±1 db). Frequency response: to 450 kc. Voltage range: —50 V DC to +50 V DC at input and output with 50 k ohm load. Output current: —1 ma to +1 ma with 50 k ohm load. Output impedance: Less than 1.5 ohms. Phase shift: Less than 1 degree at 100 kc. Rise time: 12 microseconds. Drift: Less than ±8 mv/day under normal conditions after 48 hours, or more, aging period. **AMPLIFIER 1 bias only:** May be switched for follower or inverter operation. **BOOSTER AMPLIFIER:** Maximum output: ±20 ma at ±50 V DC. Gains: Approx. 0.8. Output impedance: Less than 0.2 ohms. **POWER REQUIREMENTS:** AC INPUT: 105-125 volts, 50/60 cps. Filament power only: 44 watts. Total power required: 94 watts at quiescent operating conditions. Fuses: Two ¼ ampere slow-blow fuses; one for the filament circuits, and one for the DC+ and DC— supplies. **AUXILIARY POWER CONNECTOR:** Location: Octal socket on rear of unit. Power available: +300 volts at 20 ma and —300 volts at 20 ma with unit in operation; +300 volts at 60 ma and —300 volts at 60 ma when all amplifier tubes are removed. Balance resistors: Available at auxiliary connector to balance power supplies and adjust output voltages. **GENERAL:** Dimensions: 11¼" W x 6¾" H x 12¾" D.

1972: 1.3 MHz; g
~ 100 dB



1992
TI-OPA627BU (\$28)
G-BW: 45 MHz; g:
115 dB
Single OP AMP



2025: 8 GHz; g
~ 100 dB

Heathkit 1961 (5)

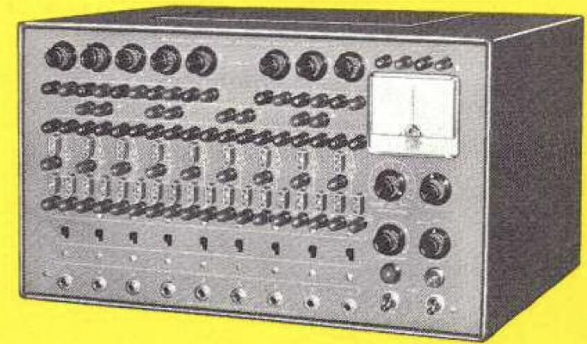


Educational electronic ANALOG COMPUTER . . . just \$199.95

- Ideal for schools, colleges, industry
- 3 initial condition supplies
- 9 DC operational amplifiers
- Built-in repetitive oscillator
- 5 coefficient potentiometers

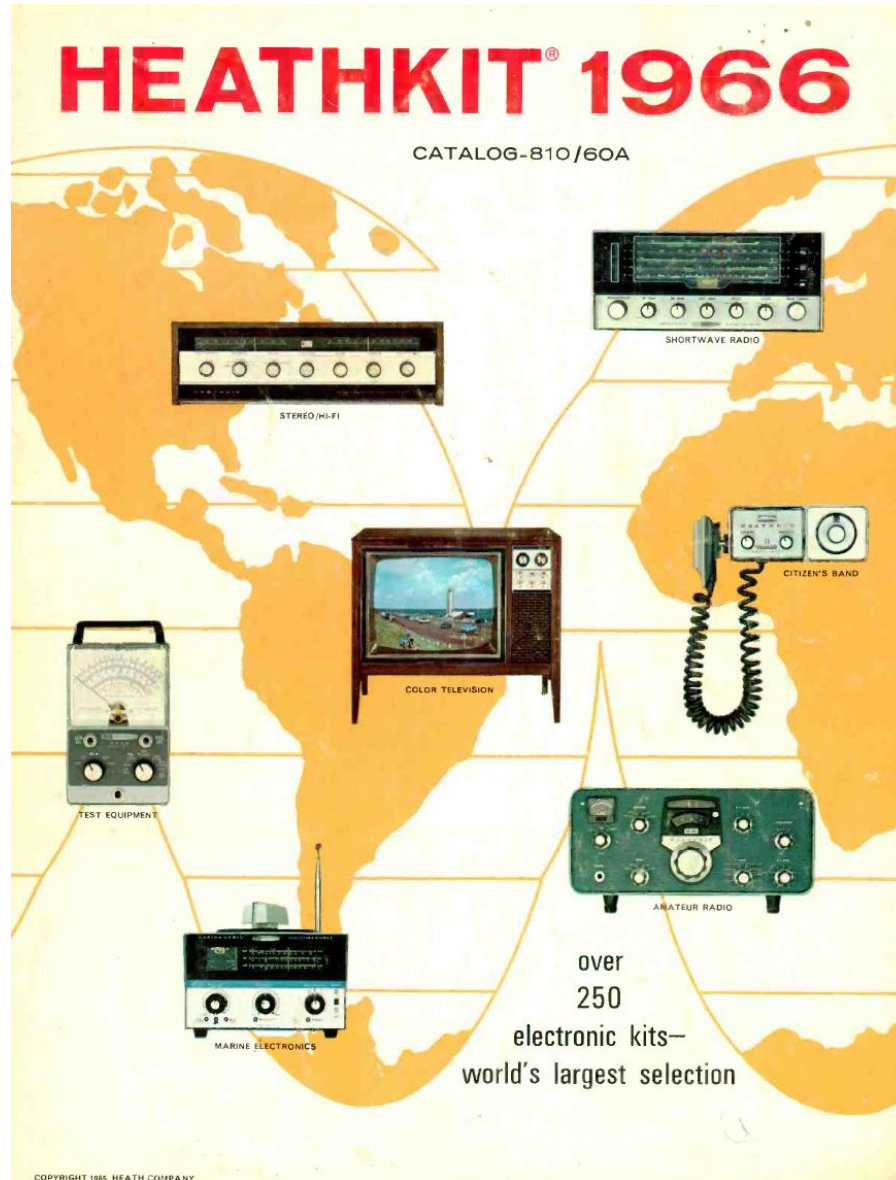
The Heathkit model EC-1, lowest cost analog computer of its quality on the market, puts advanced engineering techniques within the reach of everyone! Used widely in industry, the EC-1 is capable of solving a multitude of complex mechanical and mathematical problems with swift electronic accuracy. Many concerns are using the EC-1 to train computer operators and engineers in setting up problems. Schools and colleges find the EC-1 ideal for teaching engineering, physics and math classes the basic principles of analog computer application and design. Featured are: 9 DC operational amplifiers with provision for balancing without removing problem setup; 3 initial condition power supplies; repetitive oscillator and 5 coefficient potentiometers with terminals on the panel. Comprehensive operational manual gives basic computer theory and operating procedures. Housed in rugged steel case with convenient access hatch. Measures 19 $\frac{3}{4}$ " W x 11 $\frac{1}{2}$ " H x 15" D. 43 lbs.

Kit EC-1 . . . \$20 dn., \$17 mo. **\$199.95**



SPECIFICATIONS—Amplifiers: Open loop gain approximately 1000. Output —60 +60 volts at .7 ma. **Power supplies:** \pm 300 volts at 25 ma electronically regulated; variable from +250 to +350 by control with meter reference for setting +300 volts. Negative 150 volts at 40 ma regulated by VR tube. **Repetitive operation:** Multivibrator cycles a relay at adjustable rates (.1 to 15 cps), to repeat the solution any number of times; permits observation of effect on solution of changing parameters. **Meter:** 50-0-50 ua movement. **Power requirements:** 105-125 volts, 50/60 cycles, 100 watts

Heathkit 1966 (1)



The image is a catalog cover for Heathkit 1966. It features a stylized orange world map on a light yellow background. Various electronic kits are arranged around the map, each connected to a point on the map by thin lines. The kits include a stereo hi-fi unit, a shortwave radio, a color television, a citizen's band radio, test equipment, an amateur radio, and marine electronics. The text 'HEATHKIT® 1966' is prominently displayed at the top in red, with 'CATALOG-810/60A' below it. At the bottom right, it says 'over 250 electronic kits—world's largest selection'. The copyright notice 'COPYRIGHT 1965, HEATH COMPANY' is at the bottom left.

HEATHKIT® 1966

CATALOG-810/60A

STEREO HI-FI

SHORTWAVE RADIO

COLOR TELEVISION

CITIZEN'S BAND

TEST EQUIPMENT

AMATEUR RADIO

MARINE ELECTRONICS

over
250
electronic kits—
world's largest selection

COPYRIGHT 1965, HEATH COMPANY

Heathkit 1966 (2)

Convenient Chassis Layout
Easy access to crystal sockets, shielded final amplifier, low-pass filter. Permits fast, easy assembly.

Low Pass Filter
Built-in . . . reduces harmonic radiation, TV interference . . . assures clean signal output.

DX-60A
\$79.95

Through Heath Engineering And Design



Heathkit DX-60A Phone & CW Transmitter

- 90 watts phone or CW—80 through 10 meters • Neutralized 6146 final amplifier • Built-in low pass filter • Grid block keying—easy access to crystal sockets • May be run at reduced power for novice operation • Transmitter mate of the HR-10

NOVICE OR OLD-TIMER, CHOOSE THE DX-60A! If you're a novice, the DX-60A is right for you. Operate it at the required 75-watt maximum (crystal control) for novice class CW . . . and later when you get your general class phone license, go to VFO control and use the DX-60A's full 90 watts of power. (See the HG-10 VFO page 76, an excellent VFO for the DX-60A). No transmitter in this price range will offer you more.

GET ON THE AIR WITH A QUALITY PERFORMER. The DX-60A is the style and performance mate of the HR-10. Its quality, well-rated components, thoughtful circuit layout, clean rugged construction, and attractive styling make it the ideal low power transmitter. Building this versatile performer is fast and easy . . . step-by-step instructions and a precut

cabled wiring harness make the entire satisfying project a matter of a few evenings.

COMPARE—SEE WHY YOU GET MORE FOR YOUR MONEY WITH THE DX-60A! Check these advanced features . . . a low-pass filter to suppress harmonic interference . . . a neutralized final amplifier for high stability . . . excellent grid block keying . . . switch selection of four crystal positions or external VFO for full coverage of amateur bands . . . meter that shows final grid or plate current . . . plus single-knob bandswitching and pi-network for complete operating convenience. Less crystals. Compare! . . . you'll choose the Heathkit DX-60A.

Kit DX-60A, 25 lbs. . . No money down, \$8 mo. \$79.95
Export model available for 115/230 VAC, 50-60 cps; write for prices.

DX-60A SPECIFICATIONS—Power input: 90 watts peak; controlled carrier, phone, or CW. Output impedance: 50-75 ohm (coaxial). Output coupling: Pi-network. Operation: CW or AM phone—crystal or VFO control. Band coverage: 80 through 10 meters. Power Requirements: 105-125 V., 50-60 cps, 225 watts. Dimensions: 13 1/4" W x 11 1/2" D x 6 1/2" H.

Heathkit 1966 (3)



Standards For Amateur Radio



Heathkit SB-400 Transmitter . . . \$325

- Built-in power supply • Complete transceive capability with SB-300 Receiver • Linear Master Oscillator frequency control • Built-in antenna change-over relay • All crystals supplied for complete 80-10 meter coverage • Automatic level control for higher talk power, minimum distortion • 180 watts PEP SSB, 170 watts CW crystal filter type SSB generation • Operates SSB (upper or lower sideband) & CW • VOX & PTT control in SSB operation, VOX operated CW break-in • Crystal controlled heterodyne oscillators • 1 kc dial calibration—100 kc per dial revolution • Dial bandspread equal to 10 feet per megacycle • 500 kc coverage per bandswitch position • Switched 120 V AC for external antenna relay • Sturdy, lightweight, heavy-gauge aluminum construction throughout • Neat, modern "Low-Boy" styling • Variable loading

THE PERFECT "MATE" TO THE SB-300. The Heathkit SB-400 conforms to the same rigid specifications set by the SB-300. An identical LMO con-

Heathkit SB-200 KW SSB Linear . . . \$200

- 1200 watts P.E.P. input SSB—1000 watts CW • 80 through 10 meter band coverage • Built-in SWR meter—Antenna relay—Solid-state power supply • Automatic Level Control (ALC) • Shielded, fan-cooled amplifier compartment • Pre-tuned cathode input circuit for maximum efficiency & low distortion • Circuit-breaker power supply protection—no fuses • Designed for 120/240 volt operation

TO COMPLETE YOUR SB-SERIES 80-10 METER AMATEUR STATION . . . here in a single compact unit is a completely self-contained desk-top linear amplifier that provides up to 1200 watts P.E.P. input SSB, 1000 watts CW in a high efficiency grounded-grid circuit for improved amateur communications.

LATEST DESIGN FEATURES. You'll find many advanced-design features

Heathkit

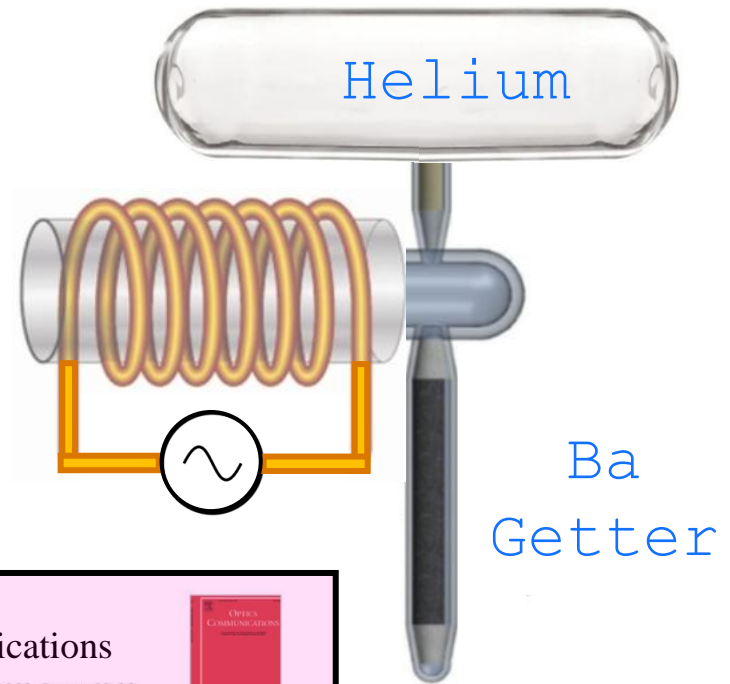
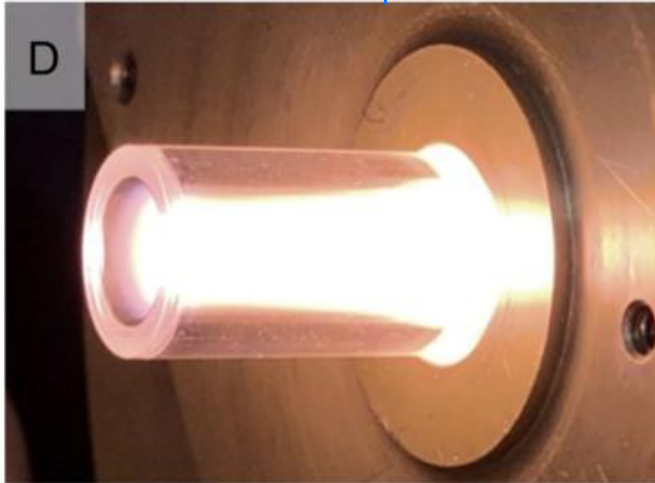
1966 (4)

Heathkit SB-200 KW SSB Linear Amplifier

Helium RF discharge lamp ($\lambda = 1.08 \mu\text{m}$); HRL, '80s



Helium RF discharge lamp (= 1.08 μm)



Optics Communications

Volume 48, Issue 1, 1 November 1983, Pages 33-38



Polarization transfer between oriented metastable helium atoms and neon atoms: A comparison of even and odd isotopes

David M. Pepper, Harry T.M. Wang

HRL Laboratories

HRL
LABORATORIES

HRL
LABORATORIES

Heathkit 1977 (1)

Heathkit[®]

FALL 1977

© 1977 Heath Company See Index on page 2

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New THE HEATHKIT COMPUTERS

The "total system" computer products for home, hobby, educational and business applications. With powerful software to get you up and running fast, superior documentation and service support, sensational low prices too. They're the ones you've been waiting for!
See pages 2-11.



M11 16-Bit Digital Computer, pages 6-7

M8 8-Bit Digital Computer, pages 4-5

M10 Paper Tape Reader/Punch, page 8

M9 Video Terminal, page 9

HEATHKIT MAIL ORDER CATALOG 817

New Heath-recommended electronic products

Telephone Answerer, page 76

Electronic Chess Game, page 77

Indoor Greenhouse, page 75

Video Recorder, page 90

New Kit Products for FALL

Active Audio Processor, page 38

Electronic Digital Scale, page 104

FET Multimeter, page 80

Low-Priced Oscilloscope, page 88

World Radio History

Heathkit 1977 (2)

Heathkit/Thomas Keyboard Kombo

*The instrument that looks like an organ,
but does a whole lot more — build it for
a lifetime of musical entertainment!*



\$549⁹⁵



Create the sound of an entire musical combo by playing simple one-finger chords!

- Provides solo instruments, rhythm accompaniment and drums
- Wide-selection of built-in tempos for real versatility
- BIG, FULL sound from the built-in 12" wide-range speaker

The TO-1102 will make you the "life of the party" as you dazzle your friends and family with exciting and creative musical entertainment all at the touch of a finger.

The TO-1102 accurately reproduces the sounds of these solo instruments: Flute, Clarinet, Trumpet, Violin, Accordion, Guitar, Piano, Banjo, Mandolin, Harpsichord, Vibes and Hawaiian Guitar. As you play the "solos" with these instruments, the TO-1102 automatically accompanies you with a wide assortment of rhythm instruments: piano, guitar, banjo, harpsichord and flute. These rhythms are automatically accompanied by alternately bass pedal notes.

And the drums provide the beat! Variable slide controls for drums tempo and volume let you create your own tempos or you can choose automatic tempos of Waltz, Fox trot, Swing, Rock and Latin.

The Keyboard Kombo has 24 major and minor one-finger chords. Simply press the key with one finger and the chord automatically plays — depressing a foot pedal switch lets you change the chord from major to minor. A special memory-chord circuit keeps the last chord sounding until you play the next, providing a smooth, professional-sounding flow of music. Vibrato and reverb controls let you create special effects for even more musical versatility!

The TO-1102's sound system delivers the music you produce with outstanding sound quality. There's a deluxe all-solid-state amplifier with a heavy-duty wide-range 12" speaker system. And its unique

electronic circuits insure that all instrument and rhythm sounds are accurately reproduced.

Has on-off switch with pilot light, volume control, slide controls for keyboard balance and reverb, a balanced expression control. There's even a headphone jack so you can entertain yourself or practice in complete privacy. The keyboard is clearly marked with each note, so learning to play is easy and fast. Just sit down with it for awhile and you'll find yourself sounding like a "Pro"! We include full instructions with songs to get you started!

Finally, the TO-1102 is as good to look at as it is to play and listen to. The contemporary designed cabinet is fully assembled and has a simulated rosewood finish for a rich, expensive look. The handsome matching bench is included too. The TO-1102 is an easy-to-build kit too, with IC's and plug-in circuit boards to simplify assembly. And it's priced a lot lower than assembled units, so you get big kit-form savings. Treat yourself and your family to musical entertainment at its best — order the TO-1102 today!

Kit TO-1102, Shpg. wt. 189 lbs. Motor Freight **548.95**

TO-1102 SPECIFICATIONS: Solo Instruments: Flute, Clarinet, Trumpet, Violin, Accordion, Guitar, Piano, Banjo, Mandolin, Harpsichord, Vibes, Hawaiian Guitar. Accompaniment Instruments (Rhythm): Piano, Guitar, Banjo, Harpsichord and Flute; Drums: Waltz, Fox Trot, Swing, Rock, Latin, Drum Controls: Tempo — Variable Slide; Volume — Variable Slide. Chords: 24 one-finger Chords, Memory Chord. Controls: Vibrato Cancel, Reverberation, variable slide; Keyboard Balance, variable slide. On-off switch with pilot indicator. Balanced Expression control, headphone jack. Cabinet: Contemporary Design with Rosewood Finish. Sound System: solid-state amplifier with 12" heavy-duty Speaker. Dimensions: 34 1/2" H x 36" W x 21 1/2" D. Net Weight: 150 lbs.

Heathkit 1985 (1)

*We wanted you
to be the first
to know...*



**We're changing our name
but not our commitment of
quality and service to you.**

Dear Heathkit Friend,
Heath/Zenith Computers &
Electronics

That's our new name...and we wanted you, our valued customers, to be the first to know. It signifies our determination to become one of the leading retail computer chains in North America, just as we have become... and will remain... the leading retailer of electronic kits in the world.

We want you to join us in celebrating this exciting event, because you helped make us what we are, and because we are counting on you to help us achieve our new objective.

In addition to changing our name, we have expanded our offering of computers, accessories and software. And we'll also be remodeling most of our stores in 1985 to better display our wide selection of computers, electronic kits and educational products.

Please accept my personal invitation to visit your new store at the earliest opportunity. And when you do, be sure to bring along the 10% SAVINGS COUPON on the back page... Good for anything in the store.

Sincerely,

Joseph M. Schulte

Joseph M. Schulte,
President,
Vertechnology Electronics
Corporation

Heath **ZENITH**

Computers &
Electronics

But first, look inside for some of
the best computer news of this year!

Heath **ZENITH**

Computers & Electronics

Heathkit 1985 (2)



The GR-2502's hide-away control panel reduces tampering with TV adjustment

Quartz-controlled electronic tuning gets rid of the need for fine tuning and eliminates the normal wear-and-readjustment common with mechanical tuners. Select any channel being telecast in your area. A built-in computer selector instantly seeks out and locks on to the exact frequency. Have sharp, color-fast television at your fingertips or from a remote location! The panel closes after making those fine adjustments.



Large-Scale Integrated Circuits let these TVs run coolly and economically. Modular construction minimizes connections and makes repair quick and easy — should it ever be required a few years down the line.

Simulated TV pictures



Make and receive phone calls using the optional Advanced Space Phone Accessory

Choose the cabinet to suit your decor



Four speakers, two on each side, surround the picture to provide more realism. Choose the elegant Classic or the smart Modern cabinet. Have an attractive piece of furniture and probably the best TV available.



Elegantly styled Classic console features the warm tones of richly-grained Pecan finish on top and sides made from durable wood products. Simulated wood front and base matches finish. Cabinet measures 32 1/2" H (with casters) x 43 1/2" W x 19 1/4" D (add 2 3/4" to depth for tube cap).

GRA-706-25, 85 lbs. Mtr. Frt. 149.95

Beautifully proportioned, symmetrical design marks this Modern console for the GR-2502. Oak veneers on top, ends and base add to its smart styling. The front is framed with hardwood solids. The cabinet measures 28 7/8" H (gliders included) x 42 1/2" W x 18" D (add 2 3/4" to depth for tube cap).

GRA-716-25, 82 lbs. Mtr. Frt. 199.95

QUALITY FEATURES

- Single UHF/VHF/CATV 75Ω antenna input
- New auto CRT tracking keeps colors like new — year after year
- Peak Resolution Picture Circuit adds 25% more detail
- Internally shielded tri-focus picture tube
- Quartz-controlled electronic tuning of 176 channels
- New switchable video filter removes excess picture-noise
- Complete picture and sound control with audio output



Heathkit 1985 (3)



6

Great hi-fi sound to go with
great VHS video recordings



7

Quality VHS video within
everyone's price range



8

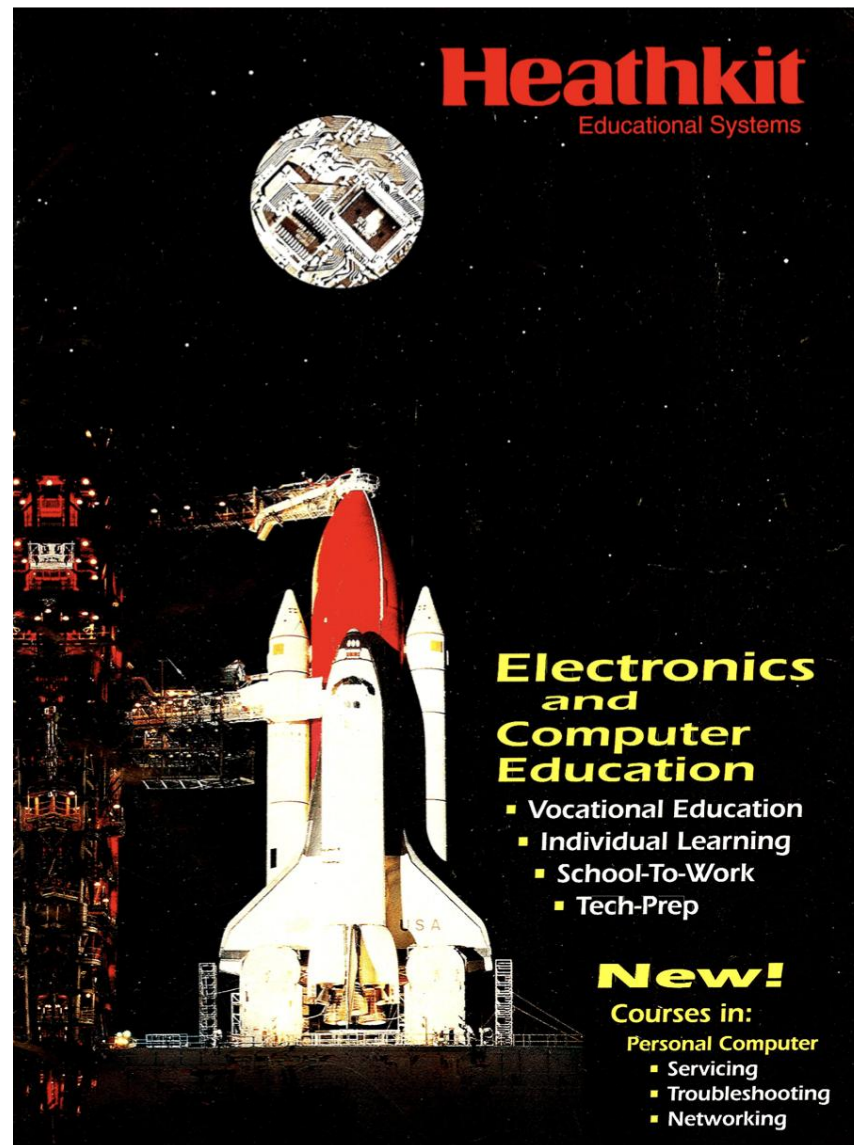
A system in itself, a compact
video movie camera/recorder
using mini-cassettes



9

Enjoy quality stereo sound
from your TV or VCR

Heathkit 1993 (1)



The advertisement features a dark background with a space shuttle on the left and a globe of circuitry at the top. The shuttle is illuminated, showing its white body and red nose cone. The globe is a circular arrangement of various electronic components like chips and resistors.

Heathkit
Educational Systems

**Electronics
and
Computer
Education**

- Vocational Education
- Individual Learning
- School-To-Work
- Tech-Prep

New!
Courses in:

- Personal Computer
 - Servicing
 - Troubleshooting
 - Networking

Heathkit 1993 (2)

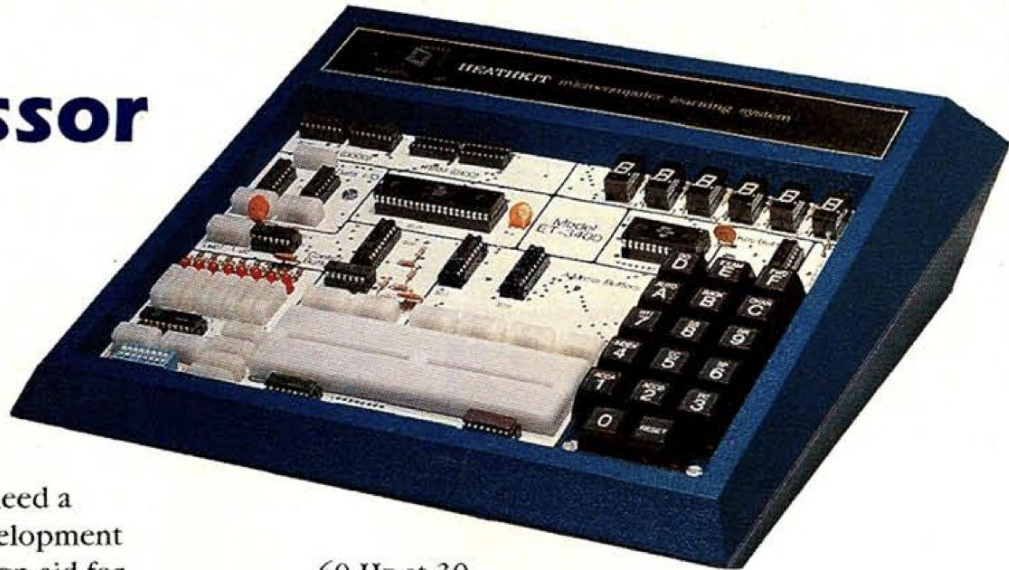
ETW-3400-A

Microprocessor Trainer

World's Most Popular Microprocessor Trainer!

Preferred by virtually every microprocessor text on the market, this flexible, general-purpose trainer can be used anywhere you need a microprocessor-based software development system. It can also be used as a design aid for developing custom interface circuitry. Supports hands-on experiments for microprocessor programming, interfacing, and applications.

The ETW-3400-A is built around the popular 6808 microprocessor and has 512 bytes of user-accessible RAM and a 1K monitor ROM. It features a solderless breadboard that lets you build prototype logic circuitry plus a 17-key hexadecimal-based keypad and six 7-segment LED display digits for easy data entry, data review and troubleshooting. UL listed. Requires 120 VAC,



60 Hz at 30
watts maximum power.
Dimensions are 3.5" H x 12.1" W x 11.8" D.

ETW-3400-A Microprocessor Trainer
ET-3400-A Microprocessor Trainer (kit)

Courses Requiring the ETW-3400-A

Microprocessor Programming

EB-6401-A (text), EE-3401-A (ILP)

Microprocessor Interfacing

EB-6402 (text), EE-3402 (ILP)

Microprocessor Applications

EB-6405 (text), EE-3405 (ILP)

Heathkit 1993 (3)

ETW-3700 Digital Trainer

Ruggedly Sophisticated

Provide yourself or your students valuable hands-on experience building digital circuits. The versatile ETW-3700 Digital Trainer speeds and simplifies digital circuit design and experimentation. It enables you to apply course material in a practical way, through experiments and by building and testing your own prototypes.

Features include 3 built-in short-circuit and overload-protected regulated power supplies: positive and negative 12-volt DC and positive 5-volt DC voltages to power both digital and linear circuits. Supplies a line-frequency square wave (60 Hz), a three range clock, and a great deal more. Compact and portable, the Digital Trainer is a solid piece of equipment that keeps working for years and years. In classrooms, students will use it to build, test, reconfigure and rebuild experimental circuits literally thousands of times.

Like our Analog Trainer, the Heathkit Digital Trainer also has a removable solderless breadboard that accepts solid wire up to #20 and the leads from nearly every common electronic component. The connector blocks are recessed for extra durability. Use the ETW-3700 alone with Parts Pack experiments, or attach the Backpack Accessory and use our time-saving, Pre-wired Experiment Boards.

ETW-3700 Digital Trainer
ET-3700 Digital Trainer (kit)
ETA-3600-1 Extra Breadboard Block



Specifications

Power Supplies

Output Voltages: +12 volts DC @ 250mA, -12 volts DC @ 250mA, +5 volts DC @ 500mA
Load Regulation: +5 volts DC supply — better than 5%, +12 and -12 volts, DC supplies — better than 1%
Line Regulation: 1% (All supplies are short-circuit and overload protected.)

Data Switches

States: +5 or 0 volts DC
Maximum Current: 10 mA each switch
Output: four terminals for each switch

Logic Switches

Number: two
Type: momentary contact, spring-loaded
Circuit: two flip-flop latches for contact bounce buffering
Output States: complementary, +5 and +0.2 volts DC

Clock

Frequency Selection: 3-position slide switch
Output Frequency: 1 Hz, 1kHz, 100 kHz
Duty Cycle: 35% to 65%
Output Voltage: 5 volts peak-to-peak (no load)
Output Terminals: normal and complement
Logic Indicators: four green LEDs with separate input terminals
Low level (OFF): 1.0 V (maximum), High level (ON): 3.0 V (minimum), input terminals able to withstand +12VDC, TTL compatible.

General

Solderless Breadboard Block: removable, 130 rows of four terminals each
Line Source: 50/60 Hz
Power Requirements: 105-130 VAC, 60 Hz @ 20 watts max
Fuses: 1/4-A slow-blow @ 120 VAC
Dimensions: 4.3" H X 12" W X 11.4" D (11 X 31 X 29 cm)
Net Weight: 6 lbs. (2.3 kg)

Courses Requiring the ETW-3700

Digital Techniques

EB-6201-A (Text), EE-3201-A (ILP), CAI-6201-01 (CAI)

For Pricing, See Center of Catalog

17

Schools and Commercial Accounts, please call your Heathkit Distributor. See page 58. Individual Students call Heathkit at 1-800-253-0570.

Heathkit 1993 (4)

LASER TRAINING SYSTEM EWS-4200-A & ETS-4200 (KIT)



- This commercial quality training system includes a low-power Class II helium-neon laser — and a laser receiver. Together this powerful system gives students first-hand experience with an actual laser and accurate laser measuring equipment.
- Transmitter features a helium neon gas laser that generates an intense, easy-to-see red light, and a pilot light.
- Features a mechanical beam shutter for extra safety, a tripod mount and signal input jacks to use with an external modulating signal source.
- The transmitter is equipped with modulation circuitry — unique for a laser in this price range — to demonstrate the latest communications technology.
- The receiver comes with a built-in detector and a built-in relative power meter to measure the beam's intensity, audio amplifier and speaker.
- UL Listed

Specifications

Output Power: 0.4-0.9 mW

Wavelength: 632.8 nm, visible red

Beam Diameter: at 1/ePTS 0.49 mm

Beam Divergence: 1.64 mrad

Polarization: random

DHHS* Class: II

Modulation Bandwidth: 300 Hz-40 kHz +/- 3 dB

Auxiliary Input: 1 volt peak-to-peak

Microphone Input: 100 mV peak-to-peak, designed for crystal microphone of 50k impedance

Power Requirements: 120 VAC, 60 Hz @ 15 watts

Dimensions: 3" H x 4" W x 14" D (8.3 x 9.5 x 35.2 cm)

Weight: 3 lbs (1.2 kg)

Ordering Numbers	SUBJECT	TRAINER	PARTS PACK	TEXT	WORKBOOK/ LAB MANUAL	INST GUIDE/ ADMIN GUIDE	IND. LEARNING PROGRAM
	LASER TECHNOLOGY (Instructor-Led) (Individualized Learning)	EWS-4200-A EWS-4200-A	EB-610-30	EB-610	EB-610-40	EB-610-50	EE-110

APEX: "The Last Electronics Store in the US"

info@apexsurplus.com

8909 San Fernando Rd, Sun Valley, CA, United States, California. (818) 767-7202



APEX: "The Last Electronics Store in the US"

So, that's where I left
my 'scope...



**APEX: "The Last Electronics Store
in the US"**

Nerd's Xmas tree



**APEX: "The Last Electronics Store
in the US"**

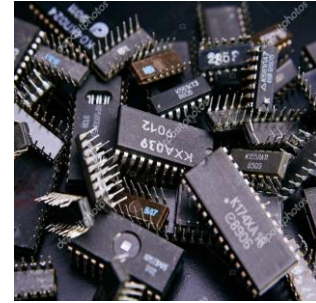
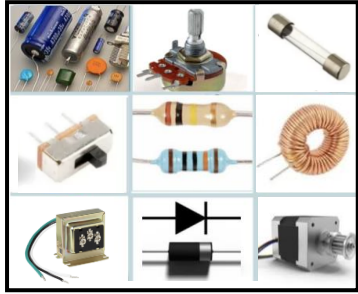
Torpedoes, Missiles

... • •

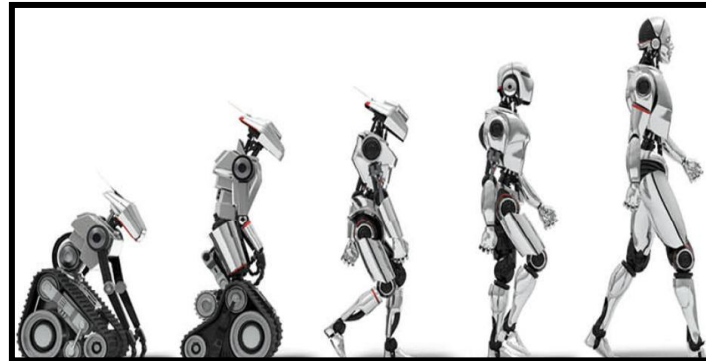
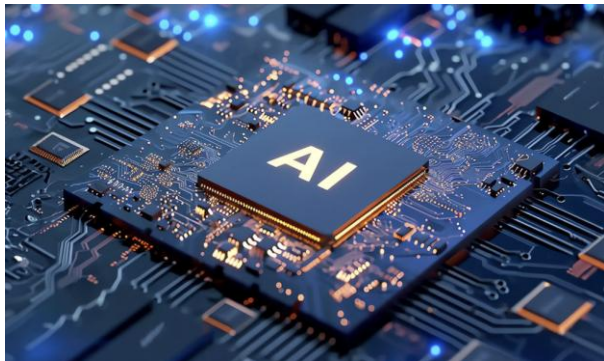


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"Evolution" of the Electronics Hobbyist



← *Components* →



Systems/Computers

Robotics

Biotech

As for me ...



*In Memory of KH6BMD
Robin Okinishi*

*... A wonderful, kind, charming man, who helped
introduce me to HAM Radio, at age 12,
and proctored my Novice Exam, 1961, WV6TWA*

 KH6BMD 	
Amateur Radio <u>KN6RAH</u>	Xmtr <u>VIKING II (100w)</u>
This confirms QSO on <u>7.1</u> Mc 	Rcvr <u>HQ-129X/PAK-7</u>
<u>DEC. 17,</u> 19 <u>56</u> at <u>1845 H ST</u> 	Ant <u>DOUBLET</u>
Ur <input type="checkbox"/> Fone <input checked="" type="checkbox"/> CW sigs RST <u>579</u>	Remarks <u>TKS FB QSO ES HPE 2</u> <u>UA9N SN-73'S Robin</u>
Robin Okinishi - P. O. Box 375 - Hanapepe, Kauai, Hawaii	