



## Fully portable loran

Totally automatic operation heads the long list of easy-to-use features found in this amazing navigation aid from Interphase. The list continues with a 2-line liquid crystal display for current position in latitude and longitude or time difference (TD), current boat speed and course over ground, time to go to a destination, cross track error (distance off a given track) and left/right steering data.

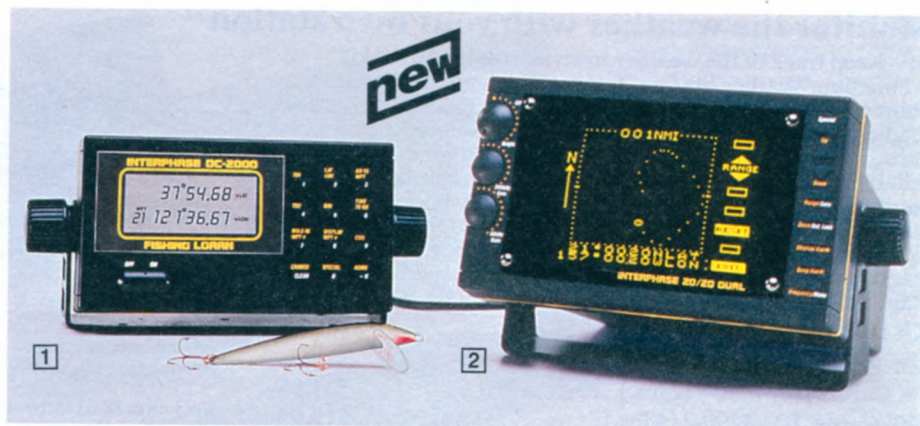
The waterproof 12-key keypad allows easy storing and recalling of up to 99 favorite locations. And, you can chain together as many as 40 spots and the Portable Loran will automatically help you steer to each. Set the audible alarm to sound when you get close to your destination or let it warn you, should your boat drift off anchor.

The Portable Loran features automatic selection of land-based loran stations. And even if the shore-based transmitter or one of its secondary transmitters fails, your unit continues to work. A feature few other lorans offer.

Two count-up timers, a 24-hour clock and a plan mode available for calculating course and distance between any two locations are standard features. Additional secondary factor (ASF) corrections for mountain ranges and ground conductivity are built in, as is a one-button *take me home* feature that guides you back over your previous course. Use at sea or on inland lakes and waterways in all but the central U.S., from the Dakotas and eastern Montana to western Texas and New Mexico.

Efficient microprocessor circuitry requires less than 0.1 amp for up to 100 hours of continuous use on the internal rechargeable battery. Or, permanently reconnect the unit to your boat's 12 VDC system and use the battery as safety backup. 10-14 VDC are required. Includes extending antenna, mounting bracket and knobs, 120 VAC battery recharger and operations manual.

**Assembled MI-3000**  
(7 lbs.) ..... \$399.95



## Easy-to-use fishing loran

1 Here's another affordable, full-function fish finder from Interphase that will guide you precisely to your favorite, hard-to-find spots. Identical in most features to the Portable Loran shown at left, the Fishing Loran operates off your boat's power supply to help you find fish...time after time.

Use the Fishing Loran by itself or as part of what Interphase calls a Fishing Data Center. As part of the Data Center, the Fishing Loran links with the 20/20 Dual Video Fishfinder, described at right, to give you a graphic track plot to any location.

Includes antenna coupler and NMEA 0183 output for interface to autopilot, track plotters or Interphase fish finders. Requires 12 VDC, less than 0.25 amp. 7" W x 4" H x 2 1/4" D.

**Assembled DC-2000**  
(4 lbs.) ..... \$429.95

**Loran to Graph Interface Cable**  
MIA-2020-3 (2 lbs.) ..... \$24.95

## 20/20 dual video sonar

2 The secrets of commercial fishermen are now available to anyone who enjoys fishing for sport. With the Interphase 20/20 Dual Video Fishfinder, the underwater world comes to you.

A superpowerful 50KHz 40° beam searches waters to a depth of 1280 feet, while a high-frequency 200 KHz 10° beam outlines the finer details in shallow water. And, you can watch them both simultaneously on the split-screen video display. Other features include on-screen fish symbols in three sizes; audible alarms for *shallow, deep, zone* and *fish*; display freeze; split-screen variable zoom; 6-inch amber screen; 800-watts peak-to-peak power. Dimensions are 8" W x 4 1/2" H x 9" D.

Combine the technology of video fishing sonar with the wonders of loran for a Fishing Data Center that really works. Includes transom transducer.

**Assembled MI-2020-D**  
(9 lbs.) ..... \$499.95



## new 20/20 video fish finder

Extremely easy to use, the popular Interphase 20/20 has proven its performance and reliability with fishermen all over the world. The bright, high-resolution amber video display offers four

different levels of shading for excellent visibility in all weather conditions. Both keyboard and o-ring sealed case are water and shock resistant, at home in either fresh or salt water. An adjustable zoom lets you take a closer look at underwater details, and an adjustable alarm alerts you to shallow water and to changes in bottom contours.

Displays include depth, surface water temperature, boat speed and distance traveled. This popular unit gives you six depth ranges, from zero to 1500 feet, and a 20° 200 KHz or 40° 50 KHz beam angle. Power consumption is less than 1.5 amps. Dimensions are 5 1/2" H x 7 1/2" W x 7 3/4" D. Includes transom transducer.

**Assembled MI-2020-A**  
(9 lbs.) ..... \$349.95

## Save over \$100 on VisiTel's picture phone

Every once in a while a new product comes along that you wonder how you or your loved ones got along without. Now, you can actually see your far-away grandchildren and other family members as you talk to them on the phone.

Mitsubishi's VisiTel visual telephone display sends black and white still images over standard phone lines in only seconds. And, it plugs right into your modular telephone jack. Your phone, in turn, connects to a modular jack in the camera/display unit, which takes power from an AC wall outlet. The unit houses a fixed-focus, black and white video camera and a 4½" TV display tube. Pose up to two feet away from the camera, then press the *send* button to transmit the picture. Brightness controls help you compose a pleasing image. As soon as both parties have completed the 5½ second image transmission, conversation can resume. And, VisiTel stores up to three images on its internal memory chip, retaining them as long as power is supplied to the machine. These stored images can then be transmitted during another phone call.

VisiTel brings the picture phone into your home without adding a penny to your phone bills. Its compact size even allows you to take it with you when you travel or share it with friends in their home. And, yes, you can use your phone to make a conventional call – even if it is attached to the VisiTel. Uses 110/220 VAC.

**Assembled LU-500 (7 lbs.) . . . . Was \$399.95 Now \$289.95**

NOTE: Both parties must have a VisiTel unit in order to transmit images.



(Simulated picture)

## LiteSet cordless personal telephone for hands-free communication

Imagine yourself at your desk, hands occupied with paperwork. The phone rings. Under normal circumstances you'd be required to put down what you're doing so you can pick up the phone. Now imagine yourself wearing a LiteSet cordless telephone headset. Your hands are totally free to write, work at your keyboard, look through reference material...all as you talk on the phone. And, your conversation takes place in privacy without disturbing people nearby.

The new LiteSet phone is designed for use in situations that make holding a conventional receiver uncomfortable or inconvenient. Its specially designed modular base unit is easy to install. Just plug it into your wall jack, and you'll be free to move up to 1000 feet away. Carry the unbelievably lightweight headset and pocket-size dial pad with you as you move freely around your office, house or even your yard. You can receive calls and dial out no matter where you are.

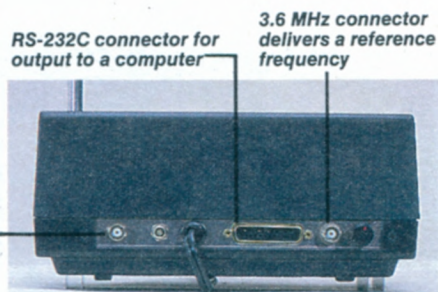
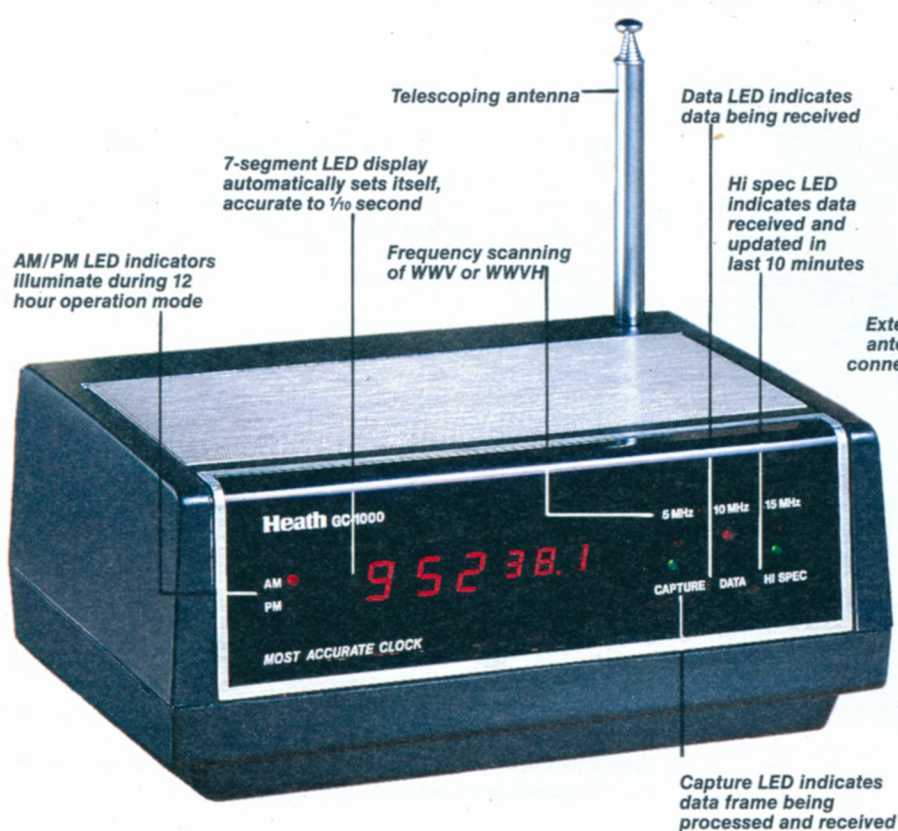
There's no need to wear the headset until a call comes in or you want to place a call since calls ring from the dial pad. A four foot cord connects the headset to the pad so you can slip the pad into your pocket or fasten it onto your belt.

Last number redial, call canceling, tactile-feel keypad, mute switch, switchable tone/pulse dialing and two volume settings are all standard LiteSet features.

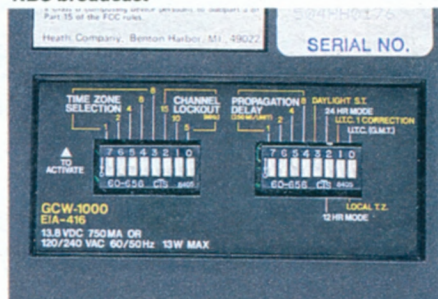
The actual weight of the set will amaze you. The pad weighs in at only 5.5 ounces and the 3-inch long headset at an incredible 0.5 ounces, giving you unprecedented comfort as you experience hands-free communication.

**Assembled RF-100-1 (3 lbs.) . . . \$129.95**





Back panel input/output connections include volume control for monitoring the NBS broadcast



Case bottom dip switches for time correction adjustments

## Heath's patented Most Accurate Clock

Experience the precision of a microprocessor-based time piece synchronized with the National Bureau of Standard's (NBS) cesium atomic clock. The patented Heath Most Accurate Clock locks onto the NBS radio station to give you the hour, minute, second and tenth-of-a-second in Universal Coordinated Time. With a hi spec accuracy of  $\pm 10$  milliseconds and propagation-delay correction, this unique clock lets you switch to any of the world's standard 24 time zones. Uses 120 VAC or 12 VDC.

An outdoor antenna is recommended, but may not be required in your area. Dimensions are 3 7/8" H x 9" W x 6 1/4" D.

Kit GC-1000-H (7 lbs.) ..... \$249.95

Accessories:

### Computer RS-232 Interface

Kit GCA-1000-1 (1 lb.) ..... \$49.95

### Heath/Zenith Interfacing Software

GCA-1000-3 (3 lbs.) ..... \$49.95

## Digital clock with battery backup

Dependable and easy to use, this reliable digital clock is perfect for anyone just getting started in kit building. Time and date are displayed in large 4-digit, 7-segment LEDs. For comfortable reading day or night, brightness automatically varies according to surrounding light. A built-in battery backup feature keeps internal circuitry running in case of power failure, and a snooze button causes the alarm to sound at 9-minute intervals each time you press it. Attractively styled dark grey cabinet measures 2 7/8" H x 7 1/8" W x 4 3/8" D. Operates on 120/240 VAC, 50/60 Hz. Battery not included.

Kit GC-1108 (4 lbs.) ..... \$24.95



Three easy ways to shop at your nearest Heath/Zenith Computers & Electronics Center



## Portable AM radio is ideal first kit

**SKILL LEVEL 1** Enjoy quality reception with this compact AM radio. The GR-1009 features a high-gain antenna and a 2-inch dynamic speaker for clear crisp sound. The sturdy, easy-to-clean cabinet measures 3 1/2" H x 6 3/8" W x 1/4" D. Use a 9-volt transistor battery (not included) or the PS-2350 Battery Eliminator with 120 VAC. Separate earphone is supplied.

**Kit GR-1009** (2 lbs.) ..... \$24.95

Accessory:

**Battery Eliminator**

Assembled PS-2350 (1 lb.) ..... \$7.95



## Keyless door lock

**SKILL LEVEL 1** Replace your existing strike plate with the keyless door lock and enter your home with a convenient four-digit code. No modifications are required to the door or the lock itself and you keep your keys. Includes 120 VAC power cube.

**Kit GD-3830** (5 lbs.) ..... \$79.95



## Keyless garage door activator

**SKILL LEVEL 1** Open your garage door without a key or transmitter. The activator works like the keyless lock above to activate your electric

garage door opener. Includes control module, keypad, interconnecting cable and 120 VAC power cube.

**Kit GD-3835** (2 lbs.) ..... \$49.95



## Non-abrasive jewelry cleaner

**SKILL LEVEL 1** Now you can use the same ultrasonic method popular with professional artisans, jewelers and coin collectors to clean and sanitize precious, delicate items. The Heathkit Ultrasonic Cleaner makes items sparkle like new. It literally vibrates dirt, stains and undissolved solids from hard-to-clean jewelry, watch parts, glass, coins, components, dentures, paint brushes and more. All delicate items, except pearls and turquoise, are safely cleaned without abrasion.

The Ultrasonic Cleaner uses ordinary laundry soap or softener for most cleaning jobs. Just fill the 6" L x 4" W x 2 3/8" D tank with one inch of solution and this gem of a cleaner is ready to go to work. Plugs into household AC outlet.

**Kit GD-1151-H** (4 lbs.) ..... \$99.95



## Exhaust gas analyzer

**SKILL LEVEL 1** Use the Heathkit Exhaust Gas Analyzer to evaluate and adjust your car's emission control system. You'll get better gas mileage, and your car will meet its clean air standard, mandatory in some states.

The sensor that's used to detect gases at the exhaust pipe ahead of the catalytic converter is made of rugged stainless steel with a flexible probe tip for easier tail pipe insertion. A 7-foot cable enables you to use your car battery as a power source. All accessories are included. Not intended for use with Chrysler "lean burn" engines.

**Kit CI-1080** (6 lbs.) ..... \$129.95

## Pocket size radiation monitor

**SKILL LEVEL 1** This Heathkit Geiger counter uses the sensitive, industry-standard Geiger-Mueller tube to detect and warn of low levels of radiation – even "harmless" levels. The monitor can be calibrated to a standard traceable to the NBS Cesium 137 Gamma source as an option. A beeper indicates detected radiation and a meter shows measured levels on three selectable ranges. Includes carrying case with strap. Requires a 9-volt battery (not included). 5 3/4" H x 2 7/8" W x 1 1/2" D.

**Kit RM-4** (2 lbs.) ..... \$129.95



## Energy-saving thermostat cuts heating and cooling costs to 25 percent

The Set-Back Thermostat replaces your existing thermostat and lets you plan daily household temperatures to suit your lifestyle.

You can't afford to pass up this chance to cut your heating and cooling costs up to 25% – without sacrificing comfort or convenience. You can program up to four temperature changes a day with separate programs for weekdays and weekends. And if you don't work a regular schedule, any two days can be selected as your weekend days.

It's designed to fit most gas, oil and electric heating and air conditioning systems with 24-volt controls (3, 4 and 5 wire type), but will not work with heat pump, high voltage electric baseboard or electric ceiling heat, gravity flow or Millivolt systems. The included manual contains a full explanation of compatible systems and installation procedures. Return the unit for a full refund if it's not compatible with your system.

**Assembled E-200** (1 lb.) ..... \$69.99



17.8 inches long!

## Experience the Fox. From starting line to 80 feet in 3.5 seconds

SKILL LEVEL It's fast and it's a winner. Born and bred for superior performance, the Fox from MRC-Tamiya represents the ultimate in two-wheel drive action. This performance-oriented automobile will give you your money's worth in speed races, obstacle runs, drag races and rallies – whether at home or out on the race course. And, so it can handle the rough and tumble excitement of off-road running, this tough racing buggy is built to a 1/10 scale, one tenth the size of a real race car.

### Acceleration, power and handling

Features that make this off-road dirt sprinter so outstanding include lightweight one-piece wheels for the quickest acceleration, and semi-pneumatic, low-profile rear tires that are oval block patterned so you'll get the traction you need, no matter what the driving surface. Once you're up and running, a powerful 540 competition motor hitched to a pre-assembled rear drive shaft – complete with ball bearings – keeps your power on the road.

An adjustable oil-filled damper and coil spring units guarantee a better ride, and race-proven double wishbone front and rear suspensions promise superior handling. And because the gearcase is sealed with precision ball bearings, your Fox will give you the superior performance you need on the race track, no matter what the weather.

### Easy to build, complete system

This sleekly styled, off-road racer is not only lightweight and good looking, it's easy to build. Instructions are clear and straightforward so whether this is your first RC kit or you're adding to an existing collection, you'll find the directions complete and easy to follow.

The Fox comes complete with its own radio (eight AA batteries required), battery and trickle charger. Everything you need to put yourself in the winner's circle.

**Kit RB-554** (8 lbs.) ..... \$269.95

30



15.4 inches long!

## The Hotshot II. An outstanding racer for the competition purist

SKILL LEVEL Redesigned to the specifications of experienced racers, the original Hotshot has made way for the Hotshot II. This off-road racer is raring to go, hotter and meaner than ever.

### Four wheel drive engineering

For thrills and high performance operation, four wheel drive racing can't be beaten. With its 540-type motor as standard equipment, the Hotshot II fits the bill. The 540 motor drives both front and rear differential axles through a solid propeller shaft for minimum friction and maintenance, plus greater strength. And, the oil-filled, adjustable monoshock front end, along with rear double wishbone suspension equipped with stabilizers, ensures easy handling, even in the toughest racing situations.

To decrease weight in the chassis thus increasing your top speed, the normal RC receiver battery has been replaced with a battery eliminator circuit. Front and rear sealed gear box with differentials, a forward three step and reverse two step speed controller, two oil-filled dampers on the rear wheels and a single oil-filled damper in front all contribute to making the Hotshot II a thoroughbred racing star.

### Easily accessible working parts

Along with keeping track dirt out, the tough monocoque chassis still allows you easy access to interior mechanics. This means that when you're at the track and need to make a quick adjustment, you can get at the working parts you need. And, this racer looks and performs like the real thing. The large rear wing for stability and the sleek, aerodynamic body styling give the Hotshot II the look of a true winner. High performance combines with easy handling to satisfy even the most discriminating RC enthusiast.

The Hotshot II comes ready to race with its own battery, trickle charger and radio (eight AA batteries required).

**Kit RB-562** (8 lbs.) ..... \$299.95



13.5 inches tall!



Wingspan: 5 feet

## Cover the roughest terrain in the ultimate all-terrain Clod Buster

SKILL LEVEL This one you've got to see to believe. One of the most exciting things to happen in radio control to date, the Clod Buster is so huge and so authentic you'll want to see it in action as it attacks the most vicious obstacles with determination.

### Mammoth tires nearly 6½" high

RC 1/10 scale cars dwarf in comparison to the Clod Buster. Set on mammoth semi-pneumatic, rubber-like tires, this monster pickup plows over the roughest terrain without a tumble, over almost any obstacle in its path. You can even climb over other vehicles with this ultimate car crusher. Power mechanics and remarkable ground clearance take the Clod Buster where you want it to go.

Sturdy and lightweight, the Clod Buster's frame is made of engineering plastics. Its highly detailed styrene resin body is finished in lifelike detail, enhanced by a custom paint job that will attract the eyes of young and old RC enthusiasts.

### Little can stop this giant

Dual 540-type monster motors can be switched to run in parallel for power climbing, or in series for endurance driving. And four wheel steering means you can navigate around fallen obstacles, park where you like and maneuver on wet or dry terrain with equal control.

The Clod Buster's rigid axle suspension incorporates eight heavy-duty coil spring damped shocks. And deep tread pattern tires are molded laterally, like the ones on real trucks and jeeps, for long life and excellent traction.

With an overall length of 19 inches, width of 14½ inches and height of 13½ inches, the Clod Buster stands at one tenth the size of a real, customized pickup.

Whether you're already a competition racer or you're just getting started in RC vehicles, the Clod Buster is a hard one to pass by. Comes complete with radio (eight AA batteries required), battery and trickle charger.

**Kit RB-565** (10 lbs.) ..... \$369.95

## Enjoy clean, quiet electric flying fun with the Kyosho Express



SKILL LEVEL Enjoy the thrill of safe electric RC flying with the Kyosho Express. The Express, as with the RC planes on the next page, includes everything you need to soar through the skies. You don't have to know which servos, radio, battery and charger are best, because we've chosen them for you. The only decision you must make is which plane to buy.

### Perfect for the beginner

An impressive 61" wingspan makes the Express a stable aircraft to fly – perfect for the beginning RC pilot. High T-tail and Eppler 178 airfoil aid in flight stability. And carefully designed wings tilt upward to increase that stability. The Express's durable construction along with a crash resistant molded plastic fuselage will survive all but the most severe landings. An extra prop is also supplied.

### Easy assembly without adhesives

Manufactured to the highest standards, the Express's parts fit together so well that no adhesives are required during assembly. In fact, the only tools you'll need for constructing your plane are ones you probably have around the house: a pair of long nose pliers, a Phillips screwdriver, a flat head screwdriver, a utility knife, and an awl or drill.

### Swift climb-out after liftoff

After takeoff, the 1/11 scale Express climbs out with unbridled power thanks to a reduction gear unit and a LeMans AP29R motor. After liftoff you'll maintain control with a Futaba Attack G, 4 channel dual stick radio and companion receiver, which use the new 20 kHz channel spacing scheme that will be required in the year 1991. Our Express package also includes two lightweight micro servos to extend flight time, the Kyosho Multi-Charger II and a 7.2V 600 mAh rechargeable battery pack with a Multi-Charger II connector. And, an auto-cutoff circuit eliminates the need for onboard receiver batteries.

**Kit RC-402** (11 lbs.) ..... \$469.95



## Take to the skies with our Cessna Cardinal package

**new**

SKILL LEVEL 1 You've just lifted off and you're climbing to two hundred feet. However, this time you're not the passenger. The stick's in your hands and you're in control. Lunge the stick forward and plummet toward the earth, or continue to climb, soaring higher and higher into the wild blue yonder.

These are just the beginning of the thrills you'll experience when you join the exciting world of electric RC flying. And, we've made it easy to experience RC flying fun by combining everything you need into our Cessna Cardinal package.

### Enough power for off-the-ground launches

Manufactured by RC industry leader Kyosho, the 1/9 scale Cessna Cardinal features a LeMans Stock 05R motor and matched prop that deliver enough power for off-the-ground launches. And, if you're a beginning RC pilot, you'll feel like a pro the first time on the field thanks to a high design 47" wing that gives the aircraft very stable flying characteristics.

When you take to the air, you'll maintain control with the included Futaba 4NBL Attack E, 4 channel dual stick radio that uses the 20 kHz channel spacing scheme you'll be required to have in 1991. Also included are two lightweight micro servos to stretch flight time, an incremental speed control so you can bring your Cardinal in under power, a 7.2V 1200 mAh rechargeable battery pack and a Kyosho 6-cell DC Power Quick Charger that's capable of 15 minute battery recovery.

### Made to survive the rough landings

Constructed to withstand the rough landings and other minor mishaps of beginner flying, the Cardinal comes with all main structural parts preassembled. In fact, you can have your plane flight-ready in just one evening. The only materials you need to supply are a Phillips screwdriver, a pair of scissors, an awl, a utility knife and some Epoxy adhesive.

**Kit RC-403** (11 lbs.) ..... \$489.95

## Learn to fly with the gas powered Trainer Hawk

SKILL LEVEL 1 If you've never experienced the excitement of RC flying, MRC's Trainer Hawk is a fine place to start. This extremely popular fuel-powered plane has been around for more than ten years. Thousands of RC enthusiasts, in fact, have learned to fly and have continued to build their skills with the Trainer Hawk, working from basic flight all the way up to the loops, barrel rolls and figure eights of more experienced fliers and more expensive, more sophisticated aircraft.

### Great flight stability

When you're ready to fly, the Trainer Hawk's steerable nosewheel lets you taxi on or off the runway. And when you're up in the air, the full four foot wingspan increases the flight stability of this high wing trainer. The Trainer Hawk responds to two or three channel radio control, for rudder, elevator and throttle. And for improved aerodynamics and realistic appearance, this popular aircraft comes equipped with scale-like wheel pants and molded tail section.

### Almost ready to fly

The Trainer Hawk comes with a .15 TV engine, fuel tank, push rods and clevises already installed so the plane is almost ready to fly when you take it out of the box. Plus, you'll find spinner, small hardware and glow plug are also included. Tools and materials required for assembly – such as screwdrivers, pliers and epoxy – are ones you already have around the house or can find in any hobby shop. A set of self-adhesive decals also comes with the plane.

Try radio controlled gas flight with this fine aircraft. It's a superior trainer for the novice *and* a reliable flier for the more experienced RC fan. The Trainer Hawk comes as a complete system, with four channel radio (12 AA batteries required) and three servos.

**Kit IF-129** (12 lbs.) ..... \$299.95

## Catch a good breeze and head out to sea with the Kyosho Fairwind sailboat

**new**

SKILL LEVEL  
Hoist the sails and head out past the breakers in the exciting Kyosho Fairwind RC sailboat. Now you can experience all the fun and challenge of navigating your own sailing ship even if you're on a dinghy budget. All you need is a body of water, a good breeze and you're ready to start your sailing adventure.

### Over 5 feet tall!

Standing a dramatic 61½ inches tall and measuring over 35 inches in length, the Fairwind boasts the classic lines of a real sailing vessel. And, the molded ABS hull cuts through the seas just like a racing yacht.

Fast and maneuverable, the Fairwind comes with an aluminum mast, nylon sails with battens for shape, decals, hardware and decorative fittings.

### Total sailing control

You'll launch the Fairwind with confidence knowing that a Futaba FP-2GS radio will keep you in touch with all onboard mechanisms. The ship's gear consists of a receiver and an S148 standard servo for rudder control. As a bonus, an FS-125 sail winch servo is supplied to give you full control over the Fairwind's sails. With this extra servo, your ship will glide through the water with the realism of a life-size sailboat, leaving boats with only rudder control far behind.

### Attractive display piece

After you leave the lake, you'll take pride in displaying your majestic Fairwind at home. The ship's striking size and handsome good looks attract attention wherever it's placed on display. You'll amaze guests when you tell them that you not only assembled the craft, but you take it out to sea on weekends.

### Almost ready to float

The Fairwind's not only fun to sail, it's fun to build as well. After only three short evenings of kit building enjoyment, your racing yacht is ready for the roughest seas. Our sailing package in-



cludes almost everything you need for assembly. The only materials you must supply are a few everyday household tools, 4 lbs. of buckshot for ballast, and epoxy and cyclocyranate adhesives. In addition, you'll need to purchase eight AA batteries for your Futaba radio and four AA batteries for the onboard receiver.

Plan your summer fun around the beautiful and graceful Fairwind. You'll be the envy of the neighborhood and the center of the beach crowd.

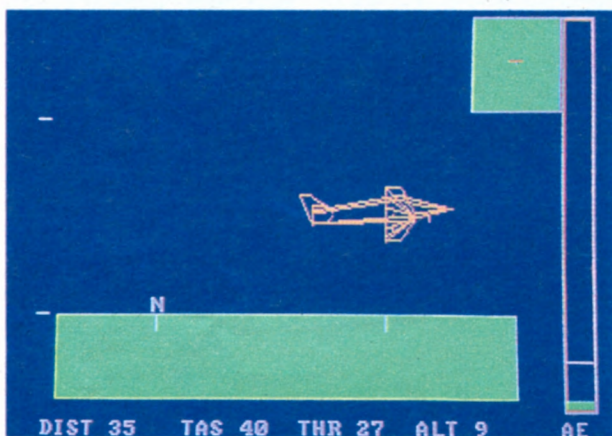
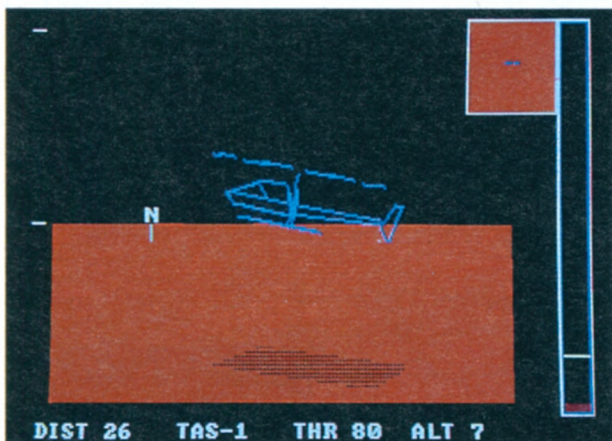
**Kit RC-301 (11 lbs.) . . . . . \$289.95**

### Our customers write...

**I** called the service department... and was connected to Matt. He's been in the Heath service department for the last 10 years or so, and he is good...I marvel at Heath's technical service department. These people know what they are doing."

Peter O'Dell  
St. James, New York





## Our new flight simulator, custom designed for Heath by Dave Brown Products

Learn on your computer what could take months of flying lessons to master. You'll save yourself time and you'll save yourself money. With this new Heath menu-driven software, which includes both aircraft and helicopter flight simulation, you'll experience real flight by just practicing on your computer screen.

As you look at the screen, you'll watch your plane as though an imaginary TV camera were pointing at it. That means, for example, that when the plane is directly above you, you'll see its belly. At the bottom of the screen, you'll have a constant read-out of the distance the plane is from you, its true air speed, its throttle setting and its altitude in feet. The simulation also includes a wind direction indicator, with wind shown relative to the craft's pilot and turning as the pilot turns.

One of the toughest parts of RC flying is judging the orientation of your aircraft, especially when lighting is poor and when the plane is far away. Another problem is getting used to the apparent reversal of controls when the plane is flying toward you. The simulation lets you experience these difficulties to the fullest, and even accentuates the orientation problem since the ground is out of sight when your craft is high in the air. And, as you're learning, the simulation shows you the dollar amount of damage right on your screen each time you crash!

Become a master flier *before* you take your plane out on the field with this exciting new simulator, custom designed for Heath by Dave Brown Products. For use with Heath/Zenith and IBM PC, XT, AT and compatibles. Comes with dual joystick controller. A gameport adapter, such as the one sold below, is required for operation.

**RC-701** (3 lbs.) ..... \$129.95

Accessory:

**Kraft Gameport Adapter**

K82-44-1 (1 lb.) ..... \$29.99



## Deluxe charger gets you back on course in minutes

For quicker charging of your RC batteries, this deluxe 12 volt DC charger will do the job in minutes. If you're a driver who insists on top performance from your RC equipment, you'll want the option of running either 7.2 volt or 8.4 volt battery packs.

With this deluxe charger, you'll get a 15 minute mechanical timer, battery clips for con-

nection to a 12V battery, a fuse-protected circuit, and a pre-installed connector for fast hook-ups with Tamiya 7.2 volt batteries. Charge your batteries in the field through your automobile cigarette lighter.

**Assembled RB-460** (1 lb.) ..... \$34.95

## Replacement batteries are reliable and economical

① For proven performance at an affordable price, the Kyosho 6-cell flat pack replacement battery uses high capacity NiCd cells, factory matched for excellent performance. A unique plate construction makes internal resistance low and discharge performance excellent. Order this battery if you purchased one of our previous RC models, the RC-101 Optima-Mid, the RC-102 Ultima or the RC-401 Valencia.

**RC-650** (1 lb.) ..... \$19.95

② The Kyosho 7-cell power battery increases voltage to 8.4 volts for maximum power. Extra high capacity NiCd cells

stand up to repeated back-to-back charge/discharge cycles without venting or loss of capacity. Order for use with the RB-554 Fox, the RB-562 Hot Shot, the RB-565 Clod Buster and the IF-167 Cessna Cardinal.

**RC-651** (1 lb.) ..... \$19.95

③ Equip your RC-402 Express electric plane with Kyosho's 7.2 volt, 600 mAh backup battery pack, for non-stop flying enjoyment, ready to go when you are.

**RC-652** (1 lb.) ..... \$29.95

## There's always something going on



Plenty of opportunities exist throughout the year for hams to get together at hamfests and conventions. You'll have a chance to participate in forums, view equipment displays and demonstrations, and enjoy the fun of flea markets and social events.

We've included here a list of major events for the rest of 1989. You're sure to find one close to home. Check the monthly listings in **QST** magazine for details, or if you have ques-

tions, contact Bernice Dunn, KA1KXQ, **QST** convention program manager, at 203-666-1541, ext. 283.

And, if you're in the neighborhood of Orlando or Dayton in April, or Dallas/Ft. Worth in June, stop in and say hi to the hams from Heath. We'll look forward to meeting you and sharing an experience or two.

### April

7-9	Orlando, FL	North Florida Section Convention
15	Flemington, NJ	ARRL Hamfest
15	Charleston, WV	ARRL Hamfest
16	Sullivan, IL	ARRL Hamfest
16	Lebanon, PA	ARRL Hamfest
16	Raleigh, NC	ARRL Hamfest
16	Southington, CT	ARRL Hamfest
22-23	Augusta, GA	ARRL Hamfest
28-30	Dayton, OH	Dayton Hamvention

### May

5-6	S. Sioux City, NE	ARRL Hamfest
7	Sterling, NJ	ARRL Hamfest
14	Medina, OH	ARRL Hamfest
19-21	Rochester, NY	Atlantic Division/NY State Convention
21	Peotone, IL	ARRL Hamfest
21	Randolph, OH	ARRL Hamfest
21	Tamaqua, PA	ARRL Hamfest
21	Wheeling, WV	ARRL Hamfest
21	Wrightstown, PA	ARRL Hamfest

### June

2-4	Dallas/Ft. Worth, TX	ARRL National Convention
2-4	Seaside, OR	ARRL Hamfest
4	Chelsea, MI	ARRL Hamfest
4	Salina, KS	ARRL Hamfest
4	Princeton, IL	ARRL Hamfest
4	Manassas, VA	ARRL Hamfest
10-12		June VHF QSO Party
11	Willow Springs, IL	ARRL Hamfest
16-17	Albany, GA	Georgia State Convention
18	Monroe, MI	ARRL Hamfest
24-25		Field Day

### July

8	Des Moines, IA	ARRL Hamfest
8-9	Indianapolis, IN	Central Division Convention
8-9		IARU HF World Championship
9	Alexander, NY	ARRL Hamfest
9	Downers Grove, IL	ARRL Hamfest
15	Union, ME	ARRL Hamfest
16	St. Charles, IL	ARRL Hamfest
16	Washington, MO	ARRL Hamfest
23	Garden Prairie, IL	ARRL Hamfest
28-30	Oklahoma City, OK	West Gulf Division Convention
29	Texas City, TX	ARRL Hamfest
30	Peotone, IL	ARRL Hamfest

### August

5-6	Cedar Rapids, IA	ARRL Hamfest
5-6		UHF Contest
6	Berryville, VA	ARRL Hamfest
12	Springfield, MO	ARRL Hamfest
19-20	Huntsville, AL	Southeastern Division Convention
19-20		10-GHz Cumulative Contest
25-27	Los Angeles, CA	Southwestern Division Convention
26-27	Saginaw, MI	Michigan State Convention
27	St. Charles, MO	ARRL Hamfest
27	Danville, IL	ARRL Hamfest

### September

9	Windsor, ME	ARRL Hamfest
9-11		September VHF QSO Party
10	Butler, PA	ARRL Hamfest
16	Wichita Falls, TX	ARRL Hamfest
16-17	Virginia Beach, VA	Virginia State Convention
17-18	Cincinnati, OH	ARRL Hamfest
23-24	Milton-Freewater, OH	ARRL Hamfest
24	Berea, OH	ARRL Hamfest

### October

8	Lima, OH	ARRL Hamfest
14-15	Memphis, TN	ARRL Hamfest
21	Brooklyn Park, MN	ARRL Hamfest
21-22		Simulated Emergency Test

### November

4	West Monroe, LA	ARRL Hamfest
4-6		November Sweepstakes, CW
10-12	Houston, TX	Texas State Convention
18-20		November Sweepstakes, phone

### December

1-3		160-Meter Contest
9-10		10-Meter Contest



**new**

## Our novice ham course now contains the latest FCC regulations

Join the world of amateur radio and communicate one-on-one with interesting people all over the world. We can get you started today with our novice ham course.

In your comprehensive study package you'll find information on how you apply to take the latest novice class license test. In addition, practice exams and a final examination give you the confidence to pass your exam the first time. And, we guarantee our course will help you earn your novice ticket or we'll refund your money.

Also in the course package you'll receive a cassette tape to assist you in learning the international Morse code and the FCC rule book to explain the latest changes. Pass the optional final exam and receive 1.0 Continuing Education Unit (CEU).

**ER-3701-B** (6 lbs.) ..... **\$44.95**

**SAVER!** Save \$15 when you buy the novice course and CW Code Oscillator shown below. Plus get a 10% certificate good for up to \$10 off any Heathkit amateur radio product.

**ERS-3701-B** (9 lbs.) ..... **\$54.90**



## Move up to general class and enjoy more operating privileges

Enjoy added general class privileges: more frequencies to operate on, radio teletype, slow scan TV, facsimile and satellite activity. An impressive list of incentives adds up to more QSOs, more QSLs and thousands of new friends.

Our general class course takes you through the material covered on the written test. Its in-depth coverage will give you more than enough information to pass either the technician or general class exam. Extra code practice teaches from zero to 15 words per minute. This gives you a two-word edge on the 13 wpm requirement. Four sample tests prepare you for the actual exam.

When you pass your general exam, send us a copy of your license or notice to receive 5.0 Continuing Education Units. We're so sure our courses provide the necessary theory and background material to prepare you for the exam that we guarantee a full refund in the event you don't pass.

**ERS-3702-C** (26 lbs.) ..... **\$64.95**



## Build up your code speed with the CW code oscillator

**SKILL LEVEL** Increase your ability to receive and transmit Morse code easily and inexpensively with the CW Code Oscillator. This handy practice oscillator features a telegraph key with adjustable rebound, built-in speaker, volume and tone controls. The CW oscillator even has a headphone jack for private listening so you won't disturb others. And once you get your amateur radio license, your unit can serve as a side tone oscillator for any transmitter using negative-grid block keying. The HD-1416-H operates on a 9V transistor battery (not included).

**Kit HD-1416-H** (1 lb.) ..... **\$24.95**



Three easy ways to shop at your nearest Heath/Zenith Computers & Electronics Center



## Amateur radio exams

Study for your amateur radio license with the exam study booklets pictured above. The booklets contain every question in the FCC pool for all elements of the exam, correct answers and distractors or "wrong" answer choices. In exams requiring a code element, study material includes a cassette tape for code practice. Bookware contains well over \$100 in discount coupons from major manufacturers, redeemable when you pass your exam.

**Novice Bookware**  
HDP-1611 (1 lb.) ..... **\$19.95**

**Technician Bookware**  
HDP-1612-T (1 lb.) ..... **\$19.95**

**General Bookware**  
HDP-1612-G (1 lb.) ..... **\$24.95**

**Advanced Bookware**  
HDP-1613 (1 lb.) ..... **\$19.95**

**Extra Bookware**  
HDP-1614 (1 lb.) ..... **\$24.95**



## Use a computer to study for your radio exams

This computer software offers the most up-to-date, FCC approved questions for all five exams, including the latest enhanced novice class. Continually updated, the software contains both a CW practice program and complete multiple choice questions from the FCC approved pool of questions used for actual exams. For use with Heath/Zenith and IBM PCs.

**Novice Software**  
HDP-1601 (1 lb.) ..... **\$39.95**

**Technician Software**  
HDP-1602-T (1 lb.) ..... **\$34.95**

**General Software**  
HDP-1602-G (1 lb.) ..... **\$34.95**

**Advanced Software**  
HDP-1603 (1 lb.) ..... **\$49.95**

**Extra Software**  
HDP-1604 (1 lb.) ..... **\$49.95**



## 100W HF all-mode transceiver with 20 memory channels

**HF Transceiver.** The SB-1400 is a feature-packed transceiver that delivers 100W of PEP output on all nine HF amateur bands, with 100kHz-30MHz general coverage reception.

An SSB/CW/AM and optional FM transceiver, the SB-1400 features dual VFOs along with 20 memory channels. These channels can store mode and skip-scan status allowing for auto resume scanning of selectable memories, controlled from the microphone up/down keys. In addition, you can store independent transmit and receive frequencies on 18 of the memories for easy recall of split-frequency operations.

Behind the SB-1400's convenient front panel layout are many standard features including narrowband (500Hz) CW and wideband (6kHz) AM IF filters, a switchable 20dB receiver attenuator, a clarifier, and a noise blanker for better reception under harsh conditions. You'll also appreciate that the transmitter power amplifier is cooled by an internal fan and is enclosed in its own diecast aluminum heat-sink chamber, which allows for full power operation of FM and Packet, RTTY, AMTOR and SSTV.

Tuning is a snap with the user-selectable coarse and fine tuning steps provided in each mode: 25 Hz and 2.5kHz for SSB and CW, 1kHz and 100Hz for AM, and 5 and 12.5kHz for FM with the optional FM Module.

**Assembled SB-1400 (9 lbs.) ..... \$799.95**

Specifications: **RECEIVER: Sensitivity:** SSB & CW: 0.25  $\mu$ V above 1.5 MHz, 0.5  $\mu$ V (500 kHz-1.5 MHz); AM: 1  $\mu$ V above 1.5 MHz; FM: (option) 0.7  $\mu$ V for 12 dB SINAD above 28 MHz. **IF Frequency:** 47.055, 8.215 MHz (and 455 kHz FM triple conversion). **Image Rejection:** >70 dB above 1.5 MHz. **IF Rejection:** >60 dB above 1.5 MHz. **Selectivity:** SSB; CW(W); AM(N), 2.2 kHz at -6 dB, 5 kHz at -60 dB; CW(N), 500 Hz at -6 dB, 1.8 kHz at -60 dB. **TRANSMITTER: Amateur Bands:** 160m, 80m, 40m, 30m, 20m, 17m, 15m, 12m and 10m. **Output:** 100W PEP (SSB, CW and optional FM), 25 watt carrier (AM). **Harmonic and Spurious Output:** Exceeds FCC requirements: **RF Connector:** SO-239 type. **Supply Voltage:** 13.5 VDC 19 amps max. @  $\pm$ 10%.

**Speaker/Power Supply.** The SBA-1400-4 is a matching speaker and power supply for your SB-1400, delivering full 20 amp output for 30 minutes on and 30 minutes off. Other features include thermally switched quiet cooling fan; high quality 3-watt, 4-ohm speaker; 13.5 VDC at 20 amps and 117 VAC, 50/60 Hz operation. UL listed.

**Assembled SBA-1400-4 (2 lbs.) ..... \$329.95**

Accessories:

**FM Module.** Add FM transceive to your SB-1400. Features triple conversion receive, 0.7  $\mu$ V sensitivity for 12 dB SINAD (>28 MHz) and 0.32  $\mu$ V squelch sensitivity.

**Assembled SBA-1400-1 (1 lb.) ..... \$44.95**

**Handheld Scanning Microphone** (pictured). Includes convenient up/down keys that scan in frequency or memory.

**Assembled SBA-1400-2 (1 lb.) ..... \$27.95**

**Mobile Bracket.** Take your SB-1400 on the road with you. Mounts above or below the dash and features quick release.

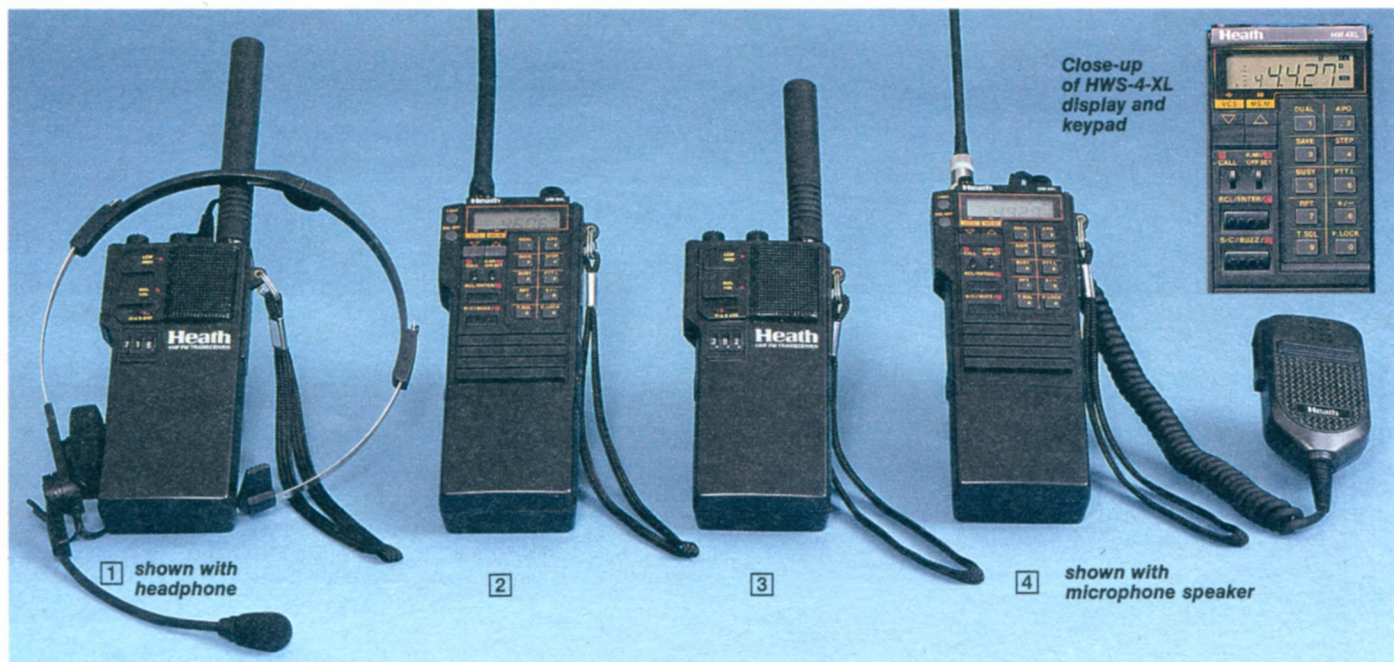
**Assembled SBA-1400-3 (1 lb.) ..... \$25.95**

**Switching Relay.** Protect your rig from transient high voltage. Use if switching voltages are greater than 150 volts or current is in excess of 1.5A. Also perfect anytime switching voltages are unknown. Features an outboard relay for non-QSK linear amplifiers. Maximum switching voltage is 250V and current limit is 2.5A.

**Assembled SBA-1400-5 (17 lbs.) ..... \$17.95**



Three easy ways to shop  
at your nearest Heath/Zenith  
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Close-up of HWS-4-XL display and keypad

1 shown with headphone

2

3

4 shown with microphone speaker

## 2 Meter and 450 MHz handheld transceivers – in standard and deluxe models

Put more fun and enjoyment into portable communications with these compact 2 Meter and 450 MHz transceivers. Besides power and easy one-handed operation, both standard and deluxe models offer many impressive features with options.

The HWS-2 2 M and HWS-4 450 MHz standard transceivers have thumbwheel tuning, hi/low power operation, squelch, repeater  $\pm$  offsets, and optional CTCSS and DTMF capabilities. The deluxe HWS-2-XL 2 M and HWS-4-XL 450 MHz transceivers include 20 channel scanning, DTMF, CTCSS encode and decode, auto power off, an easy-to-read LCD display, 100 kHz channel stepping, signal meter, RF attenuator, programmable offsets, keypad operation and battery saver. All models now include one HWA-110 rechargeable battery pack and one HWA-130 wall charger.

**Special Offer!** While they last, get a free mobile battery charger and a free mobile bracket when you purchase one of the four handheld transceivers listed below.

1 Assembled HWS-2 2 Meter Handheld Transceiver. (2 lbs.)	\$229.95
2 Assembled HWS-2-XL Deluxe 2 Meter Handheld Transceiver. (2 lbs.)	\$329.95
3 Assembled HWS-4 450 MHz Handheld Transceiver. (2 lbs.)	\$259.95
4 Assembled HWS-4-XL Deluxe 450 MHz Handheld Transceiver. (2 lbs.)	\$349.95
Accessories:	
120 VAC Wall Charger Assembled HWA-130 (1 lb.)	\$13.95
Soft Carrying Case. For HWS-2-XL and HWS-4-XL. Assembled HWA-200 (1 lb.)	\$9.95
Long Size Soft Carrying Case. For HWS-2-XL, HWS-4-XL using HWA-120 or HWA-125 battery. Assembled HWA-210 (1 lb.)	\$11.95
Soft Carrying Case. For HWS-2 and HWS-4. Assembled HWA-240 (1 lb.)	\$7.95

**CTCSS Unit.** Includes programmable dip switches for any tone frequency on the HWS-2 and HWS-4.

Assembled HWA-220 (1 lb.) . . . . . \$52.95

**Touch Tone Encoder.** Use with the remote control function on the HWS-2 or HWS-4.

Assembled HWA-230 (1 lb.) . . . . . \$29.95

Specifications: **GENERAL:** Frequency: 2/2XL: 144 – 147.995 MHz. 4: 440 – 449.995 MHz. 4XL: 438 – 449.995 MHz. **Emission Type:** FM. **Microphone Input Impedance:** 600 ohm. **Speaker Impedance:** 8 ohm. **Operating Voltage:** 2/4: 5.5 – 11 VDC. XLs: 5.5 – 16 VDC. **Antenna Impedance:** 50 ohm. **Power Supply:** 9 VDC (nom.) **Dimensions:** 2/4: 5.2" H x 2.4" W x 1.3" D. XLs: 6.3" H. **Weight:** 2/4: 14.3 ozs. XLs: 16.3 ozs. **TRANSMITTER: Output Power:** 2/4: 3 W (hi), 400 mW (lo). XLs: 5 W (hi), 400 mW (lo). **Spurious Signal:** – 60 dB. **Max. Deviation:**  $\pm$  5 kHz. **Modulation:** Reactance. **Built-in Microphone:** Electret condenser type. **RECEIVER: Sensitivity:** 0.158  $\mu$ V. **Squelch Sensitivity:** 0.1  $\mu$ V. **Circuitry:** Double conversion superheterodyne. **Selectivity:** – 60 dB. **Audio Output:** 400 mW at 8 ohms.

More accessories for all handheld transceivers:

<b>120 VAC Desktop Quick-charge Charger</b> Assembled HWA-140 (2 lbs.)	\$39.95
<b>Mobile Car Battery Adapter.</b> For charging battery during operation. Assembled HWA-160 (1 lb.)	\$42.95
<b>Microphone Speaker</b> (pictured above). Assembled HWA-180 (1 lb.)	\$34.95
<b>Headphone.</b> With push-to-talk switch (pictured above). Assembled HWA-190 (1 lb.)	\$32.95
<b>Extended Life Rechargeable NiCd Battery Pack</b> Assembled HWA-125 (1 lb.)	\$72.95
<b>Small Rechargeable NiCd Battery Pack.</b> For normal wattage output operation. Assembled HWA-110 (1 lb.)	\$49.95
<b>Large Rechargeable NiCd Battery Pack.</b> For higher wattage HWS-2-XL, HWS-4-XL and HWS-24-HT output operation only. Assembled HWA-120 (1 lb.)	\$59.95



Close-up of HWS-24-HT display and keypad

## Twin band transceiver/repeaters and dual band handheld transceiver

**1, 2 10W & 50W Twin Band Transceiver/Repeaters.** Tune up to 20 memory channels – 10 on each band – with the 10W and 50W VHF/UHF twin band transceiver/repeaters. Also set split or simplex receiver-transmitter operation for each memory channel. For repeater operation, you can memorize an offset frequency and a tone control frequency on all band channels. And, two internal VFOs allow simultaneous monitoring of one channel on each band.

Frequency response\* is an impressive 144-147.995 MHz on VHF and 438-449.995 MHz on UHF. You also get full duplex operation when you use both the VHF and UHF bands. In addition a key lock switch locks the microphone's up/down scan buttons to prevent accidental entry.

Both the HW-24 and HW-24-H include an exclusive automatic repeater function. Just set your cross band frequencies (including repeater offset) for each band and enter the repeater mode – with or without hang tail. Use as an emergency repeater or remote link, or use two units placed apart as a permanent repeater (no cavities) linked on UHF. Even use in your car as a relay between your UHF HT and a VHF repeater that you would not normally be able to access with just an HT.

**Assembled HW-24 10W Twin Band (7 lbs.) . . . . . \$739.95**

**Assembled HW-24-H 50W Twin Band (7 lbs.) . . . . . \$839.95**

**3 5W Dual Band Handheld Transceiver.** The HWS-24-HT VHF/UHF Dual Band HT gives you powerful capabilities in a compact size. It shares both the memory channel and duplex functions of the HW-24 and HW-24-H. Enter frequencies directly from the keyboard or via a rotary channel switch. Internal dual watch allows the transceiver to survey the selected frequency and the frequency stored in memory address #1 or any other memory frequency. Alternately, internal dual watch can survey the selected frequency and each memory frequency in sequence.

The HWS-24-HT delivers an extremely wide frequency response\* – 144-147.995 MHz on VHF and 438-449.995 MHz

on UHF. The unit also has a very sensitive receiver section at .15  $\mu$ V for 12 dB SINAD within amateur bands. You can receive 130-169.995 MHz on VHF and 360-469.995 MHz on UHF (except 400-418 MHz). Performance curves are available for out of band operation.

On the 22 memory channels you can scan only favorite memory channels, all channels, between two frequencies, within a band or you can search for a vacant channel. In addition, CTCSS decode as well as encode permits open squelch operation for maximum sensitivity.

Other features include full duplex operation for repeaters with full duplex autopatch, 9-step programmable battery saver, full 16-key DTMF keypad, backlit multi-function LCD display, one button open squelch, auto power off to reduce battery drain and PTT lockout prevents inadvertent operation.

**Assembled HWS-24-HT 5W Dual Band Handheld Transceiver.** Includes rechargeable battery, power cube and extra empty battery shell. (4 lbs.) . . . . . **\$489.95**

Accessories:

**Soft Carrying Case.** For the HWS-24-HT using the HWA-110 battery. Assembled HWA-250 (1 lb.) . . . . . **\$16.95**

**Large Soft Carrying Case.** For the HWS-24-HT using the HWA-120 or HWA-125 battery. Assembled HWA-260 (1 lb.) . . . . . **\$19.95**

SEE "MORE ACCESSORIES" ON PAGE 38.

Specifications for HW-24, HW-24-H and HWS-24-HT: **Frequency Range\*:** VHF: 144.000 to 147.995 MHz. UHF: 438.000 to 449.995 MHz. **Modulation Type:** F3. **Microphone Input Impedance:** 600 $\sim$ . **Speaker Impedance:** 8 $\sim$ . **Antenna Impedance:** 50 $\sim$ . **Input Voltage:** 12 to 16 volts DC (5.5 to 16 volts DC on the HT). **Operational Temperature Range:** -4°F to +140°F. **Antenna Connector:** SO-239 type (BNC type on the HT). **Memory Channels:** 10 per band, VHF and UHF. **Scanning:** 1MHz segment, all band, all memory channels, or selected memory channels. **Tone Squelch:** Simplex/Duplex; user selected. **Automatic Repeater:** VHF to UHF, or UHF to VHF.

\*May be modified for out-of-amateur-band operation for MARS, CAP and embassy operators. Contact Heath Customer Service for full information. Proof of participation required.



## Heathkit deluxe QRP CW transceiver

**SKILL LEVEL 3** The Heathkit HW-9 is a compact 80 through 10 meter HF transceiver created with the avid low-power CW operator in mind. Designed to cover the lower 250 kHz of the 80, 40, 20 and 15 meter amateur bands, the HW-9 can also cover the 30, 17 and 12 meter WARC bands and the lower 250 kHz of the 10 meter band with the optional HWA-9 Band Pack.

Utilizing broadband design, the HW-9 eliminates the need to tune circuits within a band. Just turn the band switch and select the desired frequency. The wide-band front-end uses a double-balanced mixer and 4-pole crystal filter to handle wide dynamic range signals with ease and to eliminate the customary RF amplifier in the receiver section.

The HW-9 uses a single conversion in the main signal path to reduce spurious responses and to maintain superior image rejection. In addition, a balanced product detector followed by an active audio filter provide outstanding performance. And, Receiver Incremental Tuning (RIT) lets you tune the receiver 1 kHz above or below the transmit frequency.

Microelectronic circuits reduce transceiver weight, while providing a level of performance and features unexpected at this price. Features include

continuously variable RF power output up to four watts, front panel relative signal/power strength meter and AGC circuits.

Rugged and lightweight, the HW-9 is ideal for portable operation. You can supply power to your HW-9 with batteries, lighter socket, solar photovoltaic array or by 120 VAC with the optional PSA-9 Power Supply. Dimensions are 4 1/4" H x 9 1/4" W x 8 1/2" D.

**Kit HW-9** (8 lbs.) ..... \$249.95

**Accessories:**  
**Band Pack.** Expands the transmission and reception capabilities of your HW-9 Transceiver from four to eight amateur bands. Provides full coverage on all the amateur bands from 80 through 10 meters. Kit HWA-9 (1 lb.) ..... \$44.95

**Power Supply.** 12.6-volt, 1-ampere, voltage regulated power source. Kit PSA-9 (4 lbs.) ..... \$39.95

**Specifications:** **TRANSMITTER: RF Output Power:** 4 watts, except 3 watts on 10 meters. **Transmitter Frequency Offset:** App. 700 Hz. **Antenna Load Impedance:** At least 90% of rated power with less than 2:1 SWR. Protected against high SWR. **Harmonic & Spurious Radiation:** -35 dB & -40 dB maximum, at rated output. **T/R Operation:** CW, full break-in. **RECEIVER: Sensitivity:** 0.2  $\mu$ V for readable signal; 0.5  $\mu$ V or less for 10 dB S+N/N. **Selectivity:** Wide, 1 kHz max. @ 6 dB; Narrow, 250 Hz @ 6 dB. **Dynamic Range:** 85 dB. **Image & IF Rejection:** 60 dB, min. **Audio Hum Noise:** -60 dB. **Audio Output:** 1 watt into 8 $\Omega$ .



## Companion station speaker to HW-9

**SKILL LEVEL 1** The Heathkit Station Speaker is a 3" communications receiver speaker housed in a custom designed cabinet to match the HW-9 QRP transceiver. The 8-ohm speaker has a frequency response of 200 to 5000 Hz and can handle 1.5 watts RMS. Dimensions are 8" H x 4 1/2" W x 6 3/4" D.

**Kit SP-99** (3 lbs.) ..... \$29.95



## Accurate QRP wattmeter

**SKILL LEVEL 1** Your low-watt HF or VHF station will operate at peak power efficiency when you're using the responsive HM-9 Wattmeter. A reliable instrument for measuring RF power output and the SWR of an amateur radio station, the HM-9 with 3:1 SWR bridge simplifies continuous metering of exciter or amplified output level. Plus it gives you quick, exact SWR readout for fine-tuning your antenna system. Wire the HM-9 for monitoring in three different ranges: 1.8-30, 50-54 or 144-148 MHz. Full scale ranges from 0-5 watts and 0-50 watts with exceptional  $\pm 10\%$  accuracy! Reads SWR from 1.1:1 to 3:1. Dimensions are 2 5/8" H x 5 3/8" W x 7" D.

**Kit HM-9** (3 lbs.) ..... \$59.95

## 100-watt antenna tuner with 4:1 balun

**SKILL LEVEL 2** You can have almost unlimited matching capabilities with the HFT-9-A. It provides matching to a wide range of output impedances with a built-in 4:1 ferrite balun. The HFT-9-A includes connectors for coaxial feed, balanced line and long-wire antennas. A large 12-tap, air-wound inductor, with silver-plated wire and tap switch, allows precise matching capability between 1.8 and 30 MHz. Adjustments are easy with continuously variable transmitter/antenna controls. The HFT-9-A's small size and easy assembly make it perfect for mobile HF operation and an outstanding addition to any amateur radio station.

Dimensions are 2 5/8" H x 5 3/8" W x 7" D. **Kit HFT-9-A** (3 lbs.) ..... \$59.95

**SAVER!** Purchase the matching HM-9 QRP Wattmeter and the HFT-9-A Antenna Tuner together and save. Separate prices total \$119.90.

**QRS-9** (14 lbs.) . System Price \$109.95



## Multi-mode operation with single unit TNC

The Heathkit PackKit multi-mode TNC gives you the latest in packet radio and takes the trouble out of getting on RTTY. It lets you work CW at speeds you never dreamed of and gets you on AMTOR and ASCII. With the addition of a graphics printer, you can even print weather facsimile pictures.

Computer technology combines with amateur radio so you can explore packet radio and all its applications, plus additional modes. Connect both your HF and VHF rigs at the same time and with the push of a button, switch between VHF packet and copying a WIAW RTTY bulletin on 40 meters. Work packet in both HF (300 baud) and VHF (up to 9600 baud). Above 1200 baud requires an external modem.

### Automatic baud rate and mode configuration

A unique *signal* command causes PackKit to determine correct RTTY, ASCII or AMTOR mode for the signal you're listening to and presets baud rate and mode. It even inverts the signal if necessary. All you have to do is type *OK*. Use the *opmode* command to display full details of your current operating mode without having to change mode. And, front panel LEDs clearly indicate your present mode and system status for more efficient and simple operation.

The unit supports all common baud rates for Baudot RTTY and ASCII, and CW from 5 to 99 WPM. Radio link rates are supported to 1200 baud (9600 with external modem) and computer data rates to 9600 baud. What's more, no special software is needed. Use with any modem communication package made to run on your computer or order Ham-Pak software (below). You can use the HK-232 with computers or terminals using an RS-232 industry standard serial port.

### Extensive features for greater flexibility

PackKit has all the features demanded by active amateur radio operators. For flexibility, two independent, selectable rear-panel connection ports provide interchangeable HF or VHF operation. All you need to do is connect your radio's PTT line, speaker output and microphone input. The same connections work for all other modes, too — even CW. Another high-performance feature, answer-back memory, permits auto-answer with message in both packet and RTTY. It automatically responds to WRU requests with your station ID and system status. And, for easy HF tune-up, the PackKit TNC features a built-in front panel bar graph indicator.

Includes operational manual with hookup connections for most popular HF and VHF radios. Operates on 12 VDC at 750 mA with 10% ripple or less. 2½" H x 8¼" W x 11" D.

**Kit HK-232** (5 lbs.) ..... \$279.95

**SAVER!** Save \$15 when you order the HK-232 TNC and the Technical Manual (sold below). HKS-232 (7 lbs.) ... \$289.90

Accessories:

**Ham-Pak Communications Software Program.** Use with Heath/Zenith, IBM PCs and compatibles.

HKA-232-2 (1 lb.) ..... \$19.95

**Technical Manual.** Comprehensive manual includes alignment, trouble-shooting — with over 80 waveforms, circuit board layout and detailed circuit description.

HKA-232-3 (2 lbs.) ..... \$24.95

**Power Supply 12V DC 1 Amp**

Assembled HKA-232-4 (2 lbs.) ..... \$19.95



## Pocket packet TNC

Packet radio is the fastest-growing segment of amateur radio today. With Heath's Pocket Packet TNC you get the latest and smallest TNC available, and it's TNC-2 compatible.

If your handheld transceiver, like most, uses a mini phone jack for speaker output and a sub-mini for microphone, in about 20 seconds you can connect your transceiver to the pocket packet unit at any time with the two shielded cables supplied. To connect the unit to your base or mobile (VHF or UHF) transceiver, another cable is also supplied. Once you've wired it into the microphone input, speaker output and transceiver keying line, hookup takes only seconds.

The HK-21 even includes a built-in mini bulletin board so you and your friends can leave messages for each other right on the system. They access your station with a *connect* request and automatically get a sign-on message welcoming them to your bulletin board (it uses your call!). Bulletin board commands include the following: *W(rite)* writes a message to a specific call; *R(ead)* reads a message sent to your call; *F(iles)* lists the last 10 — or all — messages in the system, plus the date each message was left; *M(ine)* lists only messages left for you. Additional commands are *H(elp)* or *?*, which lists all commands and their functions, plus instructions on how to write a message, *K(ill)* which kills a message addressed to you, and *B(ye)* which disconnects you from the bulletin board and also automatically disconnects your packet station from the mini BBS. The same commands work for you so you can leave messages for other stations.

The HK-21 requires a 9 to 13.8V supply @ 40 mA nominal current. Front panel switches disable RS-232 and turn off LEDs for maximum power savings when used as a remote site digi. You can connect it to your station 12 volt supply or order PS-2350 120 VAC Battery Eliminator.

The optional HKA-21-1 battery pack fits inside the unit, powering it for hours. And it recharges from the 12 volt DC jack on the pocket packet unit. Pocket Packet TNC comes with an industry-recognized Heathkit manual.

**Assembled HK-21** (2 lbs.) ..... \$219.95

Accessories:

**Optional Battery Pack Assembled HKA-21-1** (1 lb.) . \$17.95

**Battery Eliminator Assembled PS-2350** (1 lb.) ..... \$7.95





## You'll be a great listener with this shortwave synthesized receiver

Designed specifically for the avid shortwave listener, the SW-7800 covers 150 kHz through 30 MHz continuously in 30 overlapping 1 MHz bands. Broadband front-end circuits mean you don't have to tune circuits within a band. The wide-band front-end stages eliminate the usual RF amplifier so the receiver can easily handle incoming signals within a wide dynamic range. Excellent image rejection is provided by an up-converting, double-conversion mixing design.

Other features you'll appreciate include AGC time constant switch, muting provision to allow operation with a transmitter,

local/DX switch to protect against overload from very strong local stations, front panel jack for taping receiver material — unaffected by volume control setting and telescoping whip antenna for local reception and portable operation. Mobile operation is possible using any 11 to 15 volt DC source at 3/4 amp. Only a VTVM is required for receiver alignment. Dimensions are 4 7/8" H x 11 1/2" W x 10 1/2" D.

**Kit SW-7800** (12 lbs.) ..... **\$299.95**

Accessory:

**High-Performance Trapped Dipole Antenna.** Use with any general coverage or shortwave receiver. Eight high-Q parallel-tuned traps reduce length and isolate various segments of the antenna for full coverage of 11, 13, 16, 19, 25, 31, 41, 49 and 60 meter bands. See picture on page 46.

**Assembled HDP-7800** (3 lbs.) ..... **\$64.95**

Specifications: **Readout Accuracy:** Nearest 1 kHz. **Frequency Control:** Synthesized (PLL and LC VFO). **Modes:** USB, LSB, CW and AM (wide or narrow). **Sensitivity:** SSB/CW, less than 0.35  $\mu$ V for 10 dB (S + N)/N; AM, less than 2.5  $\mu$ V for 10 dB (S + N)/N. **Selectivity:** SSB/CW, 2.5 kHz min. at 6 dB; AM, 5.5 kHz min. at 6 dB. **Selectivity Shape Factor:** 1.5 at 6/50 dB. **Image Rejection:** 55 dB min. **OTHER: Antenna:** Built-in telescoping whip. Connection for 50 ohm, unbalanced, external antenna (SO239) and high-impedance wire. **Audio Output:** Internal speaker, jack for headphone or external speaker. **Muting:** External jack for use with transmitter. **Recorder Output:** Miniature phone jack. **Power:** 120 VAC, internally; 13.8 VDC at 3/4-ampere, externally.



## Antenna noise bridge

Reveal the cause of any mismatch between station transmitter and antenna with the Heathkit Antenna Noise Bridge. A tone-modulated broadband noise signal is generated in the bridge and coupled to an impedance bridge. Then, using your station receiver as an indicator, the impedance bridge measures the resistive and reactive components of your antennas. Use the noise bridge also to preset an antenna tuner for faster tune-ups, tune a quarter-wave transmission line and measure the value of unknown capacitors and inductors. Front panel LED indicates power on, front panel controls give direct readout of resistive and reactive characteristics of the antenna being tested. Rear panel includes external power jack and coaxial connectors for receiver and unknown antenna connections. Requires 9V battery or PS-2350 Battery Eliminator, listed at right. 2 1/4" H x 5 1/8" W x 5" D.

**Kit HD-1422-A** (2 lbs.) ..... **\$49.95**

Specifications: **Resistance:** approx. 0-200  $\Omega$ . **Capacitance:**  $\pm$  60 pF. **Operating Range:** 1-30 MHz.



## Active SWL antenna

Perfect for portable use or locations where an outside antenna is not available, the Heathkit Active SWL Antenna allows you to receive radio signals from 300 kHz to 30 MHz. And it acts as a high frequency preamplifier when used with an external 50 ohm antenna. You can also use the HD-1424 as a preselector for both indoor and outdoor antennas. It has a built-in collapsible antenna and provisions for a 50 ohm antenna. Requires 9V battery or PS-2350 Battery Eliminator. 2 1/4" H x 5 1/8" W x 5" D.

**Kit HD-1424-A** (5 lbs.) ..... **\$59.95**

Accessory:

**Battery Eliminator**  
PS-2350 (1 lb.) ..... **\$7.95**



Three easy ways to shop at your nearest Heath/Zenith Computers & Electronics Center



## VLF converter

Listen to the U.S. Submarine Fleet, European broadcasts and other distant transmissions below the standard AM band. The VLF Converter installs in your receiver antenna line to let you listen to the 10 to 500 kHz band from 3.510 to 4.010 MHz on your CW receiver. The converter contains a local oscillator generating a 3.5 MHz signal that, when mixed with the incoming VLF frequencies on your antenna, produces an RF signal that can be heard on any CW receiver capable of tuning 3.510 to 4.010 MHz. Requires 9V battery, PS-2350 Battery Eliminator, listed at left, or any source of DC power, 8.5 to 14 volts. The VLF Converter measures only 5 1/8" H x 5 1/8" W x 2 1/4" D.

**Kit HD-1420** (2 lbs.) ..... **\$49.95**





## Revolutionize your CW with the programmable $\mu$ matic memory keyer

SKILL LEVEL Add programmable excellence to all your CW. Patented command strings let you store text in buffers; select speed, weight, spacing or message repeat count for each; and link them together in any sequence. A special editing feature lets you correct programming errors. Enter text and send with any setting you wish. Text can be added into a buffer message being sent. CMOS memory with battery backup retains the buffer contents and last selected setting when the keyer is without power. 1 5/8" H x 4 1/8" W x 6" D.

**Kit SA-5010-A** (3 lbs.) ..... **\$129.95**

Accessory:

**120 VAC Power Adapter Cube**

Assembled PS-5012 (1 lb.) ..... **\$15.95**

Specifications: **Speed Range:** 1 to 99 wpm. **Character/Word Spacing:** Less than or equal to speed setting. **Number of Buffers:** 1 to 10. **Buffer Size:** 240 characters plus commands. **Weighting:** Normal plus 5 light and 5 heavy settings. **Auto Message Repeat:** 0 to 9 (sent 1 to 10 times). **Keyer Output:** Solid state: +250 volts @ 100 mA; -200 volts @ 40 mA. **Sidetone:** Approximately 300 to 1500 Hz, adjustable. **Power:** External transformer (optional) or 11 to 16 VDC @ 200 mA.

### Our customers write...

**"I** received the active audio filter I had ordered within 5 days. I was impressed with the clarity of the manual and the ease of assembly. It worked great the first time. In fact, I was so pleased that I ordered another item from the online store. Thanks!"

Joseph Bly  
Denver, Colorado

## Deluxe antenna tuner

SKILL LEVEL Use the Deluxe Antenna Tuner to match an antenna to your transmitter at any frequency in the 160-10 meter HF spectrum. You get all the features of a first-rate antenna tuner combined with most of the features of a dual wattmeter. In addition, it covers the 160-Meter and WARC amateur bands.

The tuner will effectively tune and match balanced or unbalanced feedlines and single-wire and ladder lines at the full legal power limit of your station. With its continuously variable inductor, you are assured of precise antenna matching from 1.8 to 30 MHz, including the MARS frequencies and all the newly allocated bands. A convenient front panel counter enables you to quickly set the inductor to previously calibrated frequencies.

With a single switch you can select a dummy load or any of three permanently connected antennas, including a long-wire antenna. There's no need to connect and disconnect feed lines to load your transmitter into the dummy load.

Dual wattmeters read both forward and reflected average power, in two ranges, for more efficient low band operation. The wattmeter section of the antenna tuner installs directly into your transmission line to measure the power on all frequencies between 1.8 and 30 MHz. It measures output up to 200/2000 watts in the forward direction and up to 50/500 watts reflected. Dual meters indicate the forward and reflected power separately with a high degree of accuracy. A factory aligned and



calibrated sensor head ensures that you get the highest accuracy measurement. SWR indications on the reflected meter provide direct readings from 1:1 to 3:1.

The silver-plated straps and roller contact assembly minimize RF loss at high frequencies. And the large feed-through insulators withstand high-voltage RF. The antenna tuner handles power inputs up to 2000 watts PEP on SSB and 1000 watts CW. With its factory-calibrated components, easy-to-read dual wattmeters and front panel controls, the Deluxe Antenna Tuner is an indispensable addition to your system. Dimensions are 5 3/4" H x 14 1/2" W x 13 7/8" D.

**Kit SA-2060-A** (20 lbs.) .... **\$399.95**

Specifications: **Frequency Range** (continuous tuning): 1.8 to 30 MHz. **INPUT POWER CAPABILITY:** SSB: 2000 watts (peak). CW: 1000 watts. **Input Impedance:** 50 ohms. **Output Impedance:** Wide range. **Balanced to Unbalanced Transformation:** 4:1 balun. **Meter Functions:** Forward and Reflected average power, and SWR. **METER RANGES: Forward** (2 ranges): Low - 0-200 watts. High - 0-2000 watts. **Reflected** (3 scales): Low - 0-50 watts. High - 0-500 watts. SWR - 1:1 to 3:1. **WATT-METER ACCURACY** (full scale): **200 W and 2000 W (FWD), 500 W (REF):**  $\pm 5\%$  (AVG). **50 W (REF):**  $\pm 7.5\%$  (AVG). **Insertion SWR:** Less than 1.1:1.

## Multi-mode SSB/CW/RTTY active audio filter makes the tough ones easy to copy

SKILL LEVEL Solve overmodulation splatter, partially overlapped sideband signals and more with the Heathkit Active Audio Filter. The HD-1418 consists of five-pole (section) high-pass and low-pass filters, plus a two-pole notch/peak filter. You can move these filters through a 300 to 2500 Hz audio frequency band to help you select or reject certain frequency components of signals you tune in with your shortwave equipment. Versatile



power requirements make the Active Audio Filter usable almost anywhere. Just supply 7-13.5 volts AC or 9-18 volts DC. Dimensions are 1 7/8" H x 8 7/8" W x 6 5/8" D.

**Kit HD-1418** (3 lbs.) ..... **\$89.95**

Accessory:

**120 VAC Power Adapter Cube**

Assembled PS-5012 (1 lb.) ..... **\$15.95**

## 1.6-250 MHz dip meter



Use the multi-purpose Dip Meter to find approximate resonant and operating frequencies of either energized or de-energized circuits. The HD-1250 helps adjust traps, detect parasitic oscillations and harmonics, measure unknown Q/L/C values, locate sources and frequencies of RF energy. Use too as a signal generator, relative field strength meter or receiver alignment tool. Requires 9V battery. 2" H x 2 1/4" W x 5 7/8" D.  
**Kit HD-1250 (4 lbs.) . . . . . \$129.95**

Specifications: **Controls:** Tuning capacitor, oscillator level, ON/OFF **Meter Movement:** 150  $\mu$ A. **Solid-State Circuits:** 1 NPN transistor oscillator, 1 dual-gate MOSFET amplifier, 2 diffused silicon hot carrier diode detectors.

## Coaxial-switch

Manually route one RF source to any one of several antennas or loads, while grounding all outputs not in use. Switch from up to four antennas or interconnecting equipment. Handles 2 kW PEP with maximum 1.1:1 SWR to 250 MHz. Built-in mounting brackets. Mount width: 4 1/4".  
**Kit HD-1234 (1 lb.) . . . . . \$29.95**



## Dual HF wattmeter

Achieve peak efficiency on low bands. The HM-2140-A monitors both forward and reflected power in your transmission line. A second scale on the reflected meter reads SWR directly from 1:1 to 3:1. Output is measured up to 200/2000 watts PEP ( $\pm 5\%$ ) forward direction and up to 50/500 watts reflected. Pushbutton switch to high or low power ranges for precise readings. Dual-position switch lets you read PEP or average power. Requires 9V battery or use 120 VAC with the PS-2350 Battery Eliminator. 4 1/8" H x 7 1/2" W x 6 3/8" D.  
**Kit HM-2140-A (5 lbs.) . . . . . \$129.95**



Accessory:  
**Battery Eliminator**  
 Assembled PS-2350 (1 lb.) . . . . . \$7.95



## This outlet box is smart

Flip on your transceiver and your whole system powers up. The Smart Outlet Box turns on six other units when the unit plugged into its control socket goes on. Our highest quality. Offers surge protection, noise filtering. 2 1/4" H x 14 1/4" W x 2 3/4" D. 10A capacity.  
**Kit GD-1495 (5 lbs.) . . . . . \$59.95**



## Quiet headphones

Comfortable 8-ohm headphones feature 40 to 15,000 Hz frequency range, 2 1/4" speakers, individual volume controls and 10' cord.  
**Assembled HDP-1396**  
 (2 lbs.) . . . . . \$14.95

## Our customers write...

*"Shortly after getting my first Sham license in 1949, I purchased a Heathkit Handitester model M-1. ... The unit has performed magnificently ever since in spite of brutal service. ... Speaking from 30 years as an electronic engineer, it has to be the most solidly designed piece of electronic equipment I can recall."*

Charles W. Lobb  
 Lomita, California

## Remote coax switch

Switch antennas from inside your station with the Remote Coax Switch.



Remote and indoor control unit connect through your coax cable to eliminate multiconductor control cable. Tower- or mast-mounted remote operates up to four antennas. Handles 2000 watts PEP and has a VSWR of 1.15: or less. Frequency range is from 1.8 to 54 MHz with impedance of 50 to 70 ohms and loss at 54 MHz of less than 0.2 dB. Uses 120 VAC. Control: 2 5/8" H x 5 1/2" W x 7 1/2" D. Remote: 7 1/8" H x 8 3/8" W x 4 1/2" D.  
**Kit HD-1481 (5 lbs.) . . . . . \$79.95**



## Get remote control with decoder

Hear only messages meant for you—not extraneous monitor racket. Connect the Touch Tone Decoder in series with your receiver or scanner speaker. Turn it on and it mutes the speaker until it detects the unique DTMF code you've programmed. Use also for operation of single functions in the control of a repeater, or as a secondary control link for autopatch on/off. You can preset the open line time for up to eight minutes or enter a two-digit code to open and close the line at will. Requires 7.5-11 VAC, 11-16 VDC or PS-5012, below.

**Kit HD-1530 (2 lbs.) . . . . . \$79.95**  
 Accessory:

**120 VAC Power Adapter**  
 Assembled PS-5012 (1 lb.) . . . . . \$15.95



## Low pass filter

Solve emissive RF interference problems with this low-pass Barker & Williamson filter for 160-10 meters. Minimum 70 dB attenuation. Cut-off frequency of 34 MHz, less than 0.3 dB insertion loss. 50 ohm impedance. Rated for legal power.

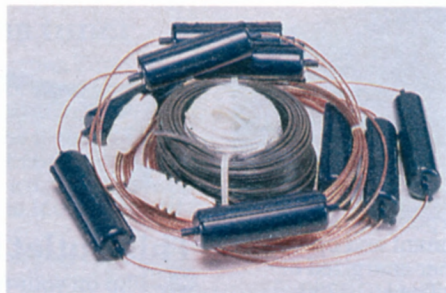
**Assembled HDP-3700**  
 (2 lbs.) . . . . . \$36.95



## Fixed station microphone

Shure's CONTROLLED MAGNETIC Fixed Station Microphone is designed with amateur radio features. It offers dual selectable output impedance and frequency response tailored for intelligibility. Normal or VOX operation. Push-to-talk switch bar.

**Assembled HDP-444**  
(3 lbs.) ..... \$64.95



## SWL antenna

This specially designed short wave listening antenna comes completely assembled and ready to use. Sturdy 14-gauge HDP-7800 antenna covers 60-49-41-31-25-19-13-11 meters. A high performance trapped dipole with an overall length of less than 43 feet.

**Assembled HDP-7800** (3 lbs.) ..... \$64.95

## World-famous HAM-IV and Tailtwister rotators

For an antenna array of up to 15 sq. ft. wind load area, the HDP-1487 features bell rotator design, dual 98 ball bearing race, machine steel ring and ring drive gear system.

The HDP-1488 handles antennas with wind load areas of up to 20 sq. ft. Features thickwall castings, 138 ball bearings and triple bearing race. Maximum mast size for both is 2 1/16."

**Assembled HDP-1487**  
HAM-IV (24 lbs.) ..... \$299.95

**Assembled HDP-1488**  
Tailtwister (28 lbs.) ..... \$369.95



## Heath cantenna dummy load

Eliminate unnecessary QRM during tune-up and minimize mistakes while performing hot gear maintenance or alignment. Handles 1 kW of RF with VSWRs less than 1.5:1 up to 450 MHz. Requires 1 gallon mineral or transformer oil.

**Kit HN-31-A** (3 lbs.) ... \$24.95

## High-quality amateur radio antennas from Heath

Model No.	HA-2513	HDP-1482	HDP-1483	HDP-1484	HDP-1485	HDP-1486	HDP-1472	HDP-1474
Bands (meters)	6, 2, 220, 450, 902, 1296	2	10	80-10	20, 15, 10	20, 15, 10	2	2
Maximum Gain (dB)	0	3	12	—	9.6	8.8	3	3
Bandwidth @ 2:1 VSWR (MHz)	50-1,300	7	1.5	—	—	—	2	4+
Front-to-Back Ratio (dB)	—	—	34	—	34	27	—	—
Elements	—	2	5	—	7	4	1	1
Max. Wind Survival (MPH)	—	100	100	80	100	100	—	—
Surface Area (sq. ft.)	—	.67	3.9	—	9.4	7.5	—	—
Length (ft.) (Beams = Boom Length)	5 1/2	—	24	25	24	14	4 1/2	2 3/4
Turning Radius (ft.)	—	—	15	—	20	17 1/4	—	—
Boom Diameter (in.)	2	—	2	1 1/8	2	2	—	—
Weight (lbs.)	6	4	29	12	82	50	3	2
Price	\$79.95	\$69.95	\$199.95	\$159.95	\$649.95	\$439.95	\$29.95	\$42.95
Antenna								

Storage tray

4" long nose pliers

Diagonal cutters

Wire strippers

Interchangeable tips



4 oz. rosin core solder

1/4" nut driver

Slotted screwdriver

Phillips screwdriver

Soldering aid tool

20-watt soldering iron

## Electronic tool kit with carrying case

This is a perfect starter selection of tools for the beginning kit builder. Included are a Weller 20-watt soldering iron with two interchangeable tips, a soldering aid, a 4 ounce spool of solder, wire strippers, diagonal cutters, 4" needle nose pliers, 1/4" nut driver, and a slotted and Phillips screwdriver. These tools are contained in a durable 3" H x 10 3/4" W x 10" D carrying case with a built-in carrying handle. All tools are stored in a molded storage tray.

Assembled GHP-1270 (2 lbs.) ..... \$42.95

## Weller temperature-controlled soldering station



This lightweight soldering pencil features low voltage, 700°F closed loop temperature control for steady and fast soldering and a component-protecting grounded tip. Detachable stand contains a water reservoir.

Assembled GDP-1108 (5 lbs.) ... \$89.95

Accessory:

5 Assorted Tips GDP-1109 (1 lb.) \$17.95

## Precision LUXO magnifier lamp



See the most minute details with the famous LUXO magnifier lamp – even those hard-to-see soldering connections. A precision-ground 2 to 1 magnifier provides a wide, distortion-free view of a circuit board through a polished 5" lens. And, an energy-conserving 22-watt circular fluorescent bulb provides uniform and shadowless lighting, moves at a touch and stays where you put it. Arms have 45" total reach. Includes clamp-type mounting bracket. 120 VAC, UL approved.




Assembled GDP-200 (7 lbs.) ..... \$89.95



## Ungar 25 watt 700°F soldering iron

Ungar irons combine economy with performance for all types of home and work jobs. This 4-ounce unit is ideal for electronics, radio, hobbies and delicate repairs. Its replaceable tip design accommodates the variety of accessory tips shown below. And the heat-resistant handle is molded for comfortable handling. UL listed. Iron holder included.

Assembled GDP-3125 (1 lb.) ..... \$12.99

	(2) pencil
	(2) small chisel
	(2) long taper chisel

## Replacement tips

2 pencil tips, 2 small chisel tips, 2 long taper chisel tips.

GDP-3100 (1 lb.) ..... \$8.95



## Ungar 40 watt 900°F soldering iron

This tool is essential for every work bench and tool kit. Balanced and cool-to-the-grip, this 40 watt soldering iron is the one you'll use for bigger electrical repair, electronics, hobby and kit assembly jobs. The GDP-3140 features a replaceable tip design to accommodate the variety of tips described above. UL listed, the GDP-3140 comes with its own holder.

Assembled GDP-3140 (1 lb.) ..... \$17.95



## Smart outlet box

Simply plug the AC line cord from the computer into the control outlet of this easy one-evening Smart Outlet kit. Plug the printer into one of the remaining six switched outlets. Power up the computer, the printer comes on automatically. Surge protection, 10A capacity.

Kit GD-1495 (5 lbs.) ..... \$59.95

## Headband magnifier

This comfortably fitting magnifier with adjustable headband frees both your hands for work. Shatter and scratch resistant lenses magnify 2 1/2 times. Works well with eyeglasses.



Assembled GDP-201 (1 lb.) ..... \$24.95

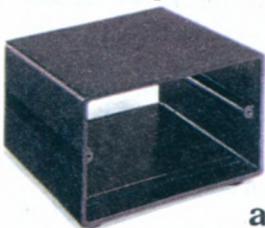


## Starter kits manual teaches principles of electronics

Turn starter kits into learning tools with a Starter Kits Educational Manual. With this manual, you'll learn the electronic principles used in all the SK-100 series starter kits. Each kit is covered in a separate lesson so no particular sequence is required — you decide which kit to build. Lessons include an introduction and learning objectives, with topics broken down into small units to make studying easier. A test at the end of each lesson gives you a chance to check what you've learned.

**SK-100** (2 lbs.) ..... **\$10.00**

**SAVER!** Buy any two SK-100 series starter kits (SK-100 through SK-111) and get the SK-100 manual FREE. Just write SK-100 on the order form and "no charge" in the price column.



## Cabinet for the audio amp and synthesizer

**SKILL LEVEL** Finish up your SK-104-H Audio Amplifier or SK-107 Stereo Synthesizer with this handsome black cabinet.

**Kit SK-99** (1 lb.) ..... **\$6.95**



## Vary small appliance motor speed

**SKILL LEVEL** Save energy and wear and tear on any of your universal-type motor-driven tools and appliances. With the Motor Speed Control, you can use a large drill to cut through steel at slow speed without overheating the motor. It's ideal for use with electric hand tools and small household appliances. You'll also learn the function of a diac and triac for AC control with this easy starter kit. Just follow the lesson in the optional Starter Kits Educational Manual. Operates on 120 VAC, 60 Hz. 2" H x 5 3/8" W x 3 5/8" D.

**Kit SK-103** (1 lb.) ..... **\$39.95**



## Low-cost stereo synthesizer

**SKILL LEVEL** Get more enjoyment from TV viewing with this dual mode Stereo Synthesizer. Pseudo-Stereo converts a mono input into two different channels for synthesized stereo, and the mono mode allows straight-through operation.

Used with the Starter Kits Educational Manual, the SK-107 demonstrates the purpose of low-pass, high-pass and band pass filters. Requires 9V battery (not included) or PS-2350 Battery Eliminator.

**Kit SK-107** (1 lb.) ..... **\$19.95**

Accessory:

**Battery Eliminator**

Assembled PS-2350 (1 lb.) ..... **\$7.95**



## Liven parties with the sound flasher

**SKILL LEVEL** Add sparkle to your next get-together with the Sound Flasher. Watch the fun as music and voices in the room cause lamps or party lights to brighten and dim in response to the ambient sound. Also see how pulses control lamp brightness and learn about rectifier theory when used with the optional Starter Kits Educational Manual. Operates on 120 VAC, 60 Hz. 2 1/4" H x 3 1/8" W x 5 7/8" D.

**Kit SK-109** (1 lb.) ..... **\$19.95**



## 1-watt audio amplifier

**SKILL LEVEL** Get extra sound and listening pleasure with the 1-Watt Audio Amplifier. Use the amplifier with radios, portable tape players, TVs, intercoms or other audio equipment. For easy hookup between your audio equipment and speaker, the amplifier has a phono input and output socket.

Learn how to change gain and frequency response with the optional Starter Kits Educational Manual. Requires 9V battery (not included) or PS-2350 Battery Eliminator.

**Kit SK-104-H** (1 lb.) ..... **\$19.95**

Accessory:

**Battery Eliminator**

Assembled PS-2350 (1 lb.) ..... **\$7.95**



## An intercom system for your home

**SKILL LEVEL** Use the Heathkit Intercom to talk to a family member

in another room without leaving what you're doing, or call someone to the phone without running to another room or shouting for them. Your whole family will appreciate the convenience and the excellent audio quality of this system.

At least two intercoms must be used, and you can link up to four units using two-conductor wire. The intercom runs for months on one 9V battery (not included) because current is drawn only when the unit is in operation. Or power your unit with the PS-2350 Battery Eliminator. The lesson in the optional Starter Kits Educational Manual will instruct you in audio amplifier theory and impedance matching. Dimensions of the unit are 4 1/2" H x 3 1/4" W x 1 3/4" D.

**Kit SK-108** (2 lbs.) ..... **\$21.95**

Accessory:

**Battery Eliminator**

Assembled PS-2350 (1 lb.) ..... **\$7.95**

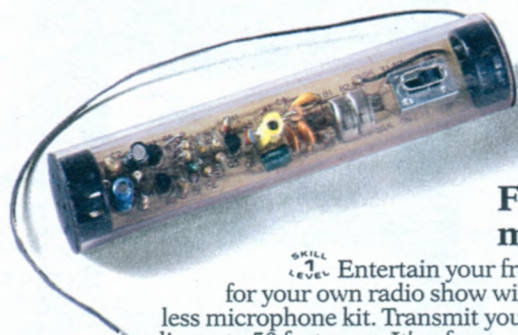


## DC power supply

**SKILL LEVEL 1** Power up your hobbyist kits, tape player or CB with the DC Power Supply. The Power Supply has a variable output from 4 to 18 volts and supplies 3 amps 50% duty cycle or 2 amps continuous. Included zener diodes change the output to either 9 or 14 volts to power DC equipment. Also learn the purpose of a power transformer, rectifier circuit, filter circuit and regulator circuit with the optional Starter

Kits Educational Manual. 3" H x 4½" W x 6½" D.

**Kit SK-101** (5 lbs.) ..... \$44.95



## FM wireless microphone

**SKILL LEVEL 1** Entertain your friends or be a DJ for your own radio show with this FM wireless microphone kit. Transmit your voice to any FM radio up to 50 feet away. It's a fun and easy kit that you can build in less than one evening. Also learn about FM radio theory with the optional Starter Kits Educational Manual. Operates on two watch batteries (included).

**Kit SK-106-H** (1 lb.) ..... \$12.95



## Hands-free speaker phone

**SKILL LEVEL 1** Now you can continue with other activities during a telephone call. The Heathkit speaker phone starter kit frees both your hands while you carry on a phone conversation. You can even answer your phone without lifting the handset from its cradle. Connect the speaker phone to your phone line by plugging it into your standard modular telephone connector. This device is phone-line powered so you don't even need batteries. Volume, privacy and answer controls are all there is to operating the speaker phone. As you build your kit, follow the matching Starter Kits Educational Manual lesson and learn about rectifiers and filters. 2" H x 5¾" L x 4¾" D.

**Kit SK-110** (2 lbs.) ..... \$44.95



Three easy ways to shop at your nearest Heath/Zenith Computers & Electronics Center

## Practice Morse code with this oscillator

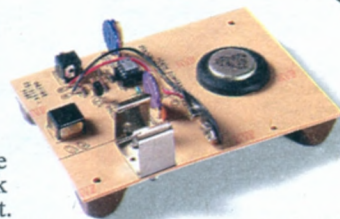
**SKILL LEVEL 1** Learn international Morse Code with this low-cost code practice oscillator. Enter code on the built-in pushbutton or hook up your own keyer to the kit.

Adjust the tone and volume to your liking. A great practice aid for beginners in amateur radio, this starter kit also demonstrates the use of the popular 555 IC timer when used with the optional Starter Kits Educational Manual. Requires 9V battery (not included) or PS-2350 Battery Eliminator.

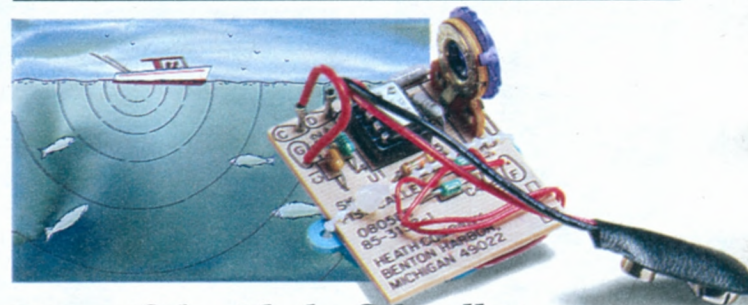
**Kit SK-102** (1 lb.) ..... \$14.95

Accessory:

**Battery Eliminator Assembled PS-2350** (1 lb.) ..... \$7.95



## STARTER KITS 1



## Attract fish with the fish caller

**SKILL LEVEL 1** You'll find that it's easy to attract and catch fish with our simple-to-build Fish Caller. The Fish Caller produces a sound that travels through water to attract hungry fish to your area. You can relax and wait for the fish to come to you.

Learn about the 555 timer IC with the optional Starter Kits Educational Manual. Requires a 9V battery (not included).

**Kit SK-105-H** (1 lb.) ..... \$7.95



## Sound activated switch

**SKILL LEVEL 1** Turn on a TV or a lamp from across the room – just by clapping your hands. The first time the switch picks up a loud sound it turns on the device. The following loud sound turns the device off again. Used with the optional Starter Kits Educational Manual, this kit demonstrates the operation of a flip-flop circuit. Uses 120 VAC. 2¼" H x 3⅞" W x 5⅞" D.

**Kit SK-111** (1 lb.) ..... \$19.95

