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In the past twenty years, the kit business has grown into a major industry with very bright prospects for the future.

ELECTRONIC KITS

BARNEY dropped his alignment tool under the service bench and smothered a huge yawn as he stooped to pick it up. "If sound from this set I'm working on is keeping you awake, I can turn down the volume," Mac, his boss, suggested sarcastically. "You were, maybe, spooning under the June moon too late last night?"

"Nope, I was home assembling my new 'Heathkit' SB-100 transceiver. When I get started on one of those darned kits, I can't seem to quit. It was one-thirty this morning when I finally yanked the pencil iron and swept up the clipped resistor leads."

"I know," Mac agreed. "An unfinished kit is harder to let alone than a bowl of salted peanuts. You ought to be pretty good at putting amateur kits together."

"If practice makes perfect I should be. I put together the Mohawk receiver, the SB-10 SSB exciter, and the DX-100 as well as the Apache and Marauder transmitters before tackling this SB-100 SSB transceiver. It's fascinating to observe how ham kits—or all kits, for that matter—and assembly manuals have improved since I started 'kitting.'"

"How do you mean?"

"Take manuals, for instance. The DX-100 manual had 68 pages that told you how to put the kit together and tune the transmitter, but that was about all. The SB-100 manual has 149 pages and is far more than a profusely illustrated assembly guide. For example, it has *six pages* of preliminary checks and resistance measurements to be made on the completed transceiver before power is ever applied to it. The function of every circuit is explained. Operating instructions for every set of conditions are given. Finally, there is a complete troubleshooting section. In short, it is a theory, assembly, operating, and service manual all rolled into one."

Early History

"I was acquainted with the man who started the *Heath Company* in the electronic kit business," Mac offered.

"After the war I bought my first 'Heathkit,' a scope, and put it together. I had some trouble getting the spot as small and round as I desired because of stray magnetic fields, and I cured this by putting a war-surplus Mumetal shield over the cathode-ray tube. I wrote *Heath* about this and started a correspondence between Howard Anthony, the president, and myself. When he invited me up to Benton Harbor to see his plant, I accepted and had a most enjoyable visit with him.

"Originally the *Heath Company* actually marketed an airplane—the famous *Heath 'Parasol'*—in kit form. The founder, Edward Bayward Heath, was killed in a test flight in 1931. Howard Anthony purchased the company in 1935.

During the war they were engaged in building some electronic gear for the government but could not buy the test equipment they needed because of insufficient priority; so they simply started building their own test instruments. Howard told me this proved to be so interesting that after the war he designed a 5-inch scope kit around a surplus scope transformer he had in quantity and took a small ad

in *RADIO NEWS*, now called *ELECTRONICS WORLD*. The response was most gratifying, and the *Heath Company* was off and running in a new direction.

Howard Anthony was killed in an airplane accident in 1954. *Daystrom* bought the company and then sold it to *Schlumberger Limited* in 1962.

"The first 'Heathkits' were service instruments—scopes, v.t.v.m.'s, v.o.m.'s, etc.—designed to be assembled by experienced technicians who needed little more than a diagram and a picture or two in the way of instructions. This continued to be true when *Heath* came out with kits for radio amateurs. Most hams at that time were experienced in construction because a large percentage of their stations were 'home-brew.'

New Trends

"But gradually two divergent trends have developed in electronic kits: 'kitted' devices are becoming more and more complicated and sophisticated; yet people buying them know less and less about electronics. Musicians are building electronic organs; housewives are assembling hi-fi amplifiers; high-school boys are building laboratory-type scopes; 'plug-in appliance' hams are tackling complicated SSB equipment; and Sunday sailors are building marine telephone, direction-finding, and depth-sounding equipment for their boats.

"This provides a real challenge to kit engineers and persons preparing the manuals. Designing a complicated instrument so that it can be easily assembled by a person who knows nothing about mechanics or electronics and must be told how to make a decent soldered connection before he starts is no snap."

"Use of printed circuits and pre-assembled and aligned critical components has helped," Barney suggested. "For example, in the SB-100, the linear master oscillator that controls the frequency in both the transmitting and receiving modes comes pre-assembled and sealed. The same goes for the crystal filter. Practically all wiring is on printed-circuit boards, and that means distributed capacitances so important in high-frequency work, are carefully controlled and independent of the builder's wiring."

"Pre-assembled and aligned units raise the cost considerably," Mac pointed out, "but through their use any kind of electronic device can be offered in kit form—everything from color-TV sets and videotape recorders to TV cameras and electronic computers."

"My friend Jerry, who is an EE student at Purdue, recently did a term paper on the kit business, and he let me read some of the background information he collected," Barney said. "It was most interesting. The *Eico Electronic Instrument Company* is another big name and pioneer in the electronic kit industry, and this company started when Harry R. Ashley, the founder and president, quit his radio servicing and insurance selling back in 1945 and brought out a v.t.v.m. in kit form. Since that time 3,000,000 *Eico* kits have been sold. Unlike *Heath*, who sells kits directly from the factory, from seven domestic Electronic Centers, or from several foreign

branch plants, *Eico* markets its 250 products through independent electronic distributors—some 2500 of them. *Eico* kits cover a wide range of service instruments, hi-fi equipment, amateur and CB equipment, and industrial electronic equipment.”

“You don’t need to tell me about *Eico* equipment,” Mac interrupted. “I’ve always admired the good shielding and excellent tracking adjustments on their Model 324 r.f. signal generator. How about ‘Knight-Kits’? Did Jerry have any dope on those?”

“You bet. ‘Knight-Kits,’ of course, are a product of *Allied Radio Corporation* of Chicago. You might say ‘Knight’ is a real patriarch in the electronic kit business. *Allied* first offered electronic kits in the 1920’s, although they were not called ‘Knight-Kits’ then. Early *Allied* catalogs offered a choice of a 3-tube Cockaday kit, a 5-tube Neutrodyne kit, or a 5-tube radio-frequency kit. All were broadcast receivers using 201-A tubes and batteries. The ‘Knight-Kit’ name was first used in the early 1930’s, and one of the first kits offered was the ‘2-Tube DX-er Shortwave Radio Kit’ with these prices: All Parts with Wiring Diagram, \$5.15; 4 Plug-in Coils, \$1.58; Tube and Battery Kit, \$2.80; Brandes Phone, \$1.65.”

“Stop! I can’t stand the nostalgia!” Mac interrupted.

“I have a ‘Knight’ s.w.r. meter,” Barney said, “and my experience with it underscores an important point. Fair results can be obtained from almost any kit with minimum effort, but quite often outstanding performance can be obtained through careful assembly and precise calibration. I took great pains putting that s.w.r. meter together and then spent a half-day calibrating it; but I was finally able to make it read right along with a directional wattmeter costing six times as much on five different bands. Anyway, ‘Knight’ offers about 100 kits that include everything from a crystal receiver to a laboratory scope. ‘Knight’ also has service instruments, ham and Citizens Band equipment, hi-fi units, and even an exposure meter in kit form.

“The *Conar Instruments Company* of Washington, D. C. is a comparative late-comer to the kit business, since it first offered kits in 1962; yet it is not new in the electronics field. You see, *Conar* is an expansion of the *National Radio Institute’s* student supply division that functioned primarily to supply test equipment to *NRI* students and graduates. In fact, the name ‘Conar’ is rather tortuously derived from the first letters of ‘Company, NAtional Radio.’ *Conar* was thus able to enter the market with a complete series of radio-TV test-equipment kits of proven design developed by *NRI’s* technical staff. Presently,

Conar offers about twenty different kits with more in the developmental stage. Some are rather unusual and exotic, such as their Model 800 closed-circuit TV camera kit that can be used with any TV set as a monitor and their metal locator kit that should go big with treasure hunters.”

“There are many more electronic kits on the market these days,” Mac said. “The success of these large companies has caused many concerns to bring out one or more of their products in kit form. Some do well; others do not. After all, I suspect there are a lot of headaches in the kit business. Do the large kit manufacturers seem to agree on many points?”

“Yes. All agree that when an instrument is offered in both kit and wired form, the kit far outsells the assembled unit. They agree aesthetic considerations are increasingly important in kit design. Not only must the completed unit work well, but it must also have an attractive appearance. The old, overgrown, boxy look is ‘out’; the new, compact, stylishly-shaped-and-colored look is ‘in.’ All kit manufacturers stress the importance of giving prompt and helpful assistance to a purchaser who has trouble with a kit. All maintain service facilities for straightening out the difficulty if it cannot be handled through correspondence. All agree engineering a kit is much more difficult than engineering an instrument for assembly by skilled workers in a factory where progress is constantly being inspected. Finally, all were unanimous in foreseeing a bright future for the kit business.”

“I can’t argue with that last,” Mac said. “Good incomes, increased leisure, and increasing interest in electronics all point toward a healthy growth of the kit business. Americans are natural-born do-it-yourselfers, anyway; and kits are to electronic design what numbered painting is to art. In neither case is there true creativity, but there is still room for a lot of personal satisfaction and pride in the finished products.”

“It seems to me,” Barney said slowly, “that kits have performed at least two major services for the electronics field. In the first place, they brought down the prices of formerly expensive laboratory instruments, such as the v.t.v.m., scope, sweep generator, and ‘Q’ meter, to where every service technician could afford them and learn to use them. Secondly, they have aroused an interest in electronics in many people working in unrelated fields. Photographers, musicians, and boat owners have assembled simple electronic instruments for use in their own hobbies and have ended up with electronics as a second hobby.”

“That’s right,” Mac agreed. “And that probably helps explain why weak little ‘kits’ have grown into roaring tigers in only two short decades.” ▲



ELECTRONICS WORLD