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Those Long-Lost Hi-Fi Kits

Walt Jung

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I got my Hi-Fi start in the mid-1950's building some Heathkits, namely a tuner. The preamp, the WA-P2, was introduced in 1954. Along with it, the tuner, the FM-3 (later superseded by the FM-3A). This WA-P2 preamp/controlling, selling for \$19.75, became a popular item (but alas, stereo soon brought about its decline). The enthusiasm typical towards this preamp is seen in a *Audiocraft* kit manual describing WA-P2 building and testing. ⁽¹⁾

Both the preamp and tuner were mono in operation, since stereo then hadn't arrived. To complement the preamp, I also built a Williamson-style power amplifier, generally similar in operation to what was to become the Heath W-5M. It was the scheme of that 1950 power amp series (W-3AM, W-4AM and W-5M) to supply the preamp power, so I matched that feature in my homemade model. With the addition of a turntable with ceramic pickup, plus the assembly of an odd lot of speakers, I had music!

This may sound a mite pretentious for anyone doing the aging math, but in truth I was a mere lad of about 16 years when all this happened. Hint— I had the good fortune to have a gifted and generous mentor, my late Uncle Harry. He supplied the initial inspiration, some of the parts, and virtually all of the wisdom and oversight to pull this off. My parents also helped substantially of course, both financially and by overseeing all of this with ample patience and support. But for me, it was the start of a life-long love affair and subsequent career, not just with audio, but with electronics in general. Between those

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career, not just with audio, but with electronics in general. Between those 1950s days and now, I have built dozens of kits, and some of them I still have and use.

But, more on those kits. In the 1950s, there were actually many companies producing kits, and among them were Arkay, Dynaco, Eico, and Heath, just to name some that I built. But, the Heath Company was *the* acknowledged leader among the many kit vendors in those days, and remained so for years to come. The company was first established in 1926 by Ed Heath, as a supplier of an aircraft kit. After his death in a 1931 airplane accident, the company was purchased by an innovative engineer named Howard Anthony. Shortly after WW II Anthony established a market for electronic kits, beginning with a 5-inch oscilloscope, the \$39.50 O-1 in 1947, and later branching into other test equipment. (2) Ham radio and hi-fi gear were also to become staples in the firm's product line.

The Heath Company set standards for the value of their kit products, the thoroughness of their step-by-step manuals, and the generally high quality of support. They even had a motto, "We won't let you fail!" But those manuals were the real secret of success, and even allowed those with little or no experience to triumph. To quote from a brief history, "The Story of Heath," "The key to the kit-builder's, and consequently Mr. Anthony's, success, was the instruction manual. Its contents still guide the Heath Company today. It contains simple, non-technical instructions and large 'exploded' diagrams that take the builder through each and every step... show him exactly what to do and how to do it."(2)

While today they have left the kit business, there still is a Heathkit company in Michigan, which is called Heathkit Educational Systems.

There is the (not related) web-based "museum" documenting many of the kit products, including not just the hi-fi gear, but the impressive array of amateur radio and test equipment. (3) Heath produced mail order kits (later available in stores) until the mid 1980's. In addition, there are also other individually run web sites on Heath equipment. A notable one is Bill Wilkinson's site. (4) Don't miss the Bjorn Heyning "Heath stories"!

So, from those electronic kit beginnings of Howard Anthony in 1947, Heath produced kits of many types, for 40-odd years, under the aegis of many different managements. The company was sold to Daystrom in 1955, later became part of Schlumberger Limited, and was finally sold to Zenith.

The Heathkit list of audio products over the years is far too long to cover here. The listing under the museum's "hi-fi & stereo" category of (3) shows some 24 products—all of them vacuum tube based. So, this list is by no means a complete one as it omits solid state audio products. One would wish for at least some of the later popular products, such as for example the 1980's flagship AP-1800 preamp and the AA-1800 power amplifier. Most kit-builder readers will likely have a Heathkit favorite, such as, among the 1960's products, the AR-15 receiver and AJ-15 tuner (the latter I still have today). Closely related in interest to the many audio kits were the audio test equipment products. For example, the HD-1 harmonic distortion analyzer, the AA-1 audio analyzer, and also general purpose test gear like the V7 vacuum tube voltmeter. Finally, one of the more useful features of the museum website is the indexed mail list on Heath products.

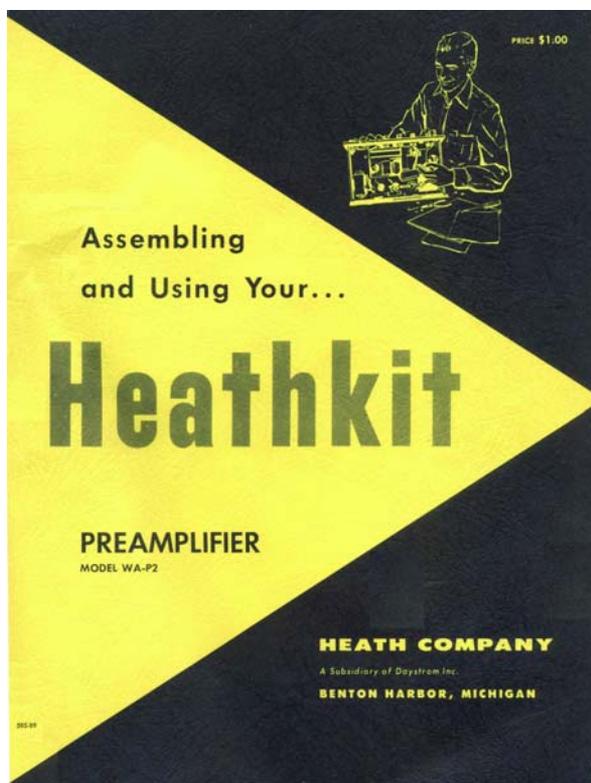


Figure 1: The WA-P2 construction manual shown was typical for the early Heathkits. While part of the kit, it was also available separately for \$1. The WA-P2 sold for \$19.75.



Figure 2: A recently purchased WA-P2 preamp shows the basic functions. And it doesn't look bad for being nearly 50 years old, after cleanup with just soap and water!

To amplify on the Heath manuals, an example is one for the WA-P2, shown in Fig. 1. Like other kits, this manual contains the specifications, a schematic, a parts list, and instructions for operation, in addition to detailed step-by-step building instructions (with individual check points for step completion). Large foldout diagrams supplemented the pictorials within the manual. Before beginning the kit, the assembler was instructed to read through the manual for familiarization, and to lay out all the parts in groups for ease of identification in the build process.

Although I did build many other manufacturers' kits successfully, none of them ever came close to the Heath style of instruction and their ease-of-assembly. And it is worth noting that my successful Heathkit resume includes several computers, a color TV, various items of test equipment, all in addition to many pieces of audio gear. These, when assembled as per the instructions, simply worked.

While those original kits have long since disappeared as shelf items, some have survived until today in used form. As a fun aside for this article, I've been re-assembling my 1950s hi-fi system, beginning with the WA-P2 and the FM-3. Figure 2 is a front panel view of a WA-P2 recently purchased online.

Of course, availability of such models today still in their *original* kit form is extremely rare, *but it does happen*. In fact, Nick England has a vintage hi-fi page which includes photos of many unbuilt kits, though he will not sell them. (5) Among these are many Heathkits (including the WA-P2) as well as ones by Dynaco, Eico, and others. Needless to say, do expect to pay a premium if you buy one of these kits. I just missed an Ebay WA-P2 kit, which sold for just under \$100.

There are many caveats to buying used electronic gear such as this, both before and after the transaction. Upfront, *make sure that you have confidence in your seller and shipper, and insure!* I just can't recommend the USPS for large packages. They somehow took nearly three weeks to get an FM-3 from Colorado to me on the East Coast! I've never had any similar experience with UPS, and they offer package tracking and \$100 of insurance — included in the price. (Editor's Note: We strongly prefer to use FEDEX for shipping gear, as we find their careful handling of the package together with their reasonable rates for two-and three-day services, make them the shipper of choice. *Gene Pitts*) With many online sellers, you can pay by check, money order or a payment service such as PayPal. Here you will need to work an agreement with the seller, but do note that the first two options have inherent delays. By contrast, a

payment service gets your money to the seller right away, and your item ships that much faster.

Of course, much vintage electronic gear offered is sold "as is," which means that no functionality is really guaranteed. If in doubt, contact the seller and clarify. This is critical to understand! You can get stung easily here when you consider that vintage tube gear like a Heathkit W-5M sells for several hundred dollars or more. If a transformer is bad (they sometimes are), you have a vintage chassis you can clean up and photograph — but not enjoy by listening! Even if everything is functional, you may still need to do some restoration, such as cleaning switches and volume controls, as well as updating electrolytic capacitors which may well have met their death. Obviously, some electronics experience is called for here.

To return to the timeline of kit developments, a major occurrence in the early 1960s was the transition from mono to stereo, which (sooner or later) caused corresponding audio system disruptions. About that time I ventured into other kits, building an Eico HFT90 FM tuner, which sold for \$39.95. With its clever "!" tuning/signal indicator, this really was a neat tuner, both more sensitive and stable than the Heath FM-3, but alas, still mono. To accommodate system stereo inputs, my next preamp was an Eico HF85, which also sold for \$39.95. This was a very flexible, self-powered preamp, offering both high- and low level inputs, loudness compensation, and other features. Bob Higgins has an Eico page which includes many details on the Eico product line. (6)

A second major player in the audio kit field was Dynaco, a company founded by David Hafler in 1955. Unlike the varied lineup of Heath, Dynaco's products were audio only. They were to become a major player in the audio kit world, initially supplying tube equipment, and later on expanding into solid state. Greg Dunn's dedicated web site includes much Dynaco information; much of it historical in nature, including details on many models, plus many links to information elsewhere. Highly recommended. (7)

Prior to Dynaco, David Hafler's early 1950's design work on amplifiers and transformers with Herb Keroes at their Acrosound company actually formed much of the basis for some of the early Dynaco products. Keroes and Hafler established two key patents on transformers

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and "Ultra-Linear" beam power pentode output tube operation. (8 – 10) Aimed at audio amplifier builders, an Acrosound design pamphlet illustrated various amplifier schematics for use with the company's transformers. (11)

But, while Acrosound had encouraged individuals to build amplifiers on their own using their transformers, the new Dynaco company took things a step further. They supplied a kit of all the parts required, building around a new series of Dynaco transformers. The first product was the \$59.95 Mark II Ultra Linear output, a 50-watt mono power amplifier introduced in 1955. Another of these models was to be the 1959 Stereo 70, a dual 35-watt per channel unit selling for \$99.95. The Stereo 70 is likely the most popular audio amplifier kit of all time. Notable for many of the Dynaco tube power amplifiers was a simple, three-tube signal path. The input and phase splitter was either a 6AN8 or 7199, and the output pair were chosen for the power required, i.e., EL-34s, KT-88s, 6550s, etc.

There also was a series of tube preamps, the mono PAM-1, followed by a pair of similar stereo preamps,

the 1960 PAS-2 (\$59.95), and the upgraded 1966 PAS-3 (\$69.95). These two tube preamps are comparable to the Stereo 70 in popularity, and likewise, are often found as used offerings.

Solid-state products appeared from Dynaco beginning in 1966. Dynaco had two solid-state preamps, the PAT-4 and PAT-5, and many solid state power amplifiers. These included the Stereo 120, Stereo 150, and the Stereo 400 series. While popular themselves, the Dynaco solid-state models have not shown nearly the longevity or popularity that their earlier tube-based counterparts from Dynaco have (and this is true for those of other companies).

Dynaco's history was convoluted in the later years. The company was acquired by Tyco in 1969, and later on sold to ESS in 1979. Thereafter, they ceased operation in 1980, selling off inventory to Stereo Cost Cutters, which extended life another 10 years or so.

David Hafler's kits (both at Dynaco and later with his namesake Hafler company) were known for the use of pre-assembled circuit boards. Obviously, having 75% of the circuit pre-wired before you start, reduces build time. But kit builders differ in their views of this, with some seeing it as a feature, while others think it is a restraint of their fun. I always saw the Heath approach to point-point wiring and stuffing your own circuit boards (when used) as a feature, i.e., it enhanced my joy and gave me a greater sense of accomplishment. But the Dynaco/Hafler approach made easier kit building for many novices, and as a result, probably made audio kits available to greater numbers of people. So, in that sense at least, it was good policy.

David Hafler formed yet another audio company in 1977, the Hafler company, with a charter similar to Dynaco, but reflecting the by-then-standard solid-state designs. Many notable audio designs came from this company, probably among the better known ones include the DH200, DH500 and XL280 stereo power amplifier series, all of which were popular as kits and in assembled form. Among the Hafler preamplifiers were the DH100, DH101, and DH110. After selling the company to the Rockford Corporation in 1987, David Hafler left the company and retired. He passed away in 2003, leaving a legacy that will likely be best known for the multitude of reasonably priced audio kits that his companies offered.

As I noted initially, there were many different companies that made audio kits say 50 years ago, but certainly the most influential were Dynaco and Heath. Unfortunately, in today's world, not many kits can be found that compare directly with the type of kits that those two offered. Today's audio world has changed radically, and few of the millions of audio enthusiasts even want to build their own gear anymore. (Editor's Note: It might even be fairly said that much of today's gear could NOT be built by hand, and indeed such items as portable CD players have to be assembled by automated machinery. And, too, while I don't have any serious problem with setting up and aligning a phono cartridge, there is no way I can install and adjust a CD player's laser diode if that key part would need replacement. And we haven't even begun to talk about surface mount components. *Gene Pitts*) That is truly sad, as today's young people starting out in audio will simply never know what they have missed. No doubt that this article's reading by old-time kit-builders will evoke

pleasant and enjoyable memories. But not quite as vivid as the nostalgia trip I had pulling it together!

Yet, there is some solace in the fact that many used vintage audio components can be found even today. With a definite *caveat emptor* suitable, the Ebay auction site is a major source of audio gear-for-trade. (12) But, this may not be a route suitable for everyone in acquiring older audio gear—for the reasons cited earlier. Note that there are also dealers who specialize in old equipment, offering checkout, service, and even upgrade features in addition to basic sales. One such source is Audio Classics of New York. (13) While they specialize in McIntosh equipment, they also offer a whole host of other audio brands, organized in terms of functionality.

Of course, any reasonably sized article trying to summarize a half century of audio developments can really only scratch the surface of things. Here, I have simply attempted to emphasize those truly classic audio kits (mostly tube types) that have shown the test of time by still being in high demand today — 50 odd years after their introduction. I've also emphasized only two major players in the audio kit world, Dynaco and Heath. This is not meant as any discredit to other fine audio companies, for example Fisher and Scott. Their gear is certainly of lasting quality as well, but for the most part, didn't always come in kit form. References are provided for additional reading on these company's products.

Acknowledgements

Thanks go to several folks who aided with this article. These include former Heath engineer Jack Crenshaw, and Dynaco enthusiast Greg Dunn, whose website is a source of key data. Helpful comments were also received from Suzanne Manko and John Oliphant of Heathkit Educational Systems, and former editor Bob Milne. My son Mark Jung offered assistance with the photos. But, appreciated most of all is the memory of Uncle Harry Miller, who got me going with audio back in the fifties!

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Further Reading

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Lee K. Shuster's H.H. Scott hi-fi Stereo Archive: <http://www.hhscott.com>



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