

Don Lancaster's

# RESOURCE BIN

number eighty seven

## Exploring used test equipment options.

**O**ur usual reminder here that the *Resource Bin* is now a two-way column. You can get tech help, consultant referrals and off-the-wall networking on nearly any electronic, *tinaja* questing, personal publishing, money machine, or computer topic by calling me at (520) 428-4073 weekdays 8-5 Mountain Standard Time.

Be certain to frequently check out my new *Guru's Lair* web site you'll find at (where else?) [www.tinaja.com](http://www.tinaja.com) This is the place you'll go for instant tech answers. Among the many files in our library, you will find complete reprint sets for all of the *Resource Bin* and other columns. Plus a brand new [Research InfoPack Service](#).

You will get the best results if you have both [Netscape Communicator](#) and [Acrobat Reader 3.0](#) installed.

### Finding Used Test Equipment

You'll find a lot of incredible buys in used test equipment if you shop around. Brought about by military and aerospace cutbacks, those schools dropping their electronics programs, and that big shift towards modeling, simulation, and computer control. On the other hand, there sure is a lot of outrageously heavy and ridiculously oversized useless junk out there.

How do you separate the goodies from the grunge?

A better home lab should have at least a good power supply or two, a multimeter, a scope, a *Basic Stamp* by [Parallax](#), and a function generator. For "level II", you'll add such goodies as frequency counters, signal generators, computer emulators, and rf gear.

Your first and foremost choice for used electronic test equipment should be right here in *Nuts & Volts*. Where you will find hundreds of ads spread out over dozens of categories. But let us take a tour of your other options in pinning down superb prices on used test gear. Let's start with...

### The Foremost Rule

The foremost insider secret rule of used test equipment is...

*There are only two kinds of used test equipment. Those which say Tektronix on them and those that say Hewlett-Packard.*

Yeah, companies such as *Fluke* and *Wavetek* can occasionally meet muster. But "service" grade or "kit" grade stuff usually is not worth the bother.

Oscilloscopes, of course, are the big exception. Where your *only* choice in brands will be *Tektronix*, *Tektronix*, or *Tektronix*. I feel the best selection for a personal analog lab scope these days is the Tek 2213 or the slightly pricier 2215 Good street prices from a bargain source should be well under \$400. We'll note in passing that your last decent H-P scope was the 130-C.

The reasons to limit yourself to Tek and HP are the massive quantities of these instruments out there; the ready

**NEXT MONTH: Don finds the hydrogen scene is a gas.**

availability for most manuals and at least some parts; and, above all, the online user expertise.

### The Blue Book

The closest thing I have found to a used test equipment blue book is the *Test Equipment Connection* free catalog.

From [www.4testequipment.com](http://www.4testequipment.com)

This *essential* catalog instantly tells you which equipment stays popular. Along with relative prices. Primarily for H-P and Tek, of course. But *Fluke*, *Racal*, *Wavetek*, and a few dozen or so other sources are also included.

*If a piece of gear is not in this catalog, the chances are it is not worth buying.*

I'll typically divide their prices by *thirty* to come up with reasonable bids on skidded surplus lots. *Never* go to any auction or a hamfest without at least one copy of their catalog.

But do keep it well hidden.

### Some Sources

As with most any field, you'll get what you pay for. Depending on how price limited you are and how much risk you are willing to take, there are several choices here...

**prime suppliers**— These firms do have very high prices but they provide like new condition, full manuals, support, leads, accessories, and even standards tracability. Typical outfits are *Danbar*, *Davilin*, *Tucker*, *Test Equipment Plus*, *Naptech*, a *Test Equipment Connection*, *TestEquity*, *ValueTronics*, *Western Test Systems*, and a dozen others.

**bargain sources**— The bargain sources typically charge only one half to one third of the prime price. But all you could end up with is the instrument itself, reasonably clean and checked only for obvious faults. Manuals are usually extra, and guarantees may be limited. Availability may be restricted to stock on hand, rather than what you really want. The lower prices are possible because of lower ad staff, and overhead costs.

**hamfests and newsgroups**— These are often your cheapest sources for single quantities of useful test gear. But they are also the ones with the highest risk. And possibly the highest rewards.

**wholesale auctions**— The lowest prices are gotten by buying blind in skid lots from military auctions and industrial distress sales. High quantities and high risks are involved. The process may take many weeks and involve truck rentals and travel to places you really did not want to go to. Again, we'll see more details below.

## Hamfests

Hamfests are technical flea markets and tailgating parties put on by local amateur radio clubs. You should find hundreds of these yearly, ranging from a few locals gathering together. To state wide regional meets. On up to their huge yearly Dayton show.

A wide variety of bargain priced test equipment is often featured from dozens to hundreds of individuals or commercial vendors. Yes, non-hams are always welcome. Admission is from free to nominal for buyers. Keep in mind that what you see is what you get. And that the ultra low prices can represent higher risks. If you don't know what you are buying, ask for the nearby expert help.

Really great buys are the norm.

Speaking of which, you'll always get the best buys before sunup or very late in the day. Very early to grab the goodies ahead of the hoarders. And late because a seller may be under a "get rid of all that junk or don't come back" edict.

These days, there are also lots of *virtual hamfests*, that are simply online classifieds that happen to cater to the amateur radio needs.

Many hamfests are listed right here in *Nuts & Volts*. There's also a lot of hamfest info on the web. Just punch "hamfest" into [www.hotbot.com](http://www.hotbot.com) to get many thousands of links. Add a state name to narrow your search.

Or, you can start off with these real hamfest directory sites...

[www.arrl.com/field/hamfests](http://www.arrl.com/field/hamfests)  
[www.seanet.com/~bobjr/hfest.htm](http://www.seanet.com/~bobjr/hfest.htm)  
[www.vartel.com/hamfest.htm](http://www.vartel.com/hamfest.htm)

Or these virtual ones...

[www.hamfest.net](http://www.hamfest.net)  
<http://vhamfest.com>

Lots of hamfests are in the monthly *Nuts & Volts* events calendar. We saw more hamfests info in [RESBN73.PDF](#), [MUSE90.PDF](#) and [MUSE128.PDF](#)

## Newsgroups

The absolute best test equipment bargains of all can usually be found in the Usenet newsgroups. Your most useful one is [sci.electronics.equipment](#). But also check [sci.electronics.repair](#) and [sci.electronics.misc](#)

But buyer beware, empty cravats, and all that other good stuff.

The newsgroup access is sometimes free with your Internet account. Other times, there is a low extra monthly

charge. Be sure to ask your ISP if you are having access problems.

If you can't access a newsgroup any other way, use [www.dejanews.com](http://www.dejanews.com)

## Auctions

Auctions are interesting but risky places to pick up used test equipment. Their prices will sometimes end up extremely low. Particularly when you choose obscure enough auctions, the weather is lousy, it is midweek, and you are the only one bidding. And if you do not commit to excessive time, dollars, and ego while attending. The usual trick is to try and score several identical units so you can make a few good instruments out of the lot.

If you are doing this commercially, the object of surplus is to buy for a penny on the dollar, sell for a dime, and try to make a nine percent profit while doing so. Lean and mean is the *only* route that works here. Auction sources include community colleges, commercial test equipment auctions, business liquidations, mil surplus, and live online venues...

**community colleges**— Many of these colleges are phasing out or sharply cutting back on electronics programs. A few years back, I bought an *entire* electronics department at auction for an obscenely low price. And made more from it than I did in ten years of teaching for them.

Ask the schools even remotely near you for ongoing auction info. You'll do best with outlying schools in small rural communities.

For higher profile examples, see [www.dist.maricopa.edu/surplus](http://www.dist.maricopa.edu/surplus) or else check into [w3.arizona.edu/~surplus/public/index.html](http://w3.arizona.edu/~surplus/public/index.html)

**commercial test equipment**— Several auctioneers specialize in commercial test gear. Mountains of stuff are often available, but the competition can also be fierce. Many of these are held in high tech areas. Albuquerque shows by *Bentleys* are examples.

At [www.bentleysauction.com](http://www.bentleysauction.com)

**business liquidations**— The listings of these often do appear in the regional auction directories. My favorite here is the Southwest *Auction Advisory*. It is also located online at, of all places, [www.auctionadvisory.com](http://www.auctionadvisory.com) I've found best results when a few odd test items are in a non-technical auction.

**Military surplus**— We've have seen in previous columns how outstanding buys in mil surplus test equipment

## new from DON LANCASTER

### ACTIVE FILTER COOKBOOK

The sixteenth (!) printing of Don's bible on analog op-amp lowpass, bandpass, and highpass active filters. De-mystified instant designs. **\$28.50**

### CMOS AND TTL COOKBOOKS

Millions of copies in print worldwide. **THE** two books for digital integrated circuit fundamentals. About as hands-on as you can get. **\$28.50** each.

### RESEARCH INFOPACKS

Don's instant cash-and-carry flat rate consulting service. Ask any reasonable technical question for a detailed analysis and complete report. See [www.tinaja.com/info01](http://www.tinaja.com/info01) for specifics. **\$75.00**

### INCREDIBLE SECRET MONEY MACHINE II

Updated 2nd edition of Don's classic on setting up your own technical or craft venture. **\$18.50**

### LANCASTER CLASSICS LIBRARY

Don's best early stuff at a bargain price. Includes the CMOS Cookbook, The TTL Cookbook, Active Filter Cookbook, PostScript video, Case Against Patents, Incredible Secret Money Machine II, and Hardware Hacker II reprints. **\$119.50**

### LOTS OF OTHER GOODIES

|                               |             |
|-------------------------------|-------------|
| Tech Musings V or VI          | \$24.50     |
| Ask the Guru I or II or III   | \$24.50     |
| Hardware Hacker II, III or IV | \$24.50     |
| Micro Cookbook I              | \$19.50     |
| PostScript Beginner Stuff     | \$29.50     |
| PostScript Show and Tell      | \$29.50     |
| Intro to PostScript Video     | \$29.50     |
| PostScript Reference II       | \$34.50     |
| PostScript Tutorial/Cookbook  | \$22.50     |
| PostScript by Example         | \$32.50     |
| Understanding PS Programming  | \$29.50     |
| PostScript: A Visual Approach | \$22.50     |
| PostScript Program Design     | \$24.50     |
| Thinking in PostScript        | \$22.50     |
| LaserWriter Reference         | \$19.50     |
| Type 1 Font Format            | \$16.50     |
| Acrobat Reference             | \$24.50     |
| Whole works (all PostScript)  | \$380.00    |
| Technical Insider Secrets     | <b>FREE</b> |

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Ongoing details on Book-on-demand publishing, a new method of producing books only when and as ordered. Reprints, sources, samples. **\$39.50**

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For most individuals, patents are virtually certain to result in a net loss of sanity, energy, time, and money. This reprint set shows you Don's tested and proven real-world alternatives. **28.50**

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The reprints from all Don's Midnight Engineering columns. Includes a broad range of real world, proven coverage on small scale technical startup ventures. Stuff you can use right now. **\$24.50**

### RESOURCE BIN I

A complete collection of all Don's Nuts & Volts columns to date, including a new index and his master names and numbers list. **\$24.50**

### FREE SAMPLES

Check Don's Guru's Lair at <http://www.tinaja.com> for interactive catalogs and online samples of Don's unique products. Searchable reprints and reference resources, too. Tech help, hot links to cool sites, consultants. email: [don@tinaja.com](mailto:don@tinaja.com)

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**SYNERGETICS**  
Box 809-NV  
Thatcher, AZ 85552  
(520) 428-4073

FREE Catalog: <http://www.tinaja.com>

## SOME USEFUL TEST EQUIPMENT RESOURCES

**Auction Advisory**  
Box 61104  
Phoenix AZ 85082  
(602) 994-4512

**EMF-EMI Control**  
PO Box D  
Gainesville VA 20156  
(540) 347-0030

**Levy Latham**  
6263 N Scottsdale #371  
Scottsdale AZ 85250  
(602) 367-1100

**Synergetics**  
Box 809  
Thatcher AZ 85552  
(520) 428-4073

**TestEquity**  
2450 Turquoise Circle  
Thousand Oaks CA 91320  
(800) 228-3457

**Bentley Auctioneers**  
3801 Academy Pkwy NE  
Albuquerque NM 87109  
(505) 344-1812

**Evaluation Engineering**  
2500 Tamiami Trail North  
Nokomis FL 34233  
(941) 966-9521

**Naptech**  
11270 Clayton Creek Rd  
Lower Lake CA 95457  
(800) 336-7723

**Tektronix**  
PO Box 500  
Beaverton OR 97077  
(800) 835-9433

**Tucker**  
1717 Reserve St  
Garland TX 75042  
(800) 527-4642

**Compliance Engineering**  
629 Massachusetts Ave  
Boxborough MA 01719  
(508) 264-4208

**Fluke**  
PO Box 9090  
Everett WA 98206  
(800) 443-5853

**Nuts & Volts**  
430 Prnceland Ct  
Corona CA 91719  
(909) 371-8497

**Test & Measure World**  
275 Washington St  
Newton MA 02158  
(617) 558-4671

**ValueTronics**  
1925 S Wright Blvd  
Schaumburg IL 60193  
(800) 552-8258

**Danbar**  
14455-C N 79th St  
Scottsdale AZ 85260  
(602) 483-6202

**Stan Griffiths**  
18955 SW Blanton  
Aloha OR 97007  
(503) 649-0837

**Parallax**  
3805 Atherton Rd #102  
Rocklin CA 95765  
(916) 624-8333

**Test Equip Connection**  
525 Technology Park  
Lake Mary FL 32746  
(800) 615-8378

**Wavetek**  
9054 Balboa Ave  
San Diego CA 92123  
(619) 279-2200

**eBay**  
2005 Hamilton Ave, #350  
San Jose CA 95125  
www.ebay.com

**Jnl of Electronic Test**  
101 Philip Dr  
Norwell MA 02061  
(781) 871-6600

**Racal Instrument**  
PO Box C-19541  
Irvine CA 92718  
(949) 859-8999

**Test Equipment Plus**  
3331 W Bright Terrace  
Tucson AZ 85741  
(520) 575-6967

**Western Test Systems**  
530-C Compton St  
Broomfield CO 80020  
(303) 438-9662

are easily gotten. You can now bid and pay online, and certain sales even deliver. The website is [www.drms.com](http://www.drms.com) Some mil stuff is now being handled commercially. See [www.levylatham.com](http://www.levylatham.com) More conveniently, you might use my DRMS1 through DRMS5 and LEVYL buttons at [www.tinaja.com](http://www.tinaja.com).

**Live online auctions**— The real biggie here, of course is [www.ebay.com](http://www.ebay.com) Who are now milking auction addicts for all they are worth. And then some. eBay is strongest in collectibles, but more and more test equipment is now starting to appear. I found 313 power supplies, 68 oscilloscopes, and 42 meters listed on a recent check. Sadly, a lot of these were ancient junk. Or were otherwise second rate. This also appears more of a place to sell than buy, because I've found many of their prices tend to end up higher than you can find elsewhere. Be sure to watch your time and energy commitment.

I do prefer sealed bid sales to live auctions because you'll have less time commitment and you are more likely to score genuine bargains. Especially when you intentionally bid low and expect only a few hits. A "never be underbid" ploy will sometimes work amazingly well. The time and energy spent on pickup can also be adjusted to the value of the goodies.

It also pays to line up "associates" or "agents" who you might trade off inspection and shipping with. This can minimize nonproductive travel.

We saw more info on auctions in general at [RESBN73](http://RESBN73) and way on back

in [RESBN06](http://RESBN06) Specific mil auction stuff is in [RESBN81.PDF](http://RESBN81.PDF) and [RESBN82.PDF](http://RESBN82.PDF) You can hit the [RESBN](http://RESBN) button at my [www.tinaja.com](http://www.tinaja.com) to access these and similar files. Other auction links are found at [www.tinaja.com/beewb01.html](http://www.tinaja.com/beewb01.html) and [www.tinaja.com/dntkwb01.html](http://www.tinaja.com/dntkwb01.html)

### For More Help

Once again, your best starting point for great test equipment buys is right here in *Nuts & Volts* magazine. A nice tutorial on finding manuals for used test equipment is in [RESBN80.PDF](http://RESBN80.PDF). Servicing info was in [RESBN57.PDF](http://RESBN57.PDF)

Many home lab test equipment recommendations were way on back in [RESBN25.PDF](http://RESBN25.PDF) More test equipment resources appeared in [MUSE128.PDF](http://MUSE128.PDF)

There's also a freebie trade journal called *Test & Measurement World* that sometimes has useful ads and info in it. Some more specialized instruments also appear in *Compliance Engineering*.

More obscure titles are *EMF-EMI Control*, *Evaluation Engineering*, and the pricey *Journal of Electronic Testing*

The classic Tek doghouse scopes no longer make sense for most people. In certain circles, owning more than a dozen Tektronix model 519 scopes is considered excessive. Tacky, even.

*Oscilloscopes— Restoring a Classic* is your definitive Stan griffiths book on this. See [www.tinaja.com/amlink01.html](http://www.tinaja.com/amlink01.html)

By one of those utterly astounding coincidences which seem to infest this column, I just happen to have a great and ongoing collection of surplus test gear and related items available. See [www.tinaja.com/barg01.html](http://www.tinaja.com/barg01.html)

I can try to answer most simple test equipment questions free by emailing me at [don@tinaja.com](mailto:don@tinaja.com)

The older personal computers can sometimes substitute for test gear and signal generators. You can usually make them do exactly what you want. I've got great heaping bunches of Apple IIe and Mac LC computers available at very low costs.

### This Month's Contest

As our contest for this month, just tell me about some bargain source of electronic test equipment that I don't already know about.

There'll be a dozen or more of my new *Incredible Secret Money Machine III* books going to the better entries. And an all expense paid *tinaja quest* for two (FOB Thatcher, AZ) going to the very best entries of all.

Let's hear from you. ♦

*Microcomputer pioneer and guru Don Lancaster is the author of 35 books and countless tech articles. Don maintains his no-charge US tech helpline found at (520) 428-4073, besides offering all of his own books, reprints, and consulting services. Don also offers a free catalog full of his unique products and resource secrets. The best calling times are 8-5 on weekdays, Mountain Standard Time.*

*Don is the webmaster of his Guru's Lair found at <http://www.tinaja.com>*

*Full reprints and preprints of all Don's columns and ongoing tech support appear here. You can reach Don at Synergetics, Box 809, Thatcher, AZ 85552. Or send any messages to [don@tinaja.com](mailto:don@tinaja.com)*

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