

# Recommended Tools & Test Equipment

Invest in quality tools. This will make the difference between a fun project and a series of frustrating experiences. With poor tools you will consistently find yourself in the position of compensating for the shortcomings of your tools rather than focusing on the details of your project.

There are tools that are essential and others that are convenience. If you plan to build one project annually, then investing in the convenience tools may be a bit of extravagance. But if you will be building several projects annually then many of the convenience tools begin to fall into the essential category. The tables indicate which category I believe each should be classified.

## Hand Tools:

DESCRIPTION	CATAGORY	POSSIBLE SOURCE(S)
Standard Screwdriver Set Flat Blade & Phillips	Essential	Sears, Quality Hardware Outlet
Jewelers Screwdriver Set	Essential	Sears, Quality Hardware Outlet
Small Socket Driver Set	Essential	Sears, Quality Hardware Outlet
Hex Key Wrench Set	Essential	Sears, Quality Hardware Outlet
Pliers Miniature (4") Long Nose, Serrated Standard (6") Long Nose, Serrated Slip Joint Type	Essential Essential Essential	MCM # 22-590 MCM # 22-815 MCM # 22-820
Adjustable Wrench Small (4") Large (12")	Essential Essential	Sears, Quality Hardware Outlet Sears, Quality Hardware Outlet
Wire Cutters Diagonal Shear Heavy Duty	Essential Essential Essential	MCM #22-540 MCM # 22-1065 MCM # 22-1705
Wire Stripper	Essential	MCM # 96-250
Crimping Tool	Convenience	MCM # 22-120
Small File Set	Convenience	MCM # 22-1440
Locking Clamps	Convenience	Sears, Quality Hardware Outlet
Hand Drill (1/4" or 3/8")	Essential	Sears, Quality Hardware Outlet
Drill Bit Set (to 1/2")	Essential	Sears, Quality Hardware Outlet
Soldering Equipment Solder Station Solder Sucker Solder Wick Solder, Rosin (Non Residue)	Essential Essential Essential Essential	MCM # 21-3475 MCM # 21-590 MCM # 21-2180 MCM #21-1570
Miscellaneous Wire Wrap & Gun Heat Shrink Tubing Assortment Electrical Tape Contact Cleaner Test Clip Leads	Essential Essential Essential Essential Essential	MCM # 21-3554 & 21-3230 MCM # 95-570 MCM # 108-950 MCM # 20-1715 MCM # 21-350



# Recommended Tools & Test Equipment

You can easily spend thousands of dollars on your test equipment. And like the tools you choose to purchase, there are essential pieces of test gear and others that are convenience.

Unfortunately (or fortunately depending on your perspective) there are many sources of test equipment. From hamfests through retail outlets you could spend 3 to five times the amount for what is essentially the same unit.

You could choose the definite low risk approach but you will pay a premium. In this case you will purchase new equipment from an authorized dealer. In this case I'd recommend MCM electronics (800-543-4330, [www.mcmelectronics.com](http://www.mcmelectronics.com)). They offer Fluke & Tektronix gear at non bargain prices. In contrast they offer some generic brands with comparable specifications at of course comparatively good prices. This is tempting but it simply is not in the same league as the name brand equipment.

This would not be my first choice - I'd rather do a little research and purchase the higher quality Tektronix or HP gear from a "reconditioned" supplier. One of the most popular suppliers is Tucker electronics ([www.tucker.com](http://www.tucker.com)). They offer fully guaranteed and fully reconditioned and calibrated test gear at associated premium prices. You could save more money and try some lesser known reconditioned test gear suppliers. If you take the time to visit the site <http://pw2.netcom.com/~sjnoll/usedequip.html> (the symbol ~ before "sjnoll" is a tilde) you will find a very long list of used equipment suppliers. If you take the time you will even find specs and photos of the equipment you are considering. Visit the Tucker electronics site ([www.tucker.com](http://www.tucker.com)) - well designed and full of information. A personal recommendation is AST Global Marketing (800-216-7159, [www.a-mall.com/testlist.com](http://www.a-mall.com/testlist.com)) in Pennsylvania. I have purchased perfect equipment from them at the most competitive prices available. Good service as well.

Finally there are the hamfests where it is possible to find the best bargains - but at a risk. Be sure to get the name of the seller and his / her address and phone number. Some will tell you that it is being sold "as is" - avoid this unless you know exactly what you are doing. Even an on the spot demo will fail to reveal all of the hidden problems. The risk is high but so are the possible rewards. Probably the best advice is to secure a genuine opportunity to return the item should it not meet condition as advertised.



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## Test Equipment

DESCRIPTION	MIN SPECS	CATAGORY
Digital VOM Fluke Series 70 Recommended Alternate - Used Fluke 8000A	0.5% Accuracy Diode Junction Test Capacitance (Not Essential) Good Test Probes	Essential
Oscilloscope Used Tektronix 465 Series Recommended	20MHz Bandwidth Dual Channel Triggered Sweep Probes (10:1)	Near Essential
Power Variac MCM # 72-110 Recommended	5 Amps Built In Ammeter	Near Essential
Test Oscillator (or Function Generator) Used HP 204C Recommended Alternate - Used Wavetek Function Generator	10 Hz to 100 KHz	Near Essential
Power Supply Low Voltage High Voltage (Lamda Model 71)	+/- 15 VDC Variable, 5 VDC 0-500VDC @ 200 mA	Convenience Convenience
Old SS Stereo Receiver & Test Speakers	10 WPC (Fuse the Speakers @ .5 A)	Essential Essential
Frequency Counter	20 Hz - 100 MHz	Convenience
AC Millivoltmeter Used HP 400F Recommended	1 mV Full Scale	Convenience
Transistor Tester	Signal & Power Bipolars J-FET's & MOS-FET's	Convenience
Capacitance Meter	20pf - 1000 uF	Convenience
Distortion Meter Used HP 331A Recommended	0.01 Full Scale	Convenience