The PL259, a Tale of Woe

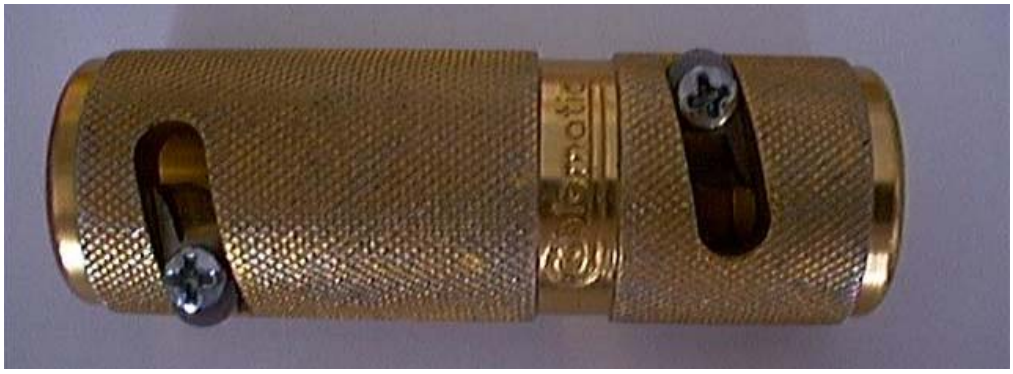
Alan Applegate (K0BG) on April 13, 2003

I'm one of those guys who buys premium silver plated PL259s and pays upwards of $5 a piece for them. While some amateurs might believe that my connector phobia borders on Barnum's "A sucker is born every minute", I think not, and I'll tell you why.

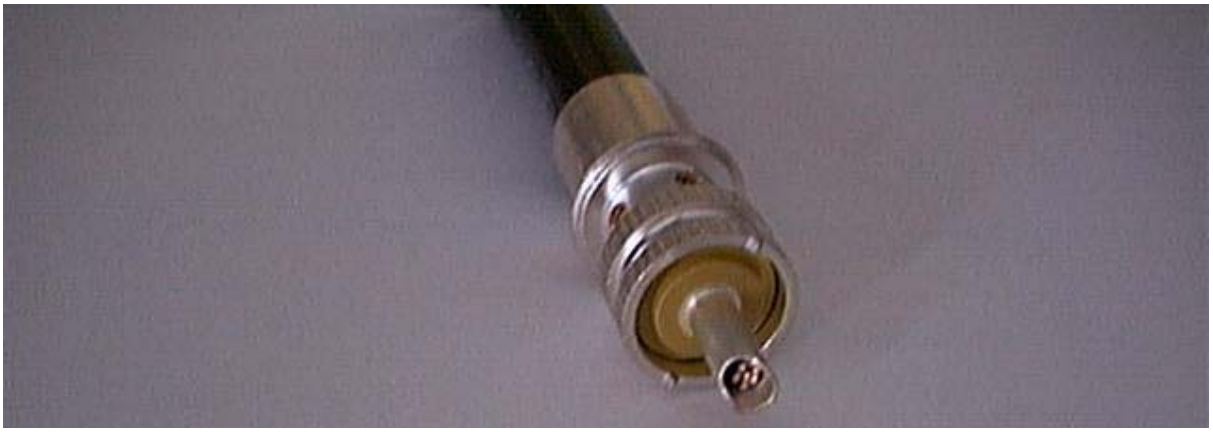
It is my humble opinion the single most prevalent problem amateurs face is caused by the ubiquitous PL259. They typically are poorly or incorrectly soldered (if at all), the coax preparation is almost never done properly, and the material making up cheap PL259s easily corrodes or rusts adding insult to an already terse situation. These situations result in blaming all matter of station equipment and antennas rather than the real culprit; the PL259. So this treatise is an attempt to address the situation by making a few pertinent suggestions. First, there are a few do's and don'ts which need to be discussed aside from the quality issue of cheap PL259s.

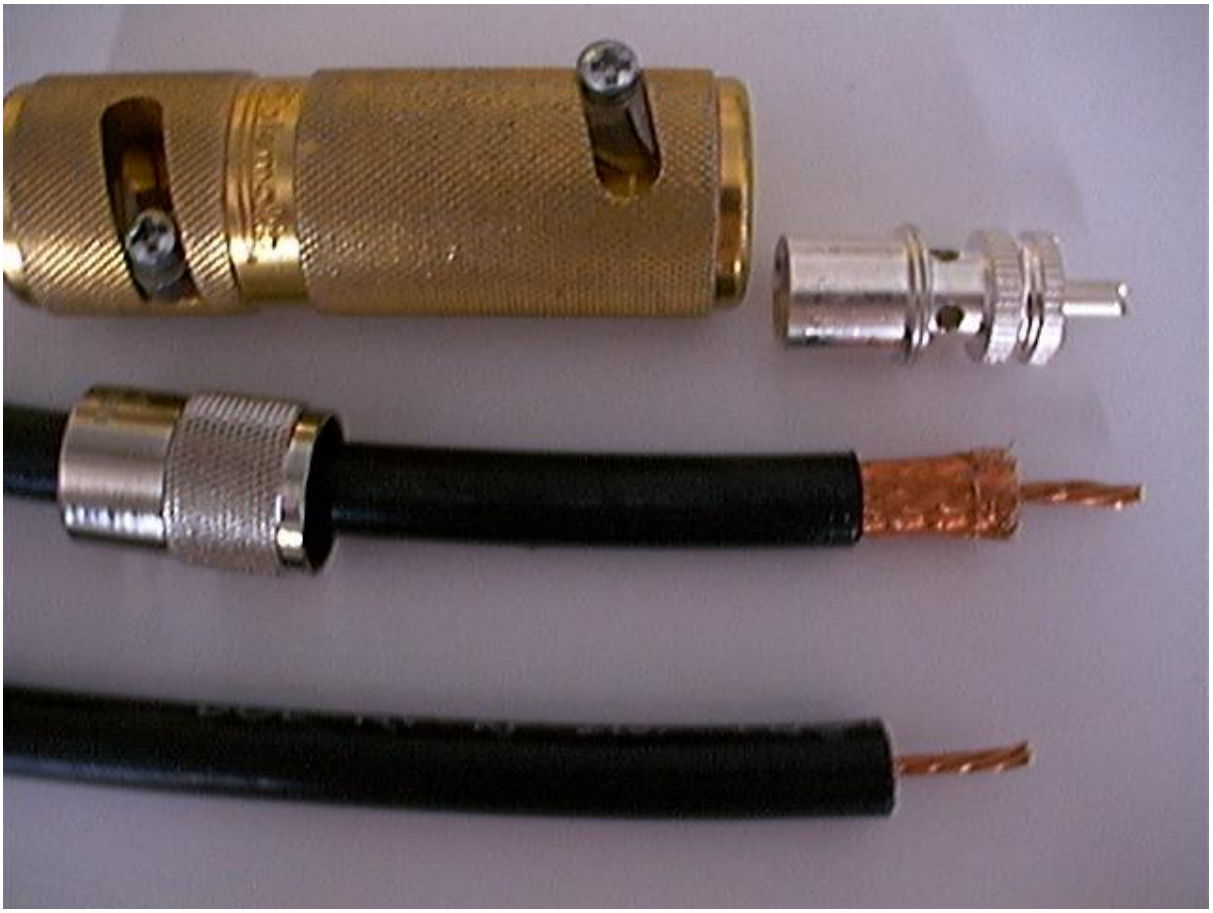
Never, ever use a soldering gun! Soldering guns have very little thermal mass and as soon as you touch the tip to a cold connector what little latent heat there is, is drawn away. While you're waiting for the material to get hot enough to melt the solder, the core is slowly but surely being damaged beyond use. Proper soldering of PL259s requires two soldering irons (more on this later).

Never, ever cut coax with wire cutters! Doing so distorts the core and the center conductor making installation of the PL259 body rather difficult. If you don't have a proper cable cutter, a heavy-duty box cutter with a new blade is your best bet. Lay the coax on a scrap chunk of lumber and tap the box cutter through the coax with a small hammer. The cut needs to be clean and even. Always use a coax cutting tool to prepare the coax for the PL259! The Cablematic® Division of Ripley Tools Corporation make the UT8000, a special coax cutter specifically for RG8U and RG213. (http://www.ripley-tools.com). The "First Cut" end cuts the coax outer jacket, shield, and core, but not the center conductor. The center conductor is cut to the exact length needed, 5/8".



Incidentally, the center conductor SHOULD NOT stick out of the end of the PL259 once it is installed, but just shy of the end (see picture below). This is the correct length! The "Second Cut" end of the tool removes just the outer jacket to the correct length, 5/8". Other companies make coax prep tools, but this one is the best. I've had mine 25 years and it has saved me countless hours in the mean time.

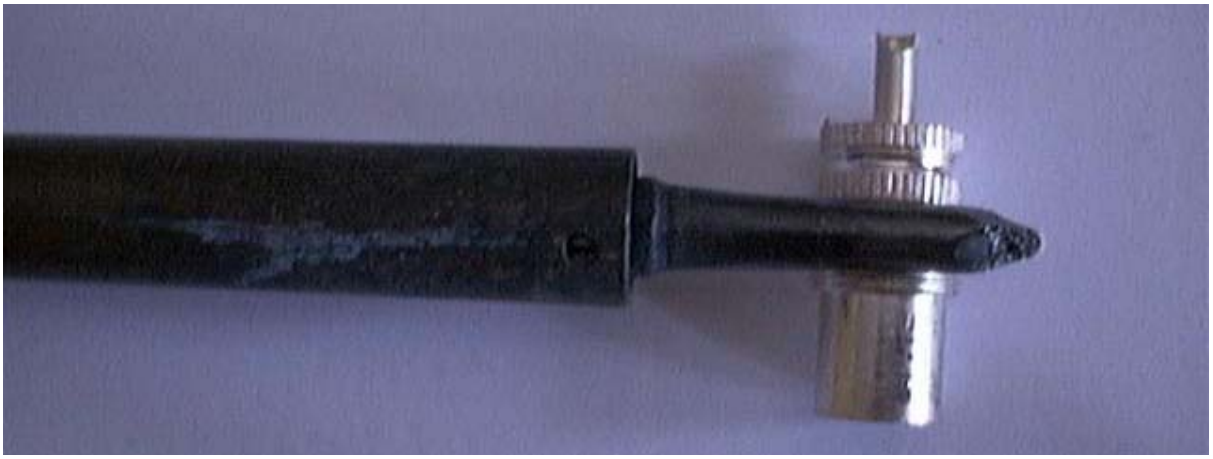




Always use good quality solder! I prefer Kesters 60/40 multicore because I know of its quality. That cheap stuff you buy from Radio Shack or Wal-Mart is not the solder of champions. I prefer the small .081 size but the .105 is okay too. Larger sizes tend to have too much rosin so I don't use them.

Now let's talk about the soldering irons. Two, count them two, are required. I use a Weller pencil type to solder the center conductor which incidentally should be soldered first. If you use good PL259s as I suggest, this operation takes about 10 to 15 seconds. Enough solder should be used to close the connector tip entirely to aid in keeping out moisture.

I use a modified 80 watt Weller SP80 iron to solder the body of the PL259. Big, ugly, but lots of latent heat to get the job done quickly! Its round tip is slightly flattened so it just fits into the groove of the PL259. I clamp the iron in the vise and rotate the work, not the other way around.



So we've got our coax prepped, our irons hot, and it's time to screw on the PL259. Remember slide the outer threaded barrel on to the coax first. I digress.

All too often I have seen amateurs cut the jacket away to the point the shield shows after assembly. This IS NOT the proper way. If you follow the cutting table listed in the ARRL Handbook, the jacket stripping length is too short, and on some PL259s, the jacket bottoms out before the core is snug against the back of the tip. Further, the jacket could cause contamination of the solder thus impeding its flow. Both good reasons for purchasing a proper stripping tool.

Make sure you put the threaded barrel over the coax and in the correct direction! Then carefully slide the PL259 body over the end of the coax and screw it down over the jacket. A small pair of channel lock pliers works well for this purpose. Once resistance is felt stop threading. And speaking of resistance, once you get connectors screwed on both ends is a good time to use your DVM or VOM to check for shorts between the center and shield.

With the center conductor should be just below the notch in the tip of the PL259, solder the tips with the small pencil iron and let them cool before soldering the shield. Again, enough solder should be used to close the end of the tip. Avoid slopping solder on the outside of the center pins.

Next solder the shields. If the soldering iron tip is well tinned, about 6 to 10 seconds later the barrel will be hot enough to accept solder. The solder should be applied just at the edge of each hole so it flows into the shield. Enough solder should be applied to just close the hole. Use too much and it could flow to the tip and cause a short. This operation should take about 20 seconds and requires both hands; one to apply the solder and the other to rotate the coax. Now you know why I clamp the iron in a vice. Once soldering is complete, it's time to recheck for shorts and continuity.

There! You have my secret.

Alan Applegate, KØBG

Member Comments:

This article has expired. No more comments may be added.

The PL259, a Tale of Woe
by KB0NLY on April 13, 2003
A good article with good information. Nice to finally read an recent article on here that is useful! I think i might have to get me one of them coax stripping tools. Do they make them for Belden 9913 and LMR-400 i wonder? Will have to go see.

I agree on the soldering gun is a bad thing, although a 120 or better wattage soldering gun will melt the solder just fine for most things they do no have enough thermal mass to retain the optimum temperate as you mentioned for a coax connector such as the PL-259. At least the radio shack ones and Weller ones that i have tried over the years dont, touch them to the room temp PL-259 and it sucks away all the heat.

I also use a two iron method, and agree in full with the way you do it. I do it almost exactly the same way except i dont have one of those handy dandy stripping tools!

73,

Scott, KB0NLY

RE: The PL259, a Tale of Woe
by KB0NLY on April 13, 2003
Oh and before i forget, how many times have you soldered on a PL-259 perfectly then notice you forgot the shield first! Boy i know ive done it at least a dozen times in the last 10 years. Almost once a year i bet!

73,

Scott, KB0NLY

RE: The PL259, a Tale of Woe
by WA9SVD on April 13, 2003
A comment:
You said that a good center conductor connection may in some way affect moisture protection or contamination ???
The PL-259 IS NOT, and never has been, (and probably never will be) ever purported as a waterproof, or even weather-proof connection! If it will be exposed to rain or weather for ANY period of time (and that means if the forecast means rain tomorrow!) the connectors HAVE to be properly weatherproofed!

The PL259, a Tale of Woe
by KU4BP on April 13, 2003
Nice article. Never thought of 2 irons and the cutter is definitely going on my "to get" list. Thanks for teaching me something new.

Ed Swiderski KU4BP

RE: The PL259, a Tale of Woe
by AC5E on April 13, 2003
One comment - the exact length of the center conductor is less important than it not protrude past the tip of the pin; and the critical part is to make abslutely sure any solder on the outside of the pin is removed so the pin diameter is not increased. Solder on the outside of the pin will distort the jack, inevitably resulting in poor connections.

And, FYI if anyone is interested, there are specialty solders that expand as the joint cools. While small quantities take a little hunting for, those solders will insure a snug wire-to-pin joint under almost all conditions. Those are the same solders tube manufacturers use to solder the pins on 3-500's - and that's the reason 60/40 generally does not do a good job there.

73 Pete Allen AC5E

RE: The PL259, a Tale of Woe
by K0BG on April 13, 2003
Larry, you are correct about the waterproofing, and I didn't mean to indicate that they (PL259s) are waterproof. Water resistant perhaps is a better word. But if you do a good job of soldering and the jacket is properly screwed onto the barrel, its ability to resist water is a whole lot better than some of the installations I've seen where the shield shows and the tip isn't soldered at all.

Alan, KØBG

The PL259, a Tale of Woe
by K3EDB on April 13, 2003
Thanks for the tips on the enervating Pl-259! This knowledge will definitely help get my signal out better!
I have found that I am using them more and more as my connectors.
I must say that I am also pleased at seeing more "information" dissemination appear in the articles section. The same old tired "argument" postings are great fun once in a while, but I'm here to learn!
I will reccomend this article to quite a few fellow hams!

73's! Eric K3EDB

The PL259, a Tale of Woe
by WB0BBC on April 13, 2003
Great advice Evan. I agree with your points. Can you write a similar forum article on installation of N-type connectors? I use these often on VHF & UHF.

73's,

Paul (WB0BBC)

The PL259, a Tale of Woe
by KN4LF on April 13, 2003
Good article. I do agree and have always used the teflon PL-259 assemblies myself, as you get rapid heat transfer and have a better chance of having success. Also I have always used a 100 watt soldering iron which makes two soldering irons unnecessary. I have been soldering for 40 years and have never had a problem soldering PL-259's or anything else. Soldering is an art that takes effort to master like morse code or anything else.

The PL259, a Tale of Woe
by WQ8Q on April 13, 2003
Great Article. I would like to mention that I found out the hard way that some PL-259s do mate mate properly with SO-239s because of a difference in the pitch of the threads. Some of the PL-259s marked "Made in America" seem to have this problem. I always try to use and match genuine Amphenol connectors and since I've done that I've had not one problem with loosening of PL-259s. In the Navy some years ago, as a Radioman, for any minor infraction of the rules, they would have us solder PL259 patch cords as punishment. Some of the fellows got quite good at it. I, of course, having never done anything wrong in my life (!), still to this day have trouble with those pesky PL259s.

The PL259, a Tale of Woe
by KE6PKJ on April 13, 2003
My preferance is to tin the center conductor before I insert it into the connector. This ensures an excellent solder joint to the tip of the PL259, then using an emery board I burnish off any rosin that may have collected on the tip to ensure a proper connection to the SO239 connector. Thanks for a great article.

A call for the end of the PL-259
by K3NG on April 13, 2003
This article brings up some of the shortcomings of the PL-259 connector. To summarize its disadvantages:

- It was never designed as an RF connector. It was meant as a power connector.

- It is not weatherproof.

- It is not a good consistent 50 ohm impedance. (It doesn't matter much at HF, though)

- The quality and specifications (or lack thereof) varies greatly.

Advantages of the PL-259 include cost and ruggedness, but that's about it.

I think the N connector should be made the standard for HF Amateur equipment. It costs a little more, but the quality is much better and it's designed to be weatherproof (although you should still weatherproof N connectors). I think the way an N connector goes together would prevent or at least discourage some of the sloppyness you see with PL-259 connectors. Of course, a lot of hams struggle with the PL-259 so maybe it's asking too much to move to an N connector :-)

RE: A call for the end of the PL-259
by AA4PB on April 13, 2003
For RG8 sized coax, my preference is to tin the braid and then cut it off to the proper length with one of the small pipe cutters. The tinned braid inserts into the PL-259 very nicely with no chance of frayed ends causing a short. The tinned braid also is much easier to solder to the connector housing - works great with a Weller 250 watt soldering iron. Use the larger size tip and make sure the connecting nuts are very tight.

My technique for waterproofing is to wrap the connectors tightly with plastic electrical tape and then cover with coax seal (duct

seal). I've had connectors exposed to the weather for 15 years. Pull off the coax seal, unwrap the tape, and everything looks bright like the day it was put in.

RE: A call for the end of the PL-259
by KD2E on April 13, 2003
I agree with AA4PB on the use of a BIG gun (250W).
This allows soldering right away. I would not use an iron as it requires too much time with heat applied. Also, a very small file set is handy when using other than silver or gold plated connectors. The nickel plated ones do not take solder very well and again, require too much heat when soldering the shield holes. Roughing up the area with a file takes care of that problem. Also, they are useful for knocking off any rosin that ends up on the tip.

The PL259, a Tale of Woe
by AC5UP on April 13, 2003
Coulpa' points...

I'm in full agreement with those above who mentioned they tin both the braid and stranded center conductor before threading the connector body. A light tinning is all it takes as this adds some rigidity, reduces the chance of an internal short from a stray strand, and definitely promotes a clean solder filet between the braid and shell.

Clamping the iron instead of the coax is a useful idea provided you take care in handling the coax... Keep your hand about a foot away from the end to avoid deforming the coax while it's soft, and make no sudden moves before the solder hardens completely lest you encourage some hairline internal cracking.

Also, have you tried a 3M ScotchBrite pad for the final clean-up of the center pin and shell? Minimal grit and they last (almost) forever provided you wait until the connector cools. Also does a dandy job in cleaning a cold soldering iron tip (but a hot tip will melt them). Next time you're at the local Handy-Guy store, check them out in the paint department. I like the pads that are equivalent to 00 or 000 steel wool. They work well for light rust removal and surface prep prior to painting as well as knocking the glaze off of rubber idler wheels and such... Just go slow with a new pad as they have a suprising amount of cutting action.

- AC5UP

RE: The PL259, a Tale of Woe
by K1CJS on April 13, 2003
I am in agreement with almost all of your article, but using a box cutter knife and a hammer??? I would never recommend using that method as the braid could be damaged.

As you say, a good co-ax stripping tool is worth its weight in gold--use that and you'll never have to end up (no pun intended) redoing that connection.

RE: The PL259, a Tale of Woe
by KA4KOE on April 13, 2003
If you want more woe, then buy the garbage PL259s Radio Shack is selling. When they quit selling amphenol and offered those connectors with the clear plastic ends, it was a dire warning that we are about to enter the end times.

REPENT!!

Philip

The PL259, a Tale of Woe
by AA3WS on April 14, 2003
Nice Job. I like the two solding irons suggestion.
73's
Charles AA3WS Extra Lite

RE: The PL259, a Tale of Woe
by VE6XX on April 14, 2003
Greetings All: Informative article! I agree completely with AA4PB & have installed connectors that way for years. The comments regarding filing the nickel connectors is alsp good. I usually use a drill bit or a deburring tool to hog out the braid holes in order to remove the nickel plating. A little solder and the Weller 250 watt soldering gun & voila! Takes only a couple of seconds. I avoid

using the damned PL-259's where possible. The comments on how poor a connector it is are correct. The RCAF (Canadian Air Force) years ago published a report on connectors & the RCA phono plug had a much better constant impedance plot than the wretched PL-259. I had never heard the story that it was designed as a power plug, & I sure would like to know the source of that story....it doesn't make much sense, but then the military was likely involved!!!
Thanks for the helpful info guys.

CHEERS! Brian, VE6XX

The PL259, a Tale of Woe
by K9KJM on April 14, 2003

Great article. I agree with AA4PB, Tin the braid, Then cut off with a Stanley type handy knife. (Sharp)

The big secret to this type of operation is to let the coax COOL for plenty of time before trying to cut the braid..... Otherwise the dielectric will get mashed out of shape.
I
agree that small gun type solder irons are no good, BUT large gun types work good. High quality solder should always be used, not just for connectors! Cheap junk solder will cause problems.
The price paid for the connector seems to have no relation to how "good" it really is..... Tower Electronics sells "discount" silver plated PL 259 connectors with a teflon center for about 1.00 each in quantity. These connectors are GREAT!

Some "discount" places sell nickel plated connectors with plastic centers for over 3 bucks each that are just junk!

No question that having the special tool to prepare the coax is nice. But If enough time is taken to carefully prepare the coax with a sharp knife, A quality job can also be done. Just takes longer (And is harder to do)

At any rate, Some other posts are also correct that PL 259 connectors should really be phased out. Switch over to type "N" Now that the newer two piece "N" connectors are available at a reasonable price. And they are about as easy to install as a common PL 259..... type N is nice for use at lower frequencies, And mandatory at UHF!

The PL259, a Tale of Woe
by K2LAM on April 14, 2003
A excellent and very informative article. My soldering techniques are horrible to say the least. Great pointers and comments from the others as well. Tnx,
Lenny K2LAM

The PL259, a Tale of Woe
by K2GW on April 14, 2003
If folks don't have the expensive, special purpose stripping tool you mention, they can substitute a common plumbing pipe cutter that they might already have around the house. Rotating the pipe cutter around the coax produces a straight, uniform score in the jacket which then can be followed with a utilty knife to carefully finish the cut.

The exposed shield can now be lightly tinned and cut just like tubing with the pipe cutter to the approriate length. The utility knife can then be used to again finish the cut and removal of the dielectric.

73

Gary, K2GW

The PL259, a Tale of Woe
by NK7J on April 14, 2003
Ok let me first say I HATE solder style PL-259s. Being in the two-way arena for some time now I have put on LOTS of them and let me say they should have been phased out with the 8-track. N connectors are far better and easier to install (imho). In recent years I have went back to CRIMP connectors for both N and PL. I know some of you are thinking "oh no crimp is no good, they corrode, make poor connections, yada yada yada" , HOGWASH. Here is why I believe the cimps work just as well if not better. I recently replaced some rg-214 on a couple sites with hardline. This RG-214 had been there for over 25 years and never cuased a bit of problem. After it was removed I noticed that the PL-259s were not solder but crimp style. They were amphenols and you could tell they used the old style AMP crimpers to put them on with. I diligently cut one in half to see what it looked like inside to see how much corrosion had taken place. Guess what, there was NONE, zero, nada, well you get the idea. I cut several of them apart and found the same thing. These were on a mountian at 8,000+ ft in the harshest enviroment you can imagine and did not

fail. Made me a beleiver in them. They were of course properly sealed but you have to do that with the solder ones too.
Of course to do crimp on you have to buy a cimp tool, and you can easliy spend $100 on that. But if you install any amount of them after about five connectors you will wonder why you had not done it before. It makes the job soooo much easier and with far less mistakes.

God Bless,
Jack NK7J

RE: The PL259, a Tale of Woe
by WB2LCW on April 14, 2003
I rub the Jacket of my coax with a block of wax.A one pound package costs about seventy cents.I heat the wax slightly with a hair dryer to soften it then rub it on the the three quarters of an inch that goes into the connector. The body of the connector will thread on to the jacket with very little effort.I also pre-tin my coax shield before assembly I use a sharp utility knife
to trim the cable.Correct! use good solder! Some people also enlarge the solder holes slightly..

73 Mike

RE: The PL259, a Tale of Woe
by WB2WIK on April 14, 2003
I might just add:

Tinning the braid of coaxial cable is often a very poor idea, because that places soldering heat (often 700 degrees F) right against the cable dielectric, which will reflow at less than 400 degrees F -- often, much less. Nowhere in the original Amphenol applications notes, or in the military digests for coaxial connector assemblies, is it recommended to pre-tin coaxial cable braid, and that's for good reasons.

Pre-tinning and then using pipe cutters, etc. is also a really bad idea, usually. It probably works okay with very robust coaxial cable like RG217, RG218, RG17A, and PTFE cables like RG142, RG400, etc (which don't require any pre-tinning, since their braids are already silver-plated copper and solder flows to the silver easier than it does to SnPB), but it's best to avoid cutting the "softer" cables we hams frequently use (RG8X, LMR400, BuryFlex, etc) with anything other than a professional coaxial stripping tool or a single-edged razor blade -- you need to use something very sharp and very thin that will slice right through the material being cut, without having to apply much pressure. The cutting "wheel" in a pipe cutter just doesn't do it.

As for the proper sequence for soldering a PL259, while the article suggests soldering the tip/center post first, there are some valid reasons for actually doing this last:

Cable dielectrics are many and varied, and behave differently, with different thermal expansion coefficients. But one thing for sure is that most all dielectrics used in coaxial cables have a notable and positive tempco, meaning they expand with heat, and contract with cold.

Thus, if you solder the center pin first (which requires little soldering heat or prolonged exposure, since the materials being soldered have very small mass), you have now "captured" that dimension inside the connector. Applying the substantial soldering heat required for the connector body-to-shield soldering operation will cause the dielectric to expand, making it protrude beyond its original location, thus trying to "push" the cable out the back end of the connector -- which it will likely do to some extent, despite its center conductor already being captive inside the PL259 center pin.

When this occurs, the cable is attempting to self-destruct from mechanical forces. In some cases, it will even push the dielectric material in the PL259 connector straight on out of the connector end, rendering a damaged or useless connector -- and all because the center conductor was soldered first.

I'd prefer to solder the body-to-braid connection first. That applies the most amount of heat, for the longest time, of the operation. If the cable dielectric tries to push the cable back out of the connector slightly -- which it will -- that's perfectly okay, because it's free to move about until the solder captivating the braid is cured and hardened.

Then, I let the connector body cool off, so the dielectric materials in both the cable and the connector have reformed to their original dimensions and states -- and *then* solder the center pin.

Having soldered countless thousands of PL259s over about 40 years, and having tried about every approach there is, this method seems to cause the least amount of damage and produces very high production yields with almost any type of coaxial cable.

WB2WIK/6

RE: The PL259, a Tale of Woe
by AA4PB on April 14, 2003
I've been tinning the braid and using a pipe cutter on various types of good quality RG8 type coax for the last 20 years - never had a problem with it damaging the insulation. A good (new) pipe cutter does have a very sharp edge on it. It can even be used to slice most of the way through the insulation on the center conductor. Not that there's anything wrong with the specialized tool - but there are other ways that work if you don't have one available.

The PL259, a Tale of Woe
by N3IZN on April 14, 2003
My first job out of the military was with a radio shop of a major radio manufacture. This was in the mid 1980s and they had fleets of 800 Mhz systems using the PL-259 connectors. After dozens of bench checked units with the remarks “NTF” for no trouble found we had to dig a little deeper.

The antenna match checked out fine on the Bird but it was discovered the PL 259s were poorly soldered. So the newbie (that would be me) was tasked with redoing or replacing hundreds if not thousands of PL259 at the customers location. It was done at first just to say they were doing something not because it was thought to be a problem.

After I did a few small fleets the complaints dropped dramatically and even praise for the “new guy” started to come in. All I was doing was replacing the PL259s. Mind you the PL259 should never have been used at that frequency but it was.

Just thought I’d share that.

The PL259, a Tale of Woe
by WY7I on April 14, 2003
A fine article. But - thermal mass?!?!?!

RE: The PL259, a Tale of Woe
by WB2WIK on April 14, 2003
AA4PB: I believe you.

However, "good quality RG8" is difficult to define. Is Times Microwave LMR-400 *poor* quality RG8? Maybe so, but it's very popular, and has a lot less loss than old-fashioned MIL-C-17 RG8A/U has. So, hams use miles of it. And it *cannot* be assembled as you describe -- it squashes flat under just a pound or so per square inch of applied pressure, since its dielectric contains lots of air. Also, there would be absolutely no reason to tin its braid, since it comes factory-supplied with tinned copper braid.

Ditto for Belden 9913, CableXperts CXP1318FX, Davis BuryFlex and many other high-quality, low-loss "RG8 type" cables.

MIL-C-17 RG214A/U, the silver-plated, double-braided version of "RG8" also requires no braid tinning -- comes already done, right from the factory.

RG8X, on the other hand ("mini-8") is normally bare copper braid and looks like it might be nice to tin it, but if you do so, you'll melt the cable during the operation. It flows at 105 degrees C, well below the melting point of solder (230 degrees C for 60/40 Pb/Sn).

WB2WIK/6

RE: The PL259, a Tale of Woe
by WA1WLA on April 14, 2003
Rule #1 (my rule) Never use a PL259 when you can use an N type.
The N type is easier to install is waterproof and doen't have an impedance bump.
PL259 goes with RG8-U, a very poor combination to connect to an expencive radio.
WA1WLA

RE: The PL259, a Tale of Woe
by KZ9G on April 14, 2003
I always apply a quality paste or liquid flux to the braid prior to tinning. Why? It make the tinning process easy...requiring less

heat (time applied) by enabling a wicking action throughout the braid. Just be sure to clean up excess flux with some alcohol prior to screwing on the 259 plug. The same holds true for the solder through holes around the plug, with maybe a smidgeon in the hole after it's screwed on. Again this makes the heat necessary for great solder flow MUCH less than without it. One more thing, ensure that all your solder connection areas are clean, bright and oxidation-free prior to applying any heat. These comments come from one who spent a FULL DAY in a class room learning how to properly tin wires in a Federal, NASA certified, High Reliability Solder Course. Get this - the instructor used a magnifying glass to inspect the tinned wires for nicks from stripping, proper coverage, and spacing between where the tinning ended, and the insulation began. He was actually teaching us how to be picky and precise... Luckily, the course moved on from there.

WB6WIK's comments are always insightful. As he states, many of the newer cables out there just won't mate well with the PL-259. For greatest reliability and least fuss, I've found myself using quality RG-213 for HF, RG-223 or RG-214 for flexible lines needed in a VHF repeater environment, and just using various sizes of Andrews "LDF" or flexible "FSJ" Heliax for those longer runs. As most of us know, Andrews' Heliax and connectors are hard to beat. And yes, they sell a block type stripping tool for Heliax, too!

My general rule of thumb: For all around use on the 50 MHz and down, stick with good RG-213. It'll handle most the heat and the RF power thrown at it - unless you go overboard. 73.

RE: The PL259, a Tale of Woe
by KZ9G on April 14, 2003
I forgot to mention... I use an telecom technician's scissors to precisely cut the braid, evenly and undisturbed, 1/16" back from the lip of the opaque dielectric. Then, I add flux and tin the braid. 73.

RE: The PL259, a Tale of Woe
by WD5DBC on April 14, 2003
And people wonder why Heath used the RCA connectors instead of PL259s.

WD5DBC
"One of the Hams at Heath" 1977

RE: The PL259, a Tale of Woe
by K0BG on April 15, 2003
Steve's (WB2WIK) comments about soldering the braid first, then the center conductor has merit. It's also a moot point.

What I don't agree with is the use of any liquid or paste pre-fluxing, or pre-tinning. First, any product which remains behind (too much flux, alcohol residue, whatever) will do nothing except invite corrosion and/or contamination; some long term, some near term. Secondly, as Steve points out, once the dialectric is heated to near flow temperatures, reheat flow temperatures are lowered. So when you reheat it again to solder on the PL259 you're redamaging the dialetric and could do so beyond use.

One of the easiest ways to check assembled coax for dialectric damage is with a megger (specialized ohm meter) (or TDR if you're lucky enough to own one). If there is dialectric damage, a megger will find it post haste.

Alan, KØBG

RE: The PL259, a Tale of Woe
by WB2WIK on April 15, 2003
Alan, the "Megger" is a good suggestion, and a whole lot cheaper than a TDR. However, a TDR won't find the problem of a dielectric that is just about to break down, but hasn't yet. The TDR will only determine if there's a "bump" in the line, and if so, where it is. A network analyzer, or even a good dummy load and SWR bridge, will yield most of the same information, without specifying the location of the bump.

Since the PL259 is not a constant-impedance device and shouldn't be used at UHF-SHF anyway, I don't particularly worry about the "bump," or any change in system Z which occurs by the use of a PL259 -- it's irrelevant 99% of the time because the connector is too short (in wavelengths) to make any difference. But, a damaged dielectric which is on the verge of flashing over is something that only high powered operation, or a Megger or Hipot tester, will find.

The leading cause of failed installations is improperly installed connectors, for sure. I think the second leading cause is damaged cables, with the damage occurring during the installation itself -- and some of that damage occurring during the connector soldering process. The "foam" dielectric cables, all of which are rated for much lower DWV (dielectric withstanding voltage) than

the "solid" dielectric cables to begin with, are easily degraded to nearly nothing if they are overheated. While RG213/U can handle 1500V easily, the soft, low-loss equivalents are mostly rated for only 300V, if they're rated at all. (A "full legal power limit" rating means nothing with regard to voltage, and it's voltage that causes cable breakdown.) 300V is dangerously close to the actual operating voltage encountered during 1500W PEP operation in a perfectly matched (VSWR = 1.0) system. At VSWR = 2.0, the 300V can be exceeded -- and that can damage brand new, previously undamaged cable.

WB2WIK/6

RE: The PL259, a Tale of Woe
by WA9SVD on April 15, 2003
I agree with WA1WLA. I use "N" connectors wherever possible, short of replacing the connectoer on equipment.
The biggest problem is that the PL-259 is an OLD design, dating from the earliest times of coax cable, when the construction materials of that cable was more heat tolerant. The current foam insulation wasn't even a glint in the eye of engineers when coax was first invented. The other problem is that the PL-259 connector is cheap and easy to manufacture. So the onus is on the installer to properly install the connector. Perhaps we need someone to design a new type connector?
Short of standardizing on something like the "N" connector, I'm not sure there is a solution. And as a final comment, there are "N" connector designs (that are an abomination upon Ham Radio) that are similar to the PL-259 that require soldering the braid, and likely to cause the same amount of damage.

The PL259, a Tale of Woe
by AA3YE on April 15, 2003
Great Info Alan. I too have had my share of problems with PL259's. I have about a half dozen that I keep around just to remind how bad of a job I did. Although, I don't like the crimp on PL259's, I don't soldier the braid, I fold it back on the outer jacket of the braid insulation. This forms a pseudo compression fitting, holding the braid (all of the braid) in contact with the connector, but not in close proximity to the center conductor where you might have a problem. One of my friends told me to do it this way and so far I have had no problems. The procedure I use is as follows:

1. I remove 1 3/4" - 1 13/16 " of black outer jacket insulation from the braid using a razor knife.

2. I place the outer part of the connector on the coax

3. I then cut a longitudinal slit in the braid to facilitate folding back the braid over the outer jacket (black insulation) of the coax. Leave at least 3/4 " of intact braid. The slit can be upto 3/4 " - 1".

4. After folding back the braid, remove 1 7/16" - 1 1/2" of the insulation around the center conductor with a sharp knife cutting on an angle towards the end of the conductor.

5. Feed via twisting the center conductor into the conector.

6. Trim off any excess braid sticking out past the connector with mini side cutters or finger or toe nail clippers.

7. Trim off any excess center conductor sticking out of the connecter.

8. Soldier the center conductor/connector.

9. (OPTIONAL) Test cable with Ohm meter for shield to center conductor short and conductor to conductor conductivity.

Your done.

Probably this procedure is not according to "Hoyle" or the ARRl Handbook, my apologies to all card players, but it does seem to work quite well. Would be curious to hear if anyone uses the same or similar technique and what their success or failure rate is. Also would be interested hearing any potential problems this technique might envoke that I haven't experienced yet.

The PL259, a Tale of Woe
by NW0LF on April 15, 2003
I use the same method as AA3YE does. I have been doing it since my CB days, 30 years ago. Sure I make mistakes, no one gets it perfect 100% of the time, but I rarely have to redo a connector. Instead of using a high wattage soldering iron, I use one of the small pocket butane torches(not RatShack) set to low flame to solder the braid. I get a better solder connection that way. I still use a small iron to solder the center connector.

" I love the smell of solder in the morning!"

73, Tom, K9WLF/4

RE: The PL259, a Tale of Woe
by WB2WIK on April 15, 2003
AA3YE, there's all sorts of things wrong with that approach; however, if it's working for you, there's no point in arguing about it!

One thing that you might consider, however, is that by taking the assembly approach you have, you have completely violated the design intent of the mechanical interface of the PL259, which is that the internal screw threads in the back end of the connector body are intended to tightly screw on to the jacket material (PVC, polyethylene, etc) of the coaxial cable, assuring a very strong mechanical connection that cannot be broken by linear force. The only way to "pull off" a properly installed PL259, even before it's soldered at all, is to unscrew it.

By covering the jacket material with the cable's braid, that integrity is completely lost and you have a weaker installation that I'd bet I can pull to destruction with my bare hands.

(And, of course, any weatherproofing designed into the connector is lost as well, since you've left the four body solder holes empty. And, of course, any impedance integrity provided by the connector design is also lost, since you're terminating the center conductor and the outer conductor in two different locations, in a non-coaxial manner.)

WB2WIK/6

RE: The PL259, a Tale of Woe
by KZ9G on April 15, 2003
I'll agree to disagree with K0BG's objection to the use of electronic flux and the alcohol used to remove flux residue. NASA and other federal agencies have liberally used flux, and alcohol to remove it, for decades. My formal, federal soldering training supports and encourages its use on circuit cards, etc. Moreover, I've cut open PL-259 connectors on a few of my old, short (3-6') RG-213 jumper cables from the late eighties to look for any negative effects of my government trained methods - none found. This is after many weekends of contesting kilowatts flowing through them at K5TYP and my own station. The key is to have fantastic electrical and mechanical connections without cable dielectric meltdown because of too much heat being applied. Proper use of electronic flux tremendously aids in tinning of any copper conductor. As long as one removes the bulk of the flux with alcohol, issues shouldn't arise in electronic environments.

RE: The PL259, a Tale of Woe
by K0BG on April 15, 2003
Steve, KZ9G, it depends upon what you use for alcohol. Certainly not rubbing alcohol which has oil and other denaturing ingredients; certainly not methanol which will in short order attack both the jacket and dialectric of RG8U; and not ethanol for the same reasons as methanol. Yes, alcohols do have their purpose in defluxing circuit boards, but not coax connectors.

And for those who insist on using solvents (alcohols) should be so lucky as to own a megger (specialized ohmmeter). Because if there is contamination, it'll show up. And contamination is there whether you see it on your VSWR bridge or not.

And the thought of folding back the shield brings shudders to these old bones. It was in fact, this very practice which drove me to write the article in the first place.

For those lucky enough to have a TDR (time domain reflectometer) and checking such assemblies as described above will quickly show up any irregularity. And trust me - they are there whether you see them on your VSWR bridge or not.

Alan, KØBG

The PL259, a Tale of Woe
by AA9KK on April 15, 2003
Never did this myself but has anyone tried resistance soldering equipment to solder the PL-259 braid holes? What brand equipment was used and what are your "secret" techniques? I'm thinking of going this route. All comments welcome.

RE: The PL259, a Tale of Woe

by WB2WIK on April 15, 2003
KZ9G and the "flux issue:" interesting.

The "NASA and other agencies..." statement doesn't mean much, though, does it? The only actual production facility NASA has is here at JPL in Pasadena, and that's run by engineers mostly without any standards organization since technology changes too frequently to develop standards. I don't recall seeing any PL259s in use in my thousands of hours there, other than maybe in the W6VIO ham club station.

The NASA/government stuff got me chuckling a little bit. I remember that I was supplying some very expensive axial-leaded components (high voltage rectifiers at a cost of $200 each, used by the hundreds in defense satellite systems) to a well-known defense contractor who was building the latest-gen satellite systems in Pennsylvania under a USAF contract. They had a little problem, in that every single $200 rectifier they installed had failed every time they applied power to the system. They called me in to see what was going on.

And, what was going on was that their line technicians, who all had hundreds of hours of military training in electronic assembly for aerospace systems, would dutifully solder in all these high voltage components on beautiful little Teflon turret standoffs, and then, noting that the components weren't quite in a straight line, would twist each part to make it line up perfectly with the next one.

Of course, that last little "twist" completely broke the hermetic seal on the part, and they were dutifully destroying 100% of the parts.

But, they were following some mil-standard regarding electronic assembly techniques. At least the training must have been very thorough, since they were all doing it the same way!

WB2WIK/6

The PL259, a Tale of Woe
by KD5ING on April 15, 2003
Great article.

This is just the kind of thing I look for in a ham related site. Great stuff for us new kids on the block.

Thanks for the lesson!

Tim Lewallen
KD5ING

RE: The PL259, a Tale of Woe
by KZ9G on April 15, 2003
Hi Steve:

Your story makes me smile, too! I've always thought that rigorous training served me well for years as a repair technician/contractor repairing Air Force and FAA radio-electronic gear ranging from multi-layer printed circuit boards to Collins URG and HF-80 high frequency radio equipment at the 3 and 10 KW level. Where else are folks going to get such training? Gee, do they even teach such things anymore in the civilian world, do they? It's highly doubtful. In fact, I tend to believe the government is the only org that's still repairing electronic circuit cards and gear at the component level. It's a lost art in the making...

Transitioning from the government electronics industry to the civilian one (telecom engineering) has been quite interesting for this young guy. I'm in my late 30's...and it's been neat to compare and contrast the differences in methodologies spanning decades (government standards and equipment tend to lag by 20 years, or more, behind current electronics). And, yep, you're right - mil-spec electronic standards are certainly different, and not always better. Also, I'd like to think I've grown way beyond those line or assembly technicians mentioned, who probably had their line supervisor instruct them to mount the component the "standard" way!!! Did you talk have a chance to with the line super? Anyway, I cannot imagine a situation where a little flux didn't aid in the creation of a electrically & mechanically sound solder joint. One that was once cleaned up with a flux remover or alcohol, looked just like any other connection on a board (or whatever). It works for me and RF connectors.

Whose going to start a thread on N type connectors and their issues? I hear respected types saying they won't handle high power

like the PL-259. Who will do it? 73.

RE: The PL259, a Tale of Woe
by KZ9G on April 15, 2003
Hi Alan:

I'm not a chemist, so I can't speak on any delayed RG-213 dielectric reaction to a short-term exposure of flux and denatured alcohol. I only know what I've viewed after cutting up two RF "jumper" cables I put together 14 years ago - or nothing abnormal. I do not have a high-voltage "megger" at the house, so I can't crank one to test their insulation resistance (leakage). But, I do know they have handled legal-limit power on our HF bands for this period. It's quite possible that I've been quite lucky with my method. Though, so far-so good...

Can a chemist please chime in on the long-term effects of short-term exposure? By long-term, I'm talking the 10 to 15 year lifespan of my feedline.

As usual, this is a great discussion board. I've always appreciated the articles and thoughtful discussion on eHam – especially yours!

RE: The PL259, a Tale of Woe
by KZ9G on April 15, 2003
This may be helpful...

A moment after the solder has solidified on a PL-259 connector, I apply an old, wet washcloth the exterior of the connector. This helps draw out that heat that may damage the dielectric, etc. I'm not saying to dip the connector in water...or to apply a dripping wet washcloth that will let water intrude, just a damp one for the withdrawal of heat. Remember that the solder may still be liquid around the braid (underneath), so wait a moment after you see the exterior solidify. The assembly shouldn't be too wet when you're done. Just dry it off when complete. Again, this works for me...

RE: The PL259, a Tale of Woe
by W1EBI on April 15, 2003
This may hold the Guiness record for the longest thread ever on eham.net, and I'm sure it's not over yet. Really good stuff that I've hoped to see as long as I can recall on the subject of the most unpleasant (to me) part of ham radio: soldering PL259's! If I had not done so already, it would have convinced me to become a $$ contributor. Thanks to all.

W1EBI

RE: The PL259, a Tale of Woe
by WA9SVD on April 16, 2003
Alan (K0BG)

Ordinary rubbing alcohol (isopropyl alcohol; aka isopropanol) does NOT need denaturing agents because it's toxic already. And it may or may not contain other additives such as oils. (The cheap stuff probably doesn't have anything else in it!) But at 70% alcohol it's not strong enough to do a thorough job of removing flux. And any flux removal agent should ONLY be applied to metal parts (so you can't get sloppy) so with proper care, I see no harm in using ethanol or methanol to remove rosin flux, as it should never come in contact with the plastic insulation. Just MY way of doing things. Other people's mileage may vary.

RE: The PL259, a Tale of Woe
by WB2WIK on April 16, 2003
KZ9G (Steve): Ordinary "radio solder" 60/40 or 63/37 as most of us use daily (Kester or Ersin) already has a rosin core, which is mildly active flux that is there to aid in efficient wetting of materials. I don't see any reason to use more flux than that, and never have with connectors.

Regarding the power handling of Type N vs. PL259, this has been pretty well researched and there's little doubt that well-mated PL259s can handle more power than the Type N, with key words being "well-mated." In both cases, the weakness isn't the male plug, it's the female receptacle. That's because in both cases, the male plug has a large, solid circular pin but the female receptacle is a 4-prong spring-tension receptor for that pin. Once any (or all) of the prongs are forced out of normal position or lose their tempering, all bets are off with regard to continuity and current handling.

With all new components and nothing bent out of alignment, the PL259/SO239 combination can handle more than 20Arms RF current, which is a rather whalloping amount of power in a 50 Ohm system (20 kW); as such, it's likely to suffer dielectric

breakdown from excessive voltage stress before it fails from conductor heating. The UG21/UG23 (Type N) combination can handle about 10Arms RF current, or about 5kW in a 50 Ohm system. Those current ratings are based on pin size, nothing more.

WB2WIK/6

RE: The PL259, a Tale of Woe
by WA9SVD on April 17, 2003
I agree with Steve (WB2WIK) that properly installed "N" connectors can handle at least Amateur legal power limits (at fairly well matched limits.)
But regardless of the type connector, it should be remembered ALL coax connectors are electrical connectors only, and should NOT be relied upon for any physical strength. (This from my trying to tell a bunch of electrical engineers, at a past Field Day, that they could NOT pull a 6M beam up four stories to the top of a building using only the coax feed line. Needless to say, I no longer participate with that group on Field Day; it was MY beam, MY coax feedline, but the "engineers" knew better, and no offer to be compensated for the replacement of bent elements and ruined connectors. And never getting on 6M for Field Day that year, missing some good band openings.)

The PL259, a Tale of Woe
by W9QKF on April 17, 2003
Has anyone found a good source for the Cablematic UT8000? The Ripley Tool Co.has a minimum order. Cost?

The PL259, a Tale of Woe
by KD6NXI on April 17, 2003
No, a soldering gun is EXACTLY what you need. Or a hand torch. Soldering the outer shield is the most frustrating part. If you even get a few threads soldered to it you're ahead of the game. So if you have nice hefy 75 watt gun or more like those you can get cheap from harbor freight you'll be doing ok. If you try to solder that thing with a pencil iron or similiar you'll be pulling your hair out. As far as removing the jacket goes, assuming you don't have one of those expensive tools, just use the tip of a soldering pencil and work your way around the jacket with it and then one long line down to the end out out. If done right you can just pull the jacket away at this point. There is not much if any smell associated with doing it this way and as long as you use a wet sponge with your iron to regularly clean it it won't get fouled.

The PL259, a Tale of Woe
by WA8VZQ on April 17, 2003
To the group,

Regarding soldering PL-259 connectors, I thought this would be an appropriate post.

It is not uncommon for me to assemble large quantities of N type coaxial connectors in a year in my job as an electronics tech for the FAA.

We do some very precise cutting of coaxial cable to specific electrical lengths. Poor soldering techniques can cause significant changes in the electrical length. (Try cutting multiple lines within
a few 10ths of a degree length of each other at VHF frequencies and then put connectors on each end and have them still be the same electrical length. It can be quite an art form ;-))

Here is a proven method we use to solder the pin connector on N type connectors using Weller type soldering guns. The usual disclaimers apply.

1. Remove the copper tip and the nuts from the soldering gun and throw them away.

2. Carefully wedge the pin of the N connector between the two posts of the soldering gun. (It can be a tight fit depending upon the gun)

3. Place the pin onto the prepared center conductor.

4. When the trigger is squeezed, the current that would normally flow through the copper tip now flows between the two posts through the pin - the pin gets very hot, very quickly. Now apply solder to the hole in the side of the pin.

5. Release the trigger and hold until properly cooled.

There are several advantages of this technique:

1. There is absolutely minimal chance of cold solder joints because the entire area between the tips gets uniformly hot. When using a gun or using an iron in the normal fashion, each side of the tip receives
different amounts of heat because heat is only applied to one side of the pin.

2. There is minimal transfer of heat to anywhere else. i.e; the center conductor insulation does not melt and the center conductor stays exactly in the center.

3. There is no chance of solder contamination of the pin caused by the pin slipping around on the tip while being soldered.

4. You will rarely loose a pin by dropping it. It is held securely by the two tips of the soldering gun.

5. Because you are using less heat, nothing gets too hot to handle.

Now the good news - you can do the same for PL-259's - works great on the center pin. With a little practice, you can also do the shield by pressing the posts of the soldering gun against the PL-259 body. I usually put the connector on the workbench and press down
with the posts straddling a solder hole and apply solder to the individual holes.

I use a 100 watt soldering gun to assemble PL-259's using this method. All of my soldering guns have the conventional tips removed.

FWIW: Regarding whether to solder or not solder braid on PL-259's: In the 70's I worked in a two way radio shop and we installed a few hundred UHF Motorola Micor radios in police cars. The high gain antennas used a small diameter hardline coaxial cable. The manufacturer stated to NOT solder the shield of the hardline to the reducer. They recommended the outer
shield be split and then folded back onto the reducer. They were relying on the mechanical connection between the shield and the reducer.

After a few months, we began to see several returns with intermittent keying problems. I found that the Micor radio's reverse power detector was intermittently seeing the mechanical connection between the shield and the reducer as a open & it would shut the radio down.

Each offending connector was disassembled, the shield was cut clean with a tubing cutter and then carefully soldered to the reducer. The reducer was not soldered to the shell but I did make sure that it was screwed in as tight as possible. This solved all of those types of problems.

Regards,

Dan
St. Cloud, MN
wa8vzq@arrl.net

RE: The PL259, a Tale of Woe
by W0FM on April 17, 2003
For W9QKF

Several outlets for the Cablematic UT8000 can be found at: http://www.ripley-tools.com/locations.html

RE: The PL259, a Tale of Woe
by N6QL on April 19, 2003
This is a VERY nice article and you are to be commended for taking the time to pull it together!

I personally don't find building connectors that challenging - just tedious - and have assembled hundreds of PL-259's, N, BNC, etc. etc. etc. but you have some nice pointers

I do get a bit of chuckle though at the amount of comments a simple activity like putting connectors together draws with other, more technical topics getting hardly a comment.

If assembling PL-259's is one of the biggest challenges hams have today (as was said in your opening paragraph) and one of the most interesting topics (as indicated by the number of comments) that indicates a sad state of affairs for a hobby that claims to be a technical hobby.

Thanks again for the nice article this is by no means intended for you or intended to show lack of appreciation it was just an observation I had while perusing the thread.

73, Ron N6QL

The PL259, a Tale of Woe
by W7NO on April 19, 2003
I've used a small copper tubing cutter to cut the shield. Seems to work fine and less chance of my doing a human sacrifice with a sharp knife!

Bill, W7NO

RE: The PL259, a Tale of Woe
by K0BG on April 20, 2003
Ron N6QL, I'm amused by your comments as this was my exact thoughts too.

And I'll bet this as well: I'm sure everyone has their pet way of installing PL259s, and each one will swear they have never had a problem with any of them. But I think the truth is elsewhere if it truely be known.

Alan, KØBG

RE: The PL259, a Tale of Woe
by KZ9G on April 20, 2003
For a nice article on the assembly of various connectors, check out KH6WZ's "Making the Right Connections: RF Connector Assembly" in the May, 2003 edition of CQ Magazine. It contains great pictures, and shows pretinning the braid on single shielded RG-8 style coax prior to screwing on the shell.

IMHO, there are probably a couple of satisfactory methods of installing viable UHF connectors. Discover what works for you...

RE: The PL259, a Tale of Woe
by KA0GKT on April 21, 2003
The umbiquitous UHF connector. If you have a piece of equipment with an SO-239 on the back for an antenna connection, get an adapter and use a N or BNC connector on the coaxial cable.

If you must use a PL-259, get a silver plated one with Teflon dielectric. When I must use a PL-259, I solder the braid to the connector with a really old 1,500 watt Tinner's iron(or more properly a soldering copper). The iron weighs about 5# and has sufficient thermal mass to make the solder flow immediately. Rarely do I have a cold solder joint, then rarely do I use a PL-259.

Most of the time, I use an Amphenol crimp PL-259 if I am using RG58 or RG59. I am lucky to be an engineer at a Television station and we have single-crimp tools to properly terminate both cables types. Why not use a UG-175 or UG-176? Why bother? The crimp termination is stronger and I am not tempted to be cheap and try to re-use a connector as I might in the case of an AG plated connector.

In short, N connectors aren't just for UHF any more. Remember, Art Collins made the 30L-1 amplifiers with N output connectors.

OBTW, at one time I ran tests on properly terminated coaxial cable with PL-259s, Ns BNCs and RCA Phono connectors. The RCA phono connector was a better RF connection than the PL-259...I suppose that's why the engineers at Collins used an RCA phono for the RF output from the KWM-2 and for the input on the 30L-1.

73! de KA0GKT/7

The PL259, a Tale of Woe
by FORMER_HOLDER_K8YK_BK on April 21, 2003
As I was reading I remembered my past struggles in the pl-259 arena . I've had this conversation with fellow local friends before and as I saw all the "rituals" that have been documented here about a simple 259 installation , I 've come to realize again that it

doesn't have to be that way !!

I've experienced the melting dielectric that holds the center pin in place , I've gritted my teeth when finished with a solder job only to find that as the rest of you all , the body didn't get hot enough for the solder to take .

Here is a very simple fix : Amphenol makes a crimp connector for rg-8 . I know what you are thinking , CRIMP !! no way !!! I'll never CRIMP !!! The connector can only be installed with a PROPER PROFESSIONAL CRIMP TOOL . I'm talking about a good tool which will run in the neighborhood of around $75 . THE CENTER PIN WILL STILL BE A SOLDER CONNECTION . This connector , when installed properly, WILL NOT COME LOOSE !! The tool I use is by Ideal Industries called the Crimpmaster and has interchangeable die for different applications and cable diameters . Installation time is literally 25% of the time it takes to install a traditional 259 .

The shield is pressure sandwiched between the "inner body" of the connector and what they refer to as a "ferule" , basically a steel cylender which is barely large enough to accomodate the shield (when uncrimped) . The ferule is slipped over the exposed shield while the body of the connector is slid underneath the shield . When crimped with proper pressure ,IT IS A PERMANENT CONTACT POINT . As a added prevention , Nolox or other suitable anti corrosion greese can be used but is not imperitive .
I have used these connectors at the home qth for years and have the same (rg-8) installed on cables in the mobile . Never in the years I have used them have I had a least problem . Certainly an N-connector is the preferred connector , if you aren't able to go in this direction , as most will not , this is as solid connection as you will ever find . There is no guesswork here , when it is crimped its done . Unlike solder , the "did I get it or not " mentality is gone . With traditonal 259's , you can't actually see if the solder bonded with the shield , you only see if the hole got filled in and after that you have to rely on a continuenty tester. All that is eliminated with this connector .

crimp tool : Ideal Crimpmaster
crimp die set : Ideal #30-577(n-series/rg8/rg213/rg216)
Amphenol connector : 83-8sp-rfx

Crimpmaster and die can be purchased at most electrical supplyhouse or perhaps Home Depot and connectors are sold through Newark Electronics

The BNC, a Tale of Woe
by K3YD on April 22, 2003
Great thread! Even though I've been putting on PL-259 connectors for more years than I will admit to, I learned some things here.

A request for the assembled experts--how about a similar article/thread on BNC connectors? I have much more trouble with those than I do with PL-259's.

The PL259, a Tale of Woe
by AC7GO on April 22, 2003
Thanks for your useful suggestions. I think you are right about using an iron with a large heat capacity for soldering to the shield, to shorten the time the dielectric is exposed to melting.

I have a large quantity of foam-core RG8, and in the circumstances under which I have obtained it, I have no alternative but to use it. I am worried about what I am sure will happen to the dielectric when I solder the shield, even with a big iron. Do you have any suggestions on how to put pl259's onto this type of cable. I am thinking of substituting the last inch or two of foam dielectric with solid dielectric from solid-dielectric RG8. At least that way the melting will not be so catastrophic. I am aware that making this substitution will likely lead to a reflection, which may be significant at the 146 MHz frequencies the cable is to be used with.

Thanks again & 73.

Max Nielsen AC7GO

The PL259, a Tale of Woe
by KG4ZAA on April 23, 2003
I located a retailer for the UT 8000 and ordered the device (It is called a "UT Drop Cable Trimmer"). The unit cost is $28.73. The retailer I found off the Ripley Company website is Multicom, Inc., 1076 Florida Central Parkway, Longwood, FL 32750. 1-800-423-2594. Website is www.multicominc.com. Multicom did not have them in stock but promised delivery in 2 to 4 weeks.

RE: The PL259, a Tale of Woe
by WB2WIK on April 23, 2003

AC7GO, I wouldn't do what you've proposed.

But, why not just use Type N connectors instead? They just screw together and clamp the braid -- the only thing you need to solder is the center pin, which takes little heat and very little time.

Also, type N crimp connectors (assuming you don't mind buying the tool and die -- it's a great lifetime investment) that work very well up to 12 GHz are available for only about $6 each. If you want real performance at VHF, type Ns are not only a good deal but easier to assemble.

Or....I have succesfully used lots of "foam" dielectric cables with PL-259s provided they are installed with a BIG FAT IRON as proposed in the article, and it's done quickly. The *worst* foam dielectric cables are commercial RG8X "mini-8" and Belden 8214, in my experience. These both reflow, and downright melt, very easily. But there are other foam cables that are more robust, for sure.

WB2WIK/6

The PL259, a Tale of Woe
by N9GXW on April 24, 2003
If you are after the fancy tool I found it at Tessco SKU number 432414 list is $22.25

73,

N9GXW

RE: The PL259, a Tale of Woe
by W2NJS on April 25, 2003
Besides Heath, Collins Radio also used RCA connectors for their RF chassis terminations. I heard a story once in which someone from Collins is reported to have said that the RCA connector was "flat" up to 900 mHz! I wonder about that even today.

Tom, W2NJS
Washington DC

The PL259, a Tale of Woe
by W2NJS on April 25, 2003
Putting a PL259 on RG58 is not too difficult a job, but putting the connector on RG8 is work! I've used the Ripley setup tools for years and they really do save a lot of time, measuring, and effort.

One thing you can do if you're using RG58 is look for flexible plastic "boots" to cover the connector. CushCraft used to make and/or market these, and they really fit the screw-on outer metal piece tightly. It would not be difficult to enlarge the end hole for the coax to take RG8 or similar cable as well.

And did anyone mention the difference in the insulation color inside the PL259s? I believe that the white material is Teflon and the darker, olive-colored material is just some kind of plastic which was the best available years ago but has been supplanted by the Teflon insulation. Can anyone shed some light on this?

Tom, W2NJS
Washington DC

The PL259, a Tale of Woe
by KD5VVK on April 21, 2004
I never knew there was so much to a PL259 connector. This article and the responses were very informative, and I appreciate all the information. Thank you.

The PL259, a Tale of Woe
by KD7KYU on May 30, 2004
After stripping the outer jacket and folding the braid back before installing the PL-259 (remember to install and face the outer sleeve connector the right way). Cut a piece of plastic tubing to put over the exposed dilectric of the center conductor

(sandwiching the braid between the outer jacket and the tubing) to twart off any stray braiding from worming its way toward the center conductor tip and coax center core. This piece of tubing is no longer than 1/4 of an inch and does not conflict with any further assembly by getting in way of soldering the braid to PL-259 base.

The PL259, a Tale of Woe
by KE4DRN on June 15, 2004
Hi,

Good info !

Ideal Tool has the Data T cutter # 45-074

http://www.idealindustries.com/dc/Tool.nsf

Cuts the cable without damaging it.

73 james

The PL259, a Tale of Woe
by KC2MMP on March 1, 2005
I was just thinking the threads aren't percision between the male and female bodies In theory they don't exactly have to be tight anyway they just have to position the contacts . maybe some silicon caulking on the threads would freeze them and stop the contacts from flexing. Anyway I really agree that this is an important topic.

The PL259, a Tale of Woe
by G8IFF on March 12, 2005
I would suggest that you don't use the style of PL259 that you've shown at all. 259s and 239s are available with the same style connections/cable clamp as good N type and BNC connectors and they're water resistant.

RE: The PL259, a Tale of Woe
by KL7HF on May 15, 2005
I Love It! The more things change, the more they stay the same.

I remember the exact same arguments for and against PL-259s,N Connectors, soldering the braid and not soldering the braid - 50 years ago!