The SPARC NEWSLETTER
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A publication of the Southern PA Amateur Radio Club

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There is nothing on Shortwave.

by W3IHM

Did you know that most modern, digital, all-mode, fancy, DSP, SDR, super-duper radios nowadays have a built-in, already hooked-up, general coverage receiver function? Yeah, well, what's that good for anyway? Isn't everyone on their WiFi streaming screens? Who listens to HF shortwave (SW) radio? What even is that? I can just doom-scroll on my phone anyway to get the latest feeds.

Well, as usual, IHM likes to hear himself talk, so he is going to pepper you with a short history lesson before he tells you anything useful. So here it comes. Be patient.

Back in the BI era, (Before Internet, and actually, before electricity) there was some various kinds of one-way information dissemination methods that will be familiar to those of us who probably soon will be joining our brethren, and sister-en, in the "great beyond."

Long-long ago, like 150 years ago, information of a timely nature was disseminated thus. There was fence-yapping, called “word of mouth” (gossip), and newspapers, books, and the like, called “printed media” that occupied the minds of many folks. This media was of a slow dissemination time constant, with a tau measured in days or even years, but had the obligation of being more complete, and less prone to issuance of sound bites, now de-rigeur.

Then came the discovery of electricity as a useful thing, and consequentially, RF and land line communications. (...see the last couple months.) Information could flow fast around the country. This was fine, as such, but wires were expensive and limited. Due to ground wave propagation, radio signals didn’t necessarily go everywhere, either.

Like today, for various reasons, depending on who was paying, “newsworthy” things didn’t always make it onto broadcast and news media. It had to be worth someone’s cost of paying the tab for eating up the bandwidth. So your diet of information was highly restricted to locals. (...here is where IHM wrote several paragraphs about information flow and political structures, but decided it was not complete, so it got cut, thank you.)

OK, avoiding THAT huge rabbit hole, let’s just say that somehow, we ended up with AM, FM and TV broadcasters. The TV, FM, and AM bands filled up rapidly, with stations. They blanked the most of this country with ready news outlets. Most.

But not everywhere. Remember that this country is BIG. Have you ever driven across her, from sea to shining sea? Also there is the seas. And across the seas are other countries.

For instance, let’s say you are driving to another state, your cellphone battery is dead, and you left your charger cable on the nightstand. That doesn’t matter anyways because you didn’t pay your bill, either. You still want to know if there is a tornado to avoid, stock prices, fires or something. Tune in to your average FM radio station and listen. Driving in your car, you can get that signal from about a 100 mile radius, and maybe a little farther. Then you need to find another FM station, if there is one.

Likewise, your AM station goes maybe 200 miles of highway during the day. Sure, at night, you can hear all over, sometimes, but that does you little good locally. After about 200-300 miles, you need to tune around and find another station.

TV is pretty much 20 or 30 miles now with the ATSC modulation. It’s really local. Anyway, you shouldn’t watch while driving.

SO? AM and FM stations are extremely plentiful here in the east. We have grown completely oblivious to this luxury over the past 100 years. I have noticed that many radio stations on AM are celebrating 100 years of broadcast history. Wow!

What if you drive way out in the country? I mean, like WAAAY out, like out west. Believe

it or not, sometimes there is just no AM or FM signal during the daytime in the car. Like cell coverage, even after 100 years, there still exists FM and AM “blind spots”. Even if you stopped at a Flying-J and bought a new charging cable and cigar lighter adapter, you still need to have cell sites. Sure, they dot the landscape now, every 10 miles or so, but remember, you didn’t pay your bill.

Like, I went to White Sands once, and the AM/FM radio scanned and scanned, not finding any station to stop on. I had to wait for nightfall to listen to AM. Forget FM. There just wasn’t any daytime AM or FM in range for my swell government Ford Tarus radio to hear.

That is when I found out some stations broadcast simultaneously on shortwave. Up north, to cover the Yukon, CFRB, on 1010 kHz AM, simulcasts on 6070 kHz shortwave. Try it. Sometimes you can listen to both signals in the evening, although you will probably hear Newark (WINS) on 1010 kHz unless you can somehow put a null on it.

Another example is down Maine, WBCQ (FM) and WXME (AM). They also simulcast, but I have yet to hear their shortwave signals. Still, these simulcast oddities are rarities on this continent. The point is, these stations are specifically for listening beyond AM and FM range.

Really, our country is pretty full of broadcasting, but what if you live in another country, or are out at sea? There are many places in the world that for whatever reason, have little or no AM, TV or FM broadcasting. There is also most of the earth, that is covered with water. No AM, FM or even cell coverage there, too.

Well, that leaves the shortwave bands via the ionosphere. This isn’t as rare as you may think. For instance, many pacific island nations have clusters of islands that are several hundred miles apart. So they rely heavily on daytime SW broadcast, like 120 m or 90 m during the day for news, weather, etc.

Until recently, China had mostly shortwave broadcasts, too. They still broadcast on SW in Chinese, to their audiences abroad.

Then there are religious and faith broadcasters, sharing the “Good News” around the world. These are private religious stations that usually lease time from SW broadcasting outlets.

But, there are lots of other signals. These are not broadcast, but are meant for specific purposes, like stock ticker latency signals, or news wire, industrial, navigation, weather, aircraft, government, embassy, or military. There are even a few satellite HF signals, like AO-7 on 10 meters. Do you know that transcontinental air traffic control is on HF?

Some signals are of the completely unknown type, where ham and hobbyist SWL types try to identify them. Some SW signals are just unknown in purpose, but have been around for

many decades, like the “buzzer”, UVB-76, 4625 kHz.

Other countries are war-torn, poorly organized or just poor. Private broadcasting relies on advertising and infrastructure for operating. Government broadcasting relies on, well, having a government. People without infrastructures or functional governments pretty much rely on SW broadcasting for whatever reason.

So, before internet, or without internet, shortwave broadcast was/is THE radio to listen to.

Try to remember that most of the world is still living in the primitive BI condition, seeking food and shelter, dodging exploding ordinance, and running for their lives. No, not everyone has a Starlink, cell coverage, WiFi, or money to pay for any such, either. They get the bulk of their information from word-of-mouth, regime-sponsored terrestrial AM, FM, but mostly HF shortwave from other countries, on little hand-cranked solar powered radios.

For some past examples, like back in the ‘50s and ‘60s, after WW2, this was also true in most of Europe and Russia. Most all the private broadcasting and infrastructure was bombed back to the stone age during the war. LW and SW was easy to set up and covered lots of area. So people got their news and information on shortwave. Many older European car radios came with built-in SW and LW radios for this purpose.

Then there was the cold war. The SW bands were like the internet now, a battleground of ideas, accessible to anyone with a SW radio.

OK, so where do I tune? Well, for international broadcasting, there are organized bands that shortwave broadcasters are supposed to inhabit.

Where? Here’s a table:

120 m	2300-2495
90 m	3200-3400
75m	3900-4000
60m	4750-5060
49m	5900–6200
41m	7200-7350
31m	9400-9900
25m	11600-12100
22m	13570-13870
19m	15100-15800
16m	17480-17900
15m	18900-19020
13m	21450-21850
11m	25600-26100

These are the official ITU shortwave broadcast bands, but vary, depending on which ITU zone you are in, as well as the whims of a government dictator. That's why you hear them dang broadcasters on 40 and 75 meters sometimes.

So here on the shortwave broadcast bands, there are some things to hear. There is always 5950 kHz, WRMI, from Florida. OK, that's not always a religious outlet. The station sells time to whoever. There was also a guy who did a radio show there for fun, with music. Occasionally a group of radio hams buy time, and do a ham show, too. Also, sometimes they just play fluffy music, when there is no buyers for broadcast time. They keep their frequency occupied that way.

Let's say you hear a broadcaster signal but can't ID it. Try punching the frequency into the shortwaveschedule.com website, and see what pops up. Maybe it is something interesting.

Sure. Canned broadcast propaganda is one thing, but I primarily like to listen to the stuff that is not planned to be intercepted. There is a bunch of stuff out there that you can hear that is not supposed to be heard.

Like, take your average HF rig with a general coverage receiver, hook up your Antron A-99 vertical, and tune below 10 meters, during your lunch break. If the band is open, there is plenty of things that you may hear that will entertain you.

For instance, let's tune down below the 10 meter band, through CB, to 25 MHz. That's less than 3 MHz of a mostly "dead" section of shortwave. There can't be much to listen to here, right?

Here we go. 27.990 MHz… down… down… Yep, there are the free-banders. They are running SSB, mostly, on ham rigs "opened up" or whatever. Some sound no different than hams. I wonder why they don't just get their license and get on 75. It probably would be an improvement.

Also, don't be too quick to think the signals are all illegal. Some countries have legitimate channels on their CB that go all the way down to 25 MHz. Some also go up to and through 10 meters. Like in China and Hong Kong, their "fishery" band goes from 27.5 to 39.5 MHz, right through 10 meters. Also, in Japan, the CB band is limited to a half watt! Major QRP. Some run FM, SSB and AM. For a real investigation on the international "CB" allocations, go to www.hfunderground.com, and poke around in the CB section.

OK, if you are hearing anything, the band must be open. Let's keep tuning. Down we go to 27.405 MHz. This is the upper edge of CB channel 40 in the U. S. of A. Down further to Channel 38, is the "sideband channel". Why is everyone on LSB? Hey you can use BOTH USB and LSB. Let's keep tuning down.

Wait! What is SSTV doing on 27.185, channel 19? I've also heard some FT8. Really? OK, then. I wonder what they put in for their QTH when running FT8? Unlike SSTV, FT8, and PSK, you may also hear analog FM, which is now legit on USA CB. Also, other countries have always had FM CB, so maybe it's DX.

Did you also know that in the USA, there are some "between" channels on CB? These are at 26.995, 27.045, 27.095, 27.145, 27.195 MHz. These are occasionally used for remote control, pagers, garage openers, etc. You may hear weird digital signals there. Our old pager at church is on CB. Some remote control doohickeys are legally 25 W.

Let's keep tuning down. Down on the lower end of CB is where the "key-down" contests and really high power CB's talk. This is called the "superbowl", mainly channel 6. Everyone's so distorted that I can't understand a word….. What's the point of that? I guess it's compensation.

OK, below channel 1, 26.965, the USA CB band ends, but not for everyone. Sure, there's more freebanders, but also South American taxi dispatchers, with many being legit in their particular country. I have also heard a few USA FM links to broadcast stations around 26 MHz. There are very few SWBC guys on the 11 meter allocation, so if you hear one, you are lucky.

If you made it this far, right above 12 meters, there's WWV at 25 MHz. Remember that is a 10 kW signal from Colorado. It sounds good here, in the east, when the band is open. The 25 MHz WWVH in Hawaii also sometimes comes in when the F layer is doing the sunspot thing.

OK, that section of shortwave was fun to tune, eh? I also listen above 29.6 MHz, up to the mid 30's for FM. There is a Japanese FM marine band there. I also hear the odd VHF Low police and fire stateside, still.

Hey! How can a fellah tell if cycle 25 is any good, anyway? Well, give a listen for the CW ID of RBU and RWM in Russia at 5, 10, and 15 MHz, if they are still on the air. Also there's BPC in China, and JJY in Japan, on 10 MHz too. These time signals usually transmit MCW, so you can copy or see the CW modulation sidebands under WWV, on your waterfall display. If you got BPC rolling in on 10 MHz, call CQ DX on your 30 meter ham band, and listen for PacRim DX.

OK, everyone wants to know where the SW pirates are. Mostly anywhere, but look below 40 m on the weekends for "broadcasters". I hear pirate broadcasters (or drug runners) sometime on 6925 kHz, USB. Another thing is radio stations playing music on 6955, 6930 and 6935 kHz. Sometimes there is an SSTV picture or two on 6339 kHz.

There is also stuff on SSB between the 10 MHz WWV and the bottom of 30 m. There is legitimate civilian air traffic control there, but also other unidentified random stuff. I heard some chatter on 10030 kHz a few times, that was not airplanes. Give a snoop and see what you hear.

I also regularly copy old fashioned CW on 6825 kHz from some spy school, or something. French? Israeli? I have also heard a similar signal in 75 m at 3881 kHz, right below the AM'ers. Groups of five letters and numbers. Old school spook stuff. If you learned CW in the military, you were probably doing 5x5 groups, so you will recognize it. Get out your pencil. 100% copy gets a weekend pass.

OK. Admit it. There may actually be some interesting stuff on shortwaves. It could be entertaining, but is not like doom-scrolling on your phone. Be patient. Spin the knob or click on the waterfall. You have to hunt. Then do some research on line. I just type in the frequency to a search engine, and see what comes up.

Maybe it fulfills some hunting urge in me. Maybe it will in you, too. If you hear something, let us know also.

If you are not interested in hunting on HF SW, go back to doom scrolling and feed the algorithms instead.

Website

The new website is a thing now. Thanks to Jim, W3BYO, and Matt, N3NTJ, for their hard work in getting the new platform up and running. Also thanks to Dave, N3NTJ, for transferring the k3ir.org domain name to the new site.

Sure, so what did they do? Well, give it a try at k3ir.org. The nifty opening drone footage is spectacular to see. It makes me want to reach out and mess with the antennas. Also check out the net roster. There's a net every night for you to participate in. Look at the northern lights picture!

What time is the net? When is Elmer night? Where's the breakfast? What time and who is going to run the DMR roundtable? VE tests? That's what the website is for. I purposefully do NOT put that information in this newsletter. Check the calendar. It changes rapidly sometimes. Go there. K3IR.org.

Ok, there's also places with nothing in them yet. That's where you come in. What have you to post?

WK3Q – SK
from N3FMO

I received this, thought someone may be interested.

From the Estate of WK3Q, Joe:

Thank you Joe & family for this donation to the Ephrata Area repeater Society, Inc. Joe and family have requested that the income from the sale of these items go directly to the EARS club.

I have been licensed for 58 years and have bought & sold literally hundreds of radios, so you'll just have to trust my judgement on cosmetic and electrical conditions of the radios. The following are results of a simple bench test where each function was checked, transmit power output was checked, receive and transmit audio were verified on the air. This equipment is sold as is, no warranty, no return, due to scammers and parts swappers. There are no manuals but all are easily obtained online.

Radios are all 12 VDC and will need the appropriate power supply. All radios include microphone & DC power cord. I put Anderson Powerpole connectors on all cords! Checks shall be made out to the Ephrata Area Repeater Society, Inc.(or cash) I will be the Point-of-Contact for all sales to eliminate issues. I can be reached via e-mail. Items sold first come first served, sold items will be deleted from updated lists as items sell.

Interested? Contact: WA3HLP@ptd.net

Kenwood TS450SAT 160-10 meter HF 100 watt $250
https://www.rigpix.com/kenwood/ts450s.htm
https://www.eham.net/reviews/view-product/989

Full xmit output all bands, has low receive audio, good condx cosmetically and electrically otherwise (An Internet search finds many solutions to the low receive audio mostly replacing a small electrolytic capacitor on the audio board).

Icom IC-746 (Not the Pro model) 160-2 meter all mode 100 watt $400
https://www.rigpix.com/icom/ic746.htm
https://www.eham.net/reviews/view-product/176

Radio is in mint condition both cosmetically & electrically. Looks like it just came out

of the box. Everything appears to work. Full xmit output all bands.

Icom IC-735 160-10 meter HF all mode 100 watt $200
https://www.rigpix.com/icom/ic735.htm
https://www.eham.net/reviews/view-product/381

Radio is in good electrical condition and good cosmetic condition. Slider and volume controls were a little “scratchy” but I applied some contact cleaner and they now work just great. Tuning knob is a bit stiff turning but again an Internet search produces several repair options. Full xmit output all bands.

Icom IC-2200H 65 watt 2 meter only $75
https://www.rigpix.com/icom/ic2200h.htm
https://www.eham.net/reviews/view-product?id=4192

Radio is in very good cosmetic and electrical condition. Mike cord works but needs to be replaced as it’s frayed a bit at the microphone end of the cord. Full power output.

Icom IC-2100H 55 Watt Two Meter Only $55
https://www.rigpix.com/icom/ic2100h.htm
https://www.eham.net/reviews/view-product?id=222

Radio is in very good cosmetic and electrical condition. Full power out, is mounted on an enclosure with an external speaker. Full power output.

Icom IC-2720H with remote head and cable (duoband 2 meter & UHF) 50 Watt VHF 35 Watt UHF $125
https://www.rigpix.com/icom/ic2720h.htm
https://www.eham.net/reviews/view-product?id=2939

Radio is in very good cosmetic and electrical condition. Full power out.

Yaesu FT-1900R 55 Watts Two Meter Only $60
https://www.rigpix.com/yaesu/ft1900r.htm
https://www.eham.net/reviews/view-product?id=8282

Radio is in very good cosmetic and electrical condition. Mike cord works but needs to be replaced as it’s frayed a bit at both ends of the cord. Full power output.

Icom IC-228H 45 watt Two Meter Only $40

https://www.rigpix.com/icom/ic228h.htm
https://www.eham.net/reviews/view-product/4861

Radio is in good condx electrically but only poor to fair condx cosmetically, lots of scratches on case (note-this may be very easily fixed by removing the covers and spray painting back to like new condx) Full power out.

More Plate Tectonics
by Sam W3IHM

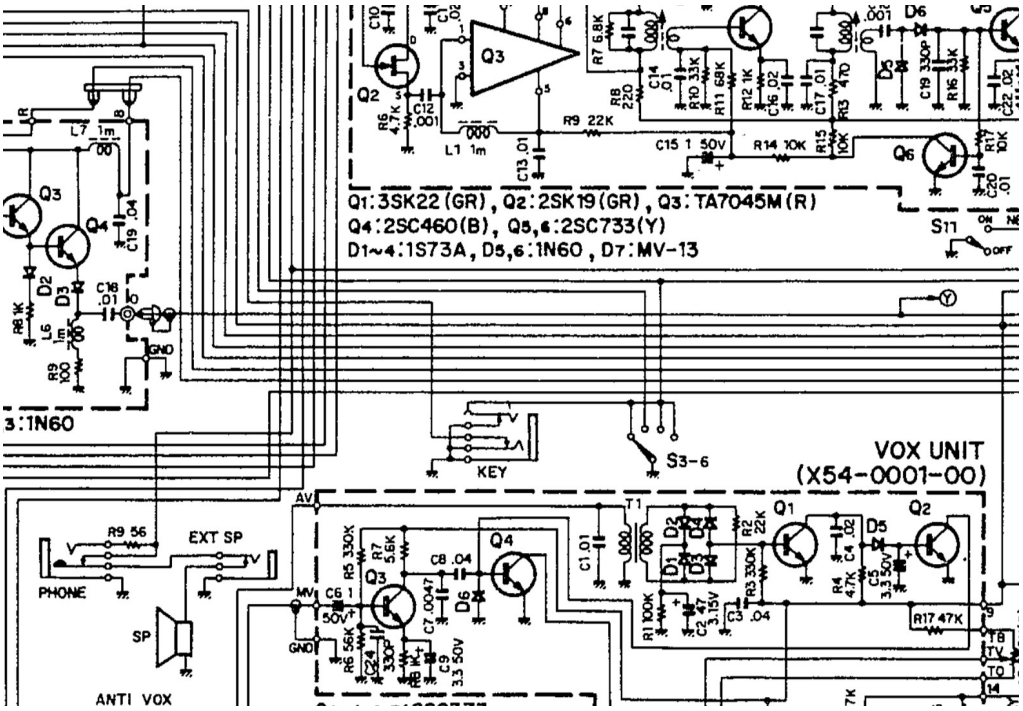
We left off chasing a grounding issue in the PA cage. Having found that being caused by an unusual oxidized solder joint, it's time to finish diagnostics and align the TS-520.

Let's see. The CW sidetone doesn't work, and the RX is still a bit stodgy. Also someone had messed the screen grid supply on the parallel 6146's. Someone had also "re-wired" the PA B+. Why?

The sidetone audio is used to "trip" the VOX and put the rig into transmit. No CW sidetone, you get no CW TX. I could use CW by throwing the manual front panel into TX, and then close the key. RF came out, but no sidetone beep. Something's not working.

OK, I know some of you are like: "CW? Whazz-dat? Who cares." Well, this old operator spends lots of time using CW, copying stations, with the headphones on, and the filters narrowed down. I set the BFO to give a pleasing 880 Hz note. It makes CW quite relaxing to copy, with no static crashes or splatter to fatigue the operator. Try it sometime.

Anyway, the CW key interlocks on this rig are fascinatingly extensive to say the least. I don’t quite understand why the Japanese engineers stressed out so much on the CW keying “ritual” in the design. Maybe some elder engineer was clamping down on the poor underlings, making some ridiculous demands. There are two sets of switched contacts just on the ¼’ key jack alone, and it is tied to S3-6. Check it out. Tracing this out was a Rube Goldberg affair. Sheesh.



Painfully tracing out the keying circuit was annoying. These schematics, drafted on paper by humans, have lots and lots and lots of parallel lines.

Ok, drawing from my ancient experience as a young fella, when drafting schematics, it’s easy to click the drafting machine, and draw a bunch of lines with your pencil. I would do this right when the boss walked by, so I was sure to look busy. Fifty years later, when it comes to reading these diagrams, it is a real pain for a technician to trace out a wire in these bundles of lines. One can get mixed up pretty easy and end up somewhere else.

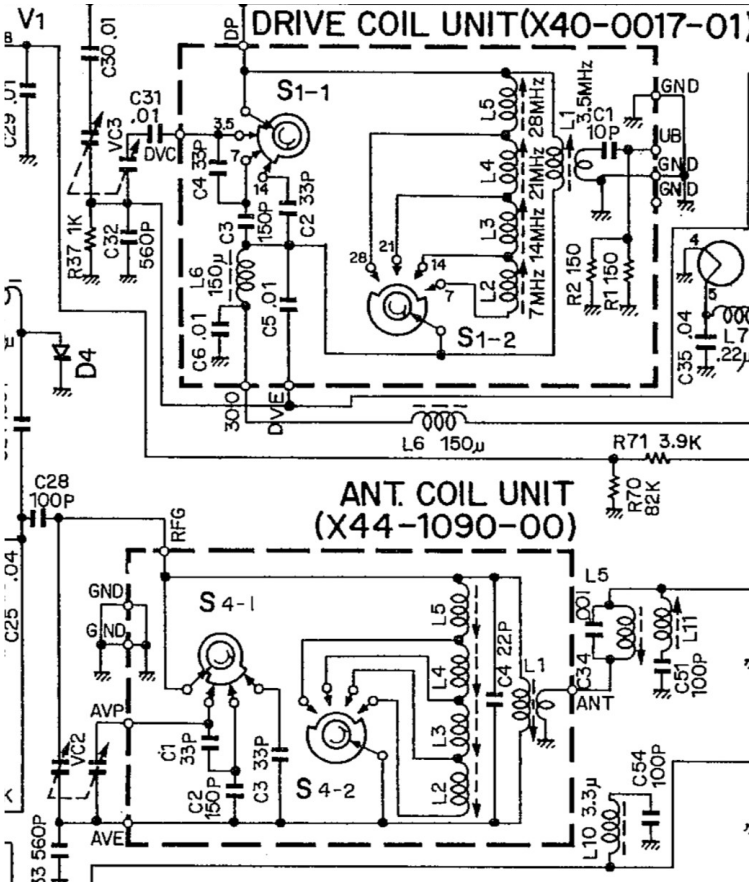
The problem was traced to a rewiring done by someone, with removal of some parts, too. What they were trying to do is a mystery.

Ok, so now we move on to alignment. Tweaking the coil packs for each band is one step in the alignment instructions, but there is a prescribed list and order of which coil should be tweaked and when.

I don’t like to tweak inductor cores unnecessarily. They crack and break. Why not just align the coils for each band that need it, and leave the others alone? Well, the PA coils are shunted to ground as the band switch is changed. Look at S1-1 and S1-2 in this piece of the diagram.

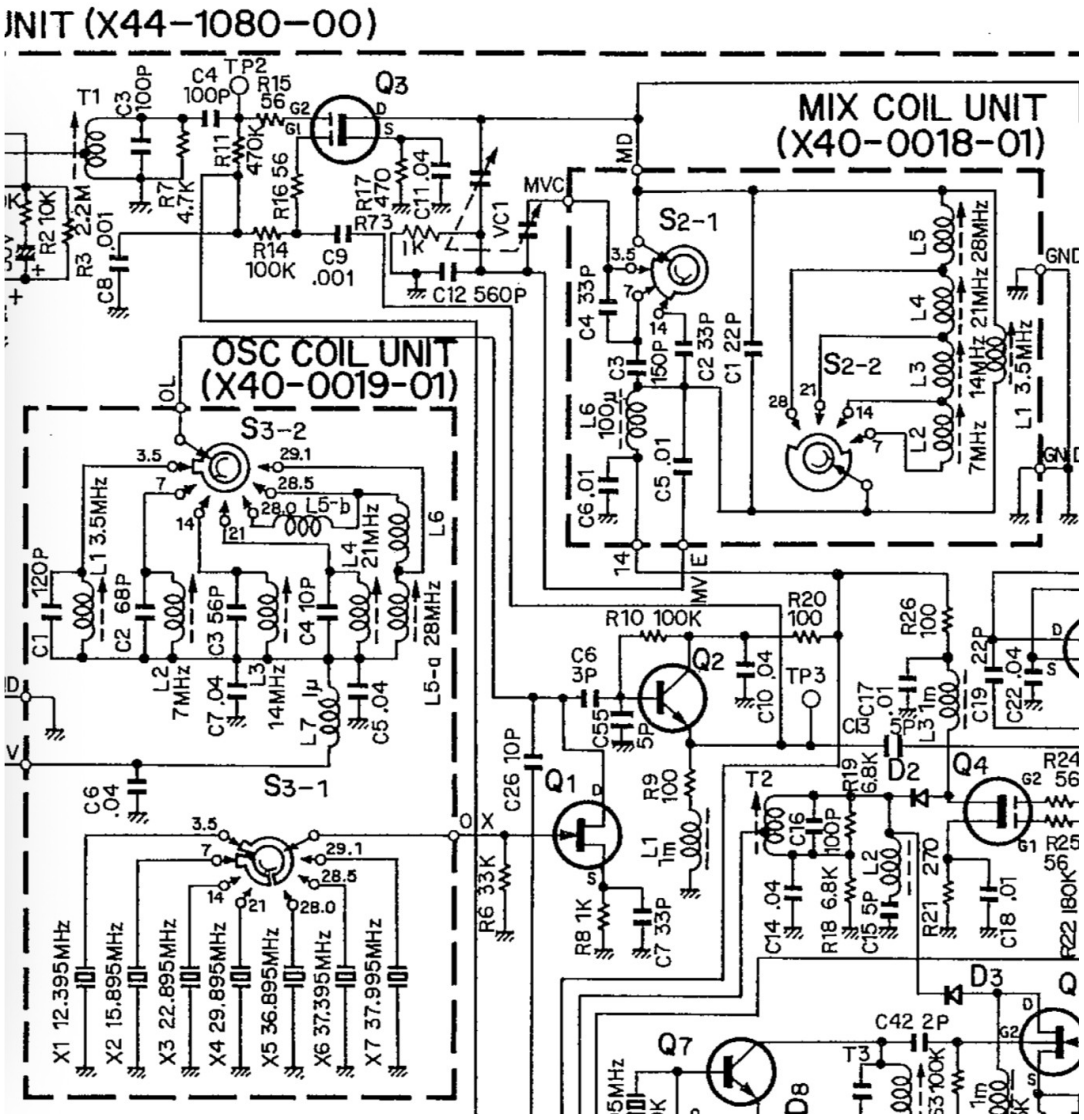
Notice that on 80 meters, (...the TS-520 does not have 160M) all the coils are still in the circuit. As we switch higher and higher, each band change shorts out a coil. All the other coils are still in circuit, so their alignments all interact. Like on 80 meters, ALL the coils change the alignment. We can’t just tweak one. Change one, and it knocks everything off. It’s like tuning a piano. There is a sequence you have to follow.

This is the old “cursed loose ends” problem that goes all the way back to the double slide tuner receivers of the spark days.



This is not the way all the coils are, though. On the same board, there is S2-2 with shunted coils, but S3-2 are not shunted. These coils can be tweaked independently of each other. So you have to look at the schematic to understand what you are trying to do.

You can just follow the alignment steps in the service manual, but you have to do it exactly.



I prefer to know what I am trying to do and why. That frees me to do things differently if I need to. Knowing how the circuit works makes odd things stick out in a design. For instance, notice the odd section of wafer switch S3-1. Why does the switch have that split double wiper contact for the crystal selection?

Well, the separate wafer switch contact will only engage on the 36-37 MHz overtone 10 meter band crystal segments. I don’t know why this is necessary, but I can guess a few reasons. This is how a schematic tells a story about who designed it. Let’s see.

Maybe there was some trouble getting the third overtone crystals to behave with the

adjacent inactive crystal's holder capacitance and structure. Notice that 80 m uses a 12 MHz fundamental crystal. Also notice that 10 m uses 36 MHz third overtone crystals, which are really just 12 MHz crystals with good active third overtones, operating in overtone mode. Probably the only way they could get the 10 m crystals to operate independently was if they had their own set of switch contacts, far away from the 80 m 12 MHz crystal. Perhaps.

Another reason may be that there was some old esteemed elder engineer who called the shots, and said that this was the only way to switch those dang third overtone 10 m crystals, and no one dared or wanted to ask them why this was always so. The engineers may have not known what they were trying to do. Perhaps.

Maybe someone goofed and ordered a bunch of these weird wafers with the split wipers, because they thought they would need them. As the design started to firm up, it was found to be unnecessary, but the parts were already specified, so they just used them anyway. Perhaps.

Crystal activity is hard to predict. Maybe the supplier of their 10 m crystals were especially weak for the third overtone mode. The designers struggled with these lousy parts, and tried to isolate the crystals as much as possible from anything else to get them to oscillate. This was their solution. Perhaps.

Perhaps. At any rate, it is an oddity of the circuit. What do you think? Anyway, I can now enjoy using this rig, having gone through it to my satisfaction. I especially like the tactile feedback of the old mechanical switches and controls, and big analog meter and dial. No digital display! No CPU backup battery! No anything. You are the DSP and memories. Fun!

Meeting Night

Like most clubs, there sets in a sort of monthly pattern of meetings, etc. Like, for SPARC, the usual average monthly general membership meeting is held the fourth Tuesday of the month, June the 24th at 7:00 PM, at the Clubhouse. Sometimes these things change, especially in the winter. Why are you looking at this newsletter for such information? Go to K3IR.org and check the calendar tab.

License Test Sessions

Want to upgrade your license? How about get a license? You will need one to be a ham operator. There IS a test. You are required to know something. It's not just a $$$ thing. Demonstrating that you indeed know something is another matter altogether.

So you will need to study some materials. There is plenty of on-line information to help you get your license. Ask us. We are here to serve. Go to k3ir.org and ask for help.

Usually, testing is conducted at the SPARC site on the first Tuesday of every month. The fee to take the exam is usually $14.00 payable on the K3IR website or in person, cash or check only. Go to K3IR.org and check the calendar tab to make sure.

If you do not already have one, go to fcc.gov and register for a FRN (Federal Registration Number). You will need this to interact with the FCC.

You can also pre-register to take the technician test, or upgrade, at Hamstudy.org. There is also a link on the K3IR web site to follow. Check the k3ir.org website for the latest in fashionable ham test news.

Upcoming Hamfests

There may be others. I try to limit the list to ones within a couple hours drive. Poke around on QRZ and Facebook. They are listed when they are posted, so you never know where they are in the list.

Saturday, September 27, 2025
ARAST 50'th Hamfest
Chemung County Fairgrounds
170 Fairview Rd.
Horseheads, NY 14845
https://www.arasth3.org/hamfest

Saturday, October 1, 2025
Red Rose Hamfest
339 East Main Street
New Holland, PA
www.w3rrr.org

Looking For Volunteers

SPARC currently has 131 “active” members on the roster. We have a lot to offer to our members. At this time we have a dedicated group of hardworking volunteers who keep the site running. Some say this is typical with most organizations. I don't think SPARC should be “typical” We need more real active members. Jobs range from the highly technical to the mundane but ALL are important. Please look at the list below and see if there is a place for you.

IT Team

Tower climbers and ground help

Operating building maintenance and cleaning

Operating building equipment maintenance and improvement

Porta Potty cleaning (not Pumping!)

Adopt a Highway crew

Elmers and Elm’ettes

Hamfest help, planning, etc.

Meeting programs and talks

Antennas! ...always more, bigger, higher.

Someone to take the trash home and pitch it when it’s full.

Someone else to either eat or toss the old stuff in the fridge.

Joke Corner:

Some Chinese parts are a joke. Look at this transformer. Does it really cost less to leave pieces off the transformer core: