JOHNSON COUNTY RADIO AMATEURS CLUB, INC.
P.O. Box 93
Shawnee Mission, KS 66201

FEEDBACK

JUNE 2021

Inside Story: The Atlas 210X HF Transceiver

by Tom Wheeler, NØGSG

Sometimes an intriguing piece of ham gear ends up on my service bench. Such equipment is usually in non-working order and it's pleading for attention:

- *I'm rare. I'm cool looking. You know you wanna try me!*
- *You've never seen anything like me. Give me a try!*
- *I've got secrets you want to know. Crack open my case and I'll tell you all of them!*
- *You know you have nothing but boring things to do. I'm much more fun, plug me in and have some fun!*
- *I'm broken. Fix me!*

A few years back I read a *QST Magazine* article about the Atlas 210X. This was quite an historic radio that I'd never heard of. When one of these showed up at a JCRAC club auction, I snagged it. It's a very basic but nice looking HF radio covering 80 through 10 meters. It operates on SSB and CW, and maybe digital if a gun is pointed at it.

So what's so special about this Atlas? Well, for starters, it was made by the Atlas Radio Company. That's the same Atlas Company founded by Herb Johnson, W6QKI, in 1974. The same Herb Johnson who founded Swan Engineering in 1961. Swan produced very popular radios--one source estimates more than 80,000 units.

This little radio happens to be one of the very first all-solid-state 100 watt HF transceivers made in the world. Unlike the Swans that preceded it, there are no tubes. It operates efficiently on 12 volt power, drawing only about a quarter amp in receive. Remember, this is 1974, and everyone else's final amplifiers had tubes. In fact, just a few years prior to 1974, a 100 watt solid-state HF power amplifier was unthinkable. So this is a big deal. Especially since none of the

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JUNE MEETINGS

June 11 *– ZOOM - TBA*
June 25 *– LIVE – Field Day Site*
June 26-27 *– Field Day*

FIELD DAY meetings are at the Hutton Farm, just west of the 87th and Ridgeview entrance to Shawnee Mission Park. The site is visible from 87th Street.

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A publication of the
Johnson County Radio Amateur Club, Inc.

Bill Gery, KA2FNK, President

Jaimie Charlton, ADØAB, Vice President

Ted Knapp, NØTEK, Secretary

Cal Lewandowski, KCØCL,Treasurer / FEEDBACK distribution

* * *

Chip Buckner, ACØYF, Editor

Charlie Van Way, NØCVW, Photography

Deb Buckner, KDØRYE, Contributing Editor

All email addresses are available at w0erh.org

JCRAC Re-elects Officers

At the May 28 meeting, President Gery yielded the video conferencing microphone to Herb Fiddick, NZØF, and asked him to conduct club elections. The membership quickly and enthusiastically nominated and re-elected Bill Gery, KA2FNK, (upper left) to be President, Jaimie Charlton, ADØAB (center left) to be Vice President, Ted Knapp, NØTEK (below) to be Secretary and Cal Lewandowski, KCØCL (lower left) to be Treasurer for the 2021-22 year.

PRESIDENT'S CORNER

What a difference a year makes. Last year COVID forced us to be a bit creative for Field Day 2020. This year we are on track for a normal Field Day experience at the old Hutton Farm just west of the Shawnee Mission Park entrance on 87th street.

As in the past we will set up Friday June 25th starting at 1PM. If you are available to help it is appreciated as the more hands the better. We can have things in place before the heat of the day.

Our first face-to-face club meeting in over a year will be at the park. Meeting time 7 PM as normal. There is talk of ice cream after the meeting. John Raydo, KØIZ, will conduct an HF clinic Friday evening on the phone station.

We will need a couple of persons to camp out over night Friday to keep an eye on the site. It also provides the opportunity to do some operating.

Field Day itself starts at 1 PM Saturday afternoon, June 26, and runs until Sunday at 1 PM. We will need help with the break down Sunday. The more help we have, the faster we can clear the park.

– Bill Gery – KA2FNK

Johnson County Radio Amateurs Club - May 14, 2021

Meeting Date: Friday May 14, 2021. The meeting Started at 7:00 PM.

Attendance: Due to COVID-19 restrictions, this Meeting took place online using Zoom Video Conferencing. 39 were present.

The Minutes from the April 23, 2021 meeting were read and accepted unanimously.

The Treasurer's report was read and accepted unanimously

Old Business:

- We welcomed all 1st time visitors to the meeting.
- Repeater Update – Bill Brinker, WA0CBW, reported that all 5 Repeaters are working as designed.
- The Club POTA (Parks on the Air) Event on May 8 was well attended, and a good time was had by all.
- Field Day 2021 – Planning will start soon around Stations with the Station Captains including a Site visit.
- Herb Fiddick, NZ0F reports the SATERN Communication Van was displayed during the SATERN/ARES meeting on May 10. Plans are to bring it to a Club meeting when we are back to in-person meetings.
- Dave Porter, K0DVP reported that the New Member Committee is just about ready to share the proposal with the Board. Dave is looking for volunteers to be "contactors" and "mentors" for these new Hams. Please contact Dave if interested.

New Business:

- Jeff Darby, KS0JD Reported that the Santa Fe Trail Amateur Radio Club will be hold a Special Event Station in conjunction with Johnson County Radio Amateurs at the Ensor Park and Museum to commemorate the 80th Anniversary of Marshal Ensor, W9BSP receiving the Wm. S. Paley Award for his extraordinary work in "Teaching Radio by Radio". The Event is Saturday June 5th from 10 am to 4 pm (CDT). Please let Bill Gery, KA2FNK know if you are interested in participating.
- In conjunction with the Special Event Station at the Ensor Park and Museum on June 5 there will be a Trunk Sale in the Museum Parking lot from 10 am to 4 pm (CDT).

Reports:

- 6 m – NR.
- 10 m SSB Roundtable – NR participated on May 13 and 3 participated on May 6.
- 40m SSB Roundtable – 5 participated on May 12 and 4 participated on May 5.
- Fusion Digital 440 net – 16 Check-ins on May 12 and NR for Check-ins on May 5.
- 2m Wheat Shocker net – 13 Check-ins on May 13 and 18 Check-ins on May 6.
- HF Activity – Hungary, Russia, New Zealand, Germany.

Announcements:

- WW1USA Remote Special Event May 15th and an in-person Special Event on November 15th. See Charlie Van Way, N0CVW for more information.
- Hawk 100 September 11-12. See Bill Gery, KA2FNK for more information.
- See Larry's List for upcoming Events.
  Business meeting adjourned at 7:28 PM.

Program:
The Program was Field Day 2021 – Planning and Information Session.

Johnson County Radio Amateurs Club - May 28, 2021

Meeting Date: Friday May 28, 2021. The meeting Started at 7:00 PM.

Attendance: Due to COVID-19 restrictions, this Meeting took place online using Zoom Video Conferencing. 38 were present.

The Minutes from the May 14, 2021 meeting were read and accepted unanimously.

The Treasurer's report was read and accepted unanimously

Old Business:

- We welcomed all 1st time visitors to the meeting.
- Repeater Update – Bill Brinker, WA0CBW, reported that all 5 Repeaters are doing well.
- Charlie Van Way, N0CVW reported that during the WW1USA Special Event on May 15 a total of 792 Contacts were made (647 SSB and 145 CW).
- The Club POTA (Parks on the Air) Event on May 8 was well attended, and a good time was had by all.
- Field Day 2021 – Planning has begun around Stations with the Station Captains including a Site visit.
- Herb Fiddick, NZ0F showed a short video Tour of the SATERN Communication Van.
- Dave Porter, K0DVP reported that the New Member Committee is just about ready to share the proposal with the Board. Dave is looking for volunteers to be "contactors" and "mentors" for these new Hams. Please contact Dave if interested.
- Jeff Darby, KS0JD Reported that the Santa Fe Trail Amateur Radio Club will be hold a Special Event Station in conjunction with Johnson County Radio Amateurs at the Ensor Park and Museum to commemorate the 80th Anniversary of Marshal Ensor, W9BSP receiving the Wm. S. Paley Award. The Event is Saturday June 5th from 10 am to 4 pm (CDT). In conjunction with the Special Event Station there will be a Trunk Sale in the Museum Parking lot from 10 am to 4 pm (CDT).

New Business:

- Annual Elections were held. Because the current president can't run this portion of the meeting, Herb Fiddick, NZ0F was volunteered to do so. A nomination was made to retain the current slate of elected officers. This motion received a second. A vote was taken, and all nominated positions received unanimous approval.
- JCRAC Elected Officers are: Bill Gery KA2FNK – President, Jaimie Charlton AD0AB – Vice President, Cal Lewandowski – KC0CL, and Ted Knapp N0TEK – Secretary. Elected officers will take office on August 1.

Reports:

- 6 m – FT8 East Coast, Canada, Mexico.
- 10 m SSB Roundtable – 5 participated on May 27 and 5 participated on May 20.
- 40m SSB Roundtable – 4 participated on May 26 and 3 participated on May 19.
- Fusion Digital 440 net – 14 Check-ins on May 26 and 10 for Check-ins on May 19.
- 2m Wheat Shocker net – 19 Check-ins on May 27 and 16 Check-ins on May 20.
- HF Activity – Ireland, Italy, Europe, Slovenia on 20m SSB.

Announcements:

- Hawk 100 September 11-12. See Bill Gery, KA2FNK for more information.
- Bike MS September 25-26.
- Lenexa Moonlight Bike Ride July 17.
- Buffalo Bill Century Ride September 18.
- See Larry's List for upcoming Events.

Business meeting adjourned at 7:46 PM.

Program: The Program was Video Tours of 4 Different Club Member's Ham Shacks.

A Hambone Story - Jaimie Charlton, ADØAB

Hambone and the Day After Field Day

A few days before Field Day

Hambone, his brother Dude and friend Tim were in Hambone's backyard repairing some winter antenna damage when Uncle Elmer – who lives next door – came across the back yards and joined them.

"Hi boys, are you participating in Field Day next month?" asked Elmer.

"Yes we are," replied Hambone. "And it's going to be great!"

"You know this is our first Field Day in quite a while and we want to make it extra fun."

"Yeah, extra fun," added Tim as he put down his nanoVNA and turned to face Elmer. "But we want to do something different.

We've already been camping and hiking on big field day projects, so we don't want to repeat that. We thought maybe we could do something simple like set up in the park and run QRP off batteries. We even went out there to scout a location. As you know, that park has a nice little lake."

"And that's what gave us the idea," blurted Dude, not wanting to be left out of conversation.

"What idea was that?" asked Elmer.

"We would do field day on the lake from a boat!" exclaimed Hambone. It would be something new and fun. So, we started figuring out what we would need and where we would get it. It's not so easy to find a big boat and boat stuff around here."

"One thing led to another," said Dude, "And I suddenly remembered my friend, Bill."

"Bill?"

"Yeah, you know, Bill, the guy who runs the Clear Blue Water Diving Academy down in Florida."

"How would Bill help you with getting a boat on that lake?" asked Elmer.

"Oh, he wouldn't," said Hambone. "We thought it would be even more fun if we did field day from Florida."

"Anyway, I called him," said Dude. "He said he would like to help, but he was closed. He suffered considerable damage during a recent storm and was making repairs. But he gave me the name of a rental shop that could help us.

I called that shop and the guy said he had plenty of 8' and 12' aluminum boats so, come on down.

He said he's located right on Boca Ciega Bay next to the big pink Don CeSar hotel. We've been there before so we know where that is."

"That sounds like fun," said Elmer. "How do you plan to set up your station?"

"Well, Unck, we want to run two radios on two different bands. Originally, we figured to use Tim's old IC725 for one radio and my trusty FT950 for the other. We'd power them both from a little thousand-watt generator. I have a couple of tripods and hamsticks we could use for antennas. The boats and the water would be the ground plane.

But when we got to figuring out the space we'd need, there was no way one 8' boat or even one 12' boat would be big enough. Our final plan was to use three boats."

"How are you going to do that?" asked Elmer, fearing what he was about to hear.

"Tim and I will use one boat each for of the radios and Dude will run a third boat with the generator an all our stuff like food and drinks. Sort of a provisions boat."

"That sounds – interesting," offered Elmer. "I suppose you're going to use those long extension cords you got me to buy for your last attempt to run multiple transmitters."

"Exactly!" said Hambone. "They're each one-hundred feet long. That should be enough distance between the stations. Oh, and we'll need to borrow your little generator, too.

It will be just like that old field day, except we will be on boats instead of on land. That worked fine."

"Good luck," muttered Elmer. I'll be listening for you on the air."

Early the next day

The boys, all excited with their new project loaded their radios, as well as GPS devices, coolers for food and drink, rain gear for themselves, tarps for their equipment, MP3 players and tablets in Tim's van. They left Kansas Monday morning to allow themselves plenty of time to cover the 1300 miles and get set up in Florida.

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One day after Field Day

"Unck, help, we're in jail!" sobbed Hambone as he used his one free call from the Pinellas County slammer.

"What do you mean you're in jail?" asked Uncle Elmer suspecting that the boys were up to a practical joke or something.

"We are in the county jail. The cops say we broke some law or another and the fine is two-hundred dollars for each of us. We don't even have two hundred dollars between all three of us. So, they threw us in jail."

"Okay, okay. So, what do you want me to do, bake you a cake with a file in it?" replied Elmer, still suspecting a joke.

"If you could pay our fines, they would let us go. We would love you forever."

"Wait a minute! You already love me forever. You said so after I saved your butts when you caught that mountain on fire. What else have you got?"

"Stop joking!" demanded Hambone. "We're going stir crazy in here. We gotta get out."

"How long have you actually been in there?" asked Elmer as he sensed that this could be a good teaching moment for his nephew.

"Almost three hours! But it seems like three days," shouted Hambone.

Lowering his voice, Hambone continued, "Besides, I think there's some bad people in here. There's a drunk guy in the corner and a gnarly old guy who keeps staring at us. He's scary."

"Well, Hambone, it is jail. There could be bad people in there. I'll lend you the money to get out under the condition you agree to work it off when you get home. But I am a good two maybe three-day drive away," said Elmer.

"He's gonna help us!" shouted Hambone to Tim and Dude who were a few feet away, but still in the holding tank.

"Unck, there's no need to come down here, just call the Pinellas County Clerk and tell her that you want to pay our fines. Her name is Shirley, She takes credit cards and she's there right now. Hurry!

"Oh, one last thing, please don't tell Dad about this. He's still pissed about that last Field Day."

Three days after Field Day

"I'm glad to see you boys made it home safe and sound," said Elmer to Hambone, Dude and Tim as they burst into his ham shack bright and early Wednesday morning.

"Now that you are indentured to me for two hundred dollars each, I have a to-do list for each of you to start working on. But first, I want to hear what happened."

"It wasn't really our fault," said Hambone.

"It never is," mumbled Elmer. "Go on."

"The drive down there was uneventful. We checked into our hotel Friday afternoon and on Saturday morning headed to the boat rental place. It was not quite what we expected and nothing like Bill's diving academy.

It was an old shack and the guy had exactly two 8' aluminum dinghies and a really long, skinny aluminum canoe. The two dinghies had small outboard motors, but the canoe only had paddles. They were not what we expected, but we decided that they were good enough and loaded our gear. It was only a few hours until the start of field day."

"How did you rig your boats?" asked Elmer.

Tim responded because Hambone was munching on one of his uncle's doughnuts. "We rigged both of the boats the same. The tripod holding the hamstick antennas was in the bow. We secured it to the forward most seat with bungy cords. The coax for the antenna ran to the center seat where the radio with its power supply and tuner were installed. The coax shield was grounded to the boat at the antenna with a heavy clip lead.

The radio, power supply and tuner were all secured with bungy cords. The 100' extension cord was secured to the port side of the boat and went directly to the power supply.

The only difference between the two installations – besides the radios themselves – was the power supplies. Hambone's boat had an old transformer-type power supply we borrowed from the school's ham club junk room. I guess some student built it years ago. It looked pretty beaten up, but it still worked. My boat had a nice new switching power supply."

"We loaded the canoe last," said Dude. "We put the generator and its gas can in the front and right behind it was the cooler with drinks. I sat in the middle with the paddles and the cooler with food was behind me. In the rear was a duffel bag with tools and other stuff.

"The extension cords ran off the front of the canoe.

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from HAMBONE on page 6

Oh, and the guy at the boat rental tossed a cushion into each boat and said to use them if we needed flotation."

"So, what got you tossed in jail?" asked Elmer, getting a bit bored with this blissful tale of ignorance.

Hambone swallowed the last of the doughnut and continued. "The radios worked fine, and the long extension cords gave enough separation so that we didn't interfere with each other. We motored/paddled to a nice spot just off the pier in front of the Don CeSar Hotel. There was no wind the boats stayed together without much effort.

"Since Field Day had already started, we proceeded to make contacts. We said we were maritime and everyone we talked to was amazed at what we were doing. I think some thought we were nuts."

"I can understand that," added Elmer.

"We had been operating for about two hours when the first problem arrived in the form of a uniformed concierge from the hotel standing on the end of the pier and hollering and waving frantically at us. We couldn't hear him very well, but we finally figured out he was telling us to move away. Apparently, we were coming in very loud over the hotel's background music system and guests were complaining. Not wanting to cause a problem, we motored/paddled out into the bay and well away from the hotel. I guess that got rid of the interference because the guy never showed up again."

"But the fun wasn't over," said Dude. "We were minding our own business making contacts when two cops in a small police boat came zooming up to us so fast that their wake nearly capsized my canoe.

The younger officer, clearly unfamiliar with the operation of their boat, was trying to avoid hitting Hammy's boat while the older more rotund officer stood in the front hollering at us through a bull horn. We weren't sure what he wanted so we smiled and waved and just sat there.

Apparently, there were a lot of nosey people around that bay who had nothing better to do than watch us with binoculars, and one called the cops. The older cop said someone reported that we were shock fishing. That is, killing fish with an electric shock and picking them up when they float to the surface. The cop said shock fishing is illegal."

Hambone cut in, "I said we weren't fishing, we were just amateur radio operators making legal radio contacts. The cop said that he thought we were fishing because we had a generator and there was a number of dead fish floating around our boats. I hadn't noticed that before, but he had a point.

"The cop wrote us each a ticket and said the fines were one-hundred dollars and we could pay at the station. Then the big problem happened.

"The cop used an aluminum boat hook to pull my boat closer so he could hand me the tickets. But as soon as his hook touched my boat, he got a terrific shock and fell into the bay.

"The young cop, saw the first cop fall in, panicked, and immediately started shouting 'officer down!' into his walkie talkie. He rushed forward and made a grab for my boat. But he didn't understand what was happening and got shocked and fell into the water, too."

Tim added, "To make matters worse, the aluminum boat hook now connected both boats together so when the cops tried to get back into their boat they got shocked again.

"Dude, realizing the situation, was trying to get forward in his canoe to turn off the power. But he kept stumbling over the drink cooler that was between him and the generator.

"I disconnected my boat from the extension cord and was trying to help the cops but my boat and the police boat kept bumping into each other."

"So, you finally rescued the cops and the event ended?" asked Elmer.

Hambone said, "Oh, it was nowhere near over. It appeared that the cops were having a hard time treading water. They were weighted down with all the cop stuff they were wearing and neither of them was wearing a life vest. They looked a little like a couple of blue porpoises bobbing up and down. We threw the flotation cushions the rental guy gave us to help them.

By now, the cop's call for help had been answered and two more police boats with cops without life vests and a Coast Guard boat arrived. Dude made one more big leap to reach the generator. He failed, but the sudden weight shift capsized his canoe and submerged the generator.

"It turns out, Unck, that your generator does not run under water. Just so you know.

"Well, the two cops in the water were mad and madder, probably

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"big three" (Kenwood, Icom, and Yaesu) would offer an all-solid-state HF radio until around 1978.

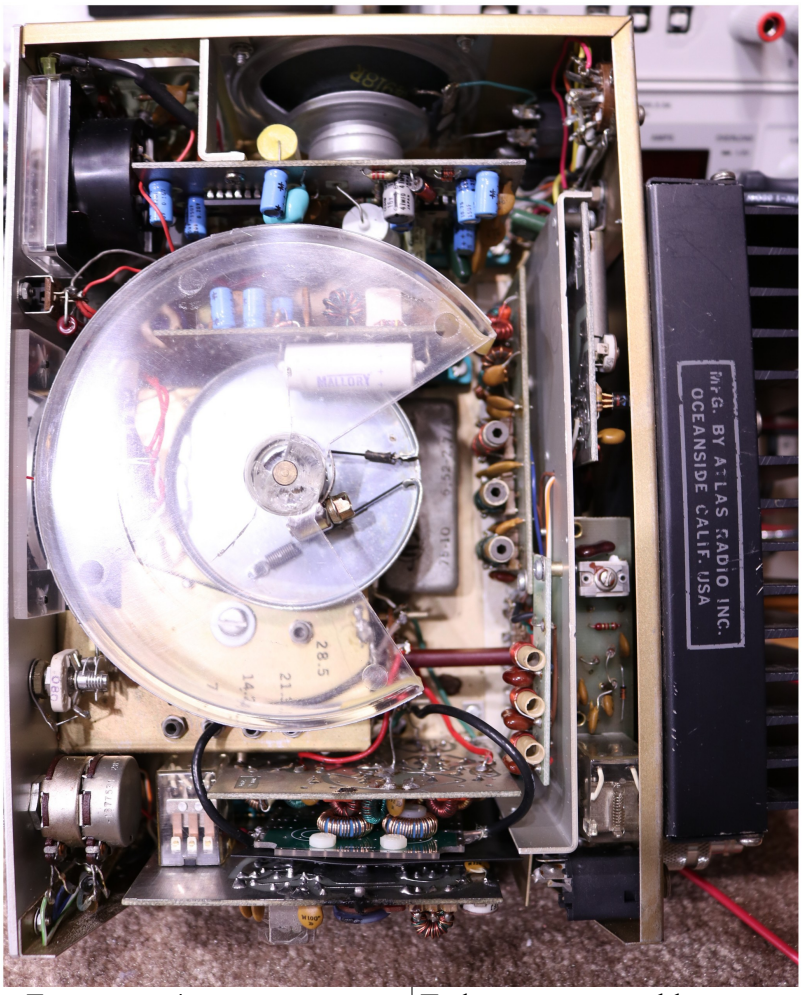
The convenience of all-solid-state, no-tune construction came at a cost of $649.00. This was not a cheap radio by any means—at today's prices that comes out at around $3,500.

The Atlas uses an ultra-simplified circuit design that's pretty effective. There are some glitches with this design, but overall it works pretty well.

Inside the Radio

The 210X is constructed in a fairly simple manner as you can see. It was made to be easily serviced. Most of the electronics are contained on plug-in boards. This type of construction (also popular with Yaesu in the same time period) can also be a nightmare for signal tracing - you can't get to the test points on the modules without using extender cards. Both Atlas and Yaesu offered a quick turn around repair service on defective modules, so it was relatively easy to repair these radios.

The big translucent wheel in the middle is the tuning drum. Yes, this radio has an analog VFO. The dial scale is printed on the edge of the drum and shows through the window on the front. If you look closely, you can see a dial cord, just like on other old-time radios. This dial cord mechanism is partly at fault for this model's tendency to drift. Once you tune onto a signal, the dial cord holds some residual tension. After you let go of the tuning knob this tension is slowly released, resulting in mild tuning shift.



A Hot Transmitter!

At right you can see the RF power amplifier and its black-finned heatsink. There is no cooling fan. Atlas gave the following advice to owners regarding PA temperature:

THE MAXIMUM SAFE TEMPERATURE OF THE HEAT SINK NEAR THE OUTPUT TRANSISTORS IS ABOUT 150 DEG F. THIS IS A TEMPERATURE THAT WILL BE TOO HOT FOR YOUR FINGERS TO HOLD, SO A GOOD TEST IS TO PUT YOUR FINGERS ON THE FINS CLOSEST TO THE TRANSISTORS. IF YOU CAN HOLD ON WITHOUT A LOT OF DISCOMFORT, YOU'RE OK.

Today no one would ever put instructions like this on a product—they'd be sued back to the stone age. The 1970s were a much more free-wheeling time—hot fingers were apparently not a problem.

The Circuit Design

The Atlas 210X is a single-conversion superheterodyne radio. It uses just two oscillators and mixers to carry out all transmitting and receiving operations.

In transmit, the circuit action looks like this. The green lines trace the flow of the information, while the red and blue lines trace the two oscillator signals.

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In this example the radio is transmitting in USB on 28.400 MHz. The tuning dial operates the VFO, which produces 22.880 MHz. At the same time, the NORMAL sideband crystal generates a steady 5.520 MHz signal, which feeds into the 1ST BAL (balanced) MIXER along with the microphone audio to generate a double-sideband suppressed-carrier (DSB-SC) signal at 5.520 MHz. The lower sideband is lopped off by the 5520 KC 8 POLE LADDER FILTER, leaving only the upper sideband signal remaining.

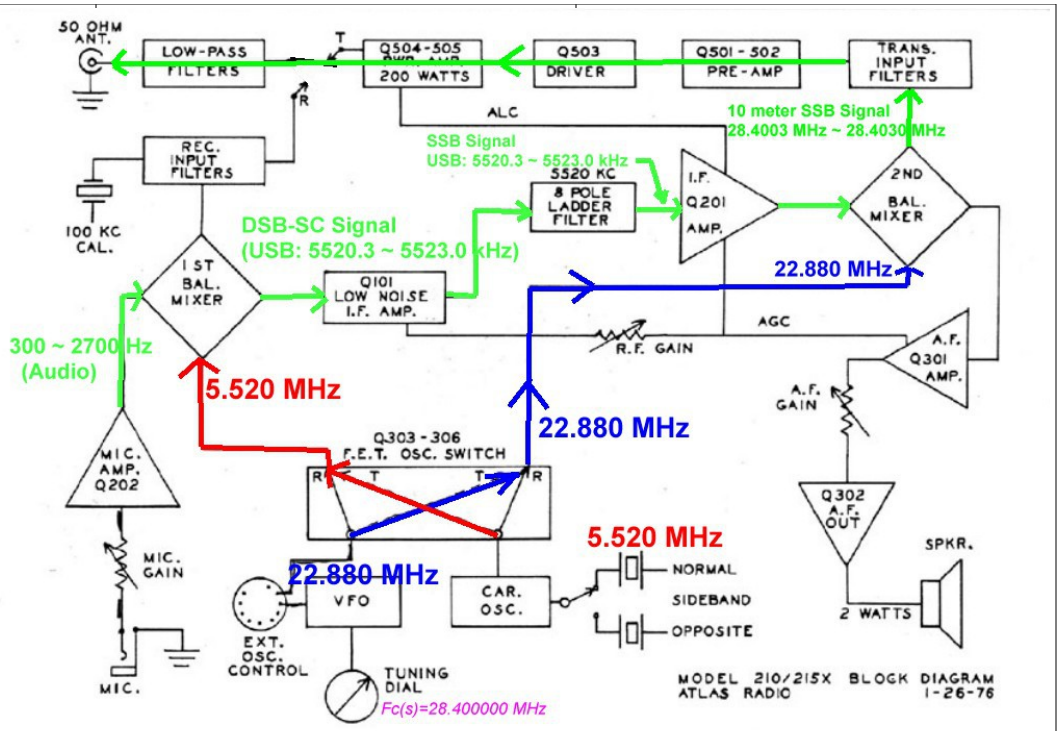

Figure 4-2. ATLAS 210x/215x Block Diagram

This USB signal is up-converted to the final frequency of 28.400 MHz by mixing with the 22.880 MHz VFO OUTPUT in the 2ND BAL MIXER. The TRANS INPUT FILTERS get rid of any unwanted frequencies from mixing, leaving the final 28.400 MHz USB signal to be amplified, filtered, and passed to the antenna.

The receiver cleverly uses most of the same circuitry as well, the same as most other HF transceivers. The receive signal flow is below. Note that the only real "switch" is the swapping of the VFO and CAR OSC outputs. This "swap" is performed electronically by Q303 - 306 (FET OSC SWITCH) without any mechanical intervention. The microphone amplifier is inactive during receive, allowing the 1ST BAL MIXER to convert the incoming RF signal down to the IF frequency of 5.520 MHz. Meanwhile, the 2ND BAL MIXER acts as the SSB product detector with help from the 5.520 MHz signal from the CAR (carrier) OSC circuit.

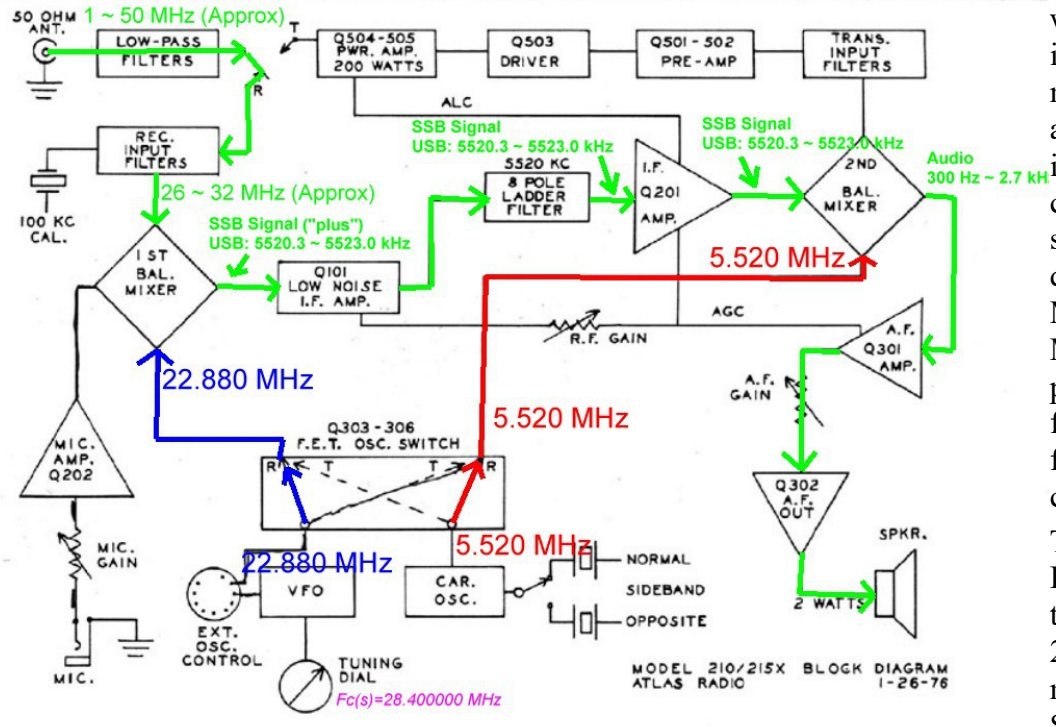

Figure 4-2. ATLAS 210x/215x Block Diagram

The 5520 KC 8 POLE LADDER FILTER is part of the secret sauce of the Atlas 210X. This filter was custom made for Atlas by Network Sciences, Inc. It provides

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phenomenal selectivity that rivals even the latest of today's HF radios.

There's no RF amplifier in this receiver to overload. Received signals go right into the 1ST BAL MIXER for processing after passing through the selected bandpass filter. The designers of the Atlas knew that both tube and solid-state RF amplifiers were very easily overloaded by nearby strong signals and avoided this problem entirely with this approach.

Instability and Offset

Remember how I mentioned that this transceiver uses only two oscillators and mixers to cover all the HF bands? The secret to this is the VFO. The VFO in the 210X is unusual.

In most HF transceivers, the VFO operates over a fixed range, usually between 5 and 5.5 MHz. This enables the designers to focus on making the VFO very stable, both electrically and mechanically. But this approach requires extra mixer and oscillator stages along with a bank of crystals (or a PLL synthesizer) to select the operating band.

The Atlas does business differently. The VFO is band-switched, operating in a different frequency range for each HF band. This means that the VFO operates over almost a decade (10:1) frequency range. That's a difficult engineering problem; it's solved by switching

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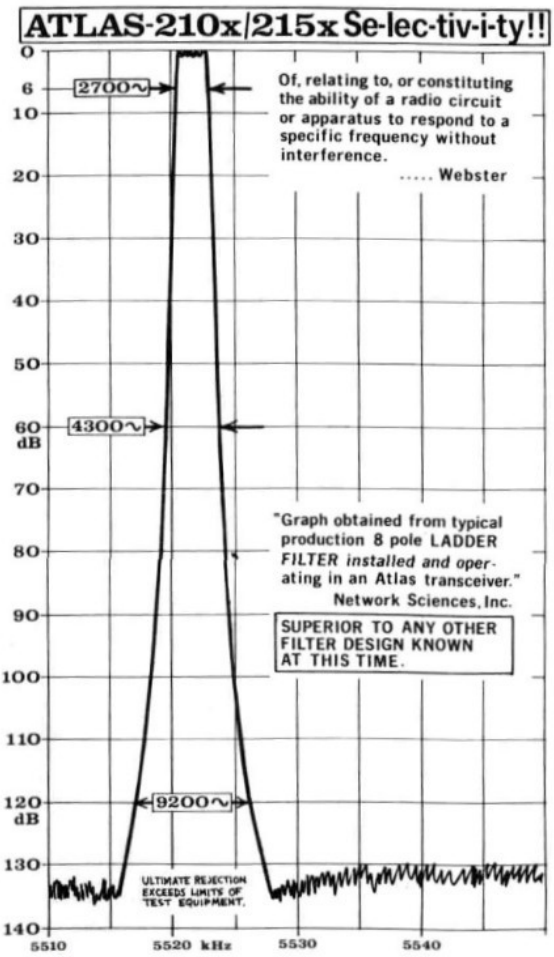

Figure 4-3. Crystal Ladder Filter Selectivity Characteristics

different capacitors and inductors into the VFO circuit based on the band in use. This leads to frequency stability problems, especially on the higher bands. Atlas did an admirable job with the VFO - though it's hard to imagine this radio actually staying on frequency in a mobile. Even a gentle tap on top of the unit will audibly move the VFO.

The VFO T-R switching scheme also leads to unwanted transmit-receive frequency shifts. On the lower bands (80 and 40 meters), the frequency shift is small - perhaps 40 Hz maximum. Back in the day, no one would have noticed that—SSB was still relatively new and Donald Duck was popular, no matter how much his voice rasped and gurgled.

But on the higher bands, the T-R shift grows to several hundred Hz. That makes SSB downright unpleasant, and CW impractical. This radio has no RIT control, so there's no way of fixing this from the operator's standpoint.

The partial block diagram below shows why this happens. I've added two equivalent stray capacitances, C(stray1) and C(stray2). These capacitances appear across the VFO and CAR OSC outputs in both transmit and receive.

The crystal-controlled CAR OSC isn't bothered at all by these extra capacitances. Crystal oscillators are quite stable. The Atlas CAR OSC is well insulated from load changes by a buffer amplifier stage.

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The VFO isn't so fortunate. Even though the VFO is followed by two buffer stages (the 210X designers knew this was a problem), the VFO is still "pulled" slightly by the stray capacitances. The problem isn't so much the stray capacitances themselves, it is the *difference* between them. That difference causes the VFO frequency to shift slightly between transmit and receive.

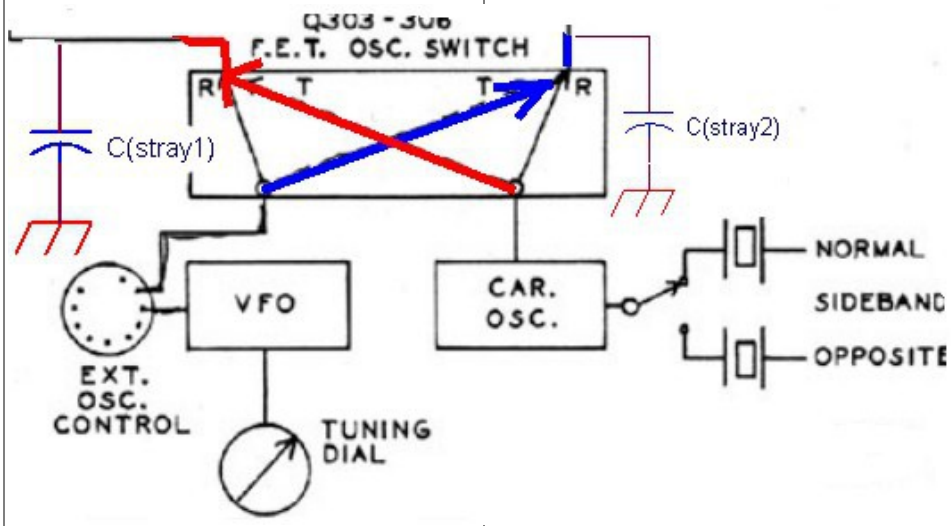
The fix is simple though - - the addition of a small trimmer capacitor (a 10-100 pF unit works fine) under the chassis on one of the two FET OSC SWITCH outputs allows the load imbalance to be dialed out, putting the transmitter and receiver on the same frequency.

Conclusion

The Atlas is a great old radio. The receiver is very pleasant to listen to, even if it takes a very light touch on the VFO dial to properly tune SSB. We don't need no stinkin' RF amplifier in our receiver!

The transmitter gets good signal reports on the air. With its limited 300 Hz - 2700 Hz audio frequency response, the audio is penetrating and punchy.

If you come across one of these and want to own a piece of radio history, go for it.



from HAMBONE on page 7

because the Coast Guard sailors were laughing at them. The newly arriving cops were mad that they had been called out needlessly and the Coast Guard was generally pissed off at us for not having life preservers or something. Of course, we didn't have any 'flotation devices', we had thrown them to the cops, duh!"

"Finally," Tim said, "The Coast Guard grew tired of the comedy and left and the cops got their act together and towed us to their pier, confiscated all our stuff and wrote us a bunch of tickets totaling about two-hundred dollars for each of us.

When we told them we couldn't pay, they locked us up."

"Okay with all of that, but why were there dead fish around your boats?" asked Elmer.

"It seems," said Hambone, already tired of talking about this fiasco, "that old power supply was not being used because it had a short in the transformer that connects one side of the 120-volt input to its chassis. The power supply works fine. But depending on which way you plug its two-prong plug in, you can connect the hot lead to the housing. That's what happened in our case.

"Because Dude's generator was properly grounded to his canoe and my boat was connected to the hot side of the 120 volts, we really were electrocuting fish. We didn't know what was going on because none of us ever touched both boats at the same time.

"That's the whole story, Unck. But remember, don't tell Dad. He's not as understanding as you are.

"Oh, and one more thing. You need a new generator, the old one's shot."

>> JCRAC FEEDBACK <<

Going to Dayton Hamvention next year (2022)?

One of the most popular hospitality suites is hosted by the Kansas City DX Club. Local people, lots of fun, and they do the CW Shootout contest.

The suite has traditionally been held at the Dayton Crowne Plaza but is moving to the Hope Hotel at Wright-Patterson AFB. This hotel has been used over the years by many from our club. Room rate is $143 plus tax. Rooms are expected to fill up fast so if you have plans for the Hamvention now would be a good time to make your reservations.

John, KØIZ