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Author Topic: Kenwood TS-450SAT Puzzle. (Read 5948 times)

KC4ZGP Member



Kenwood TS-450SAT Puzzle.
« on: June 04, 2017, 07:23:11 AM »

Posts: 1961



Here is the problem and it occurs in the 20 meters band only and connected to my delta loop cut for twenty meters.

I key up.

When I adjust either the CAR or MIC control, I get smooth increase of the ALC indicator until I get to about fifty watts then the ALC and SWR indicators go nuts as if arcing is detected.

The Bird meter inline shows forty watts forward, 0 watts reflected. No arcing indicated.

This problem goes away when I insert my 949 Versa Tuner into the circuit; full power out full ALC indicator, SWR 1:1 or near there. The transceiver is happier than pigs in mud.

My first action: I replaced capacitors in the low-pass filter. Thought they might be arcing. Same problem.

Such a frequency-unique problem.

My other TS-450SAT loves the delta loop. Full-power ahead!

Oh my this TS-450SAT is cursed, cursed I say!

Back to the paddle.

--- ... ---

Kraus

Oh my

Donate to keep eHam on the net

N8YX
Member

Posts: 1332



RE: Kenwood TS-450SAT Puzzle.

« **Reply #1 on:** June 04, 2017, 07:56:57 AM »

Look at the coupler/detector circuit for the ALC. Did Kenwood do what Yaesu did and put that (eventually) conductive potting compound on the pickup loop?

Logged

N4ATS
Member

Posts: 1282



RE: Kenwood TS-450SAT Puzzle.

« **Reply #2 on:** June 04, 2017, 09:53:23 AM »

Increase the length of the jumper between the Bird and exciter to at least 6-9 foot.

Logged

KC4ZGP
Member

Posts: 1961



RE: Kenwood TS-450SAT Puzzle.

« **Reply #3 on:** June 04, 2017, 11:26:07 AM »

Quote from: N8YX on June 04, 2017, 07:56:57 AM

Look at the coupler/detector circuit for the ALC. Did Kenwood do what Yaesu did and put that (eventually) conductive potting compound on the pickup loop?

No conductive stuff. Looks to be a non-conductive spacer insulating the main line from the torid pickup/sensor coil.

I disconnected CN8 off the filter board. CN8 feeds signal from the filter board SWR detector circuit to the IF board to give front panel ALC and SWR meter readings.

According to the Bird, I do get one-hundred watts out but the Bird indicates 20 watts coming back, an SWR of 2.6:1. Might be the ALC is now uncontrolled.

Getting whackier.

I reconnected CN8 and the Bird shows no more than 45 watts and maybe one watt back, a reasonable SWR. But still no more than 50 watts allowed out when the SWR and ALC indicators go whacko.

Apparently the SWR circuitry is controlling the output power as it should. But why when the output gets to near fifty watts, the SWR circuitry thinks something is wrong. Something is falsely telling the SWR circuit something is wrong.

This problem is not apparent on any other band, just 20 meters.

This transceiver got struck by lightning many years ago. I replaced the IF board and it came back to life.

I sent it to the Kenwood joint-eth in California for a complete alignment.

Ever since it's return, it has not been normal and at only at 20 meters.

I shall replace the relays of the 20 meter filter unit. Maybe at the higher power,

the contacts inside each relay just can't conduct and sparks or arcing inside the relay themselves is occurring.

This is 20 meter-only problem.

If I had any hair, it'd be pulled out.

Thanks all.

Kraus

« Last Edit: June 04, 2017, 11:28:34 AM by KC4ZGP »

 Logged

KC4ZGP
Member

Posts: 1961



RE: Kenwood TS-450SAT Puzzle.

« Reply #4 on: June 05, 2017, 04:16:45 PM »

I replaced relays K5 and K12 and chokes L1 and L2 of the filter board.



No difference.

Back to the hair pulling.

Kraus

 Logged

KA5IPF
Member

Posts: 1614



RE: Kenwood TS-450SAT Puzzle.

« Reply #5 on: June 05, 2017, 08:21:24 PM »

When aligned correctly the ALC meter will not move until the power out gets to 100w. At that point it will start reducing the drive to maintain the 100w without exceeding. The more it reduces the drive the higher the ALC reading. Do all testing into a dummyload and align the power out and protection circuit correctly. Once that is working align the ALC meter. Then see what happens.

 Logged

KC4ZGP
Member

Posts: 1961



RE: Kenwood TS-450SAT Puzzle.

« Reply #6 on: June 06, 2017, 05:48:39 AM »

KA5IPF,



Thanks for the response.

So the ALC is 'overacting'? Could the ALC circuitry be that frequency selective? This problem occurs only on 20 meters and to its delta loop antenna. Its fine into a dummy load.

One would conclude the antenna, but my other TS-450S is fine with the antenna.

This problem does not occur at 17 meters on its delta loop nor does it occur at 160 meters on its 'BIG' horizontal loop. 17 and 160 are all di jobu as we said in Japan. My other 450S is alright with all three.

Hmmm...I sent this transceiver to the radio doctor back in January. This issue was never detected via alignment procedure or the chap didn't really do a thorough alignment. Maybe he just pencil whipped it.

I haven't a test bench of lots of equipment. So alignment by the service manual would be beyond me.

And the mystery goes. (Sonny and Cher?)

Kraus

 Logged

W9IQ

Member

Posts: 2959



RE: Kenwood TS-450SAT Puzzle.

« **Reply #7 on:** June 06, 2017, 09:41:31 AM »

Kraus,



Have you tested it into a dummy load on the problematic frequency?

Also when putting in a tuner, you are often changing/adding cables which will likely change the impedance the radio is seeing even if the tuner is in bypass. Take this into account during your diagnostics and analysis.

- Glenn W9IQ

« *Last Edit:* June 06, 2017, 09:55:43 AM by W9IQ »

 Logged

- Glenn W9IQ

I never make a mistake. I thought I did once but I was wrong.

KC4ZGP

Member

Posts: 1961



RE: Kenwood TS-450SAT Puzzle.

« **Reply #8 on:** June 06, 2017, 10:16:52 AM »

Glen,



It's actually very difficult to pin down this one. It shouldn't be since this happens on 20 meters only. All other bands work fine.

I've put it to a dummy load and it likes it or it doesn't like it.

A week later it doesn't like the dummy load but it likes a tuner added instead.

Also, after I've used the transceiver on the air, things warm up, the problem subsides somewhat.

Problem still there but not as bad. I can get a whole forty watts out but don't touch a thing, he'll go whacko.

This morning in a effort to get another 'what the heck it's doing', I quietly got 25 watts out, SWR meter solidly display 1.5:1 as my antenna is about that. I increase the CAR adjustment. Just the ALC display shows any deflection, the SWR and ALC indicators go nuts.

For an experiment, I disconnected the VSF and VSR line from the filter board. He easily put out one hundred watts. However, the Bird meter showed 25-30 watts reflected. I assume since the control lines were disconnected, no limiting control was in effect, the transceiver went into run-a-way?

I would love to see this problem eradicated so much, I'd let whoever could fix it, have the transceiver for free. I want to see it work as it did before the lightning strike in 1992. A new IF board brought it back to life then.

There you go Glen. Clear as mud. This is a 'you gotta be there to see it' problem.

Thanks.

Kraus

 Logged

KC4ZGP
Member

Posts: 1961



RE: Kenwood TS-450SAT Puzzle.

« **Reply #9 on:** June 06, 2017, 02:49:07 PM »

Alrighty Glen,



Got home, checked a voltage on the filter board relay driver and 11.8 volts is there.

Disconnected any and all automatic antenna tuner connections.

Still the problem exists.

This evening it loved the dummy load but didn't quite like the 949D. Although the 949 showed very low reflected power, the TS-450SAT's SWR meter displayed 1.5:1. ALC works smoothly however. Maybe the SWR meter is over adjusted. And I do have 100 watts out.

Hmmmm....

I'm going to play PSK31, 14.070MHz for a while. I'll let you all know.

It's 2149 right now.

Kraus

 Logged

KA5IPF

Member

Posts: 1614



RE: Kenwood TS-450SAT Puzzle.

« **Reply #10 on:** June 06, 2017, 03:02:12 PM »

Do you have access to the small coax cables used in the radio? Maybe from another radio? You need one about 18" long. In the past I have had 450's that the final oscillated at certain power levels. I replaced the short jumper from the final to the filter with a longer one and that stopped it. I haven't seen that problem in years but just a thought.

 Logged

KC4ZGP

Member

Posts: 1961



RE: Kenwood TS-450SAT Puzzle.

« **Reply #11 on:** June 07, 2017, 05:00:04 AM »

Quote from: KA5IPF on June 06, 2017, 03:02:12 PM

Do you have access to the small coax cables used in the radio? Maybe from another radio? You need one about 18" long. In the past I have had 450's that the final oscillated at certain power levels. I replaced the short jumper from the final to the filter with a longer one and that stopped it. I haven't seen that problem in years but just a thought.

You know the chap who aligned/calibrated both TS-450S suggested a long cable. He didn't say where to exactly install it. Someone else here suggested same.

Well I could get some RG-58, make a jumper, tin the shield, tin the center conductor, reproduce the ends. I am a ham radio guy. We love to modify/change/improve/break. We do the last one best.

But why just at 14 MHz? I guess that'll be the mystery.

Yesterday, I worked PSK on 14MHz but I had to insert my 949 to give the transmitter what it wanted to see. I got almost 80 watts out. I couldn't get SWR flat. Perhaps, the mystery oscillation you indicate was still festering but to a lesser degree.

I love mysteries but they always solve on TV. Hey that's an idea. I'll give this mystery to Hollywood. They'll invent a solution? Naw! That's bad idea.

It's 14.050MHz or thereabouts CW this afternoon, 2200UTC or thereabouts.

Kraus

N8YX
Member

Posts: 1332



RE: Kenwood TS-450SAT Puzzle.

« **Reply #12 on:** June 07, 2017, 08:28:19 AM »



Quote from: **KC4ZGP** on June 07, 2017, 05:00:04 AM

...
But why just at 14 MHz? I guess that'll be the mystery.
...

The PA brick is possibly self-resonant at that frequency. Changing the input reactance via the longer coax shifts the resonance point to somewhere other than the 20M band.

KC4ZGP
Member

Posts: 1961



RE: Kenwood TS-450SAT Puzzle.

« **Reply #13 on:** June 07, 2017, 08:48:33 AM »



Alrighty. I shall get started on a short cable.

I just hope it doesn't push the resonate point to 17 or 160, my other bands.

And if it does, I shall fashion a band switch-switch.

Is everyone having fun repairing the 25 year old Kenwood TS-450SAT.

To the paddle this evening on 14.050MHz or thereabouts, 2200UTC.

-- ... --

Kraus

KC4ZGP
Member

Posts: 1961



RE: Kenwood TS-450SAT Puzzle.

« **Reply #14 on:** June 18, 2017, 05:00:53 PM »



Ah ha! Eureka!

I think I have a grip on the trouble.

I got thinking when this transceiver got struck by lightning, did windings for the 14MHz filter inductors get welded, perhaps shorted together changing inductance thus changing the whole filter anyway.

I took my Bic pen plastic cap and slightly spread each winding of each coil.

Now I can get full power with smooth ALC adjustment.

I further discover though three coaxial jumpers I use to insert the Bird meter into the antenna circuit seem to let the original problem appear but to a lesser degree. The ALC whacko deflection quickly diminishes. So the transceiver is still not completely happy. Just happier.

The other TS-450S does not act up at all.

The Bird connected directly to the transceiver shows no problem.

I declare the problem resolved.

I sure want one of them TS-480HX. As the soul of the wolf is in your dog, so is the soul of the TS-450 in the TS-480. Makes sense to me.

And it's just a thousand bucks.

--- ... ---

Kraus

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