Subject: ICA AC Companion Radio
Posted by gofar99 on Mon, 28 Jan 2019 17:24:50 GMT
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Hi Everyone, I have one of these things in fair conditon. It needs the wiring replaced and likely a few other things fixed. The problem is that all the electronics are encapsulated in a single chunk of plastic stuff. Does anyone have a schematic of this radio? Or at least hook up connections. I would like to restore it if possible.

https://www.radiomuseum.org/r/insuline_companion_110v.html

Subject: Re: ICA AC Companion Radio
Posted by Wayne Parham on Mon, 28 Jan 2019 23:56:09 GMT
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Oh, dude, that's cool!

Are you saying the wiring beneath the chassis is covered in epoxy or some such thing?

Subject: Re: ICA AC Companion Radio
Posted by gofar99 on Tue, 29 Jan 2019 16:28:12 GMT
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Hi Wayne, The radio is very vintage (ca 1931). Coupling caps are about the size of postage stamps and look like sandwiches. Resistors are rectangular and look a lot like fuse links for cars. The two tubes are type 227. One is an original RCA mesh plate. It appears to use a TRF stage feeding a regenerative detector. It is transformer powered. That leads to the problem. It seems that all power supply components are inside a block of black hard plastic stuff and that is inside a metal enclosure welded to the chassis. Completely un-serviceable. Considering the state of the wires and general condition there is virtually no chance the PS is any good. I can probably trace out the rest of the circuitry as I replace the wiring. Any thoughts are welcome.

Subject: Re: ICA AC Companion Radio
Posted by Wayne Parham on Tue, 29 Jan 2019 19:16:17 GMT
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I love these old tube radios. I have some Sam's Photofacts and a collection of CDs with thousands of schematics of old tube radios. I'm going to try to find your radio on one of them. Gotta find the disks first though - I haven't repaired a tube radio in about ten years.

I was on a tube-radio collecting kick about 20 years ago. My first radio looked great, but the

electronics were in really bad shape. It had been repaired during WWII - from a date on a repair tag on the chassis - and had an output tube that was different than what was shown in the schematic. I imagine the technician didn't have the right output tube, so he re-wired the chassis to use a tube that he had on hand.

If that was the only problem, it would have been cake. But all the capacitors were open, and the insulation on the wires was brittle and cracking off, leaving exposed conductors. So I bought a couple spools of cloth-insulated wires and rewired with that. As an aside, I like cloth insulation in tube radios 'cause it'll last a hundred years.

If the wiring and the caps were the only remaining problem, it wouldn't have been too bad, but I still had no high voltage... Because the field coil was open. Now I could have just replaced the speaker with a fixed magnet and run a resistor in place of the field coil but I really wanted the radio to be "right" so I wound the field coil myself. Couldn't just wind it like you would on an open spool either, because the speaker frame prevented that. I had to push the wire through the side of the frame and then wrap it around for each and every turn. That's a repair I had to fight for. And in the end, I'm most proud of that radio.

I bought maybe a dozen tube radios after hat one. None were anything close to that much trouble. In fact, one or two worked without any repair needed. But I replaced all the capacitors anyway. Several other radios would have worked except the PS caps were bad. So I always replace them with poly caps. Most are 20uF to 40uF, and a poly cap is about the same size, so that's an easy fix.

Subject: Re: ICA AC Companion Radio
Posted by gofar99 on Tue, 29 Jan 2019 22:19:13 GMT
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Hi Wayne, thanks for looking. I have not found anything except the one site with any info on the radio. Even the long defunct company's site doen't show it. Not in Rider either. I have started to trace out the circuit. It looks pretty typical of the vintage. I can't be sure at this point, but it appears to have a regenerative first stage with grid leak detector and an audio amplifier stage. At first I thought it was a TRF with regen, but the use of an actual audio transformer is a bit unusual. Odd AC hook up. The case is not connected electrically to the line, but the guts are. It uses insulated knobs to cover mounting bolts. I will have to alter that to keep from having live juice on the phones. Nothing like a tingle between the ears to make your day. :roll: More to follow as I disassemble it.

Subject: Re: ICA AC Companion Radio
Posted by gofar99 on Wed, 30 Jan 2019 19:54:04 GMT
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Hi Everyone, After dissembling the radio I have come to a few conclusions. First this thing is dangerous to use. Back in the era of knob and tube AC mains it might have made sense. Now it

is a serious no go. The tubes are powered by a dual winding 2.5 volt secondary. The high voltage is taken from the AC mains directly (ouch). Much worse when you discover that the phones are only isolated from the AC mains by a resistor. If it fails and the polarity is wrong you hear music of the angels and not the local AM station. BTW no fuse either and only one side of the AC is switched. Now to other details. The filter capacitors inside the Bakelite mass are toast. The B+ is created from the AC mains with one of the type 227 tubes used as a rectifier. Crude to the max. The wiring is toast and the coil is damaged. So I am not going to refurbish this thing. I'll keep it as it is interesting, but there is no real way to make it safe and useful without a complete rebuild.

Subject: Re: ICA AC Companion Radio
Posted by Wayne Parham on Thu, 31 Jan 2019 00:04:52 GMT
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Lots of equipment and appliances were made that way back in the 2-wire AC days. If you had two appliances side-by-side, one might have the chassis connected to one side and the other to the other side, so touch them at the same time and get a shock. More common was the arrangement like you described, or floating grounds, which often had the chassis sitting at 70v. Gotta love the good old days!
