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CBTricks.com Forums » 10 Meter & CB Radios » Radio Repair and Troubleshooting Discussions » Vintage CB Radios (Moderator: nomadradio) » Ye Olde 858 restoration and mods

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Author

Topic: Ye Olde 858 restoration and mods (Read 1288 times)

lbcomms

Hero Member



Posts: 215



Ye Olde 858 restoration and mods

[Quote](#)

« **on:** August 08, 2012, 10:16:37 AM »

For the last few years we've been hearing from old timers about how good the 858 chassis was in it's day. Nearly all the ones we see here are "golden hacked" to the point of being unrepairable / unusable over the last 35 or so years when this chassis was around, but I'd always promised myself that if a good original one came along, as unlikely as that may be, I'd restore it to original condition and see if the old timers were correct or the perceptions had changed over the years.

An original one came in for repair, filthy but complete and almost unmolested. Owner was an old trucker who retired in the 80's and wanted a radio to listen to the caravan / camper crowd. Problem was here in Oz, the truckers and campers moved to UHF years ago, so the 858 was no good for him. He ended up trading it in on a new UHF rig. We finally had our 858!

We opened it up and it was far from a pretty sight. No TX or RX, 9V rail shorted to ground (bad cap). Fixed that, no RX and TX in AM only, channels incorrect, and missing half the display segments, no audio. PCB and components covered in a thick film of diesel and nicotine.

The green flexi board for the channel selector and LED was crumbling away, not sure if it was diesel, nicotine, or both that did it.

The channels switch and LED were removed, along with other moisture sensitive parts (speaker, meter, knobs, and front panel). Radio was placed in an ultrasonic bath and left for 10 minutes, the liquid turned dark brown 🤢

Replace liquid, wash again, repeat 5 times. It's looking a lot better now.

Brown goo is now leaking from all of the cans. Slugs removed, wash again twice. No more brown goo.

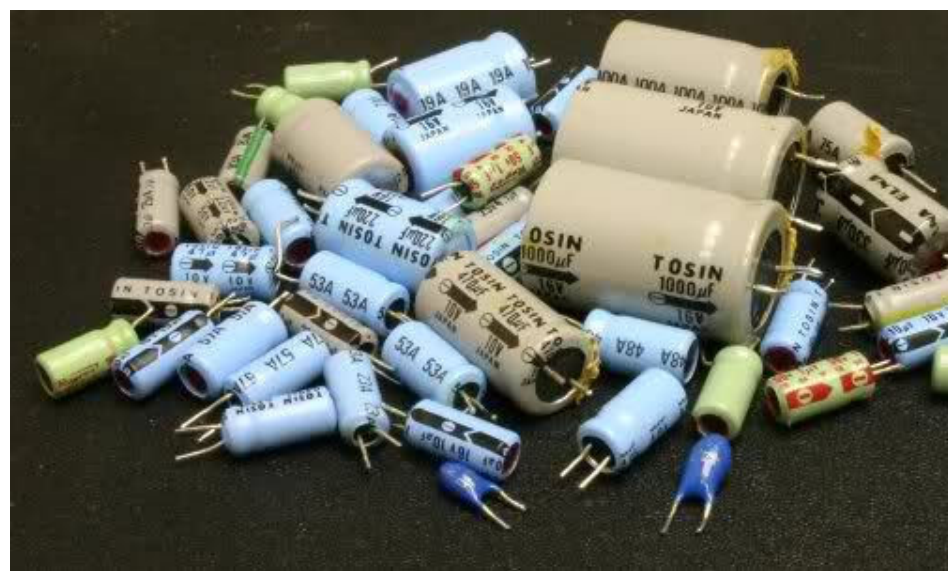
Jury-rigged the PLL for N=100 (27.055, channel 8), and fired it up again. No slugs in any cans, so it's not going to work, but there is no RX 9V supply. Another shorted electrolytic. Turned it off and went over a few with an ESR (capacitor tester) meter. All were bad to some degree, so **every** electrolytic was replaced with a new one. 2 more ultrasonic washes to remove the flux and other residues, overnight in the dryer, and replace all the slugs. The bath had removed the heatsink compound so that was replaced.

Full alignment and it now works perfectly on channel 8 🤩

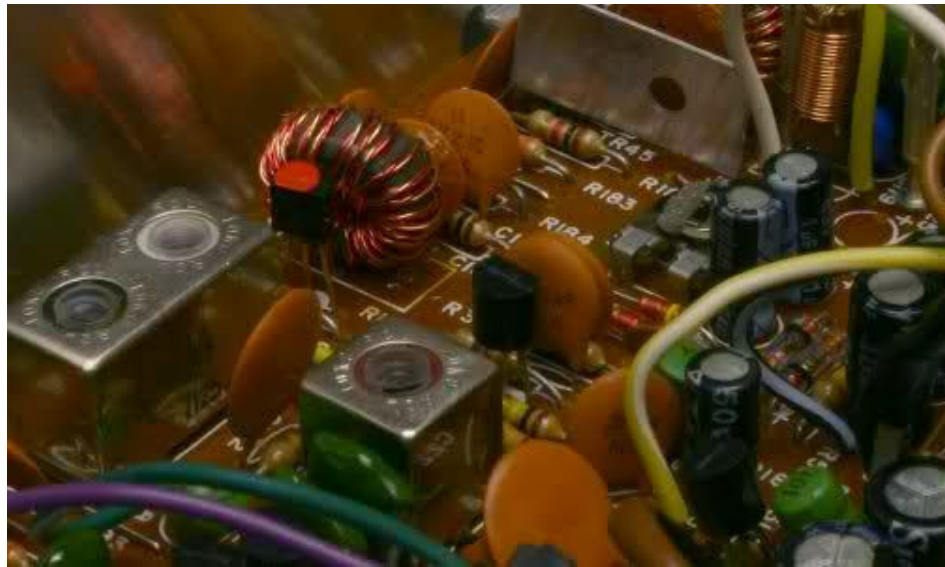
The bad flex board was cut out, and the channel switch wired to the PLL (via some added diodes, more on this later) and to the LED display.

14 tiny surface mount resistors were built into the LED to keep the brightness constant, and that too was wired to the channel selector.

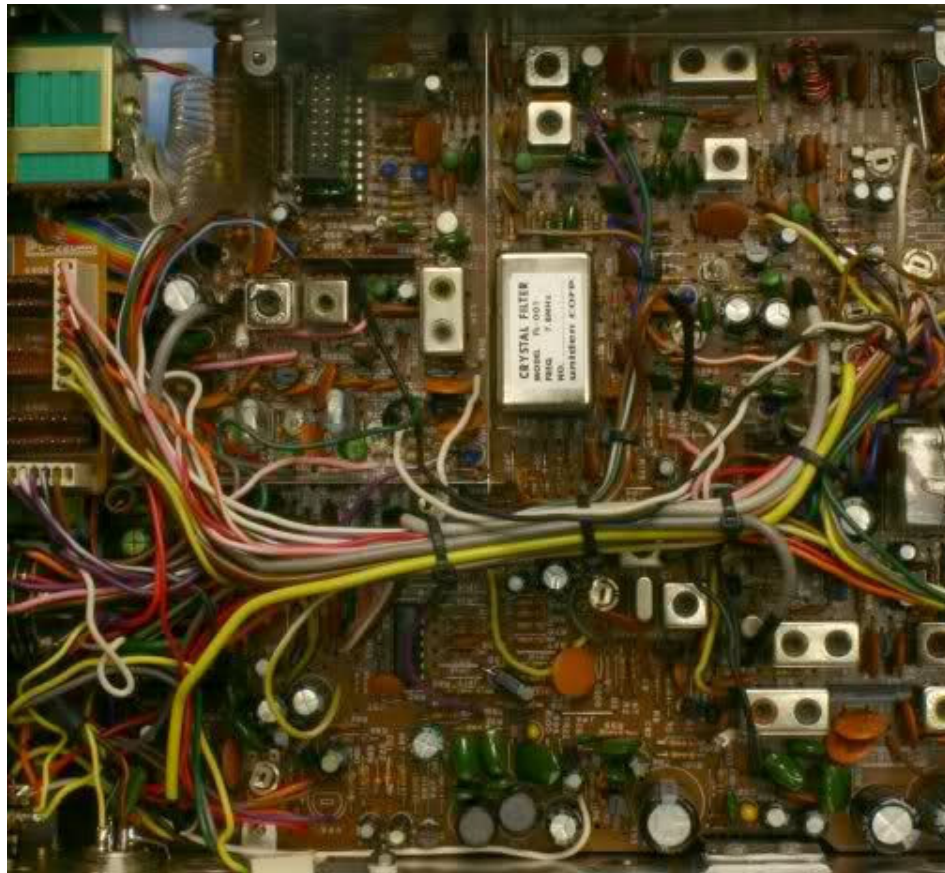
We now had a clean and fully functional 40 channel radio.



Electrolytics, anyone?

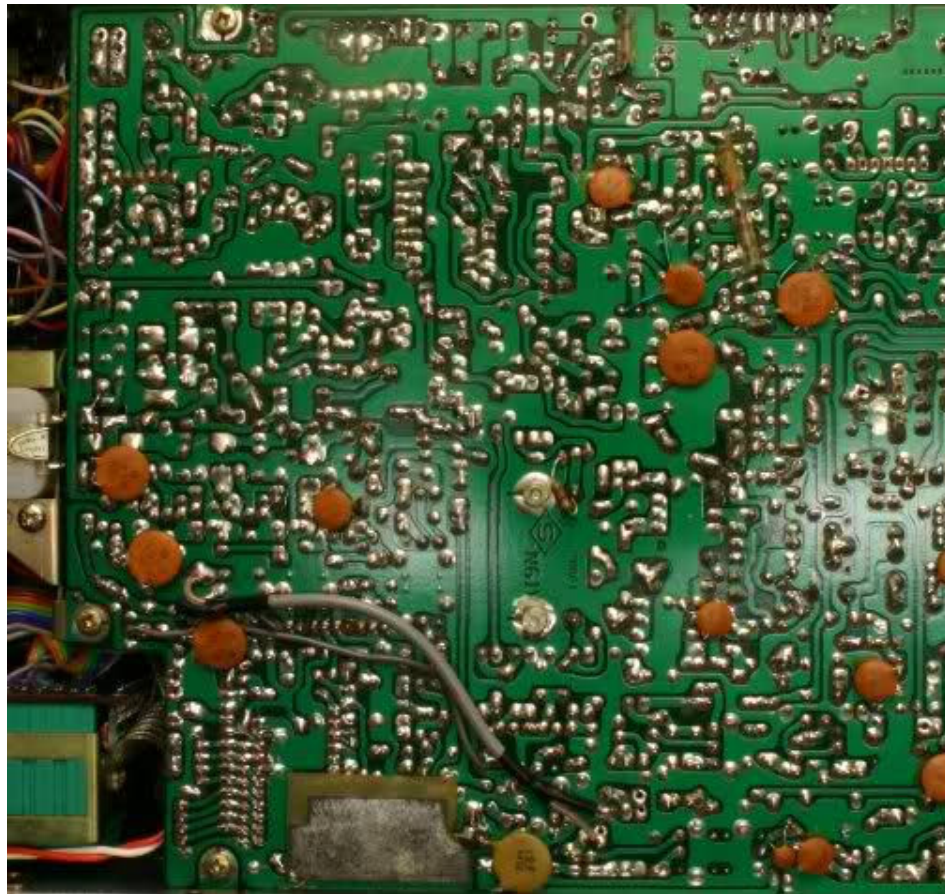


Board came up like new.



This is pretty close to what it would have looked like in 1976.

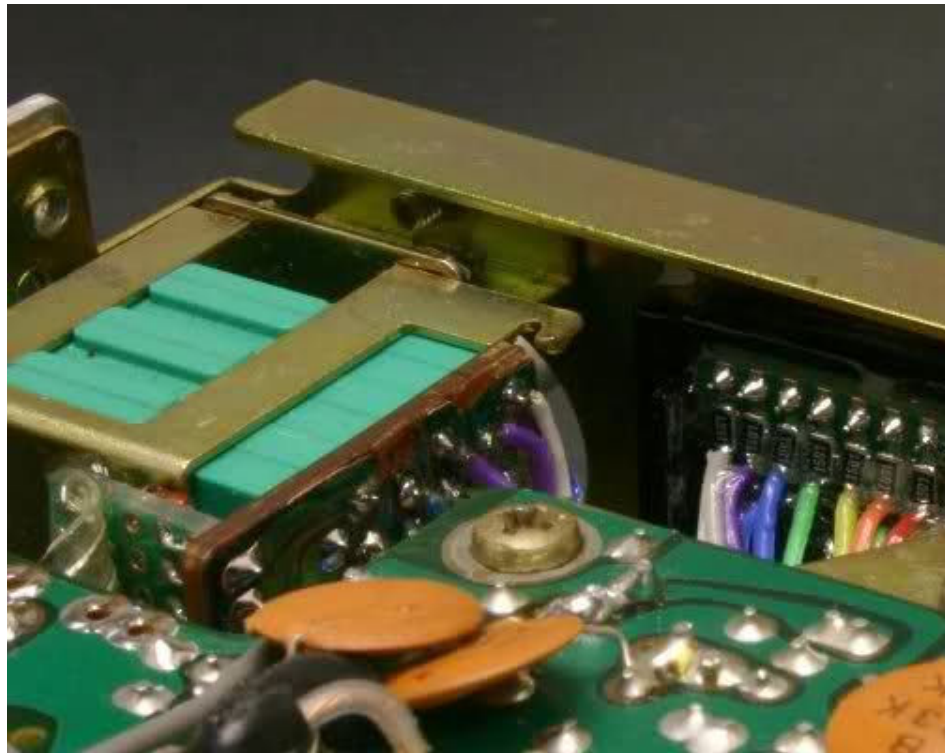
PS: Ignore the connector on top of the PLL 😊



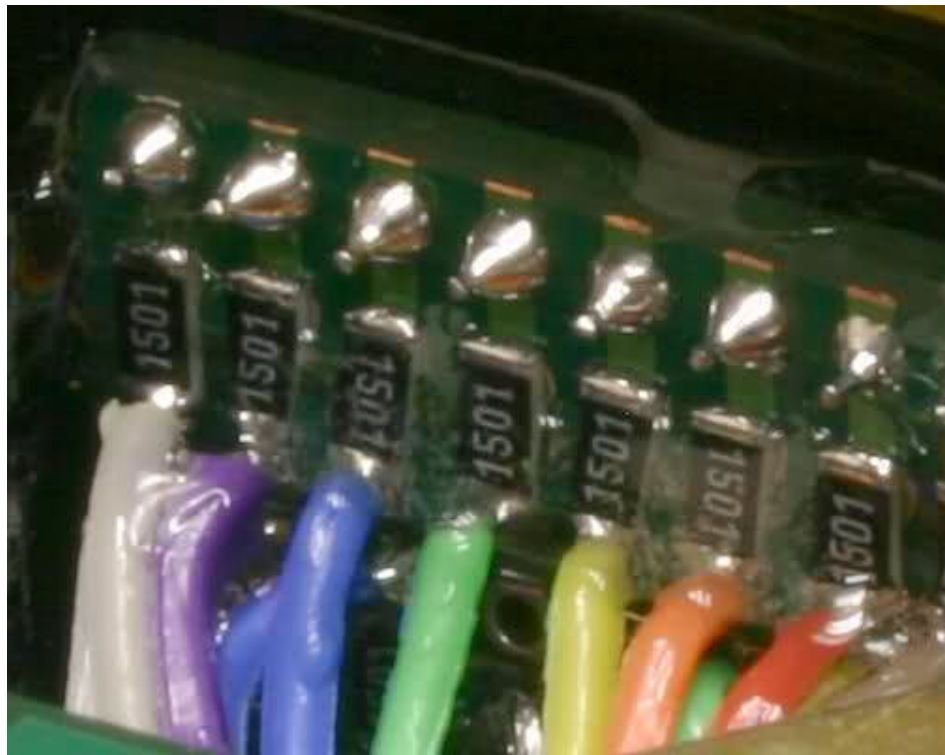
Apart from a bit of corrosion on the shield over the PLL, the print side cleaned up well, too.



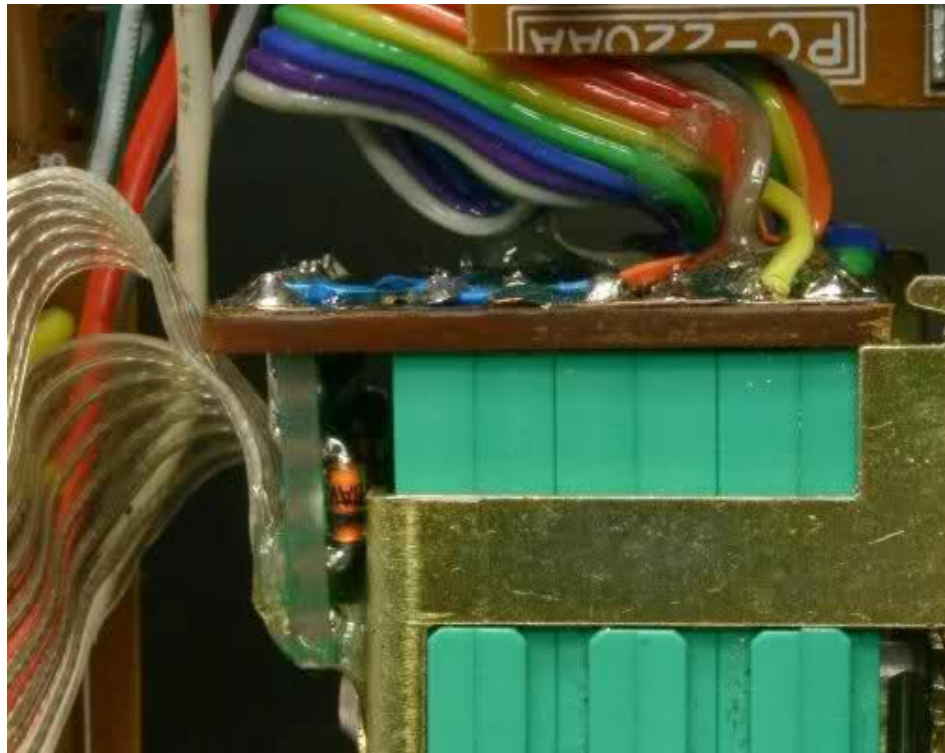
Front panel and knobs also cleaned up nicely.



Flex PCB bypass:



Close up of the 14 x 1.5K resistors.

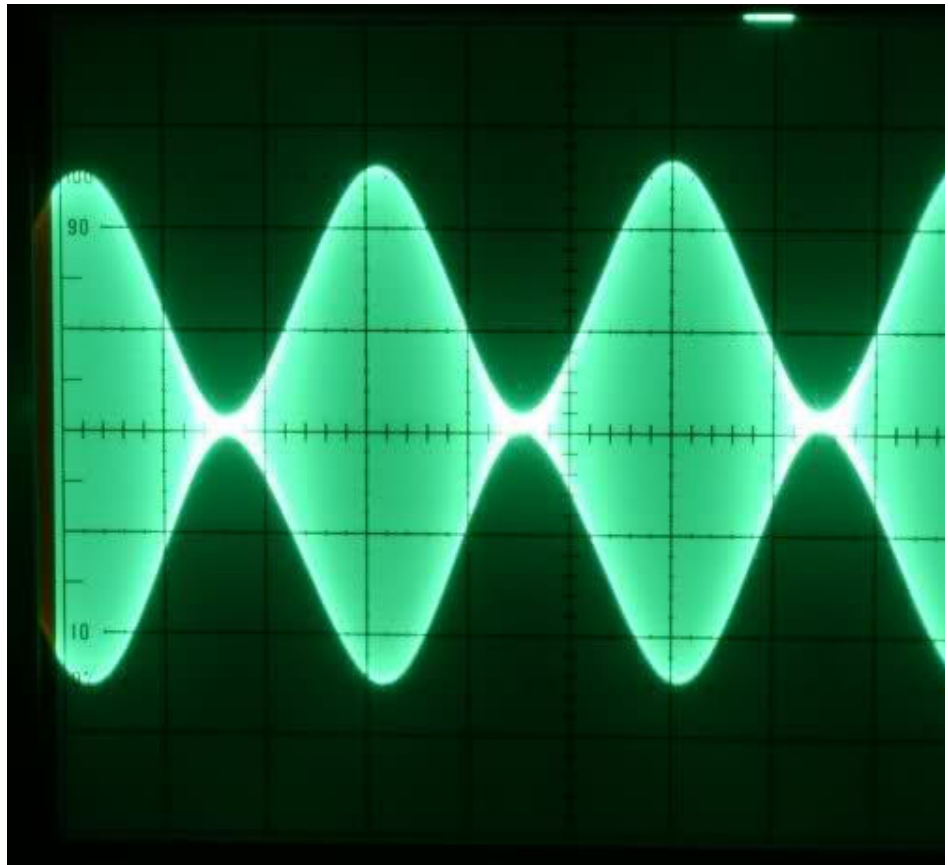


Diodes added to rear of channel switch.

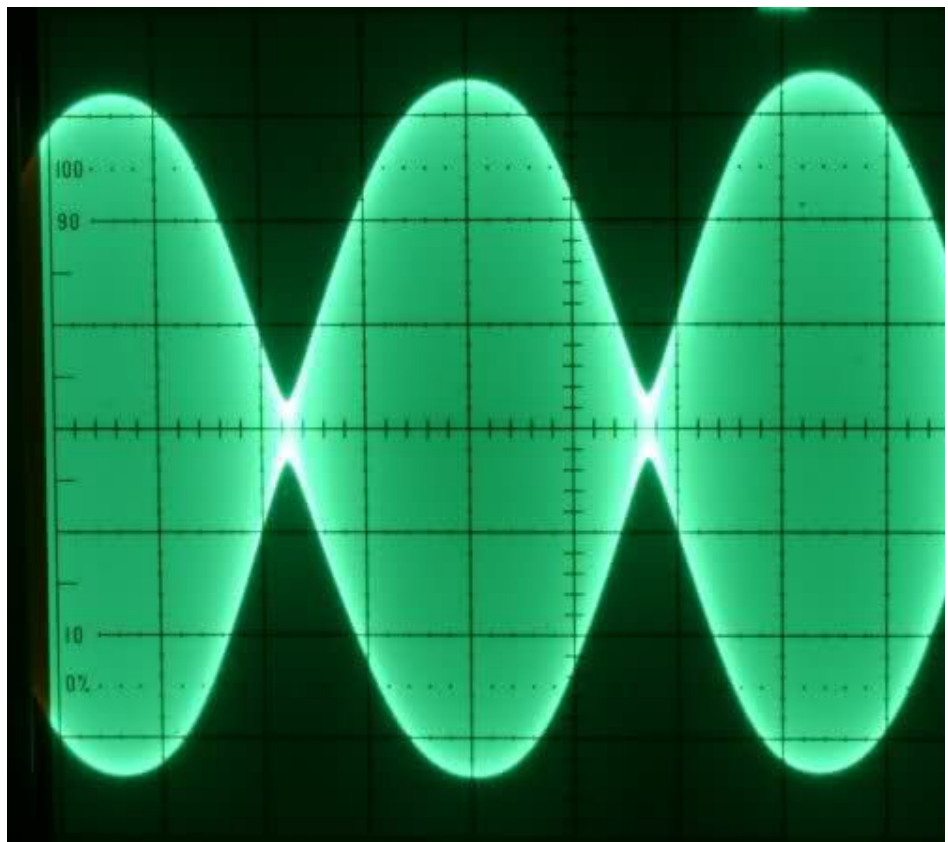


Track cuts were from the 70's, but we replaced the huge old-school resistors with the modern surface mount variety.

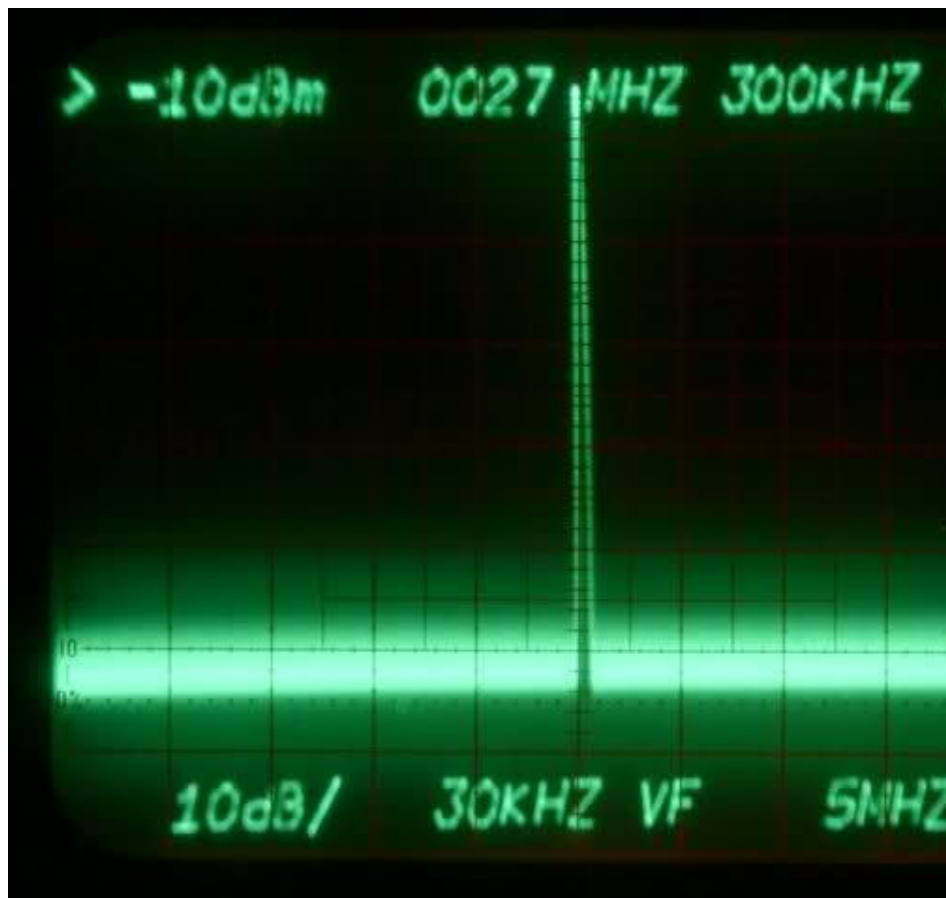
How well did it work? Measurements count for far more than opinions:



AM fully modulated. No visible distortion...



Two tone on SSB. No fuzzies or flat tops here...



30 Mhz either side, spurs at least 55dB below the carrier.

In theory, it should sound nice, and it did. Spoke to a few locals who reported it sounded natural and clean. Sensitivity measured 0.4uV for 10dB SINAD, not quite on spec but close enough. On air, receiver was noticeably quieter (like 3 "S" points!) than a much newer SSB rig. Maybe the old timers were right...

It's not without issues though. It has a noticeable frequency shift if the supply voltage is varied between 11 and 14V, a limitation of the zener shunt regulators of the day. Ordered some ultra-low-dropout 9V regs from Digikey for it, will take a couple of weeks to arrive. In the meantime it works fine on a well regulated 10A 13.8V supply.

More to come (including the reasoning behind the mods to the PLL circuit)

Sue

[Report to moderator](#)  [L](#) [Logged](#)

 **nighthark63**

Hero Member



Re: Ye Olde 858 restoration and mods

« **Reply #1 on:** August 08, 2012, 11:09:13 AM »

[Quote](#)



Posts: 538


 firebottle

Hero Member



Posts: 550



nice job looks great.

[Report to moderator](#) [Logged](#)

 Re: Ye Olde 858 restoration and mods

Quote

« **Reply #2 on:** August 08, 2012, 01:51:43 PM »

The board did clean up rather nice, it would have been nice to have a pic(s) of it covered with grime, oh well. Sensitivity is 0.5 uV for 10dB SINAD on AM so 0.4 uV is better than spec. SSB is 0.25uV for 10 dB SINAD, 0.4uV is worst case spec for SSB so 0.4uV isn't bad at all for a 34 or so year old radio particularly one that has had a hard life.

So NICE SCORE and WELL DONE. Now you know first hand what us old buzzards mean when we say that it's hard to beat a Uniden 858 chassis. No, they weren't perfect and they did (and still do) have some drawbacks and limitations but nothing serious and certainly nothing that can't be worked around.

just some random rantings from the frozen north.

[Report to moderator](#) [Logged](#)

 rockhavenradio

Hero Member



Posts: 384


 Re: Ye Olde 858 restoration and mods

Quote

« **Reply #3 on:** August 08, 2012, 07:50:27 PM »

What's the standard generator set-up to test ssb sinad?
For FM 3 khz dev, for AM 30% mod, for ssb?
Zero beat AM generator at 30% mod?
Or set generator +/-1 khz no mod? (cw sinad?)
What's the standard for this?

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 Froggy
CBTricks Supporter
Hero Member
 Re: Ye Olde 858 restoration and mods

Quote

« **Reply #4 on:** August 08, 2012, 08:31:41 PM »

wow.....wow.... what more can i say

[Report to moderator](#) [Logged](#)



Posts: 2784



rockhavenradio

Hero Member



Posts: 384



Re: Ye Olde 858 restoration and mods

[Quote](#)

« **Reply #5 on:** August 08, 2012, 08:57:23 PM »

What fluid is used in the ultrasonic bath?

[Report to moderator](#) [Logged](#)

low_boy

Hero Member



Posts: 637



Re: Ye Olde 858 restoration and mods

[Quote](#)

« **Reply #6 on:** August 08, 2012, 10:30:05 PM »

Beautiful Job.

[Report to moderator](#) [Logged](#)

577-Jersey

Hero Member



Posts: 2878

Assume nothing until you have proven it.



Re: Ye Olde 858 restoration and mods

[Quote](#)

« **Reply #7 on:** August 08, 2012, 10:43:18 PM »

Nice job!!

How much do you charge to do something like this?

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You hypocrite!!, first take the plank out of your own eye, and then you will see clearly to remove the speck from your brother's eye.-Jesus-

Matthew 7:5

Lazarus

Hero Member



Posts: 1242



Re: Ye Olde 858 restoration and mods

[Quote](#)

« **Reply #8 on:** August 09, 2012, 01:14:40 AM »

Quote from: firebottle on August 08, 2012, 01:51:43 PM

Now you know first hand what us old buzzards mean when we say that it's hard to beat a Uniden 858 chassis. No, they weren't perfect and they did (and still do) have some drawbacks and limitations but nothing serious and certainly nothing that can't be worked around.

i guess i'm an old buzzard too then, because i think, well actually i know for a fact, that the uniden 858 SSB chassis is one of the finest SSB CB chassis ever built, and the fact that it is so easy to implement a controlled carrier mod on it, makes it stand out above several of its contemporaries, it is one of my very favourite radios, and to me the woodgrain robyns are by far the best looking of the lot, absolutely beautiful radios, with looks to match their performance,



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Sometimes I wonder whether the world is being run by smart people who are putting us on or by imbeciles who really mean it. - Mark Twain

 Number Three

CBTricks Supporter
Hero Member



Posts: 1024

I'm 100% certified
Heyseed hick and bitter
clinger


Re: Ye Olde 858 restoration and mods

Quote

« **Reply #9 on:** August 09, 2012, 08:47:46 AM »

Saweeet! We run-across those 858 Grants from time to time, too. I tend to "collect" them, not wanting them to be mounted in a dump truck. Almost EVERY one I've seen in the past 10 years has needed a full 'lytic replacement. The ol-school techs here have even defined the anomaly as "the 10-volt blues", because Uniden used many 10V 'lytics that were "up against it" under normal conditions. Add to that, the age, and you have the blues. Member "Klondike Mike" even assemble re-cap kits and sold them for a fair profit, considering the "gathering", shipping chores. He may still offer them.

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Get along, little doggies.

 lbcomms

Hero Member


Re: Ye Olde 858 restoration and mods

Quote

« **Reply #10 on:** August 09, 2012, 09:34:58 AM »



Posts: 215



Quote from: firebottle on August 08, 2012, 01:51:43 PM

The board did clean up rather nice, it would have been nice to have a pic(s) of it covered with grime, oh well.

By the time we realized it would be a "goer" it was too late. It looked to dirty to be fixable, so we didn't bother with the "before" pics.

Quote

Sensitivity is 0.5 μV for 10dB SINAD on AM so 0.4 μV is better than spec. SSB is 0.25 μV for 10 dB SINAD, 0.4 μV is worst case spec for SSB so 0.4 μV isn't bad at all for a 34 or so year old radio particularly one that has had a hard life.

I forgot to mention that the 0.4 figure was for SSB, hence it didn't make spec. AM is dead here, in a city of 4.5 million people we would be lucky to hear one AM user in a month.

There is some upper-audio noise (in the 5 to 15Khz range) in the IF or demod stages that is affecting the noise figure. Most likely a noisy transistor, I'll go looking for the source of it when Ive sorted the stability and PLL addon issues out.

Sue

[Report to moderator](#) [Logged](#)
 lbcomms

Hero Member



Posts: 215


Re: Ye Olde 858 restoration and mods
[Quote](#)

« **Reply #11 on:** August 09, 2012, 09:39:55 AM »

Quote from: rockhavenradio on August 08, 2012, 07:50:27 PM

What's the standard generator set-up to test ssb sinad?
 For FM 3 khz dev, for AM 30% mod, for ssb?
 Zero beat AM generator at 30% mod?
 Or set generator +/-1 khz no mod? (cw sinad?)
 What's the standard for this?

We used a carrier only for SSB, 27.204 (for LSB) and 27.206 (for USB). AM was as you stated - 30% modulated at (channel 20) 27.205.

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lbcomms

Hero Member



Posts: 215


Re: Ye Olde 858 restoration and mods

Quote

« **Reply #12 on:** August 09, 2012, 09:58:12 AM »

Quote from: rockhavenradio on August 08, 2012, 08:57:23 PM

What fluid is used in the ultrasonic bath?

The initial cycles were done with warm distilled water with a wetting agent added (similar to detergent but without the suds).

The last 2 cycles (and the additional ones to remove the flux residues, which are insoluble in water) use methylated spirits (I think it's known as "denatured alcohol" in the USA). This removes any organic junk that the water can't dissolve, and also soaks up the water, making drying easier. This second stage takes place in a *very* well ventilated area...

The drying is done with forced air circulation at 80 degrees C and 3% to 5% humidity for at least several hours.

[Report to moderator](#) [Logged](#)

 sonoma
CBTricks Supporter
Hero Member

Posts: 1302

bite is worse than his bark


Re: Ye Olde 858 restoration and mods

Quote

« **Reply #13 on:** August 09, 2012, 10:10:37 AM »

which radio is it? did not see many with the dimmer in that location.

[Report to moderator](#) [Logged](#)

 lbcomms

Hero Member


Re: Ye Olde 858 restoration and mods

Quote

« **Reply #14 on:** August 09, 2012, 10:17:19 AM »



Posts: 215



Quote from: 577-Jersey on August 08, 2012, 10:43:18 PM

How much do you charge to do something like this?

It's being done because it's an interesting and different thing to do, for me. If it was a paying job it would not be worth doing.

I've spent maybe 6 hours on it so far, with another 2 or 3 to go. If I say 4 more to be on the safe side, that would make it 10 hours. At workshop rates of \$75 to \$85 per hour it would be getting close to a grand by the time parts and shipping were factored in.

A good tech here can earn \$40+ per hour, not including things like workers injury insurance and paid holidays (Aussie workers are legally entitled to 4 weeks paid vacation per year). We need to get \$60 - \$65 per hour just to break even 😞

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Author

Topic: Ye Olde 858 restoration and mods (Read 1288 times)

lbcomms

Hero Member



Posts: 215



Re: Ye Olde 858 restoration and mods

[Quote](#)

« **Reply #15 on:** August 09, 2012, 10:19:37 AM »

Quote from: sonoma on August 09, 2012, 10:10:37 AM

which radio is it? did not see many with the dimmer in that location.

It's a President Grant. Date coded September 1976.

Sue

[Report to moderator](#) [Logged](#)

577-Jersey

Hero Member



Re: Ye Olde 858 restoration and mods

[Quote](#)

« **Reply #16 on:** August 09, 2012, 10:21:33 AM »

Quote

We need to get \$60 - \$65 per hour just to break even



Posts: 2878

Assume nothing until you have proven it.



rockhavenradio

Hero Member



Posts: 384



Wow,,I hear that!I guess if you want to play you have to pay...lol

[Report to moderator](#) [Logged](#)

You hypocrite!!, first take the plank out of your own eye, and then you will see clearly to remove the speck from your brother's eye.-Jesus-

Matthew 7:5

Re: Ye Olde 858 restoration and mods

[Quote](#)

« **Reply #17 on:** August 09, 2012, 10:22:30 AM »

Ok, now I'm on same page.
Got one cooking at .5 uv AM and .2 uv SSB.

What would really spark-up this chassis is a drop in crystal filter for AM receive.
Or something like the Fox Tango AM crystal filter/kit for the Yaesu 101E.
Be nice for the Uniden Washington 8719 radios as well.

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lbcomms

Hero Member



Posts: 215



Re: Ye Olde 858 restoration and mods

[Quote](#)

« **Reply #18 on:** August 09, 2012, 10:35:10 AM »

Quote from: Lazarus on August 09, 2012, 01:14:40 AM

i know for a fact, that the uniden 858 SSB chassis is one of the finest SSB CB chassis ever built, and the fact that it is so easy to implement a controlled carrier mod on it, makes it stand out above several of its contemporaries,

Comparing it with a couple of more modern 27 meg sets there was no comparison, even though the 'Grant is not even finished. On the test hear it looks nice, on air 7 out of 7 said it sounded better than the others.

It's going to be interesting to compare it with some higher end radios. I've got a Icom IC-735 ham set coming in next week for this, and I'm going to set my mobile rig (Barrett 2050 military quality SSB transceiver) up in here and have a 3 way contest.

I won't be doing controlled carrier / npc type mods to it. AM usage is almost unknown here, and with only 4 to 5 watts of carrier I can't see the point anyway.

Sue

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lbcomms

Hero Member



Posts: 215



 **Re: Ye Olde 858 restoration and mods**

[Quote](#)

« **Reply #19 on:** August 09, 2012, 10:44:44 AM »

Quote from: 577-Jersey on August 09, 2012, 10:21:33 AM

Wow,,I hear that!I guess if you want to play you have to pay...lol

It's not just radio repairs, it just expensive to hire workers here. Minimum wage here in NSW is \$16 hour, and it costs at least twice that when the other costs are taken into account. I could go on for hours on this topic, but I'll restrain myself - back on topic...

Sue

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lbcomms

Hero Member



Posts: 215



 **Re: Ye Olde 858 restoration and mods**

[Quote](#)

« **Reply #20 on:** August 09, 2012, 11:01:03 AM »

Quote from: Number Three on August 09, 2012, 08:47:46 AM

The ol-school techs here have even defined the anomaly as "the 10-volt blues"

We still see the later Uniden SSB chassis in here from time to time (the MB8719/34 and the uPD2824 chassis). The most common problem with those is the grey colored 10V electrolytics, and it's gotten so bad we now refuse to repair them unless the owners agree to a full "recapping".

If we do any repair to one of these and a radio fails shortly after with a 10V cap issue, it'll be our repair that gets the blame, not the radio, even if the repair had nothing to do with the new failure. So now it's "recap or take it elsewhere", no exceptions.

I've got recapping these radios down to a fine art now. I can do a 2824 chassis in 14 minutes and a MB87xx chassis in 21, using a Hakko electric vacuum pump repair station iron.

Sue

[Report to moderator](#)  [Logged](#)

Number Three

CBTricks Supporter
Hero Member



Posts: 1024

I'm 100% certified
Heyseed hick and bitter
clinger



 **Re: Ye Olde 858 restoration and mods**

[Quote](#)

« **Reply #21 on:** August 09, 2012, 11:57:37 AM »

Quote from: lbcomms on August 09, 2012, 10:17:19 AM

A good tech here can earn \$40+ per hour, not including things like workers injury insurance and paid holidays (Aussie workers are legally entitled to 4 weeks paid vacation per year). We need to get \$60 - \$65 per hour just to break even 😞

That tears it. I'm moving! 😞

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Get along, little doggies.

marc

Hero Member



Posts: 335



 **Re: Ye Olde 858 restoration and mods**

[Quote](#)

« **Reply #22 on:** August 09, 2012, 01:27:09 PM »

Quote from: rockhavenradio on August 09, 2012, 10:22:30 AM

Ok, now I'm on same page.
Got one cooking at .5 uv AM and .2 uv SSB.

What would really spark-up this chassis is a drop in crystal filter for AM receive.

Or something like the Fox Tango AM crystal filter/kit for the Yaesu 101E.

Be nice for the Uniden Washington 8719 radios as well.

Rock were you thinking opening up the bandwidth. You can use a Maurita 455g for that it is a 9KHz filter 4.5 above and below center. The 455HT is the stock filter which is 6KHz 3 above and below center the T designation indicates a tighter skirt shape.

[Report to moderator](#)  [Logged](#)

ibcomms

Hero Member



Posts: 215

**Re: Ye Olde 858 restoration and mods**

Quote

« **Reply #23 on:** August 09, 2012, 06:20:34 PM »

That won't work, the 858 SSB chassis is a single-conversion design with a 7.8Mhz IF. The Murata filters you mention are for 455Khz IFs, used mainly in AM-only transceivers. A few SSB radios use a second IF at 455Khz for AM (the later President Grant and the Cobra 148's are two examples of this design), but that's not the case here.

If you wanted to use the 455Khz filter in an '858 Grant, you would have to build in a second frequency changer (mixer) and another IF strip, detector, and AGC voltage generator. 😊

Sue

Report to moderator Logged

 marc

Hero Member



Posts: 335

**Re: Ye Olde 858 restoration and mods**

Quote

« **Reply #24 on:** August 09, 2012, 06:41:06 PM »

Thanks Did not know this one did not have the 455

Report to moderator Logged

 rockhavenradio

Hero Member



Posts: 384

**Re: Ye Olde 858 restoration and mods**

Quote

« **Reply #25 on:** August 09, 2012, 07:49:59 PM »

Not sure about C39.

TRC-449 and 139XLR schematics show negative lead of C39 to pcb ground. 138XLR shows the reverse. White print on 139XLR and 138XLR pcbs, and pictorial TRC-449 shows positive to pcb ground.

Also junction D11, R39, R38, and C38 is omitted in 139XLR schematic.

And, R42 should be 56K, not 156K. (139 sch)

And had problems with R53...changed it to 100k... 😊

http://www.cbtricks.com/radios/realistic/trc_449/index.htm

<http://www.cbtricks.com/radios/cobra/139xlr/index.htm>

<http://www.cbtricks.com/radios/cobra/138xlr/index.htm>

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□ **lbcomms**

Hero Member



Posts: 215



 **Re: Ye Olde 858 restoration and mods**

Quote

« **Reply #26 on:** August 10, 2012, 12:22:48 AM »

Quote from: rockhavenradio on August 09, 2012, 07:49:59 PM

Not sure about C39. TRC-449 and 139XLR schematics show negative lead of C39 to pcb ground. 138XLR shows the reverse.

White print on 139XLR and 138XLR pcbs, and pictorial TRC-449 shows positive to pcb ground.

Part of the ANL circuit. Should be negative to ground (because R42 and D12 will bias the non-grounded end positive). Will probably work OK (cap will re-polarize itself if reversed), given the very low voltage and current involved.

Quote

Also junction D11, R39, R38, and C38 is omitted in 139XLR schematic.

Typo by the person who drew up the circuit. If this is open, no AM receive.

Quote

And, R42 should be 56K, not 156K. (139 sch)

56K should be right, 156 is not a standard value. It would be a typo by the person who drew up the circuit.

Quote

And had problems with R53...changed it to 100k

It's half of the bias network for TR15, the product detector (SSB demodulator) transistor. Being a mixer of sorts (modulated 7.8 Mhz IF signal is mixed with the 7.8 Mhz carrier oscillator, leaving behind just the modulation signal as audio) it's operated at the edge of it's linear region (i.e. close to cutoff). This can make the biasing critical for good performance - too low and it distorts the audio, too high and it fails to mix. With variations between (TR15) devices, you may get some benefit by changing the value of R53. Not necessarily to 100K - 82K or 120K might be better. Experimentation is the only way to find out. Use a resistor wheel.
www.scientrific.com.au/imagepopup.php?src=gra/product/sc4417.jpg&cap=

TR15 is also a buffer amp in AM mode. If you do make any changes, check both modes. You might end up making one mode better and the other mode worse...

[Report to moderator](#)  Logged

 **rockhavenradio**

Hero Member



Posts: 384



 **Re: Ye Olde 858 restoration and mods**

[Quote](#)

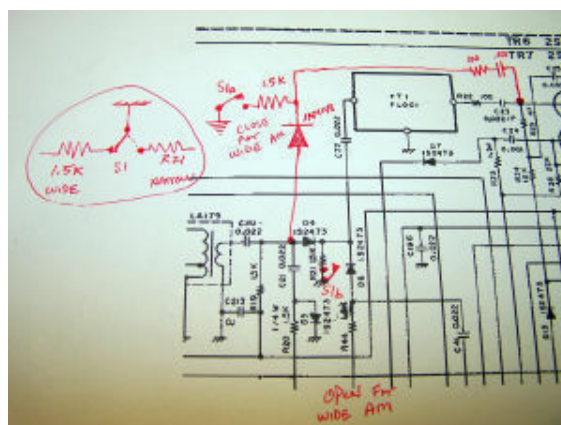
« **Reply #27 on:** August 10, 2012, 10:06:18 AM »


Great radio.

But narrow receive puts my 858 in storage.

I tried this with good results, but needs refinement. Needed attenuation for one.

I am not concerned with selectivity. When skip rolls out there are only a few channels active around here.



 [Wide AM RX Pres Wash.jpg](#) (2067.31 kB, 2304x1728 - viewed 14 times.)

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 **lbcomms**

Hero Member



Posts: 215



 **Re: Ye Olde 858 restoration and mods**

[Quote](#)

« **Reply #28 on:** August 10, 2012, 10:20:30 AM »

Had another user have a play with it tonight - all OK except for having to have the mic gain fully up and desk mic at 3/4 to make her talk on SSB.

Nearby users complained of slight overdrive.

Turned both the controls back to about half and it sounds good but the meter doesn't jump like his other rigs. It also shows no "swing" on AM.

In the CRO and external meter it was working OK, so we made a few changes to the meter circuit. The original detected RMS

(average) power, so we made it show peak power instead...

Change C154 > 22p

Change C168 > 4.7p

Change D50 to 680 ohm, 1/4W resistor

Change C166 to 3.3uF (negative to ground side)

Add original C166 in parallel with the 3.3uF electro in the previous step, on the print side of the board.

Re-adjust the ALC for maximum SSB transit power without a two-tone signal "flat topping" on a CRO.

Typically 15W PEP @ a supply of 13.8V, if the rest of the radio is correctly aligned.

If it flat tops, back it off a bit.

Readjust VR12 (transmit power meter adjustment) on a steady tone during SSB transmit.

Meter now shows plenty of "swing" on AM, and the readings shown during SSB transmitting are 2 to 3 times higher average reading than before.

Returned the radio to the person who borrowed it earlier on today. He just got back to me and says we have completely fixed the distortion on SSB transmit and that the mic gains only need to be set to just under half way now for good results. I didn't have the heart to tell him I'd only changed the **METER** circuit 🤔

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 **lbcomms**

Hero Member



Posts: 215



Re: Ye Olde 858 restoration and mods

[Quote](#)

« **Reply #29 on:** August 10, 2012, 10:42:20 AM »

Quote from: rockhavenradio on August 10, 2012, 10:06:18 AM

I tried this with good results, but needs refinement.

That's bypassing all the hard work performed by the crystal filter 😊

You should retain something frequency selective in there. If you have a sweep generator and something that can measure bandwidth, it's possible to crack open old crystal filters and modify them. When you get exactly what you want... switch it in and out with a small relay.

Sue

« *Last Edit: August 10, 2012, 10:45:06 AM by lbcomms* » [Report to](#)

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Author

Topic: Ye Olde 858 restoration and mods (Read 1288 times)

ibcomms

Hero Member



Posts: 215



Re: Ye Olde 858 restoration and mods

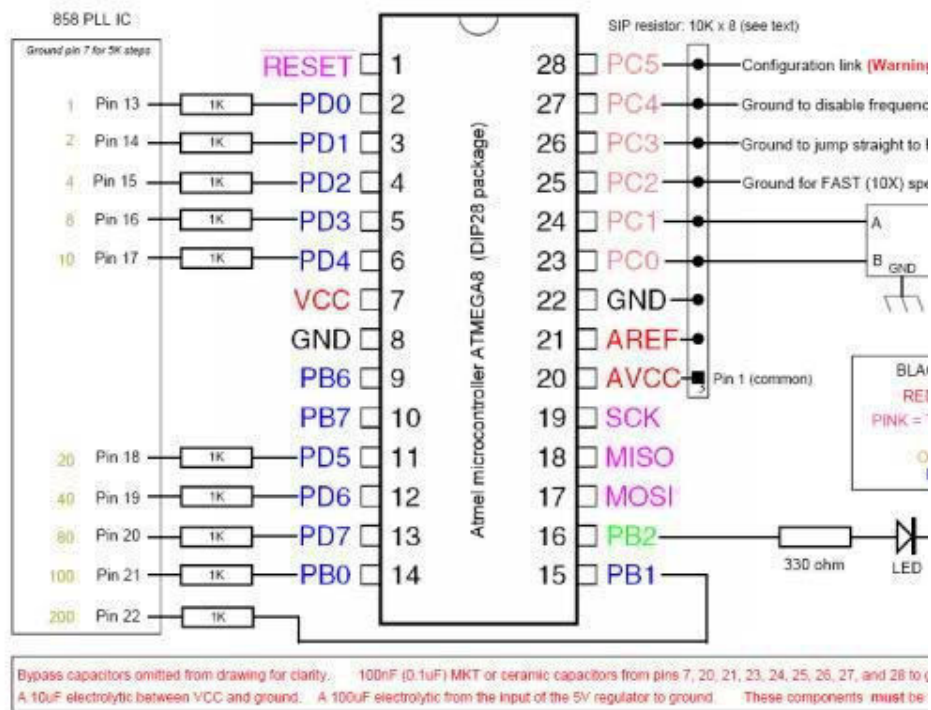
[Quote](#)

« **Reply #30 on:** August 12, 2012, 10:00:42 AM »

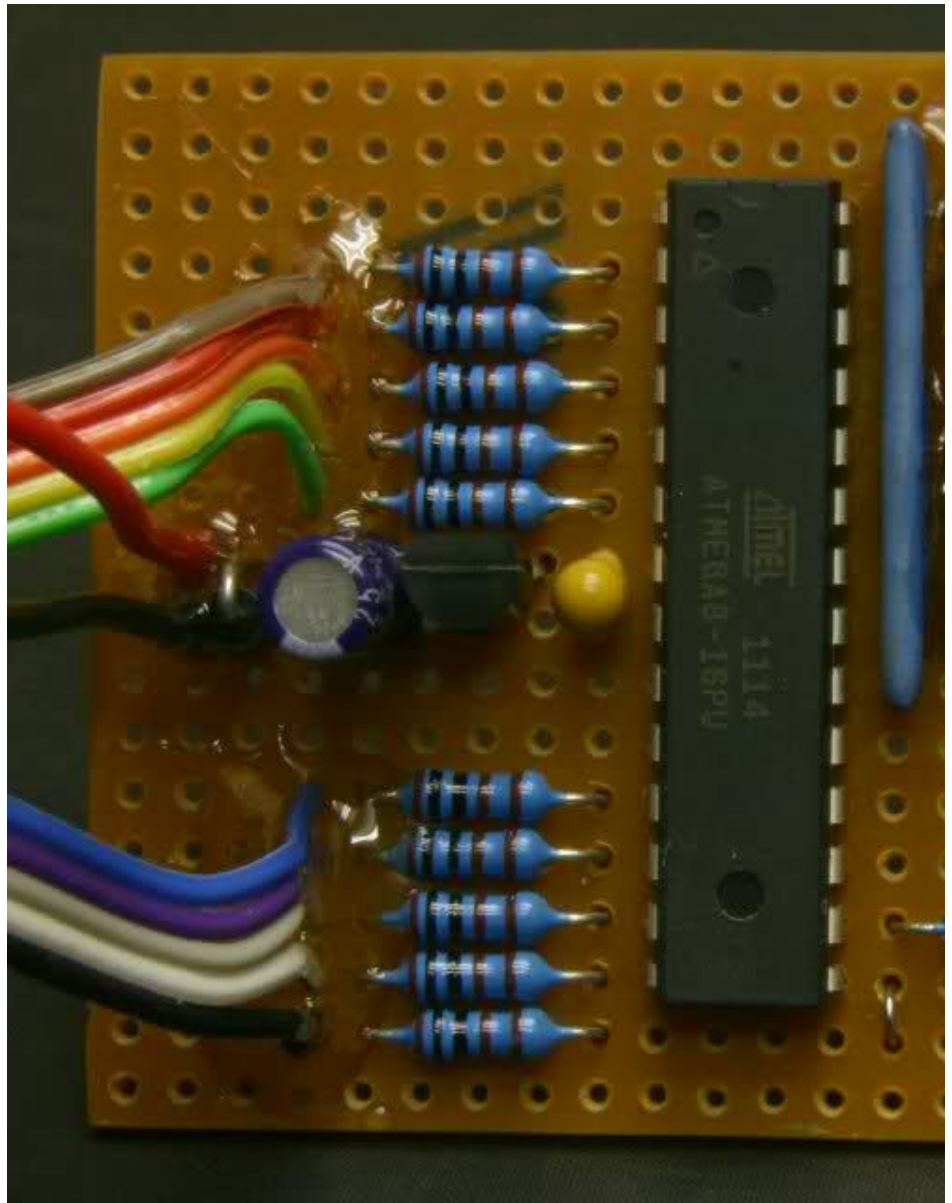
Adding some modern tech: 399 channel encoder switch. The reason for the diodes on the rear of the channel selector switch was to be able to isolate the switch from the PLL by removing the 5V supply to it. The header connector on top of the PLL IC is then used to plug in an alternative means of selecting the operating frequency [on a receive-only basis, of course 😊]

This uses a cheap Atmel Mega8 microcontroller (\$2) to get all channels from a single switch.

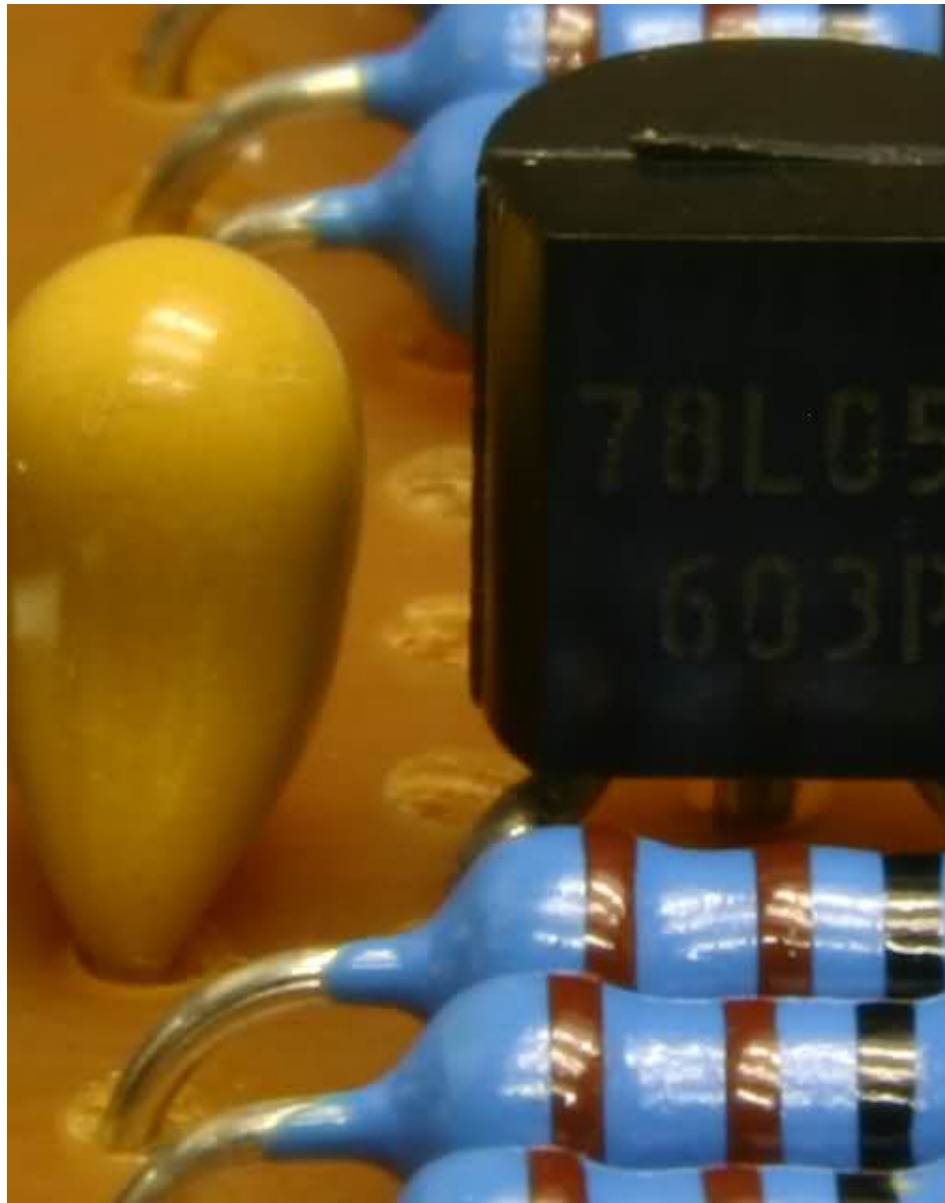
If the radio has a frequency counter, use that so you know where you are. If it hasn't, next week (time permitting) I'll use the 2 unused pins to "bit bang" an I2C bus and drive an 8 digit LCD display from it...



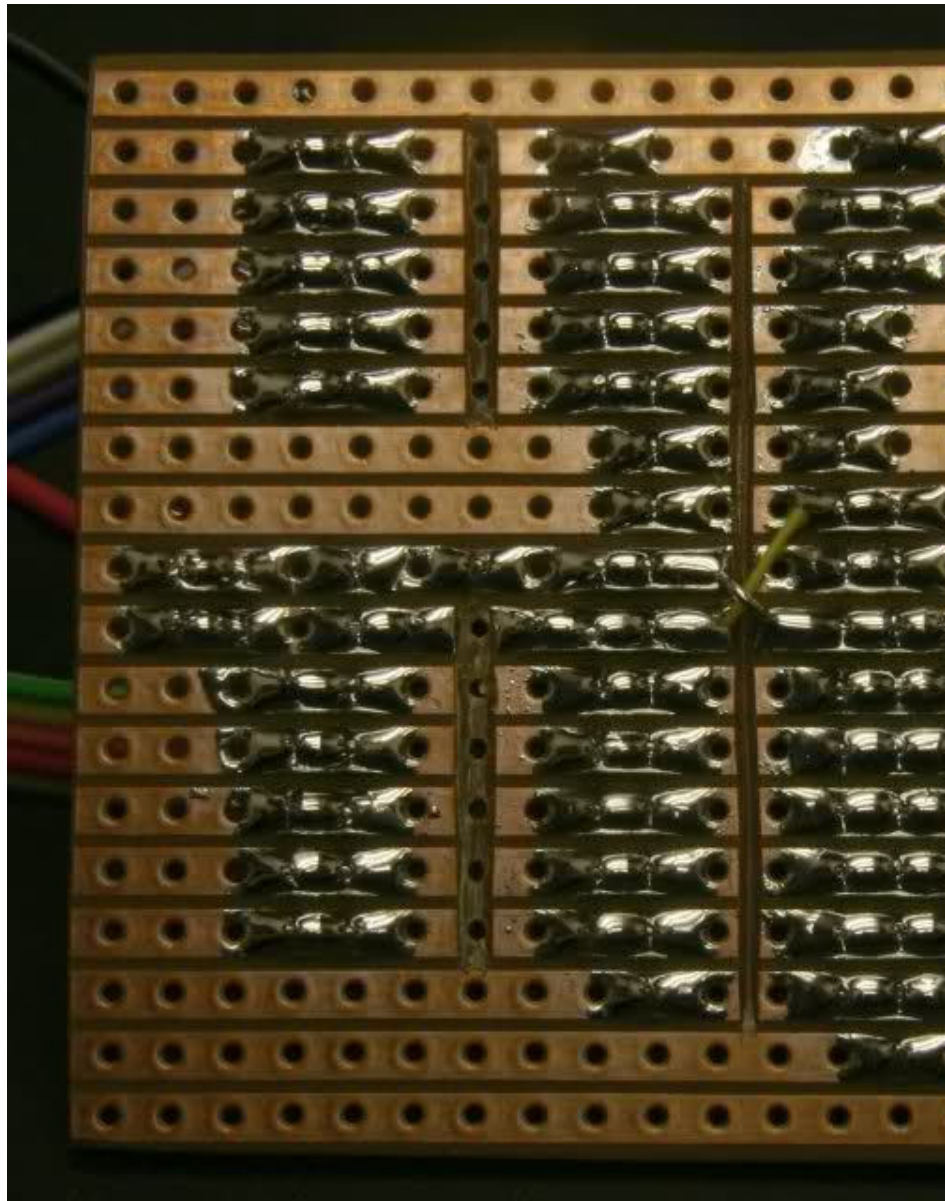
Schematic (a high resolution printable version can be downloaded [here](#))



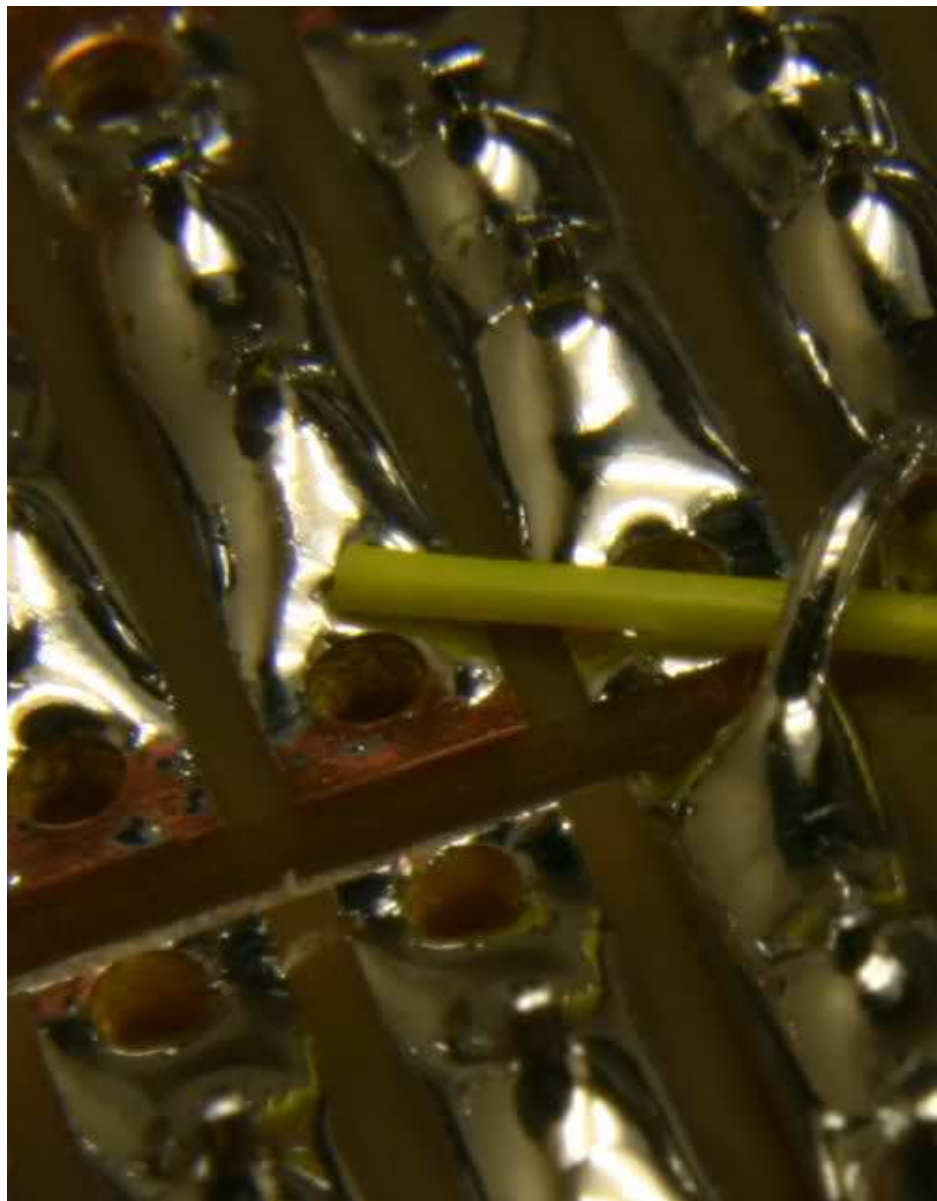
Top of the prototype encoder board



The radios 5V regulator circuit cannot supply the 50-75mA needed, so it's own regulator was added



Layout is not critical, anything close will do. We just used some cheap perfboard to make the prototype



The supply and ground need to be connected (linked) to both sides of the micro

The old Grant covered 26.700 to 27.900 in 5K steps without too much loss in performance.
It was surprising how much local activity was present around the 27.555 region...

[Report to moderator](#)  Logged

 **rockhavenradio**

Hero Member



Posts: 384



 **Re: Ye Olde 858 restoration and mods**

[Quote](#)

« **Reply #31 on:** August 12, 2012, 12:06:56 PM »

What was that tid-bit about the PLL filter and 5kc steps?
Should that be modified as well?
I noticed on other 858 (29xlr) radios a high pitch tone on the 0's channels.

« Last Edit: August 12, 2012, 12:15:00 PM by rockhavenradio »

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Lazarus

Hero Member



Posts: 1242



Re: Ye Olde 858 restoration and mods

[Quote](#)

« **Reply #32 on:** August 12, 2012, 01:08:14 PM »

this is starting to get real interesting, where's the source for the μ ? i want to play,

this might just give me the incentive to learn some coding skills,

oh, that is some pretty work on the perf board by the way,



« Last Edit: August 12, 2012, 01:27:24 PM by Lazarus » [Report to moderator](#) [Logged](#)

Sometimes I wonder whether the world is being run by smart people who are putting us on or by imbeciles who really mean it. - Mark Twain

rockhavenradio

Hero Member



Posts: 384



Re: Ye Olde 858 restoration and mods

[Quote](#)

« **Reply #33 on:** August 12, 2012, 01:58:13 PM »

What is the procedure for programming the chip?
Wire a connector permanently for programming?
Just not sure about the hardware for sequencer to computer for programming.

Or sequencer to programming device to computer.

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Number Three

CBTricks Supporter

Hero Member



Posts: 1024

I'm 100% certified
Heyseed hick and bitter
clinger



Re: Ye Olde 858 restoration and mods

[Quote](#)

« **Reply #34 on:** August 12, 2012, 05:38:10 PM »

I always wanted to cut a DB-9 jack in the side of an old Grant, hack HRD to run it, and make an SDR outta the thing. I just lack the skills.

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Get along, little doggies.

Lazarus

Hero Member



Posts: 1242

**Re: Ye Olde 858 restoration and mods**

Quote

« **Reply #35 on:** August 12, 2012, 07:25:17 PM »**Quote from: rockhavenradio on August 12, 2012, 01:58:13 PM**

What is the procedure for programming the chip?
Wire a connector permanently for programming?
Just not sure about the hardware for sequencer to computer for programming.
Or sequencer to programming device to computer.

heres some stuff, looks like the ponyprog software will load the bin file onto it, there are a couple of programmers to build on that page too

<http://www.lancos.com/prog.html>

but this one looks like the simplest one to me,

<http://avrprogrammers.com/bld-avr-serial-programmer-1.php>

now all we need is some source code,



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Sometimes I wonder whether the world is being run by smart people who are putting us on or by imbeciles who really mean it. - Mark Twain

 The 2X4

Hero Member



Posts: 547

**Re: Ye Olde 858 restoration and mods**

Quote

« **Reply #36 on:** August 12, 2012, 10:38:40 PM »

It's that simple with PIC'S also.
I started out just like that. 10 years now working with 858's an' 45106 PLLs.
No problem just this simple stuff is restricted to certain small chips.
Get a USB programmer and program 'em all. < \$50.

This stuff is great. Only 1 chip does it all. No glue needed...Do any PLL mod with 1 chip.

Carl

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If you don't know your radio...know your Radioman.

Lazarus

Hero Member



Posts: 1242

**Re: Ye Olde 858 restoration and mods**

Quote

« **Reply #37 on:** August 13, 2012, 01:02:22 AM »

Quote from: The 2X4 on August 12, 2012, 10:38:40 PM

It's that simple with PIC'S also.

I started out just like that. 10 years now working with 858's an' 45106 PLLs.

No problem just this simple stuff is restricted to certain small chips.

Get a USB programmer and program 'em all. < \$50.

This stuff is great. Only 1 chip does it all. No glue needed...Do any PLL mod with 1 chip.

Carl

ok Carl, you've just about talked me into it, i think i'll order a few of the 8 pin critters and start out trying to get a simple multi tone roger beep out of it, that oughtta be simple enough for starters, then if that flies i'll move up to bigger and better stuff,

but this atmega8 controlling the 858 looks so interesting tho, i sure hope we can talk her into posting the source so we can play around with it, i've already got a couple those chips laying around here somewhere, got a few at90s2313's and a couple atmega128's too, but not the first pic chip on the place,

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Sometimes I wonder whether the world is being run by smart people who are putting us on or by imbeciles who really mean it. - Mark Twain

The 2X4

Hero Member



Posts: 547

**Re: Ye Olde 858 restoration and mods**

Quote

« **Reply #38 on:** August 13, 2012, 01:13:52 AM »


OK! Sinewaves from ucontrollers, at least all I've seen, require lookup tables. That requires more memory than small

chips can provide in most cases.

If and when you have a programmer for PIC's, I'll send all you need to control 858's, 8719's and/or 45106's with the 16F883 PIC.

My website features this chip: www.n9efj.net

Carl

« *Last Edit: August 13, 2012, 01:15:53 AM by The 2X4* » [Report to moderator](#)  Logged

If you don't know your radio...know your Radioman.

 **Lazarus**

Hero Member



Posts: 1242



Re: Ye Olde 858 restoration and mods

[Quote](#)

« **Reply #39 on:** August 13, 2012, 01:55:51 AM »

thanks Carl, i really appreciate that, i'm very interested in this, i'll be building the programmer, i've found a suitable serial programmer that is supposed to work, if my serial port has enough umph, if not i'll use a level shifting buffer chip like a 74xx244 or similar to shift the levels to and from it, i've successfully programmed pics before using a similar programmer, but that was on an older puter that had a real 16550 I/O card in it tho, these new onboard I/O's are not the same critter as that was and lots of times have some timing problems as well as logic level problems too when programming certain stuff, but if that fails then i'll break down and buy a real programmer, but i had much rather build it if a home brew will still work with this newer puter,

have to wait till next payday to order the chip tho,



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 **The 2X4**

Hero Member



Posts: 547



Re: Ye Olde 858 restoration and mods

[Quote](#)

« **Reply #40 on:** August 13, 2012, 03:19:23 AM »

OK


I'll provide you with a chip.
I have 16F628A that I no longer use.

Not enough I/O's for me now. OK for a starter though.

I used 2 of them in an FT-101 7 digit counter that went in the VFO dial. Looked great.

Let me know....

Carl

« *Last Edit: August 13, 2012, 03:24:02 AM by The 2X4* » [Report to moderator](#)  Logged

If you don't know your radio...know your Radioman.

 **Lazarus**

Hero Member



Posts: 1242



 **Re: Ye Olde 858 restoration and mods**

[Quote](#)

« **Reply #41 on:** August 13, 2012, 06:37:42 AM »

i really appreciate the offer Carl, but i'll have some spending money in a few days, just had to get another car, the old one layed down on us, if it wasn't for that i would order one tomorrow, but kinda short right now, but payday is just a few days away, i'll get it then, think i'll order 3 or 4, if i get the hang of this, i might want to try some other stuff i've been thinking about with DDS, i would like to get a development board of some sort, i haven't researched pics to see whats available for them, guess i'll be hitting ebay the next few days to see what they got,

software defined radio is another thing i've been wanting to play around with,

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Sometimes I wonder whether the world is being run by smart people who are putting us on or by imbeciles who really mean it. - Mark Twain

 **lbcomms**

Hero Member



Posts: 215



 **Re: Ye Olde 858 restoration and mods**

[Quote](#)

« **Reply #42 on:** August 13, 2012, 09:11:58 AM »

Quote from: Lazarus on August 12, 2012, 01:08:14 PM

this is starting to get real interesting, where's the source for the μ c?

I wrote it originally in C, but as it's turned into an educational thing instead of a one-off project, I'm rewriting it in BASIC which is easier for people not familiar with coding to see how it works.

C is great for real-time stuff but it's not beginner friendly, and best taught in a course.

See here <http://www.cbtricks.com/forum/index.php?topic=14686.msg103040#msg103040> for a simple LED flasher in BASIC and a link to the compiler software.

Quote

this might just give me the incentive to learn some coding skills

First of all, pick your language. If you are doing things like PLL mods then BASIC will do all you want with smaller learning curve.

On the other hand, if you want to do things like digitizing and processing data in realtime you are going to need C or assembler.

If you haven't used micros before, I'd start off with simple things (such as flashing an LED) and work your way up from there.

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 **lbcomms**

Hero Member



Posts: 215



Re: Ye Olde 858 restoration and mods

Quote

« **Reply #43 on:** August 13, 2012, 09:24:31 AM »

Quote from: rockhavenradio on August 12, 2012, 01:58:13 PM

What is the procedure for programming the chip?

- 1) Build circuit and verify it's correct as per the diagram / drawing.
- 2) Connect 5 wires (MOSI, MOSO, SCK, RST, GND) **temporarily** to the USB programmer
- 3) Connect circuit to power
- 4) Use programmer software to upload the HEX file from your PC to the micro IC.
- 5) Verify the board does what it's supposed to do (in this case, count in BCD)
- 6) Disconnect temporary wires (MOSI, MISO, SCK, RST, GND) from programmer, these are not needed any more.
- 7) Fit board permanently to radio.

8) Configure the home, bottom, and top channels as per the supplied instructions.

9) Enjoy up to 399 channels 🗨️

Quote

Wire a connector permanently for programming?

No, it's only needed to upload the data to the micro.
After it's uploaded, the programmer is disconnected and never used for that micro again.

The home, bottom, and top channel programming can be done with temporary touching connections (such as a multimeter lead).

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lbcomms

Hero Member



Posts: 215



 **Re: Ye Olde 858 restoration and mods**

[Quote](#)

« **Reply #44 on:** August 13, 2012, 09:36:30 AM »

Quote from: Lazarus on August 12, 2012, 07:25:17 PM

heres some stuff, looks like the ponyprog software will load the bin file onto it, there are a couple of programmers to build on that page too

Those need serial (RS232) or parallel ports, a lot of modern computers lack these.

I've already given rockhavenradio a link to a cheap USB programmer, I think he said he had he had already ordered or bought one of them.

Quote

now all we need is some source code

No, all you need is the HEX file. I can create that here and email or upload it to him (currently being rewritten).

The source code is the human readable instructions telling the micro what to do. This is "translated" with a program called a compiler, which converts it into a file (called a HEX file) that the microcontroller understands. If you are just uploading existing

data, you don't need the source code or the compiler. These are only needed if you want to change what it does.

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Author

Topic: Ye Olde 858 restoration and mods (Read 1288 times)

ibcomms

Hero Member



Posts: 215



Re: Ye Olde 858 restoration and mods

[Quote](#)

« **Reply #45 on:** August 13, 2012, 09:57:11 AM »

Quote from: Lazarus on August 13, 2012, 01:02:22 AM

i think i'll order a few of the 8 pin critters and start out trying to get a simple multi tone roger beep out of it,

Easy to do with a small Atmel (i.e. ATTiny45).

Dim D.0 As PTT
Dim D.1 As MicAudio
Dim D.2 As ToneSelectSwitch

Do

If PTT Rise Then

Select Case ToneSelectSwitch
Case 0
PTT = 0
Sound 1000, 100, MicAudio
Case 1

```

PTT = 0
Sound 1500, 100, MicAudio
End Select

```

```
PTT = 1
```

Loop

This gives a 1Khz beep for 100mS if the selector switch is low, and a 1.5Khz beep if it's high.

The above source code is cut down quite a bit by the way, it's just to give you what a BASIC program looks like.

Quote

but this atmega8 controlling the 858 looks so interesting tho, i sure hope we can talk her into posting the source so we can play around

I'll post the source here for it when it's finished (probably not until the weekend, as Ill be away for a couple of days interstate this week).

You'll need to either buy the compiler or adapt it to another language though.




Quote

got a few at90s2313's and a couple atmega128's too

2313's don't have enough input / output pins (unless you use serial bus or shift register tricks), and need an external crystal oscillator.

A mega128 is overkill for an 858 😊

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 **gadget73**
 CBTricks Supporter
 Hero Member

 Posts: 1282
 

Re: Ye Olde 858 restoration and mods

[Quote](#)

« **Reply #46 on:** August 14, 2012, 07:14:44 PM »

The old 858 rigs are neat, but the AM front end can be a little tight, especially if you ragchew with guys that run wideband splatterboxes. SSB really rocks on them though. More than once I've had people tell me they were surprised I was running something as lowly as a CB just because the sound it made. I had a long conversation with a guy in Ireland who swore I was talking on an Icom or something.

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Tram D201a, JB-12 modulator, Imax 2000 antenna.

lbcomms

Hero Member



Posts: 215



 **Re: Ye Olde 858 restoration and mods**

[Quote](#)

« **Reply #47 on:** August 15, 2012, 08:56:55 AM »

It's not the front end that's a bit tight, it's the main crystal filter. AM requires twice the bandwidth of SSB, so two filters are needed if you want the most out of both modes. This is done in many AM/SSB rigs (i.e. Cobra 2000 and 148, Later President / Uniden Grants with 5 pin mic).

Makers can "cheapen up" a radio by using a single filter with a bandwidth in-between the needs of the two modes, so you end up with an IF (and therefore a receive audio bandwidth) that is a bit too wide for SSB and a bit too narrow for AM, hence the "bit tight on AM" sound.

The filter in the 858 can be partially bypassed (rockhavenradio posted the mod in another post) to increase the AM receive bandwidth.

Didn't do the mod here though. AM over here (Sydney, Australia) is dead and buried, in a city of 4 million plus, you would be lucky to hear a single AM user in a month. All of the truckers / convoy / camper trailers / etc moved to UHF years ago, 27 megs is pretty much an SSB only medium here, with most of the activity on 28, 35, and 38, all on LSB.

I'm comparing it at the moment with 2 other radios, one military (Barrett 2050) and one ham rig (Icom 735). It actually beat the Icom to all but one user, but it's no match for the Barrett (comparing it to a \$4000 state of the art digital processing SSB radio is hardly a fair comparison though).

Only issue left to sort is the slight drifting with varying supply voltage, I'm waiting for parts to arrive from the USA to fix that one. I'll then do some more extensive comparisons and install it to our work van for a while and see how it works in a mobile situation.

Sue

[Report to moderator](#)  [Logged](#)

gadget73

CBTricks Supporter
Hero Member

 **Re: Ye Olde 858 restoration and mods**

[Quote](#)

« **Reply #48 on:** August 15, 2012, 06:47:03 PM »



Posts: 1282



Oh, crystal filter related, does your Grant have two filters, or just the one? My Robyn has both the large filter (I think all have this) plus a small filter over towards the mic plug area. The ones that lack the second filter have a jumper from the crystal filter spot to an adjacent spot where a can should be. The ones with the filter have the extra can. I'm sort of curious how much that secondary filter does for the IF bandwidth.

[Report to moderator](#) [Logged](#)

Tram D201a, JB-12 modulator, Imax 2000 antenna.

rockhavenradio

Hero Member



Posts: 384



Re: Ye Olde 858 restoration and mods

[Quote](#)

« **Reply #49 on:** August 15, 2012, 07:43:55 PM »

Lift r21 and tack the parts to the bottom of the board omitting the switch to test. Keep leads short as possible. SSB tx output will be very low... reason the switch.

Looks like the mobile units did not have FT2. I installed this mod a few days ago into a 139. Only regret is not having done it earlier. FT1 *sounds like* it's around 2 to 3 KHz.

[Report to moderator](#) [Logged](#)

lbcomms

Hero Member



Posts: 215



Re: Ye Olde 858 restoration and mods

[Quote](#)

« **Reply #50 on:** August 16, 2012, 09:25:36 AM »

Quote from: gadget73 on August 15, 2012, 06:47:03 PM

Oh, crystal filter related, does your Grant have two filters, or just the one?

The Grant I've got has both. The smaller one has a bandwidth of 15-20Khz, and the larger one 5 Khz (approximate measurements at the -10dB point). The larger one could therefore be bypassed for wideband AM reception, at the expense of interference from strong signals one channel either side. Way too wide for SSB though...

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lbcomms

Hero Member



Re: Ye Olde 858 restoration and mods

[Quote](#)

« **Reply #51 on:** August 16, 2012, 09:33:43 AM »



Posts: 215


 ibcomms

Hero Member



Posts: 215



Quote from: rockhavenradio on August 15, 2012, 07:43:55 PM

FT1 *sounds like* it's around 2 to 3 KHz.

It's 5 KHz wide, so the AM response would be exactly **half** this (i.e. audio response to 2.5 KHz, assuming the carrier is at the center of the passband).

Report to moderator Logged

Re: Ye Olde 858 restoration and mods

Quote

« **Reply #52 on:** August 16, 2012, 10:16:04 AM »

Had another SSB radio come in for repair today - a "ten meter export" radio called a Galaxy Pluto. Normally we would run a mile from these things, but it was likely to be a simple fault and I wanted to see how well it compared to the 35 years older 858 radio.

The Galaxy fault was easy - shorted reverse polarity diode and melted negative power wire. It took minutes to fix both issues.

Radio was thankfully unmolested except for the expanded frequency coverage - no clipped limiters, modulator hacks, or the like. Comparison on...

It beat the Grant for AM transmit to about half the users. It was louder but less clear - the more distant listeners preferred the Galaxy, the closer ones preferred the lower distortion of the Grant.

SSB transmit was something else. Galaxy was beaten by the Grant to all listeners, the Galaxy audio ranged from "fuzzy" and "talking with your mouth full" to "sounds like <first expletive> <second expletive>". On the test bench it showed a flat topped fuzzy two-tone waveform and a fair chunk of phase noise (unwanted FM) to boot - little wonder it sounded like trash in comparison to the Grant.

Receive was no comparison either. The Grant still has an unresolved minor noise issue (I suspect it's a noisy transistor in the IF somewhere, but haven't got around to looking at it yet), yet it was 4 to 5 "S" points quieter than the Galaxy when connected to the antenna. At first I thought it might be just the meter that was the difference, but listening to a base user about 30 miles from here showed that it wasn't the case - he came in slightly noisy but 100% readable on the 858, but on the Galaxy he was almost buried in the noise and unreadable.

How far have we come in 35 years? It would seem not very far at all. The Galaxy had much better "features" - roger beep, SWR meter, frequency counter, dual clarifier, 10Khz switch, hundreds of channels, and FM capability - but as a **radio**, it was left for dead by a much older design.

Sue

[Report to moderator](#)  [Logged](#)

Number Three

CBTricks Supporter
Hero Member



Posts: 1024

I'm 100% certified
Heyseed hick and bitter
clinger



 **Re: Ye Olde 858 restoration and mods**

[Quote](#)

« **Reply #53 on:** August 16, 2012, 10:57:04 AM »

Thanks for the side-by-side, Sue.

Now that you've made the comparison unmodded, you can make the 858's (if it's the same as a Grant) great RX is even better by replacing TR14 (AM detector) with a 2sc2229, putting the pulled transistor in TR19 (SSB detector) and replacing the 1n60 pin diodes with bat83's, or 1n6263's (D1,D2, and D21,D22).

« *Last Edit: August 16, 2012, 11:05:22 AM by Number Three* »

[Report to moderator](#)  [Logged](#)

Get along, little doggies.

sonoma

CBTricks Supporter
Hero Member



Posts: 1302

bite is worse than his
bark



 **Re: Ye Olde 858 restoration and mods**

[Quote](#)

« **Reply #54 on:** August 16, 2012, 01:01:43 PM »

Quote from: Number Three on August 16, 2012, 10:57:04 AM

Thanks for the side-by-side, Sue.

Now that you've made the comparison unmodded, you can make the 858's (if it's the same as a Grant) great RX is even better by replacing TR14 (AM detector) with a 2sc2229, putting the pulled transistor in TR19 (SSB detector) and replacing the 1n60 pin diodes with bat83's, or 1n6263's (D1,D2, and D21,D22).

I always use a 2sc2999 instead of a 2sc2229. is it the same trans as the 2999?

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Number Three

CBTricks Supporter
Hero Member



Posts: 1024

I'm 100% certified
Heyseed hick and bitter
clinger


 Re: Ye Olde 858 restoration and mods

Quote

« **Reply #55 on:** August 16, 2012, 02:22:26 PM »

Quote from: sonoma on August 16, 2012, 01:01:43 PM

Quote from: Number Three on August 16, 2012, 10:57:04 AM

Thanks for the side-by-side, Sue.

Now that you've made the comparison unmodded, you can make the 858's (if it's the same as a Grant) great RX is even better by replacing TR14 (AM detector) with a 2sc2229, putting the pulled transistor in TR19 (SSB detector) and replacing the 1n60 pin diodes with bat83's, or 1n6263's (D1,D2, and D21,D22).

I always use a 2sc2999 instead of a 2sc2229. is it the same trans as the 2999?

Yes. Thanks I always do that.. 2SC2999

[Report to moderator](#) Logged

Get along, little doggies.

 mad scientist

Hero Member



Posts: 726

Rode the Lightning


 Re: Ye Olde 858 restoration and mods

Quote

« **Reply #56 on:** August 16, 2012, 03:33:10 PM »

Quote from: Number Three on August 16, 2012, 10:57:04 AM

Thanks for the side-by-side, Sue.

Now that you've made the comparison unmodded, you can make the 858's (if it's the same as a Grant) great RX is even better by replacing TR14 (AM detector) with a 2sc2229, putting the pulled transistor in TR19 (SSB detector) and replacing the 1n60 pin diodes with bat83's, or 1n6263's (D1,D2, and D21,D22).

what about those nte 583's?

don't forget about the hfe test on those 2sc2999's. i have seen those with a lower gain than that of the one being replaced.

« *Last Edit:* August 16, 2012, 03:35:06 PM by mad scientist »

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" When injustice becomes law, Then resistance becomes duty."--
Thomas jefferson

"You cannot strengthen the weak, by weakening the strong."
--Abraham lincoln

Number Three

CBTricks Supporter
Hero Member



Posts: 1024

I'm 100% certified
Heyseed hick and bitter
clinger



 **Re: Ye Olde 858 restoration and mods**

Quote

« **Reply #57 on:** August 17, 2012,
07:34:33 AM »

Quote from: mad scientist on August 16, 2012, 03:33:10 PM

Quote from: Number Three on August 16, 2012, 10:57:04 AM

Thanks for the side-by-side, Sue.
Now that you've made the comparison unmodded, you can make the 858's (if it's the same as a Grant) great RX is even better by replacing TR14 (AM detector) with a 2sc2229, putting the pulled transistor in TR19 (SSB detector) and replacing the 1n60 pin diodes with bat83's, or 1n6263's (D1,D2, and D21,D22).

what about those nte 583's?

don't forget about the hfe test on those 2sc2999's. i have seen those with a lower gain than that of the one being replaced.

I don't have either of the datasheets to compare them to handy, but maybe someone could check this --

I think they are the same gain-per-volt, but the 2999 can be spanked harder? Maybe there are some sub-spec copies out there? If so, those counterfeiters werk fast!

[Report to moderator](#)  Logged

Get along, little doggies.

mad scientist

Hero Member



 **Re: Ye Olde 858 restoration and mods**

Quote

« **Reply #58 on:** August 17, 2012,
07:12:42 PM »

the benifit of using the 2n2999 as i understand it is the lower noise figure, with a slightly higher gain as compared to the original part as a secondary benifit.



Posts: 726

Rode the Lightning



it is important though to check the gain on these to see exactly what you are dealing with. the original sanyo ones that i have here are showing a much lower gain than the 2sc1674's that are used in the galaxy radios.

[Report to moderator](#) Logged

" When injustice becomes law, Then resistance becomes duty."-- Thomas jefferson

"You cannot strengthen the weak, by weakening the strong." --Abraham lincoln

rockhavenradio

Hero Member



Posts: 384



Re: Ye Olde 858 restoration and mods

[Quote](#)

« **Reply #59 on:** August 22, 2012, 04:49:00 PM »

So I need to make a mini programming cable to go from five pins on the programmer (left side or use existing cable).



100_5266.jpg (531.39 kB, 2286x806 - viewed 5 times.)

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Author

Topic: Ye Olde 858 restoration and mods (Read 1288 times)

ibcomms
Hero Member



Posts: 215

Re: Ye Olde 858 restoration and mods
« **Reply #60 on:** August 22, 2012, 05:09:54 PM »

[Quote](#)

You need five **temporary** connections:

MOSI on the programmer to pin 17 of the Mega8.

RST on the programmer to pin 1 of the Mega8

SCK on the programmer to pin 19 of the Mega8

MISO on the programmer to pin 18 of the Mega8

GROUND on the programmer to pin 8 of the Mega8

Once the code has been successfully uploaded (this is done in 2 stages, Code and Fuses, more on this later) the above 5 wires can be removed.

Catch you when I get back to Sydney...

[Report to moderator](#) [Logged](#)

sonoma
CBTricks Supporter

Re: Ye Olde 858 restoration and mods

[Quote](#)

Hero Member



Posts: 1302

bite is worse than his bark



mad scientist

Hero Member



Posts: 726

Rode the Lightning



sonoma

CBTricks Supporter
Hero Member



Posts: 1302

bite is worse than his

« **Reply #61 on:** August 22, 2012, 05:05 PM » **Quote from mad scientist on August 17, 2012, 07:12:42 PM**

the benifit of using the 2n2999 as i understand it is the lower noise figure, with a slightly higher gain as compared to the orignal part as a secondary benifit.

it is important though to check the gain on these to see exactly what you are dealing with. the orignal sanyo ones that i have here are showing a much lower gain than the 2sc1674's that are used in the galaxy radios.

are you using a 2n2999 and not the 2sc2999 that everyone else uses. I have never seen the 2n2999. guess I will have to look it up and see what it specs out at.

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Re: Ye Olde 858 restoration and mods

[Quote](#)

« **Reply #62 on:** August 22, 2012, 05:14:14 PM »

i was mistaken sonoma, it is a 2sc2999. it helps to have things in front of you before you post...LOL

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" When injustice becomes law, Then resistance becomes duty."-- Thomas jefferson

"You cannot strengthen the weak, by weakening the strong."
--Abraham lincoln

Re: Ye Olde 858 restoration and mods

[Quote](#)

« **Reply #63 on:** August 22, 2012, 05:22:37 PM »

every since I posted was trying to find the 2n2999 and no luck. finally gave up. thought was something new.LOL

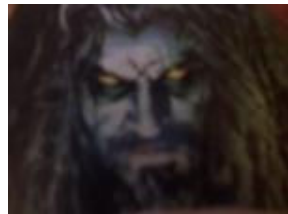
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bark



mad scientist

Hero Member



Posts: 726

Rode the Lightning



Number Three

CBTricks Supporter
Hero Member



Posts: 1024

I'm 100% certified
Heyseed hick and bitter
clinger



rockhavenradio

Hero Member



Posts: 384



Re: Ye Olde 858 restoration and mods

Quote

« **Reply #64 on:** August 22, 2012, 05:31:51 PM »



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" When injustice becomes law, Then resistance becomes duty."--
Thomas jefferson

"You cannot strengthen the weak, by weakening the strong."
--Abraham lincoln

Re: Ye Olde 858 restoration and mods

Quote

« **Reply #65 on:** August 23, 2012, 08:56:21 AM »

Quote from: sonoma on August 22, 2012, 05:22:37 PM

every since I posted was trying to find the 2n2999 and no
luck. finally gave up. thought was something new.LOL

The 2SC2999's are now unobtainium, having been discontinued since 2004 (or somewhere in there). My last attempt at getting a few to replenish stock ended in a global hunt. I had parts requests on all of the pricing sites. Once I found them at a *reasonable* cost, I bought 100 of them.

Like many discontinued semiconductors, they have more than tripled in price sitting in my parts bin in 2 years. RF Parts has 'em.. After all, they exist on that business model. They are also still available on egay (at least, they were in May before I shut down my egay acct).

« *Last Edit: August 23, 2012, 09:26:29 AM by Number Three* »

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Get along, little doggies.

Re: Ye Olde 858 restoration and mods

Quote

« **Reply #66 on:** August 24, 2012, 09:15:30 PM »

Not sure how to set up the voltage regulator for the sequencer.
What's best for C-in and C-out?

I am having problems with the PIC16F628A based frequency counter. I think the 78L05 5 volt regulator circuit is the culprit. PICs keep going bad.
Input is 47 ohm bypassed with 470 uf. Output is bypassed .1uf and 100 uf.

[Report to moderator](#)  [Logged](#)

The 2X4

Hero Member



Posts: 547



 **Re: Ye Olde 858 restoration and mods**

[Quote](#)

« **Reply #67 on:** August 25, 2012, 01:45:32 AM »

You really need a 7805 in there. 78L05 is only rated at 500 ma. LED's, if that's the display, can draw more current than you would commonly think.

Carl

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If you don't know your radio...know your Radioman.

CHA195

CBTricks Supporter
Hero Member



Posts: 652

Rum is Better!



 **Re: Ye Olde 858 restoration and mods**

[Quote](#)

« **Reply #68 on:** August 25, 2012, 06:18:43 AM »

Wrong button pressed carl , 100ma .

cheers.....

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The very first Radio Operator was a CB'er!

Think? about it.

The 2X4

Hero Member



Posts: 547



 **Re: Ye Olde 858 restoration and mods**

[Quote](#)

« **Reply #69 on:** August 25, 2012, 07:32:46 AM »

44 my friend 44

Carl

[Report to moderator](#)  [Logged](#)

If you don't know your radio...know your Radioman.

rockhavenradio

Hero Member



Posts: 384

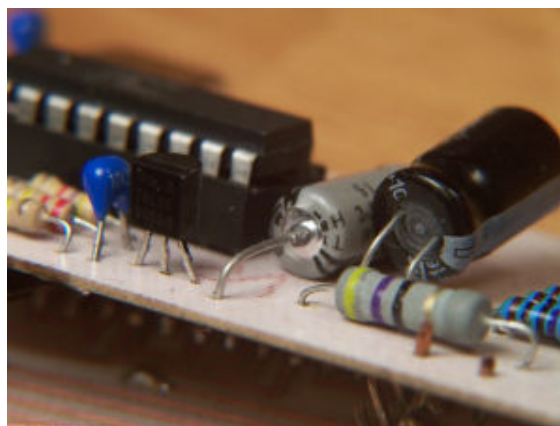


Re: Ye Olde 858 restoration and mods

[Quote](#)

« **Reply #70 on:** August 25, 2012, 09:18:37 AM »

2 out of 3 of these counters so far have died.
yes running 6 large digits from a 78L05.



100_5269.jpg (379.15 kB, 2304x1728 - viewed 0 times.)

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rockhavenradio

Hero Member



Posts: 384

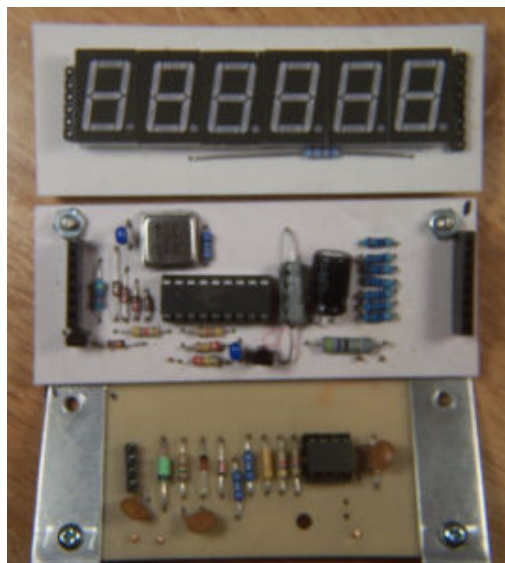


Re: Ye Olde 858 restoration and mods

[Quote](#)

« **Reply #71 on:** August 25, 2012, 09:19:30 AM »

counter



100_5267.jpg (391.98 kB, 1514x1682 - viewed 1 times.)

[Report to moderator](#)  [Logged](#) **rockhavenradio**

Hero Member



Posts: 384

 **Re: Ye Olde 858 restoration and mods**[Quote](#)« **Reply #72 on:** August 25, 2012, 09:36:07 AM »

The digits still light up, just erroneous values.
5v still good. My guess, the PIC chip getting spiked from 5 volt reg under to much demand?

[Report to moderator](#)  [Logged](#) **lbcomms**

Hero Member



Posts: 215

 **Re: Ye Olde 858 restoration and mods**[Quote](#)« **Reply #73 on:** August 25, 2012, 11:20:01 AM »

The Atmel sequencer chip only draws about 30 to 40 mA, so a 78L05 will be fine.

Capacitor values are in red at the bottom of the Rev2 drawing, I used 100uF on the 12V input side and 10uF on the 5V output side. These are not critical, anything from 10 to 1000 on the input side will work, and anything from 1 to 100 on the 5V side will be OK. Just use whatever you have handy.

Can't comment on the counter board, as I don't know the current, but if it's over say 75mA you should have a larger (i.e. 7805) regulator in there. A simple mA measurement with a multimeter will give you the answer.

[Report to moderator](#)  [Logged](#) **The 2X4**

Hero Member



Posts: 547

 **Re: Ye Olde 858 restoration and mods**[Quote](#)« **Reply #74 on:** August 25, 2012, 01:58:43 PM »

Cha

That's American slang for 10-4

"Foty Fo" "Foty Fo"

I'll bet you knew that!!!

Carl

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If you don't know your radio...know your Radioman.

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Author

Topic: **Ye Olde 858 restoration and mods** (Read 1288 times)

The 2X4
Hero Member

Posts: 547

Re: Ye Olde 858 restoration and mods

[Quote](#)

« **Reply #75 on:** August 25, 2012, 02:10:08 PM »

Hey Rockhaven

That's 15 to 20 ma * 42 if all "8" are displayed = 840 milliamps. Pretty close to an amp. Fortunately multiplexing lowers the demand .

I use a 7805 in my Ultimate 7 digit counter and it gets warm. A zener driven 4 amp [2sc1419 type] would be better for me and when I run out of boards, I'll incorporate that design in the next batch.
I use an external TO-220 type using point to point tacking when needed. Wires right in to the 7805 connection.

You're probably well aware of that method. OK

Carl

« *Last Edit:* August 25, 2012, 02:15:03 PM by The 2X4 » [Report to moderator](#) Logged

If you don't know your radio...know your Radioman.

rockhavenradio

Hero Member



Posts: 384

 **Re: Ye Olde 858 restoration**

The Digits are # 5611AS.

[Quote](#)**Re: Ye Olde 858 restoration**
« **Reply #76 on:** August 25, 2012, 08:16:38 PM »
SSB is 30ma max. Max is all digits?

I'm willing to ditch this counter and look for something else. Red LEDs. The window I'm stuck with is red. No adjustment for frequency on this, or offset for ssb. I'm on the fence about even wasting \$1.20 for a regulator on this counter.

Will need something for the GAPING HOLE if the LB 858 Sequencer project works.

[Report to moderator](#) [Logged](#) **The 2X4**

Hero Member



Posts: 547

 **Re: Ye Olde 858 restoration and mods**[Quote](#)« **Reply #77 on:** August 25, 2012, 08:45:07 PM »

My Ultimate system counter is 7 digit with big or little displays. I tried selling kits but in general techs and users are lost when working with PIC micros. Calibrating the system requires reprogramming the PIC.

I can sell you the 2 boards with displays for \$60. When you got it built you could return it and I'll calibrate it for you.

If you can do the programming here is how it works:

Check the crystal on the counter. Set it to 1.000000 mhz.

Monitor the VCO. Ohh It can provide 3 offsets. if the counter reads low, you have to program a variable in the code. Increase it by 1. Your error is caused not counting the signal long enough. Incrementing the variable will cause the pic to delay farther and count more cycles. You may have to do this a few times.

The inverse is true if the counter reads high. Decrease the variable. Retweaking the counter crystal will get you right on the money if the code won't set on frequency.

Good luck...

Carl

[Report to moderator](#) [Logged](#)

If you don't know your radio...know your Radioman.

rockhavenradio

Hero Member



Posts: 384



Re: Ye Olde 858 restoration and mods

Quote

« **Reply #78 on:** August 25, 2012, 09:13:03 PM »

Would be nice to have a Ziff socket programmer hooked up to a **new** computer for the PIC and ATMEGA...Lets make this stuff easy....I know all you computer people can flash a program from old coconut shells....time to bring this technology into the daylight. Make it as simple as programming any two way radio.



[Report to moderator](#) Logged

The 2X4

Hero Member



Posts: 547

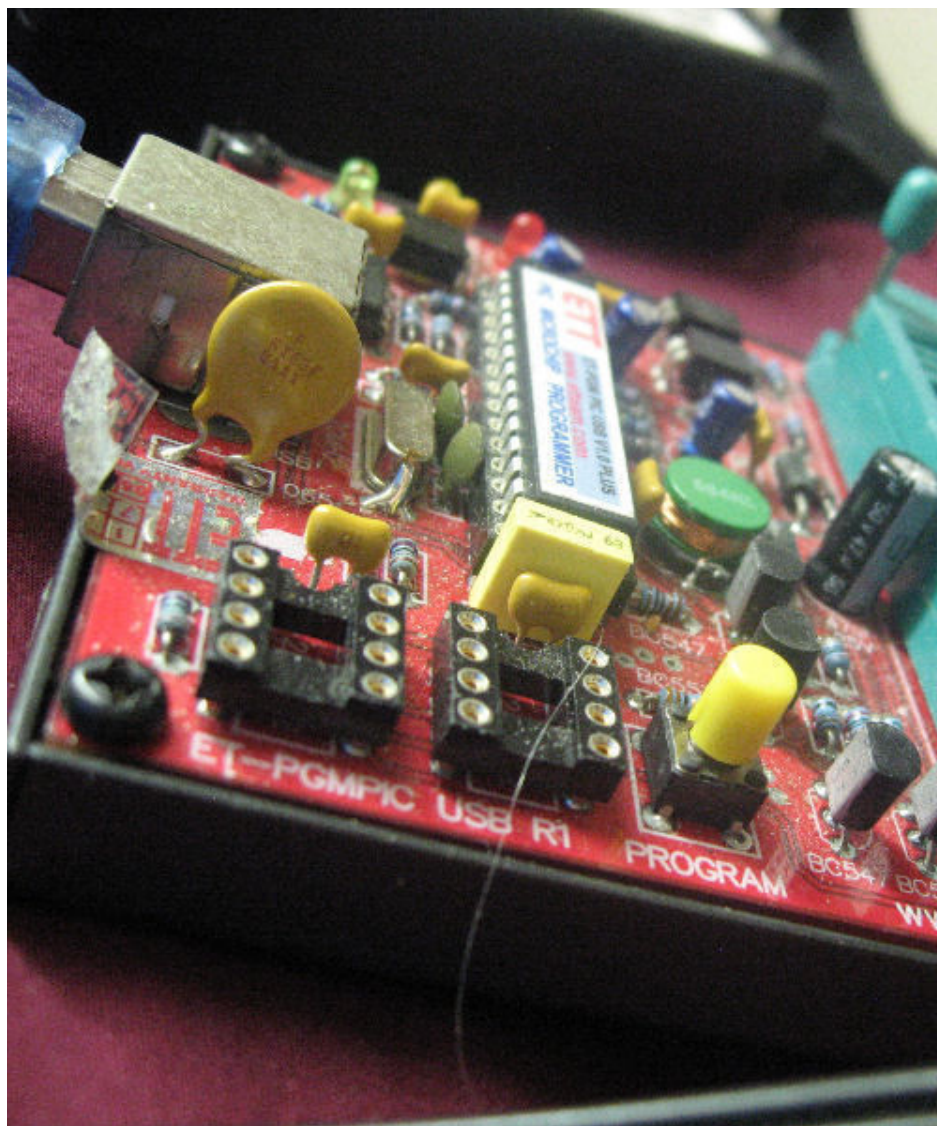


Re: Ye Olde 858 restoration and mods

Quote

« **Reply #79 on:** August 25, 2012, 09:33:47 PM »

Really hard stuff takes a little longer.



PicKit2 USB

But you probably knew that already. PICs can be programmed while in the circuit. But you might have known that too.

[Report to moderator](#)  Logged

If you don't know your radio...know your Radioman.

 **CHA195**

CBTricks Supporter
Hero Member



 **Re: Ye Olde 858 restoration and mods**

[Quote](#)

« **Reply #80 on:** August 26, 2012, 03:24:14 AM »

Quote from: The 2X4 on August 25, 2012, 01:58:43 PM

Cha

That's American slang for 10-4



Posts: 652

Rum is Better!



"Foty Fo" "Foty Fo"

I'll bet you knew that!!!

Carl

LOL big time 😄 , no i did not and could not find 44 on the net , i was scratchin me head , i was thinking 44 as in 44 magnum 😄 , but i knew , that you knew , that i knew , what you actually meant as you play with the 78105's all the time=wrong button 😄

[Report to moderator](#) Logged

The very first Radio Operator was a CB'er!

Think? about it.

rockhavenradio

Hero Member



Posts: 384



Re: Ye Olde 858 restoration and mods

[Quote](#)

« **Reply #81 on:** August 27, 2012, 01:49:05 PM »

Got the counter back by injecting 7.785 mhz into it, then running through program menu....forgetting what I actually did....now it works.

[Report to moderator](#) Logged

rockhavenradio

Hero Member



Posts: 384



Re: Ye Olde 858 restoration and mods

[Quote](#)


« **Reply #82 on:** August 28, 2012, 10:39:38 AM »

When first turned on, the counter displays a French amateur radio call sign, F8FII.

I could not find information about this specific program. But apparently, the offset can be manually changed with a tactile push button by selecting "2.ero" (zero?) while injecting the frequency of the offset desired. Then select "add" or "sub" from the menu to add or subtract the offset from the actual frequency.

I had three of these PIC16F628A chips that failed in the same way. I do not know why. So far the "repaired" counters are still working.



 100_5271.jpg (1092.5 kB, 2304x1728 - viewed 13 times.)

[Report to moderator](#)  Logged

The 2X4

Hero Member



Posts: 547



Re: Ye Olde 858 restoration and mods

[Quote](#)

« **Reply #83 on:** August 28, 2012, 02:35:03 PM »

If the PIC was damaged how did you retain the code to program another?

Carl

[Report to moderator](#)  Logged

If you don't know your radio...know your Radioman.

rockhaveradio

Hero Member



Posts: 384



Re: Ye Olde 858 restoration and mods

[Quote](#)

« **Reply #84 on:** August 28, 2012, 02:54:03 PM »

With the tactile button on one of the three boards, I scrolled through an "on chip" menu with the existing "bad" chip.

About 2/3rds down this page gave me the idea:

http://www.qsl.net/dl4yhf/freq_counter/freq_counter.html

Adding or subtracting an offset frequency

I used an HF radio to supply the 7.785 mhz carrier to enter into the chip.

On the menu: "Table" then select a preprogrammed offset, like 10.700 is one offset.

For some reason my needed offset disappeared.

This happened on 2 out of 3 of these counters.

The first one, the seller sent me another chip to replace the "bad" one, and the repair is still working.

And so far this hack job is still working.

So I am in the dark about this. Will this chip retain the new offset?

I am wondering how reliable these new devices are.

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 **rockhavenradio**

Hero Member



Posts: 384

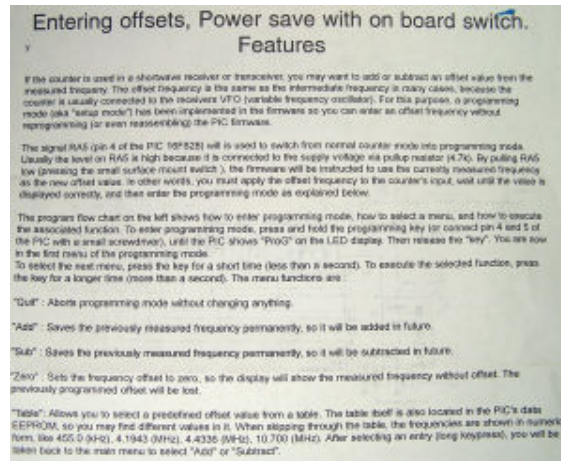



 **Re: Ye Olde 858 restoration and mods**

[Quote](#)

« **Reply #85 on:** August 28, 2012, 03:15:48 PM »

Just got this in the mail today from the seller:



 [100_5272.jpg](#) (1064.39 kB, 2048x1666 - viewed 15 times.)

« *Last Edit:* August 28, 2012, 03:17:26 PM by rockhavenradio »

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 **The 2X4**

Hero Member



Posts: 547



 **Re: Ye Olde 858 restoration and mods**

[Quote](#)

« **Reply #86 on:** August 28, 2012, 03:20:18 PM »

Ok

I am familiar with that counter.

Why the 7.785?

That's not an offset for any CB radio I know of.

What Cobra is that?

Carl

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If you don't know your radio...know your Radioman.

 **rockhavenradio**

 **Re: Ye Olde 858 restoration**

[Quote](#)

Hero Member



Posts: 384



rockhavenradio

Hero Member



Posts: 384



The 2X4

Hero Member



Posts: 547



and mods

Reply #87 on: August 28, 2012,

03:18 PM » 800, the readout showed 15 khz off.

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Re: Ye Olde 858 restoration and mods

[Quote](#)

« **Reply #88 on:** August 28, 2012, 03:59:12 PM »

Cobra 139XLR.
Just checked channel 20. Input = 35.005 - 7.800 = 27.205
Why the 15 KHz?

I can get the counter within 50 hz now...not bad for a channel chart.

[Report to moderator](#) Logged

Re: Ye Olde 858 restoration and mods

[Quote](#)

« **Reply #89 on:** August 28, 2012, 04:34:53 PM »

Don't know. I did not look at the code yet.

Maybe I can find out why. But it works.

The design is really 5 digits. The MSB is hardwired to a "2"

You could inject the SSB offsets from TP9.

Use the kHz option to really see 7 digits.

It's a common design from the 80's.
A lot like my 7 digits really.

Carl

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If you don't know your radio...know your Radioman.

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Author

Topic: Ye Olde 858 restoration and mods (Read 1288 times)

ibcomms

Hero Member



Posts: 215



Re: Ye Olde 858 restoration and mods

[Quote](#)

« **Reply #90 on:** August 29, 2012, 12:22:30 AM »

Back from trip to WA, time to get the 858 finished.

There are 2 issues to sort out - noise in the RX path somewhere is degrading the SINAD figure, and the radio is sensitive to power supply voltage shifts. These 2 had to be fixed before the sequencer recoding.

Poor regulation was tackled first, as changing the supply rails slightly could undo any work done on the noise issue. There are 4 zener based regulators in the chassis, a limitation of 1976 technology. Time to bring it forward...

First of all, a "before" measurement. Switching between the 2 supply limits of 10.8V and 13.8V, the 9V rail changes from 8.282V to 9.043V, and the operating frequency shifts by 270Hz.

The 4 regulators are:

Constant 7.5V at 25mA (D25 / R113). This was replaced with a 78L08 8V/100mA IC regulator.

Constant 9V at 35mA (D44 / R161). This was replaced with an LP2951ACN regulator IC (9.6V) on a small added PCB.

9V TX at 350mA (TR24 / D24): The existing pass transistor was retained, but the base driven directly from another LP2951ACN on a small added PCB.

9V RX at 115mA (D28 / R112). Replaced with LM2940-10 10V/1A low dropout IC regulator.

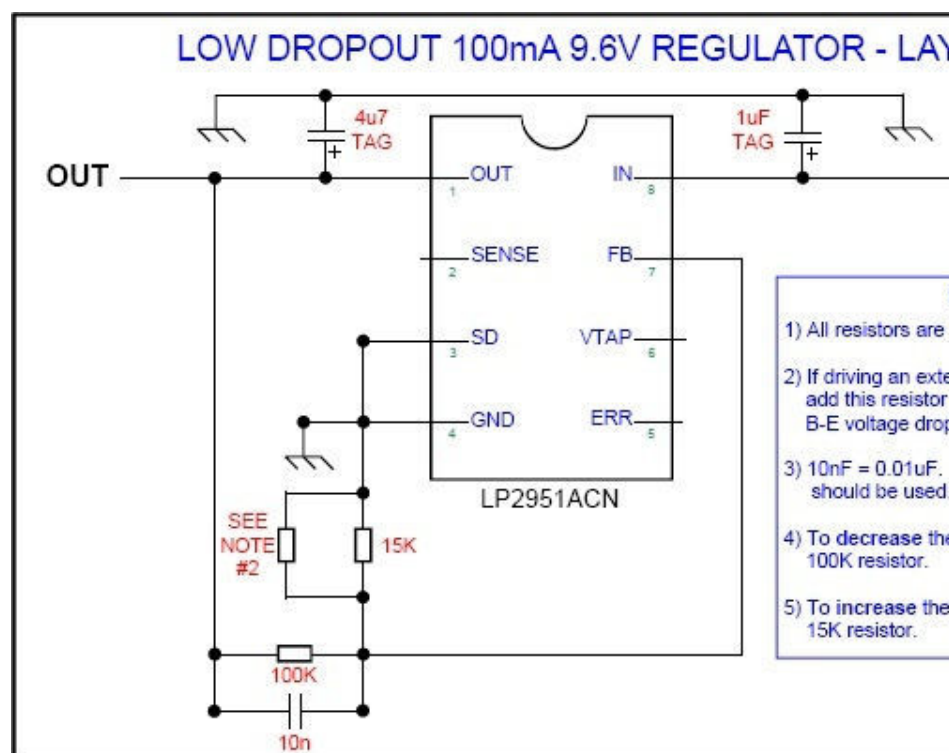
3 different types of regulators were used.

The 7.5V rail was easiest. Replace with an 8V / 100mA fixed regulator.

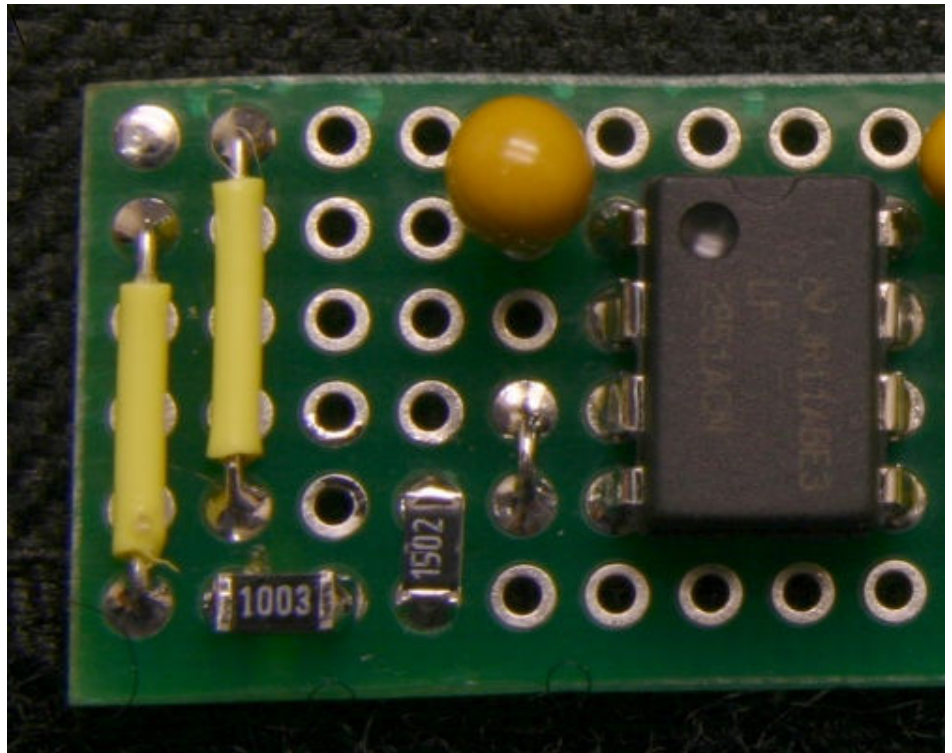
The 9V constant and 9V TX used a very low dropout voltage (typically 0.35V) regulator IC, an LP2951ACN in an 8 pin DIP package.

The 9V RX regulator current was above the rating of the LP2951ACN, so a higher current type was used - an LM2940 type in a TO-220 package and rated at 1A.

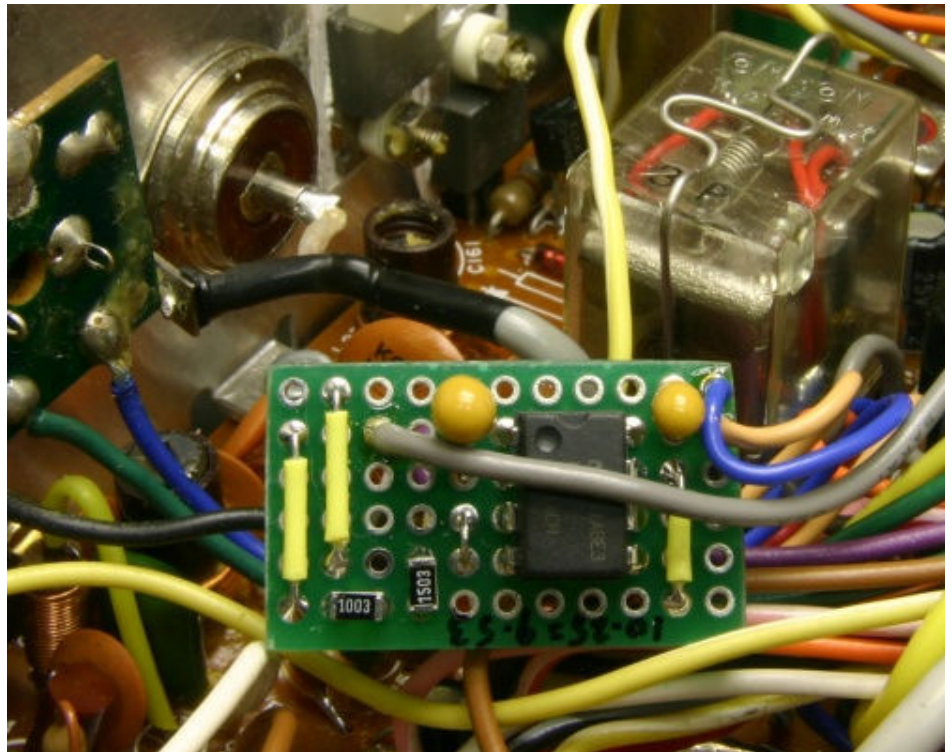
Some pics:



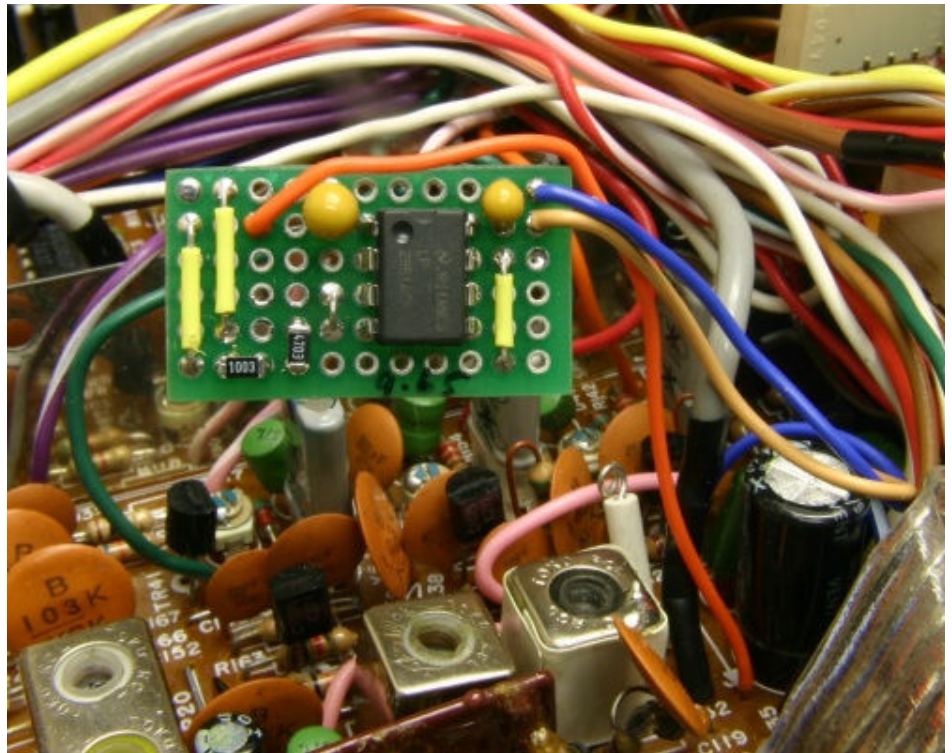
Circuit of the LP2951ACN regulator. These will regulate down to an input of only 0.35V above the output voltage.



The regulator circuit mounted on a small piece of prototyping board.



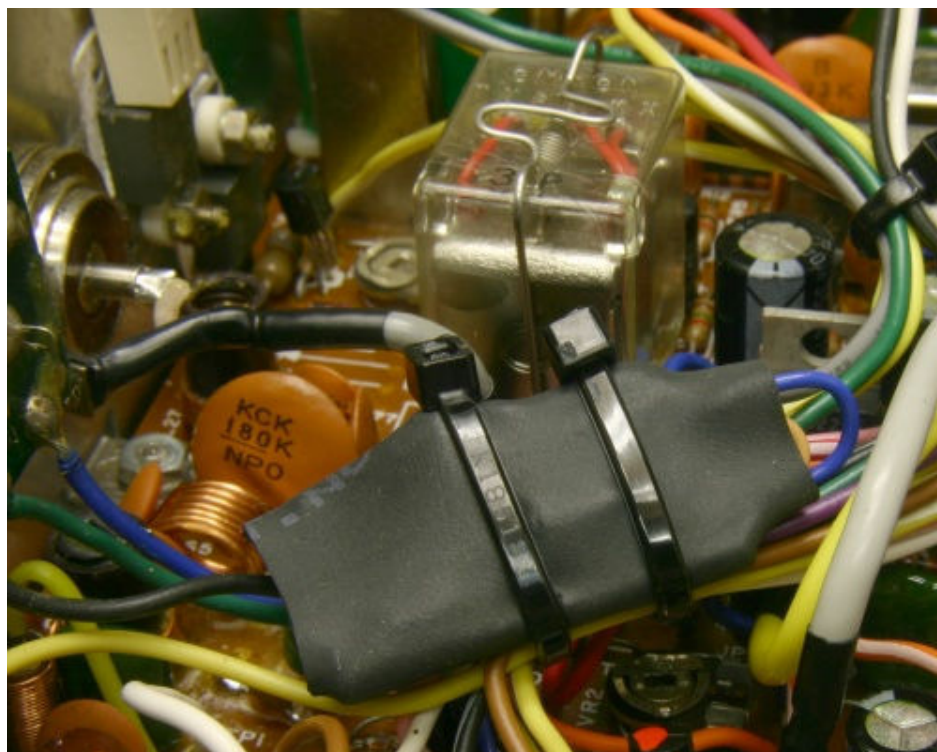
TX regulator driver, loosely fitted for testing.



The other one (9.6V constant that replaces D44 / R161).



The LM2940-10 used for the regulated RX supply (which is now 10V, not 9)

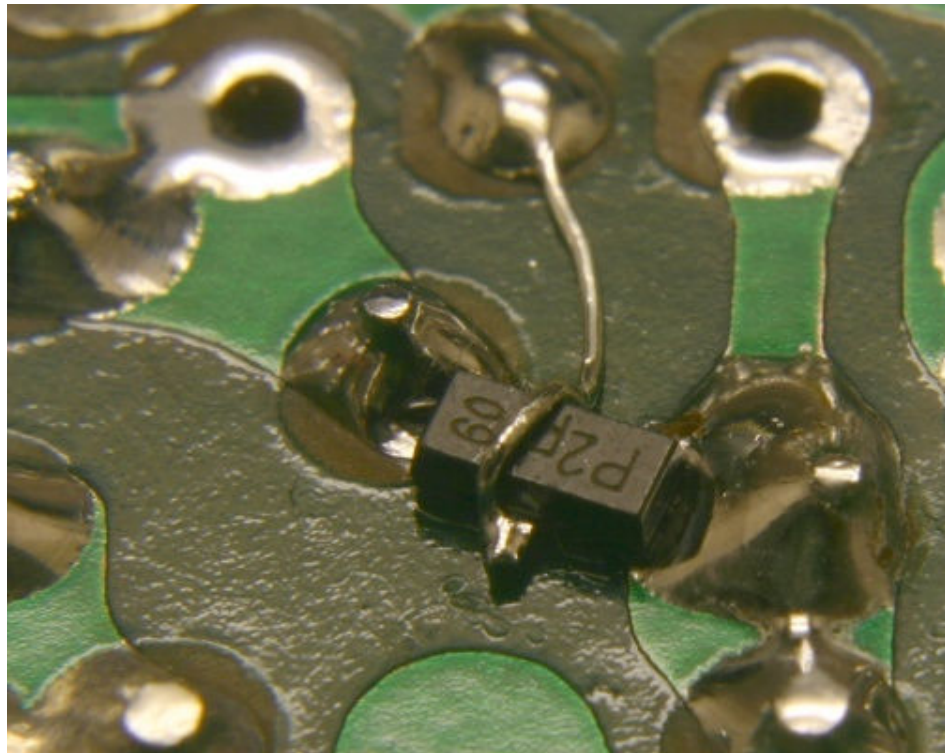


After testing the circuit works correctly, heatshrink and cable tie it to the wiring loom.

The noise on RX was fixed next. Easy to find - the RF amp transistor was noisy. Our stocks of 2999's had dried up months ago, but a BFR92 is a pretty close substitute. Only one small problem, we only had them in SMT...



Mounted onto the print side of the board. Base / emitter side of the component shown.



The collector side, showing the thin wire link needed.

Re-tune L3 and L4, sensitivity is now nearly 2dB better than spec



Switching between the same 2 supply limits of 10.8V and 13.8V, the 9V rail changes from 9.594V to 9.600V. It's stable to within 10mV for any supply voltage from 10.6V to 16V. The radios operating frequency shifts up by just 3Hz when the supply is varied from 10.7V to 16.0V, a huge improvement (nearly 100 times better) over the original regulators.

Next job: the sequencer and an external frequency display.
Working on these after lunch...

[Report to moderator](#) Logged

0069

Hero Member



Posts: 738



Re: Ye Olde 858 restoration and mods

[Quote](#)

« **Reply #91 on:** August 29, 2012, 01:28:46 AM »

Quote from: lbcomms on August 29, 2012, 12:22:30 AM

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The 9V RX regulator current was above the rating of the LP2951ACN, so a higher current type was used - an LM2940 type in a TO-220 package and rated at 1A.

Well what can I say, Awesome!!

Quote from: lbcomms on August 29, 2012, 12:22:30 AM

The LM2940-10 used for the regulated RX supply **(which is now 10V, not 9)**

It will like it. 🤖

Quote from: Ibcomms on August 29, 2012, 12:22:30 AM

The noise on RX was fixed next. Easy to find - the RF amp transistor was noisy. Our stocks of 2999's had dried up months ago, but a BFR92 is a pretty close substitute. Only one small problem, **we only had them in SMT...**

No problem, just make it work, oh wait, you did, sweet.

Quote from: Ibcomms on August 29, 2012, 12:22:30 AM

Re-tune L3 and L4, sensitivity is now nearly 2dB better than spec 😊

Switching between the same 2 supply limits of 10.8V and 13.8V, the 9V rail changes from 9.594V to 9.600V. It's stable to within 10mV for any supply voltage from 10.6V to 16V. The radios operating frequency shifts up by just 3Hz when the supply is varied from 10.7V to 16.0V, a huge improvement (nearly 100 times better) over the original regulators.

Next job: the sequencer and an external frequency display. Working on these **after lunch...**

A little late for lunch around here but never too late for something to eat so I'm on it, see ya. Enjoyed the read.

[Report to moderator](#)  [Logged](#)

**Ibcomms**

Hero Member



Posts: 215

**Re: Ye Olde 858 restoration and mods**

[Quote](#)

« **Reply #92 on:** August 29, 2012, 08:01:02 AM »

Quote from: 0069 on August 29, 2012, 01:28:46 AM

A little late for lunch around here but never too late for something to eat

From memory, did that post at about 2PM (Sydney, Australia) so it was a little late by us too, lunch for us can be anywhere from midday to 3PM.

Tried the 858 rig in the van tonight. Before, it was barely usable

on SSB when mobile, especially at night when we've got the lights and heater (it's the middle of winter over here) going and engine idling at things like traffic lights. No such issues now. Sequencer and frequency readout adapters are coming along nicely, if it don't get too busy in the 'shop we should have these done before the weekend.

Sue

[Report to moderator](#) [Logged](#)

nighthark63

Hero Member



Posts: 538

Re: Ye Olde 858 restoration and mods

[Quote](#)

« **Reply #93 on:** August 29, 2012, 10:06:35 AM »

wow sue you are one smart lady you know your stuff.great job

[Report to moderator](#) [Logged](#)

Froggy

CBTricks Supporter
Hero Member



Posts: 2784

Re: Ye Olde 858 restoration and mods

[Quote](#)

« **Reply #94 on:** August 29, 2012, 05:01:24 PM »

wow....wow....wow

[Report to moderator](#) [Logged](#)

nomadradio

Moderator
Hero Member



Posts: 3799
Analog Retentive

Re: Ye Olde 858 restoration and mods

[Quote](#)

« **Reply #95 on:** August 29, 2012, 05:47:56 PM »

Rock on, Sue!

I would probably have wimped out and just used 78L09 regulators. Would not have helped once the radio's main power fell below 12.0 or so.

I like your LDO solution better.

73

[Report to moderator](#)  [Logged](#)

"If I could explain it to the average guy, it wouldn't have been worth a Nobel Prize"

-- Richard P. Feynman

"One accurate measurement is worth a thousand expert opinions"

-- Admiral Grace Hopper

 **gadget73**

CBTricks Supporter
Hero Member



Posts: 1282



 **Re: Ye Olde 858 restoration and mods**

[Quote](#)

« **Reply #96 on:** August 29, 2012, 09:26:16 PM »

Nice. Sadly, even with stock 1970s regulation technology these things are more stable on SSB than some modern radios. I've heard a few of the locals with their hot-rodded RCI-2990's that sounded positively horrible. Nothing quite sounds like frequency modulated single sideband, other than someone drowning in a toilet.

[Report to moderator](#)  [Logged](#)

Tram D201a, JB-12 modulator, Imax 2000 antenna.

 **lbcomms**

Hero Member



Posts: 215



 **Re: Ye Olde 858 restoration and mods**

[Quote](#)

« **Reply #97 on:** August 29, 2012, 09:35:24 PM »

Quote from: nomadradio on August 29, 2012, 05:47:56 PM

Would not have helped once the radio's main power fell below 12.0 or so.

Unless it was in a base set (i.e. with an internal 110/220V supply) I wouldn't ruin an SSB radio by using 7809's.

Those LDO regulators are great for mobile SSB rigs.

[Report to moderator](#)  [Logged](#)

□ **lbcomms**

Hero Member



Posts: 215



Re: Ye Olde 858 restoration and mods

Quote

« **Reply #98 on:** August 29, 2012, 10:08:48 PM »

Quote from: gadget73 on August 29, 2012, 09:26:16 PM

Nice. Sadly, even with stock 1970s regulation technology these things are more stable on SSB than some modern radios.

The SSB stability issue with newer radios is a different issue, not related to 1970's power supply technology. The newer ones suffer from **thermal** drift (i.e. frequency shifts as the components change temperature).

Simplified explanation: Generation of AM/SSB for a single conversion radio needs six reference frequencies (3 for the loop mix, 2 for the carrier oscillator, one for the PLL reference). The older rigs like the 858 use a separate crystal for each, giving good thermal stability.

Unless you modded it by adding inductors to give you more "slide", that is. If you did that, the value of the inductor, and therefore the frequency of the circuit, changed with temperature. You needed a sliding clarifier to compensate, and had to wait for someone else to talk so you could set your own frequency...

Fast forward a few years. Crystals are expensive for radio makers, so any way of getting rid of a few = more profit / lower selling price.

How to do it? Use inductors to "bend" (slightly change the frequency of) the oscillators for the different modes instead of switching in new crystals. The six crystals are reduced to two or three, at a price - if we change the temperature of the board, the radio drifts a bit... just like the slider mods of olde.

Better quality radios, such as ham and commercial SSB rigs would never do this. The makers of new SSB CB sets and especially the majority of those "ten meter export" things know that most are going to spend 99% of their lives on channel 19 AM so stability is not really an issue for them. High output power, lots of channels, and gimmicks like inbuilt noise toys/echo/colored lights sell these things, not good RF performance.

Quote

a few of the locals with their hot-rodged RCI-2990's that sounded positively horrible.

Nothing quite sounds like frequency modulated single sideband, other than someone drowning in a toilet.

But they sound so LOUD on AM channels 6 and 19 🗣️

[Report to moderator](#)  [Logged](#)

gadget73

CBTricks Supporter
Hero Member



Posts: 1282



 **Re: Ye Olde 858 restoration and mods**

[Quote](#)

« **Reply #99 on:** August 30, 2012, 12:28:59 AM »

yup, definitely understand the main market segment for the "export" rig. I also understand the thermal drift. Theres a reason I don't use my RCI-2980 much, and basically never on SSB. I run the old Robyn with the 858 board, or my Ranger AR-3500 because they actually stay put. I have good AM radios too, none are "loud", but I'm seldom asked to repeat myself because the other end didn't understand me.

[Report to moderator](#)  [Logged](#)

Tram D201a, JB-12 modulator, Imax 2000 antenna.

lbcomms

Hero Member



Posts: 215



 **Re: Ye Olde 858 restoration and mods**

[Quote](#)

« **Reply #100 on:** August 30, 2012, 03:16:52 AM »

Quote from: gadget73 on August 30, 2012, 12:28:59 AM

Theres a reason I don't use my RCI-2980 much, and basically never on SSB.

Is that reason frequency drift, or some other problem? How does it look on a two-tone test?

Back when we used to service these things, about 75% of the ones that came in had hacked up (npc, limiters cut, etc) modulator stages.

Quote

I run the old Robyn with the 858 board,

Which probably sounds 10 times better than the RCI. After we restored the '858, and put into a 3 way competition with an ICOM IC-735 and a Barrett 2050 (military radio). It actually beat the Icom but got beaten by the Barrett, though it's not really fair to compare a 1976 radio to a digital signal processed \$4000 rig from

2010 🗨️

We are supposedly getting our first Uniden 780 SSB rig in here next week - if it turns up (it's in a unrelated vehicle issue repair) it's going to be interesting to do a side-by-side....

[Report to moderator](#) 🗨️ Logged

🗨️ **gadget73**

CBTricks Supporter
Hero Member



Posts: 1282



🗨️ **Re: Ye Olde 858 restoration and mods**

[Quote](#)

« **Reply #101 on:** August 30, 2012, 05:25:24 PM »

The RCI 2980 drifts. If its on long enough it will get stable enough to use but it takes a while. The RX is also not wonderful. It seems too wide for my liking. Its good on AM, but not so much on SSB. I've put it back to stock-ish though I haven't had it on in so long I couldn't tell you what it looks like on the scope. I seem to recall something not working right in the limiter circuit, don't recall what or if I ever fixed it. It may even be completely stock now, though I think I may have played with a couple caps in the mic amp section to change the tone a little. I may have also fooled with the caps in the AMC area to tweak the response time to get it to sound a little better.

[Report to moderator](#) 🗨️ Logged

Tram D201a, JB-12 modulator, Imax 2000 antenna.

🗨️ **lbcomms**

Hero Member



Posts: 215



🗨️ **Re: Ye Olde 858 restoration and mods**

[Quote](#)

« **Reply #102 on:** August 31, 2012, 11:40:15 AM »

Quote from: gadget73 on August 30, 2012, 05:25:24 PM

The RX is also not wonderful. It seems too wide for my liking. Its good on AM, but not so much on SSB.

There are two issues at play here. The first is many radio makers cheapen out be using a single filter for both AM and SSB. AM needs double the bandwidth of SSB, and therefore a wider filter.

By using just one filter for both modes, you end up with not enough bandwidth for AM and too much for SSB - it's a compromise. Because most 10 meter radios are aimed straight at channel 19 AM crowd, they lean towards wider filters so AM sounds clearer. Result: SSB is way too wide.


The second issue is the RF bandwidth. The amount of noise in a circuit is directly related to the bandwidth, in other words, wider bandwidth = more noise. Result: Receiver is noisy and prone to

interference from unwanted mixing products. There are two ways around this problem - double balanced mixers and/or varactor tuned front end. You will likely never see these used in an "export" radio due to the cost.

Quote

I've put it back to stock-ish though I haven't had it on in so long I couldn't tell you what it looks like on the scope.

Do you have a two tone generator? In not, there are plans to build your own own on the main CBTricks site.

« *Last Edit: August 31, 2012, 11:50:38 AM by lbcomms* » [Report to moderator](#)  Logged

gadget73

CBTricks Supporter
Hero Member



Posts: 1282



Re: Ye Olde 858 restoration and mods

[Quote](#)

« **Reply #103 on:** August 31, 2012, 05:29:59 PM »

no I don't, but I have cheated and used a DTMF touch-tone generator I found online and simply held the mic near the speaker on my shop computer. Its something of a halfass method, but it worked. I've used that to align other radios. I just haven't cared enough to hook the thing up and see what its doing honestly.

[Report to moderator](#)  Logged

Tram D201a, JB-12 modulator, Imax 2000 antenna.

The 2X4

Hero Member



Posts: 547



Re: Ye Olde 858 restoration and mods

[Quote](#)

« **Reply #104 on:** August 31, 2012, 06:03:45 PM »

I've used a handheld DTMF for SSB setup since '85. Just hold it against the mic.

Did you know if you hold down 2 buttons in a row or column, you get a single tone for that row or column?

Carlos

[Report to moderator](#)  Logged

If you don't know your radio...know your Radioman.

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Vintage CB Radios (Moderator: nomadradio) » Ye Olde 858 restoration and mods

I TNK TO CAI FNDAR

Jump to:

SMF 2.0.2 | SMF © 2011, Simple Machines
XHTML RSS WAP2

Page created in 0.097 seconds with 22 queries.



Hello Sandy7
 Show unread posts since last visit.
 Show new replies to your posts.
 November 27, 2012,
 05:22:56 PM

News:
 We have upgraded the forum to SMF 2.0.

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Author

Topic: Ye Olde 858 restoration and mods (Read 1288 times)

Radio Tech

Hero Member



Posts: 1006

The Radio Shop, Eastern NC



Re: Ye Olde 858 restoration and mods

[Quote](#)

« **Reply #105 on:** September 01, 2012, 09:21:47 AM »

I have used a wide range of things over the years for this. A DTMF touch pad wired into my mic tester, the CB42 SSB test tone (500hz and 2400hz) and my SM-220 station monitore with a built in test tone. Works real well for looking at the trapezoidal waveform.

[Report to moderator](#) [Logged](#)

Check out my hobby forum
www.gokarters.com/smf

The 2X4

Hero Member



Posts: 547



Re: Ye Olde 858 restoration and mods

[Quote](#)

« **Reply #106 on:** September 01, 2012, 10:11:51 AM »

Buddy

In the early days, broke, I used an ol' Radio Shack 160 I think. The oscillator was perfect for weak signal tune up.

Carl

Report to moderator  Logged

If you don't know your radio...know your Radioman.

Radio Tech

Hero Member



Posts: 1006

The Radio Shop, Eastern NC



 **Re: Ye Olde 858 restoration and mods**

Quote

« **Reply #107 on:** September 01, 2012, 10:22:20 AM »

Quote from: The 2X4 on September 01, 2012, 10:11:51 AM

Buddy

In the early days, **broke**, I used an ol' Radio Shack 160 I think.

The oscillator was perfect for weak signal tune up.

Carl

Carl, that I can relate too lol. I stay broke.

Old 160 eh? Now that is being very creative!

Report to moderator  Logged

Check out my hobby forum

www.gokarters.com/smf

rockhavenradio

Hero Member



Posts: 384



 **Re: Ye Olde 858 restoration and mods**

Quote

« **Reply #108 on:** September 01, 2012, 11:00:18 AM »

On the sequencer project:

I am thinking both original selector and ATMEGA selector can be hooked to the PLL chip at the same time.

Power the one I want to use.

Another 139xlr schematic error: 5v connection missing to ic7 pin7, channel selector, and r151 (TRC-449 sch is correct).

Report to moderator  Logged

lbcomms

Hero Member



 **Re: Ye Olde 858 restoration and mods**

Quote

« **Reply #109 on:** September 01, 2012, 01:04:24 PM »

It can be done, you'll need about 20 diodes to isolate the unused selector from the PLL. See PM.



Posts: 215


 rockhavenradio

Hero Member



Posts: 384



If you had mentioned this before, I could have out an "isolate all outputs" command in there 😊

Just for now, make it sequencer only and get that part working.

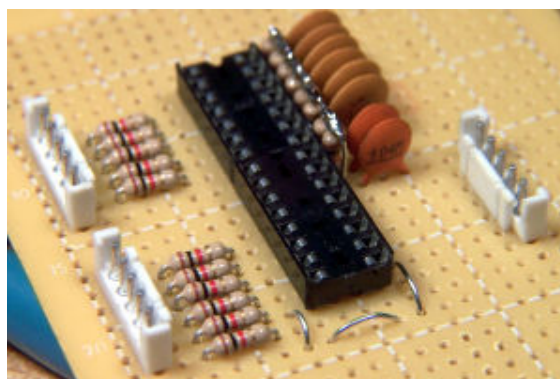
Report to moderator Logged

Re: Ye Olde 858 restoration and mods

Quote

« **Reply #110 on:** September 06, 2012, 11:34:59 PM »

Got some parts started 😊



100_5273.jpg (588.43 kB, 2178x1450 - viewed 6 times.)

Report to moderator Logged

 Lazarus

Hero Member



Posts: 1242



Re: Ye Olde 858 restoration and mods

Quote

« **Reply #111 on:** September 07, 2012, 12:00:42 AM »

Quote from: rockhavenradio on September 06, 2012, 11:34:59 PM

Got some parts started 😊

nice work, looking good,



Report to moderator Logged

Sometimes I wonder whether the world is being run by smart people who are putting us on or by imbeciles who really mean it. - Mark Twain

lbcomms

Hero Member



Posts: 215


 rockhavenradio

Hero Member



Posts: 384


 lbcomms

Hero Member



Posts: 215


 **Re: Ye Olde 858 restoration and mods**

Quote

« **Reply #112 on:** September 07, 2012, 09:21:29 AM »

Looking good, but (not being able to see the underside) make sure the bottom 1K goes to pin 15. Looking at the topside wire links, it's out by one pin. If it's linked underneath correctly, then "kindly disregard this message".

Report to moderator  Logged

 **Re: Ye Olde 858 restoration and mods**

Quote

« **Reply #113 on:** September 07, 2012, 12:33:34 PM »

I made a 30 pin socket and did not notice till the resistors didn't line-up. 😞
Extra 2 socket pins and extra resistor.

Report to moderator  Logged

 **Re: Ye Olde 858 restoration and mods**

Quote

« **Reply #114 on:** September 08, 2012, 10:40:47 AM »

The Guide - Programming the chip

- 1) Get your PC ready.
 - a) Turn on extensions (instructions [here](#))
 - b) You need Administrator user level.

Instructions for [Windows 7](#) and [Windows XP](#)

- 2) Download the 4 hex files from [here](#):

```
seq_100.eep
seq_100.hex
test_100.eep
test_100.hex
```

Save them in a folder, for example make a folder called "Hex files".

When they appear when you open the folder, the file extensions (the .EEP and the .hex at the ends of the name must be visible). If they don't show (for example the last file appears as test_100) , you messed up step 1. Go back and get step 1 working and try again.

3) BEFORE YOU PLUG IN THE PROGRAMMER:

Install the [drivers](#) for the usbasp
Extract to desktop.

Plug in programmer, the new hardware wizard will appear
If it wants to search the internet, select "No, not this time" and click Next

Select "install from a specific location", Next
Select ONLY "include this location" and browse to the folders created at the start of step 3.

"xp" for windows 2000 or XP, "vista" for Windows Vista or 7

Click "Next", let it install the driver, and click Finish.

You should end up with a message that your hardware is installed and ready for use.

LEAVE THE PROGRAMMER PLUGGED INTO THE USB PORT

4) Install "Extreme burner AVR" We used version 1.2 for Windows.

5) Start Extreme burner AVR.

On the "Chip" menu, select "ATMega8"

File > Open Flash. Select the folder you saved the hex files to and open test_100.hex

Plug in the programmer to the AVR.

Click the "Chip Erase" icon, Yes, and check it erases it with no errors (no red icons in the task screen).

Click the "Write All" icon. After it programs the Atmel, no error messages and a flashing LED on the board you made should happen.

The LED should flash about once per second. If it's way slower the fuse bits are incorrect.

Click the "Fuse bits/Settings" tab. Click "Read all". They should be as below:

Low fuse: E4

High fuse: D9

Extended: FF
Lock fuse: FF
Calibration: B5B5B5B5

If they are wrong, put these values in the boxes and click "Write"

DOUBLE CHECK BEFORE CLICKING ON "WRITE".
WRONG VALUES HERE CAN BRICK (DESTROY) THE ATMEL IC!

The LED should now be flashing about once per second.

6) Put the sequencer code into it:
Click Open > seq_100.hex
Click "Write All"

The LED should flash on when the encoder is turned Clockwise.
If it's the opposite, swap over the data lines (that go to pins PC0 and PC1).
If it doesn't flash on either direction it flashes in both directions, check your wiring and make sure the encode switch is a suitable type.

7) Configure the lowest, highest, and home frequencies:

a) Set Low slot
Turn off power.
Ground pins 17 and 28.
Turn on power.
Turn the encoder switch to set the LOWEST frequency desired.
Turn off power.

b) Set High slot
Open pin 17, and ground pins 18 and 28.
Turn on power.
Turn the encoder switch to set the HIGHEST frequency desired.
Turn off power.

c) Set Home slot
Open pin 18, and ground pins 19 and 28.
Turn on power.
Turn the encoder switch to set the HOME frequency desired.
Note: The home frequency is both the startup and the instant recall frequency.
Turn off power.

d) Make changes permanent
Open pins 19 and 28.

e) Check it starts up on the home channel and is limited to the programmed range.
If any are wrong, fix them now by repeating steps a, b, or c as needed, followed by step D.

If the Atmel power source does not switch cleanly, you might have to do this 2 or 3 times.

Disconnect the programmer wires to the Atmel, these are no longer needed.

This concludes the configuration of the sequencer board.

[Tried this on a fresh XP installed PC tonight, worked perfectly.](#)

Report to moderator  Logged

 **rockhavenradio**

Hero Member



Posts: 384



 **Re: Ye Olde 858 restoration and mods**

[Quote](#)

« **Reply #115 on:** September 08, 2012, 08:53:15 PM »

Thanks lb. 😊
This channel sequencer is finally working.

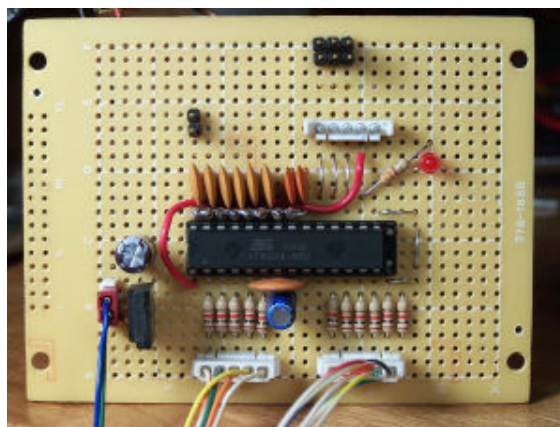
Don't toss anything in the trash.


The encoder is from a beat RCI-2990.

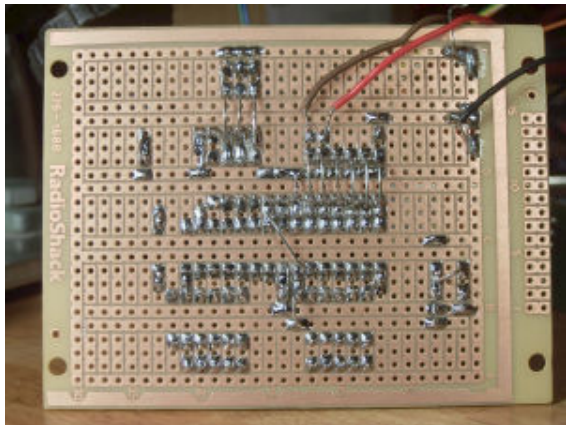
The 5 volt regulator is from an old TV.

The ic sockets and jumper pins are from an old GE two-way radio console.

Pin headers and sockets are from a Kenwood TS-940S that I found in the dump on "appliance day".



 100_5276.jpg (865.94 kB, 2304x1728 - viewed 10 times.)



100_5277.jpg (983.83 kB, 2304x1728 - viewed 12 times.)

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