From: http://www.ve7ca.net/TstH86.htm

HP-8640 Service: Hints & Kinks

Service Hints

1. Output dies on tuning to high-end on all bands, November 2004: Markus VE7CA

This may be due to a problem with the 128-256 MHz band ECL divider in RF Divider A10A2, the board located just under the large die-cast cover on top-side of generator. If there is input at the divider over the full freq. range but the output fails above a certain freq. then this fix may apply.

A factory modification was made: 100 ohm variable resister R6 was added from pin 13 of this divider to ground. This mod. increases the sensitivity of the divider. To adjust the resister, tune gen. to high frequency end of band and set resistor half-way between the high and low cutout. If the bias is too high or low, the divider will not clock.

2. Cracked Wheels, November 2004: Hadley K7MLR

I just finished the first read of your article, quality work, thank you very much. There are two other, very common, problems with the HP8640:

a. The nylon gears, in the gear trains, of the audio osc. and range switch crack and will eventually fall apart. If caught in time, epoxy will extend their life.
b. The small finger contacts, mounted to the clear Styrene wheels, located on the range switch assembly and the attenuator will become intermittent. Again with some work and epoxy this is pretty easy to fix. The Styrene wheels are reversible and give new purchase points to re-mount the fingers when they fall off. Every HP8640 I work on gets the epoxy treatment on the wheels because the fault will occur sometime down the road. Just a warning, don't lose any of the fingers during disassembly or you will be up the creek unless you have a hanger queen.

Ed. Note: Picture of a Cracked Styrene Wheel on EB5ABV's Web site is here. It shows a cracked wheel before repair and the small finger contacts, mounted to a clear styrene wheel.

3. More Cracked Wheel Help, November 2004: Ken VE3FIT ve3fit @ rac.ca

I read your article in QEX about repairing an HP8640 and it led me to your web site. I greatly enjoyed both. Last winter, I restored an 8640B which I had bought "as-is" on e-Bay. Fortunately, it was a long winter: I did a repair on several cracked Delrin gears and in a nutshell, here it is:

- Having removed the gear, I put it in a refrigerator's freezer compartment for a few hours. This will cause the delrin to shrink more than the brass hub. Drift out the brass hub. Mine came out with just a gentle tap on a hammer and drift. (Credit the next part to Jeff Liebermann). Use 24 hr epoxy to glue the Delrin back together. Use a round file to open up the delrin centre hole so that the brass hub will just fit back in. Epoxy the hub back in.

I had to replace the final power amp in my unit. Fortunately, I managed to get a 'pull' from Fair Radio, but it cost about US $125. I was just looking on the WJ Communications web site and it looks like they now have several MMICs that could work in the 8640B. Check out their ECG008.

4. Caution when storing HP8640, November 2004: Terry K7TAU

A retired co-worker (George Steen) has located a fellow that worked at HP on the HP-8640-B RF generator and has been corresponding with him regarding the instrument. Here is something George passed along to me and suggested that I copy you on this information.

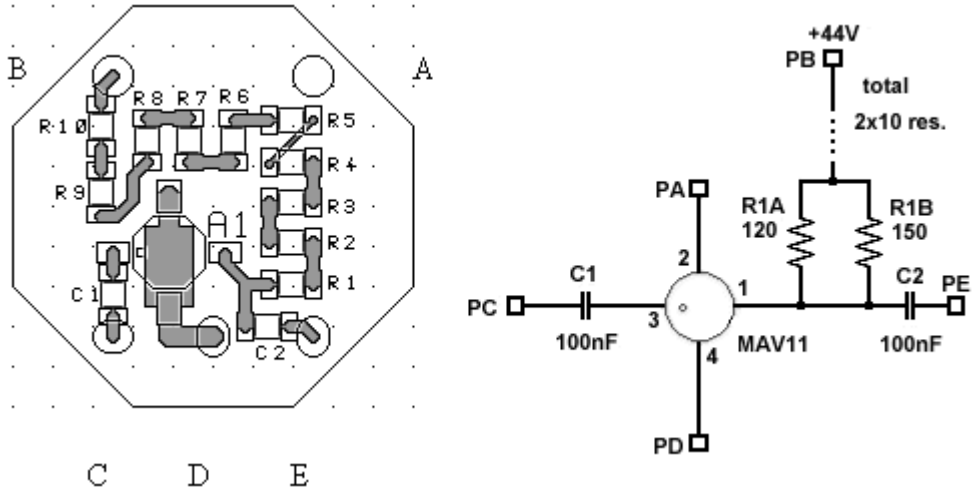
> "Word of caution: don't store the oscillators on-end (with their tuning shaft pointing up), because if you do so, eventually the internal silicone grease migrates down to (and saturates) the back plate where the transistor oscillator resides. The grease sometimes gets between the plate and the case, causing loss of good electrical connection. End result: the unit drops out of oscillation at parts of the band - - or in bad cases, won't oscillate at any part of the band."

This is a direct quote taken from correspondence between George Steen and Greg Burnett, Retiree of HP. Thought you might be interested in reading this and perhaps posting this on your web page. Regards, Terry K7TAU

5. Using a surface mount type MAV-11 and PCB, December 2004: Angiolo Chiti I5SXN

I am I5SXN, an old Italian radio amateur no more active but I am now only a technician. In 1999 I had the same problems on two generators HP 8640B. At that time HP asked me $600 for that modules. I solved the problems in the same way, as you, but I opened the container of the amplifier and I introduced inside a small printed circuit with an MMIC type MAV11, two condenser and a lot of chip resistors series and parallel to obtain the right current for the MMIC and dissipation using directly the 44 volt supply. I closed the container and in this way if you open my HP8640 you do not see any transformation. I send You the schematic diagram and the printed circuit indications.

PC Board Layout & Schematic



Printed circuit and mounting position of the components. The shape is octagonal for problems with my CAD, I rounded the circuit before mounting in the container. Diameter 25 mm. Distance between pins A and B 12.5 mm, and between B and C 16.4 mm. The circuit was of 0.8 mm thickness, with copper on the lower side. I scratched the copper around the active pins. With small holes and wires I connected the

ground pins of the MMIC to the lower copper side. I used the original pins of the module. Another time I repaired the burned final amplifier adding a zero bias diode on a different printed circuit. I hope to be useful to you. Good luck and 73. Angiolo Chiti I5SXN, E-mail: a.chiti @ rossbauer.it

6. Another replacement type for the MAV-11, May 2005: Tom Bruhns K7ITM

I just photocopied a mixer article from QEX (July/Aug 2004 issue) and happened to get the last page of an article you apparently wrote about HP8640 amplifier issues. In footnote 4, you mentioned a WJ amplifier. For a little better output power and quite a bit better IP3, have a look at Sirenza SBF-5089. It's rated nominally for 500MHz high end, but the rolloff is gradual and it should be no problem using it in the 512MHz HP8640B. It's probably a bit shy on power output to be used directly in the output stage if you need full power output. The SBF-5089 has a particularly high IP3 (which is why I know about it...), and you probably don't need that linearity in the 8640 output. For power output from a monolythic gain block, have a look instead at the Sirenza SGA-7489, which should give you a bit better IP3 than the WJ part and about twice the output power--maybe enough to actually give full 8640 output. Plus, it's rated for a wider frequency range. Cheers, Tom Bruhns

7. Help for Oscillator Failure in the HP8640B., October 2005: John Klingelhoeffer WB4LNM

John wrote an excellant article in the Sep/Oct 2005 issue of QEX describing how he fixed the oscillator in his HP8640B generator. John describes in great detail the process of disassembling the A3 oscillator assembly in order to get at the oscillator circuit. He included many clear pictures of the inside of the generator and oscillator assembly. If you don't have a copy of the QEX article you can order a copy from ARRL.

8. Oscillator Frequency Adjustment HP8640B., January 2005: Markus VE7CA

If you set your HP8640B so that the frequency counter reads exactly 10.000 Mhz but the output frequency is not exactly 10.000 Mhz, you can easily calibrate it yourself.

a. Remove trim strip that holds front panel window in place. Gently pull window up and out and remove it. Allow generator to warm up for 2 hours.
b. While listening to WWV at say 10 MHz in a AM receiver,(with a a short length of wire attached to the generator output), if your generator is off frequency even though the frequency counter reads 10.000 Mhz, then you will hear a beat note over-riding the WWV carrier. Adjust the time base adjustment pot (available through the hole in the front of the counter casting) until the oscillator is zero beat with WWV at 10 MHz, i.e. the beat note disappears.
c. Replace front panel window and trim strip.

9. More Gear Information for the HP8640B, March 2005: Jim, K8JL

In order to purchase new plastic gears for the HP 8640B one must specify the Diametral pitch (DP), the Pressure Angle, and of course, number of teeth, bore, thickness, etc. The DP is 48. A new 20 deg. pressure gear does NOT mesh correctly with the original gears. Hence, I conclude the pressure angle is 14.5 deg., the other choice. I have not tried a new 14.5 gear with the originals, however. I used Super Glue to mend split gears and it worked well. Clamp the pieces together for a few hours. I could not pull the joint apart with my hands.

NOTE: The latest available manual from 1992 for the 8640-B covers the "new" assembly and it gives a detailed gear specification for the combination gear:
"48-T 48-DP 14.5 DEG-PA".
Regards, and tnx for your help. Jim, K8JL.

10. More Information regarding Storing the HP8640., January 2006: Jim Korenz N8PXW

Hi Markus:

I E-mailed you awhile back about HP8640B problems. I stored my 8640 face up. When I read your webpages, I saw the comment bout intermittent frequency operation. Sure enough, I had 7 dead sections in the tuning range, including both ends. Additionally, the generator would not lock, even after an hour warmup. I E-mailed Terry, K7TAU, for help. He recommended operating the unit face down, to let the silicone grease flow back. After three months in this position,the HP8640 had only one dead spot in the middle of the range and would lock. I turned the unit off and let itset flat for another couple of months. I turned it on before Xmas, and lo and behold, the oscillator works perfectly. The bottom line, you don't have o open the unit and dissemble and clean the cavity oscillator to restore proper operation. You can let it sit face down, but it will take some time to come back to full operation.

11. Information regarding variable and fixed audio irregularities in the HP8640., September 2006: Markus VE7CA

After finding and reading through the HP repair information on your site, I thought the following may be of some interest to fellow HP user's. My HP8640A developed a fault causing the variable and fixed audio oscillator to stop working. I located the problem to the thermistor module and discovered that the fault seemed to be an open circuit between the common point (A) and the two series connected thermistors to connection point (C). The path between (B) to (A) was ok. No information is forthcoming in the HP manual regarding this component.

After trying several sources for a replacement and in most cases only being offered a complete replacement board for £50 plus vat etc, decided a cheaper cure must be sought. Trying various remedies I recalled that a solution might be to use series connected lamps to replace the whole original thermistor sealed assembly. I happened to have a supply of miniture 16v lamps so connected 3 in series and placed them on the top of the pcb soldering directly to the pads and interconnecting with thin wire.

The idea worked OK apart from a slight bouncing of the o/p amplitude at switch on. The output remains stable otherwise. It may not be the best of "fixes" but it cost nothing to achieve and will certainly suffice for my needs.

12. Information regarding manuals for the HP8640, July 2007: Markus VE7CA

Aglient Technologies who purchased HP has now posted operating and service manuals for many of the older HP test equipment.

13. Combination Gear Replacements. , October 2007: Markus VE7CA

One of the problems that many owners of the HP8640 series signal generators face is finding a replacement for the combination gears (("Fig. 8-97, A9 Peak Deviation and Range Switch Assembly" it is called: Item Number 13 and 19 (they are identical!), Reference Designator A9MP12 and MP13, Description: Combination gear.))

Recently I recieved an email from Mr. Wieschhoff in France regarding the Split Gear Combination Assembly:

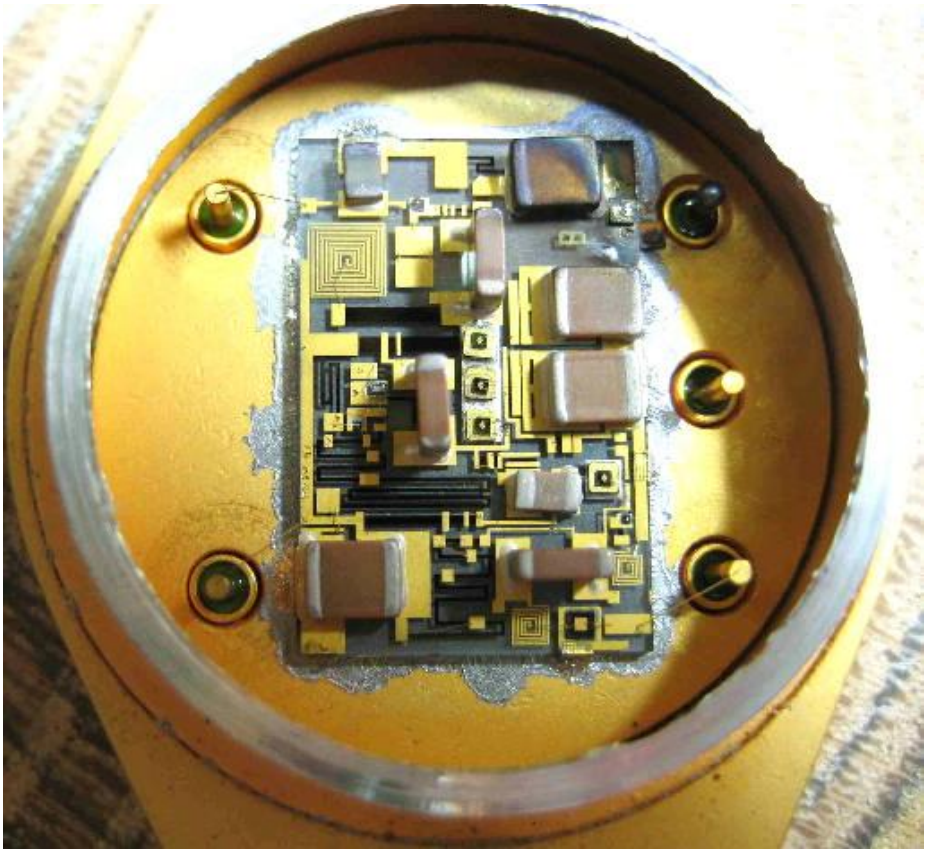
"After having followed the conversation of some interested circles in early 2007 about the re-manufacture of the combination gears in the HP generator 8640B I tried to get some information about the follow-up and result. The early generators manufactured containing what I would call the "old" dev./freq. switch assembly. The difference to the "new" one is that it uses standard type switch segments where as the "new" ones uses a printed circuit type rotary whiper discs to switch. Apparently both assemblies were manufactuerd in parallel for some time, since the manual from 1976 covering the generator version HP8640-A shows still the "old" assy. The latest available manual from 1992 for the 8640-B surely covers the "new" assembly and for the fist time I see it gives a detailed gear specification for the combination gear: "48-T 48-DP 14.5 DEG-PA". It may also have been given in manuals between 1976 and 1992 but I do not have any. In ALL manuals quoted (including the one covering the "old" version) the part numbers for these gears are identical: 1430-0773 and 1430-0774. In fact both different numbers describe identical parts. Why HP did this I do no know but it may have been for internal procedural reasons. I used a 0734 replacement gear bought from HP some years ago (unfortunately at the time I only bought one) in place shown for the 0774: no problems."

14. Final Hybrid Amplifier Replair, November 2008: Markus VE7CA

I recently made a small SMD board to plug in in place of a blown output hybrid in a 8640B. I used the Philips BGA6589 and could reach about +6dBm. Whilst this got the machine back in working order it was not as linear when modulated really only got to 0dBm.

I started to wonder why the hybrid had died since it showed output on the meter but none at the output pin. I concluded the either the output C had become detached or it’s bond wire to the output pin broken. So I mounted the hybrid on a hardwood mandrel and centred it in the lathe and gently turned off the top.

Fig 6. Final Hybrid Amp. with lid removed.



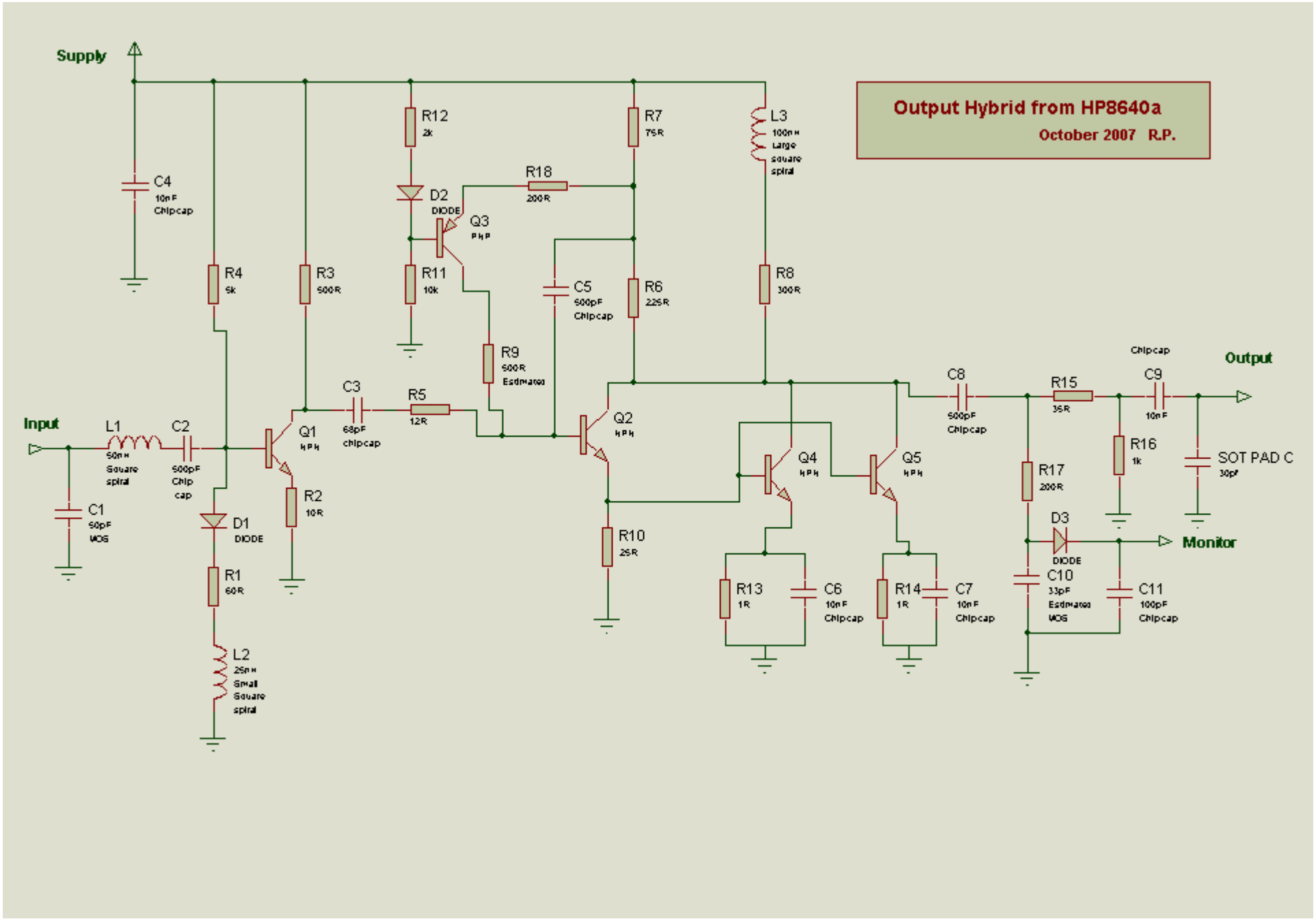
As the picture shows the bond wire to the output was vaporised! The output C had a slight coating of gold sputter but was otherwise OK. A small semiconductor pad capacitor which had been bonded to earth had also melted and was undoubtedly the path to earth for the blast of volts which took out the hybrid.

I soldered on to the output pin an 0805 50V 0.1 and connected it to the original output C with a single strand of 0.2mm. The added capacitor is because the old output C has now 10K of leakage. I re-inserted it in the 8640B put a piece of cling film over it and all is back to normal.

Click Here to view a copy of the circuit for the final Hybrid Amplifier. [see next page]

"The schematic attached is an educated guess at the hybrid by looking closely at the blown up photo. The resistor values are scaled by measuring the square area of a couple of known resistor values and applying this to the other resistor tracks. Capacitors are estimated. The inductors are calculated. This excellent job was done by Richard, G3SHK who made this sort of stuff in a past-life at Philips labs".

I am pretty certain a good number of old output hybrid may have been zapped by working on valve kit as the DC input voltage of the spec is very low. If anyone has hung onto the hybrid I recommend peering inside! Mine had a sapphire substrate but since you might encounter Beryllium Oxide turn at low speed with care and wear a face mask!


Output Hybrid from HP8640a
October 2007 R.P.
Supply
Input
Output
Monitor
C4 10nF Chipcap
R12 2k
R7 75R
L3 100nH Large Square spiral
R18 200R
D2 DIODE
Q3 PNP
R4 5k
R3 500R
R11 10k
C5 500pF Chipcap
R6 225R
R8 300R
R9 500R Estimated
C3 68pF chipcap
R5 12R
C8 500pF Chipcap
R15 36R
C9 10nF Chipcap
L1 50nH Square spiral
C2 500pF Chip cap
Q1 NPN
Q2 NPN
Q4 NPN
Q5 NPN
R16 1k
SOT PAD C 30pF
C1 50pF MOS
R2 10R
D1 DIODE
R17 200R
D3 DIODE
R1 60R
R10 25R
C10 33pF Estimated MOS
C11 100pF Chipcap
R13 1R
C6 10nF Chipcap
R14 1R
C7 10nF Chipcap
L2 25nH Small Square spiral

15. Various: Display - Lock Range - Split Gears, January 2009: Mark Kolber WB2WHC
Mark has kindly provided details of several remedies that he performed to his ailing HP8640B in (.doc) format. #1 describes how he fixed his display, +5 Volt supply and added a coupling capacitor to the EXT input of the the counter to it is AC coupled. (Mark used one 0.001 uF coupling cap. I would suggest using two 0.001 uF capacitors in parallel). #2 details how Mark increased the Lock Range. #3 talks about the split gear situation common to the HP8640B.

#1 Display+

Following are my experiences working on the HP8640B. This unit is serial number pre-fix 1405A.

The display did not work. I traced that to a bad counter IC in the timebase. U17 was replaced with a 74LS90. A bad U16 would cause the same problem.

Now the display was working but was off by a factor of 10. It would read 5.00 MHz when the output was actually 50.00 MHz. Checking the timebase signal, it was 3.15 kHz and was supposed to be 315 Hz. U13 and U14 are supposed to divide by 25, 32 or 40. My unit was dividing by 4. This was also a bad counter in the timebase, U13, replaced with 74LS160.

When replacing ICs on the time base board, be sure to trim the leads very short, there is only a small clearance down to the plate below. I installed an insulator there just to be sure.

Finally the +5 Volt supply was intermittent and would cut out for a few seconds at time. This was found to be bad solder joints on the transistor sockets for the regulator power transistor on the rear panel. I re-soldered all of them.

Lastly, in the process of trouble shoot using the extender card, the extender card itself had bad solder joints that made things very confusing to troubleshoot. I re-soldered all of those.

I also made two changes that others might be interested in.

I really did not like the way the 10 dB step attenuator and the variable control were ganged together. This is an interesting piece of engineering and some folks may like it, but I didn't. It was easy to remove the gear at the end of the shaft and store it in a plastic bag inside the unit. Now the step attenuator and variable operate separately and are mechanically much smoother as well.

#2 Lock Range

The HP8640B is a great generator. It combines the low phase noise of a cavity oscillator and the stability of a crystal oscillator. This is accomplished by using a low bandwidth PLL to lock the cavity to the crystal. As the cavity drifts with temperature, the PLL varies the tuning voltage fed to Varacter diodes to keep the cavity in tune. As designed, the PLL can keep the cavity locked over only a few kHz worth of drift. If you turn the unit on from a cold start and put it in lock mode, it will probably drift out of lock by the time it warms up. In fact the unit will maintain lock over only a fraction of a turn of the front panel fine tuning knob. When I first got my unit working, I noticed this limited lock range and thought something was still wrong with it. I scoured the manuals and made some voltage measurements and found everything worked as described in the manual. The Counter lock board was able to put out a range of +/- 5 Volts centered around +10 Volts. Beyond that, an error sensor decides there is an error. This +/- 5 Volt signal travels through the Phase lock loop filter (located on the FM Shaping card) and is applied to

the cavity Varacter. At the output of the loop filter the tuning voltage is centered around -16 Volts and has a range of only about +/- 1 Volt. I thought this was odd. I simulated the circuit in PSPICE and found that my unit was working as per the design on the schematic and the way the manual describes. Apparently the 98640 is designed with a limited lock range.

But while perusing the loop filter circuit, I noticed VR1, a 6.2 Volt Zener diode that seemed to be used as part of the voltage level shifter to shift the 10 Volts control voltage to -16. But during the testing my unit I saw there was only 0.7 Volts across the Zener diode. Was something wrong with my unit? But this is also what the simulation said is correct, so there was nothing broken in my unit. I looked at the schematic again and saw that the Zener diode was placed backwards from what I would have expected. I thought about what would happen if I reversed it. Would I be able to increase the range of the tuning voltage? Checking in the simulation I found yes, if I also change the connection of the Varacter bias pot. To make a long story short, I tried the change shown in the accompanying schematics and pictures, and low and behold the lock range was increased by about 3.5x. The unit now holds lock for at least +/- 1 full turn of the fine tuning knob. I also checked the phase noise performance and found it to be as good as before in the x1 display mode. In the x10 display mode there is some phase jitter, but that has always been the case. I looks like the design was really intended to use the lock feature only in the x1 mode. Per HP the lock node doesn't even work at all in x100 mode.

The connection of Zener VR1 in the original circuit is very odd. The diode was forward biased like a standard diode and had only 0.7 Volts across it. HP could have used a regular diode there instead of a Zener. With the modified circuit, with the Zener reversed, the Zener is now operating as a Zener with 6.2 Volts drop across it. I can't help but wonder what were the intentions of the original designer.

In any case, I am very happy with this change, it is very simple to make and needs no new parts!

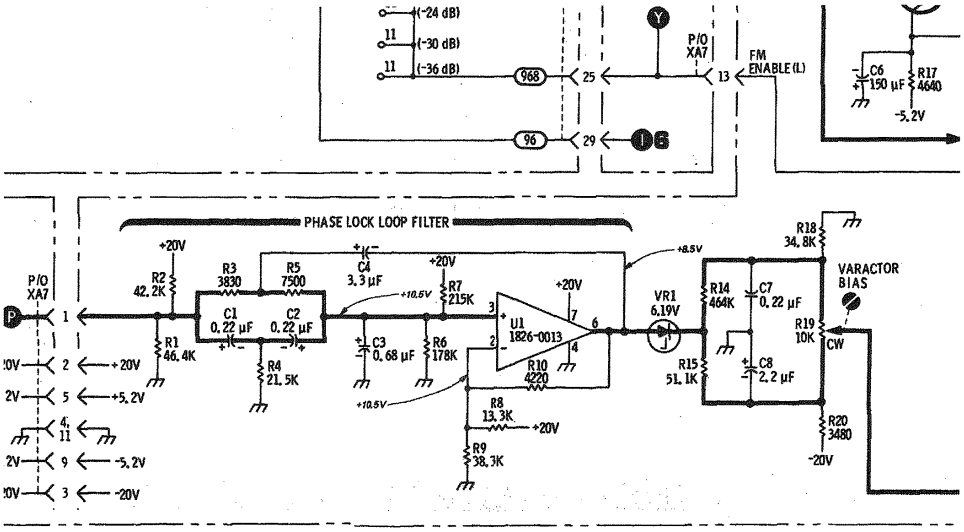


Figure 8-27. FM Shaping Circuits and Phase Locl

PHASE LOCK LOOP FILTER BEFORE MODIFICATION

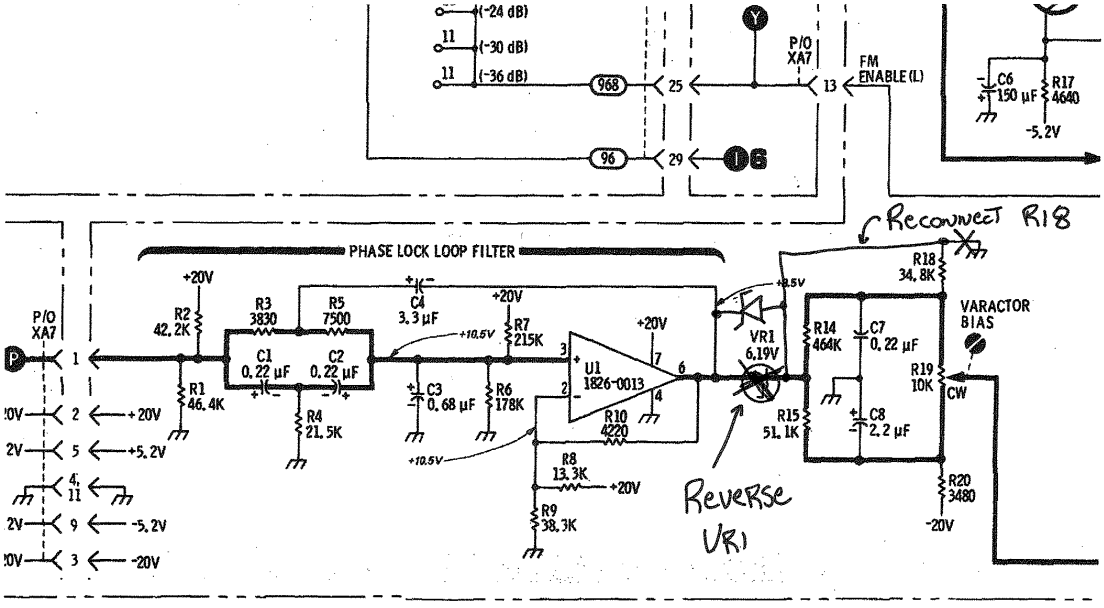


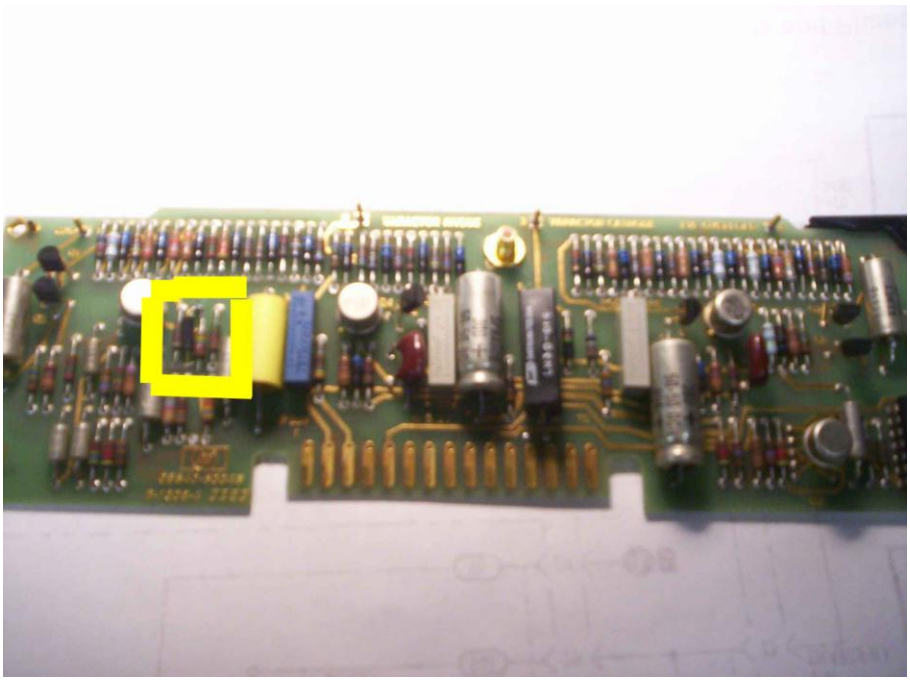
Figure 8-27. FM Shaping Circuits and Phase Locl

AFTER

PHASE LOCK LOOP FILTER AFTER MODIFICATION

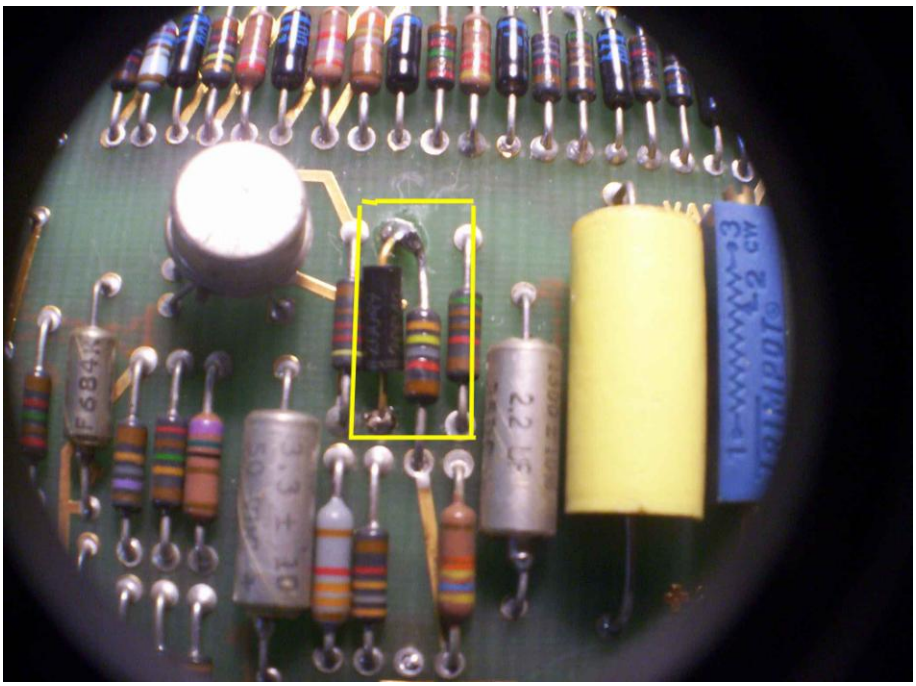
Reverse VR1

Reconnect the ground side of R18 to Anode of VR1 so R18 is in parallel with R34.



Zener diode VR1 and R18 located here on FM Shaping Card

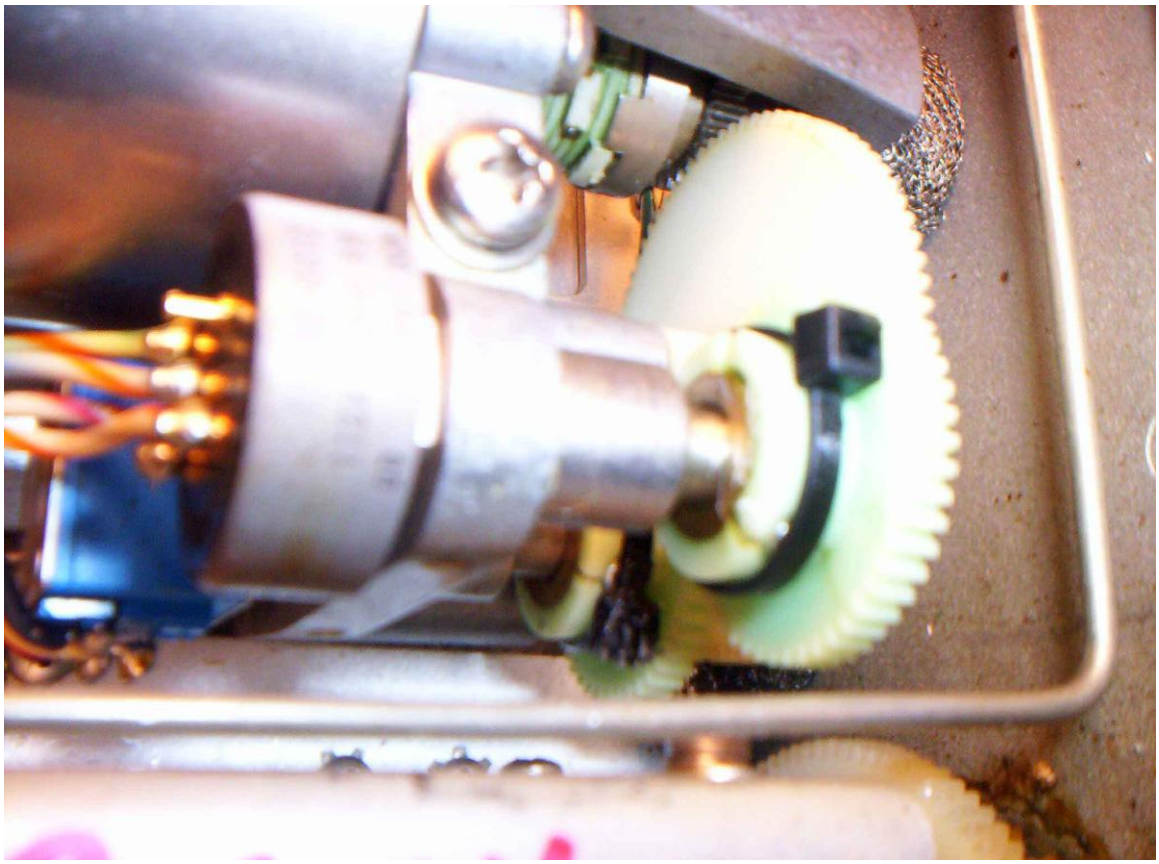
If your unit is the version that has a mini-coax attached to the FM Shaping Card, be careful when removing the card so as not to yank on the cable.



VR1 removed and re-installed in the reverse direction. Anode is now UP.
R18 34.8K unsoldered from the lower ground pad and rotated up 180 degrees and soldered to what is now the anode side of VR1.

#3 Split Gears

The differential gears on the FM deviation and band-switch assembly of my generator were in good shape. Surprisingly, the gears on the cavity tuning were split. These gears drive two pots, one controls the FM deviation gain and the other controls the switching of the output bandpass filters. I was able to glue these gears but I decided to also reinforce them with tie-wraps. My reasoning is that the plastic material is under tension and will eventually split as we see many of the gears do split. If something can be wrapped tightly around the outside of the gears and perhaps reduce the tension or even keep the material in compression, they will be less likely to split. The tie wraps don't work that well. One problem is that the locking mechanism is a bit large and just barely clears the mounting ears. I hope someone will read this and come up with a better solution. Something like a snap ring or something that can be slipped tightly over the gear and will provide a compressive force to the body of the gear.



16. -5.2V Supply - No RF - Counter, January 2009: Johan, KC7WW
Johan described solutions to several problems he inherited after he purchased a HP8640B.

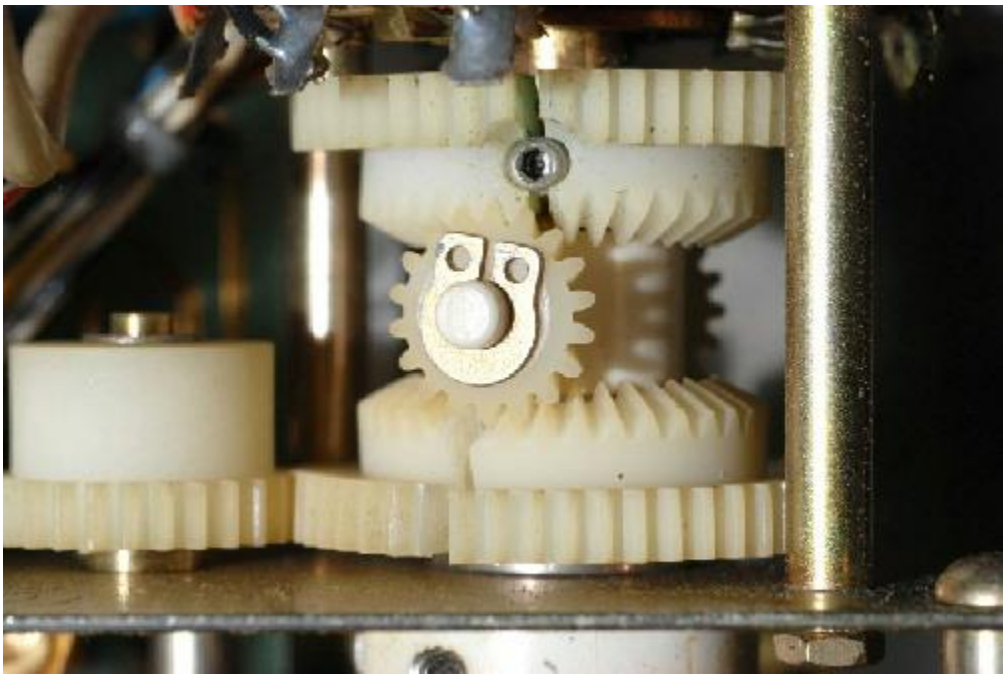
- KC7WW's Web site for his HP8640B restoration.

17. Frequency Tuning Gears, January 2009. Markus VE7CA,

Recently I noticed that when turning the main frequency tuning dial I reached a point where I began to feel resistance and if I continued to turn the dial further I heard a loud click. This did not sound good so I

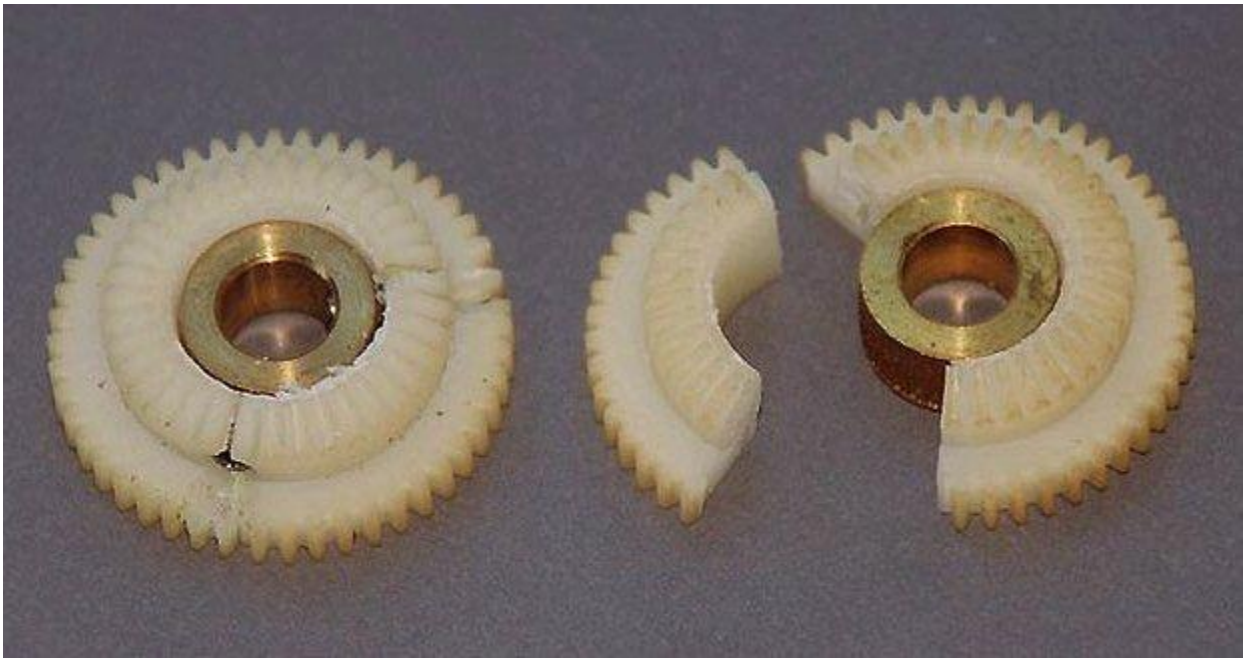
decided to investigate. After removing the bottom cover from the HP8640B, the first thing I noticed was that some of the range assembly gears were cracked.

Fig 5. Split Gears in my HP8640B Combination Gear Assembly



Following the directions on Page 7-71 of the manual I removed the Switch Assembly. Don't forget to take lots of pictures so that you can refer to them again when putting everything back together. You need two different sized allen wrenches, a 1/16" (inch) and a 0.050" to remove the knobs. I found that the set screws in the knobs were very tight and my cheap set of allen wrenches stripped so I had to purchase a high quality set. Referring to page 7-70 in the HP8640B manual, gear numbers 13 and 14 were the two effected gears. Do not remove the two small gears (which mesh with gear #13 and #14) from shaft numbered #12. When you take the front gear off, remove the whole shaft (#12) by gently pulling it out. Remember these gears are very old and there are no replacements readily available. You can then remove the rear gear #14.

The gears have cracked apart at the weakest point where the set screws go through to the brass centre hub. The gears have shrunk for some reason so they can not simply be glued back together because the brass centre didn't scrink along with the delrin gears.
Fig 6. Here my delrin gears after dis-assembly



Using a file I carefully filed the centre of the delrin gears so that when replaced over the centre brass hub, the two pieces met. Leave enough room for the glue and the delrin gears centre rough so that the glue has something to adhere too. I strongly advise taking your time so you get it right the first time! It is also necessary to enlarge the hole around the set screw with a small file. This is really important. If you don't make the wholes large enough, when you try to put the set screw back in, the set screw will pry the delrin gear apart again! Check it once and once again before gluing.

I was not able to find any 24 hour epoxy however I did find 5 hours expoxy. In order to hold the gears together while the glue sets I used a hose clamp. Be very careful that you don't tighten the camp too much or you may crush the teeth! Make sure there is no glue between the teeth and the gear is flush with the brass hub.

Fig 7. Hose clamp holding gear together while glue sets

I recommend that you leave the gears in the clamp for 24 hours before removing them.

Now all you have to do is re-assemble the gear assembly following the directions in the manual. Hopefully you have taken notes and photographs in case you forgot some important detail!

17.(B) Fixing the snapping sound. On the left side of the main oscillator cavity there are two pots (VT and FM Gain Compensation pots) with gears attached that turn in conjunction with the main tuning dial. Being I had a probem with the gears binding I removed the oscillator cavity to investigate and saw that the lower pot gear was split. Mark WB2WHC, in Hints and Kinks #16, notes that he had a similar problem. The snapping sound I heard occured when the gear driving the two pots tried to jump over the gap in the gear that had split apart. After glueing the split gear together I re-assembled the gears and as Mark suggested, set the two pot gears so they didn't mesh with the centre gear at the set screw positions. You can do this because these pots do not turn a full 360 degrees. I also re-set the Cavity oscillator "end stop postion" as per the instruction on page 5-36 and 5-37, making sure that the VT and FM Gain Compensation pots did not reach their stops first.

Since I had all the knobs off, I did a thorough cleaning of the knobs and front panel. After re-assembling everything and setting the knobs to their correct position I was happy that the Main Cavity Tuning Knob turned without binding and the frequency display corresponded to the Range Switch setting. I let the generator warm for 2 hours and then following the instructions in Hints and Kinks #8 I calibrated the frequency read out. (See page 5-35 in the manual for further details.)

18. HP8640 High Speed Divider, April 2009: Nevel N2GX
Nevel kindly shared his solution to repairing his HP8640 High Speed Divider Circuits. This is a very creative solution describing how Nevel subsituted presently available IC's for original HP parts which are no longer available. Click to view a PDF file of Nevel's article in PDF.

19. Lesson from Jeff King, ZL4AI, Learning something the hard way. September 16, 2009

With my last HP8640B, I undertook the careful file out and epoxy gluing of one of the Delrin gears. I clamped the parts together with a spring type clamp. In a hurry, wanting to speed up the gluing process, I decided to heat up the gear. I figured about one minute in the microwave would not be too much. BIG MISTAKE. Basically the gear melted! The Delrin material melts at very low temperatures. Jeff ZL4AI

20. My (opt 002) had a dead output amp., 4 May, 2013 John Antone, VK3ZAF

My unit (opt 002) had a dead output amp but luckily I found a replacement part on Ebay (1st May 2013) the vendor has a few of these and they work fine, search under HP Agilent 08640-67025. They are not the specified amp as the handbook calls up 8640-67002 but they have the same specs except they need Vcc of +23V and +44V I chose a 90 resistor so that it would run on 30V. Info attached is what I did and the outcome.

Installed in sub assembly A26A1 is the 08640-67025. Please note that this amplifier has Vcc of +23v to +44v MAX, therefore it cannot be just plugged in or the 44.6V supply will zap it!. At the back of sub assembly A26, is where feed thru capacitors provide power to the components, the output amplifier and the pre-amplifier, the original output amplifier 08640-67002 is powered by 44.6V fed from the rightmost feed thru. Unsolder this connection and insert a 90 ohm 3 Watt resistor into the circuit. I chose two 47 ohm resistors connected in series mounted on a bracket (all components found in my junk box) I'm sure a much more elegant solution could be effected! This powers the Amplifier (0840-67025) with about 30 volts. When removing the old amp and installing the new one pay attention to anti static installation techniques.

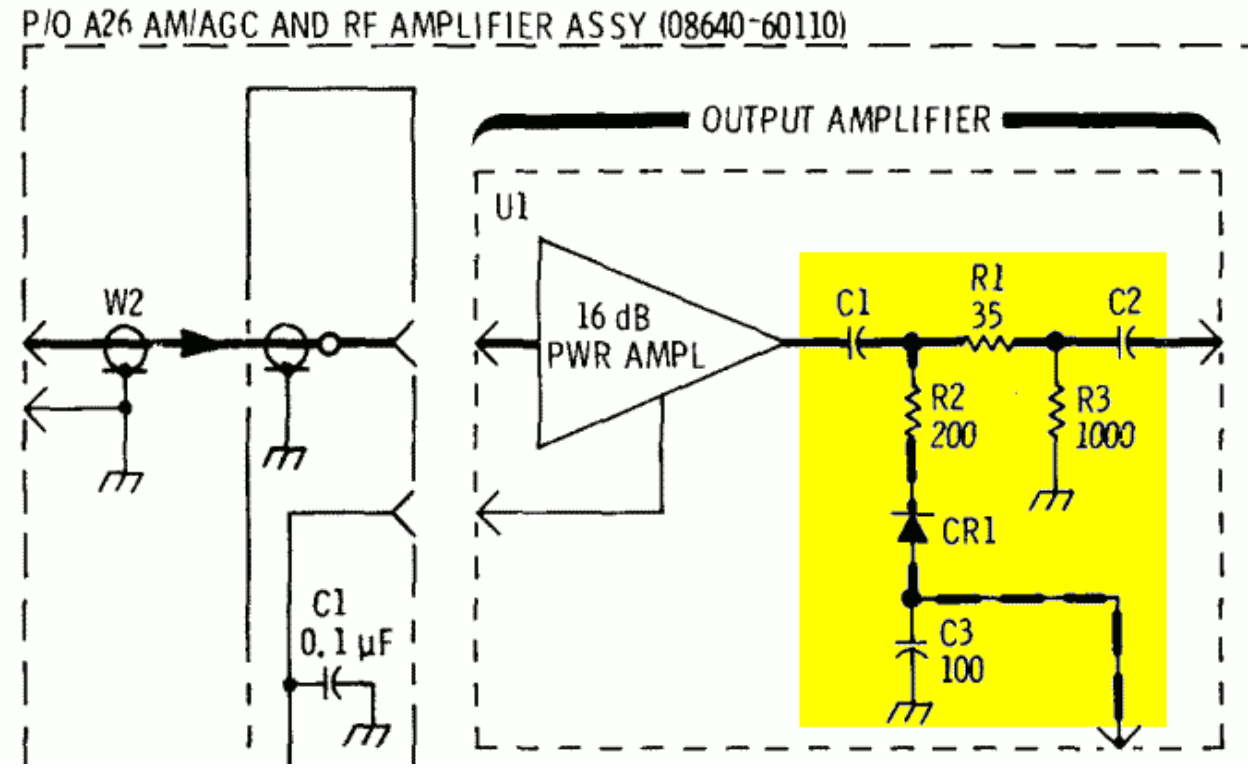
After, I tested all frequencies, Flatness 512Mhz to 1024 Mhz about 0.2 db except at mid band where it rises to about 0.5 db over a range of about 50 Mhhz. Lower bands is about 0.2-0.3 db. Phase noise and FM and AM modulation unaffected. Measurements made with 8553B and 8555A. The 08640-67025 could be used to replace output amplifier on standard version of the 8640A or B. Cheers VK3ZAF, jantonel @ bigpond.net.au

If you have any solutions for problems you have encountered for the HP8640 series signal generators, please let us know at: ve7ca@rac.ca

From: http://hacem.org/hp-8640b.html

In the summer of 2005, I purchased an almost mint condition HP-8640B signal generator on E-bay. Unfortunately, the RF final amplifier was defective, and finding a replacement is almost impossible these days. I found this most excellent website which provided a little more insight into how to go about repairing this section of the signal generator.

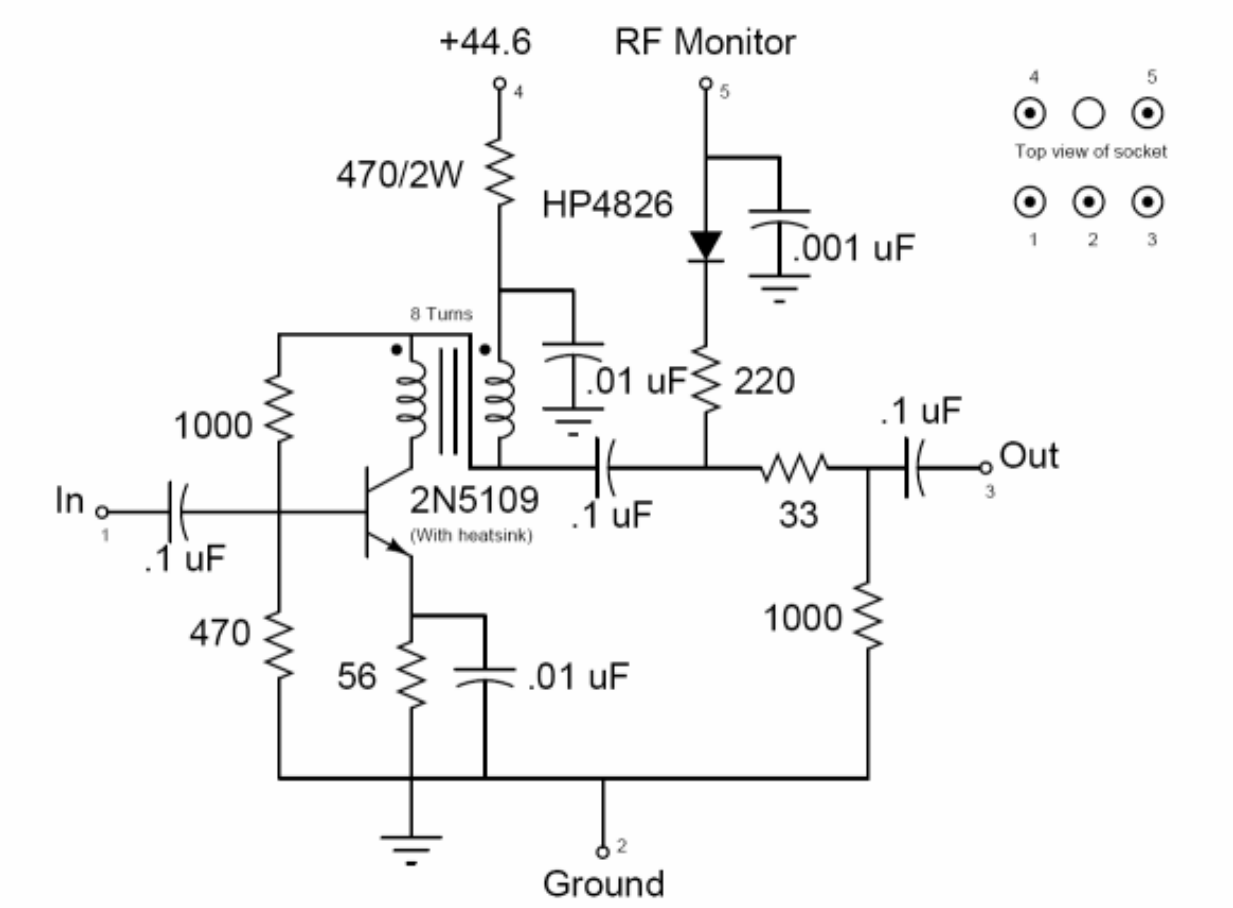
Apparently, my version (Option 1) uses a bias voltage from the hybrid amplifier to control the output signal level, where the above link was designed for the avionics version (Option 4), which does not. I could see on the schematic, (provided by one of the best sites around for older equipment manuals), that the hybrid contained a small RF detector circuit.



Discrete Amplifier

After many attempts using various MMICs from Sirenza, I was ready to throw in the towel. The MMICs worked fairly well, as long as the output load was 50 ohms. But when adjusting the output step attenuator, it appears that the SWR rises during the switching process, instantly blowing out the miniscule amplifier. After destroying about a half-dozen of these pinhead sized devices, I decided to try going with a heftier amplifier using discrete components.

The circuit is a standard broad band amplifier with an added RF detector. The 4:1 transformer was created with 8 turns of wire wound on a 3/8" toroid. I am not sure about the properties of the core material, as it was salvaged from some surplus microwave equipment. The amplifier seems to provide a good signal up to about 300 MHz with this transformer, but I can still get a usable signal up to 512 MHz.



HP-8640B Replacement Amplifier