



2017 Dayton Hamvention Drake Forum





- **Drake Forum Committee**
- **Mark Gilger – WB0IQK**
- **Ron Baker – WB4HFN**
- **Jeff Covelli – WA8SAJ**
- **Evan Rolek – K9SQG**



Agenda

User Survey

Recurring Technical Net Questions

Back to Basic Trouble Shooting

Common & Easy Fixes For the Drake 4&7 Line Radios

Question & Answer Session



Drake Forum

Request for information...

- Suggestions for future Forum subjects.
- Future Forum presenters needed.
- Send information to **WB0IQK@ARRL.NET**



Drake Trivia

**The first Drake Dayton Forum
was held in what year?**

1998

- **Started by: W8NS (Ex: WZ8O), Don Spillman
& WA4SDE, Danny Shrader**
- **Number of years: 19**



Drake Trivia

- What year was the Drake & Antique Tube Net started on 3.865mhz?
- It was started in 1994 by Danny Scrader, WA4SDE and Jeff Weinberg, W8CQ.
(23 years)



Drake Trivia

- The 40 meter Drake Technical Net was started in what year?
- John Loughmiller, KB9AT and Jeff Covelli, WA8SAJ started it in 1999.
(18 years)



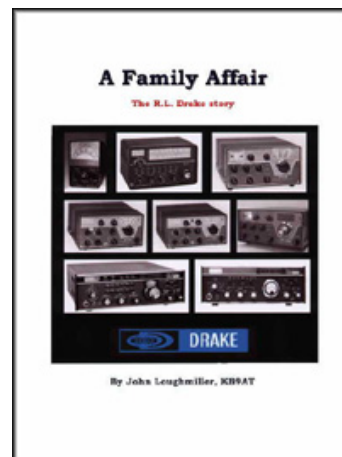
Resources

Drake Technical Net: Sunday, 7238 kc @ 4:00 PM Eastern

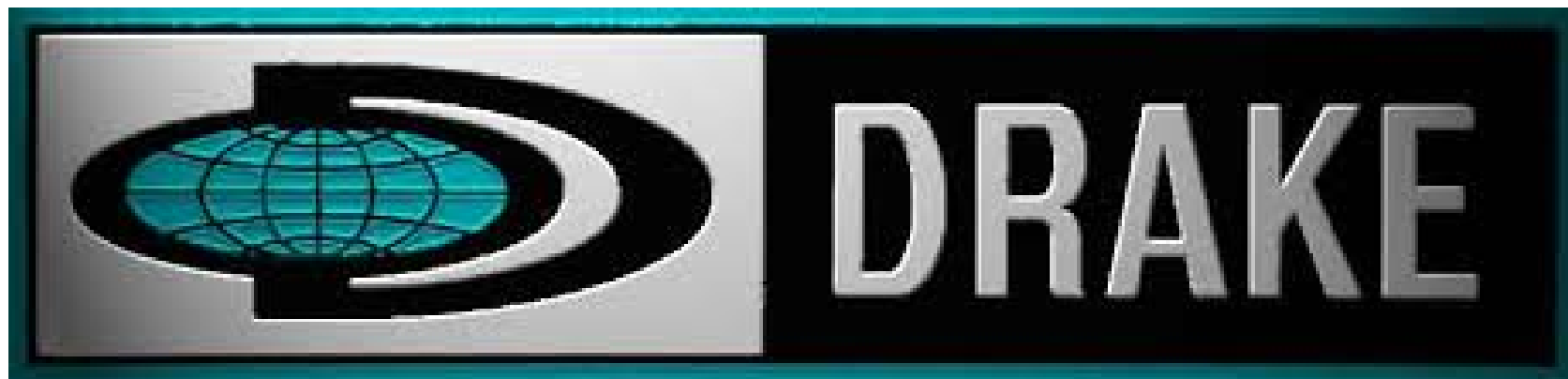
Drake & Antique Tube Gear Net: Tue. 3865 +/- kc @ 8 pm Eastern

Drake West Coast Net : Thur. 3895 +/- QRM @ 8pm Pacific Time

Drake Family Affair Book by John Loughmiller, KB9AT
Available @ Universal Radio



DRAKE





Technical Net Recurring Questions

- Where can I get tubes?
- What Mic. Works good with the 4 line?
- Should a fan be added?
- Can I replace the #47 lamps with LED's?
- What can I do about hum in my transmit signal?
- Should I replace the caps in my L4/L7?
- What's the difference between L4 & L4B?
- Receive signal strength low.
- TR-7 Digital Display is intermittent or dead.
- Can L4/ L7 be keyed from solid state radio?



TUBES

- Where can I get Tubes:
- ESRC Vacuum Tubes:
 - <http://www.esrcvacuumtubes.com/index.html>
- VacuumTubes.net:
 - <http://www.vacuumtubes.net/>
- Nebraska Surplus Sales
 - <http://www.surplussales.com/index.html>
- RF Parts Company:
 - <https://www.rfparts.com/>






www.wb4hfn.com

- **TUBES:**
- **ESRC Vacuum Tubes**, 6424 Pinecastle Blvd. Suite B, Orlando, FL 32809 Phone: 407-826-5808, Email: CustomerService@ESRCVacuumTubes.com Web: <http://esrcvacuumtubes.com/>
- **VacuumTubes.net**, 20323 North Hwy 121, PO Box 433, La Crosse, FL 32658 Phone: 800-326-4140, Email: sales@vacuumtubes.net, Web: <http://vacuumtubes.net>
- **W9TEW Tube Sales**, Bob Bieker, 9528 Farmer Dr., Highland, IN 46322 Phone: 219-924-0945, Email: www.hamtubes.com ,
- **John Walker JR.**, 13406 W. 128TH Terr., Overland Park, KS. 66213, PH: 913-782-6455 (Home Evenings) PH: 913-568-7057 (Cell), Email: JWALKER83@KC.RR.COM
- **TTC The Tube Center**, Orlando, FL 32809 Phone: 407-826-9172, Email: customerservice@thetubecenter.com Web: <http://www.thetubecenter.com/index.html>
- **Radio Electric Supply**, 3500 N.W. 97th BLVD. Suite R, Gainesville, FL 32606, Phone: 352-332-8881, Email: tubes@mindspring.com Web: <http://www.vacuumtubes.net/>
- **Vacuum Tubes, Inc.**, Phone: (407)481-9994 Web: <http://www.vacuumtubesinc.com/> email, jim@vacuumtubesinc.com
- **SND Tube Sales**, Phone 636-939-9190, Fax 636-922-0601, E-mail: sndtubes@vacuumtubes.com Web: <http://www.vacuumtubes.com/>
- **The Tubestore.com**, Phone: 1-877-570-0979, Web: <http://www.thetubestore.com/thetubestore/index.html>
- **Antique electronic supply**, Phone 800-706-6789, E-mail: info@tubesandmore.com, Web: <http://www.tubesandmore.com>
- **VACUUMTUBES.BIZ**, KE7NTD – Roger Gould - Washington 16953 Tyee Drive, Entiat, WA 98822 Web: <http://www.vacuumtubes.biz/index.html>
- **RF Parts** – San Marcos, California, Email: Terry@rfparts.com , 435 South Pacific Street, San Marcos, California 92078, Phone: (800) 737-2787, 760 – 744-0700 Web: <http://www.rfparts.com/?gclid=CJPr0Jf04cECFYdzMgod9woAgg>
- **Nationwide Radio & Eq. Sales LLC**, Email: ke9pq@new.rr.com Phone: (920) 434-8097 Web: <http://www.ke9pq.com>



Technical Net Recurring Questions

Which is the best Microphone to use with the 4 line radios?

- Astatic D-104 no pre-amp, but a pre-amp can be bypassed & left installed
- Astatic 10D
- Shure-444
- Shure-522, lower drive than a 444 ( from Amazon)
- Shure-450, (New from Amazon)
- Shure-444D dual impedance.
- Turner 454C Ceramic, adding a 100K to 150K in series will up the base response.
- Turner 454X Crystal, adding a 100K to 150K in series will up the base response.
- Turner 254C

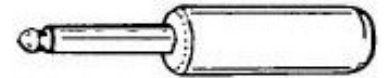


Technical Net Recurring Questions

- **Where can I obtain the .210 inch stereo microphone plug?**

MICROPHONE PLUGS, .206 INCH, STRAIT: (Switchcraft S-260)

- **Mouser Electronics**, Phone 800-346-6873, E-mail: SALES@MOUSER.COM, Part Number: 502-S260, Web: <http://www.mouser.com/>



MICROPHONE PLUGS, .206 INCH, RIGHT ANGLE: (Switchcraft S-230)

- **Newark InOne**, 4801 N. Ravenswood, Chicago, Illinois 60640, Phone: 773-784-5100, Part Number: 98F7746. Web: <http://www.newark.com/>
- **ONLINECOMPONENT.COM**, Part Number: S230, <http://www.onlinecomponents.com>
- **Mouser Electronics**, Phone 800-346-6873, E-mail: SALES@MOUSER.COM, Part Number: 502-S230, Web: <http://www.mouser.com/>
- **Nationwide Radio & Eq. Sales LLC**, Mark Olson "President", 1490 Norfield Rd, Suamico, Wi. 54173, Email: ke9pq@new.rr.com Phone: (920) 434-8097 Web: <http://www.ke9pq.com>

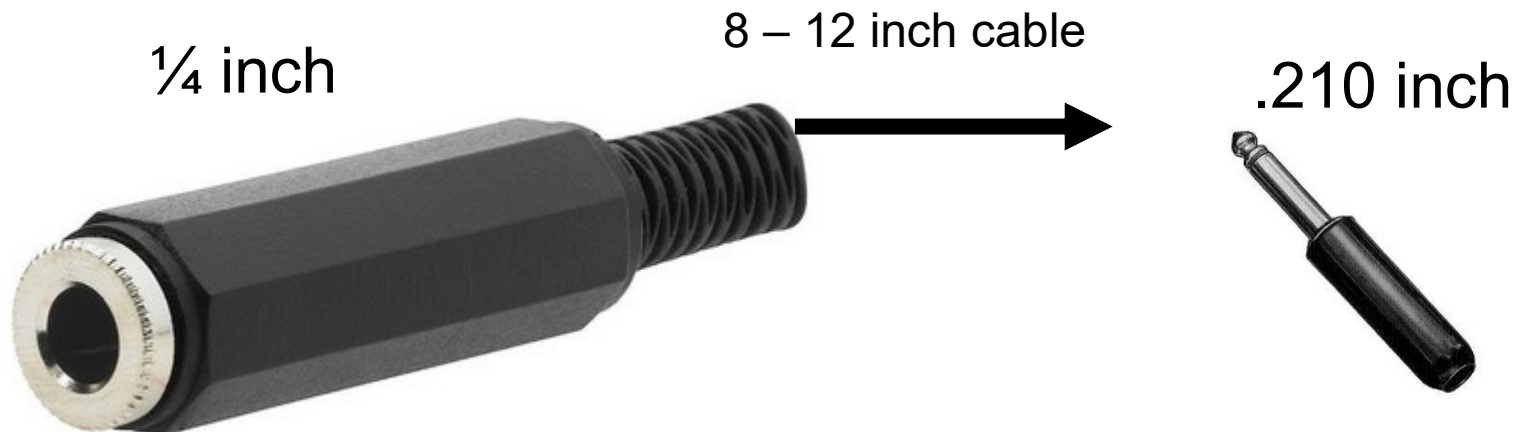


- **Radio mic interface cable to 1/4 inch stereo plug.**



Technical Net Recurring Questions

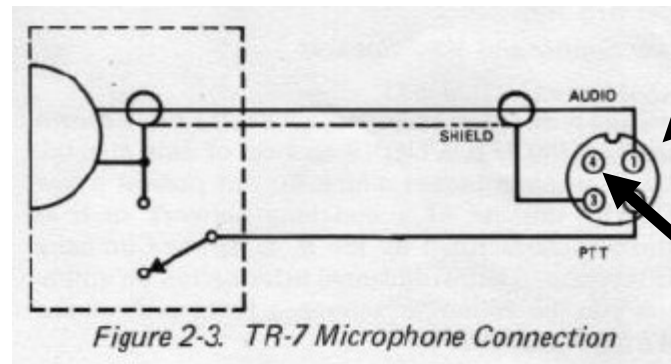
Radio .210 inch mic interface cable to 1/4 inch female stereo plug.





Technical Net Recurring Questions

- Which pin do I wire my low impedance mic into on the TR7?
 - Low Impedance Mic wired to Pin 1



- High Impedance Mic wired to Pin 4



Technical Net Recurring Questions

- Should I add a fan to my 4 line transmitters.
 - Definitely YES
- Should the fan be blowing in or out?
 - Pulling air out is preferred method.....



Technical Net Recurring Questions

LED Lamp Upgrade

We don't recommend using LED lamps, but if you going to use LED's to replace the #47 bulbs, use a small .25 amp Pico fuse in series with each bulb.

Mouser stocks a wide variety of these fuses.



Technical Net Recurring Questions

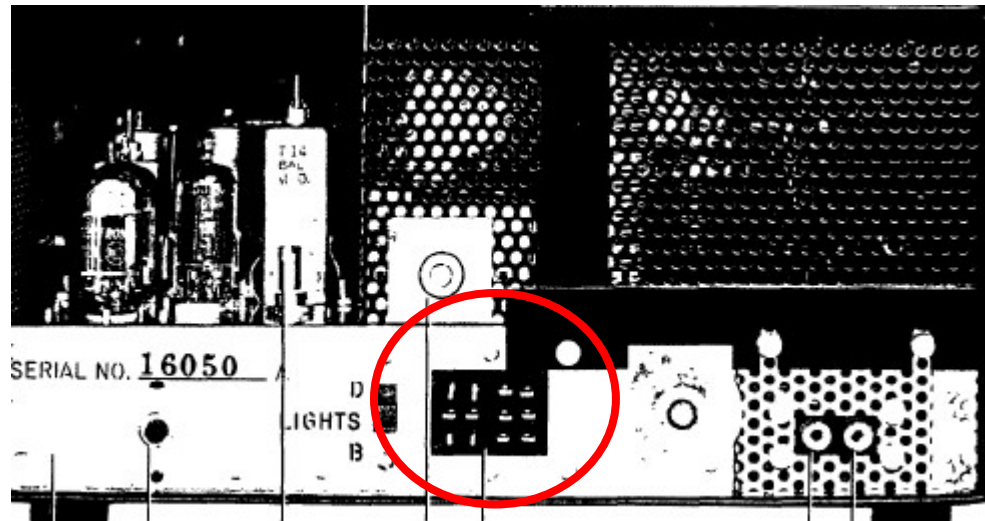
- TR4 Hum
 - Rebuild the AC4 supply.





Technical Net Recurring Questions

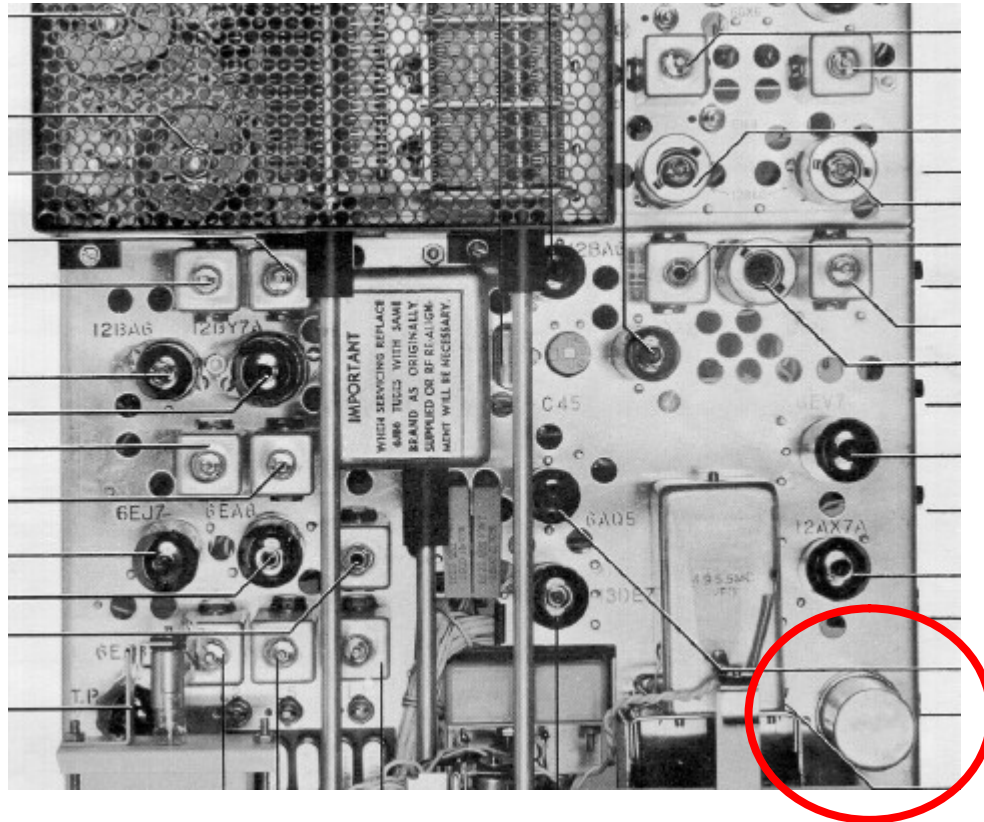
- TR4 Hum
 - Rebuild the AC4 supply.
 - Apply DeOxit to Jones plug





Technical Net Recurring Questions

- TR4 Hum
 - Replace C145





Technical Net Recurring Questions

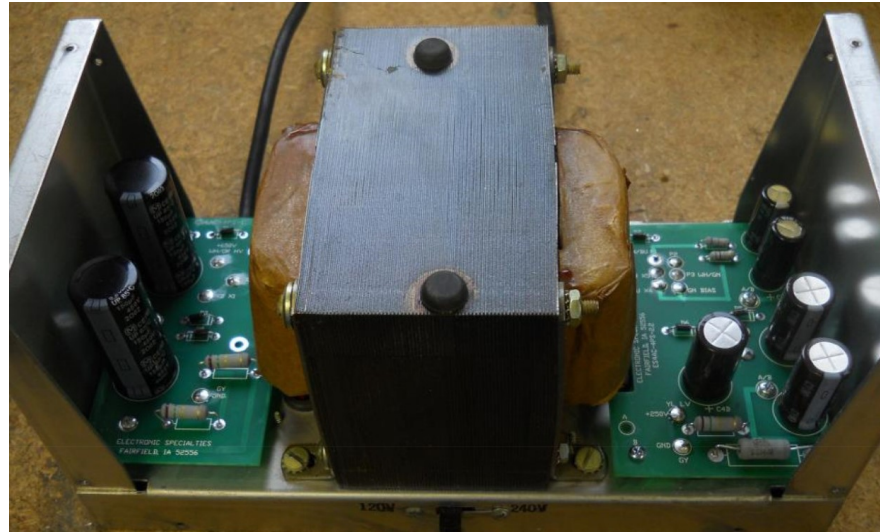
- AC4 upgrades. Which is best?
 - AC4R Kit – Sold by TheHeathkitShop.com
 - ES4AC-4 – Sold by Harbach Electronics
 - Hayseed Hamfest Capacitors

AC4R – The Heathkit Shop



<https://theheathkitshop.com>

ES4AC-4 – Electronic Specialties –
Sold by Harbach Electronics



<http://harbachelectronics.com/>



Technical Net Recurring Questions

- Hayseed Hamfest – AC4 & AC3 capacitor replacement sets.





Technical Net Recurring Questions

- L4B/L7 upgrades. Which is best?
 - L4R - Sold by TheHeathkitShop.com
 - PM-400 – Sold by Harbach Electronics

L4R - The Heathkit Shop



<https://theheathkitshop.com>

PM-400 – Electronic Specialties –
Sold by Harbach Electronics



<http://harbachelectronics.com/>



What are the differences between the L4 and L4B?

L4 vs L4B

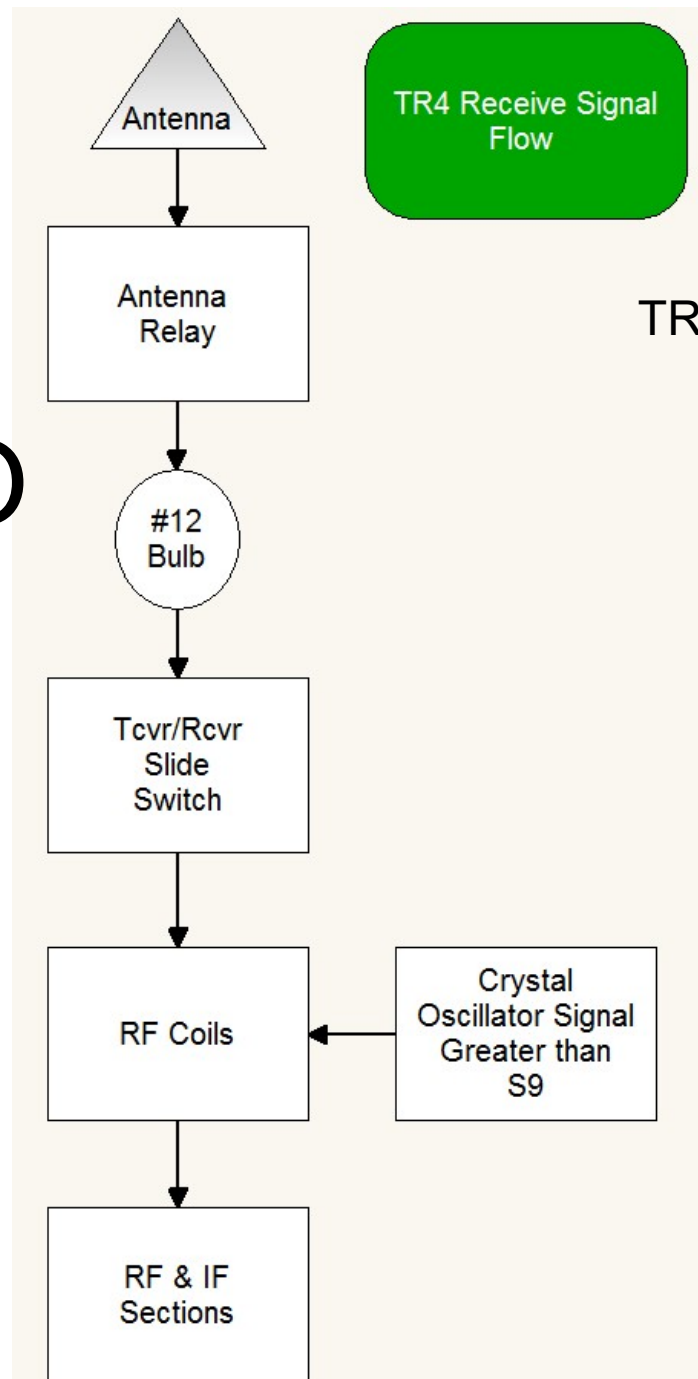
How They Differ

Evan Rolek, K9SQG

		Linear Amplifier	
Parameter		L4	L4B
RF deck size		13-15/16 W, 7-7/8 H, 14-5/16	
RF Deck Weight		32 lbs	
Tubes (Eimac specs)	Type	3-400Z/ 8163	3-500Z
	Height	5.5" max	6.1 " max
	Diameter	3.562" max	3.44" max
	Plate dissipation	400 wts max	500 wts max
	Grid current per mode	100-163 ma	108-170 ma
	Plate current	400 ma	
Chimneys	Style	Curved Top	Straight edges
	Eimac No.	SK-416	SK-406
PTT Connector		2 pin	
ALC Pot		Rear panel	Front panel
Stby Switch		None	On ALC pot
PS Diodes		600 PIV 1 A	600 PIV 1.5 A or 3 A
PS bleeders and ALC string		2-200K in parallel	2-50K in series
PS Weight		43 lbs	
PS Size		6-3/4 x 7-7/8 x 11	



BACK TO BASICS

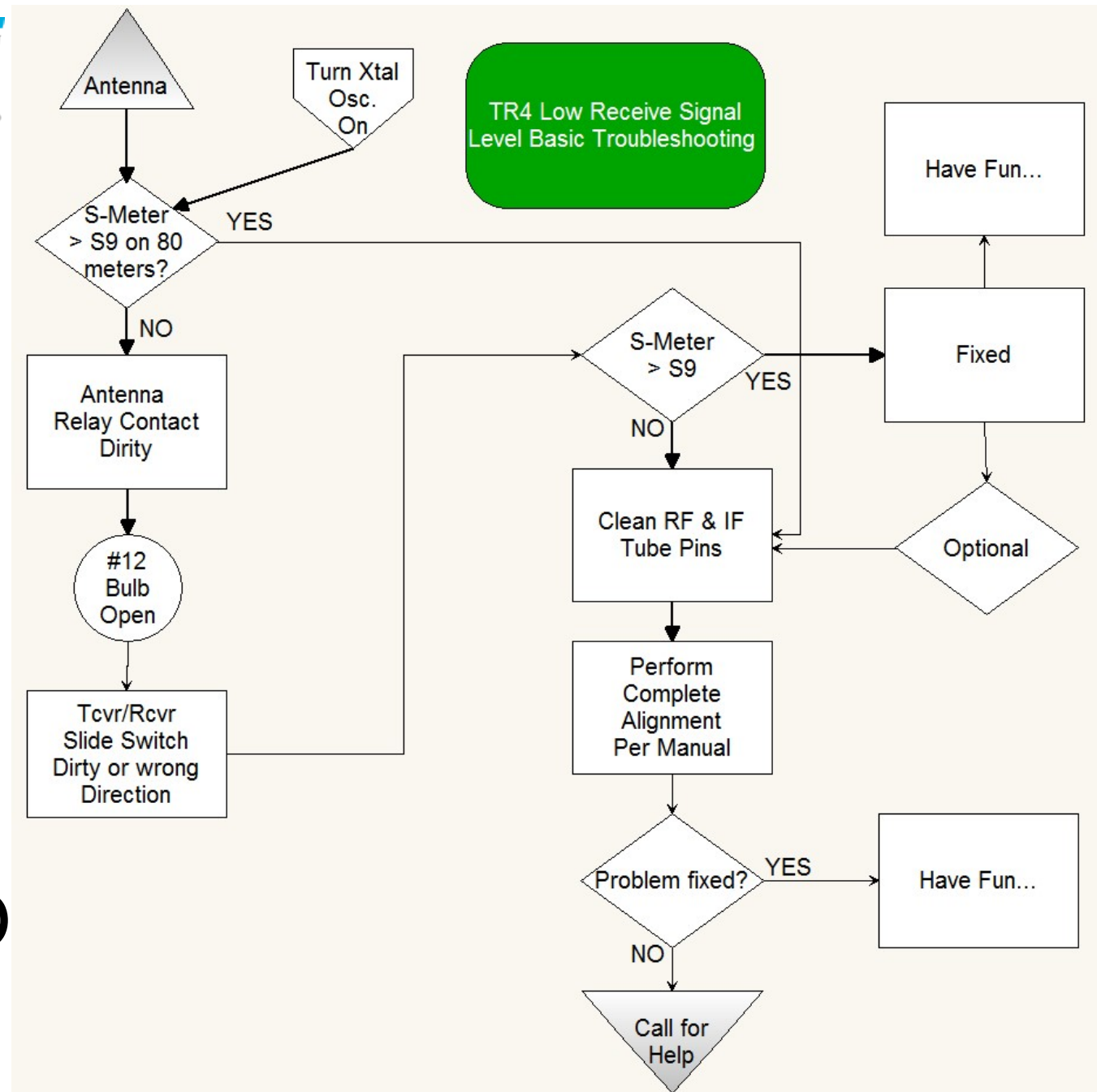


TR4 Receive Signal Flow

TR4/TR4C RECEIVER
SIGNAL FLOW



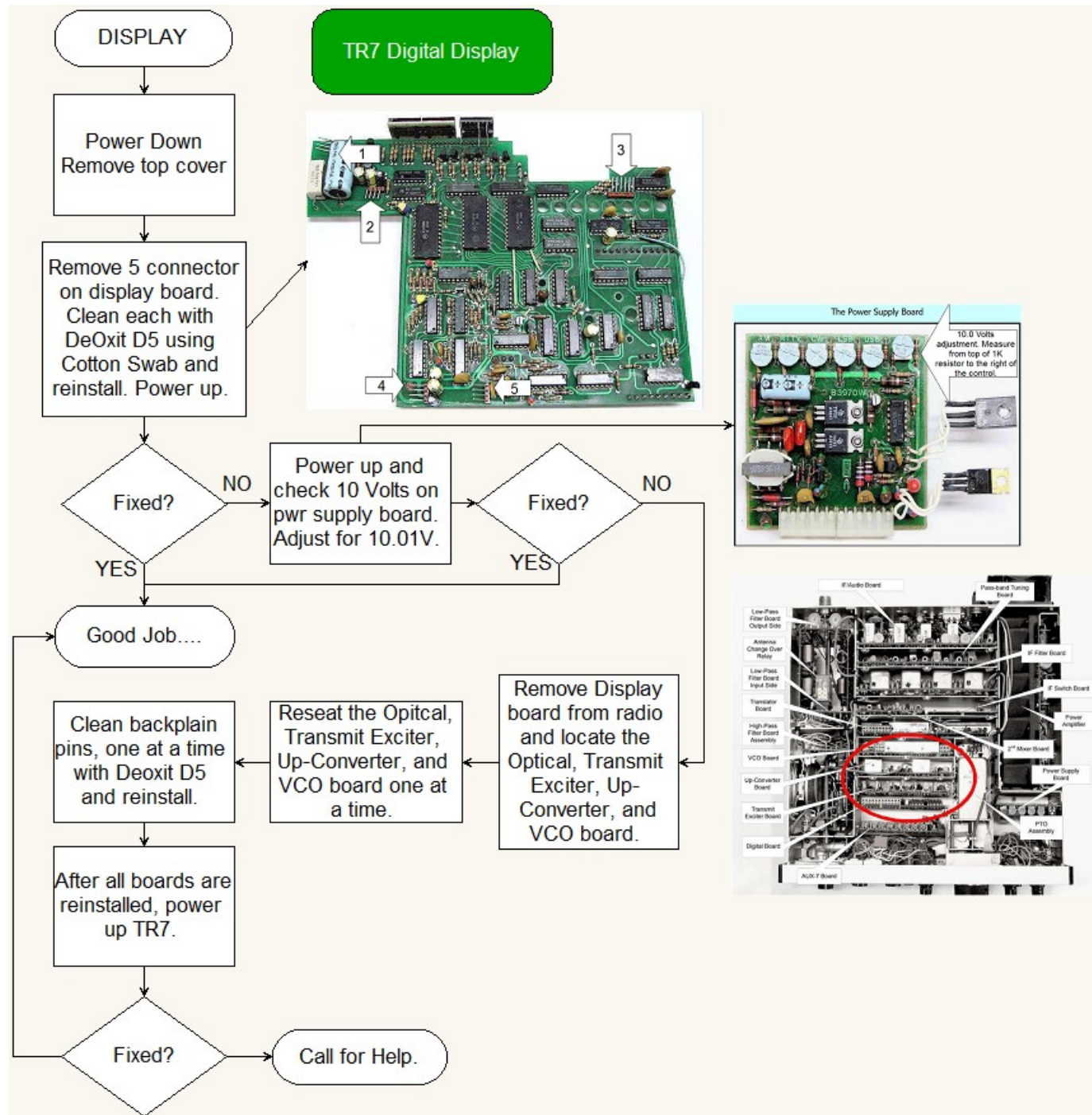
BACK TO BASICS





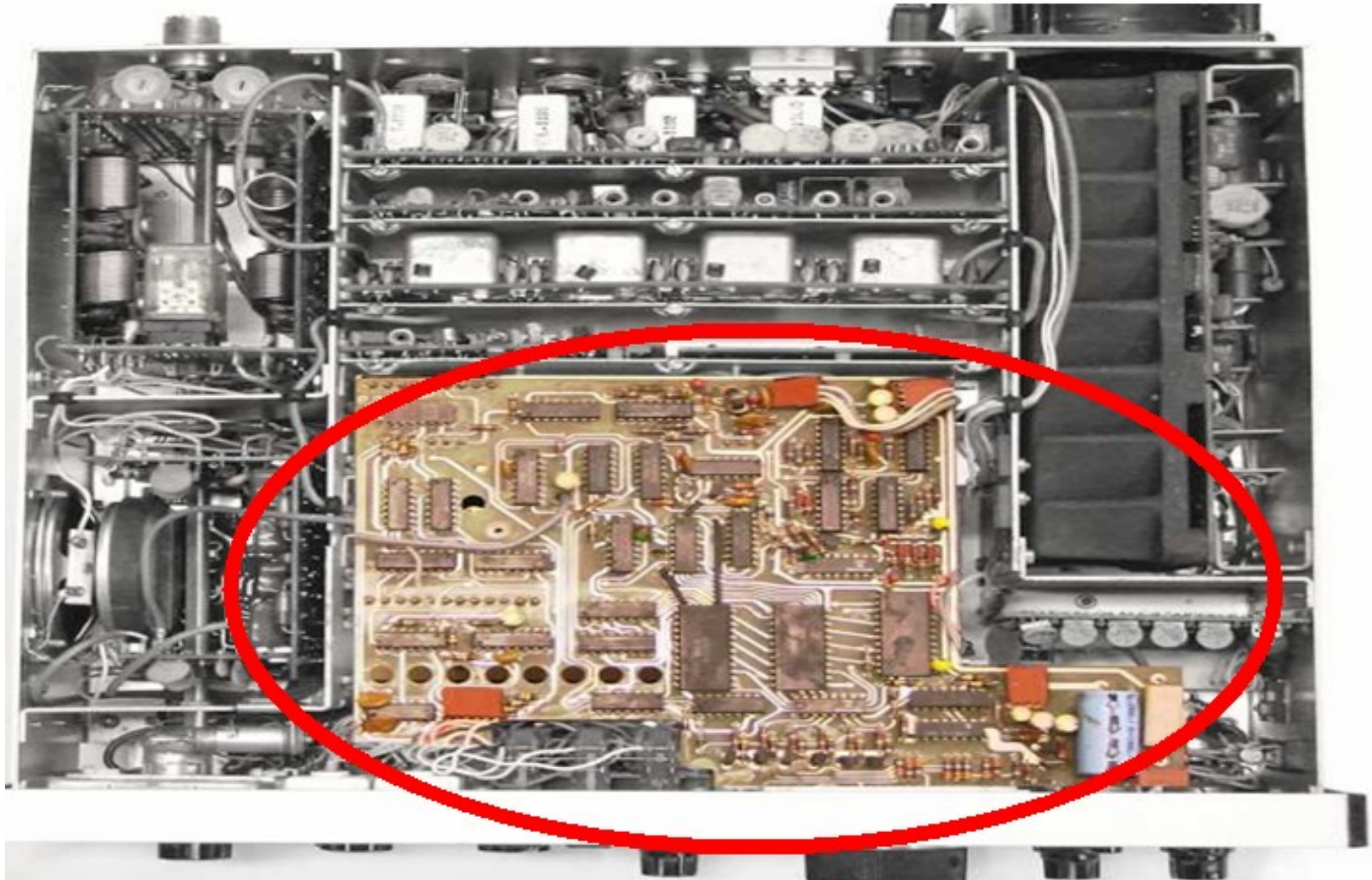
Back to Basics

TR7 DIGITAL DISPLAY PROBLEM



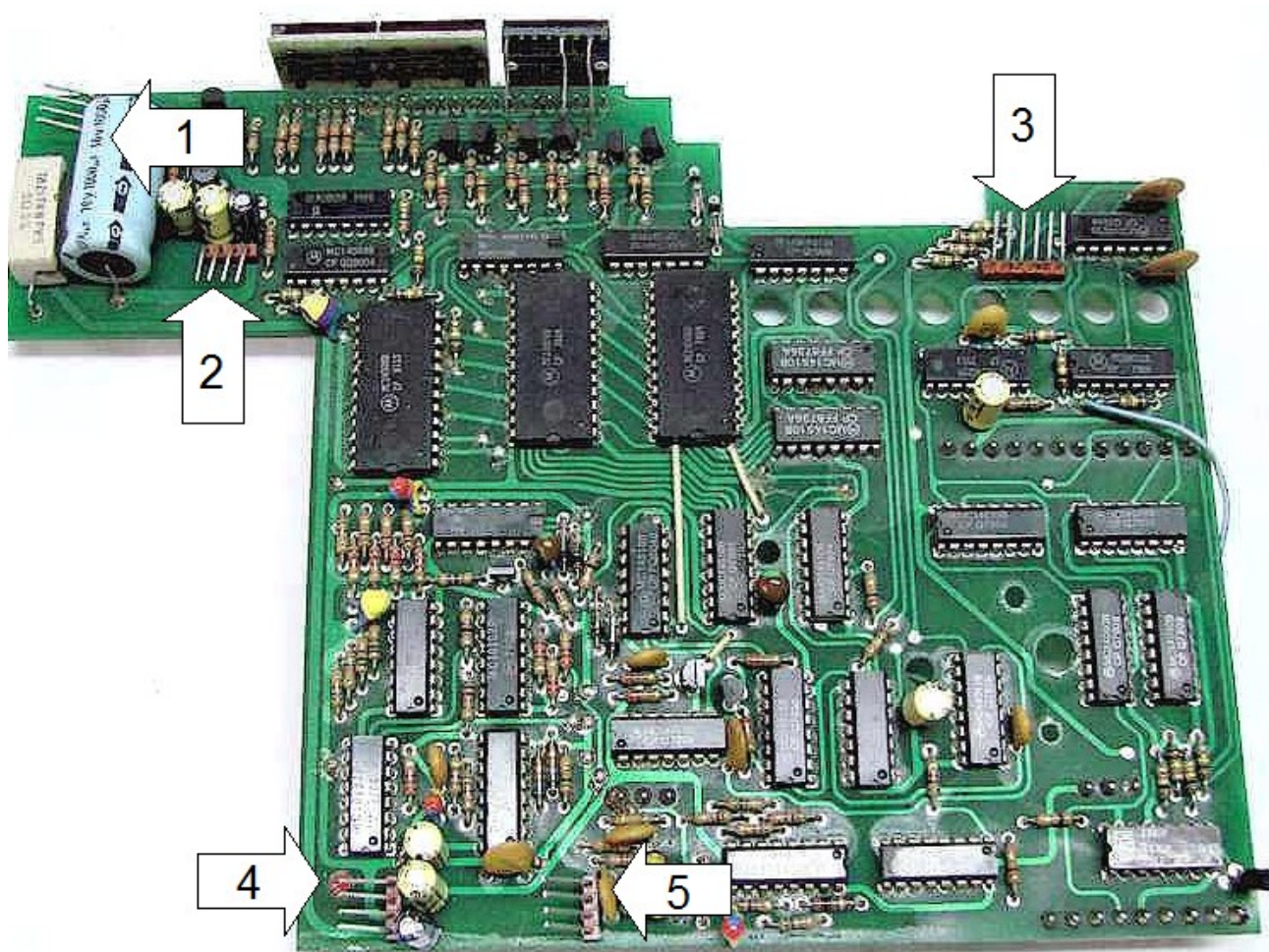


Digital Display Board



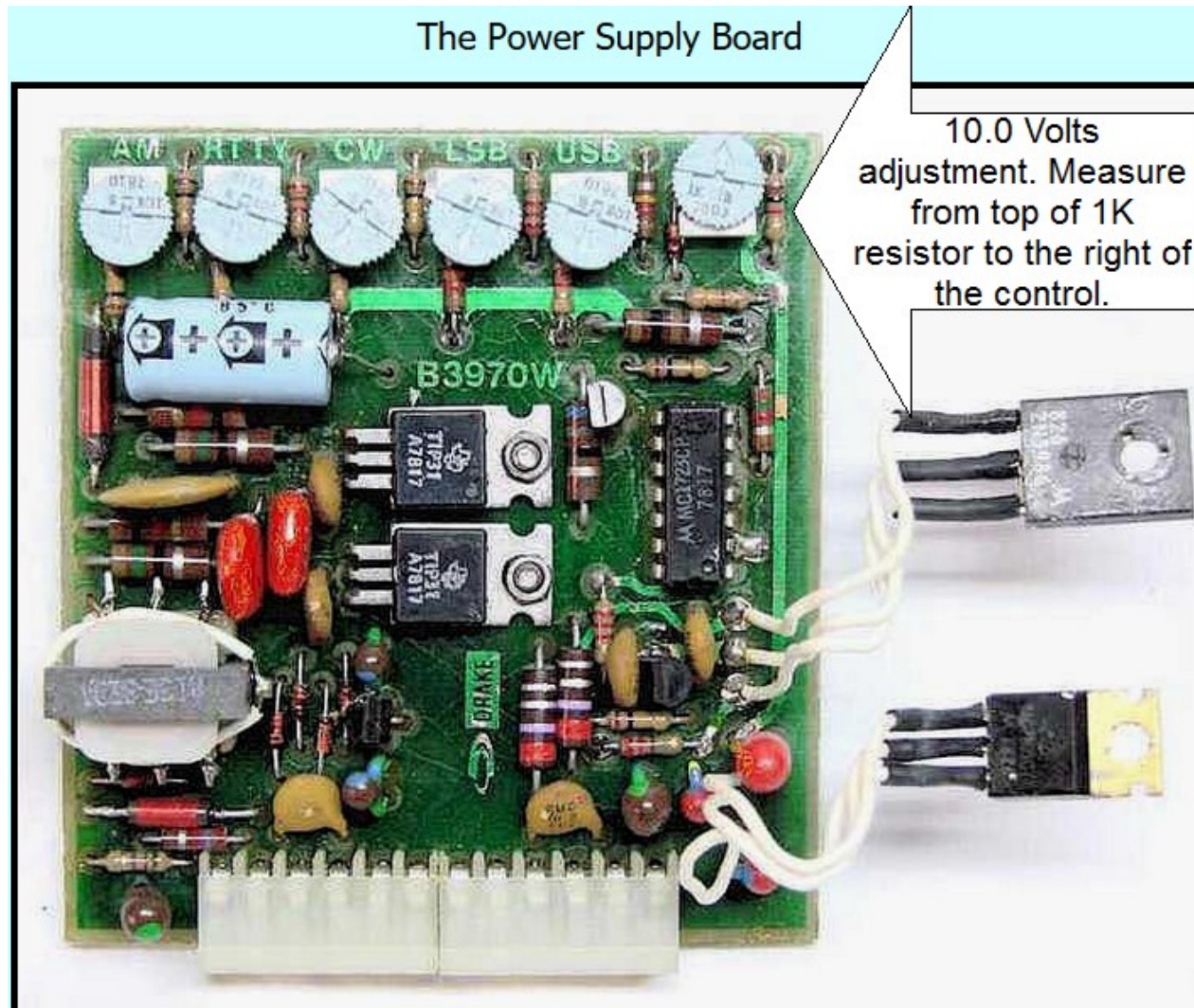


- **TR-7 DISPLAY PROBLEMS:**
 - Clean board connectors



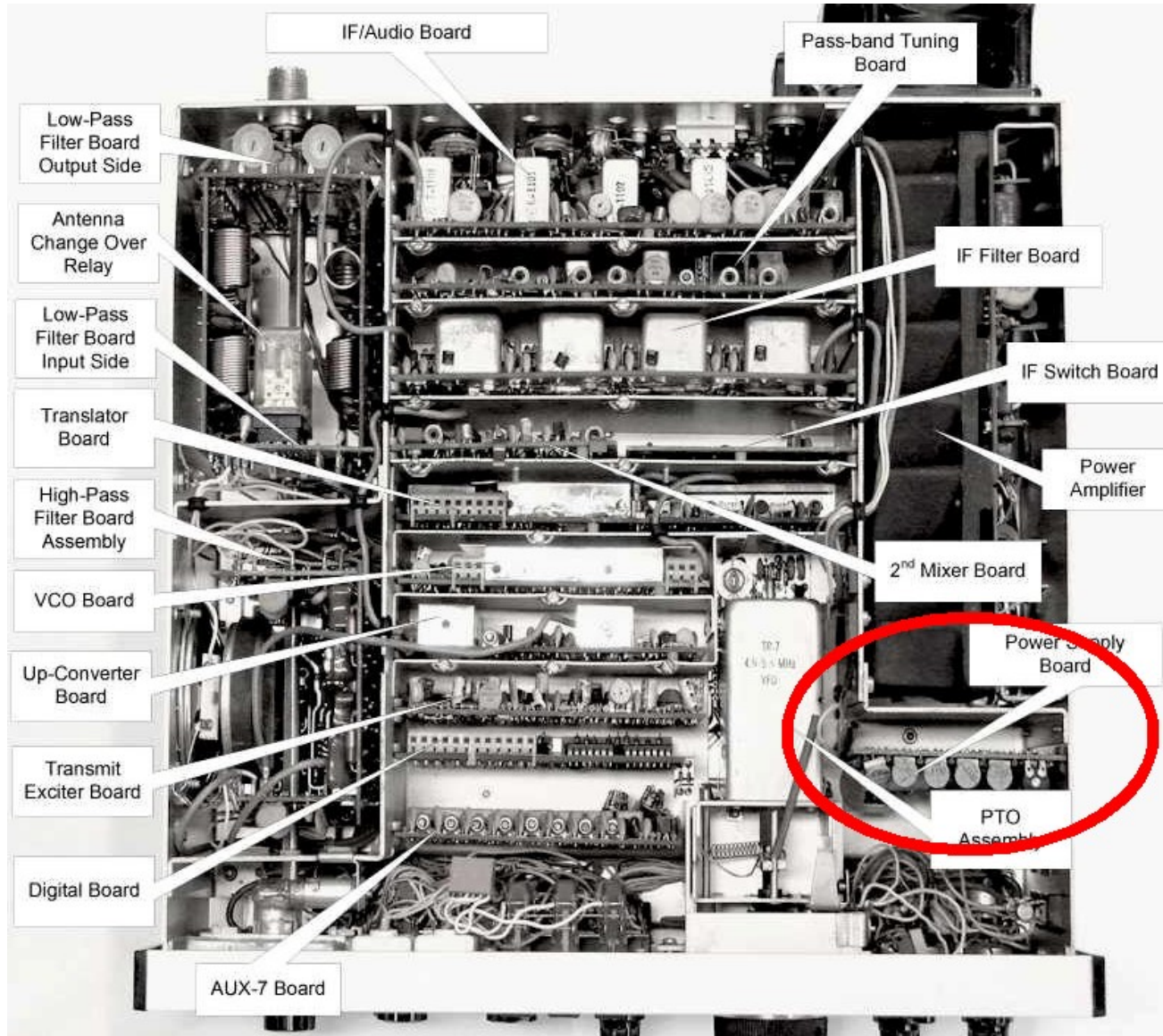


- Adjust 10.0 volts as needed.





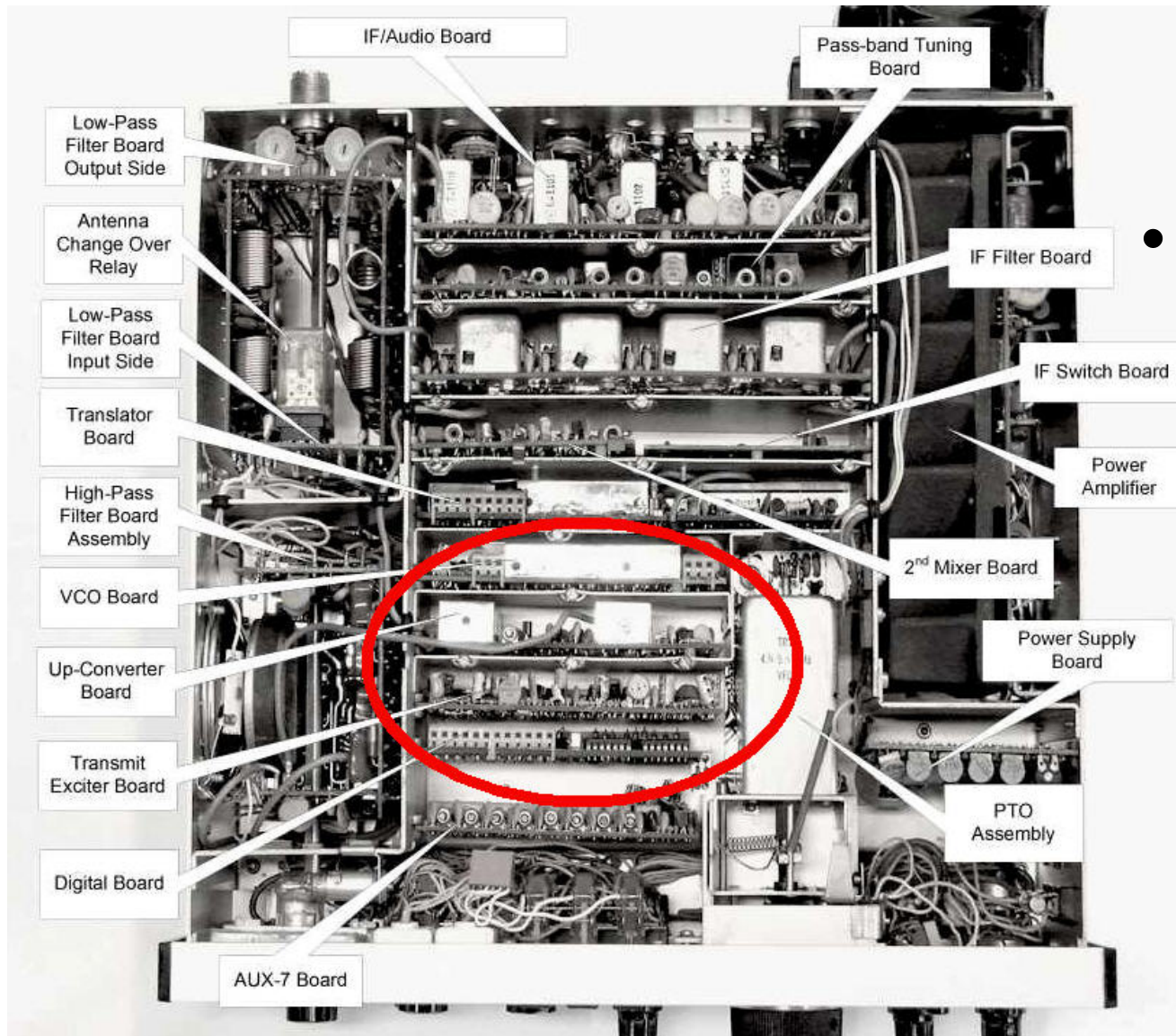
POWER SUPPLY BOARD



Power
Supply
Board



BOARDS NEEDING TO BE RESEATED



Re-seat:

- 1. Digital board
- 2. Transmit Exciter board
- 3. Up-Converter board
- 4. VCO board



Can my L4/L7 be keyed from a new Solid State radio?

- Maybe, but it's best to use a keying adapter.

Hamgadgets
UKA-3
Universal
Keying Adapter



DRAKE



DRAKE®

**WB4
HFN**

**Drake Vintage Radio
Repair And Restoration**

Email: wb4hfn@wb4hfn.com

Website: www.wb4hfn.com



Drake Radios

Common Repair Problems And

Easy Repairs

Topics Of Discussion

Drake TR4 & TR4C Series

Drake R4 – R4A & R4B

Drake TR-7(A)

MN-2000 / W4

Drake L4 – L4B



Drake TR-4 & TR4C Transceivers Tube Shields Over the 12BY7 and 12BA6 Tubes

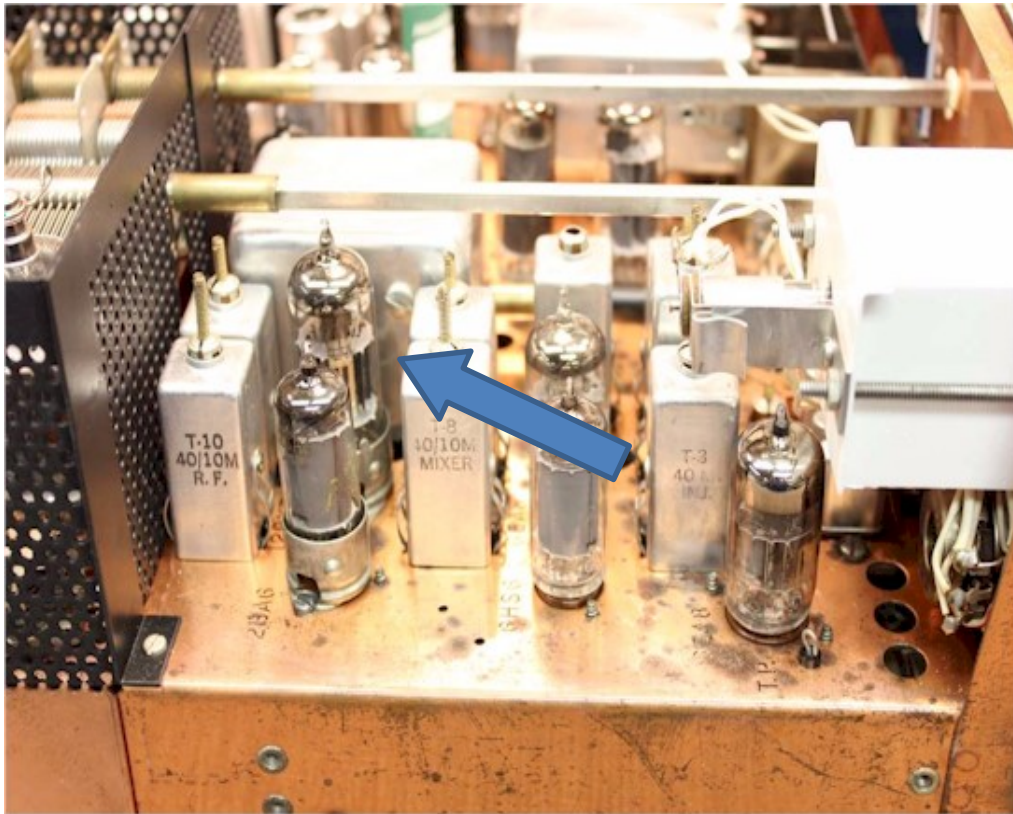


Tube shields do not go over the 12BY7 transmit driver tube and the 12BA6 RF Amplifier tube.

According to the Drake service bulletin, all the shielding needed was provided with the tube socket and collar for the lower part of the tube.



Drake TR-4 & TR4C Transceivers Tube Shields Over the 12BY7 and 12BA6 Tubes



Keep the shields off both these tubes.

Tube shield over the 12BY7 transmit driver tube, it operates at a much higher temperature and will cause premature tube failure, and it also effects the circuit alignment.



Varley Brand T/R Relay Found In The Drake TR4C Transceivers And T4XC Transmitters

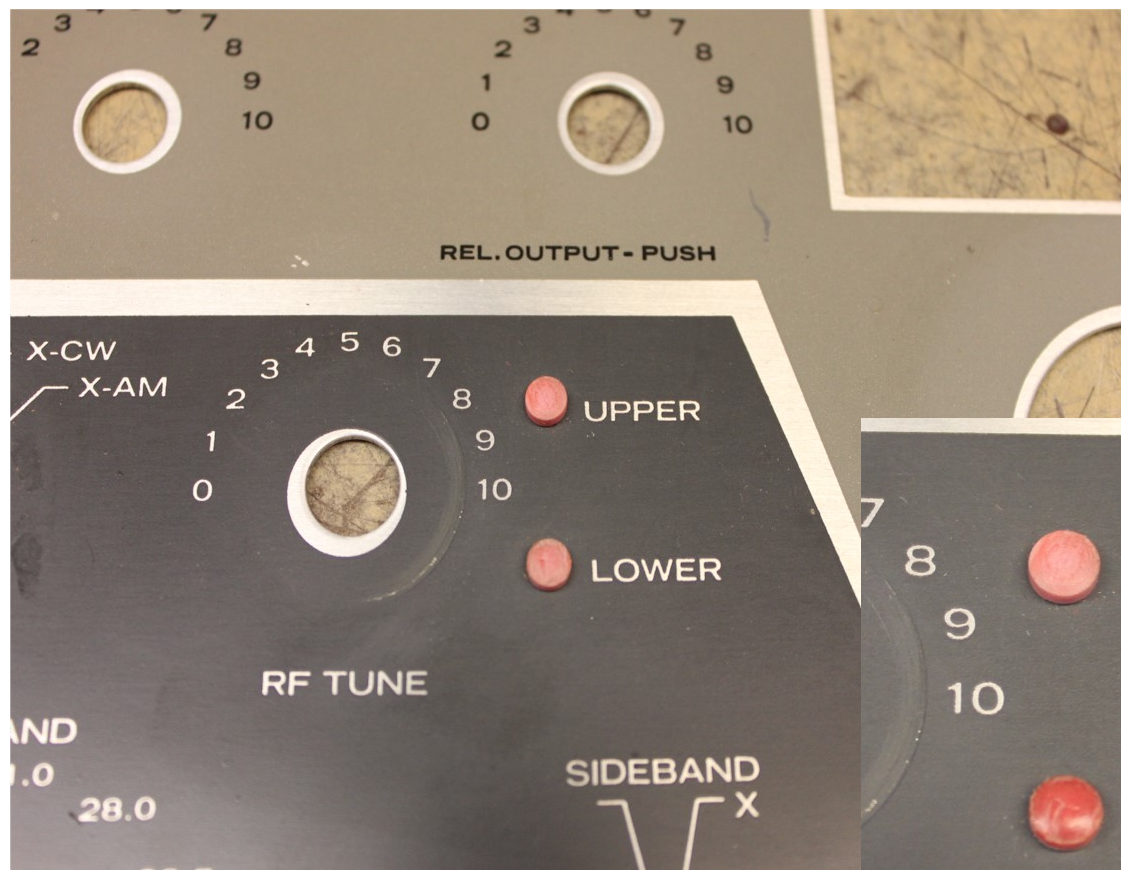


Varney brand relay, made in England, can be an intermittent problem in the Drake radios. Relay contact tension is weak with age, the contacts no longer make contact when closed, or, sometimes does not make a solid contact leaving a few to several ohms of resistance between the contacts when closed. The amount of contact resistance or no contact when closed will vary with each activation, very intermittent.

Replacement relays are available through DigiKey, Harbach Electronics P/N (RY-TR4C/T4XC) and Mouser Electronics, P/N(655-R10-E1Y4-V2.5K).



Drake TR-4 & TR4C Transceivers, The Red Sideband Indicators Turning White in Color



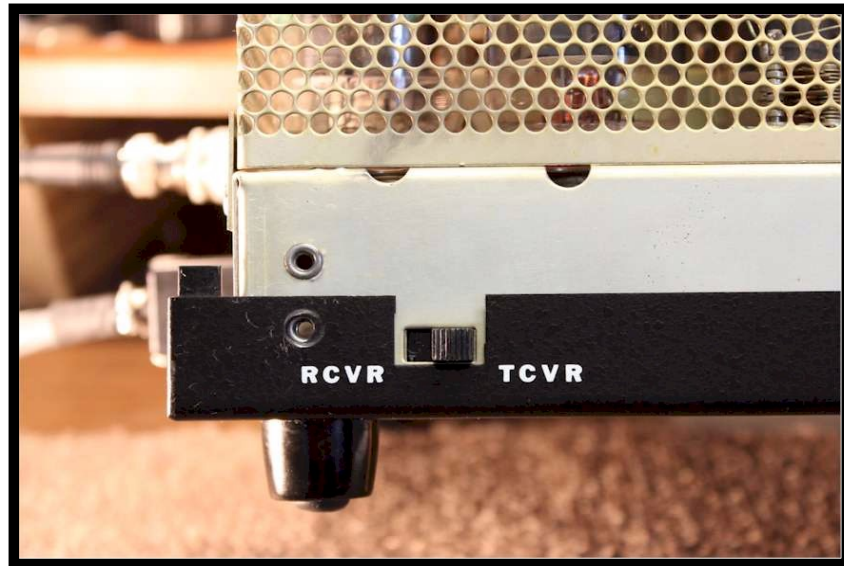
With aging the red sideband indicators may turn a power white. This is a white coating that is easily removed by scraping the red surface clean using your finger nail.





Drake TR4 and TR4C Transceivers, Transmit Okay, Intermittent Receiver Or No Receive

The transceiver transmits okay with full power output, but the receiver signals are very weak, but it hears a strong calibrator signal.



Check for the switch is in the "RCVR" position, switch needs to be cleaned, switch not making contacts in the "TCVR" position. When the transceiver is laid on its side that puts pressure on the switch handle. The handle pushes back on the rear switch contacts board and pushes it out the back of the switch housing.

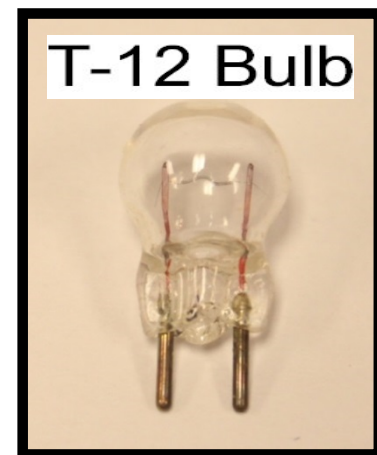


Drake TR4 and TR4C Transceivers, Transmits Okay, Very Weak Receive or No Signal Received

The transceiver transmits okay with full power output, but the receiver signals are very weak, but it hears a strong calibrator signal.



Check the T-12 receiver fuse bulb, bulb could be bad or have a broken pin, check the socket itself for loose solder connection, socket pins are not providing proper tension, the bulb itself may have tarnished pins, use a wire brush or Dremal tool rotary brush to shine up the bulb pins. You can increase receiver sensitivity by a microvolt just by cleaning the bulb pins.





Drake R4, R4A, R4B, Receivers Not Working On Any Band, Or Intermittent When Tapped

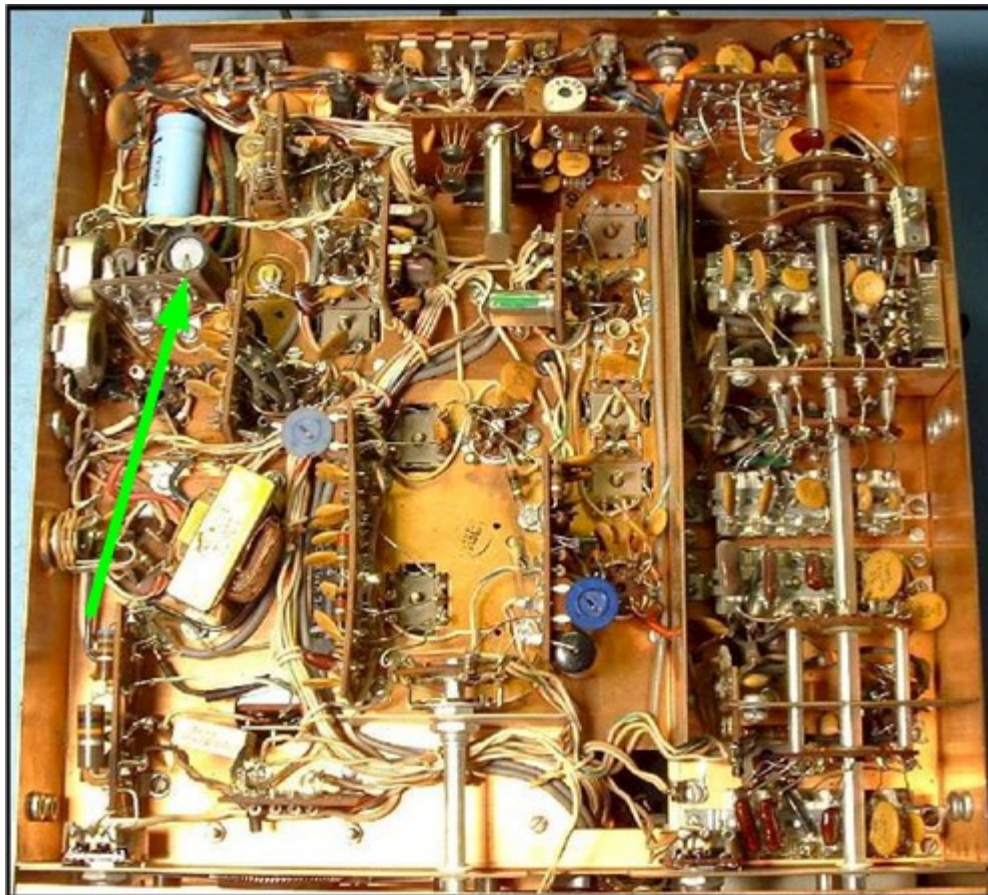
- The receiver has good back
- ground noise, meter functions
- normal, but does not receive
- signals on any band and the Calibrator does not work.



Check to see if the switch is in the “XTAL” position, the switch needs to be cleaned, switch not making contact in the “VFO” position. When the receiver is laid on its side that puts pressure on the switch handle. The handle pushes back on the rear switch contacts board and pushes it out the back of the switch housing.



Drake R4, R4A, And R4B, Receivers Will Not "MUTE" or S-Meter Not Working



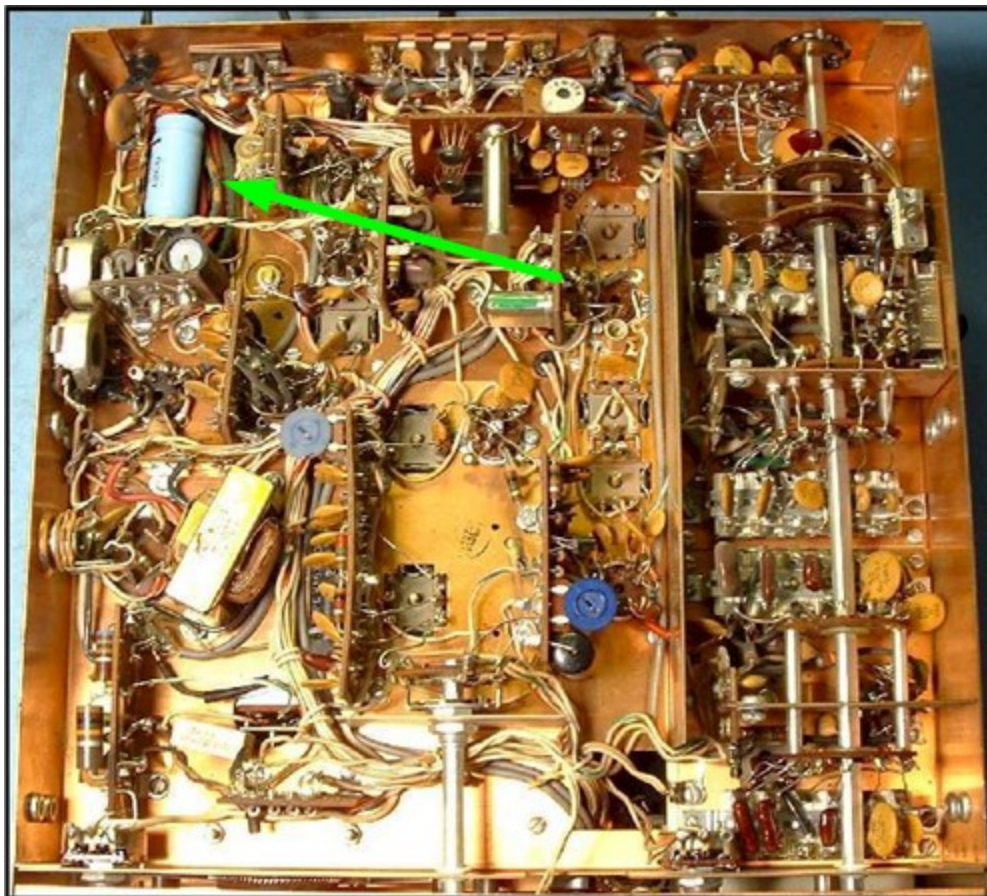
The R4 Series receiver does not mute properly, S-Meter adjustment does not work or will not zero with adjustment or significantly off or just pegged.

What Is Happening ????

The 10MF / 150VDC filter capacitor in the negative voltage supply is leaking or open. There is very little to no negative voltage being produced. Normal negative bias should be around -80VDC



Drake R4B Receiver, Calibrator Does Not Work Or Has A 60 Cycle Hum In Audio



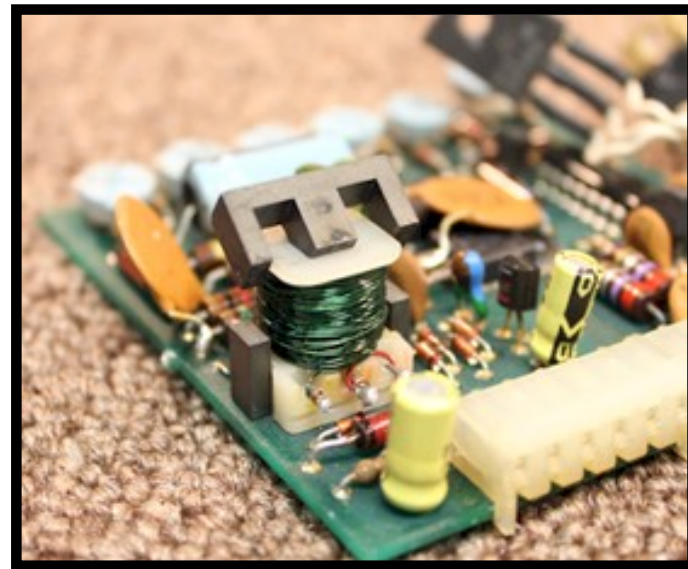
The R4B calibrator does not work or has 60 cycle hum in the tone produced in the receiver.

What Is Happening ????

The 1000MF / 25VDC filter capacitor is open, not filtering the +12VDC supply voltage to the crystal calibrator.



Drake TR7(A) Transceiver VCO Will Not Lock On 15 and 10 Meters, Display Runs Randomly



The top and bottom core halves are held in place with a twisted wire. When the core halves separate the output power supply voltage goes down. The 24VDC supplies the primary power to the VCO oscillators. There are two VCO frequencies, the 16Mhz VCO variable range produces the injection signal for 160 through 20 meters. The second VCO frequency, 32Mhz, produces the injection signals for 15 and 10 meters. The second and higher VCO frequency needs a full 24VDC to produce the higher frequencies needed for 15 and 10 meters. When core halves come loose use a dot of Super Glue on each end of the core to hold in place, do NOT glue the center or the core.



Drake MN-2000 Replacement Meter



The Drake MN-2000 Antenna Tuner currently sells in a range of \$250.00 to \$400.00.

So what do you do if the meter movement goes bad ??

Meters are no longer available from any known source. Does it become a parts unit ?? **NO**

The basic meter movement is a 200uA meter. You can use a meter taken from a Drake W4 Watt Meter, this is basically the same meter. Today the W4 watt-meter sells for about \$75.00.



Drake MN-2000 Replacement Meter



Sacrifice a W4 watt-meter for the meter movement. The meter is easily removed, its held in place with three small nuts on the backside of the meter. Carefully remove the clear plastic face plate and remove the white calibration plate from the meter. This white plate mounts over a post on each side on the bottom and a piece of double sided tape on each side at the top. Place the white calibration plate from the bad MN-2000 meter into the W4 meter movement and install the new meter in the MN-2000 tuner.



Drake L-4B Simple Repairs

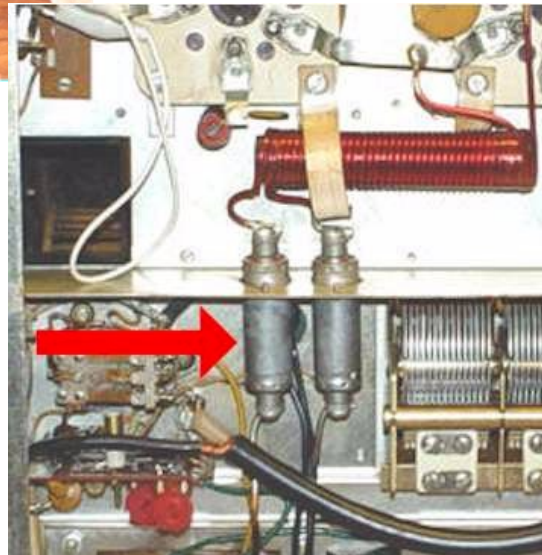
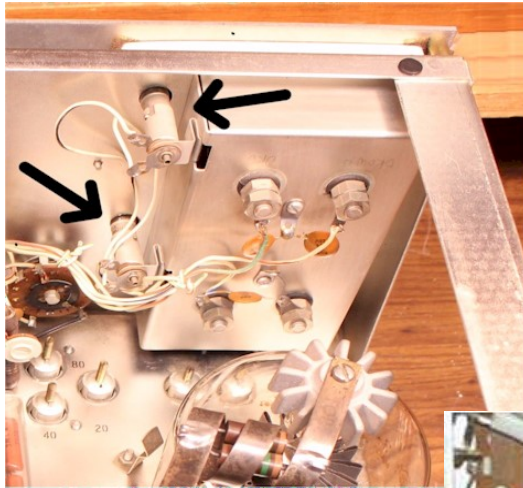


Simple Repairs

- Amplifier Staying Keyed
- Loss of air flow through the tube chimneys.
- Loss of high voltage.



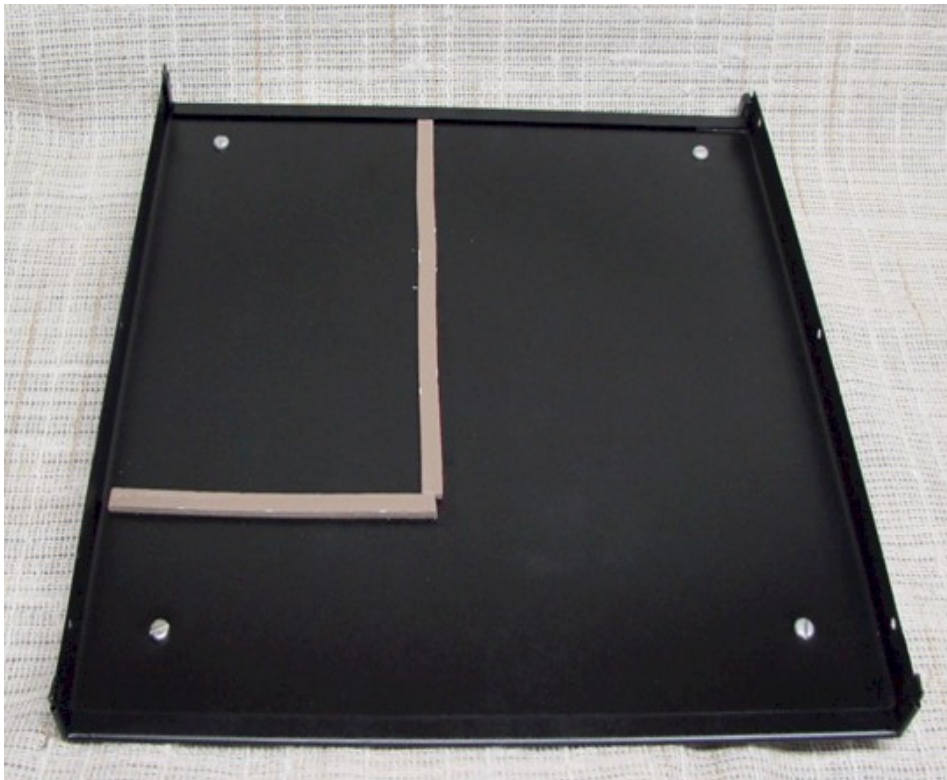
Drake L-4B Amplifier Stays Keyed All The Time



- Were the pilot lamps recently replaced ??
- Check pilot lamp socket body may be grounded to the chassis. The ground side of the lamp socket is floating above ground. The lamp can ground where the lamp goes through the hole to the front of the amplifier.
- One of the feed-through capacitors is shorted to ground in the L4B, or in the L-7 Amplifier one of the decoupling capacitor across the Filament Choke is shorted to ground.



Drake L-4B Amplifier Not Cooling Properly, Poor Air Flow Through The Chimneys



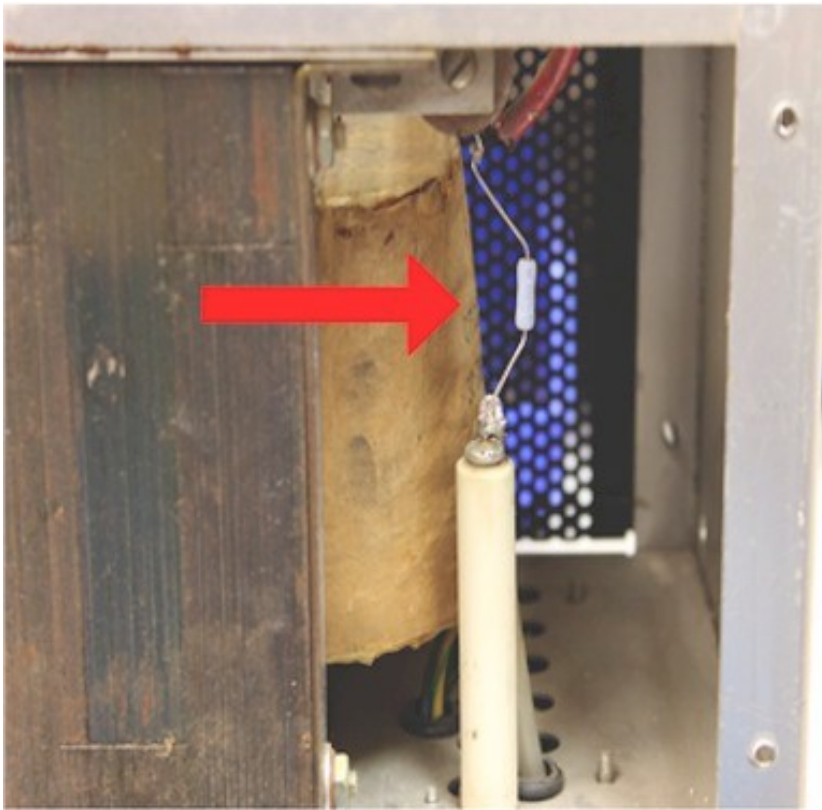
Blower creates air pressure in the sealed chamber under the chassis and that pressure forces air flow through the tube sockets and up through the tube chimney.

The chamber gasket seal may be deteriorating and no longer forming a tight chamber seal.

To replaced the chamber seal use a vinyl rubber weather stripping, $\frac{3}{4}$ " wide, $\frac{1}{2}$ " tall found at most all hardware stores and home centers.



Drake L-4B Amplifier Has No High Voltage



The most common issue with the L-4B with no high voltage is a blown fuse link in the L4PS power supply. This is a .82 ohm, 2 watt resistor. The resistor is available from most any electronics parts house, or, available from Mouser Electronics, there part number, 785-VC3D1, cost is \$1.18 each.

When installing keep away from power transformer to prevent arcing.



Here is a perfect example of what NOT to do. This resistor found in an L4PS, has a combined total of 30 ohms at 30 watts used for the fuse link.



Drake TR4C Transceivers, Main Tuning Knob Black Tuning Insert

With the earlier Drake TR4C radios the dimple or tuning insert in the main tuning knob was a painted metal.

With the later series the tuning insert was made of black plastic. The earlier painted metal inserts, the paint wore off easily with use, as shown in the picture to the left, the tuning insert is normally black.





Drake TR4C Transceivers, Main Tuning Knob Black Tuning Dimple

This is what the tuning insert looked like when new.

There is a quick fix to refinish the tuning insert bringing it back to its original appearance.





Drake TR4C Transceivers, Main Tuning Knob Black Tuning Dimple

The quick fix to restoring the tuning insert is by using a Sharpie black Magic Marker. Coat the entire surface of the insert, let dry, and apply a second coat. Don't forget to do the insert edges and go around the outside edge a couple of extra times.





The Latest Trend

Selling Radio Parts On e-Bay

Sellers parting out perfectly good radios to sell for parts at outrageous prices.

Large Knob Set - \$29.00



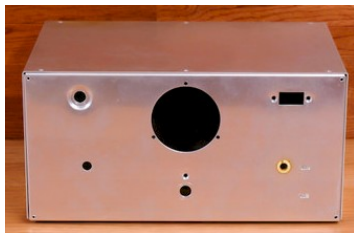
MN-4 Case - \$55.00



Variable Capacitor - \$39.00



Metal Housing - \$39.99



SWR Level Set Knob - \$9.99



Front Panel - \$50.00





Your e-Bay Experience Caveat Emptor Or Buyer Beware

- > Is the sale price reasonable**
- > Money back guarantee or exchange policy**
- > Read closely the sellers feedback**
- > Know who you're buying from**
- > Is the shipping cost reasonable**



Nice Drake TV-1000-LP Low-Pass Filter for Ham Radio Transmitter CB HF TVI LPF

★ ★ ★ ★ ★ 1 product rating

Item condition: Used

Time left: 23d 10h 6/4, 6:45PM



Price: **US \$42.00**


Buy It Now

Add to cart

Best Offer:

Make Offer

Seller information

 (13967 ★)

99.1% Positive feedback

 Follow this seller

[See other items](#)

Feedback Rating

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QUESTIONS

???

WB4
HFN

**Drake Vintage Radio
Repair And Restoration**

**Email: wb4hfn@wb4hfn.com
Website: www.wb4hfn.com**





Questions & Answers

Ron, WB4HFN

Mark, WB0IQK

Jeff, WA8SAJ

Evan, K9SQG



The Path Ahead...