



2014 Dayton Hamvention Drake Forum



TR-8



*Drake Equipment's Legacy and Performance:
Keeping Them Alive Is Fun!*

Agenda

Recently Purchased Drake Linears:
What to Check Before Power Is Applied, and After

Technical Advances and Innovations Pioneered by Drake

Performance Curves for Drake and Inrad Filters

FREE prize drawing including Drake memorabilia

Ask the Experts: Questions and Answers



Prize Donator

Drake Forum Committee

K9SQQG – Evan Rolek
WB0IQK – Mark Gilger
W4WTO – Bob Harman
WA8SAJ – Jeff Covelli
WB4HFN – Ron Baker
W9DCQ – Doug Ward

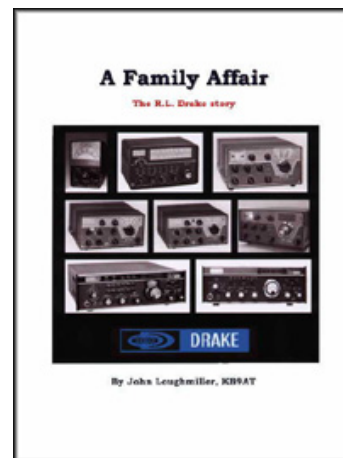


Resources

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

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

Drake Family Affair Book by John Loughmiller, KB9AT





Recently Purchased Drake Linears: What to Check Before Power Is Applied, and After

Evan, K9SQQ
K9SQQ@ARRL.net



- * Outside
 - *RF Deck
 - *Power Supply

- * Inside
 - * RF Deck
 - * Power Supply

- * Operational Checks
 - * Static
 - * Dynamic

- * Logging Findings



My Approach Using L4B as an Example

Cosmetics

Mechanical

Electrical

People have asked, "What should I do?"

Amplifiers serviced have had a wide range of issues.

I know what I do; you probably have more or better ideas.



Safety is #1.

Very familiar with high voltage, fragile vacuum tubes???

Now is NOT the time to be self-taught!

A needed mentor...at all times!

Wear safety glasses!

* Glass shards, solder blobs, flying pieces of solid wire from diagonal cutters, etc. are not your friends!

* You can chew with false teeth, walk with an artificial leg, but you can't see with an artificial eye!

Resist the urge to "see if it plays"; rushing in can have disastrous consequences.

Review available documentation: modifications, repairs, receipts, etc.

Properly operating, the L4B is close to legal limit. But save the tubes...

DRAKE



M.V.G. May 2014



External Cosmetics--General Things to Look for

Dents (especially near plastic feet)

Discoloration, soot

Pits, cracks, rust

Scrapes and gouges

Worn cabinet screws

Etc., etc., etc.

Anything that hints of misuse, shipping damage, modifications, etc.



RF Deck—front

Mechanical zero for both meters

Bandswitch force needed

Pointer calibration for plate tuning, smoothness of vernier drive

Pointer/knob calibration for load capacitor

"Feel" of on/off and CW/SSB switches

ALC pot/switch

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RF Deck—back

Blower impeller moves freely, cracks near hub?

Dirty pins, pits, arcs on Jones power connector

Integrity of Millen HV connector

Arcs, soot, corrosion on coax connectors





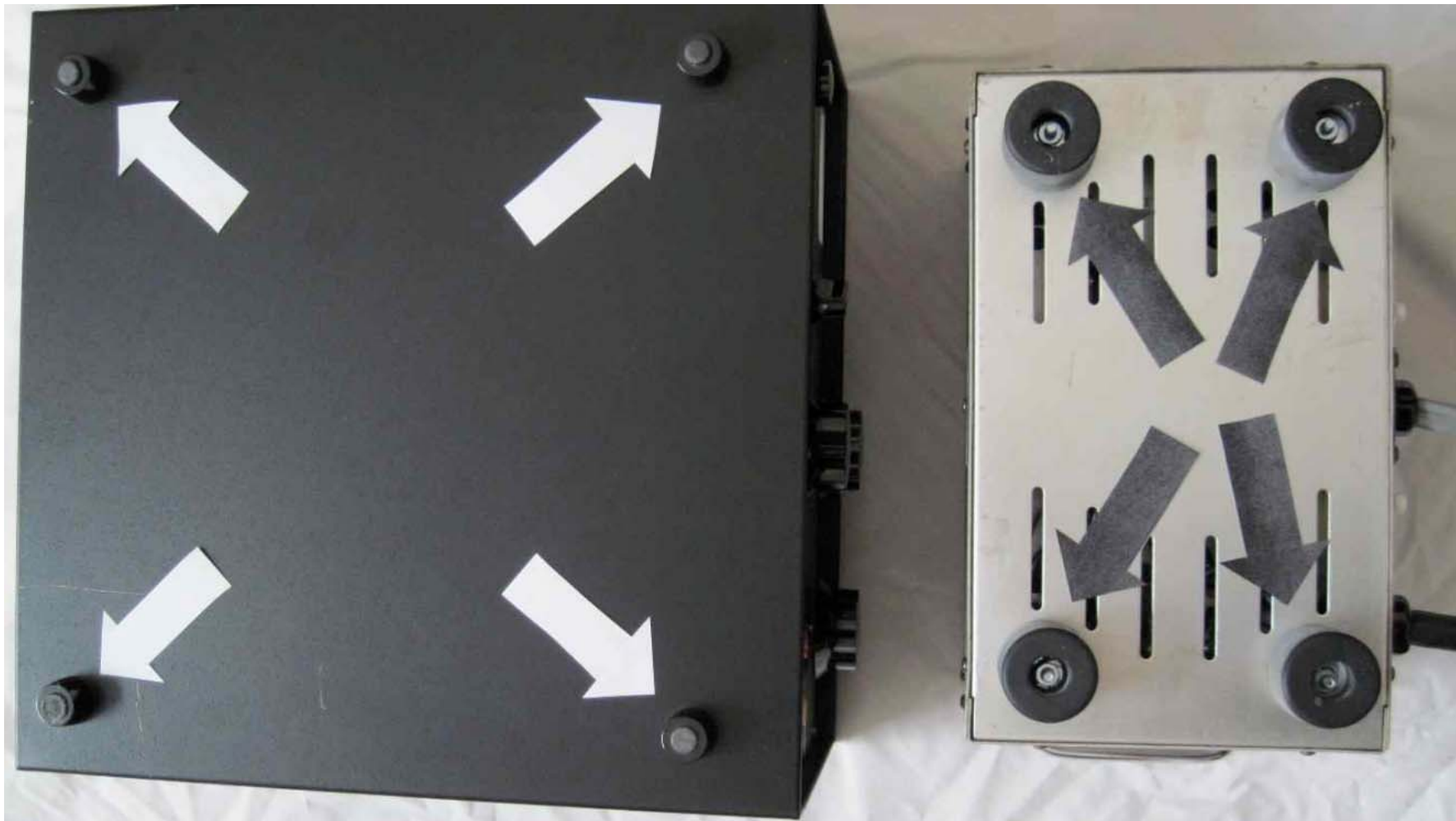
Power Supply—external

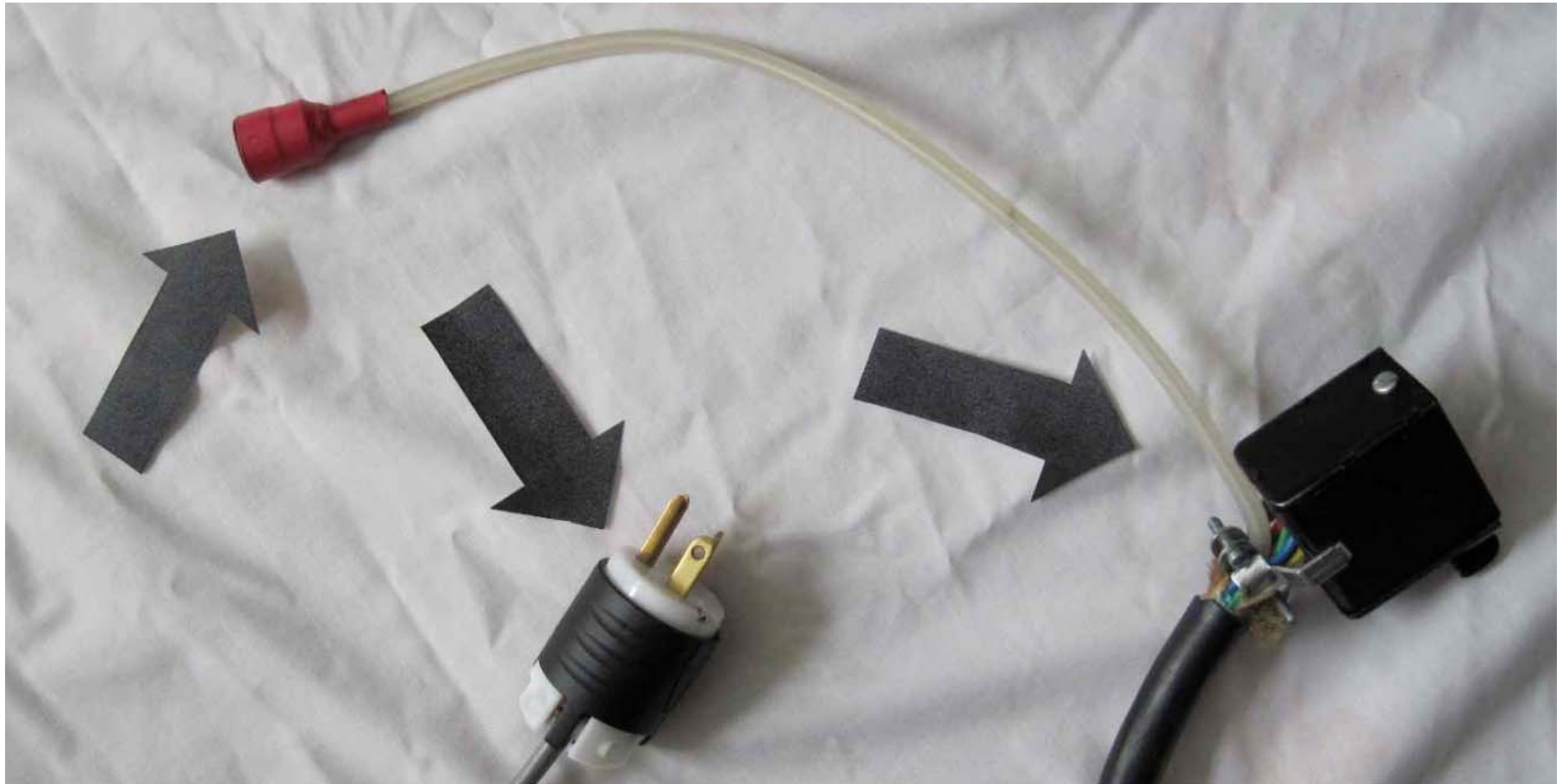
Integrity of Millen HV connector

Exposed wires on Jones power plug, insulation cracks or scrapes

Integrity of power plug for wall outlet, proper pin configuration, strain relief

Deformed bottom near plastic feet







Power Supply--inside cosmetics & mechanical

Loose parts, pieces of wire, screws and nuts, washers,
signs of arcing, smoke residue, small solder blobs on
chassis or other parts, etc.

Non-original parts, parts with wrong values, etc.

Discolored parts like resistors, signs of heating, etc.



RF Deck—top

Interlock

Cracked insulators, missing screws, glued parts, etc.

Switch contacts: output bandswitch, multimeter

Plate RF choke

Plate caps, parasitic chokes

Chimneys

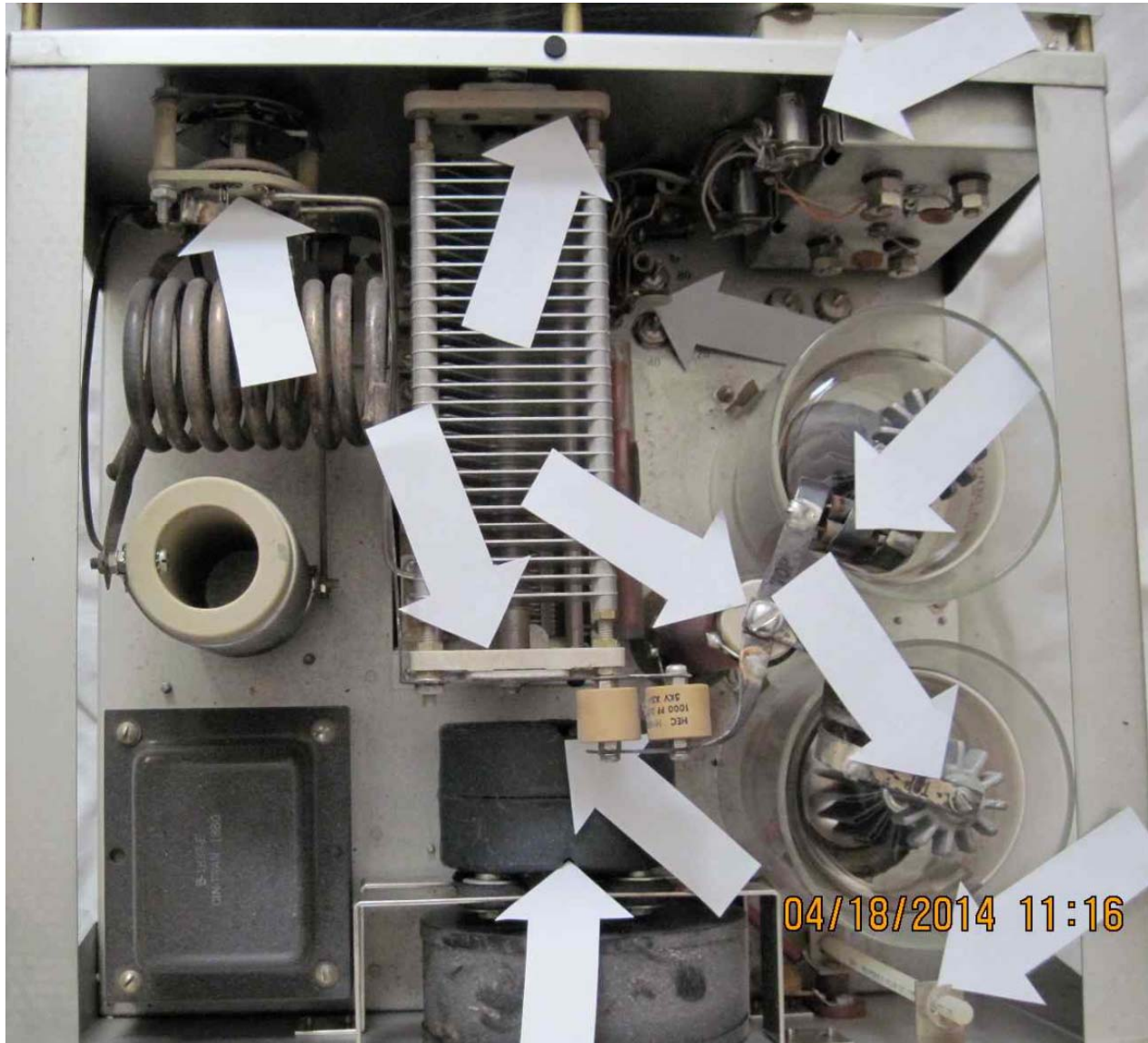
Tube color

Meter bulbs, replace them now?

Oil the blower now?

Meter calibration for grid current (adjustable) and plate voltage (wattmeter?)

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RF Deck—bottom

Plenum gasket (on bottom cover)

Interlock

Wired for 220 or 110?

Relay contacts

Tube pins, sockets

Grid grounding RF chokes, protection choke (output lead)

Plastic clamps for input balun

Power switch continuity

Input bandswitch

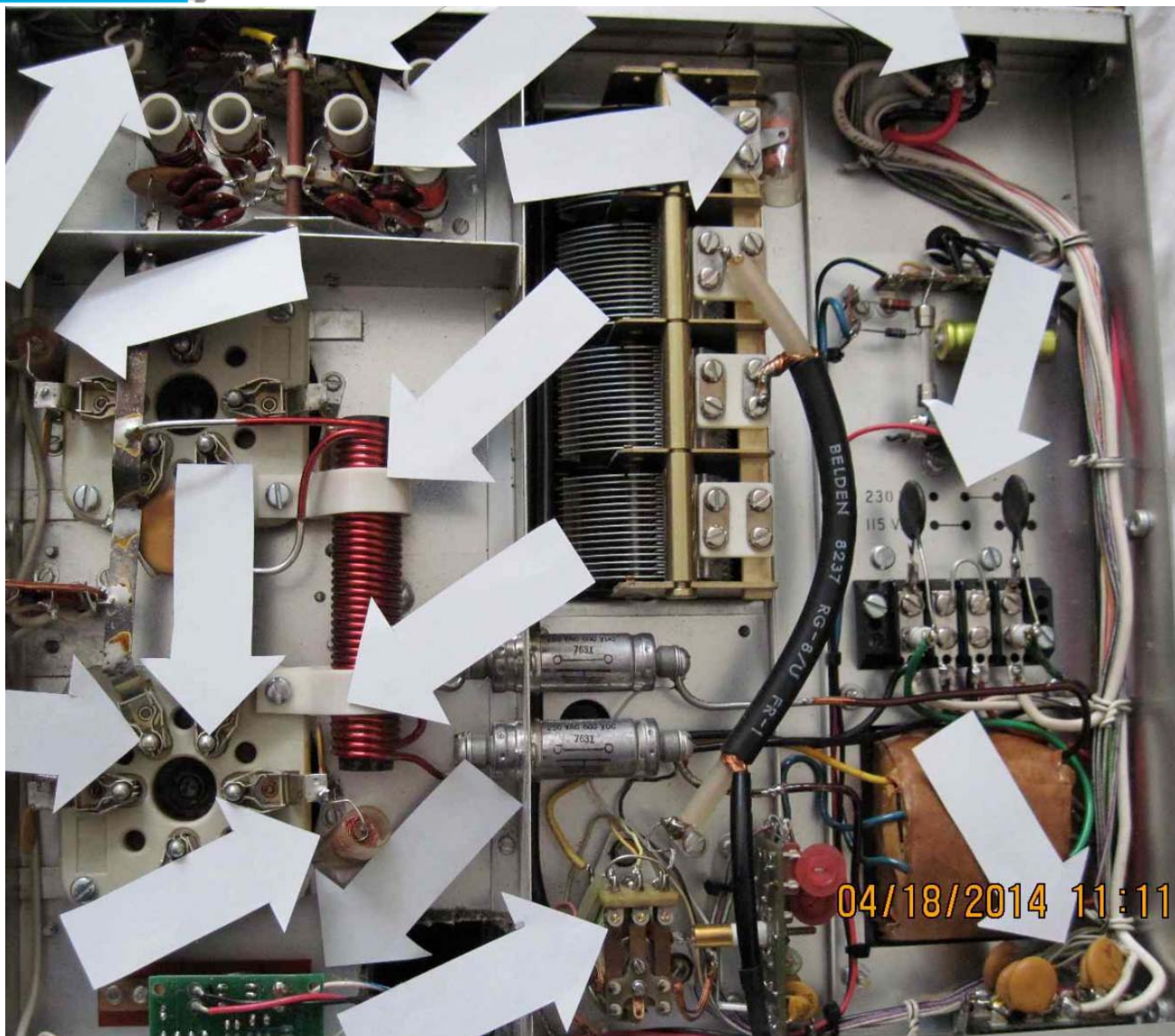
ALC pot taper (HV?) and standby switch

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Power Supply—top

Venting electrolytics

Diodes of marginal ratings

Different styles of capacitors, diodes

Fusible resistor (0.82 ohm)

50K 50 watt bleeders discolored, or open

HV wiring integrity

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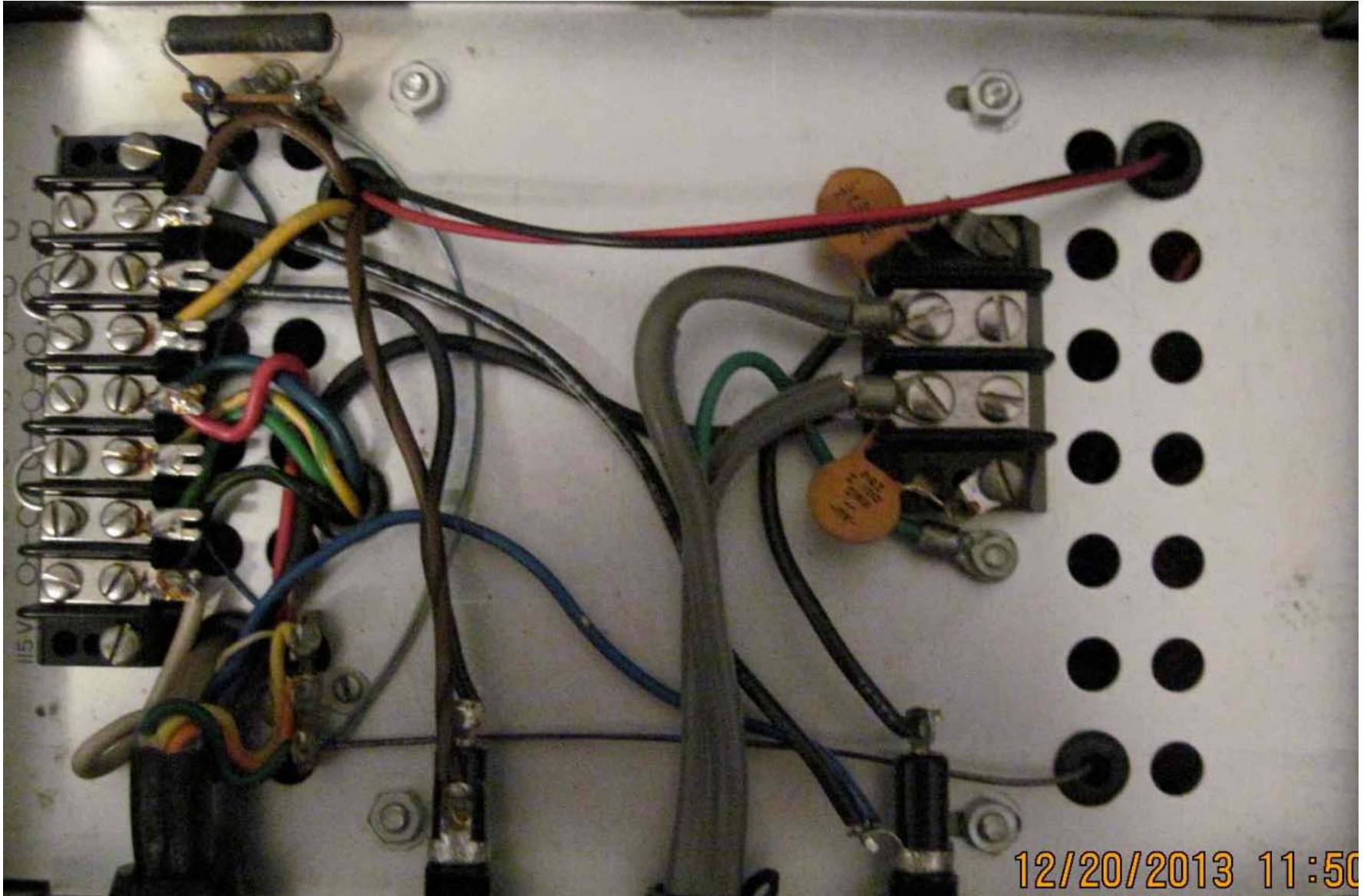
Power Supply—bottom

Wired for 220 or 110?

5K 7 watt resistor for ALC circuit

Circuit breakers or fuses?!

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M.V.G. May 2014



Electrical Checks—static

One hand on master power switch

Assuming HV meter is calibrated

Bring up slowly via Variac, monitor voltage AND current

Take voltage readings in CW (~1800) and SSB (~2500)

Ensure both tubes light

Listen, watch (with safety glasses), smell



Electrical Checks—dynamic

Start with an adequately rated dummy load

Measure plate voltage in standby, transmit with no drive, and full drive

Monitor drive power continuously along with grid current, start low

Ensure bandswitch and plate tuning are set for band of interest

Tune up ~ per manual

Input coil SWR, center of each band

Measure input and output power on all bands



L4B Linear Amplifier Test: after power supply rebuild

RF Deck SN: XXXX

L4PS Power Supply SN: XXXX

Band	Frequency (kc)	Drive		Plate Current (ma)	Input Power at 2425 vdc (watts)	DC Output Power (watts)	Efficiency (%)
		Power (watts)	Grid Current (ma)				
160	1900						
80	3750	50	175	550	1334	975	73%
40	7150	55	180	575	1394	940	67%
20	14175	60	200	580	1407	970	69%
15	21225	65	225	580	1407	950	68%
10	28850	55	200	550	1334	775	58%

Notes:

Plate voltmeter is out of calibration. SSB=2375 vdc indicated is actually 2425.

Grid current meter circuit calibration was right on and needed no recalibration.

Tuned approx. for max output power per max grid current or max plate current per manual.

Calculations above based upon 2425 vdc loaded plate voltage.

No load to full load caused 4% drop in plate voltage.

Load was B&W model 374A dummy load and wattmeter.

Drake W4 wattmeter used for measuring output power.

Power input measured on TR-7A meter known to be accurate with Autek WM-1, etc.

Tubes equal. Equal red during key down test.

Power will be higher as measured by PEP with voice input.



1 or 2 quick questions?



Drake Innovations - “The Early Days In History” & Troubleshooting Easy Fixes



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



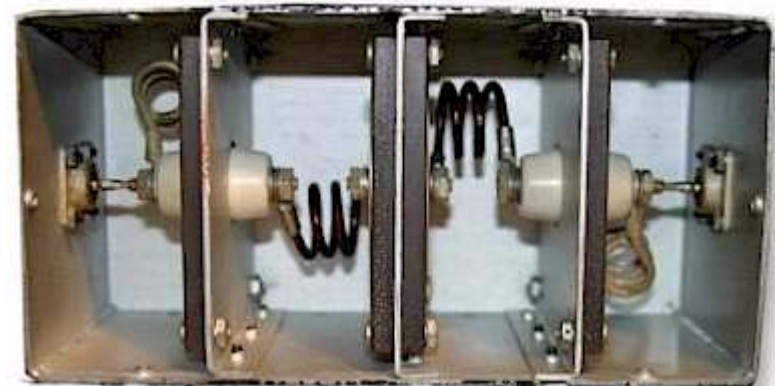
In The Beginning

The R.L. Drake Company started with building pass band filters in 1943-44 for the government during WW2. They were used for jamming and decoding radio transmissions. Bob Drake developed a good reputation around his products which led him to building his first receiver for the military.

During the lean times Bob Drake built anything to keep his employees busy. This included making spring contacts for GE, coils and chokes for Delco Electric and table lamps for S.S Kresage.



The Drake Pass Band Filters, F-14/U and the F-15U were designed and built in 1943 and 1944.

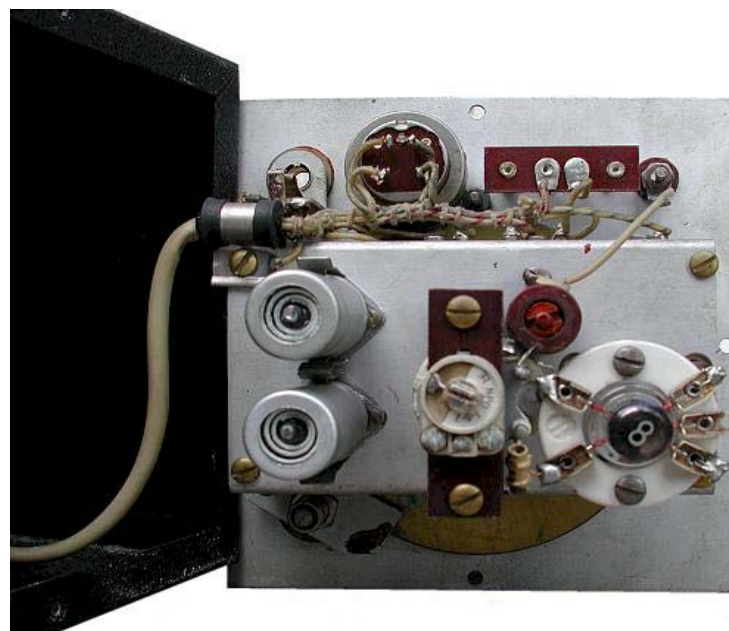




The FIRST Drake built receiver was the BC-1255A for the military in 1944. Today it is considered the rarest of all radios manufactured by the Drake Company.



- BC-1255A Signal Corps U.S. Army VHF monitor
- Manufactured by R.L. DRAKE COMPANY—1944
- 3 tubes: 2 x VT-212 (858) - 1 x VT-172 (1S5)
- Frequency coverage: 70-150 MHz
- battery Powered: Two 45 Volts and One 1.5 Volt
- Dimensions: 6" x 6" x 6"





The first Drake receiver designed for Amateur Radio was the Model 1-A

Around this time in history most receivers were big and heavy and mainly designed for AM reception. Bob Drake was first to introduce a new trend, in 1957, a receiver with a small foot print, light weight and designed to support the new and upcoming mode of communications called Single Sideband. The radio resembled a rural mail box and sold new for \$259.00.





Drake's First Transceiver The TR-3 Was Introduced in 1963

Bob Drake wanted a radio with both the receiver and transmitter in the same box and what if they could share some of the same circuits. Bob Drake and Milt Sullivan, his Chief Engineer, set to work and the TR-3 emerged. The TR-3 became

the hallmark of the company, robust and overdesigned, that happily married the engineer's goals with the user's dreams of the perfect radio.



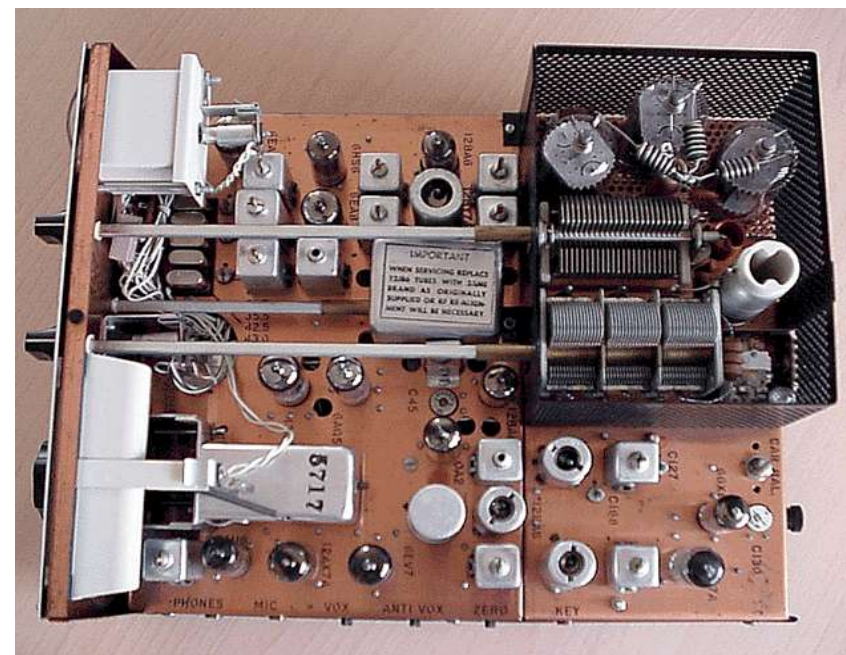
Even now, 47 years later, you can find the TR-3 still working. Finding one in a flea market or set aside for decades, chances are with a little TLC it will still work fine today.



Drake's First Transceiver The TR-3 Was Introduced in 1963

The TR-3 had 20 tubes, generated 300 watts PEP, and covered all the HF ham bands with a 600Khz tuning range.

Before going with the copper plated chassis the first five TR-3's built had a chrome plated chassis, which is now considered the rarest of all Drake radios made for Amateur Radio.





Drake's First All Solid State Transceiver, The TR-7 in 1977

The development of the TR-7 transceiver was the first attempt of the Drake engineers, basically tube guys, switching to all solid state, went through a lot of pain-taking trial and errors. Drake convinced a young engineer, Mike Elliott, to come to work for Drake to help with the TR-7 design. At that time Mike worked for Heathkit and was the designer of the Heathkit SB-104, the first all solid state transceiver ever built.



Mike Elliott's engineering and design background was very instrumental in the design of the TR-7 radio. The most unusual design innovation of the TR-7 was the use of a very high IF frequency. Using 48.05 Mhz IF frequency eliminated most the birdies, whistles and squawks that popped up on the tuning dials commonly found in most radios of that era.



Troubleshooting “Hits and Kinks”



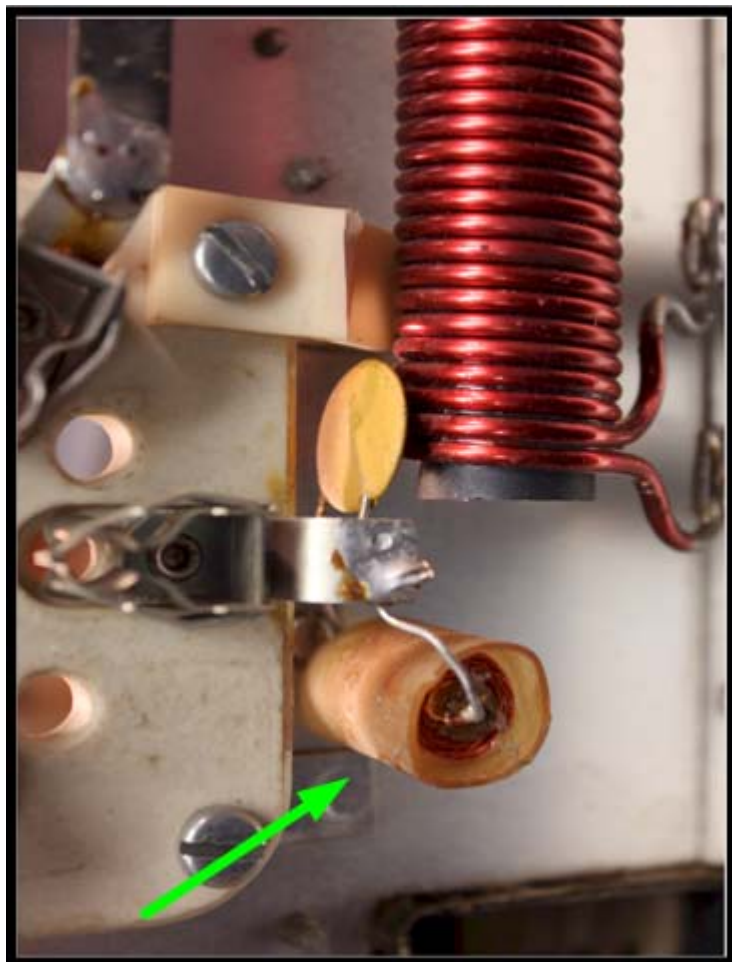
**Drake Vintage Radio
Repair And Restoration**

Email: wb4hfn@wb4hfn.com

Website: www.wb4hfn.com



The Drake L-4, L4-B, L-7 and L-75 Amplifiers



The amplifier tube appears to be working normal, possibly with less power out than normal at first, but continues to get hotter and glows much brighter than the other tube the longer it is keyed. Finally draws too much current then, blows the circuit breaker and possibly arcs internally.

What Is Happening ????

At some point the tube high voltage arced from plate to grid which burns open the tube grid choke. The tube grid is no longer grounded causing the tube to go into thermal run-away.



The Drake L-4, L4-B, L-7 and L-75 Amplifiers



The amplifier works fine, possibly with a little less power output than normal, but still draws current during standby. You checked the relay contacts and those are switching properly.

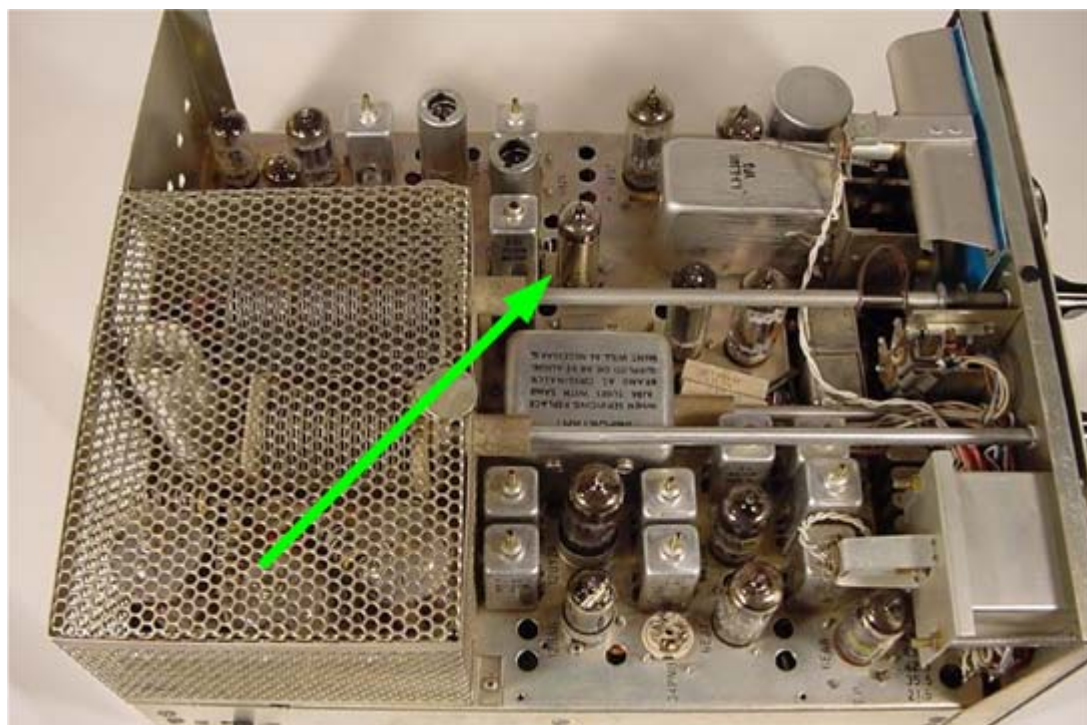
What Is Happening ????

One of the final tubes has a filament to grid short. The grid being normally grounded is putting the filament/input circuit to ground causing both tubes to conduct during standby. You have a bad tube.

Cost wise: **OUCH !!!**



Drake TR-4, TR-4C, TR-4CW, TR-4CW/RIT Transceivers



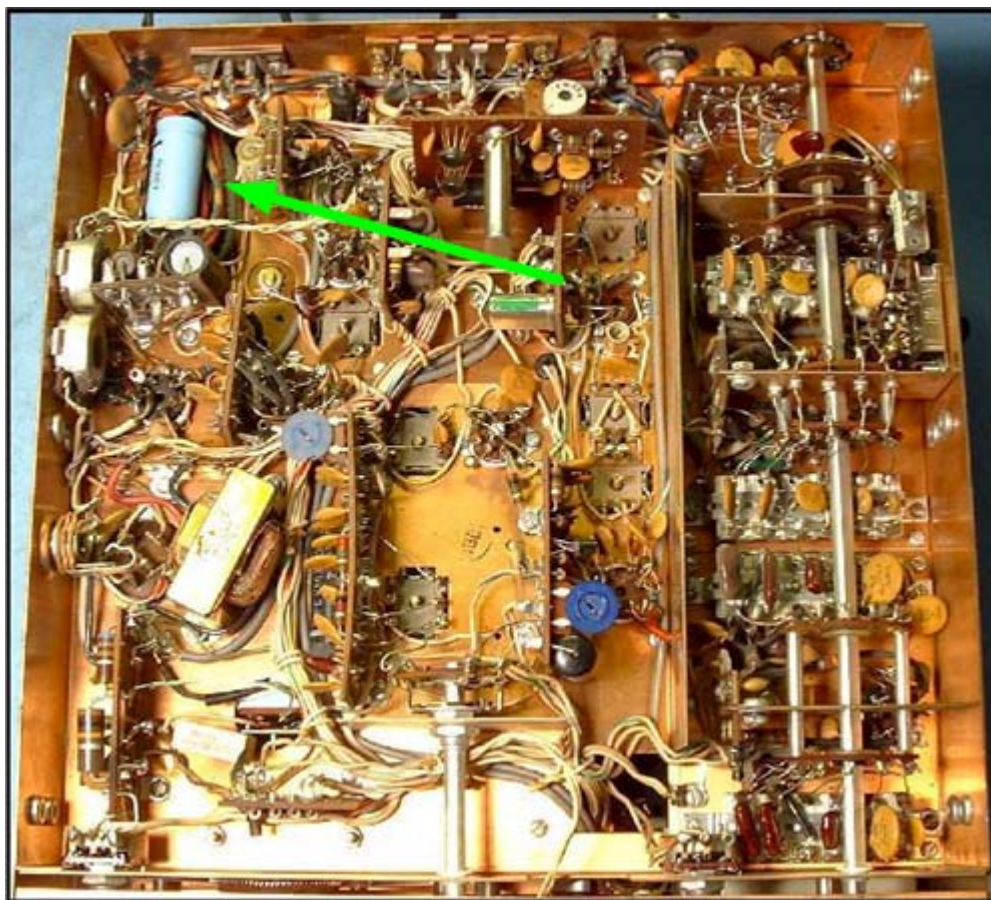
The transceiver side tone operates normal in transmit mode, but you can still hear the side tone coming out the speaker during receive.

What Is Happening ????

The OB2 regulator tube is bad, not regulating the 150VDC supply voltage. That excessive voltage is causing the tone oscillator to not full cut-off during the receive mode.



Drake R-4B Receiver



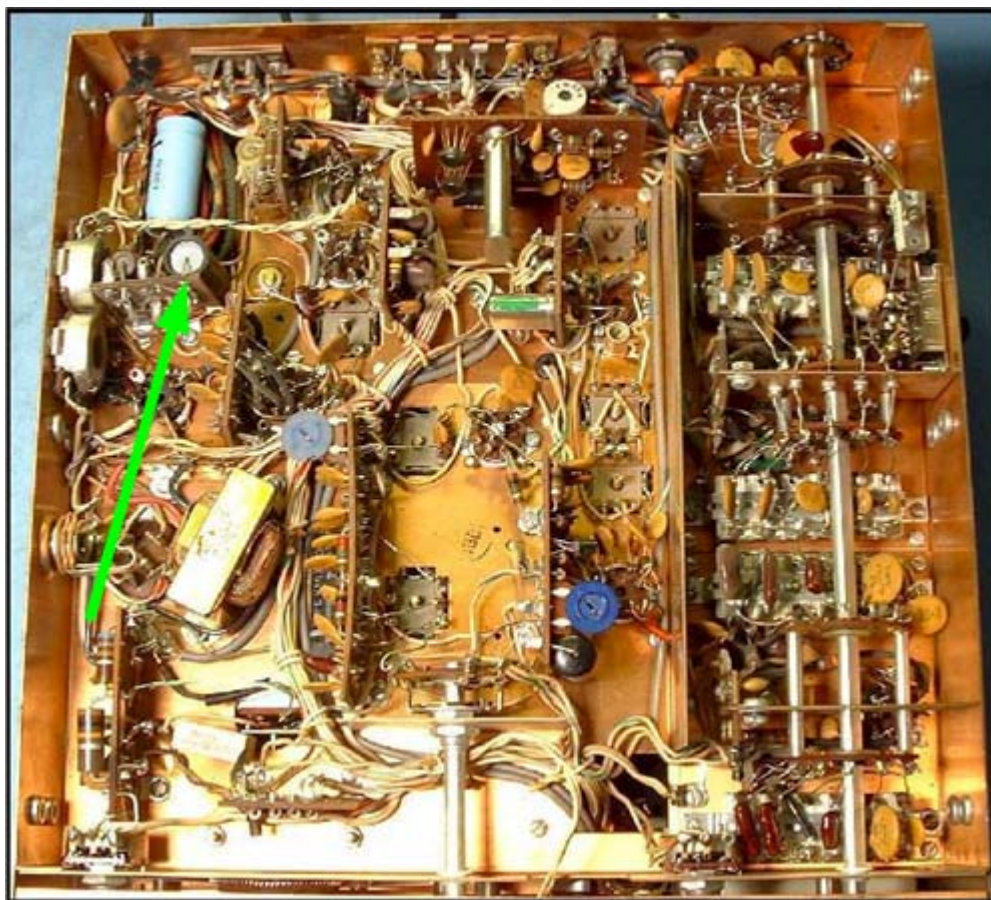
The R4B calibrator does not work or has 60 cycle hum in the tone produced in the receiver.

What Is Happening ????

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



Drake R-4B Receiver



The R4B does not mute properly, S-Meter adjustment does not work or is 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.



QUESTIONS ???



**Drake Vintage Radio
Repair And Restoration**

Email: wb4hfn@wb4hfn.com

Website: www.wb4hfn.com



DRAKE 2014 FORUM





**Sweeping I.F. L/C and Crystal Filters
Using A Tracking Generator, Spectrum Analyzer
&
Audio Sweep Generator**

Jeff, WA8SAJ
wa8saj@ncweb.com



Drake R-4B Receiver

Pass-Band Tuning with L / C Filtering @ 50 kHz





R-4B Receiver Last 50 kHz I.F.

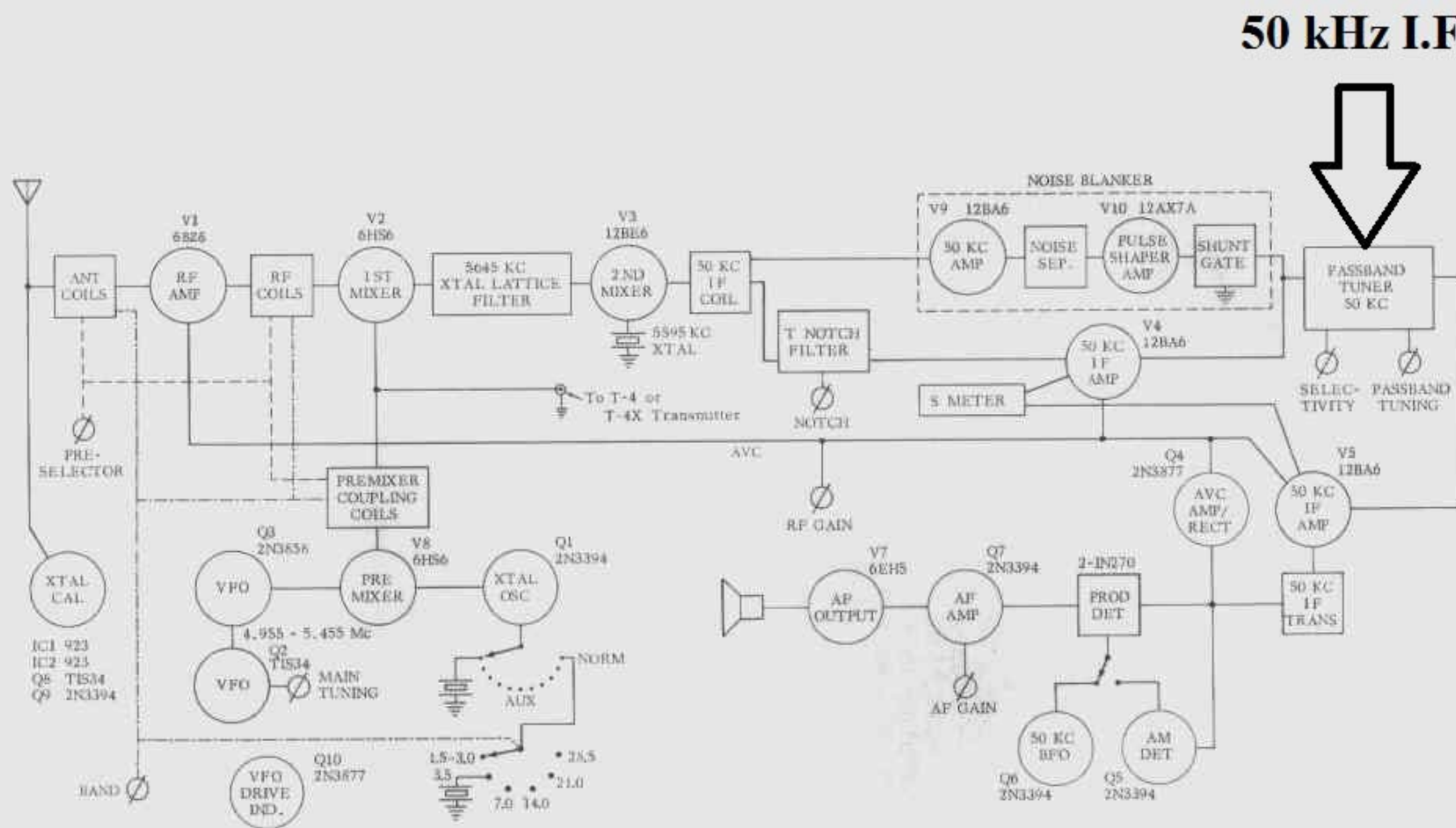
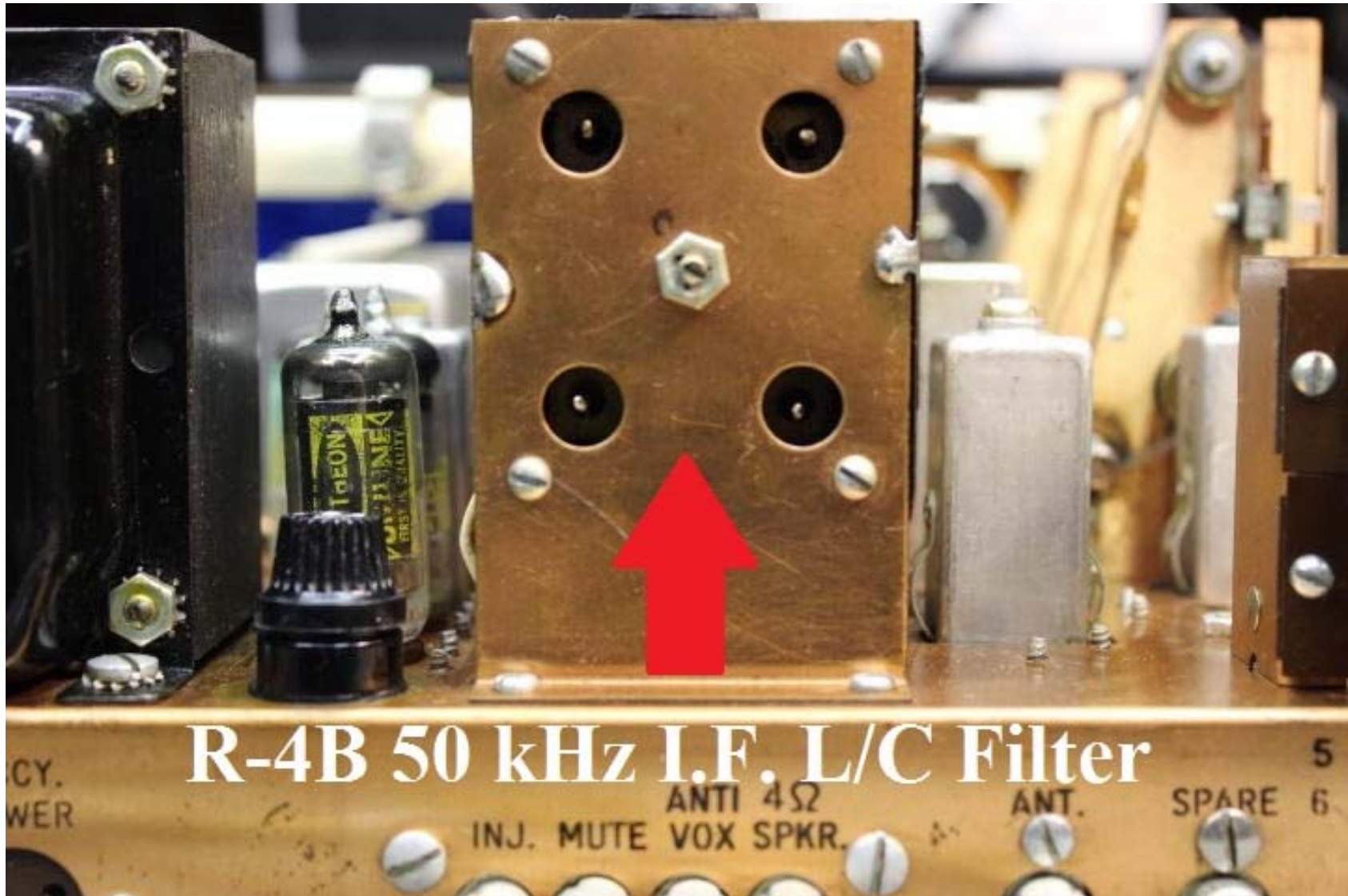


FIGURE # 9



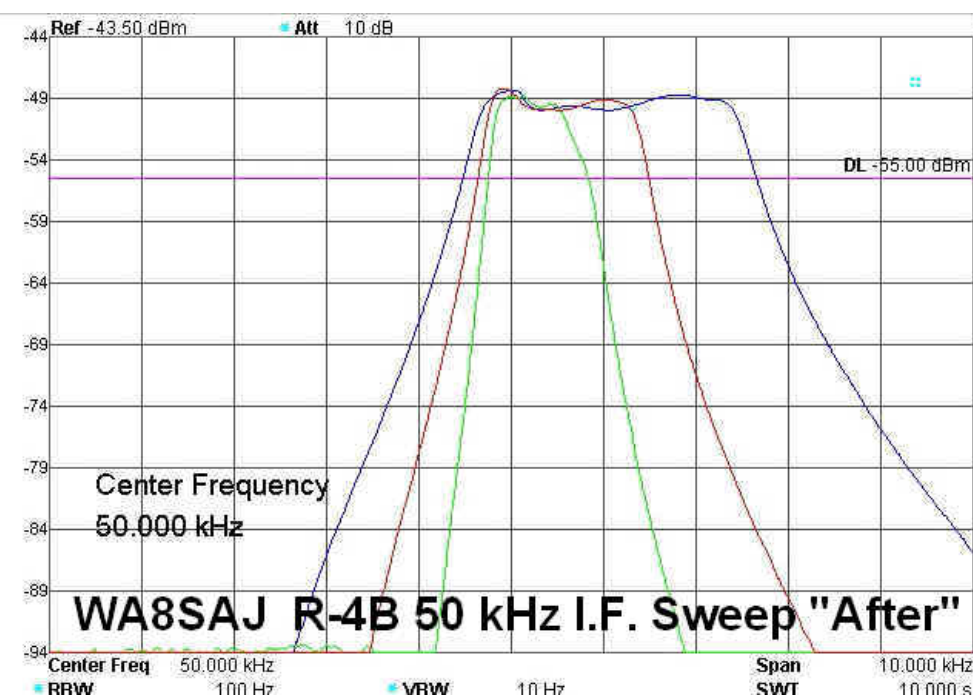
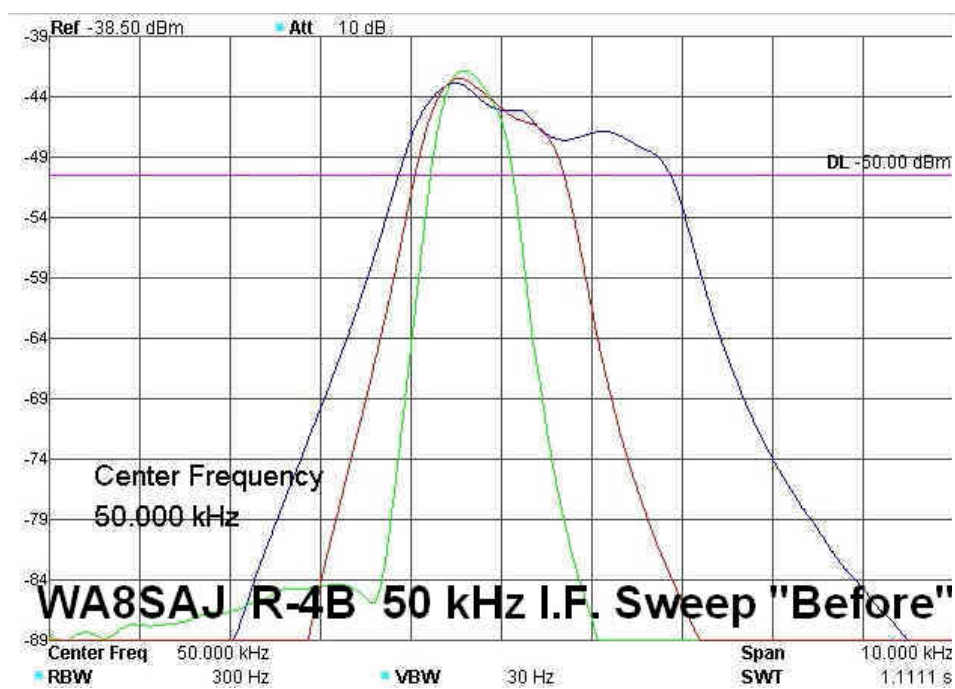
50 kHz Pass-Band Tuning





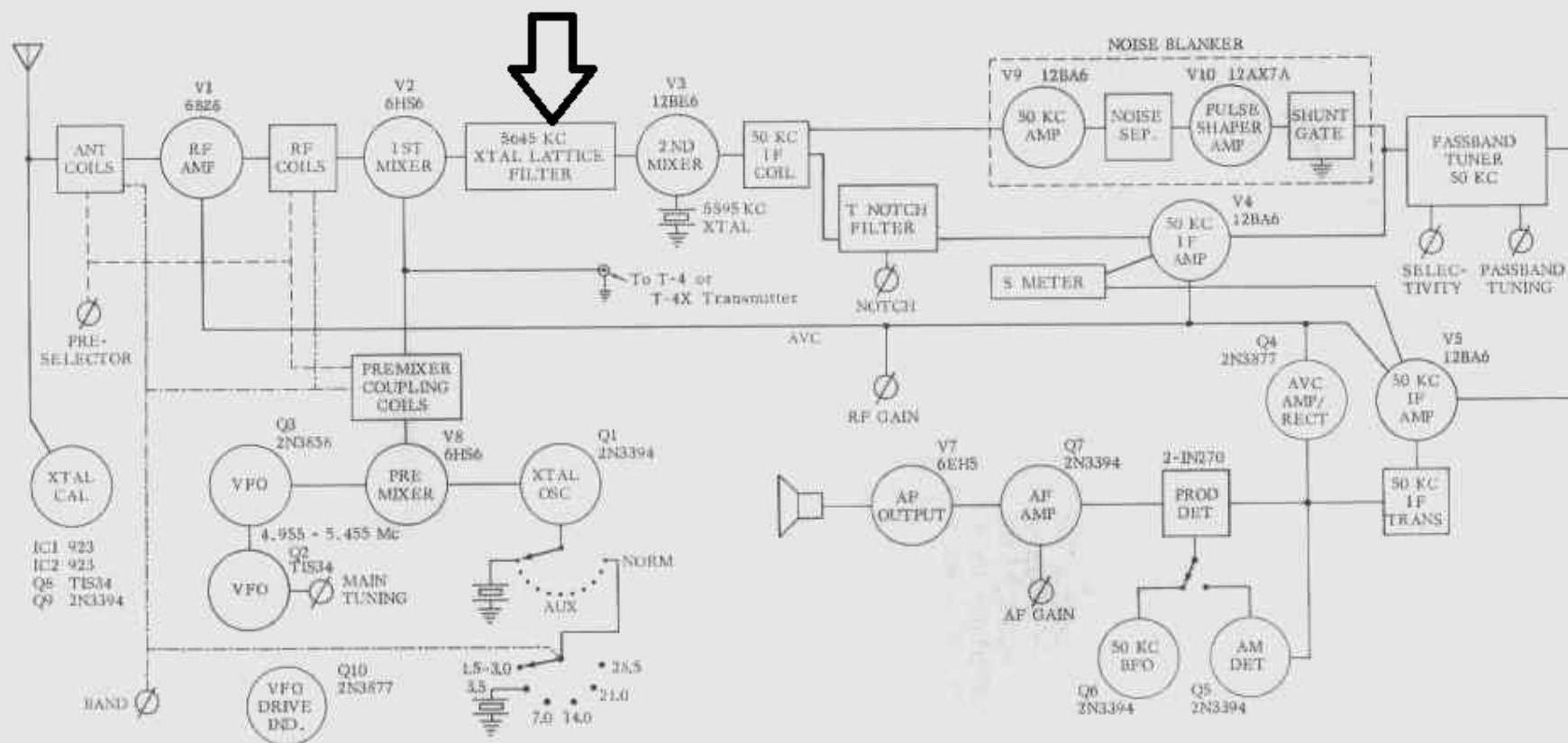
R-4B Sweeps

400 Hz
1.2 kHz
2.4 kHz



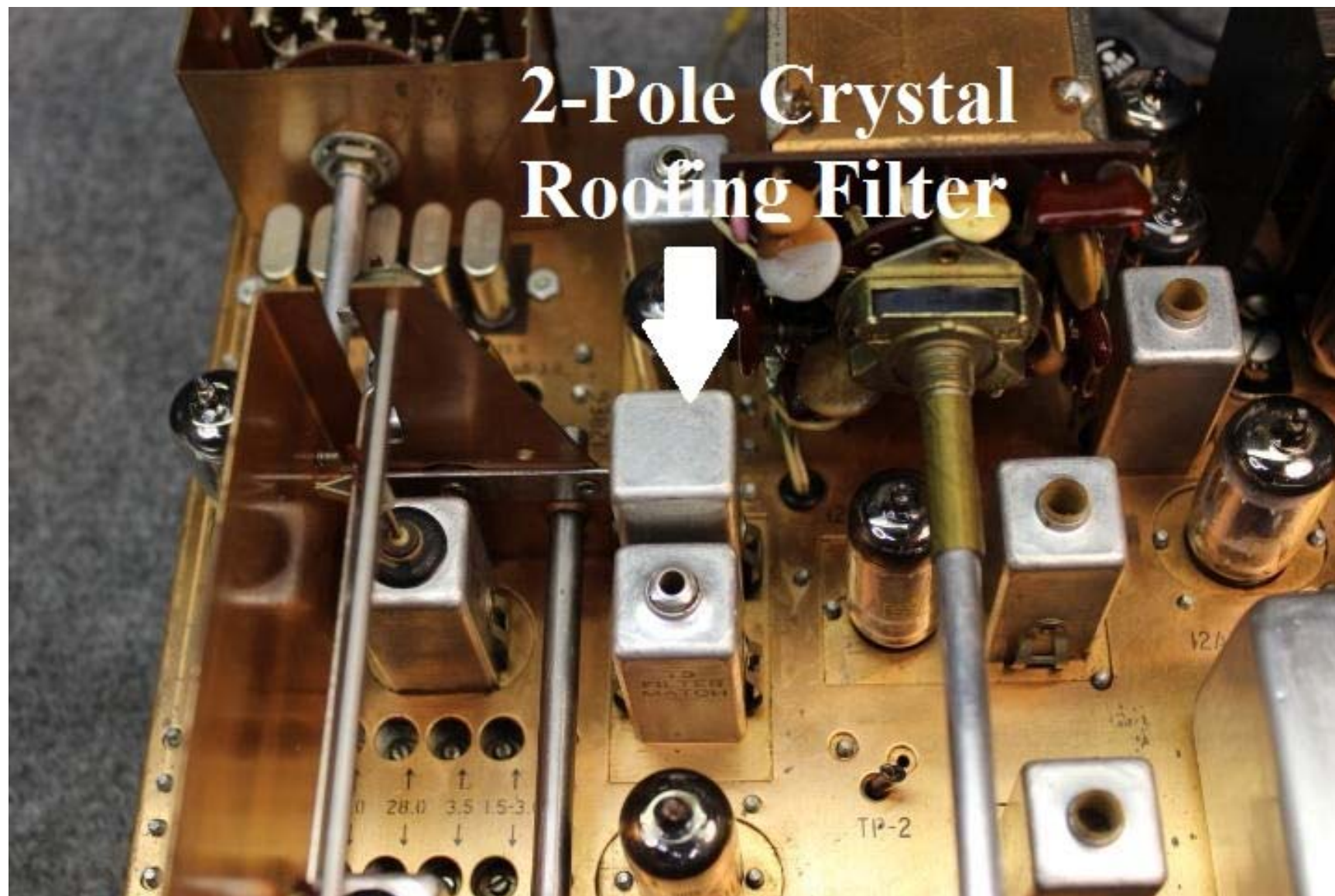


5646 2-Pole Roofing Filter



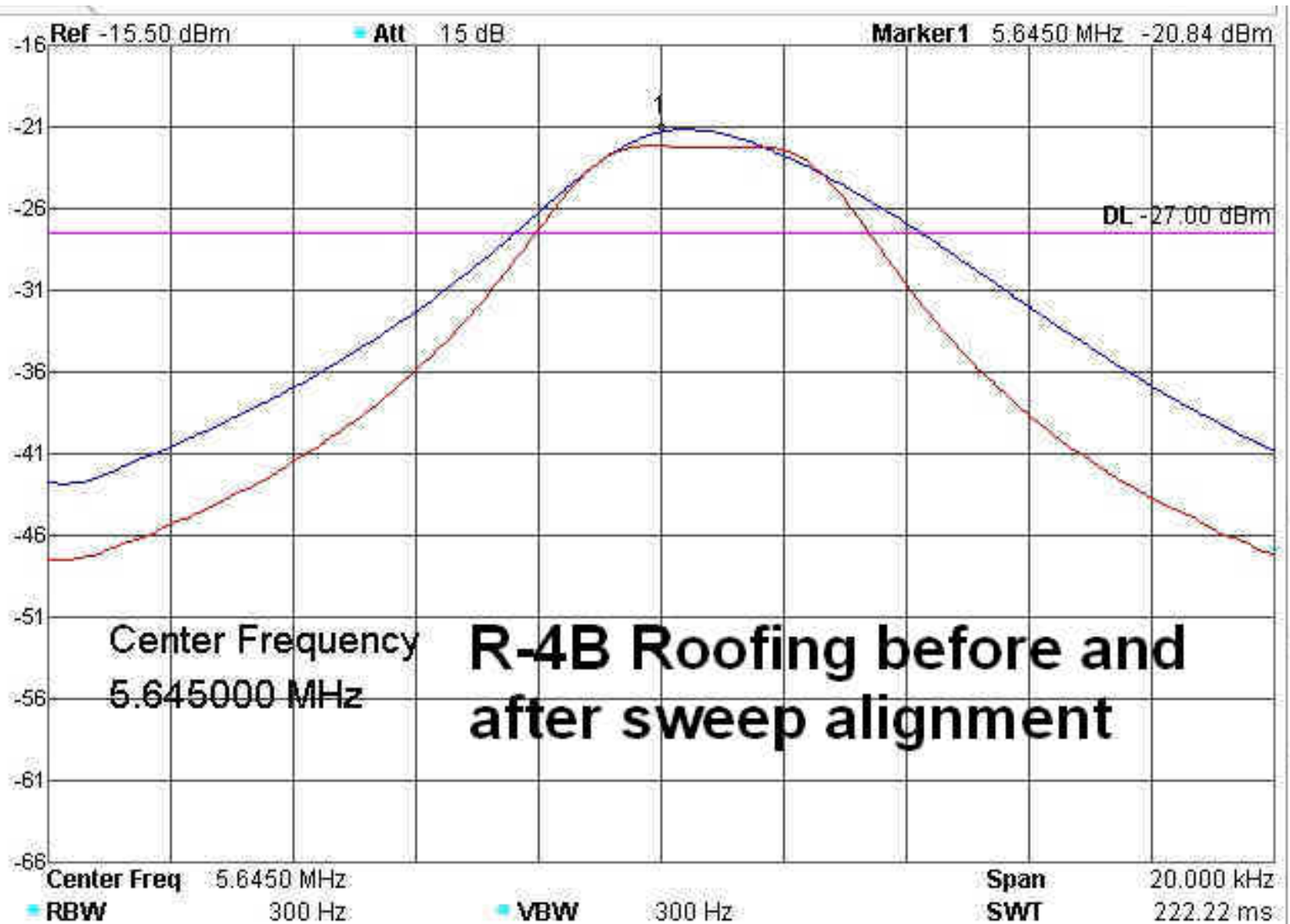


R-4B 2-Pole Crystal Filter





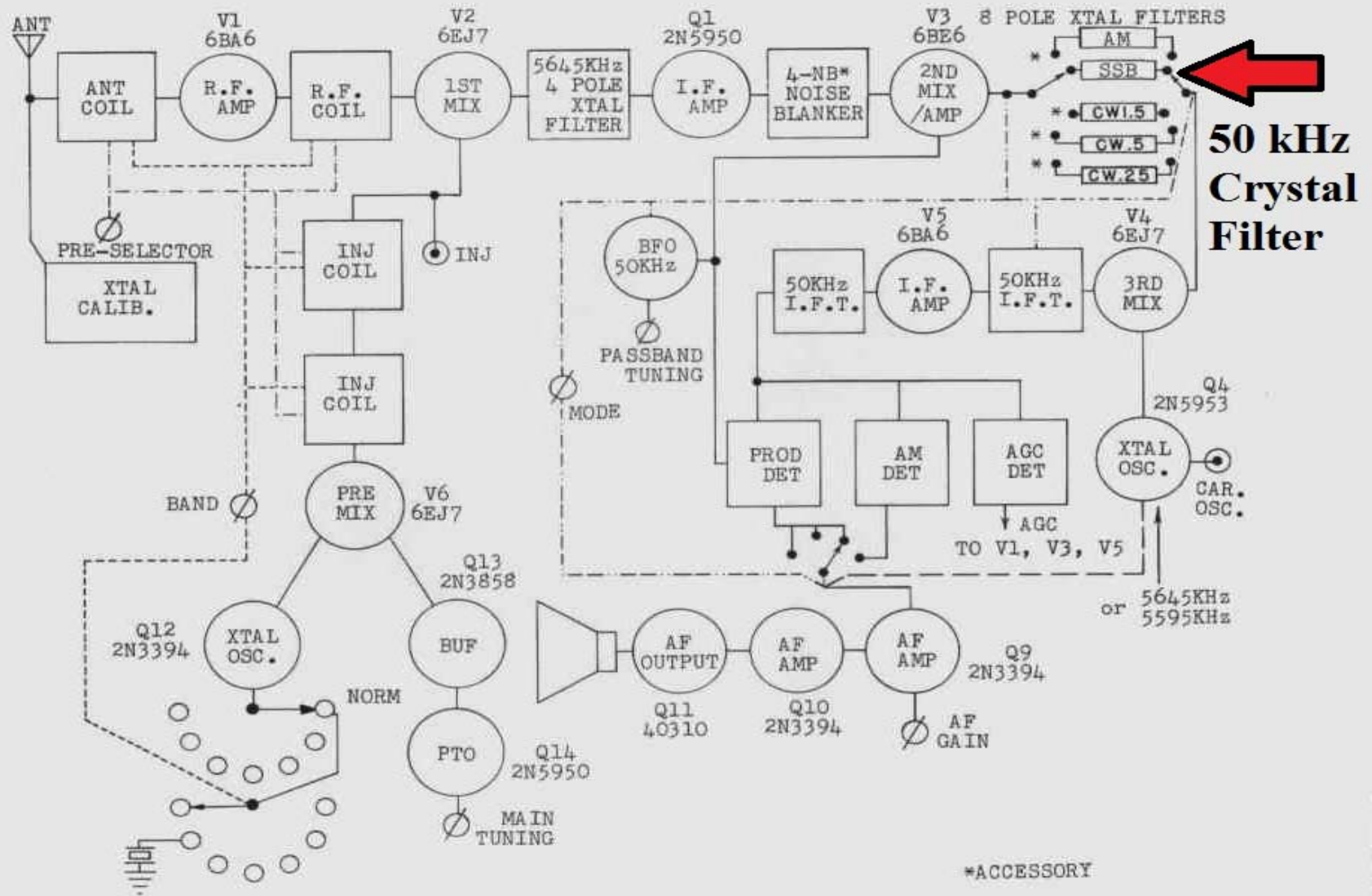
R-4B Sweep at 5645 kHz



Drake R-4C 50 kHz I.F. Using Crystal Filters



R-4C 50 kHz I.F.



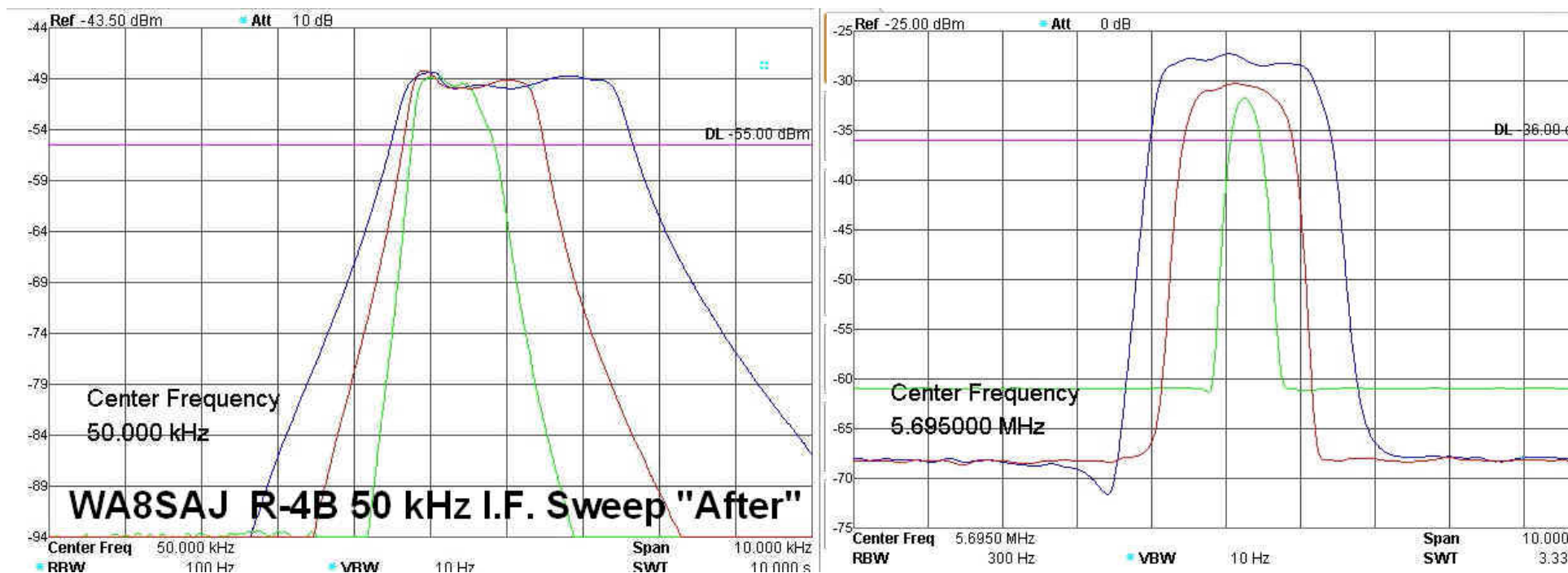


R-4C Crystal Filter 50 kHz



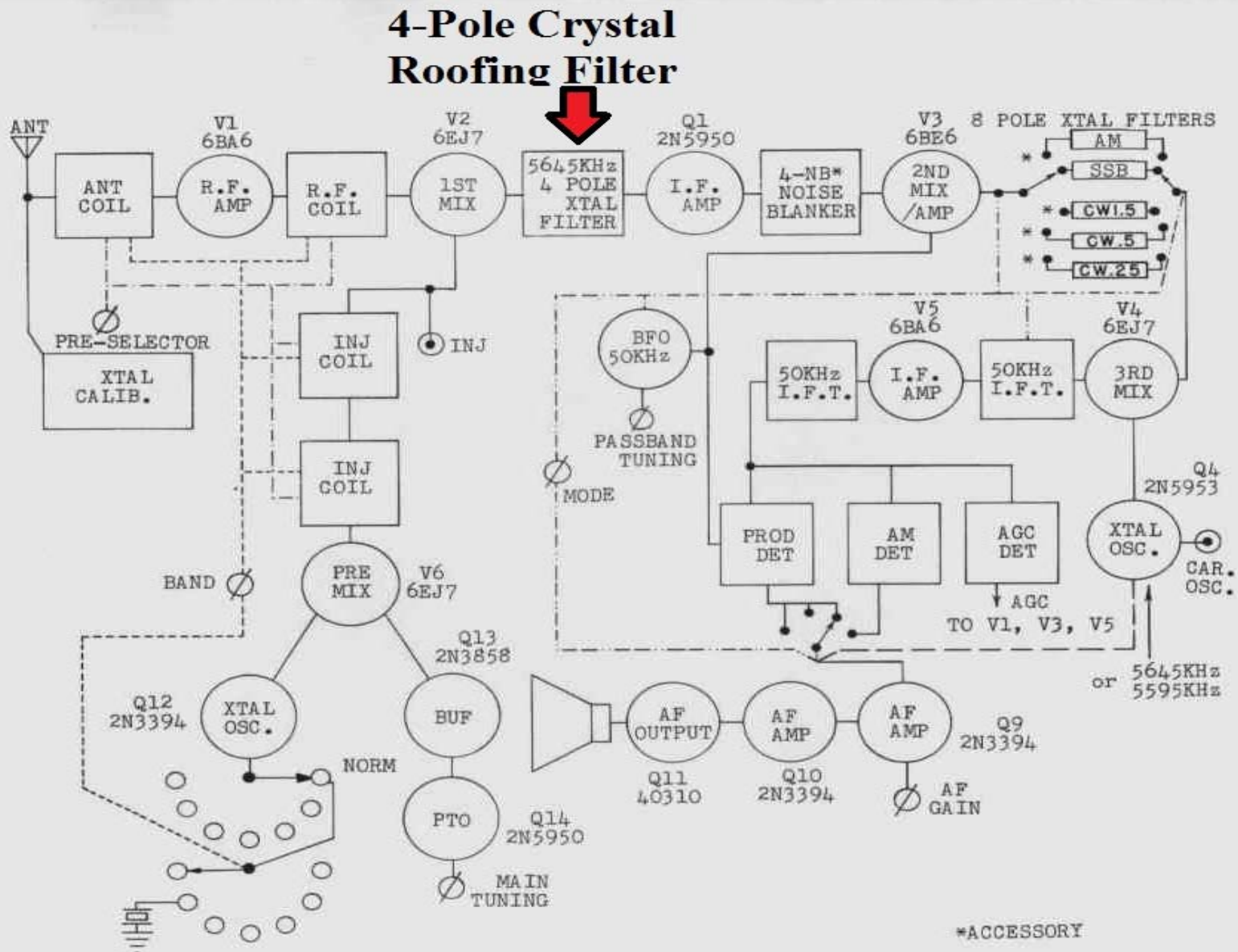


L / C vs. Crystal in the Last I.F.



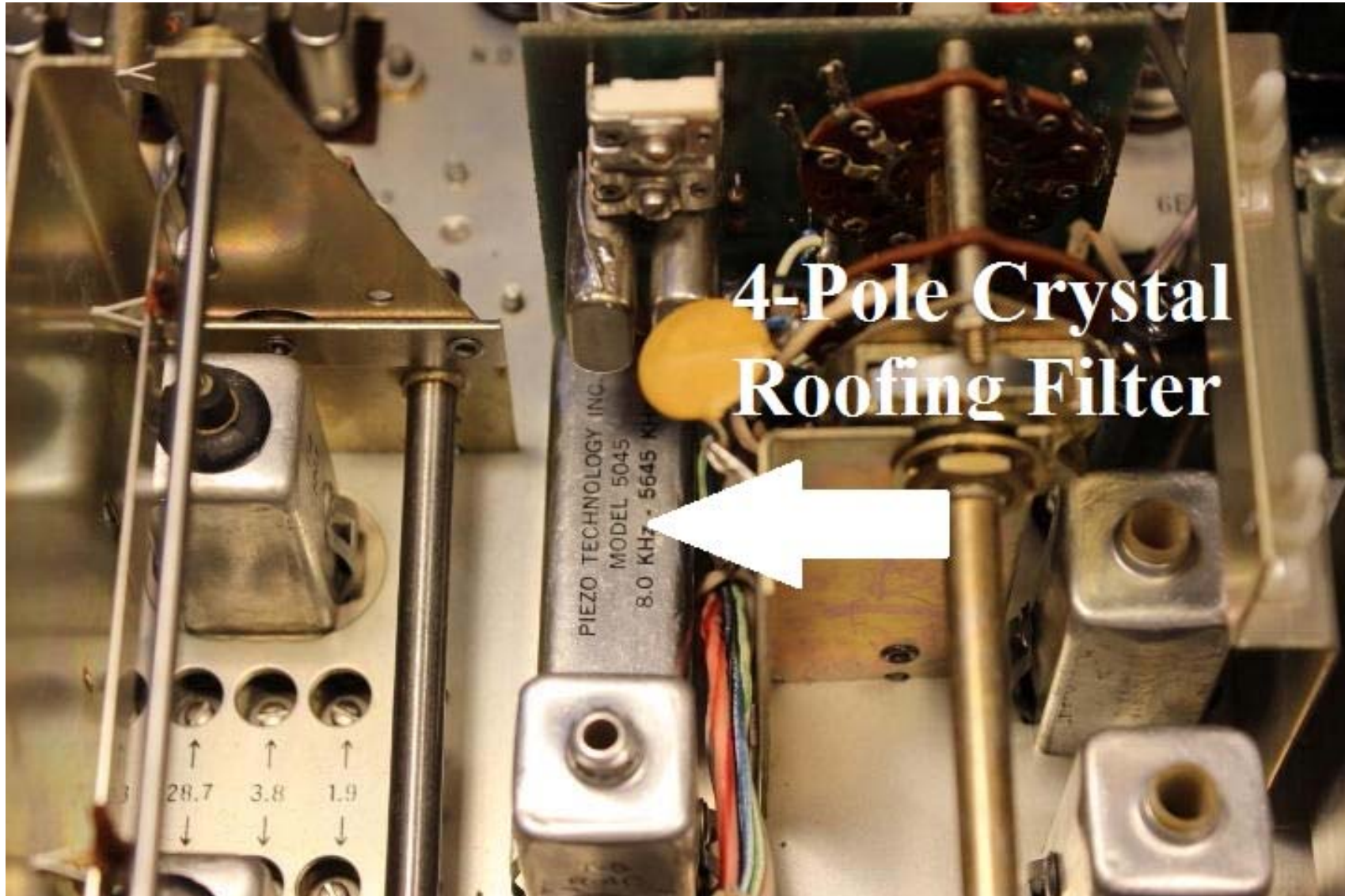


R-4C 4-Pole Roofing Crystal Filter



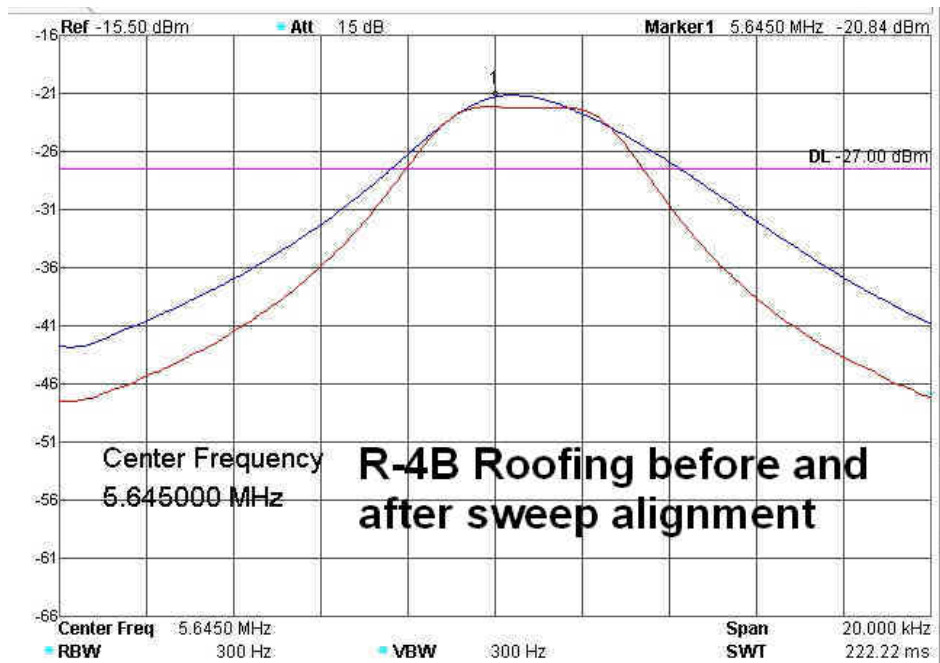


R-4C Roofing Filter

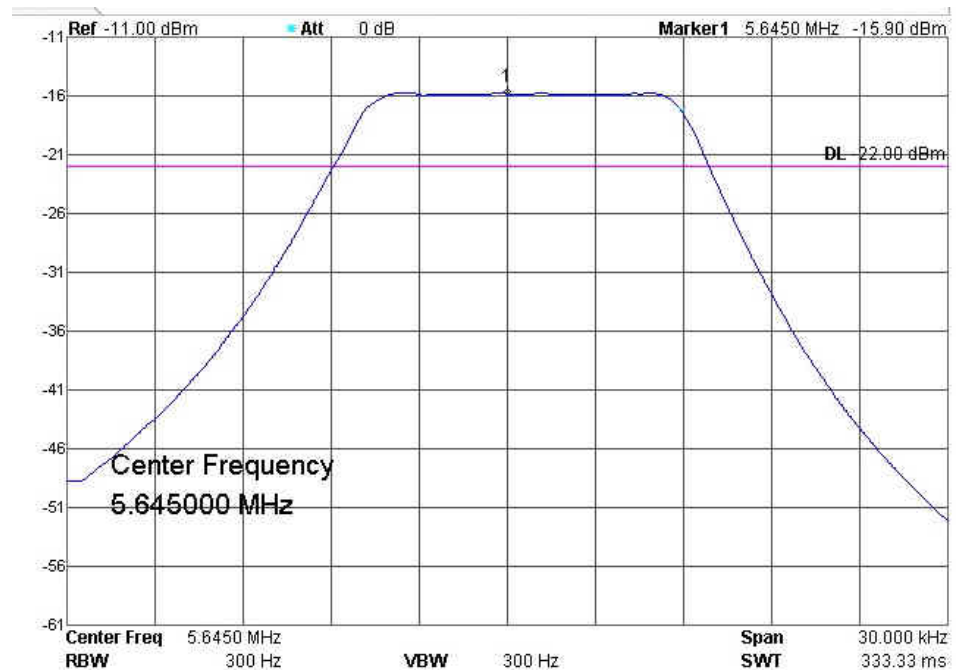




2-Pole Crystal Roofing Filter



4-Pole Crystal Roofing Filter

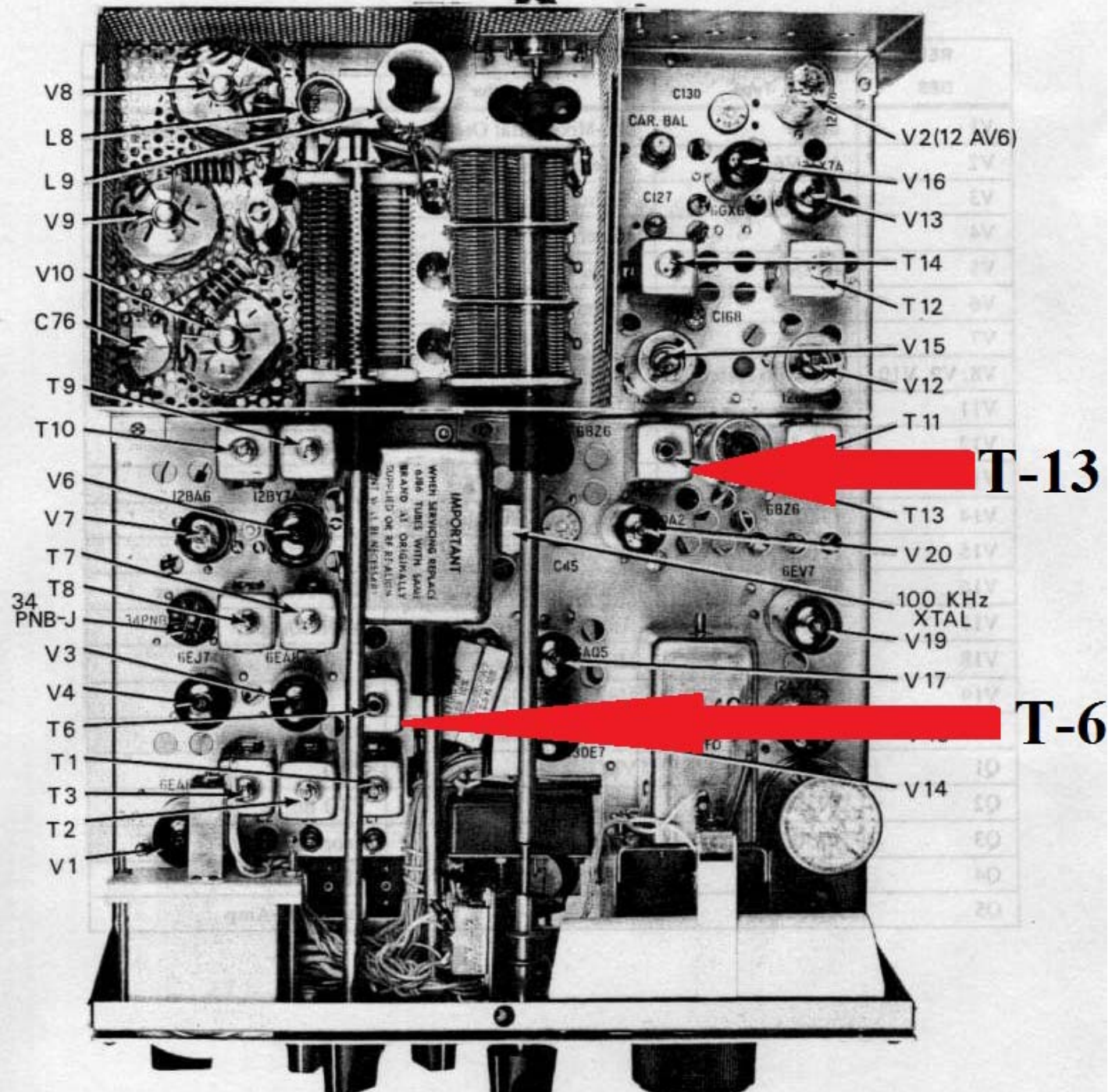




Drake TR-4CW / R.I.T. Filter Alignment

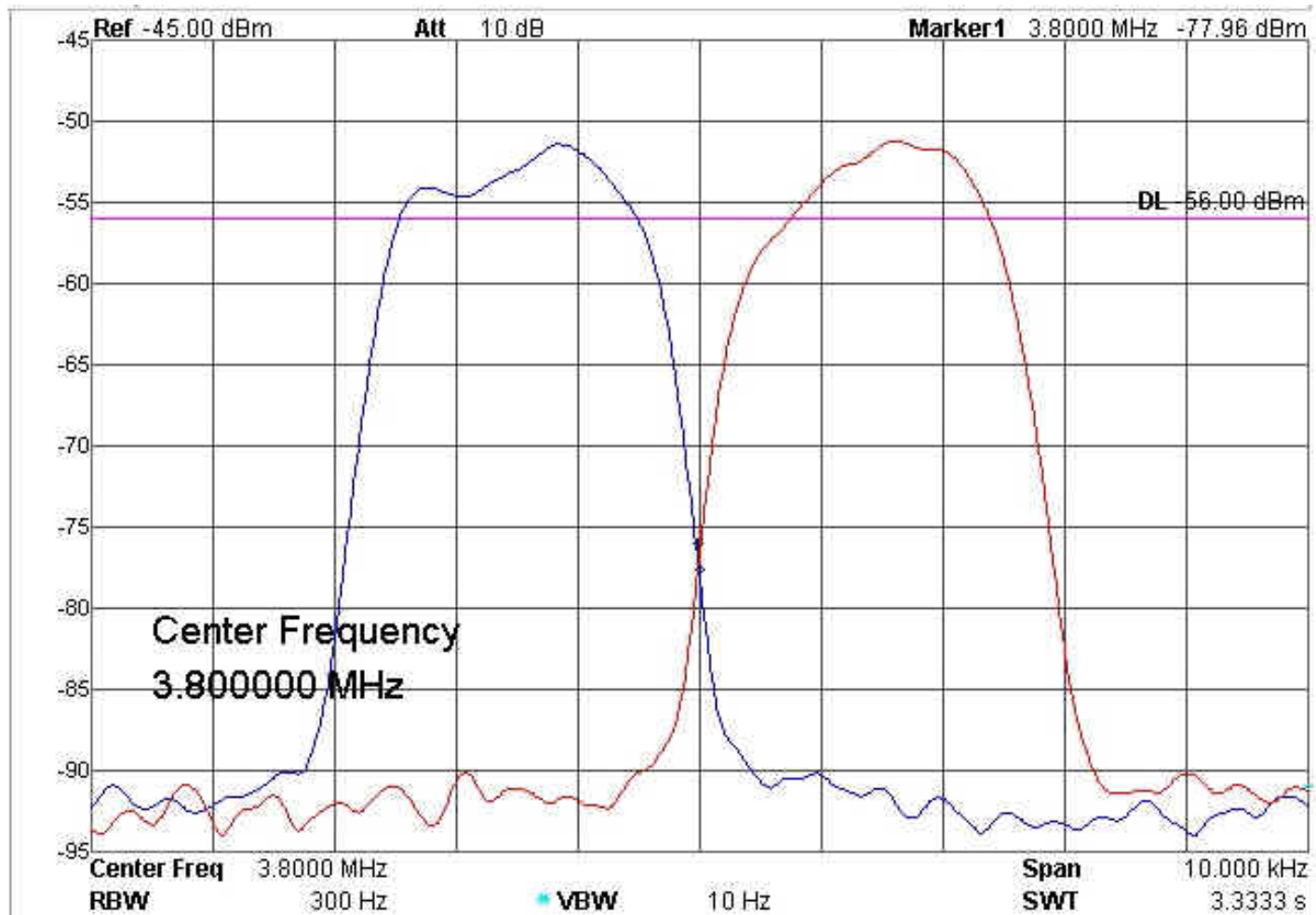


DRA



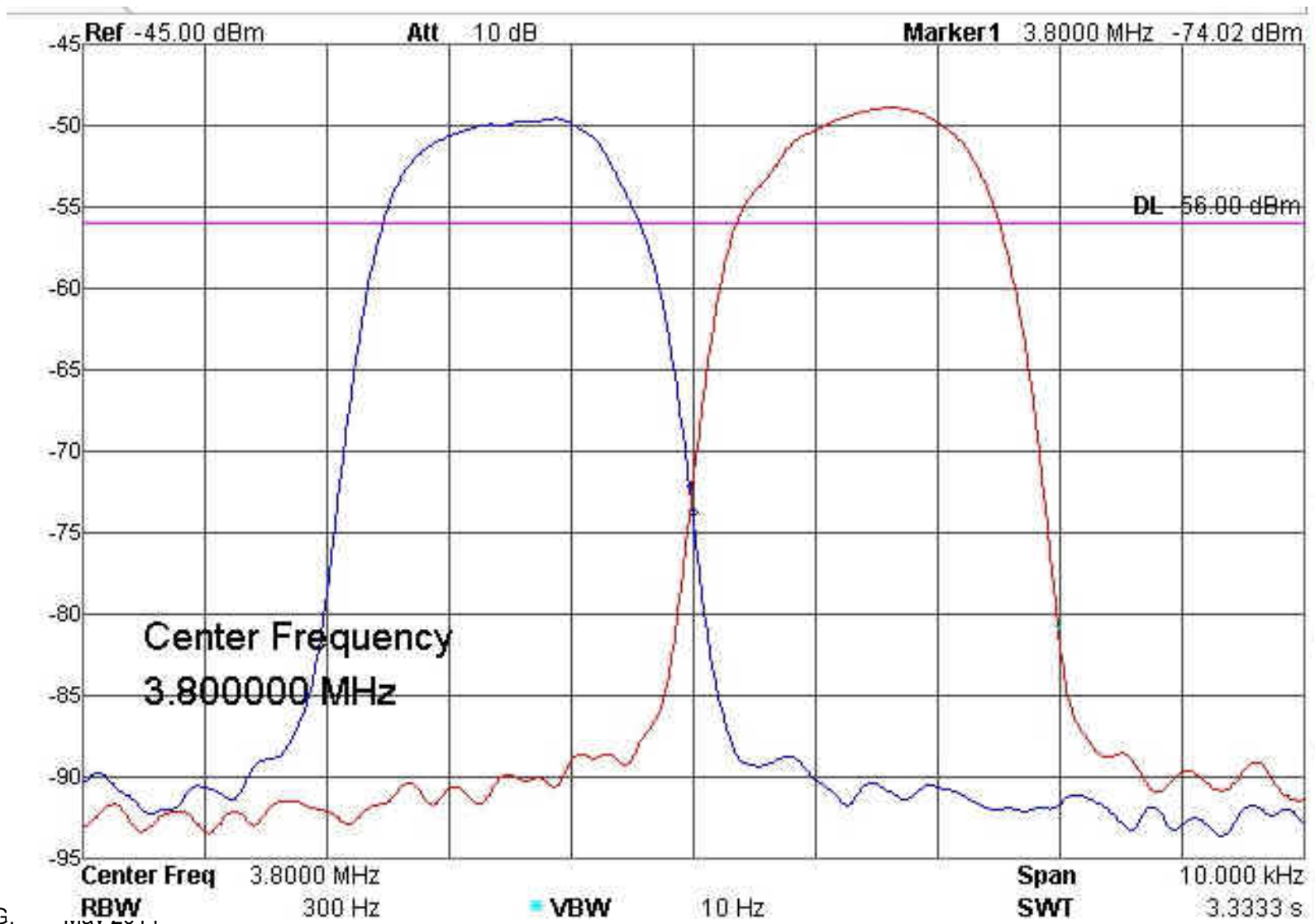


TR-4C Alignment of Matching Transformers T-6 & T-13 Before Sweep Alignment





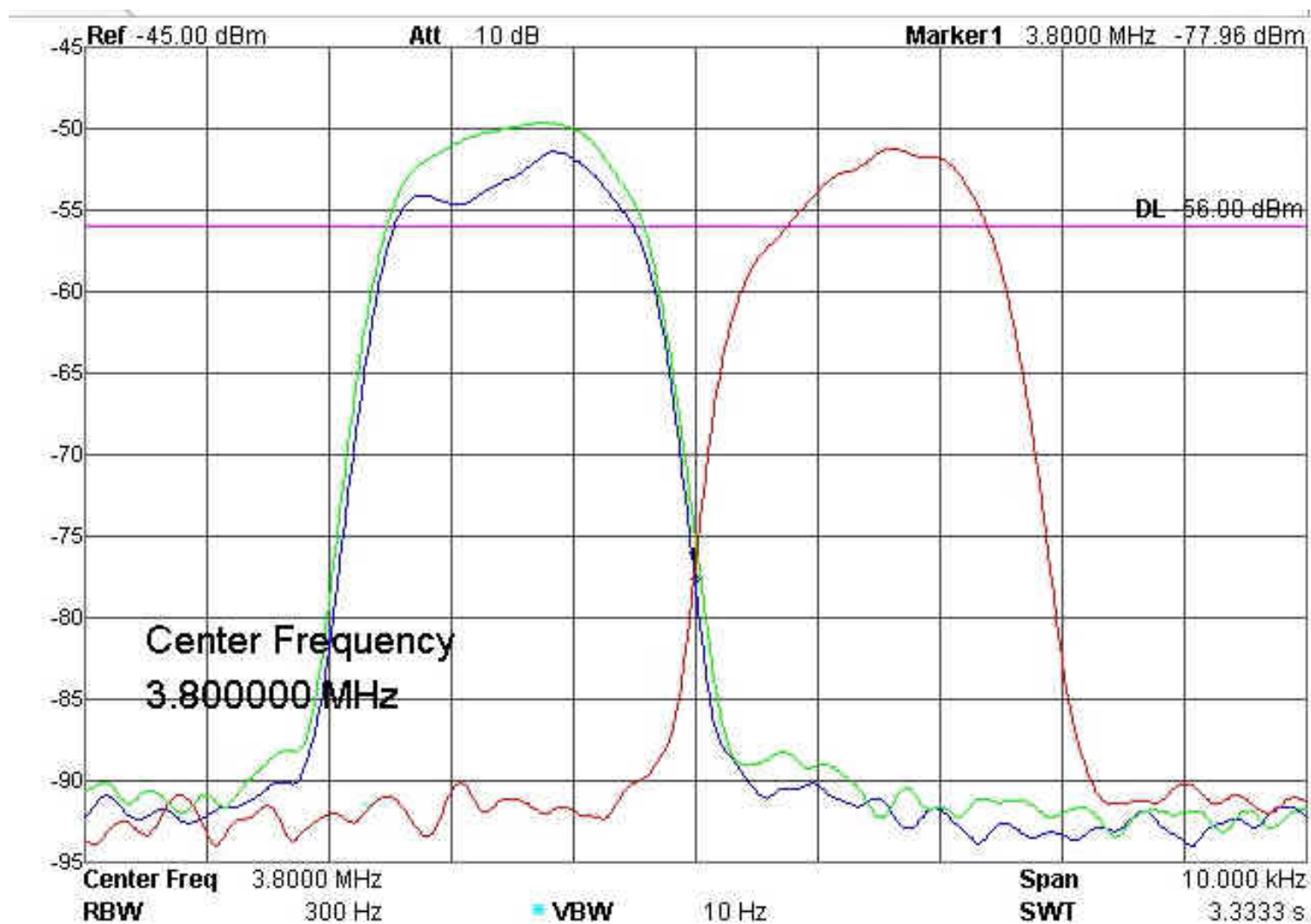
TR-4C After Alignment Both Correct



M.V.G.

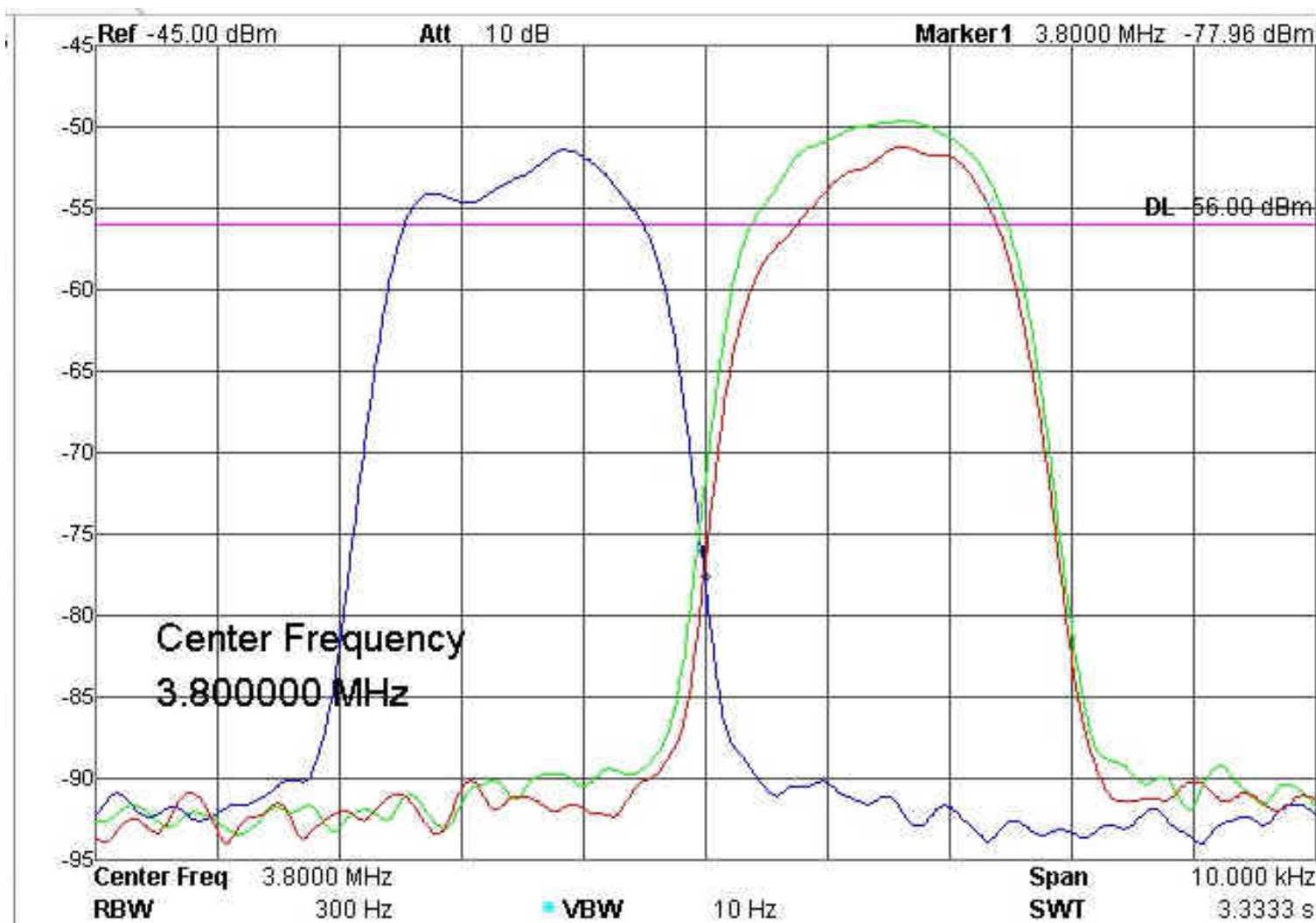


LSB Before & After Alignment





USB Before & After Alignment





TR-4CW
Stock 2.1 kHz Wide
SSB Crystal Filters
vs.
INRAD
2.5 kHz Wide
SSB Crystal Filters

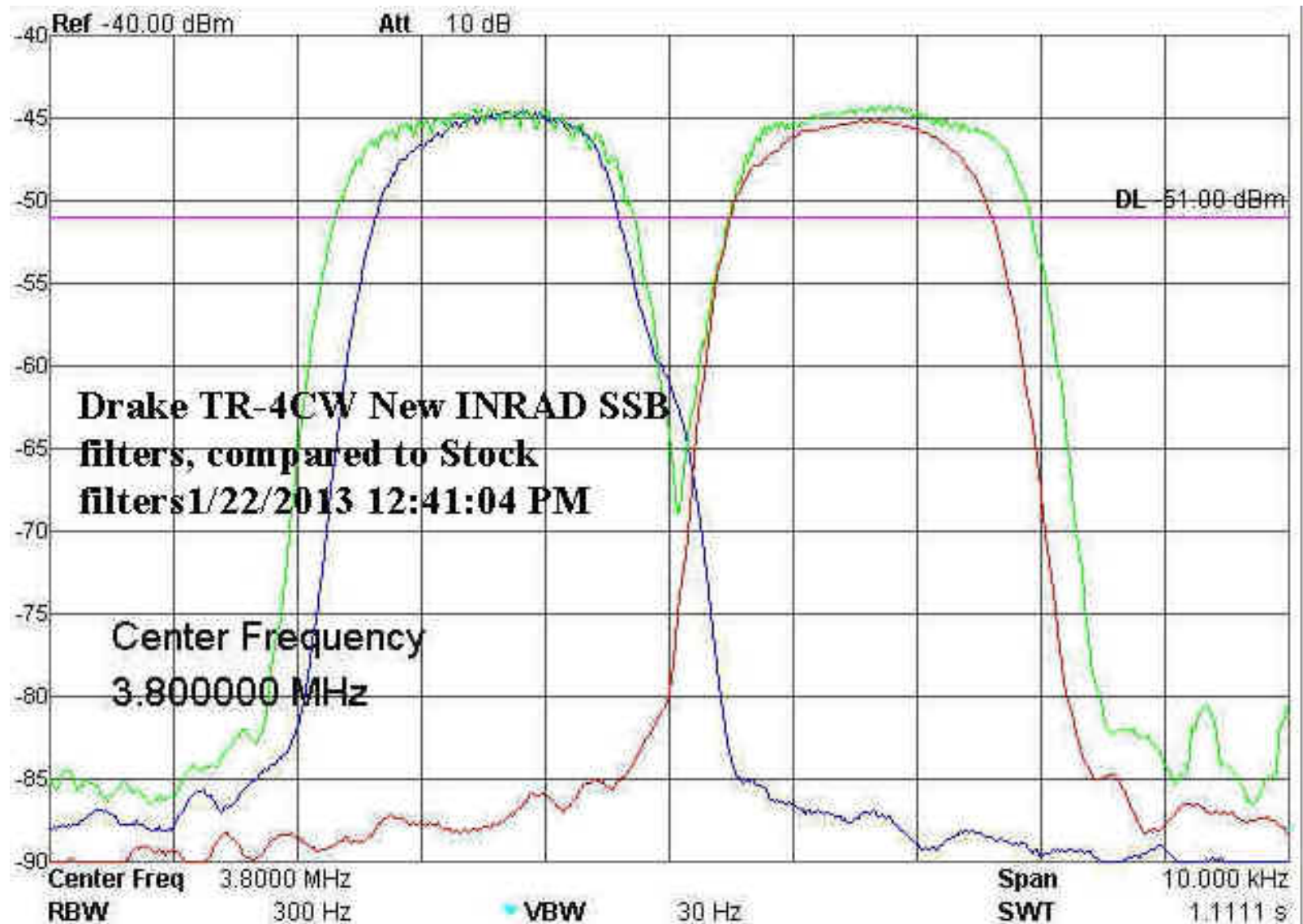


TR-4 INRAD Filters





TR-4C Filter Comparison





Drake TR-7A





TR-7
Stock 2.1 kHz Wide Filter

VS.

INRAD 2.8 kHz Wide Filter



Stock 2.3 kHz
Filter

Replaced
by

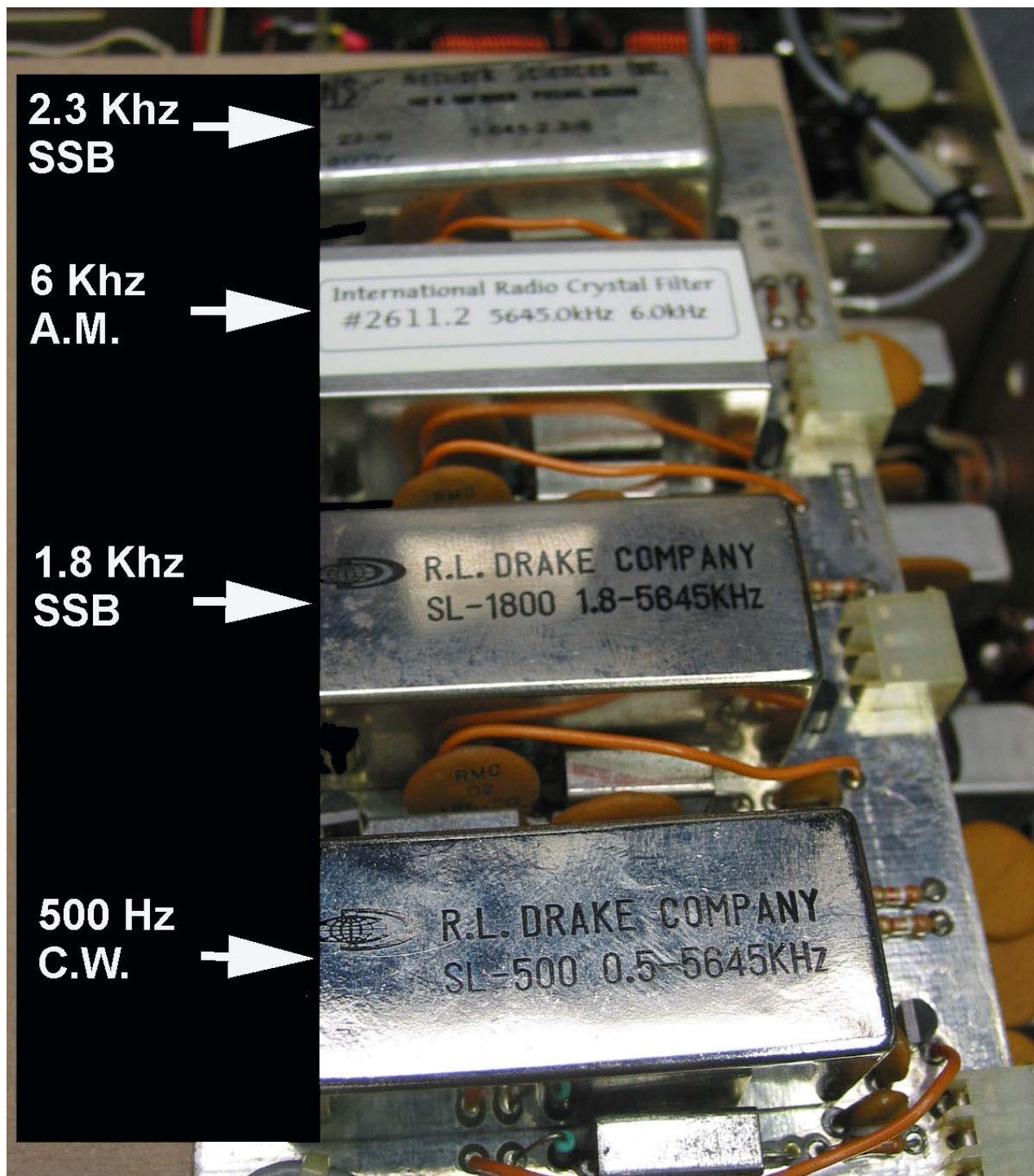
2.8 kHz
Filter

2.3 KHz
SSB

6 KHz
A.M.

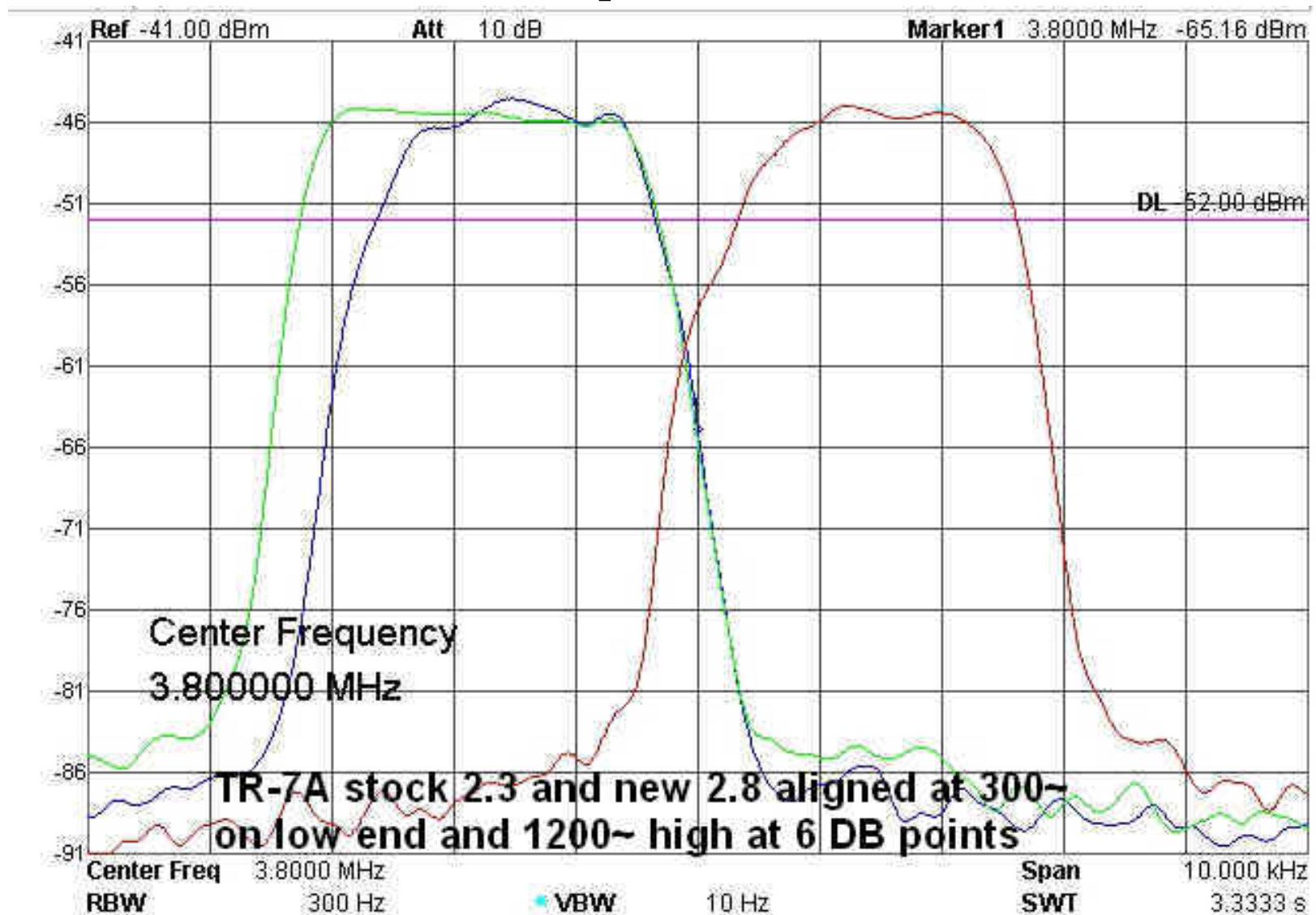
1.8 KHz
SSB

500 Hz
C.W.





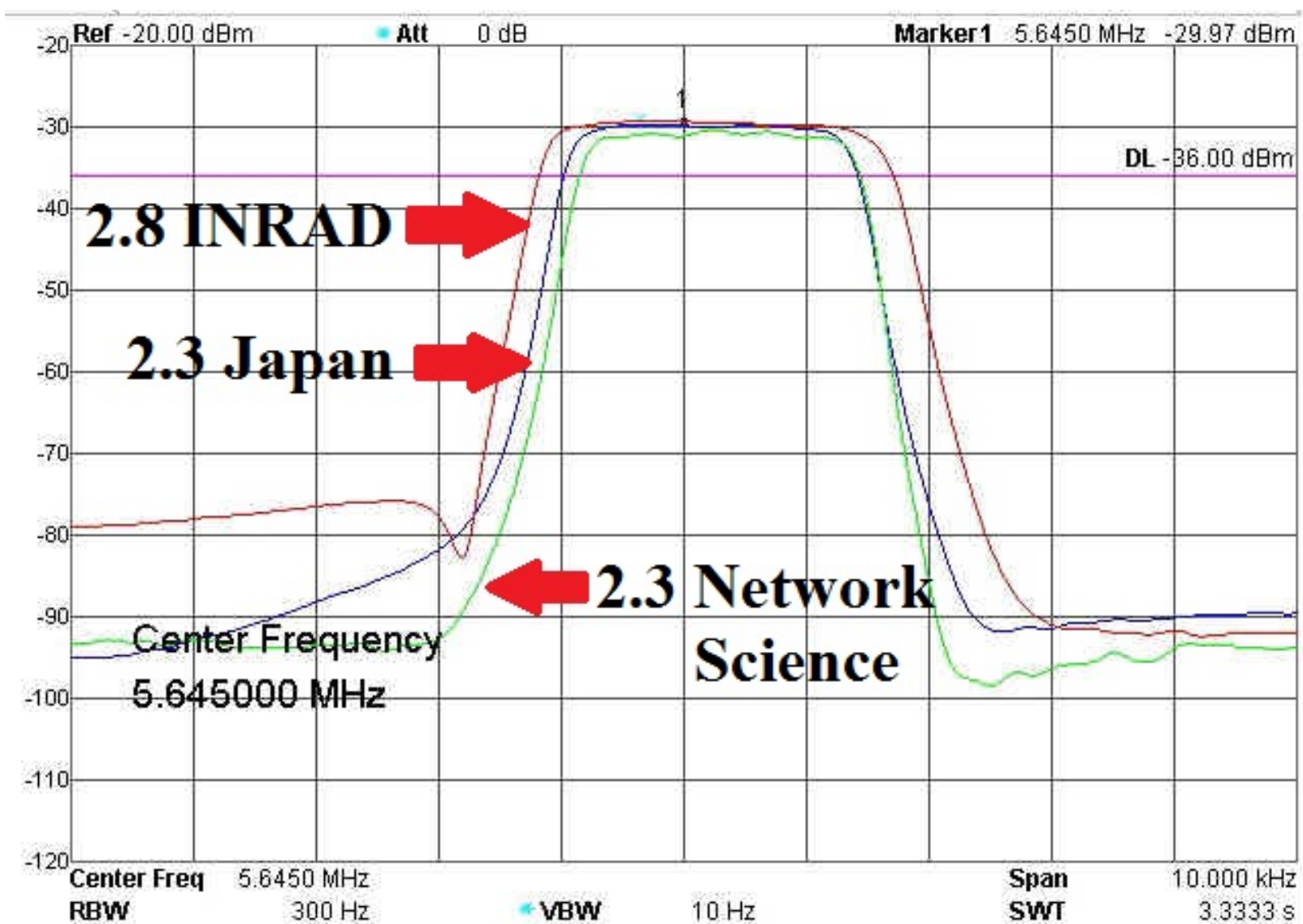
INRAD Compared to Stock LSB





TR-7 Filters

2.3 Network Science, 2.3 Japan, 2.8 INRAD



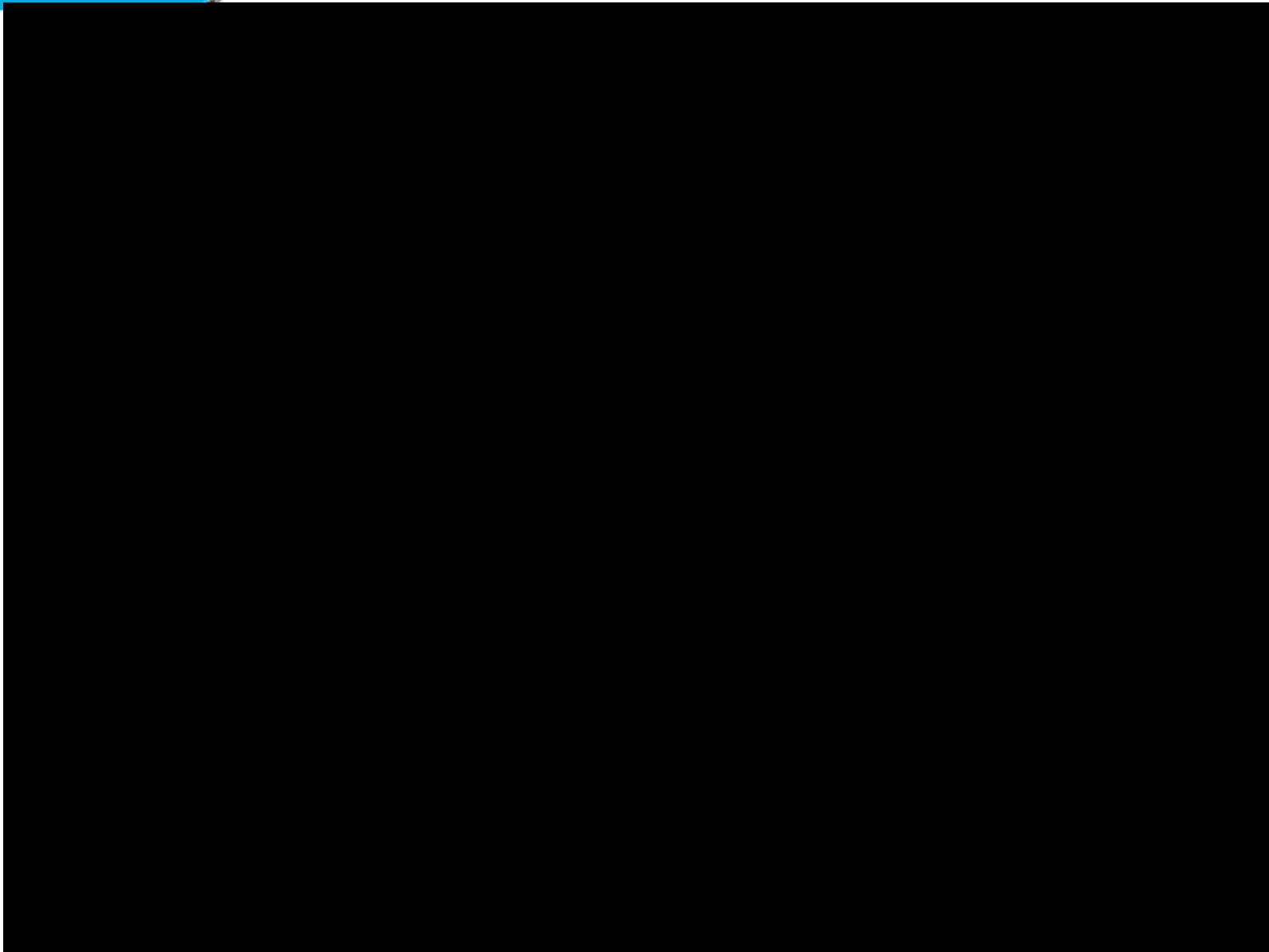


TR-4C

“Filter Matching”

Using a Audio Sweep Generator and Spectrum Analyzer

DRAKE





*Thank You
For Watching*



Jeff Weinberg – W8CQ –
www.harbachelectronics.com

HAMVENTION BOOTH
2208, 2209, 2010 & 2211

**P
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ES4AC-3 AC-3 Power
Supply Rebuild Kit



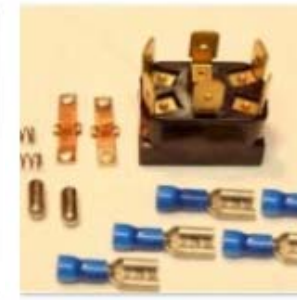
ES4AC-4 AC-4 Power
Supply Rebuild Kit



PM-400 Replacement
Power Supply Module



RA-T4X/B Plug-In Relay
Adapter Kit



SW-400 Power &
CW/SSB Rocker Switch
Rebuild Kit



RA-TR4 Plug-In Relay
Adapter Kit



RES-400 5-Pack of HV
Safety Resistors



RES-402 50KΩ 50W Bias
Resistor



RES-407 5KΩ 10W
Resistor



SS-400 Soft-Start
Module



RY-L4B Replacement
T/R Relay



RY-TR4C/T4XC
Replacement T/R Relay



SK-401 Soft-Key Keying
Interface



SRB-400 AC Power Cord
Strain Relief



SRB-401 Remote Cable
Strain Relief



Prize Donator

Donnie Garrett, WA9TGT

Drake 4-Line Replacement

Drake A/B 4-Line Dial Windows

OUT OF STOCK

Drake C-Line Dial Windows

Drake TR-4/S Dial Windows

Replacement P/S Filter Capacitor Module Fits 84/84A/84B

4-NS Dummy Plug For 84C

NEW!

34-PNB Dummy Plug For TR-8C

Blue Dial/Meter Filters for A/B/C 4-Line and T-Line

84A/84B/EW-4A/2C AF Gain Control

PBT Knob 1/4" to 1/8" Reducer Kit

NEW!

C-Line PTO Shaft Rubber Sleeve

Plate / Load & RF Tune Shaft Couplers Fits T-4VB and TR-4 series

NEW!

T-Line PTO Shaft Rubber Sleeve

Drake 2-Line Replacement

2-Line Fuses

PBT Knob 1/4" to 1/8" Reducer Kit

Capacitor Re-cap Kits Fits 2A/2B

Replacement P/S Filter Capacitor Module Fits 2A/2B/2C

2A/2B AF Gain Control

Dial Glass Window "Red" Adjustment Pin

Replacement 2B Power Cord

100Kc Crystal Calibrator Fits 2A/2B/2C

2-Line Lamps

NEW!

Replacement 2A/2B Dial Springs

30 Meter Receive Crystal


Low Cost Band Crystal For The 2A/2B/2C



Prize Donator

Ron Baker, WB4HFN


**Welcome to the
WB4HFN Amateur Radio Website**



[Drake Amateur
Radio
Equipment](#)

This section is dedicated to the vintage radio equipment from the R.L. Drake Company. Life before solid state devices, tubes were the hot ticket items. Featuring radio equipment from the 1960's and 70's era.

[Heathkit Home Page](#)
[Kenwood Net Home Page](#)



[Collins Amateur
Radio Equipment](#)

This section is dedicated to the vintage radio equipment from the Collins Radio Company. Featuring the "S" Line radio equipment from the 1960's and 70's era.

[Radio Document Resource Home Page](#)
[Radio Modifications Home Page](#)



Prize Donator

Mike Bryce, WB8VGE

The Heathkit Shop



L4 Interface



L4R



AC4R

Flea Market Space #FW509-FW510



K4QU, John March
mikek4qu@gmail.com

Prize Donator



HAMVENTION BOOTH 3421

Custom Made Parts



R8 Tuning Knob Insert

Custom machined aluminum
\$20.00 ea



TR-7 End Panels

Custom machined textured ABS plastic
\$10.00 / set (L&R) Other sizes available



73CNC.COM

Prize Donator

NORTH HALL Space # 220 and # 221



**A new weighted spinner knob designed for the Drake
4 Line Radios.**

Fits all 3 and 4 Line models.



**Weighted Spinner type VFO Knob for all R.L. Drake Radios
including the:**

Drake: R-4, R-4A, R-4B, R-4C R-7, & R-7A Ham
Receivers

T-4X, T-4XB, T-4XC Transmitters, TR-3, TR-4,
TR-5, TR-7 TR-7A Transceivers



These 3-500Z High Performance Plate Caps are precision machined from Billet 6061 Aircraft Grade Aluminum. They are designed to maximize the heat dissipation from the plate (anode) pin and keep the Plate Pin Seal well below the maximum operating temperature specified by Eimac even under high duty cycle use. With over 3 times the surface area of the original Eimac plate cap and DIRECT contact with the Plate Pin generous amounts of heat are removed.



Prize Donator



Sherwood Engineering

<http://www.sherwood-engineering.com>

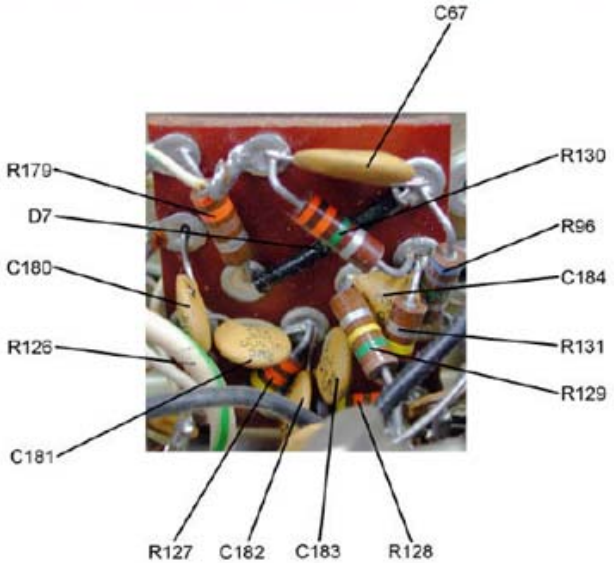

<http://www.NC0B.com>




Prize Donator

K4OAH Drake Parts Locator CD's

Home 2-B CD 2-C / 2-NT CD **A-Line CD** B-Line CD C-Line CD TR-4 CD TR-4C CD **Ordering**



PRODUCT	PRICE
 Drake A-Line Service CD	\$25 Postpaid US & Canada

VIEW Complete part full color photos, showing their location on the PC board or chassis.

VIEW Full color, high resolution photos of the chassis and each PC board (excluding PTO) with each part identified.

- Hi resolution scans of original manuals for the R-4A and T-4X plus related models C-4, FS-4, L-4B, MN2000, W-4, ++
- Additional information, including earlier Schematic Versions, Errata, Update and Alignment pages, along with a copy of Drakemod 6A. Also included is never before published data on the Passband Tuner, both electrical and mechanical.



Prize Donator

UKA-3 Universal Keying Adapter



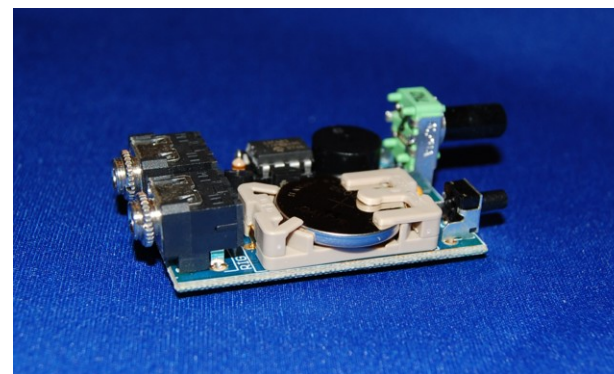
<http://www.hamgadgets.com/>

HAMVENTION INSIDE BOOTH BA482

MK- 1 Master Keyer



Low Power Iambic Keyer Kit



HamGadgets.com



Prize Donator

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HAMVENTION INSIDE BOOTH FW 2745 TO FW2749



AC-4 Upgrade <http://www.hayseedhamfest.com/>

- **Rebuild kits for:**
- AC3-AC4
- 1-A Receiver
- 2-A Receiver
- 2-B Receiver
- 2-C Receiver
- 2-NT Transmitter
- R-4 Receiver
- R-4A Receiver
- R-4B Receiver
- R-4C Receiver
- T-4/T4X/B/C Transmitter
- TR-3 Tranceiver
- TR-4 Tranceiver
- TR-4C Tranceiver
- TR-6 Tranceiver



Flea Market Space #FW1737-FW1738



Alan Phillips , KC9YS, 630-879-1132

[Previous Menu](#) [Drake Home Page](#)

Drake B-Line Chrome Center Replacements

[E-Mail Me For More Details To Purchase](#)

Spun aluminum inserts for the Drake "B" Line radios and TR4 transceiver. Listed below are a series of pictures of the new inserts and shows how their installed. To make a purchase on any product, or for further information please e-mail or call 630-879-1132. Thanks, Alan / KC9YS

Spun Aluminum B-Line Knob Inserts - \$6.50 Each

Drake "B" Line Complete Knob & Chrome Insert - \$20.00

Shipping Cost not Included



New B-Line And TR4 Spun Inserts



THE RADIO LAB WORKS

WWW.RADIOLABWORKS.COM

Blue LED Backlighting for
all Drake 4-Line and 7-Line Equipment

- Plug & Play (4-Line) or Simple Soldering (7-Line)
- Ten year continuous operation life expectancy
- 1/10th the current draw
- Eliminates Gel Filter use
- Assembled in the U.S.A.
- Over 2000 currently in service



D.A. Buska Engineers LLC

Owned and Operated by Don Buska N900
engineering@radiolabworks.com



[www. Radiolabworks.com](http://www.Radiolabworks.com)

Drake 4-Line Solid-State Blue LED illumination

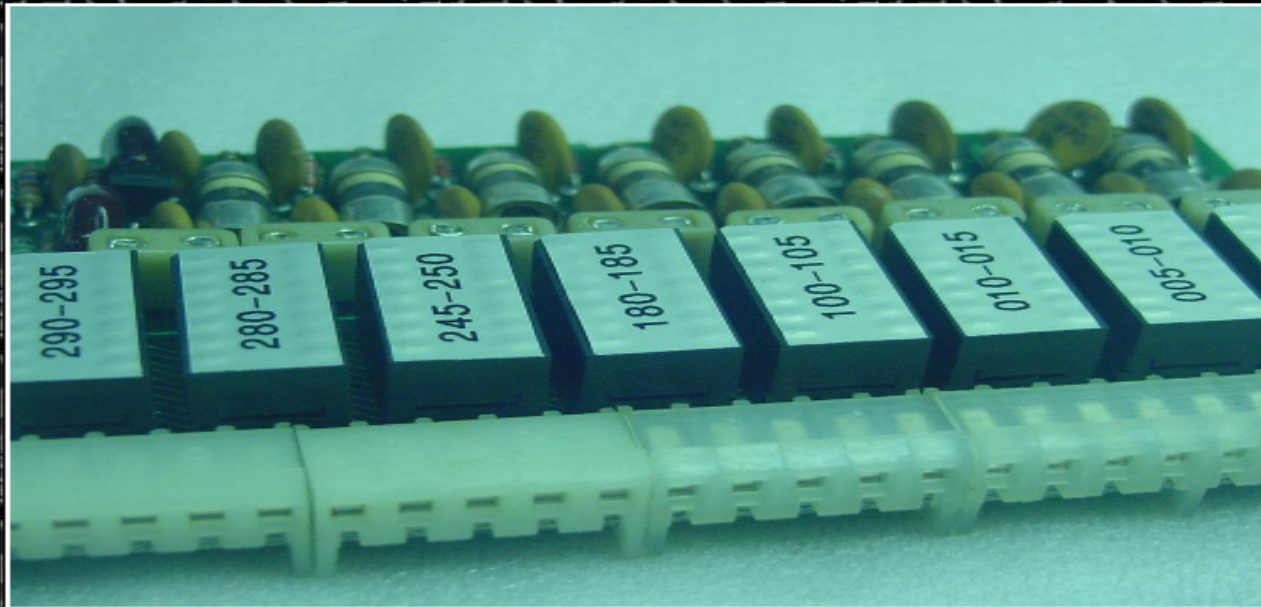




<http://www.radiolabworks.com>

Drake TR7 and R7 AUX7 Band Modules

For those who have the installed AUX7 board in their TR7 or R7 you can now fill in those blank positions with your most frequently used bands. Avoids having to use the UP and DOWN buttons on the radio to cycle through the 500KHz band segments outside the normal band selections.





LA6OP, Sindre Torp: <http://home.online.no/~sindtorp/>

Drake Museum

[Main](#)

LA6OP SINDRE TORP **NORWAY**

[Speaker at The Dayton
Hamvention 1999, 2000, 2002
and 2004; Moderator of The Drake
Forum 2001](#)

[E-mail](#)

[Drake equipment list](#)

[Drake wanted](#)

[Service equipment wanted](#)

[Drake links](#)

[Some pictures](#)

[There will come more here
with detailed pictures of rare
units!](#)

Welcome to my homepage, and the World's largest collection of equipment made
by





K3HRN, Thom LaCosta: <http://www.zerobeat.net/drakelist/>

- DRAKE**
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Drake List Home Page



WinLink Wants YOUR Frequencies

If the ARRL has its way, you'll hear a lot of this in the bands!
Tell The League what you think about the latest push to mis-use the Ham Bands!

- [Drake Online Database](#)
- [Parts Sources, Service, Tips](#)
- [DrakeList Web Based Forum](#)
- [New! Drake Mailing List Online Forum](#)
- [New! DrakeList IRC Chat](#)
- [The OLD Drake Web Based Message Board](#)
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- [New! Join the Drake Mailing List](#)
- [The NEW Drake Mailing List Archiv](#)
- [The Drake Reunion Video Tape](#)

The Drakelist

	Bulletin Board System Description of this system	3 Posts 3 Topics	Last post by k3hrn in Registration on September 23, 2008, 04:25:46 PM
Drake Equipment			
	General Discussions Non-Technical Discussions(Operating, contests, ARRL,FCC)	98 Posts 54 Topics	Last post by w8psg in Headphone monitoring dur... on January 15, 2012, 08:27:42 PM
	Technical Discussions Technical Discussions relative to R.L. Drake equipment	588 Posts 259 Topics	Last post by W1KF in Re: PTO for a TR-5 like ... on April 11, 2012, 11:24:28 AM

M.V.G.

May 2014



Bob Magee , W7AWK 509-750-7589



Recreated TR-7 / R-7 Service Kit

HISTORY - Several years ago I purchased a TR-7 and wanting to be able to work on it obtained a copy of the Service Manual. I soon learned to do any serious work a Service Kit sold by DRAKE 20 - 25 years ago as an option was required. These kits nowadays are essentially unavailable. In a year of looking the only one I saw sold was on E-Bay going for \$320. I started exploring the possibility of making my own by asking what the design was like and collecting parts. As others learned of my project several asked to be included until I determined a small lot might be produced.

The biggest problem I have had is finding parts. The printed circuit circuit cards were professionally designed and supplied. But the various connectors used by Drake were by MOLEX who only sells in very large quantities. I was lucky and found several components which had been setting in the ware house back rooms for years.

Over 75 kits have been supplied with very positive feedback

OFFER - The cost of a kit is \$60 plus postage. In the USA and using priority mail the total cost is \$64.80. In the EU countries air letter postage is \$8.90 USD making the total \$68.90 USD. My Payapl ID is w7avk@arrl.net

If interested or have questions I may be contacted by e-mail at: Bob.W7AVK or by phone at [509] 750-7589.

These images are provided for informational purposes for the Drake community.

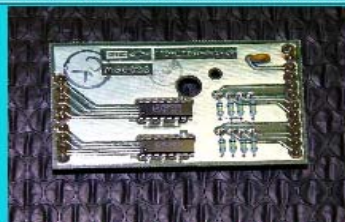
(photos of DRAKE gear by KF4FJH - RF Buchanan)



5 Sizes Extender Boards in 13 Set by DRAKE



13 Extender Board Set I Supply



DIGITAL JUMPER Board by DRAKE



DIGITAL JUMPER Board I Supply



Other resources documented on WB4HFN.COM

- KC9YS - TR-4 Knobs and Inserts, Space #2328 - 2330
- W2ENY - Drake Web Page
- Charlie Talbott TR-4 Main tuning knob inserts
- Allen Martin / W7APM – Cabinet screws, w7apm@mtaonline.net



PRIZE DRAWING

Goal was to make time for presentations.

Tickets were pre-drawn in the presence of honest witnesses.
Stubs handed out randomly as you entered.

Only 1 prize per person.

Please claim your prizes in the hall after we dismiss.

The winning ticket numbers are.....



Questions & Answers

Evan, K9SQG

Jeff, WA8SAJ

Gary, W8PU

Ron, WB4HFN

Mark, WB0IQK



The Path Ahead...

DRAKE



M.V.G. May 2014