



Drake Vintage Radio
Repair And Restoration

Email: wb4hfn@wb4hfn.com
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Work Order Date:	Friday, February 23, 2018
Invoice Number:	180225

Model/Serial No.:	Drake R4C	26968
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Transmit Power:	Power Output (Watts)
160 Meters	1.900 MHz
80 Meters	3.800MHz
40 Meters	7.200MHz
20 Meters	14.200MHz
15 Meters	21.200MHz
10 meters	28.200MHz

Calibration And Reference Settings:	
Receiver Internal Calibrator Set At:	14.200MHz
Receiver ACG Bias At Idle / No Signal In:	-1.20VDC
Receiver S-Meter Calibration Set To:	40/S-9 = 700uV
Signal Level Meter Reading At S-9:	25.00uV
Notch Filter: Null Depth In dB:	>20db/down noise pulse
Noise Blanker: Blanking Depth In dB:	>20dB down w/carrier
Transmitter Final Operating Voltage:	
Transmitter Final Output Device Bias:	
Transmitter Carrier Balance Set:	
Transmitter Neutralization Set:	
Transceiver Feedback Audio Null Adj:	

Receiver Checkout:		
Band Setting	Measured Sensitivity	Notes & Calibration Offset
1.900MHz	.15uV	
3.800MHz	.15uV	Indicated signal level is the lowest
7.200MHz	.15uV	audiable signal or CW tone that
14.200MHz	.15uV	can be clearly detected.
21.200MHz	.15uV	
28.200MHz		
28.700MHz	.15uV	
29.300MHz		

Additional Specific Radio Test Results As Listed:	
TR7, +10VDC Control Voltage Set:	
TR7, Master Oscillator Frequency:	
TR7, PBT Center Frequency:	
TR7, IF Center Frequency:	
TR4, 2nd Oscillator 40M Test Point:	
TR4, 2nd Oscillator 15M Test Point:	
TR4, 2nd Oscillator 10M Test Point:	
R4 A/B/C Master Osc Frequency:	5.645MHz
R4 A/B/C BFO Frequency Set:	50.000Khz

Parts List / Line Item Description	Qty	Cost	Line Total
1: Panel Lamp, #47, 6.3VDC, 150MA	2	1.50	\$3.00
2: VFO & Meter blue tint filters & white background	1	5.00	\$5.00
3: Drake Case Foot	2	3.50	\$7.00
4: Drake Case Foot Rubber Tip Protector	4	0.50	\$2.00
5: Transistor, 2N5953, J-FET, Mixer	1	3.50	\$3.50
6: Tube, 6EJ7, 3rd Mixer	1	4.50	\$4.50
7:			
8:			
Sub-Total - Parts & Line Items Listed Above:			\$25.00
Hours Of Service/Repair Labor: Refurbish, CW&S	7.50	\$40.00	\$300.00
Shipping Charges: 20x16x12 22# UPS Ground	1.0	\$23.60	\$23.60
Insurance ----- In the Amount of: \$500	5.0	\$1.00	\$5.00
Packing and/or New Box Cost, or, Deposit New Box	1.0	\$4.50	\$4.50
Total Charges			\$358.10

Payment Received

Date: 03/05/18
Amount: \$358.10

Summary Of Work Preformed	Repair Work Details
1: Found crystal oscillator not working, replaced J-FET transistor	Refurbish radio, repair as needed, case paint is in good condition
2: Found 3rd Mixer tube very noisy, replaced 6EJ7 tube	
3: Replaced blue tint filters behind Meter & VFO, old filters faded	
4: Replaced white background filter in VFO window	> Type Of Service Requested: Refurbish
5: Replaced panel lamp behind panel meter and VFO tuning assembly	> Return Old Radio Parts To Customer: NO
6: Repaired/aligned RF tuning rack, assembly had excessive slippage and hard tuning adjustment	> Repaint Case with Textured Finish: NO
8: Disassembled VFO assembly, cleaned, replaced bearing grease, mechanical adjustments, cleaned frequency dials and aligned dials to the operating frequency.	> Provide Estimate Quote: YES
11: Cleaned & lubricated all controls and adjustments	> Estimate Quote / Labor: \$300.00
12: Cleaned & lubricated all switches, checked contact switch alignment	> Estimate Quote / Parts: \$40.00
13: Cleaned & lubricated band switch using DeOxit, checked alignment	
14: Checked tubes for shorts & emission, pins cleaned & straightened	
15: Cleaned all tubes sockets, checked/adjusted pin clamp tension	
16: Cleaned & shined rear apron power and all interconnect connectors	
17: Replaced broken/missing Drake case feet	
18: Replaced worn/missing Drake case foot rubber protection bumper	
19: Checked noise blanker with pulse generator reducing noise down greater than 20dB below normal signal levels.	
21: Cleaned dust & dirt from chassis top/bottom with air hose & brush	
22: Chemical degreased chassis & tube sockets removing grease & dust	
23: Performed complete chassis washing/scrubbing & degreasing	
24: Performed high pressure steam cleaning top & bottom of chassis.	
25: Performed any needed chassis damage repair from rust/corrosion	
26: Applied clear coat sealer to chassis to prevent metal deterioration	
27: Performed external cleaning, front panel, knobs, and case	
28: Performed case paint touch-up, small scratches & chipped areas	
29: Cleaned & polished & buffed case.	
30: Performed complete circuit alignment according to manual	
31: Final assembly, 1 hour burn-in on bench, on-air contact for test	
32: Checked for proper operation in Transceive mode, cross aligned for best match, RX & TX VFO matched and sync properly	
33:	
34:	
35:	

General Information / Inspection / Estimate Notes

- Shipping box damaged, ripped and crumpled side, inadequate
- to safely ship radio and prevent possible damage.
- Will use new box for the return shipping.
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Thank you for your Drake service and repair work.
Please contact me if you have any questions
regarding this invoice at: wb4hfn@wb4hfn.com
Thanks Again, Ron