RECEIVER CONDITION ASSESSMENT · NO COVERS REMOVED

Collins 51S-1 — Field Inspection Form

TOTAL TIME ≈ 60 MIN
MARK EACH LINE P / F / N/A

Before starting: do NOT warm the radio up.

GEAR — DMM · headphones or 4 Ω/600 Ω speaker with leads · screwdriver · reference receiver or SDR dongle · antenna T or switch · 3–6 m wire antenna · dim-bulb tester or variac if available · step-down transformer if the set is 115 V.

PHASE 1 — POWER OFF

10 MIN

#	DO THIS	PASS	CONCERN	P/F
1	Smell the vents	Neutral, dusty	Burnt phenolic, mildew, rodent urine	☐
2	Torch through top & bottom covers	Clean, original-looking	Bulging or leaking electrolytics, melted wax, nesting debris, modern parts	☐
3	Read transformer primary voltage & frequency rating on rear plate	230 V or dual primary, 50/60 Hz	115 V only → needs step-down. 60 Hz only → flag before powering	☐
4	**Tuning knob, full range, 3–4 sweeps**	Buttery smooth, even weight	Gritty, stiff, notchy, slipping = **dried PTO grease, specialist job**	☐
5	Watch counter through the sweep	Tracks smoothly, clean rollover	Sticks, jumps, misaligned digits	☐
6	Click MHz switch through all 30 positions	Crisp, identical detents	Vague, loose or missing detents	☐
7	Work RF gain, AF gain, rejection tuning, mode, AGC	Smooth, no wobble or grinding	Scratchy, loose, gritty	☐
8	Rear panel inspection	Correct fuse, original connectors, sound cord	Nail or foil in fuse holder, extra holes, added jacks, frayed cord	☐
9	**DMM: AC plug pins → chassis, power switch ON**	Very high / open	**Low reading → STOP. Do not power up.**	☐

PHASE 2 — POWER UP

10 MIN

10	Connect speaker or phones to rear terminals (GND + 4 Ω or 600 Ω)	—	No internal speaker fitted. Skip this and the set will seem dead	☐
11	Set RF gain max clockwise, AF gain low-medium, mode AM, AGC SLOW	—	—	☐
12	**Bring up slowly on dim-bulb or variac. Warm 60 sec**	Bulb dims after inrush. No smoke or smell	**Bulb stays bright → STOP, shorted supply**	☐
13	Check tube glow through vents	Filaments lit	Dark tubes, or one running red	☐
14	Advance AF gain, listen	Smooth white-noise hiss	Silence, crackling, motorboating	☐
15	Listen for hum	Faint hum OK	Loud 50/100 Hz not affected by AF gain = filter caps gone. Expected on an unrestored set — price it in	☐

PHASE 3 — PTO & DIAL

12 MIN

16	Mode CW or USB. Engage 100 kHz CAL. Select 14 MHz	—	—	☐
17	**Zero-beat 14.000, set dial hairline to 0. Then zero-beat every 100 kHz marker up to 15.000**	Every marker within ±1 kHz	Growing or erratic error = tired PTO	☐
18	Backlash: zero-beat 14.500 approaching from below, note dial. Repeat approaching from above	Difference under ~500 Hz *(rule of thumb, not a Collins spec)*	Larger = worn gear train or dial drive	☐
19	Zero-beat a stable carrier in CW now. Re-check at end of session	A few hundred Hz over 20–30 min from cold is normal	Continuous wander or sudden jumps	☐

PHASE 4 — BAND COVERAGE

10 MIN

20	**CAL on, CW/USB. Step through all 30 MHz positions, 0.2 → 29 MHz, listening for the marker on each**	Marker audible at similar strength, S-meter deflects, on every band	Dead or weak bands. **Record which**	
21	On each band, lightly wiggle the MHz knob within its detent	Nothing changes	Signal pops or cuts out = oxidised turret contacts. *Cleaning job — a different fault to a dead crystal*	
22	Note low bands 0.2–1.5 MHz separately	Markers or atmospheric noise present	Whole low group dead = separate front-end path	

PHASE 5 — FILTERS, MODES, NOTCH, AGC

10 MIN

23	**On a steady CAL tone, switch through every bandwidth position (≈5 / 2.75 / 2.4 / 0.8 kHz)**	Each gives an obvious, distinct change in bandwidth and hiss	Two identical, or one causing severe loss or complete dropout. **Log the symptom, don't diagnose** — filter or switch contact. Expensive if it's the filter	
24	Switch AM / USB / LSB	Clean beat note. USB and LSB roughly symmetrical	Muffled, distorted, or one sideband dead	
25	CW mode on a ~1 kHz beat note. Sweep rejection tuning *(if fitted)*	Sharp, deep null that nearly extinguishes the tone	No null = notch circuit needs alignment or a tube	
26	Switch AGC OFF / FAST / SLOW on a strong carrier	Audio stays level, S-meter tracks smoothly	Blasting, pumping, dead meter	
27	Back off RF gain, watch S-meter	Needle deflects **upscale** — normal Collins behaviour, not a fault	No movement = meter or AGC circuit fault	

PHASE 6 — ON-AIR SENSITIVITY

8 MIN

28	CAL off. Clip on the wire antenna while listening to a low band	Noise floor clearly jumps	No change = dead or misaligned front end	
29	Antenna trim *(check the panel — may not be fitted)*	Peaks sharply on a real signal	No effect	
30	AM broadcast band 540–1600 kHz	Clean, undistorted audio — tests the AM detector	Distortion, weak recovery	
31	**Comparative: switch the same antenna between the 51S-1 and reference RX. Use local MW and RNZ Pacific 11725 / 13840 / 15720 / 17675 kHz. WWVH 5 / 10 / 15 MHz if propagation allows**	Comparable, and all bands consistent with each other	One band far weaker than its neighbours. **Record which**	
32	Knuckle the cabinet gently while listening	Nothing changes	Crackles, dropouts, ringing = intermittents or microphonic tubes	

REPORT BACK

Bands dead or weak (list)

Bands recovered by wiggling the switch

Filter positions present and distinct?

Tuning feel and backlash

Hum level — none / slight / loud

Notch null — sharp / weak / absent

Drift over session

Signs of prior repair

Anything that made you stop