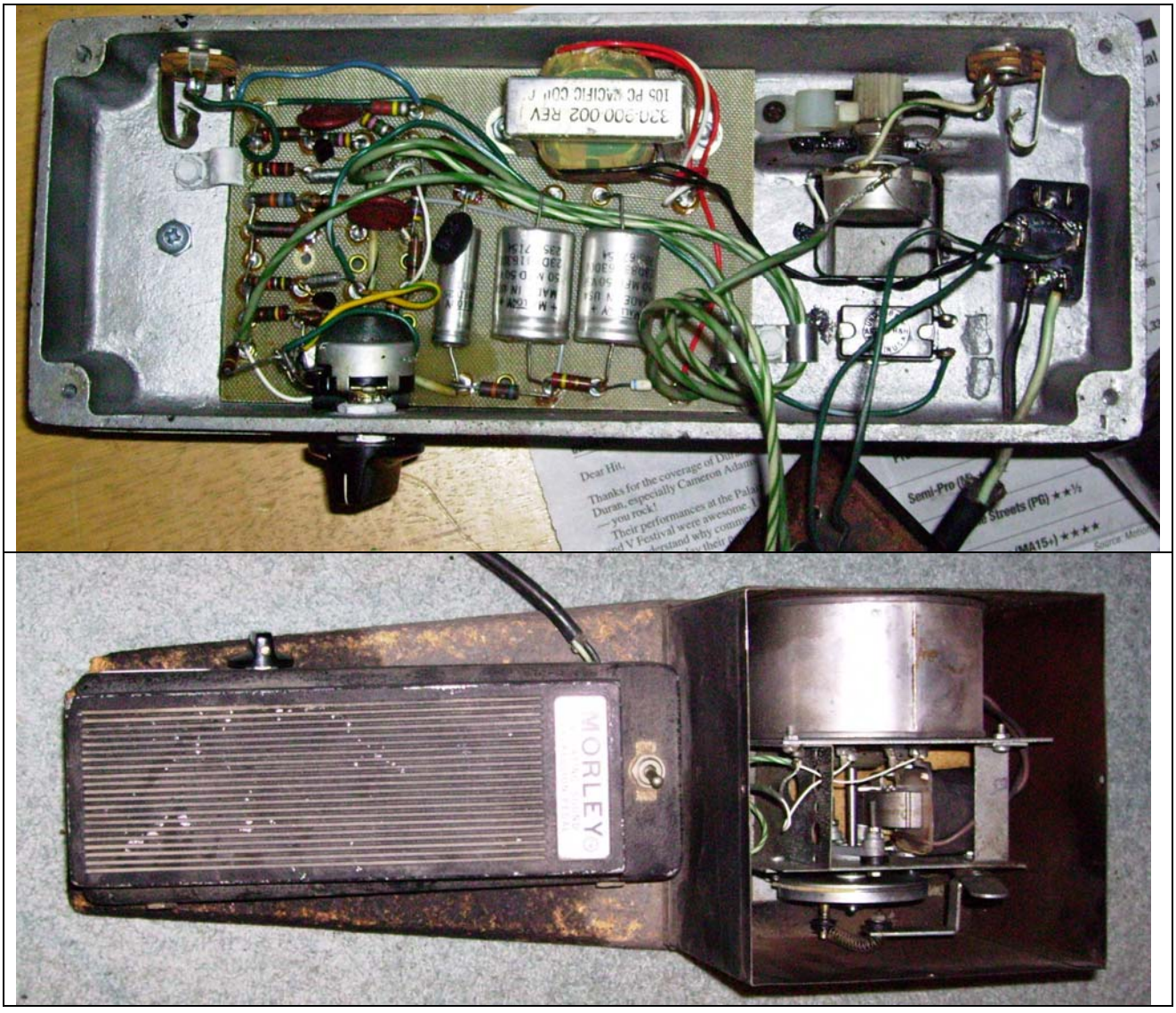
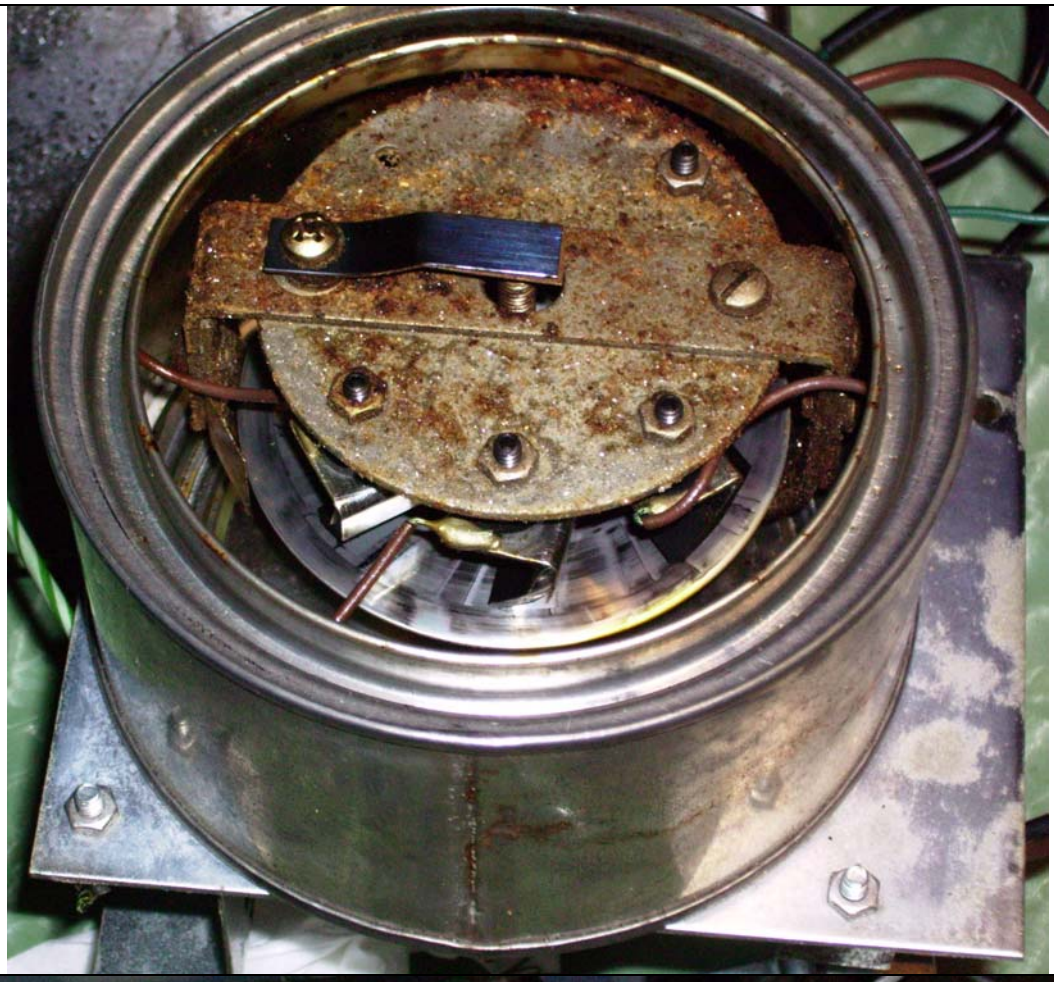
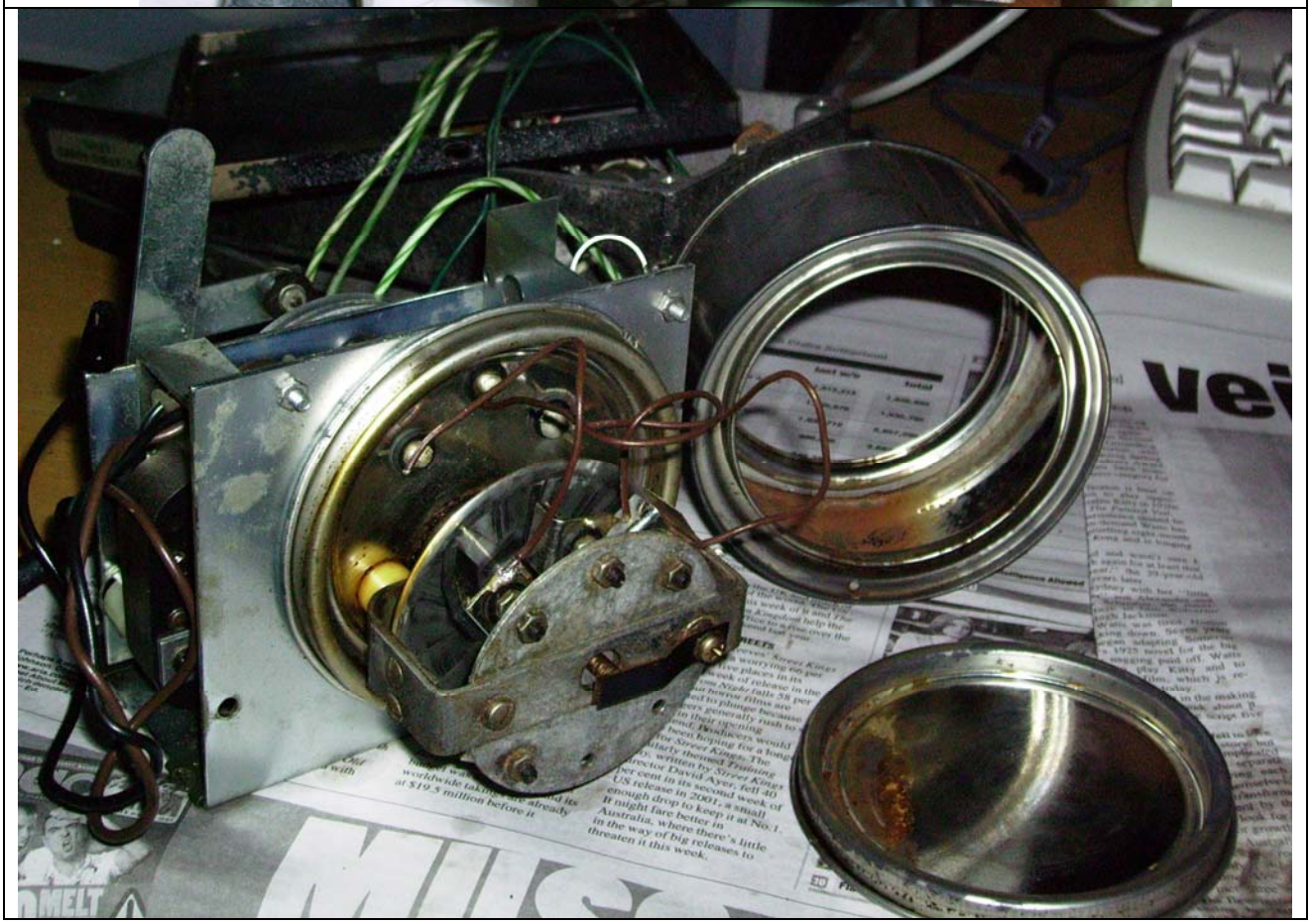
Renovation of Morley Rotating Sound Expression (RSE) Pedal

Original assessment:
All components and rubber insulators and seals appeared to be in good original condition, and with no indications of later-life modifications. Red oil residue in bottom of can – crust on steel frame. No top metal cover to oil-can box.
Can casing and lid removed. Disk wiper assembly separated by removing 4 screws – but still connected by 3 wires to the signal wipers. Crust cleaned using methylated spirits and scraped off using scalpel blade. Care taken not to touch disk surface. Signal wires that were nearly broken off were carefully resoldered (so as not to heat up rubber insulators). Can body external seal was re-sealed using superglue, as original internal seal coating was peeling off. Hole in can made by chassis box screw was plugged with araldite. Wiper assembly and can re-assembled. Wires unsoldered from external signal terminals and resistance measured to be > 20Mohm on all three signal terminals.







Operation with 110VAC 50Hz showed that motor worked, and power supply rails showed 67VDC and 13VDC, with the secondary (two red wires) at 46.7VAC unloaded. The transformer white wire is from a screen, and is soldered to the ground.
Schematic for RSS was marked up with correct details for RSE.
Lubricating oil added to shafts of both pots.
Washer added to nylon cable clamp to support rear of volume pot cam.
Rubber stopper added for foot switch under pedal.
Rubber belt made up (really needs circular belt).
Power supply modified:

- 15K// R4 to give 10K nominal (same as late model circuit value)
- 33K// R5 to give 15K nominal (same as late model circuit value)
- 7805 + 2x NMA0515D + LC filters to give isolated 60V from 9V Boss connector input.
- This gives operating voltage rail levels very close to +55 and +25V schematic levels.

Retrofit zinc-steel plate to underside of wooden base – added new rubber feet.
Fabricated new top to can chamber.
Found Arlec 40VA 115V step-down transformer to use with unit.

Initial Testing:
Fairly low noise level - hum and hiss just noticeable at max RS level. However there is a noticeable repetitive clicking noise at the can rotation rate.

Later investigation:
The click is made up of 2-3 transients of short duration, but not filtered out completely with "treble" turned down. Click is due to surface markings on the disk – aligned to 12 noon level. Refitted shield braids to can ground, with as much signal wire shielding as possible – this is a single point ground connection. Removed centre, unconnected wiper (later model schematics show this terminal is connected to input via cap – this wiper could be refitted and tested with cap connection). Re-aligned wipers to be radial. Repositioned disk to be more centred (it was a bit off-centre). Added 390pF cap directly across output to shield – this gave a marked reduction in the noticeable 'click' level – still discernable but a good compromise to adding too much high freq roll-off to the delayed signal.

Vol pedal adjusts level down 20dB – could refit adjust shaft so that zero signal at bottom end of travel. Harmonic distortion level way down. RSL adjust boosts input level by 3dB at half position. Impulse response indicates flat frequency response, but with gradual 7dB peak at 3kHz, with nominal 10dB/dec roll-off – see graph.

Motor shaft sometimes has a vibration.

Electrolytics swapped out in 2011 – starting to load down dc/dc supply.

Use:
Need to keep pedal in horizontal position at all times – do not tilt in any way.
Motor body gets hot so don't let motor run for long unattended periods.

Pot manufacturer code:
137 = CTS (Chicago Telephone Supply, pots and speakers)
615 = IRC (International Resistive Company)

CTS Type 320 100K pot for pedal pot, with cog. Pot marking 44597 and 7231.

- Appears to be 4 digit date code: 1972, week 31.

IRC 6154807 50K 519 pot for Rotating Sound Level.

- Appears to be 3 digit date code: 1965 or 1975, week 19.

Capacitor manufacturer code:
235 = Mallory

Mallory 50MFD pots marked 235-6715A.

- Possibly a 4 digit date code: 1967, week 15.

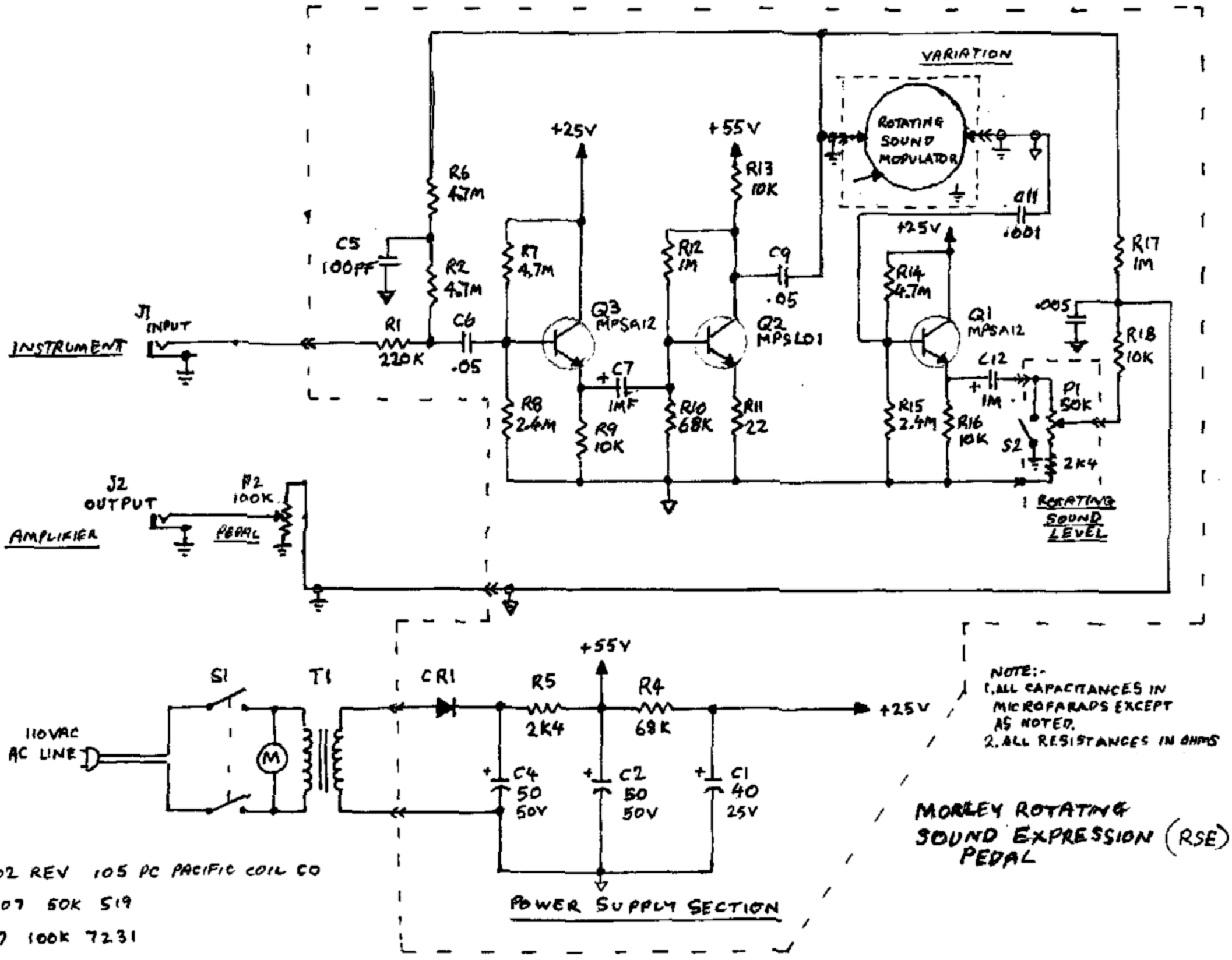
Mallory 40MFD pots marked 235-6841A.

- Possibly a 4 digit date code: 1968, week 41.

Transformers & Coil manufacturer code:
1052 = Pacific

Transformer marked 105 PC Pacific Coil Co, Type 330-900-002 REV ?

Aim:
- Fabricate new swing handle.
- Add good picture to can top.
- Try capacitor coupled signal to middle wiper
- get better drive belt.



T1 330-900-002 REV 105 PC PACIFIC COIL CO

P1 IRC 6154807 50K 519

P2 CTS 44597 100K 7231

S1 DPST ON/OFF POWER

S2 SPST PEDAL FOOT SWITCH