

# TROUBLE SHOOTING



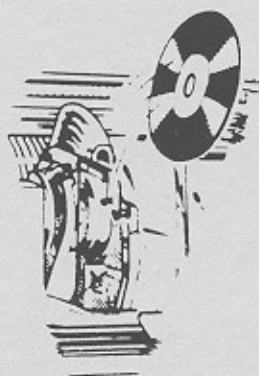
Coins do not work right -

"Credit" lamps do not light when money is deposited.



No Sound -

Poor Sound



Incorrect record cycling.



Phonograph is dead.  
(Lights are out -  
nothing operates)

## INTRODUCTION

This section contains troubleshooting charts listing troubles, probable causes, and corrective procedures. Seventeen sequence of operation schematic diagrams plus a brief explanation of the operation of each phonograph component are included to aid in isolating and correcting equipment malfunctions easily and rapidly. Use the instructions in this section in conjunction with the adjustment instructions in Section 4 - Maintenance to isolate and correct phonograph malfunctions.

## TROUBLESHOOTING CHARTS

It is important to troubleshoot logically so that effort is not wasted in removing and replacing the wrong parts. Most failures are caused by minor defects, such as loose connections or dirty contacts. Check the following before replacing any parts:

- a. Check that all plugs are firmly seated in their receptacles.
- b. Check that connector pins are not bent, broken, or pushed through the back of the connector or receptacle when mated.
- c. Check that wires are not broken at connector pins.
- d. Check that the area of the search unit and credit unit commutator boards that mate with harness edge connectors are clean and intact. Make sure that the connectors are firmly seated.
- e. Check that commutator segments are clean and that all wiper blades are properly positioned on their respective commutator segments.

The possible malfunctions of the Phonograph, their probable causes and remedies are listed in tables 3-1 through 3-3. The TROUBLE column contains specific failures. Each failure has one or more corresponding causes in the PROBABLE CAUSE column. If more than one probable cause and remedy are listed for a particular trouble, perform the procedures in the REMEDY column in the order listed.

TABLE 3-1. CREDIT AND SELECTION SYSTEM TROUBLESHOOTING

TROUBLE	PROBABLE CAUSE	REMEDY
Valid coins fail to pass through slug rejector into cash box. Coins remain jammed in rejector.	Dirt or foreign matter clogging coin passages in rejector.	Refer to coin rejector service manual for cleaning procedure. Clean in accordance with instructions.
	Scavenger binding, rejector out of adjustment.	Refer to coin rejector service manual for adjustment procedure.
Valid coins pass through rejector into coin box but credit is not established.	Coin switch contacts dirty, bent, or broken.	Adjust coin switches. Check for bent or broken contacts. Clean contacts.
	Incorrect alignment of slug rejector or coin switches. Coins drop between switch levers.	Be sure that slug rejector is firmly clamped in place. Adjust coin switches as necessary.

TABLE 3-1. CREDIT AND SELECTION SYSTEM TROUBLESHOOTING (CONTINUED)

TROUBLE	PROBABLE CAUSE	REMEDY
Valid coins pass through rejector into coin box but credit is not established. (continued)	Credit coil plunger binding.	Check credit coil plunger for binding due to dirt. Check coil windings for continuity.
	Blown 0.6A fuse in credit unit.	Check for binding coin switch.
	Coin switch connector not seated.	Check that connector is firmly seated. Check for broken wire in common line.
Valid coins are accepted but credit lamp does not light.	Lamp burned out.	Replace lamp. Check for broken wires.
	Broken wiper blade on credit unit wiper arm assembly.	Replace wiper blade. Check that credit unit edge connector is firmly seated.
Coins accepted; credits not registered properly- credit unit fuse blows.	Coin hanging up on coin switch. Coin switch not opening.	Check for jammed coin. Free binding coin switch.
	Coin switch contacts closed by metallic foreign matter.	Clean contacts and replace fuse.
Continuous free play. Credit light remains on.	Credit coil plunger binding in raised position.	Free credit coil plunger. Replace credit coil if necessary.
	Cancel coil burned out.	Check cancel coil for continuity. Check for burned appearance. Replace defective coil.
	Cancel circuit open.	Check credit cancel coil.
More than normal number of credits established for coin deposited.	Appropriate stop coil not being energized.	Check for intermittent open circuits, loose wires, or poor solder connections.
	Appropriate stop coil plunger sticking.	Manually actuate plunger to check for free operation. Clean or replace plunger or spring if necessary.
	Improper credit set-up.	Check pricing against credit and pricing chart. See page 2-9
Valid coins accepted, credits are established, pushbuttons do not latch in.	Latch coil not operating. Select pulse and latch relay R1 not picking up.	Check coil for continuity. Check relay contacts for closure. Replace relay or coil if necessary.
	Select pulse and latch relay R1 contacts broken, dirty, or out of adjustment. R1 not picking up after credit is established.	Clean and adjust relay contacts.
	Open circuit between credit unit and select pulse and latch relay R1. R1 not picking up after credit is established.	Check for open circuit. Refer to sequence of operation, page 3-7.



TABLE 3-1. CREDIT AND SELECTION SYSTEM TROUBLESHOOTING (CONTINUED)

TROUBLE	PROBABLE CAUSE	REMEDY
Pushbuttons latch in, but release prematurely; no selection played.	Select pulse and latch relay R1 time delay circuit giving short pulse.	Check diode on selector assembly. Check relay R1 for dirt between core and armature. Replace parts if necessary.
Pushbuttons latch in; no further action.	Open circuit to search unit motor.	Check wiring. See page 3-34.
Pushbuttons latch in, search unit motor starts, but runs continuously.	Open circuit in selector assembly, wiring from pushbutton switches to search unit printed board segments.	Check wiring against selector assembly wiring diagram. See page 3-31.
	Contacts on mechanism control relay R dirty, broken, or out of adjustment.	Check mechanism control relay R for proper operation. Replace if necessary. This relay is nonrepairable.
Selection is registered, magazine rotates one complete scan cycle and stops. No record is played.	No circuit through stop switch.	Check wiring to stop switch. See page 3-28.
	Selected pin not pushed far enough; select coil not properly positioned.	Check inside and outside row select coils for proper operation. Adjust select coil arm assembly. See page 4-27.
Wrong selection is played every time.	Search unit select coil arm assembly out of adjustment.	Adjust search unit select coil arm assembly. Check search unit wiper adjustment. See page 4-25.
	Stop switch out of adjustment.	Check stop switch alignment. See page 4-6.
	Stop switch gear not properly installed.	Check stop switch gear alignment. See page 4-6.
One particular letter or number, in combination with all letters and numbers, will not register.	Open circuit in the particular letter or number wiring.	Check for dirt on search unit commutator board or wiper contacts. Clean with alcohol, if necessary. To locate the open circuit, make 20 selections in the following order: A1, B1, C2, D2, E3, F3, G4, H4, J5, K5, L6, M6, N7, P7, Q8, R8, S9, T9, U0, V0. This test combination will determine which letter or number has an open circuit.
Search unit motor energized but does not run.	Search unit gears binding.	Check for dirt or foreign matter lodged in gear teeth. Check backlash adjustment. See page 4-20.
	Tip of select coil plunger hung up on side of pin, excessive backlash causing select coil arm overtravel.	Adjust search unit gears for proper backlash. See page 4-20.

TABLE 3-1. CREDIT AND SELECTION SYSTEM TROUBLESHOOTING (CONTINUED)

TROUBLE	PROBABLE CAUSE	REMEDY
Only one selection is made but two selections play.	Select coil plunger hitting two adjacent pins; select coil arms out of adjustment, or overtravel caused by excessive gear backlash.	Adjust select coil arm assembly. Adjust search unit gears for proper backlash. See pages 4-20 and 4-27.
50-cent coin establishes only 25-cent credit (50¢ bonus relay being used).	50¢ bonus relay not picking up, or picking up and dropping out prematurely.	Replace 50¢ bonus relay. Check that relay is firmly seated in socket.

TABLE 3-2. RECORD CHANGER MECHANISM TROUBLESHOOTING

TROUBLE	PROBABLE CAUSE	REMEDY
All selections register properly but magazine does not rotate.	Scan Assembly not operating.	Check scan coil for open, check for binding linkage.
	Scan switch defective or out of adjustment.	Check scan switch for proper operation, adjust switch position.
	Diode D-1 open.	Check by shorting across diode.
	Cam switch CS2 faulty or out of adjustment.	Check switch for proper operation or adjust switch position.
	Magazine detent coil open or binding detent linkage.	Check coil for continuity, free linkage.
	Relay contact 1 & 9 faulty.	Check relay, replace if necessary.
	Detent switch faulty or out of adjustment.	Check switch for proper operation or adjust switch position.
	Magazine motor faulty or drive gears binding.	Check motor and gear train for proper operation.
Scan linkage operates, magazine one complete scan cycle and stops - no record is played. Stop switch jumps pins.	No circuit through step switch.	Check stop switch and wipers on back of stop switch.
	Diode D-2 defective.	Check diode.
	Short circuit in 50 MFD capacitor.	Check capacitor resistance.
	Faulty mech. relay. (R)	Replace relay.
	CS5 cam switch defective or out of adjustment.	Check cam switch for proper operation - replace if necessary, adjust switch position.
	Short circuit on common side of magazine detent coil.	Check detent coil circuit.

TABLE 3-2. RECORD CHANGER MECHANISM TROUBLESHOOTING (CONTINUED)

TROUBLE	PROBABLE CAUSE	REMEDY
Magazine stops at proper selection, but record transfer assembly does not operate. Relay (R) picked up.	Open circuit to transfer motor.	Check relay contacts 6 and 10, 7 and 11, for proper operation.
	Defective transfer motor.	Check motor, replace if necessary.
Transfer arm stops in mid travel between magazine and turntable. Phono power is on.	Cam switch CS2 faulty or out of adjustment.	Check for proper operation of switch. Replace if necessary. Adjust as required.
	Blown fuse in junction box.	Check 2-8/10 and 6-1/4 Amp fuse in junction box. Replace if necessary.
Transfer arm moves each selection record from magazine to turntable and back without being played, all other functions normal.	Diode D-3 shorted.	Check for short.
	Short circuit in cancel line, cut off switch or automatic cancel circuit.	Check for short.
	Cam switches CS4 or CS5 faulty or out of adjustment.	Check switches - adjust or replace if necessary.
	Needle height improperly adjusted.	Adjust height of needle.
Wrong side of record plays; selection is improperly registered.	Center slip ring wiper broken or out of adjustment.	Adjust or replace.
	Left side switch in stop switch assembly faulty.	Check left side switch - replace if necessary.
	Toggle switch coil open or linkage binding.	Check coil and linkage. Replace or free if necessary.
	Diode D-3 open.	Check diode.
	Cam switch CS4 faulty or out of adjustment.	Check switch, replace or adjust if necessary.
	Mechanism relay (R) contacts 5 and 9, not making connection.	Check relay - replace if necessary.
Wrong record played, selection is properly registered.	Stop switch gear out of adjustment.	Align 200 mark on stop switch gear with step in search unit mounting bracket. See page 4-6.
	Stop switch out of alignment.	Align stop switch. See page 4-6.
Selections play over and over, pins not being reset.	Slip ring wipers No. 2 or 3 broken or out of adjustment.	Adjust or replace slip ring wiper blade assembly.
	Cam switch CS3 or CS4 faulty or out of adjustment.	Check switches - replace or adjust if necessary.
	Reset pawl out of adjustment.	Adjust reset pawl. See page 4-5.
Magazine scans continuously after last selection is played.	Detent coil plunger binding or detent assembly out of adjustment.	Manually operate plunger to check that the detent pawl locks the detent wheel. Adjust or replace if necessary.
	Scan switch faulty or out of adjustment.	Check switches, repair or replace if necessary.



TABLE 3-3. SOUND SYSTEM TROUBLESHOOTING

TROUBLE	PROBABLE CAUSE	REMEDY
No sound. Phonograph mechanical operation normal.	Blown amplifier fuse.	Check for short or overload condition which caused fuse to blow. Replace fuse after this condition is corrected.
	Faulty mute relay.	Check operation of mute relay; replace if necessary. This relay is nonrepairable.
	Cartridge leads broken or shorted.	Check that both cartridge leads are intact and that all connectors and plugs are firmly seated.
Partial or distorted sound.	Damaged stylus.	Carefully check stylus, replace if necessary.
	Incorrect remote speaker hookup.	Check remote speaker connections. See page 2-6.
	Defective output transistors or tubes in either channel.	Check output transistors or tubes. Replace if defective. See page 4-31/4-32.
	Partial short in local or remote volume control. Incorrect speaker hookup. Incorrect remote volume control hookup.	Check volume control and speaker connections as shown in sound system connection diagram. See page 2-6.
Low volume apparent in one channel.	Cartridge defective.	Replace cartridge if necessary. Check by substituting a cartridge that is known to be good.
	Faulty preamplifier board.	Replace preamplifier board.
	Faulty driver board. (Solid-State Models Only)	Replace driver board.
	Balance control not properly adjusted.	Adjust balance control for equal sound from each stereo channel. See page 2-3.
Constant high volume, cannot be adjusted at volume control.	Short in volume control circuit.	Check wiring. See sound system connection diagram. See page 2-6.
Excessive record scratch evident through speakers.	Scratched or worn records.	Replace records.
	Damaged stylus.	Check stylus force. Replace stylus.
	Treble range control set too high for condition of records.	Reduce treble range control setting. See page 2-3.
Intermittent sound. Amplifier cycles on and off. (Solid-State Models Only)	Overheated output transistors cause heat sensitive semi-conductors on heat sink to clamp amplifier input.	Check for shorted or partially shorted speaker lines.
		Check for component failure that may cause high heat dissipation in output stages.
Excessive hum-low volume.	Broken shield on cartridge leads.	Be sure that shielding or wires are not broken at any point between the cartridge and amplifier input plug.
	7868 tube failure.	Replace tube.