

MX-1 SERVICE CHECKLIST

This checklist contains symptoms and cures for problems which are most frequently encountered on the model MX-1. The following information is provided to aid technicians in locating specific as well as intermittent problems. To avoid repeat service calls check all items listed when servicing this model for any reason.

POWER SUPPLY AND AMPLIFIER TRAY (sch. 31 & 32)

SYMPTOM: Intermittent static which is not effected by expression control pedal.

CURE: Remove ty-rap on socket S-2 located on crossover board 51. Make sure shields connected to pins 2, 4, 7 & 10 are not shorting the amplifier inputs on pins 1, 3, 5, 6, 8 & 9.

SYMPTOM: Intermittent static or loss of volume on some or all sections of the instrument.

CURE: This condition may be caused by a faulty speaker relay. If speaker relay is a part number 921-024167 change relay to part number 921-035111.

ADDITIONAL POWER SUPPLY & AMPLIFIER TRAY CHECKS

1) Remove and straighten all pins, on all voltage regulators mounted on power supply tray. Clean the pins of any heat sink compound. Be sure there is a sufficient amount of heat sink compound on the IC body, and the mica is good. Reinsert regulator in the socket and check for proper output voltage.

2) The -15V regulator will exhibit intermittent failure. If the instrument has a history of intermittent problems and repeat service calls replace -15v regulator IC.

3) Make sure that all star lugs are tightly mounted to the amplifier tray. then cut off all spade lugs and hard wire wires directly to star terminal.

4) Lift Regulator board 50 and check all solder connection on the bottom side, check especially the large caps.

5) Tighten the four 5/16 screws on the heavy copper ground strap.

POWER DISTRIBUTION BOARD 11

Resolder all solder connections on the backside, and clean all plugs on the front side. Be sure that all plugs are tight. Tighten screws on copper ground strap.

ORCHESTRATION PLUS BOARDS 25A & 25B (Schematic 19-21)

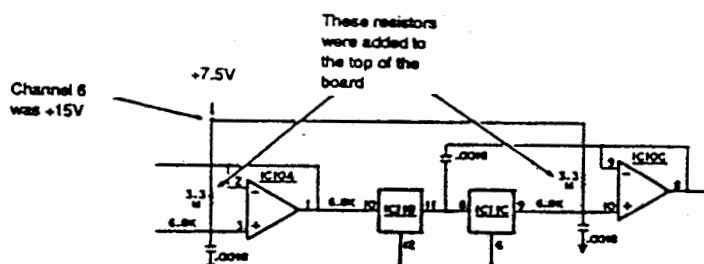
SYMPTOM: Orch plus channels 2 & 5 dead or fails intermittently.

CURE: In some early models the source for the 2 MHz pulse code clock which connects to IC24 pin 1 schematic 21 came from POP IC2 schematic 17. If this is the case then make the following change: Remove the wires connected to pins 4 & 5 of S8 on board 30, and remove the 470 OHM pullup resistors connected to pins 15 & 16 of buffer IC19.

On boards 25A & 25B connect a jumper wire from the collector of Q21 to pin 1 of IC24. (NOTE: In some cases this change was made without removing the 470 OHM resistors. Make sure those resistors have been removed.)

SYMPTOM: Intermittent pop in orch plus voices most noticeable on Blue Grass pattern.

CURE: Two 3.3M pullup resistors have been added to channel 3 (6) IC10 pins 3 & 10, and where attached to +15V. This wire should be removed and attached to 7.5v see diagram below.



CPU ROM & PIC BRDS 32,31 & 30 (Sch. 15-18)

SYMPTOM: 1) Orch. plus and rhythm out of sink with each other. 2) Pedals hang on intermittently. 3) Minor footswitch causes some Genie Chords to play only one or two notes. 4) Orch Plus waltz pattern has a DC pop on some chords.

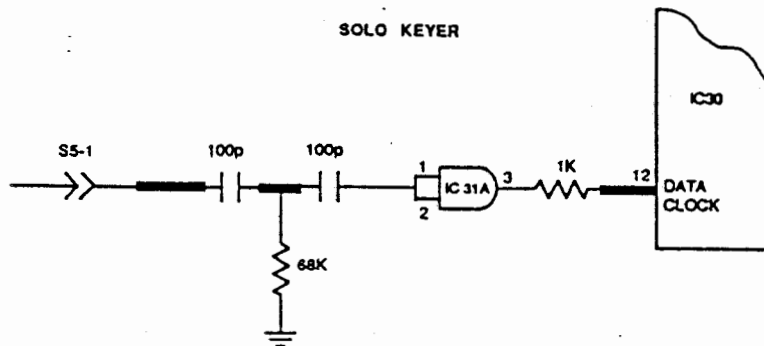
CURE: Replace ROMS IC2, IC3, IC14 with part number 920-033866-010, 011 & 012 respectively.

SOLO KEYER BOARD 12 (schematic 26)

SYMPTOM: 1) Solo percussion voices rekey when held or
2) Solo brass voices have intermittent thump noise when held.

CURE: Make the following circuit changes to schematic 26 board 12.

- 1) Cut the copper track between S5 pin 1 and the 1K resistor located at pin 12 of IC 30 in 3 places.
- 2) Add 2 100P capacitors in series as shown below.
- 3) Connect a 68K resistor from the junction of 100P capacitors to ground at pin 31 of IC30.
- 4) Cut copper track that connects pin 1 & 2 of unused AN gate IC31A to ground.
- 5) Connect a wire from the open ended 100P capacitor to the pin 1 & 2 of IC31A.
- 6) Connect a wire from pin 3 of IC31A to open end of 1K resistor that connects to pin 12 of IC30.



UPPER LOWER & FRACTIONAL SUSTAIN KEYER BOARDS 24, 21 (sch.3,9 & 5)

SYMPTOM: All upper keyboard notes play simultaneously.

CURE: Check for shorted or leaky .1 capacitors located at pins 3, 2 & 37 of upper fractional and lower keyboard decoders IC1 & IC2 on boards 24, 23 & 21, schematics 3, 5 & 9. Change the three (3) 1 Meg pullup resistors at these inputs to 100K OHM. **NOTE:** If power remains on for any length of time while the above symptom exists, the 3.9V zener diode Z1 located on board 24 & 21 shown on schematic 33 can overheat and fall out of the board. Change the 3.9V zener to a 5.1V zener part number 919-017406-058. Add a 1 OHM 2Watt resistor in series with the zener on the Cathode side, this will limit the current and stop it from overheating.

SYMPTOM: Intermittent operation of pushbuttons.

CURE: On CPU board 32 schematic 18, change 8- 4.7K pullup resistors to 22K. Resistors are connected to the Y2 thru Y9 scan lines at the input of buffers IC13 & IC14. LOWREY Newsletter MAR/APR 1982.

SYMPTOM: System does not run or crashes intermittently.

CURE: This condition may be caused by a poor ribbon cable connection on the A0 address line that runs between the CPU and the ROM board. The A0 address line is at the inner most edge of the cable. Relieve any stress on the cable at this point. Flex cable gently, checking for good connection.

SYMPTOM: Rhythm stalls or slows down intermittently.

CURE: 1) If pin 1 of IC9 on CPU brd 32, schematic 15 is not grounded then connect a jumper between ground and pin 1. 2) On PIC brd 30 schematic 17, cut the copper trace that connects pin 8 of IC39 to pin 11 of IC39. Install a jumper from pin 9 to pin 11 of IC39.

SYMPTOM: 1) Instrument intermittently goes into light scan routine. 2) Orch. Plus patterns change randomly while playing.

CURE: Make the following checks and changes to the CPU board 32 schematic 15. 1) Add .1 capacitor in parallel with the 3.3K resistor at the base of the reset transistor Q1. 2) Make sure RAM IC20 is part number 920-030708-001. 3) Remove and discard NAND gate IC12. 4) IC15 is not used it can be removed also.

ADDITIONAL CPU, ROM & PIC BRD CHECKS:

1) Check 5V supply at pin 40 of IC1 on the CPU Brd 32. Exceptable voltage range is between 4.90 & 5.20 volts. If voltage is not in this range see tailoring procedure on page 46 of the MX1 service manual.

2) Check CPU, ROM & PIC grounds by connecting a ground lead of a scope to a star lug on the power supply chassis, connect the scope probe to the ground on the board to be checked. If constant noise level including any DC offset is in excess of 500 milli-volts then run additional heavy ground wire (18 gauge minimum) from the board to the power supply star lugs. Be sure to hard wire it in.

3) Check yellow and white wires that run along upper right hand side of the CPU board. Make sure they have not been pinched between the tray and tray mounting bracket. To eliminate this possibility, lift CPU board off right mounting post then position the wires under the CPU board and remount CPU board.

GENERAL ITEMS:

SYMPTOM: Sustain always on full ,and sustain pot has no effect.

CURE: Problem can be caused by a faulty ground connection to PIC IC6 pin 2 on board 30 schematic 16. Check IC6 for a proper ground between pin 2 and S13 pins 5 & 6.

SYMPTOM: Short life of halogen spot lights.

CURE: Follow disassembly instructions for access to side panels on page 98 of the MX1 service manual. Mount two 3-position terminal strips, one to board 40 and one to board 47 (see board location on pages 10 & 11 of the fold out book). Mount strips using upper center mounting screws. Add two 2 OHM 5 watt resistors one accross each terminal strip. For each spot light, cut either black halogen lamp lead near terminal srip. Strip and solder cut ends to opposite sides of the 2 OHM resistor.

ADDITIONAL CHECKS:

1) Check brown ground leads connected to upper left corner (tray down) of printed circuit board trays 1, 2 & 3 for breakage, and be sure screw is tight.

2) If an intermittent problem can be isolated to a particular circuit or circuit board, resolder all red connectors on suspected board.

3) If a customer complains about the Orch. Plus Brass voicing sounds weak. NOTE: give office a call and discuss the problem with us.

MX-1 SERVICE CHECK LIST

CPU, ROM & PIC BOARD CHECKS:

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