AXSYS 212 / AX2

Symptom: Stuck in 'Tuner' mode, or toggles between different sounds/channels (A, B, C or D).
Solution: Replace U7 on main board and install surge suppressors on rear board (ECO #22).

Symptom: Intermittent crackling sound.
Solution: Wiggle the ribbon cable by hand to see if it is causing the crackling. Also, wiggle the master volume pot and the breakaway pcb it is mounted to.

Symptom: Signal distorts at higher volumes, but is OK at lower volume.
Solution: Check the power supply filter capacitors on the rear board. Sometimes one lead will break off at the capacitor. If the leads are fine, check the continuity of the through-hole connections at the solder pads.

Symptom: Loud hum or no audio at all.
Solution: Check to see if one or both of the power amp chips are blown. This usually only happens when the amp has the wrong transformer [8604 transformer] installed. If this is the case, it means the amp is an older one and needs several ECO's done to it, including ECO #16 which implemented use of a different transformer.

Symptom: Extremely loud buzz.
Solution: Check C18 on rear board for a broken lead.

Symptom: Strange behavior after warming up for a few minutes, which might include: Distorted audio, decrease of volume level, display reading incorrectly.
Solution: Check the +5V regulator on the rear board (U3). Make sure the hex stand-off heat sink is screwed firmly to the regulator. Sometimes the heat sink comes loose and falls off, so it might be missing altogether. (Con't on next page)

Axsys 212/AX2 (con't)

Symptom: Lots of digital noise in 'User' presets.

Run the 'Battery' test. Chances are you'll get an error message. Could be anything in the battery circuit – diodes, transistor, resistor, the battery...sometimes the SRAM chip is the culprit, but that's the least likely suspect.

Symptom: No lights, no audio...amp appears dead but all voltages are correct.

Check pin #10 of the microprocessor (U9). That pin should see +5Vdc momentarily, as the amp powers up. After that it should drop to 0V. If it's being held at +5Vdc, then the amp is being held in a perpetual state of 'reset'.

Symptom: No audio until you turn the "Volume Pedal On/Off" control (found on the front control matrix of the amp) to the "Off" position.

The amp is being fooled into thinking the floorboard is plugged in and its volume pedal is in the heel-down position. Something is probably dragging down the voltage at pin 7 of U7. Check everything in the path from that pin to the RJ45 jack on the rear board (including the prongs inside the jack).

Duoverb

Symptom: Unit has no audio, just steady clicking sound from power supply and the pilot light flickers very faintly with the clicking.

A blown power amp is probably causing this. Always replace both power amps if one is blown, because the other one will also be damaged (even if only one of them measures as having an internal short).

Flextone 2 (all versions)

Symptom: Unit will not power up, or will power up sometimes but not others.
Check C44 and C45 next to the crystal. If one or both of them are being held high (probably at +5Vdc) then replace both caps.

Symptom: Audio is intermittent or garbled.
Look at the ¼" audio jacks. They should have a metal sleeve that lines the inside of the jack where the ¼" plug goes in. If the jacks are the kind with no metal sleeve, they may be intermittent. (Continued on next page)

FLEXTONE II TROUBLESHOOTING GUIDE

January 13, 2000

MAIN PCB:

Nothing Works (No LEDs turn on): If you power up the board and no LEDs are on, try the following suggestions.

1. Check if EPROM (U18) is installed backwards or check for a bent pin. Also try replacing EPROM.
2. Check power supply. No digital circuitry will work if the +5V supply (U6) isn't working.
3. Check if 11.9808MHz master clock (MCLK) is working. Clock circuitry is located near U10 pin#20,21.
4. Check reset circuitry, Q4. Reset circuitry is located on pg.2 near U10 pin#10. When the board is power up, you should see Q4 pin#1 go from 0V to 5V and back to 0V. It is only at 5V for a short time so you need to use an oscilloscope to see this. Also check RESN on U21 pin#12. RESN goes to U11 pin#1, U15 pin#1, U2 pin#23.
5. Check address lines (A00-15) and data lines (D0-7). You should see digital signals on most of them. Check for opens and shorts.
6. Check if LEDs are installed backwards.
7. Check for solder shorts on all ICs, especially, U10 and U7.

AUTOMATED HARDWARE TESTS:

GND1/GND2: This test checks for a ground connection on the RJ-45 jack J7 pin#5,6.

1. Check if J7 pin#56 are connected to ground. Also check for solder shorts.

+5V1/+5V2: This test checks for +5V on the RJ-45 jack pin#1,8.

1. Check connections to J7 pin#1,8 and check for solder shorts.

+15V/-15V: This test checks for +/-15V on the 20-pin ribbon cable M3.

1. Check for +/-15Vdc at the power supply U23,24 (pg.3 of schematic).
2. Check connections between U23,24 and M3.

R33: This test checks for R33 (0.33 ohm 5W resistor).

1. Check if R33 is installed on pcb.
2. Check connections from 20-pin ribbon cable M3 pin#13,14 to R33 and R33 to AGND.

AUTOMATED SOFTWARE TESTS:

EPROM: EPROM is located on page 2 of schematic, U18. EPROM is mounted in 32-pin DIP socket on pcb.

1. Try a different EPROM.
2. Check all address (A00-15) and data lines (D0-7).

SRAM: SRAM is located on page 2 of schematic, U20. SRAM is located next to ERPOM 32-pin DIP socket.

1. Check all address (A00-15) and data lines (D0-7).
2. Check all circuitry connected to pin#28 of SRAM.
3. Replace U20

MIDI: MIDI In/Out circuitry is located on page 2 of schematic. MIDI circuitry is located near MIDI jacks (J8,9) on pcb.

1. Check all MIDI circuitry.
2. If many boards are failing, try replacing MIDI cable.

ADC: ADC is located on page 2 of schematic, U12. This test is checking for 2.5V on the inputs of pin#8,9,11. This voltage will only be present when the board is connected to the test fixture. Otherwise you will see +5V.

1. Check resistors R50,51,52.
2. Check traces between RJ-45 jack pins#2,3,4 and ADC pins#8,9,11.
3. If many boards are failing replace RJ-45 cable or check for problem with test fixture circuitry.

BATTERY BACKED RAM: Circuitry is located around SRAM on page 2 of schematic. Circuitry is located near lithium battery B1 on pcb.

1. Check all circuitry connected to pin#28 of SRAM.

ADDITIONAL SOFTWARE TESTS:

TEST A - LED/Serial: LED circuitry is located on page 2 of schematic connected to U11. Serial circuitry starts at U10 pin#14 and ends at RJ-45 jack, J7 pin#7.

1. Check for bad or backwards LEDs. Check for missing resistors (R36-42).
2. If SERIAL line doesn't work follow circuitry starting at U10 pin#4 and ending at J7 pin#7. Check if diodes D33,34 are backwards. Check for solder shorts on J7.

TEST B – Button/Encoder/Pots: Circuitry for buttons, encoders and pots are on page 2 of schematic. Encoders and buttons are connected to U10. Pots are connected to ADC, U12.

Buttons:
1. Check for a defective button. NOTE: If button are run through a liquid wash to remove solder flux, water may get trapped inside switch.
2. Check for missing, bad or backwards diodes (D20-23).
3. Check traces between buttons and U10.

Encoders:
1. Check for missing, bad or backwards diodes (D13-19,26).
2. Check traces between encoders and U10.

Pots:
1. Check if voltage range is 0-5V on wiper when pot is adjusted from minimum to maximum setting.
2. Check traces between pots and U12.
3. If all pots don't work, check pins#16-19 on U10.
4. Replace U10.

AUDIO: Audio enters the pcb at J1. The Audio enters U2 and is converted to a digital signal called ADC_DATA. ADC_DATA goes to the DSP processor U7 where it is processed. It is output from U7 at DAC_DATA where it returns back to U2. The digital audio signal is converted back to analog and output at AOUTL, AOUTR (pins#26,27). Audio signal bypasses the FX Loop when nothing is connected at goes to the master volume (R56). Both PRE and POST signals go to the ribbon cable M3. POST goes to the inputs of the power amplifier U4. The output of the power amplifier also goes to the ribbon cable M3. POST also goes to the headphone amplifier circuit U5, U22.

When you find an audio problem, try to determine where the audio is failing. Sometimes no audio will work which means the problem is before the master volume. Other times, only one part of the audio will fail such as the power amp output.

No Audio Anywhere:

1. Check +/-15V supply (U23,24 pg.3 of schematic). If you don't see the correct voltage for either supply, check for a backwards op-amp (U1,3,16,22). This part will get very hot. Also check polarity of power supply electrolytic capacitors (C78-80,82 pg.3 of schematic)
2. Check for audio at U2 pin#26,27. If there is no audio continue to step#4 otherwise got to AUDIO WORKS AT U2 OUTPUT.
3. Check 5V supply of U2 on pin#7,21,1.
4. Check for 2.5Vdc on U2 pin#28. If you don't see 2.5Vdc, replace U2.
5. Check MCLK (11.9808MHz), SCLK (2MHz), LRCLK (31.2KHz) on U2 and U7.
6. Check ADC_DATA on U2 pin#14 and U7 pin#56,57.
7. Check DAC_DATA on U2 pin#13 and U7 pin#48.
8. Check All connections between U7 and U9. Check for solder shorts on U7 and U9. Check all connections on U7.

Audio Works at U2 Output:

1. Check for audio at U3 pin#8,14. If there is no audio check circuitry near U3.
2. Check audio at U3 pin#1,7. If there is no audio check master volume (R56) and all circuitry between U3 C,D and U3 A,B.

Power Amp Audio:

1. Check for audio at U16 pin#1. If there is no audio check all circuitry around U16.
2. Check audio at U4 pin#3. If there is no audio check the +/-35V supply. Check the mute pin#8. The power amp must be unmuted to get audio at the output. You should see –2.1 to –5.0Vdc if the power amp is unmuted. If the voltage is –2.1Vdc or higher the power amp is muted. Check the mute circuitry (Q3,7,8,9).
3. Check for missing or incorrect components in power amp circuitry.

PRE/POST Audio: PRE audio comes from the master volume pot (R56 pin#3,6). It is not affected by the volume setting. POST audio comes from after the master volume pot wiper (U3 pin#1,7). It is affected by the volume setting.

1. Check all audio connections between R56 and 20-pin ribbon cable M3 pin#2,3,5,6.
2. If POST audio volume level is too loud or soft, check resistor values R57-60 located near U3.

HEADPHONE Audio: The headphone audio comes from the headphone amplifier U5 and U22 (pg.1 of schematic).

1. Check for audio at input of headphone amplifier (U5,22 pin#3). If there is no audio, check connections between U3 pin#3,5 and U5,22 pin#3.
2. Check for missing or incorrect resistor values in headphone amplifier.
3. Check connections between headphone amplifier output U5,22 pin#14 and ¼" jack J4 pin#3,6.

FLEXTONE II TROUBLESHOOTING GUIDE

January 13, 2000

LINE OUT/POWER AMP PCB:

R/L SPKR NO PLUG: This test checks for the following connections. For any failures, check connections listed below. If the same test consistently fails, try replacing 20-pin test fixture ribbon cable. NOTE: The ¼" phone plug cables used for this test have the hot and ground shorted together. The cable serves no purpose except to keep the plugs connected to the test fixture so they don't get lost. If you use a standard ¼" plug cable, the test will always fail.

R SPRK NO PLUG – 20-pin ribbon cable J5 pin#9,10 ---------- J2 pin#3
20-pin ribbon cable J5 pin#11,12 ---------- J2 pin#4

L SPRK NO PLUG – 20-pin ribbon cable J5 pin#15,16 ---------- J1 pin#3
20-pin ribbon cable J5 pin#17,18 ---------- J1 pin#4

R SPRK PLUG – 20-pin ribbon cable J5 pin#13,14 ---------- J2 pin#3
20-pin ribbon cable J5 pin#11,12 ---------- J2 pin#5

L SPRK PLUG – 20-pin ribbon cable J5 pin#13,14 ---------- J1 pin#3
20-pin ribbon cable J5 pin#19,20 ---------- J1 pin#5

R/L GND: This test checks the functionality of the SW2 slide switch. With the switch in the GND position, pin#1 of J3,4 XLR jacks are grounded. In the NO GND position, pin#1 of J3,4 are floating. If there is a failure, check connections between SW2 and J3,4. Make sure pin#2,5 of SW2 are connected to GND. If the test consistently fails, try replacing XLR cable.

SENSE: This test is checking the functionality of the Live/Studio slide switch SW1 and is checking for R56 (10K ohm). If there is a failure, check connections between ribbon cable J5 pin#8 and SW1 pin#8,9. Check if R56 is 10K ohm. If SENSE LED doesn't turn off when cable is inserted into Right Speaker Jack, check if R5 is missing or wrong value.

AUDIO: There are 3 audio channels to check XLR+, XLR-, and AMP_R. The XLR channels have a left and right channel but the AMP_R is a mono signal that goes to both the left and right sides of headphones. If you notice consistent audio problems, try changing test fixture ribbon cables, XLR audio cables, or headphones.

XLR+: Check all circuitry between J5 pin#2,3,5,6 and J3,4 pin#2. Note that PRE or POST is selected depending on which position the Live/Studio switch is in. EXAMPLE: No Audio on XLR+ left side with Live/Studio switch in STUDIO position. Check connection between J5 pin#3 and R51. Check connections between R51 and J4 pin#2.

XLR-: Same as XLR+ except output comes from J3,4 pin#3.

AMP_R: Audio comes from power amp board.

1. Check for audio at 8-pin ribbon cable M3 pin#2. If there is no audio check continuity of ribbon cable. Also check test fixture ribbon cable.
2. Check audio at U8 pin#3. If there is no audio check the +/-35V supply. Check the mute pin#8. The power amp must be unmuted to get audio at the output. You should see –5.0Vdc if the power amp is unmuted. If the voltage is –2.1Vdc or higher the power amp is muted. If this is a frequent problem, check –5V supply inside test fixture.
3. Check for missing or incorrect components in power amp circuitry.

FLEXTONE 1 COMBOS

Symptom: Floorboard lights up but doesn't control amp properly, although pushing buttons on amp might get appropriate response at floorboard.
Solution: Try replacing C26, which is connected to the ADC that handles the floorboard and the amp's pots.
Symptom: Does not retain memory of user presets.
Solution: Install Q4 reset chip and remove C43. On Rev. A and B pcb's, there is no dedicated place for the reset chip, so you have to solder pin 3 of the chip to pin 10 of U11, pin 2 of the reset chip to the positive pad for C43, and pin 1 of the reset chip to the negative pad for C43.

Symptom: Audio cuts out after amp warms up.
Solution: Check power amp chip(s), and make sure they are firmly screwed to their heat sink(s).

Symptom: Distorted audio.
Solution: Check power supply filter capacitors for broken leads. Also check through-hole pcb traces at filter caps for continuity.

Symptom: Distortion
Solution: Make sure the +5V regulator's hex stand-off heat sink is securely screwed in place.

Symptom: After plucking a string, as the note dies out, it becomes distorted [fuzzy]. A low level input signal is distorted, but as you increase the amplitude of the injected signal, it crosses a threshold where the signal becomes clean.
Solution: Usually this is caused by C8 being bad or needing to be resoldered. If that doesn't fix it, check C9, and the other components in that op amp circuit.

Flextone 2 HD

Symptom: Amp works fine except the floorboard can't control it properly.
Check H1 and H2 on the power supply board. Are you seeing the correct DC voltages? Do the voltages change as they're supposed to when you switch the Speaker Impedance switch on the back of the amp? If the voltages are low, check C1 and C2 (the big filter caps) for broken leads. This symptom can also be caused by a bad U4 op amp.

Symptom: Distorted input signal
Sometimes U19 on mainboard (input op-amp) can sustain electrostatic damage. Replace U19 and add two 1N4148 small signal diodes as per Technical Bulletin #016.

Stompboxes (DL4, MM4, DM4, FM4)

Symptom: Unit will not power up, or will power up sometimes but not others.
Solution: Check C27 and C28 next to the crystal. If one or both of them are being held high (probably at +5Vdc) then replace both caps.

Symptom: Audio is intermittent or garbled.
Solution: Look at the ¼" audio jacks. They should have a metal sleeve that lines the inside of the jack where the ¼" plug goes in. If the jacks are the kind with no metal sleeve, they may be intermittent.

Symptom Won't power up correctly
Solution: Check the springs on the switch actuators. Sometimes they press against the tact switches, causing them to be 'on' all the time.

Symptom: Delay signal is distorted.
Solution: Check the DRAM pins for solder bridges.

Symptom: Audio passes in 'Bypass' but not when effects are engaged (when looking on scope, signal disappears at input jack, but does not appear to be grounded).
Solution: The relay switch might be bad. Check to see that the proper pins have continuity.

POD/POD2

Symptom: **Unit switches to 'Tuner' mode by itself, or display is erratic.**
Check the +5V regulator. On some rev. pcb's it lies next to a trace. It should not, however, be lying on top of the trace. If it is, loosen the hex standoff heat sink and slide the top of the regulator over so it is not on top of the trace.

Symptom: **Unit will not power up, or will power up sometimes but not others.**
Check C24 and C25 next to the crystal. If one or both of them are being held high (probably at +5Vdc) then replace both caps.

Symptom: **Audio is intermittent or garbled.**
Look at the ¼" audio jacks. They should have a metal sleeve that lines the inside of the jack where the ¼" plug goes in. If the jacks are the kind with no metal sleeve, they are unreliable and should be replaced.

Symptom: **The Floorboard doesn't control the unit properly, or doesn't read out properly.**
Take a look at the RJ-45 connector to make sure that none of the metal prongs on the inside of the jack are bent or shorting against one another. Also check the surface mount caps and inductors near the RJ-45 connector. They can be cracked, and the cracks might not be visible so check them by heating up one side with your soldering iron and seeing if you can flick the component off the board with very little pressure.

Symptom: **No audio, or just lots of static.**
Check the codec. Early models of Pod were susceptible to random static charges which could blow the codec.

FLOORBOARD

Symptom: Volume or Wah pedal doesn't work. Wah led may work, but moving the pedal doesn't change the sound, and amp sounds as if pedal is stuck in either 'toe-down' or 'heel-down' position.

Solution: Check the filmstrips for creases. If they're damaged so they can't move freely in and out of the pcb slots, the pedals won't function properly

Solution: If the filmstrips are OK, check the solder joints at Q1 and Q2 on the pedal pcb. If any of them are broken, check the positioning of the transistors. They should not be physically touching the metal chassis. If they are, mount them lower (closer to the pcb), so the chassis can't put any pressure on them.

Solution: If it's not the filmstrips or the Q1/Q2 solder joints, it's probably a burned out emitter or phototransistor on the pedal pcb.

Symptom: Button doesn't work, or works intermittently.

Solution: The tac switch is probably bad.

Spider (All Models)

Symptom: Audio is intermittent or garbled.
Solution : Look at the ¼" audio jacks. They should have a metal sleeve that lines the inside of the jack where the ¼" plug goes in. If the jacks are the kind with no metal sleeve, they may be intermittent.

Symptom: [1 X 12 model only] Audio level is very low, increases slightly when you turn on Reverb or Delay.
Solution: Make sure the main pcb is configured correctly. R 27 should be removed 1 X 12 configuration.

Symptom: The amp changes settings by itself, including amp models, effects, and. presets. It also does not respond correctly to the floorboard.
Solution: Check the +5V at pin 13 of U14 on main board [it should be at least 4.8V]. It could get dragged down by C65, L4, R30, D8, D9, the RJ-45 connector or cable, or U14 itself.

Spider 212

Symptom: Audio is intermittent or garbled.
Solution : Look at the ¼" audio jacks. They should have a metal sleeve that lines the inside of the jack where the ¼" plug goes in. If the jacks are the kind with no metal sleeve, they may be intermittent.

Symptom: Intermittence on input jack or headphone jack / Low output / Noisy output / Static / No output
Solution: If there is no signal after input inductors, L3 and/or L4 could be open. If there is signal after input inductors but no signal at headphone and speaker output, L5, L6 or L7 could be open.

Symptom: Lights dim on floorboard
Solution: If floorboard LEDs are dim or floorboard switches do not function properly, L11 could be open.)

Symptom: Volume or wah pedal on floorboard not operational
Solution : If wah does not work, L12 could be open. If volume pedal does not work, L13 could be open.)

VETTA COMBO Service Center FAQ

Symptom: Unit has low audio and white noise/distortion.

Check the op amp on the little guitar input breakaway pcb. It might not be getting both the +15v and –15v that it needs. If this is the case, it's probably caused by the surface mount capacitors on the breakaway pcb. Also, check R165 and R166 on the main pcb.

VETTA HD Service Center FAQ

Symptom: Rattling sound, even though chassis seems secure.

Check the two big inductors on the power supply pcb for physical damage. They might be cracked, and the loose parts might be rattling.

Symptom: No audio output.

Check ***ALL*** the mosfet transistors in the output stage for internal shorts. Be sure to check all the surrounding components as well (diodes, resistors, etc..) because some of them will be shorted as well. Some of the components will probably look burned.

Symptom: Unit has low audio and white noise/distortion.

Check the op amp on the little guitar input breakaway pcb. It might not be getting both the +15v and –15v that it needs. If this is the case, it's probably caused by the surface mount capacitors on the breakaway pcb. Also, check R165 and R166 on the main pcb.