Eon 515 Troubleshooting Guide

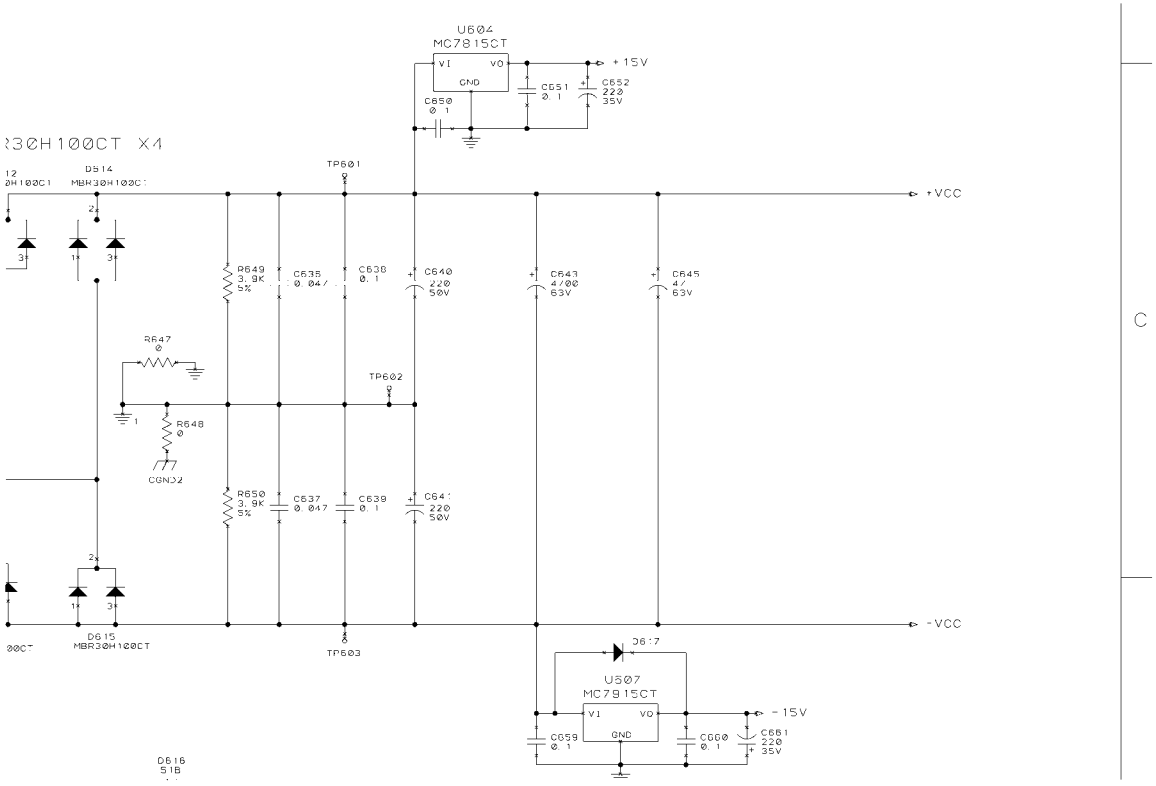
E.Bird/T.Walbert 1-15-09

Secondary circuits.

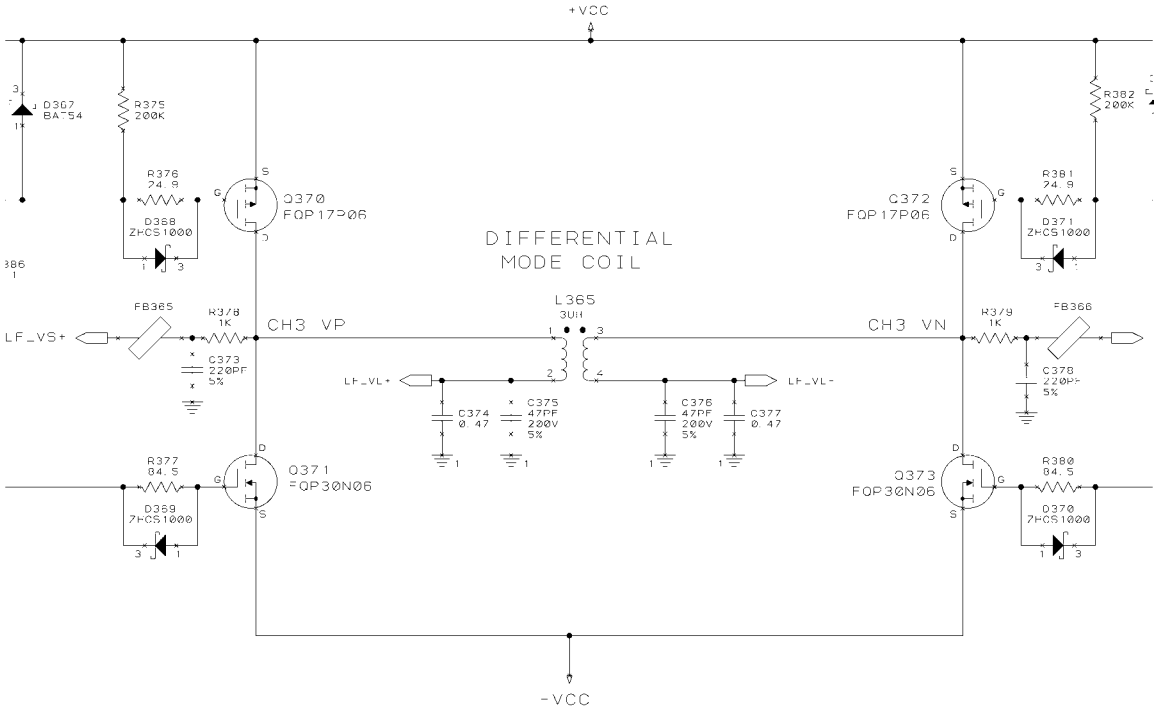
1. Start by doing a thorough visual examination of the assembly for any sign of damage. This will help guide you to the trouble area.

2. Using an ohm-meter measure from TP601 (+VCC) to TP602 (Ground). It should measure over 2K and rising as it charges up the capacitors. If this reads near 0 ohms then you will need to remove the PWA from the heatsink and check for a silpad short.

3. Using an ohm-meter measure from TP603 (-VCC) to TP602 (Ground). It should measure over 2K and rising as it charges up the capacitors. If this reads near 0 ohms then you will need to remove the PWA from the heatsink and check for a silpad short or a short between U402 and the heatsink.



4. Using an ohm-meter measure from TP601 (+VCC) to TP603 (-VCC). It should measure over 2K and rising as it charges up the capacitors. If this reads near 0 ohms, then check Q370, Q371, Q372 and Q373 for shorts, and replace the damaged parts. If two of these MOSFETs are shorted then replacing them is all you will need to do to the amplifier section but you will need to check the power supply for damage.

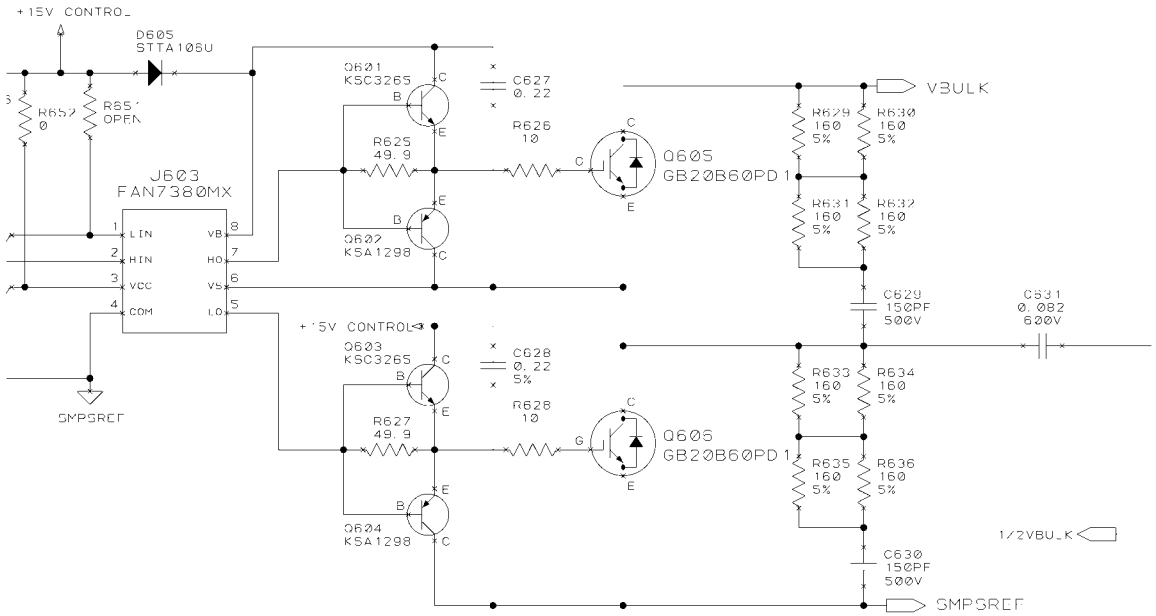


5. Connect a low voltage supply capable of +/-20Vdc to TP601 (+VCC), TP602(GROUND) and TP603(-VCC). Verify that the +15, -15, +5 and –5V regulators have the proper voltage output. If the voltage is low on any of these and there is not excessive current draw, then replace the regulator.

6. Connect a 40K ohm resistor from D611 cathode (+VCC SENSE) to +VCC, with the supplies set to +/-20Vdc. This will allow the amplifier to start switching. Verify the switching waveforms at Q370 Drain pin and Q372 Drain pin are square and stable.

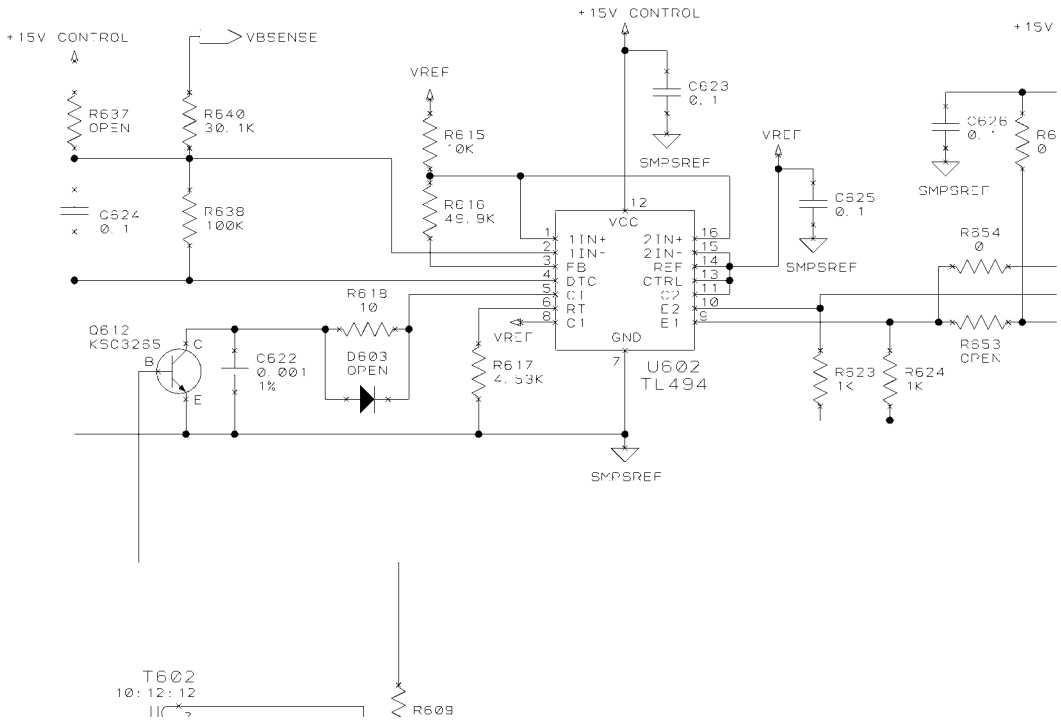
Primary circuits.

1. Using an ohm-meter check Q605 and Q606 for shorts. If these devices are shorted then check R626 and R628 which should read 10ohms. Next check Q601, Q602, Q603, Q604 for shorts and opens. If any of these are damaged then you will most likely need to replace the following parts along with the ones already identified. U603, R623, R624, U602, U609 and U 601.



2. After replacing all failed parts, connect a power supply set to 13Vdc from +15V control to SMPSREF and place a 1K ohm resistor from U602 pin 2 to +15 control. Verify that the signal at Q606 Gate is a square wave at approximately 140KHz.

3. Remove the 13V supply and resistor then connect a 300Vdc supply from VBULK to SMPSREF. Verify that the signal at Q606 collector is a 300V peak to peak square wave. The current draw should be less than 70ma.



4. Verify that +Vcc and –Vcc are ~ 21Vdc with 300V on Vbulk.
5. Remove the supply, check the AC fuse and verify proper operation when plugged into the AC line.

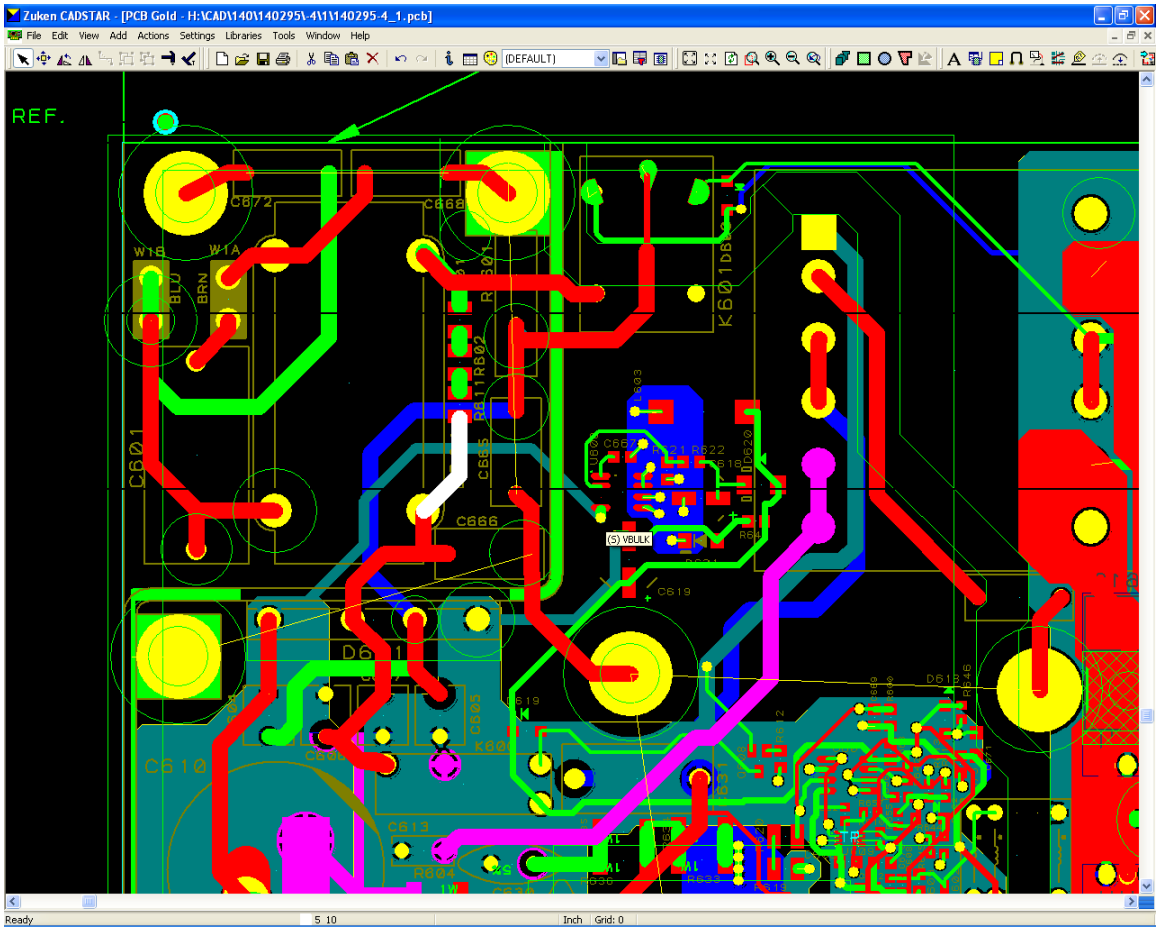
Initial Field Failure Reports

To date early field failures have been observed in the 3 categories listed below. Included in each category are typical warning signs indicative of each as well as corrective actions implemented.

1. Shorted devices due to metal shaving contamination. Single shorted output device with no other failures. Look for metal shavings in the silpad insulator. Vtech has added an additional cleaning stage to remove these from the heatsink.

2. Low IGBT gate drive at start up. Typically a catastrophic failure with extensive power supply gate drive damage (R625-628,Q601-606,U602-602,U608,U609) . The 15 ohm PTC at RT601 allows U608 to fully initialize before the supply is enabled.

3. 230V power up failures due to a sticking relay. The dominant failure modes observed have been a blown fuse and/or damaged U603. Check for a stuck relay by looking across the contacts of K600 while unpowered for a short between 1/2VBULK and DOUBLER. These can be accessed topside by probing T601 Pin 6 (highlighted in pink and R611 Pin 2 highlighted in white).



In some cases a stuck relay can be “unstuck” by getting knocked about in shipping and will measure ok. It is also worth noting that the bulk caps C610 and C611 can be damaged due to overvoltage stress if powered on at 220-264V with a stuck relay. In this case the unit will power up successfully but will not work when driving a load. Replacing C610 and C611 will remedy this. The auto detect circuitry has been redesigned effective 1/14/09 to prevent a power down glitch which causes the stuck relay.