

Ten Tec Titan 425 Amplifier with Ameritron AL800H P. S. Transformer

John, W1AN 8/7/2014

There have been several failures of the original power transformer in the Titan 425 amplifier from shorts in the HV winding. This was possibly caused by less than adequate insulation layers at the internal lead wiring points that eventually wore through. The one most recent failure from James K1SD amplifier showed a short from the 240V primary to the HV secondary, an odd failure. This showed up as a fault only when the HV secondary winding was plugged into the rectifier board to get a return path to ground through the primary! It was discovered the cost of the Ameritron transformer was considerably less than one from Peter Dahl/Hammond and a review of his options and his decision led to this project.

The Titan 425 schematic I modified was posted originally by Jim K9YC who redrew it from the study of his amplifier, the factory schematic being difficult to follow. Thanks to K9YC for sharing. I believe it was Lou at King Conversions who did the first transformer swap. James K1SD provided the attached photos from his successful project from the modified schematic which included multiple repairs caused by the transformer failure. James' modification also included several customizations. He has a more detailed writeup on his website.

Below is a summary of what was done in the basic transformer swap to present the scope of work.

The information is provided without any warrantee of any kind. Always Use CAUTION when working on a powered unit. Never energize with covers off or interlocks defeated!

The original transformer was unplugged, unbolted and removed. The Molex connector and leads were saved. Leads were kept as long as possible and extended as necessary.

A control transformer for 20V was mounted. A Triad FD7-20 was used as it had windings for both 120 and 240v. A further investigation may reveal the possibility of using the yellow lead winding on the Ameritron transformer for this purpose of control voltage.

A screw terminal strip was added for wiring the new transformer with provisions for differences in line/mains voltage using jumper or lead changes. The original Molex connector leads were dressed and routed to this terminal strip and attached with fork terminals and solder lugs.

A low voltage 6-28VDC Sonalert was mounted in the power supply case for high temp alarm. A 1.8K 1W resistor was added to provide a few milliamps from the +28V supply.

A resistor was added across the FAST/SLOW switch to restore a low speed selection for the fan.

On the Rectifier board Relay K2, D5 and resistor R8 were removed. They were no longer needed. Removing D5 added clearance to the ground trace for B+ level voltages.

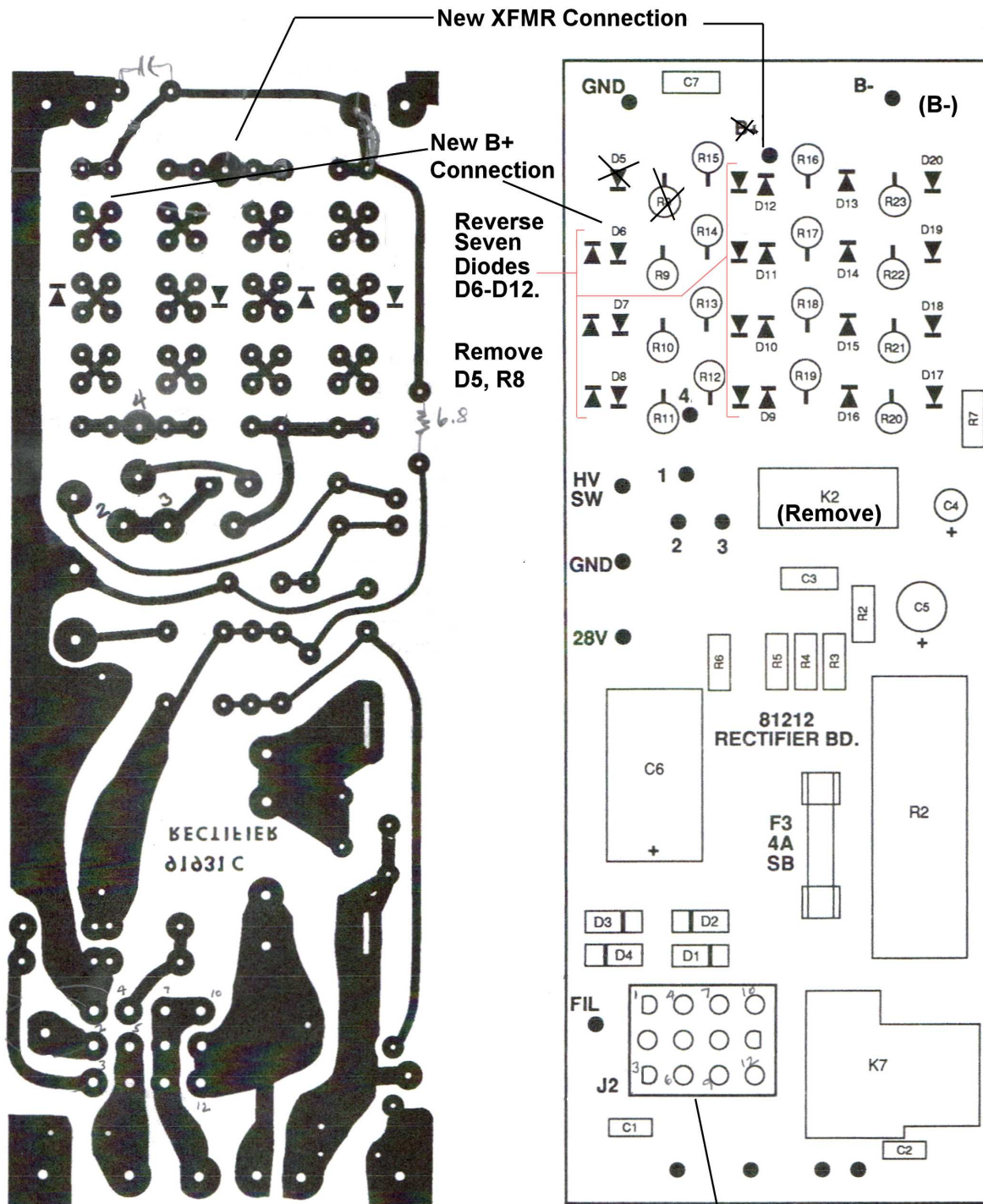
On the Rectifier board D6-D12 diodes were removed, reversed and replaced. (Seven diodes) Several of the original diodes were bad so it was easy just to reverse several with the new ones. (Suggest 1N5408).

Red HV leads from the transformer connector were relocated. One was to the rectifier board. One small hole was drilled on the Filter board as a tie point for the other. Two red wires were cut off from the connector.

The new transformer was mounted with 10-32 screws nuts and lock washers and wired to the terminal strip with fork terminals. The transformer wiring color codes were included with the transformer.

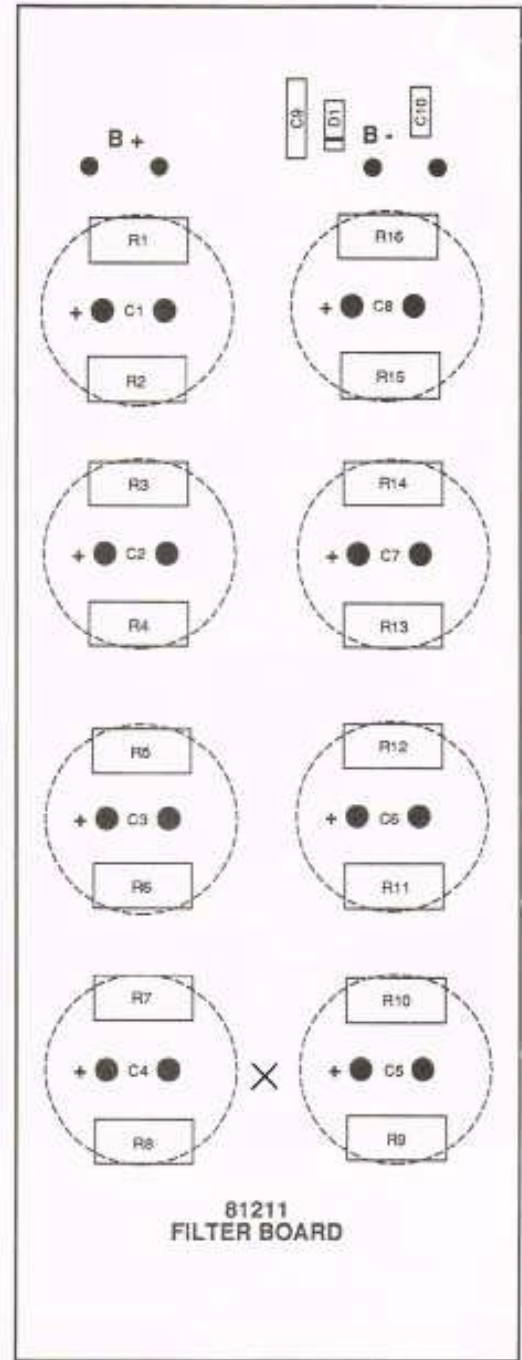
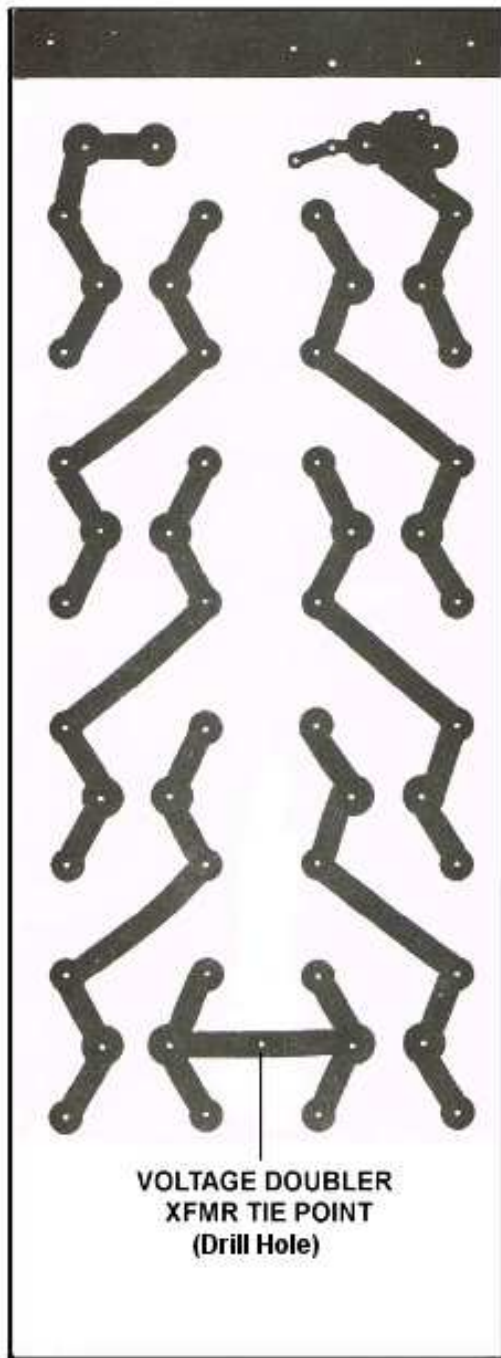
The Rectifier and Filter boards show the connection point and diode changes required to change from a full wave bridge to a voltage doubler. The schematic shows the wiring, and other interconnections within the power supply.

Notes:



VOLTAGE DOUBLER MODIFICATIONS

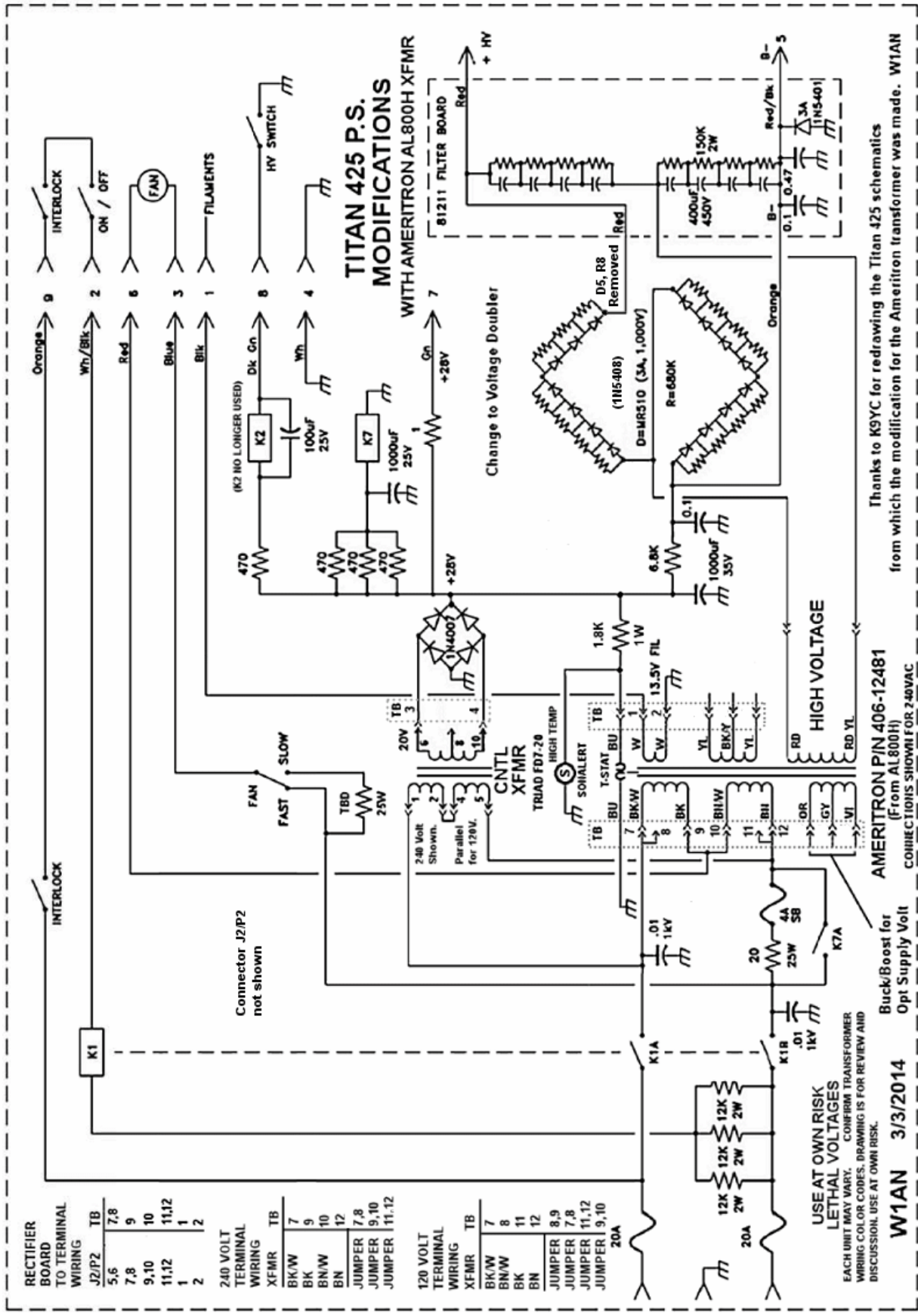
- POWER SUPPLY RECTIFIER BOARD CIRCUIT TRACE
- POWER SUPPLY RECTIFIER BD. COMPONENT LAYOUT



VOLTAGE DOUBLER CHANGES

POWER SUPPLY FILTER BOARD CIRCUIT TRACE

POWER SUPPLY FILTER BOARD COMPONENT LAYOUT



RECTIFIER BOARD TO TERMINAL WIRING

J2/P2	TB
5,6	7,8
7,8	9
9,10	10
11,12	11,12
1	1
2	2

240 VOLT TERMINAL WIRING

XFMR	TB
BK/W	7
BK	9
BN/W	10
BN	12

JUMPER WIRING

JUMPER	7,8
JUMPER	9,10
JUMPER	11,12

120 VOLT TERMINAL WIRING

XFMR	TB
BK/W	7
BN/W	8
BK	11
BN	12

JUMPER WIRING

JUMPER	8,9
JUMPER	7,8
JUMPER	11,12
JUMPER	9,10

TITAN 425 P.S. MODIFICATIONS WITH AMERITRON AL800H XFMR

Change to Voltage Doubler

USE AT OWN RISK LETHAL VOLTAGES

EACH UNIT MAY VARY. COMPROM TRANSFORMER WIRING COLOR CODES. DRAWING IS FOR REVIEW AND DISCUSSION. USE AT OWN RISK.

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AMERITRON PIN 406-12481 (From AL800H)

Thanks to K9YC for redrawing the Titan 425 schematics from which the modification for the Ameritron transformer was made. W1AN

