ETO-Alpha 89

The 89 was produced from 12/92 to 9/2000, 408 units were built during this time. These units were much like the 86, but with many updates and refinements.

The 89 uses a pair of 3CX800A7 triodes in a grounded-grid class AB2 linear amplifier, with Pi-L output network and Pi tuned input network. The plate voltage is 2700-2800Vdc no-load, and drops to about 2500Vdc under full load. The HV power supply is a full wave bridge rectifier with 25µF of filter capacitance. The 89 operates ONLY on 220-240Vac! The 89 delivers 1500 watts RF output with little effort, typically 35 watts drive.

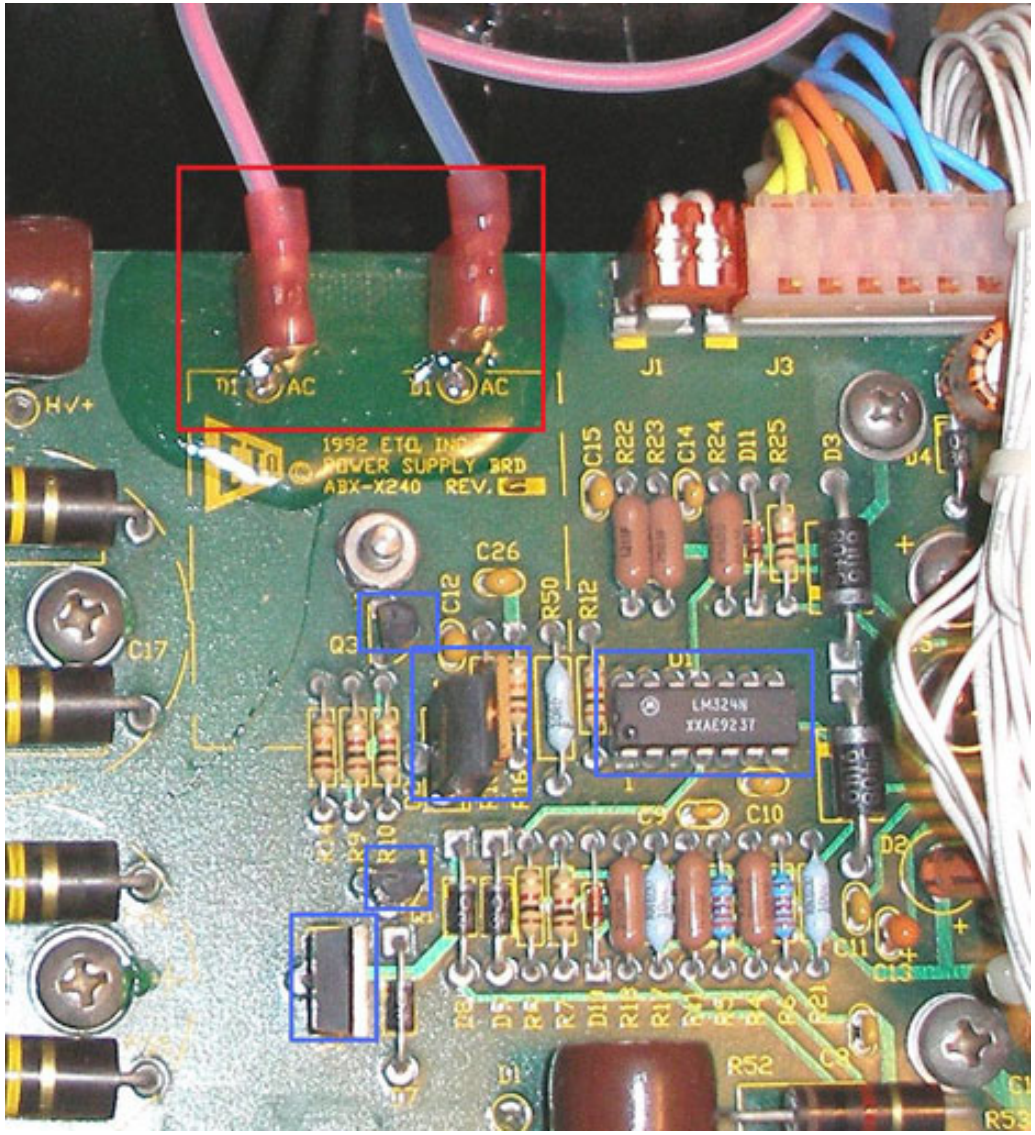
It covers all bands from 160 to 10mtrs, 10 meters is not operational from the factory, a diode is cut to enable it. It can be found inside the top cover just above the bar-graph display. (it is easy to see with the top cover off)

PIN diodes provide T/R switching, and QSK type capability. This PIN diode system is an improved system over that used in the 86, which had a weaker system and was prone to diode failure.

Above is a photo of the rear panel, showing the factory installed auxiliary cooling fan and washable air filter. The "key out" port is for QSK operation only, it insured proper key sequencing, and need not be used when PTT SSB is used.

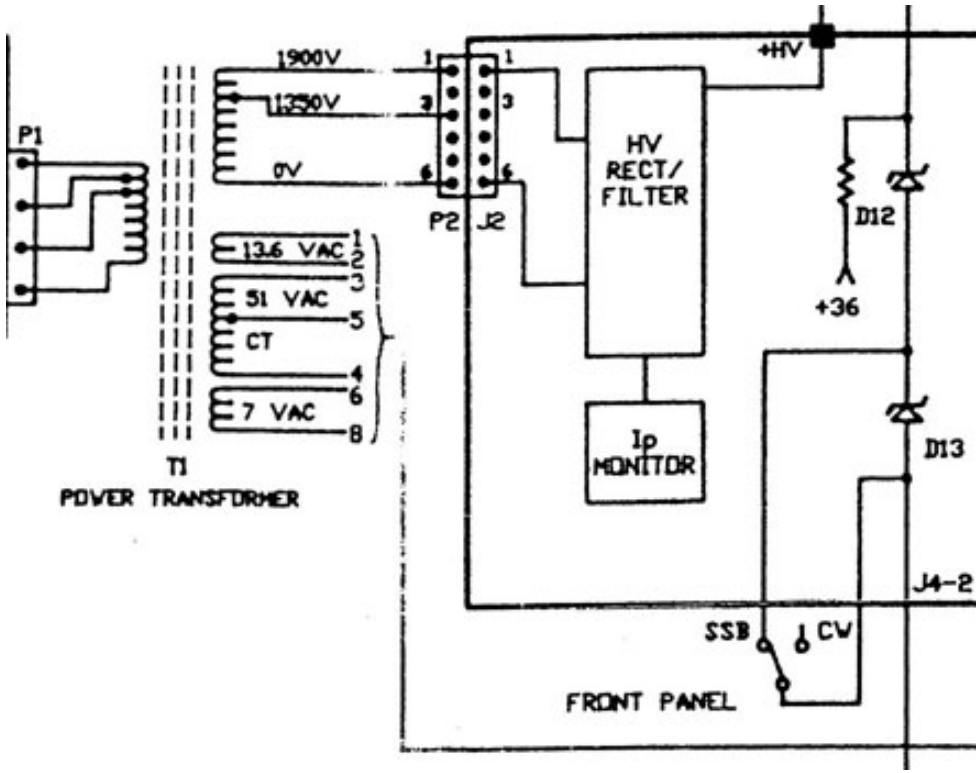
Above, you will see the RF tank section on the left and the power supply section on the right. The tube blower is the black object in the rear of the photo on the left. In the photo on the right the large black object is the main power transformer. To the left of the transformer is the T/R board. The HV rectifier is under the PCB along with the HV filter capacitors and low voltage PS.

An area to keep watch on in these amps is the connector J2 on the PS board, which is where the HV AC comes from the transformer to the rectifier. Dust and or moisture can accumulate in and under the connector and possibly cause an HV arc across it. I have encountered at least one unit where this has happened and required the total replacement of the connector and repair to the PCB as well as additional damages. If your unit has not done this, to prevent it, pull up the plastic connector header on the PCB, clean it with alcohol and apply a coating of silicone RTV and press the header back down on it, allow 24 hours for it to cure before powering up the amp. This should keep moisture out of the area between the PCB and the connector female.



The photo above shows that damaged unit repaired. The burnt out connector was replaced with a set of vertical spade connectors and "flag" type female connectors on the wires (see red box). The PCB is cleaned of all carbon traces and sealed with epoxy cement to prevent future arcing across the PCB surface and to add strength to the connectors. The arc damaged the IC and transistors in the blues boxes (likely the magnetic pulse produced by the arc). The IC is U1 on the PS board and is the Ip, Ig, and ALC controller, it is a quad op-amp. The small transistors amplify the Ip & Ig signals fed to U1. The large transistors are MOSFETs and are cathode bias regulators.

Interestingly, the 89 does not have an HV plate voltage selection like the older 86. The plate voltage is fixed, but the lower voltage is available from the transformer.



However, this feature could be added to the 89. The SSB/CW switch on the front of the 89 switches the cathode bias from class AB2 for SSB, to class B for CW/FM for better efficiency, but linearity if decreased. There are an extra unused set of contacts on this switch that can be used to operate a vacuum relay coil to switch the HV lines for these modes if the user wishes to do so. I can provide a modified schematic for this feature on request.

If you are experiencing difficulties with your 89, or have other questions, let me know, I'll try to help you.