

Pbar Note #700

DRF1 Anode Supply Replacement

RJ Vargo
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This note is for MCR operators and other personnel that may be required to replace these high voltage supplies.

There are three types of Glassman supplies being used in the DRF1 system:

20KV 50mA ---- Used for the rotators power amplifier (DRF1-2 thru7)

10KV 100mA --- Used for the rotator driver amplifier (DRF1-2 thru7) also

Used for the adiabatic power amplifier (DRF1-1 and 8)

5KV 60mA ----- Used for the adiabatic driver amplifier (DRF1-1 and 8)

All three are controlled by the interlock chassis and cable using a Burndy Smooth Bantam connector (the green military type). All the pin outs are the same. The high voltage output uses a customized (by Glassman) PL259 connector (RF connector commonly found on CB radios). The high voltage is then connected to the capacitor box by a black RG213 cable using the appropriate terminations on each end.

The procedure, precautions and safety issues:

Because of programmed controls within the interlock chassis, the apparent symptoms observed may lead to an incorrect diagnosis. Please consult a knowledgeable person for help on this subject. (BobVargo, Dave Peterson, Ralph Pasquinelli, Dave McDowell, Wes Mueller).

Replacing a failed unit is mostly mechanical; however, please be aware that the 10 and 20 KV supplies must be changed with its matched calibrated multiplier unit. The 5KV supplies are a single unit. The matched pairs are connected together with cables having exclusive terminations and lengths. Common sense should guide the way. Turn off the system by switching the interlock chassis to local and turning off the power. Then switch on the crowbar to safely discharge the capacitor bank. This is the first level of safety one **must always use**. Unplug the AC power to the HV supply. A possible safety issue exists at the output connector. Since it is connected to the capacitor bank, a potential for the full charge of the capacitors could be present at the power supply end of the cable. This is possible if: The steering diode shorts, the bleeder opens, the crowbar fails and you remove the wrong end of the cable first. Although a robust steering diode is incorporated within the capacitor box, these items can fail with no operational impact. (This is bad!). Therefore: **Disconnect the capacitor box end of the cable before removing the other.** Remove the interconnecting wiring and replace the unit with the appropriate spare located on the bench in back of the DRF racks. Remember matched pairs! These units are bench tested at the same power level as the operating system, but not necessarily the exact same voltage and current settings. To reduce turn on difficulties, duplicate the current and voltage settings on the 10 turn adjustment dials to that of the one taken out. The current limit is normally set to 80%. Then fine tune after the five minute filament warm up timeout. For adjustment, the voltage is set for the DC current (between pulses)

meter to indicate 10mA (PA) and 20mA (Driver). Because of cavity mistune during downtime, expect an occasional power supply trip.

Supporting information

Relationship of tube anode volts, anode current and bias:

Please consider these relationships when adjusting the above. From engineering design these are the typical anode operating voltages:

	Rotator	Adiabatic
PA	13KV	8KV
Driver	4.5KV	4KV

This is a guide, since each tube has a slightly different cutoff characteristic. Tube cutoff current can be adjusted in two ways:

- 1) Change the anode voltage with the bias voltage held constant.
- 2) Change the bias voltage with the anode voltage held constant.

The bias voltage is supplied by the Kikusui DC supply located near the interlock chassis. This sets the tubes to operate in class C.

In all of our PA and Driver amplifiers the bias is held constant (since it is clamped to a maximum by the bias zener within the amplifiers). The only change that can be done is with the anode voltage. This should be held within 10% of the chart above. However, as components deteriorate, technical adjustments may be made and in practice you may find these settings slightly outside of this range. Therefore, adhere to the above adjustment recommendation.