SCE Model 4400 Power Supply

This high voltage supply is part of a dual-display radar system. It has some very impressive specs:

- 10KV Output: temperature coefficient of .0027%ºC (2.7ppm)
- Focus adjustable from 2500 - 3000V
- Dynamic focus control ±100V / 10µsec step response
- Focus tempco 2ppm

Our design consisted of 4 separate modules. Each module contains a push-pull driver section and a potted output module, and produces one (HV) output. A fixed 10,000V reference voltage (from a VERY good source) fed all modules, where it was compared to a divided sample of its output (from VERY good high voltage dividers). The resultant error voltage controlled the voltage to each module.

The dynamic focus requirement was met with a high voltage discrete-component amplifier which added the dynamic focus voltage to the low side of each (floating) focus supply.

SPECIFICATIONS

Electrical

Input:

- Voltage 26VDC ±10%
- Current 1.35A max at nominal output

Output:

J1, J2 (Anode):

- Voltage 10KV fixed output (±2%)
- Current 5µA nominal, 20µA max
- Regulation ±0.1% load, ±0.05% line
- Ripple 5V p-p, maximum
- Temperature Coef. .0027%/ºC 0 to 55ºC, .0054%/ºC -54 to +85ºC

J3 (Anode):

- Voltage 10KV fixed output (±5%)
- Current 50µA nominal, 100µA max
- Regulation ±1% load, ±1% line

- Ripple 10V p-p, maximum
- Temperature Coef. .036%/ºC 0 to 55ºC, .036%/ºC -54 to +85ºC

J4, J5 (Focus):

- Voltage 2500 - 3000V, adjustable via external potentiometer
- Dynamic Focus 0-200V, 1:1 from user input
- Current 50µA nominal, 200µA max
- Regulation ±0.1% load, ±0.05% line
- Ripple 3V p-p, maximum
- Temperature Coef. .002%/ºC 0 to 55ºC, .04%/ºC -54 to +85ºC

Protection Circuits

- Output Overload Supply protected against excessive load on output
- Short Circuit Protected against output shorts for an indefinite time
- Reverse Polarity Inputs protected against reverse polarity

Environmental

- Operating Temperature -54°C to 85ºC
- Humidity To 100% (fully sealed construction)
- Shock Per MIL-STD-202, Method 213B, 25G
- Vibration Per MIL-STD-202, Method 204C, Condition A
- Thermal Shock Per MIL-STD-202, Method 107D, Condition A