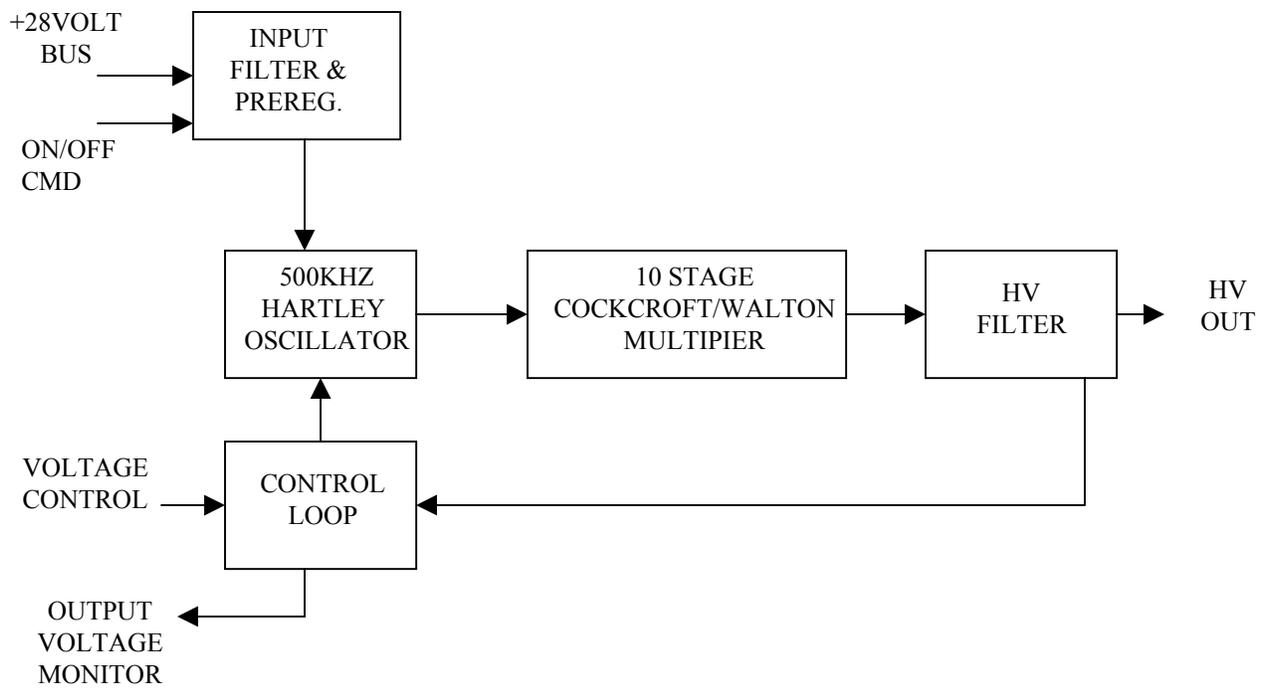


## **KEY HVBS REQUIREMENTS**

- 18 PMT's PER POWER SUPPLY.
- OUTPUT VOLTAGE ADJUSTED FROM 400 TO 1500 VOLTS LINEARLY AS CONTROL VARIES FROM 0 TO 2.50VOLTS.
- OUTPUT CURRENT 60uA max.
- LOAD AND LINE REGULATION 1.0%.  
OUTPUT RIPPLE – LESS THAN 2mV.
- POWER CONSUMPTION WITH MAX. LOAD 450mW.
- OSCILLATOR FREQUENCY GREATER THAN 100KHZ. NO SYNCHRONIZATION REQUIRED.
- DC ISOLATION +28RTN. TO HV RTN. 100 OHMS

# HVBS BLOCK DIAGRAM



## **HVBS Design Features**

- **SIMPLE, RELIABLE, FLIGHT PROVEN CIRCUIT APPROACH USED.**
- **VOLTAGE GENERATED FROM 500KHZ RESONANT SINE WAVE HARTLEY OSCILLATOR WITH 170VOLT P-P OUTPUT.**
- **10 STAGE MULTIPLIER STEPS VOLTAGE TO 1500 VOLTS, DC. MAX.**
- **0 – 3.0 VOLT LINEAR REFERENCE INPUT ADJUSTS OUTPUT LEVEL FROM 400 TO 1500 VOLTS.**
- **OUTPUT REGULATION ACHIEVED BY CONTROLLING CONDUCTION OF OSCILLATOR SWITCHING TRANSISTOR.**
- **PLANAR TRANSFORMER IMPLEMENTATION**
- **LOW POWER CONSUMPTION.**

## **HVBS LAYOUT**

- SUPPLY TO CONSIST OF 2 X 4 INCH PC CARD MOUNTED ONTO FREE CARD WITH MECHANICAL ASSEMBLY SERVING AS SHIELD/HOUSING.**
- HIGH VOLTAGE SECTIONS (MULTIPLIER & HV FILTER) UTILIZE SM CAPACITORS, DIODES, AND RESISTORS. HV SENSE RESISTOR AXIAL LEADED.**
- ALL HIGH VOLTAGE COMPONENTS AND CONDUCTORS CONTAINED ON TOP LAYER OF PC CARD. NO HIGH VOLTAGE NODES CARRIED ON INNER BOARD LAYERS.**
- TRANSFORMER AND MULTIPLIER SHIELDED FROM HV FILTER AND CONTROL ELECTRONICS.**
- VOID FREE CONFORMAL COATING USED IN DIELECTRIC DESIGN.**

## **HVBS TESTING**

**•ELECTRICAL DESIGN HAS BEEN BREADBOARDED AND SUCCESSFULLY TESTED OVER TEMPERATURE.**

**•A PC CARD CONTAINING THE PLANAR TRANSFORMER AND HIGH VOLTAGE MULTIPLIER HAS BEEN TESTED WITH THE BREADBOARD OVER TEMPERATURE.**

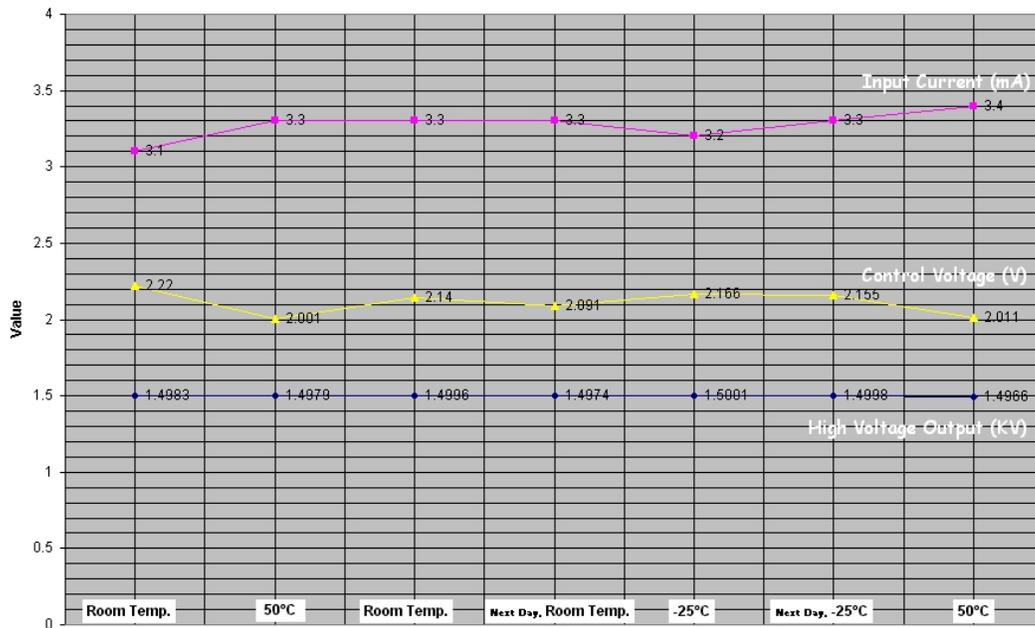
**•A CONDUCTED SUSCEPTIBILITY TEST CONDUCTED ON THE +28 VOLT INPUT. SOME SUSCEPTIBILITY OCCURRED IN THE 100HZ-3KHZ RANGE NECESSITATED A PRE-REGULATOR TO BE INCORPORATED.**

**•LONG TERM VACUUM TESTING TO BE PERFORMED ON ENGINEERING UNIT. ALL FLIGHT UNITS WILL RECEIVE VACUUM TESTING.**

**•ALL HIGH VOLTAGE CAPACITORS TO RECEIVE CORONA TESTING. FLIGHT UNITS TO RECEIVE SUB-ASSEMBLY CORONA TESTING IN CODE 563 FACILITY.**

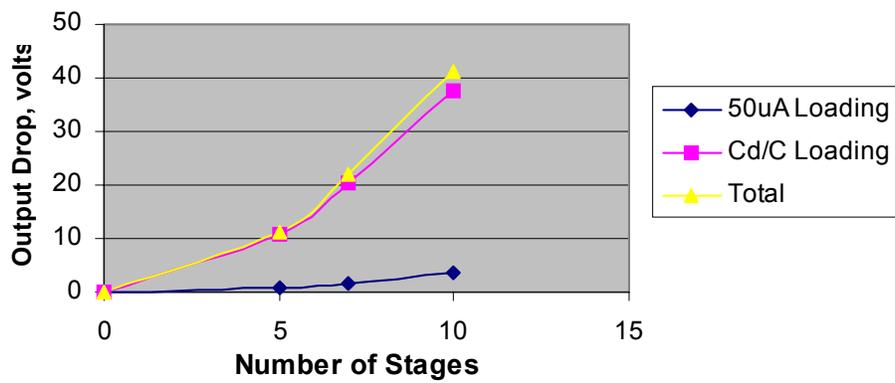
# ELECTRICAL PERFORMANCE OVER TEMPERATURE AT 1500VOLTS

Planar Transformer (Vin=28V, Vref=-3.00V)



**VOLTAGE MULTIPLIER  
CHARACTERISTICS  
WITH 0.01 $\mu$ F CAPACITORS AND Cd  
of 2pF, 500KHZ OPERATION**

**Multiplier Output Voltage Drop From  
1500Volts**



**Multiplier Output Ripple Voltage**

