

17.0 TUNE TRIM POWER SUPPLY SPECIFICATION DATA SHEET

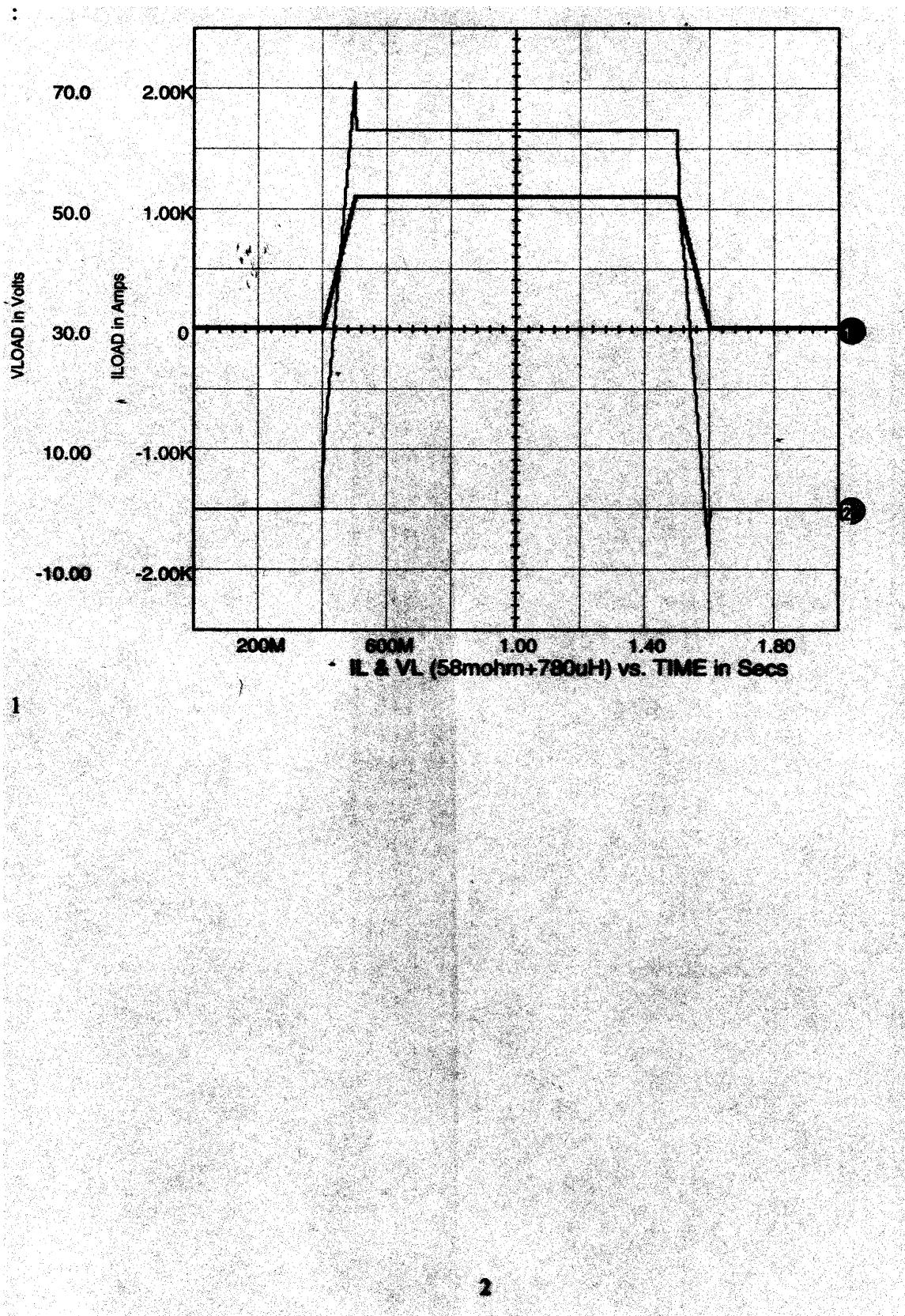
17.1	Input Voltage	460 Vrms 3 phase, +10%, -5%, 60 Hz
	[1.] DC Output Voltage	-170 V to +170 V
17.3	DC Output Current	Continuously Adjustable -1100A to +1100A
17.4	Pulse Repetition Frequency	Continuously Adjustable DC to 10 Hz
17.5	Regulation mode	Current
17.6	Load Current Tracking	+/- 0.01% during flat-top 0.5% during rise/fall
17.7	Zero Current Crossover Distortion	< 0.5%
17.8	Load Current Rise Time	< 2 msec @ 100A
17.9	Load Current Settling Time	< 1 msec
17.10	Back EMF from Magnet Load	+70V to -70V
17.11	Output Voltage Ripple	< 0.02%, DC to 10 kHz < 1%, 10 kHz to 1 MHz
17.12	Electrical Load	0.058 ohm + 780 uH
17.13	Ambient Air Temperature.....	10 to 40 degrees C
17.14	Maximum Inlet Water Temperature.....	40 degrees C
17.15	Maximum Size of Unit	84" (W) 54" (D) 78" (H)

NOTES

[1.] The Tune Trim power supply will be connected to the secondary winding of the dipole magnet. With the primary winding driven by the Main Magnet power supply, the +/- 70V back emf developed across the secondary winding must not in any way upset the performance of the Tune Trim power supply.

[1.] The part of the power supply that does the current regulation should be a PWM switching (IGBT switching modules) regulator.

[1.] Any overshoot in the current waveform shall be restricted to less than 1% and settled in less than 1ms.



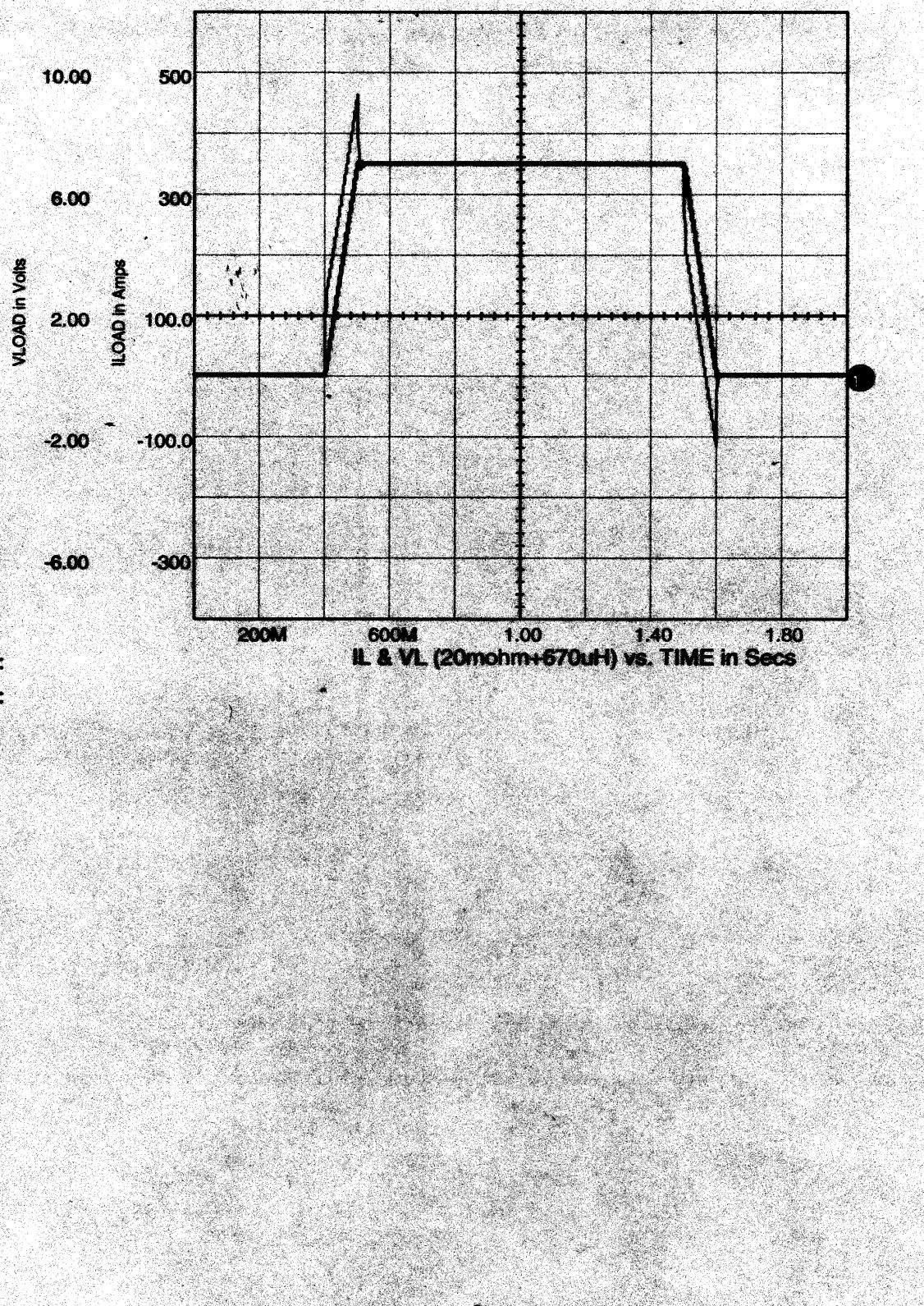
17.0 RESONANT SEXTUPOLE P. S. SPECIFICATION DATA SHEET

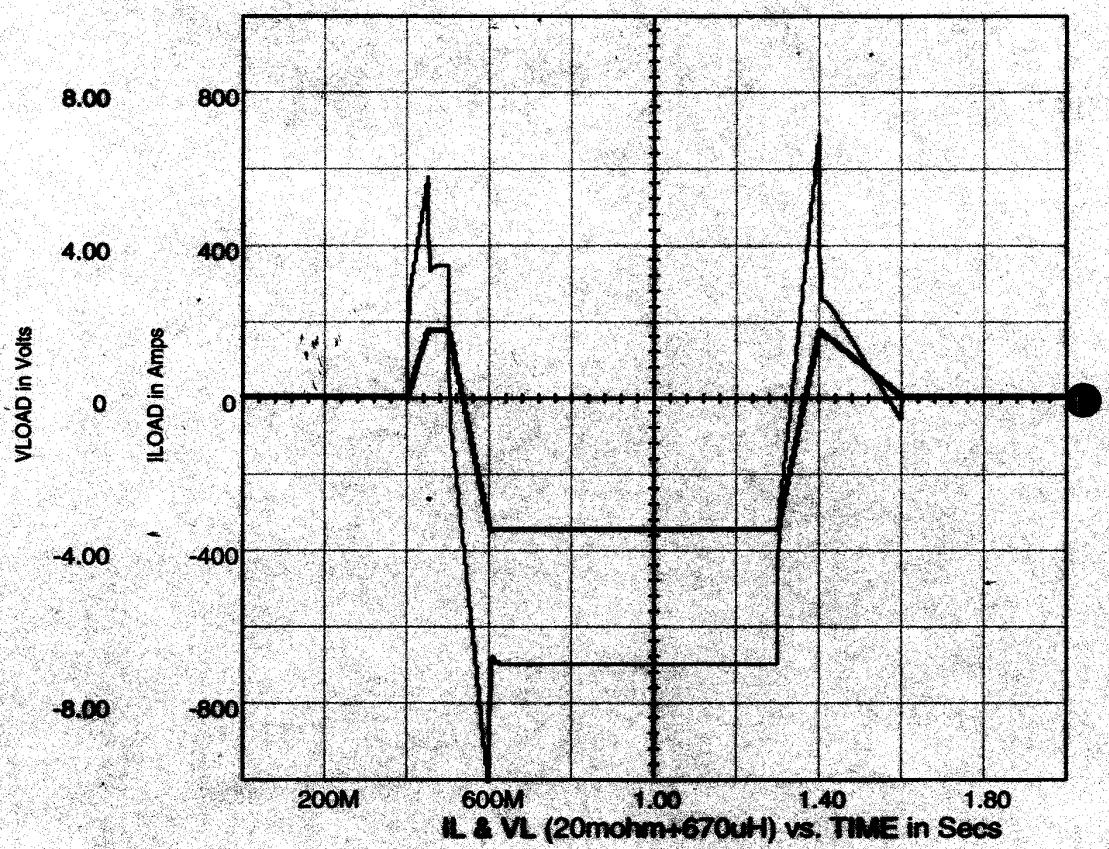
17.1	Input Voltage	460 Vrms 3 phase, +10%, -5%, 60 Hz
[1.] [1.]	DC Output Voltage	-30 V to +30 V
17.3	DC Output Current	Continuously Adjustable -350A to +350A
17.4	Pulse Repetition Frequency	Continuously Adjustable DC to 10 Hz
17.5	Regulation mode	Current
17.6	Load Current Tracking	0.01% during flat-top 0.5% during rise/fall
17.7	Zero Current Crossover Distortion	0.5%
17.8	Load Current Rise Time	< 1 msec @ 40A
17.9	Load Current Settling Time	< 1 msec
17.10	Output Voltage Ripple	< 10mVpp (DC to 10 KHz) < 100mVpp (10 KHz to 1 MHz)
17.11	Electrical Load	0.02 ohm + 670 uH
17.12	Ambient Air Temperature.....	10 to 40 degrees C
17.13	Maximum Inlet Water Temperature.....	40 degrees C
17.14	Maximum Size of Unit	42" (W) 54" (D) 78" (H)

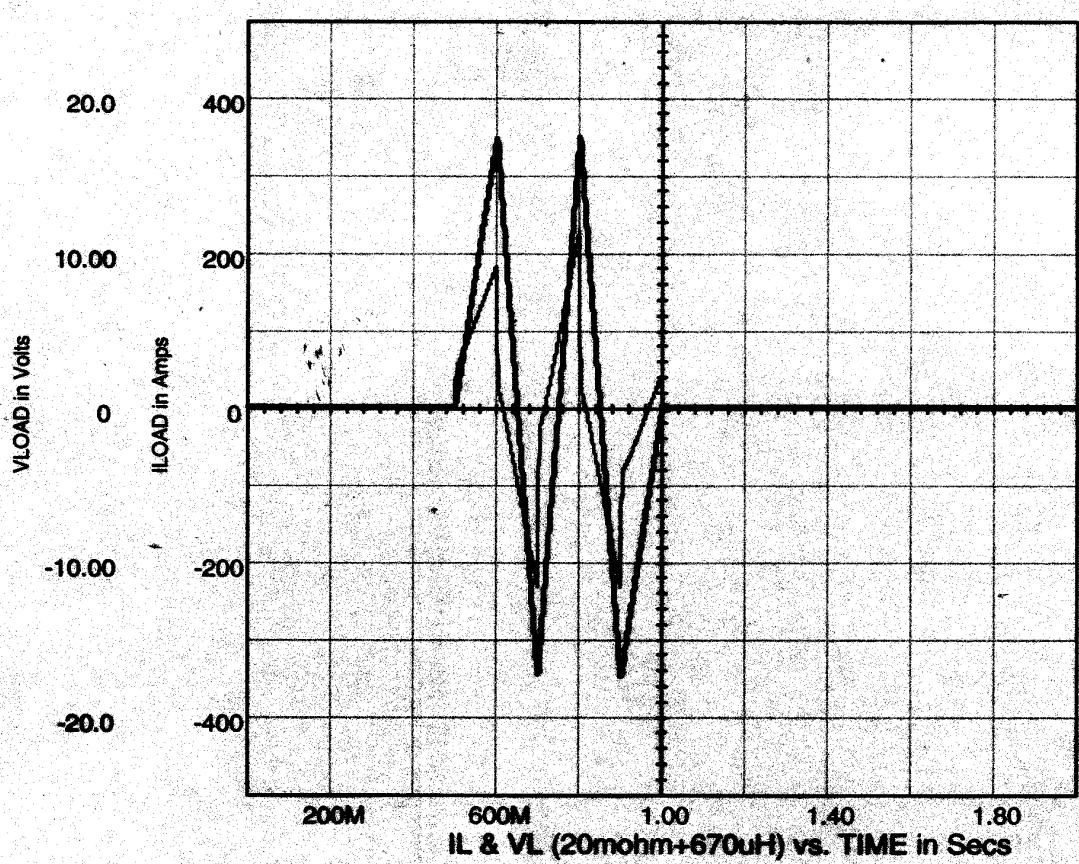
NOTES

[1.] Any overshoot in the current waveform shall be restricted to less than 1% and settled in less than 1 msec.

[1.] The part of the power supply that does the current regulation can be either a linear (transistor or IGBT bank) or a PWM switching (IGBT switching modules) regulator. In either case the output voltage ripple specification must be met before satisfying the other performance requirements.







17.0 ORBIT DEFORMATION P. S. SPECIFICATION DATA SHEET

17.1	Input Voltage	460 Vrms 3 phase, +10%, -5%, 60 Hz
	[1.] [1.] DC Output Voltage	+40V to -40V
17.3	DC Output Current	Continuously Adjustable 0 to 600A
17.4	Pulse Repetition Frequency	Continuously Adjustable DC to 10 Hz
17.5	Regulation mode	Current
17.6	Load Current Tracking	0.1% during flat-top 0.5% during rise/fall
17.7	Back EMF from Magnet Load	+/- 25V (50 Vpp)
17.8	Load Current Rise Time	< 1 msec @ 600A
17.9	Load Current Settling Time	< 1 msec
17.10	Output Voltage Ripple	< 10mVpp (DC to 10 KHz) < 100mVpp (10 KHz to 1 MHz)
17.11	Electrical Load	5.5 mohm + 55 uH
17.12	Ambient Air Temperature.....	10 to 40 degrees C
17.13	Maximum Inlet Water Temperature.....	40 degrees C
17.14	Maximum Size of Unit	42" (W) 54" (D) 78" (H)

SPECIFICATIONS

FIELD, B	.52 KG
BEND ANGLE	3 m Rad $\Theta_{Be} = 16.7 \text{ TM/Rad}$
STRAY FIELD,	< 2 G
CURRENT	1100 AMPS, PULSED
LENGTH IRON	100 Cm
GAP	2.54 Cm VERT. X 5.08 Cm HOR.
POWER	1.1 KW MAX.
TURNS	1
SEPTUM	.76 mm THICK
WATER FL.	4 l/min.
RESISTANCE	.001 OHMS

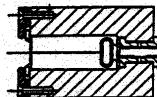


FIGURE 2·5·1 - THIN SEPTUM MAGNET

SPECIFICATIONS

FIELD, B	8.8 KG
BEND ANGLE	155.5 mRad $\Theta_{Bp}=13.0 \text{ TM/Rad}$
CURRENT	4800 A
LENGTH IRON	230 CM
GAP	2.74 CM VERT. X 7.68 CM HOR.
POWER	92 KW
TURNS	4
SEPTUM COND.	1.2 CM X 0.65 CM
TOTAL SEPTUM THK.	1.52 CM
WATER FLOW	96 L/MIN.
RESISTANCE	.004 OHM

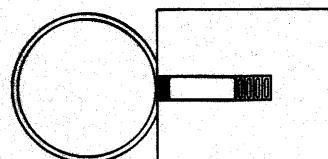


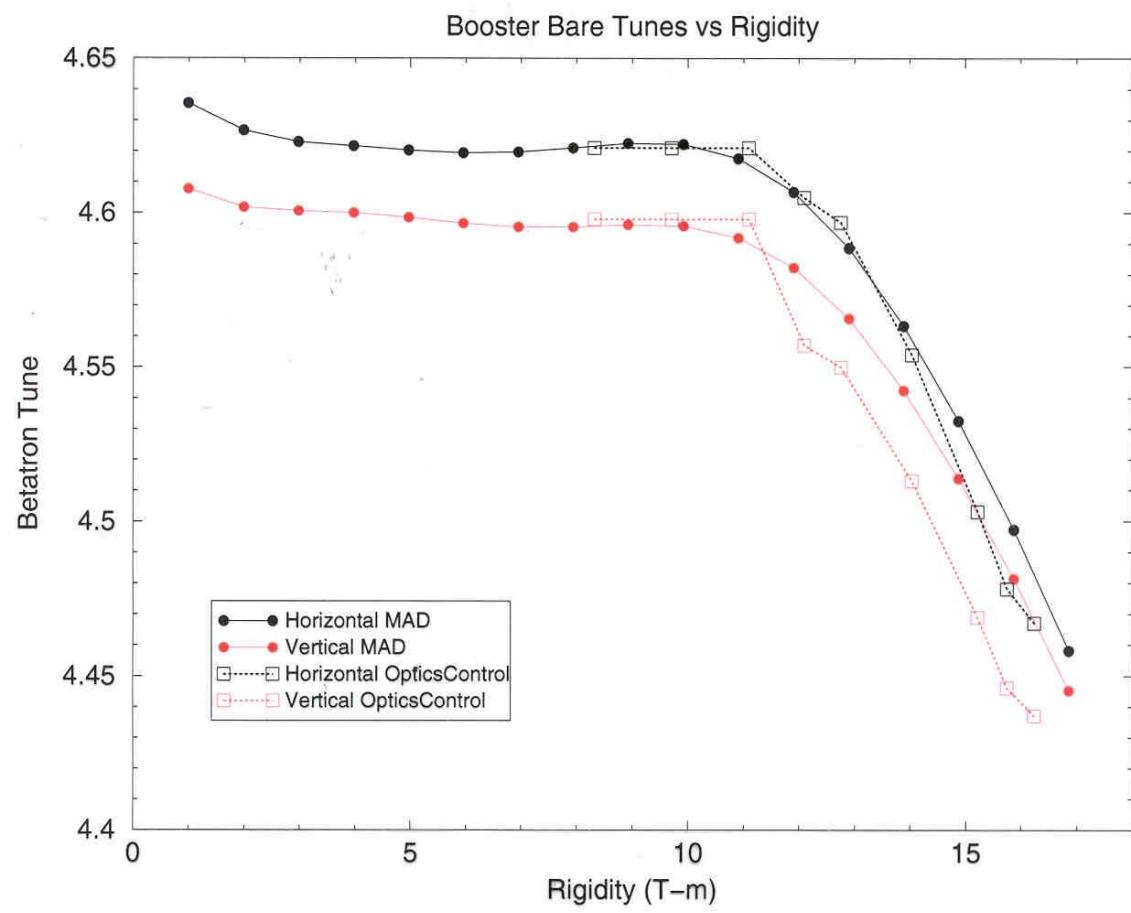
FIGURE 2·5·2 - THICK SEPTUM MAGNET

SPECIFICATION DATA SHEET
DC MAGNET POWER SUPPLY

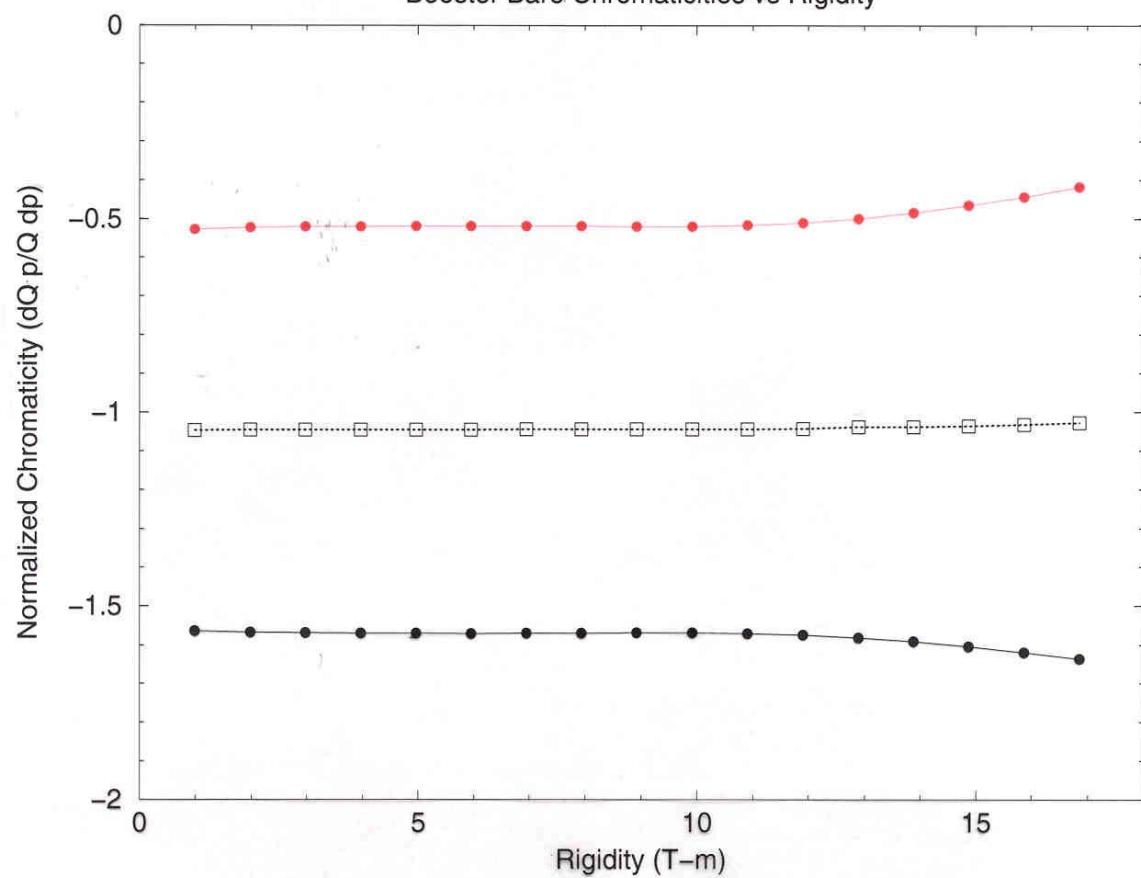
1. AC INPUT VOLTAGE 460 Vrms, $\pm 10\%$
3 phase 60 Hz
2. DC OUTPUT LOAD VOLTAGE continuously adjustable from 0 to 36 volts
3. DC OUTPUT CURRENT continuously adjustable From 0 to 5500 amps
4. CURRENT REGULATION OVER THE CURRENT RANGE OF 500 TO 1500 AMPS 01% 
5. RIPPLE CURRENT Peak-to-Peak (Ip-p) 01%
6. CURRENT ADJUSTMENT RESOLUTION 0.005%
7. RISE TIME plus SETTLING TIME 120 millisec max.
8. LOAD PARAMETERS
 $R = 5.42 \text{ milli ohms}$
 $L = 158 \text{ micro henries}$
 $L/R = 0.9 \text{ milli sec}$
9. CURRENT TRANSDUCTOR
DRIFT 100 ppm/degC
STABILITY 10 ppm/MONTH
10. SIZE (MAX. DIMENSIONS)
PACKAGING OPTION NO. 1
A SINGLE ENCLOSURE 7 FT HIGH x 9 FT WIDE x 7 FT DEEP
PACKAGING OPTION NO. 2
TWO ENCLOSURES CONSISTING OF:
A. A dc POWER SUPPLY AND FILTER 7 FT HIGH x 7 FT WIDE x 7 FT DEEP
B. A TRANSISTOR BANK 7 FT HIGH x 7 FT WIDE x 2 FT DEEP

SPECIFICATION DATA SHEET
D3 MAGNET POWER SUPPLY

1. AC INPUT VOLTAGE 460 Vrms, $\pm 10\%$
3 phase 60 Hz
2. DC OUTPUT LOAD VOLTAGE continuously adjustable
from 0 to 13 volts
3. DC OUTPUT CURRENT continuously adjustable
From 0 to 2000 amps
4. CURRENT REGULATION OVER THE
CURRENT RANGE OF 500 TO 1500 AMPS 0.1%
(LINE, LOAD, TIME, TEMPCO)
5. RIPPLE CURRENT Peak-to-Peak (Ip-p) 0.1%
6. CURRENT ADJUSTMENT RESOLUTION 0.05%
- PULSED OPERATION
 - A. TURN ON TIME (zero current to 1% of desired current) 120 millisec max.
 - B. REPITION RATE 1 Pulse per second min.
 - C. PULSE WIDTH 0.1 TO 1 SEC
8. LOAD PARAMETERS (Buss & Magnet).
R = 4.7 milli ohms
L = 23 micro henries
L/R = 4.9 milli sec
9. CURRENT TRANSDUCTOR
DRIFT 50 ppm/C
STABILITY 1000 ppm/MONTH
10. SIZE (MAX. DIMENSIONS) 7 FT H x 5 FT W x 3 FT D



Booster Bare Chromaticities vs Rigidity



Booster Tune Control At High Field

2nd and 3rd Order Resonances

