



The Specialist Range allows tube amplifier designers to go beyond existing technologies. The Specialist Range introduces output transformers for use in amplifiers with sophisticated circuit topologies.

## Toroidal Output Transformer for Tube Amplifiers

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### PAT-4070-CFB Ratings

Type & Applications	:	PAT-4070-CFB		
Primary Impedance	:	Raa = 3.995	[k $\Omega$ ]	
Secondary Impedance	:	Rls = 5	[ $\Omega$ ]	
Turns Ratio Np/Ns	:	Ratio = 28.267	[ ]	
Ultra Linear Tapping at	:	tap = 33	[%]	
Flat Frequency Range	:	f1f = 0.971	[Hz]->	fhf = 67.483 [kHz]
-1 dB Frequency Range	:	f11 = 0.414	[Hz]->	f11 = 137.031 [kHz]
-3 dB Frequency Range	:	f13 = 0.211	[Hz]->	f13 = 223.771 [kHz]
Nominal Power (1)	:	Pn = 70	[W]	
-3 dB Power Bandwidth starting at	:	fu = 14	[Hz]	
Total Primary Inductance (2)	:	Lp = 1.056 $\cdot$ 10 <sup>3</sup>	[H]	
Primary Leakage Inductance to sec.	:	lsp = 3.1	[mH]	
Effective Primary Capacitance	:	cip = 0.358	[nF]	
Total Primary Resistance	:	Rip = 120	[ $\Omega$ ]	
Total Secondary Resistance	:	Ris = 0.15	[ $\Omega$ ]	
Tube-Resistance per section	:	ri = 1	[k $\Omega$ ]	
Q-factor 2-nd order HF roll-off	:	Q = 0.607	[ ] (5)	
HF roll-off Specific Frequency	:	Fo = 266.745	[kHz] (5)	
Quality Factor = Lp/Lsp	:	QF = 3.406 $\cdot$ 10 <sup>5</sup>	[ ] (5)	
Quality Decade Factor = log(QF)	:	QDF = 5.532	[ ] (5)	
Tuning Factor	:	TF = 3.115	[ ] (5)	
Tuning Decade Factor = log(TF)	:	TDF = 0.493	[ ] (5)	
Frequency Decade Factor (4)	:	fdf = 6.026	[ ] (5)	

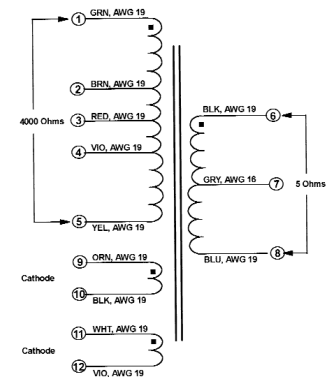
- (1): calculated under the conditions of balancing the DC-currents and the AC-anode voltages of the powertubes driving the transformer.
  - (2): 240 Volt 60 Hz measurement over the total primary winding
  - (3): calculated and measured at 1 mWatt in Rls; ri and Rls are pure Ohmic
  - (4): defined as  $fdf = \log(fh3/f13) =$  number of frequency decades transferred
  - (5): ir. Menno van der Veen: Theory and Practise of Wide Bandwidth Toroidal Output Transformers, 97-th AES Convention San Fransico, preprint
- (@): copyright Vanderveen Sept 20 1994, Version 1.5, design date Apr 26, 97

### Specialist Range Toroidal Output Transformers



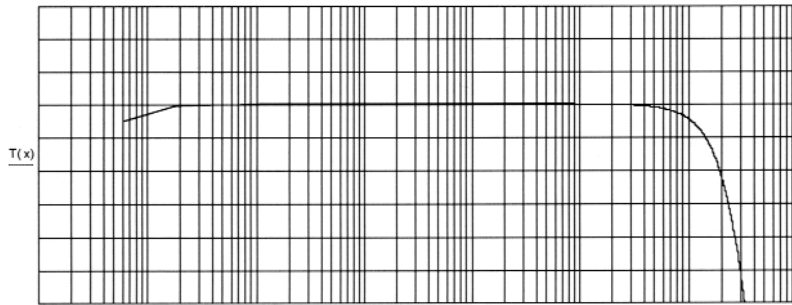
- Cathode feedback tap
- 70 watts power
- primary impedance 4000 ohm
- Power bandwidth  
14 Hz – 222 kHz (-3dB)

### Schematic

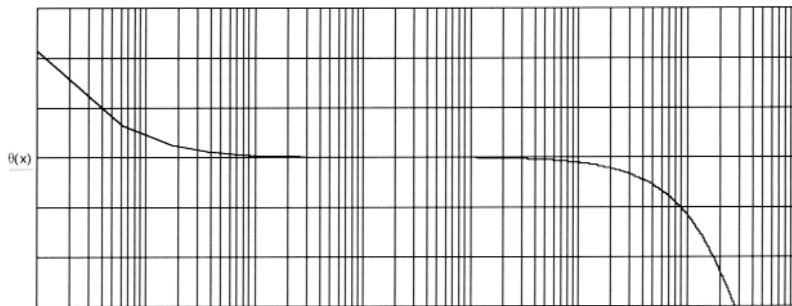


# PAT-4070-CFB Response Curves

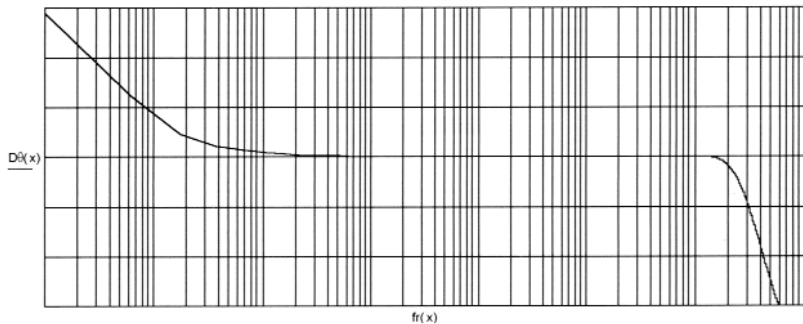
[dB] Frequency Response; Vertical 1 dB/div; Horizontal .1 Hz to 1 MHz (3)



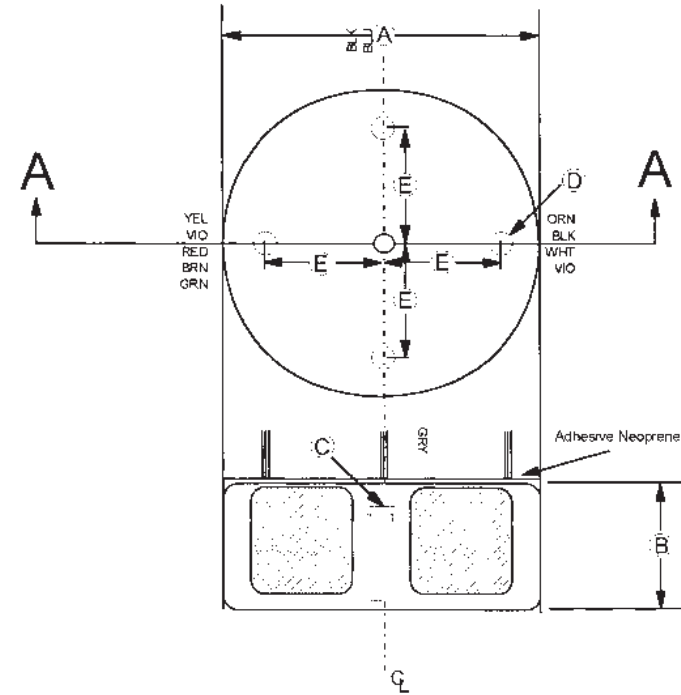
[degrees] Phase Response; Vertical 30 deg./div; Horizontal .1 Hz to 1 MHz



[degrees] Differential Phase Response; vert 30 deg./div; hor .1 Hz to 1 MHz  
See: W.M.Leach, Differential Time Delay..; JAES sept.89 pp.709-715



# Mechanical



REF	Dimension, in mm
A	152.4 nominal
B	88.9 nominal
C	5/16-18T-NUT
D	16 nominal
E	50 +/- 3

Weight: 5.62kg  
Lead Length: 300mm (+/- 10mm)

