

Fluorescent Magic Eye Tubes

© Forrest Cook 2008-2015

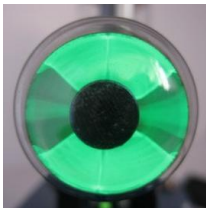
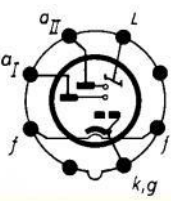
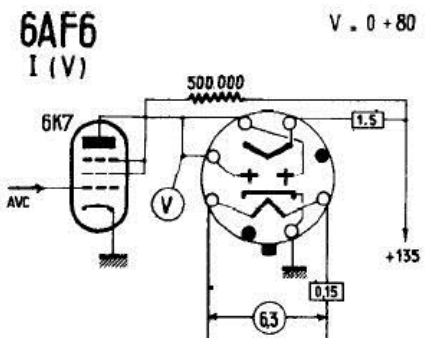
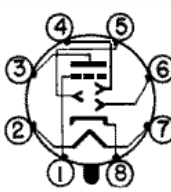
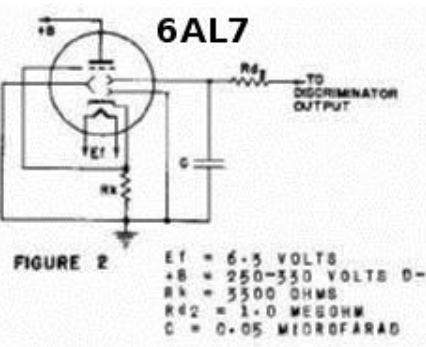
Here is a collection of information on a variety of fluorescent magic eye vacuum tubes that I assembled. The emphasis is to have a collection of information for those who wish to design circuits that use this type of tube. The list includes a wide variety of fluorescent indicator tubes. Many of these tubes are available on eBay for reasonable prices.

The 6U5/6E5 tube is one of the most common magic eye tubes; it was frequently used as a signal strength indicator in 1940s and 1950s consumer radios. The 6U5/6E5 uses an antique 6 pin tube base and has a 6.3V filament. The 1629/VT138 is electrically equivalent to the 6U5/6E5 except for its 12.6V filament voltage; it uses an octal tube base. These types of indicator tubes were sometimes referred to as "gooney eyes".

Both the EM83, EMM801 and 6AL7 tubes are dual-bar displays that would be well suited for use as a stereo volume meter. The EM84/6FG6 and EM87/6HU6 are fairly common single channel tubes in Noval 9 pin base; they were originally used as tuning indicators in radios and as a recording level meter in tape recorders. The EM80/6BR5 and EM81 is in Noval 9 pin base and it has a fan-shaped display.

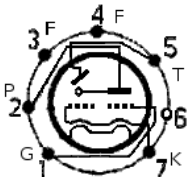
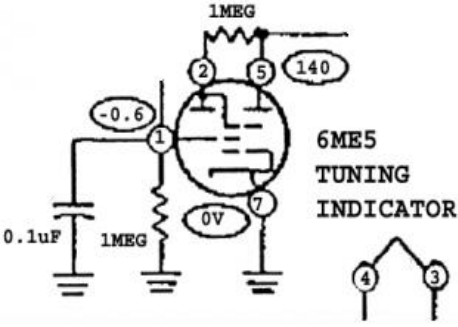
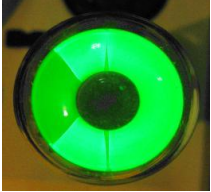
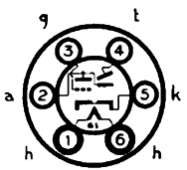
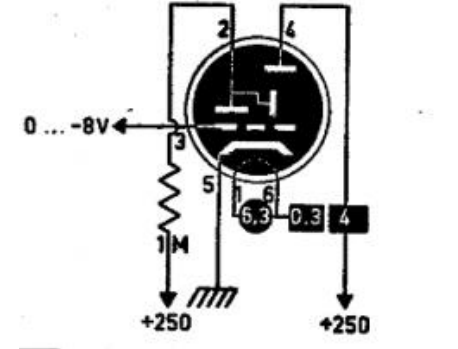
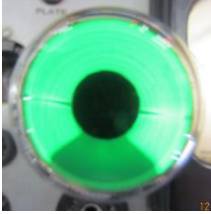
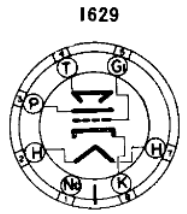
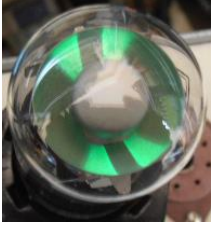
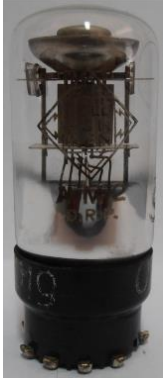
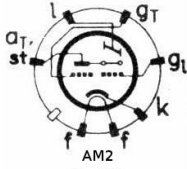
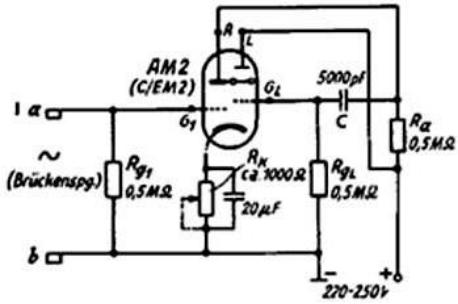
Some rare types of eye tubes include the miniature 6355, 6977/DM160 and R2164 tubes and special 6U5/6E5 tubes with a red lamp crystal over the center filament. Used as a radio tuning indicator, the combination 6AD6 eye tube and 6AE6 dual-plate triode control tube was designed so that one side of the eye tube was sensitive to weak signals and the other side was sensitive to strong signals.

Many of the photos and schematics shown here were pulled from eBay ads and radiomuseum.org articles, some of them are originals.

Type	Display	Side View	Pinout (bottom)	Circuit
6AF6			 Octal	
6AL7			 Octal	 FIGURE 2 E1 = 6.3 VOLTS +B = 250-350 VOLTS D-C R1 = 3500 OHMS R2 = 1.0 MEGOHM C = 0.05 MICROFARAD

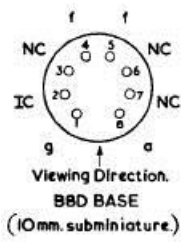
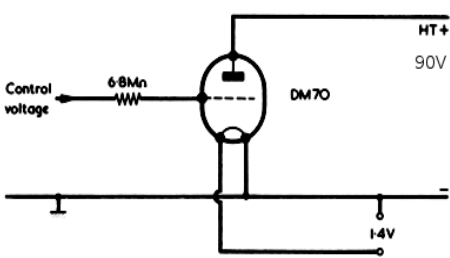
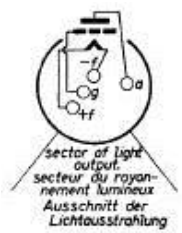
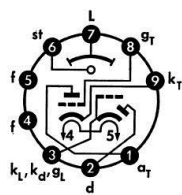
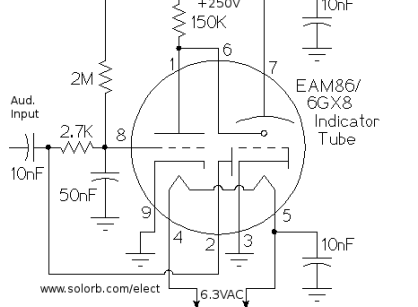
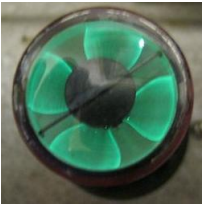
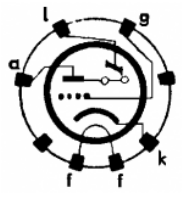
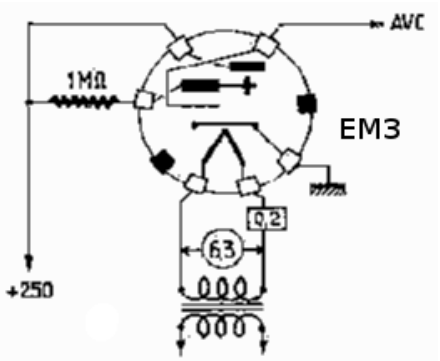
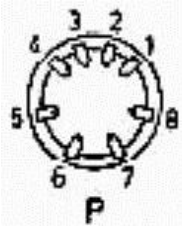
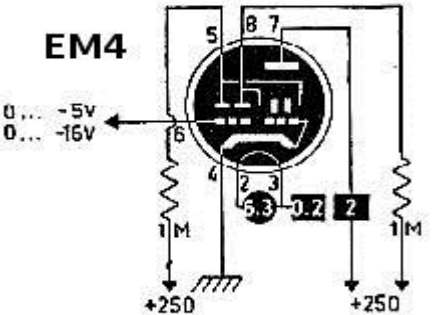
Fluorescent Magic Eye Tubes

© Forrest Cook 2008-2015

6ME5 6M-E5			 Minature B7G	 6ME5 TUNING INDICATOR $V_f = 6,3 \text{ V}$
6U5 6E5 (2E5) (EM35- 6 pin)			 UX6	 (2E5 $\rightarrow V_f = 2,5 \text{ V}$)
1629 VT138	 1 shadow angle		 Octal	
AM2			 AM2	 AM2 (C/EM2) 220-250V

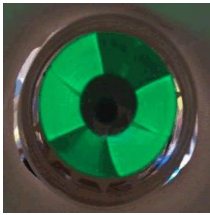
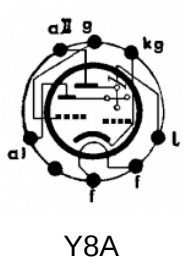
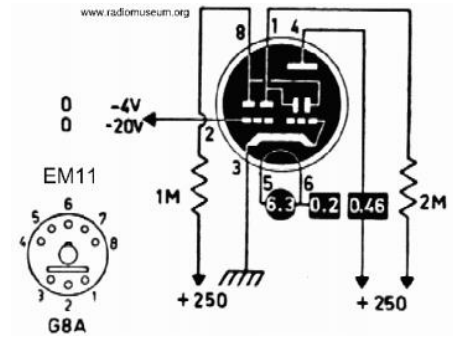
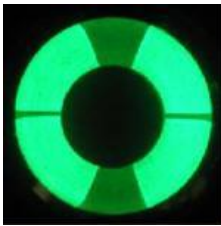
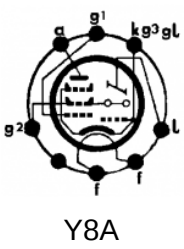
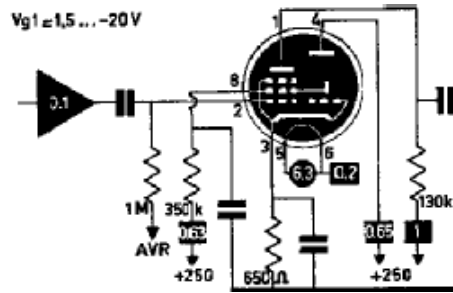
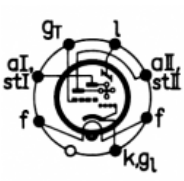
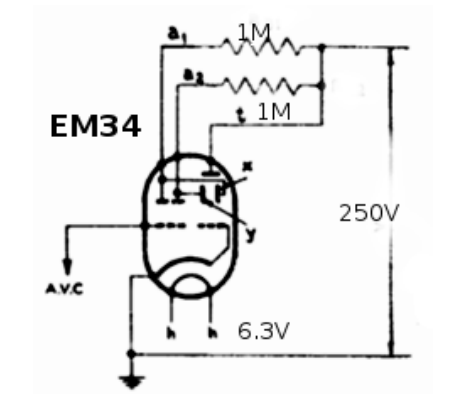
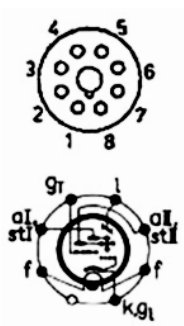
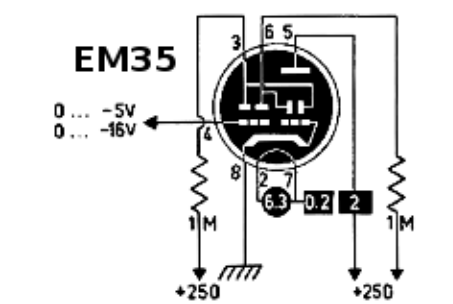
Fluorescent Magic Eye Tubes

© Forrest Cook 2008-2015

DM70 DM71 1M3				 $V_f = 1,4 \text{ V dc}$ $V_a = 90 \text{ V dc}$
DM160				
EAM86 6GX8				
EM3				
EM4				

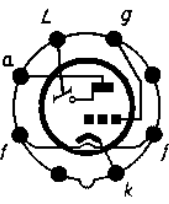
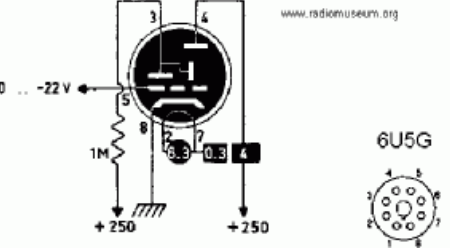
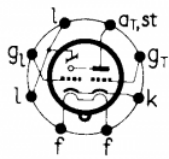
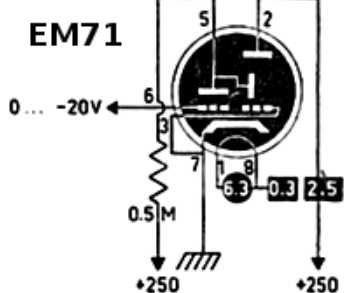
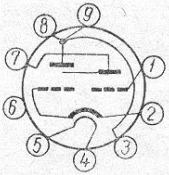
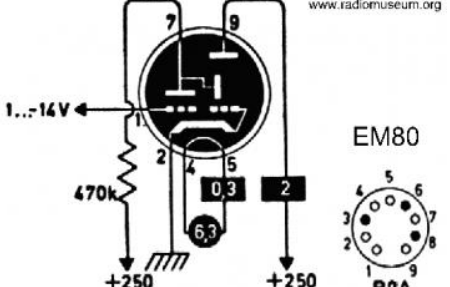
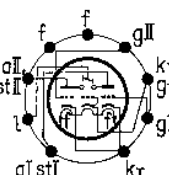
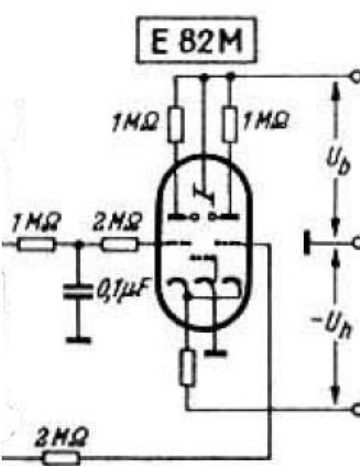
Fluorescent Magic Eye Tubes

© Forrest Cook 2008-2015

EM11				
EFM11 V _f 6,3 UFM11 V _f 15				
EM34				
EM35				

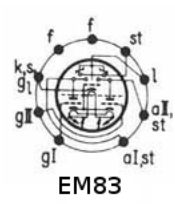
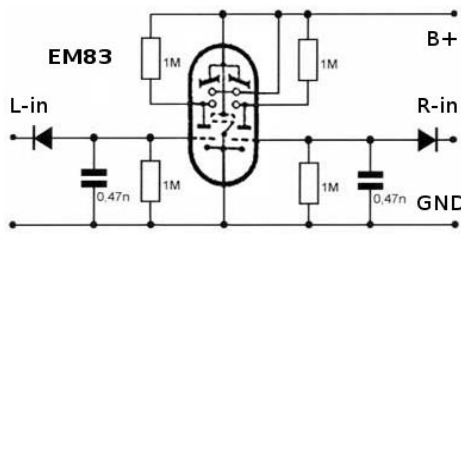
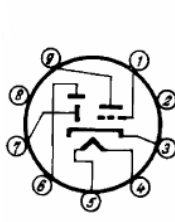
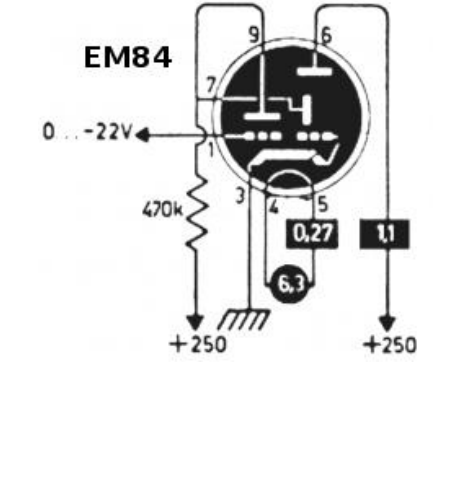
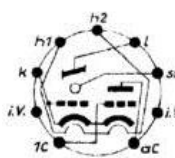
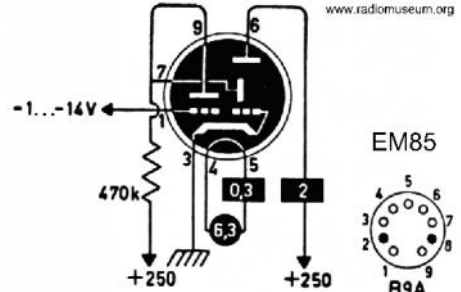
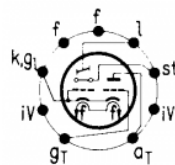
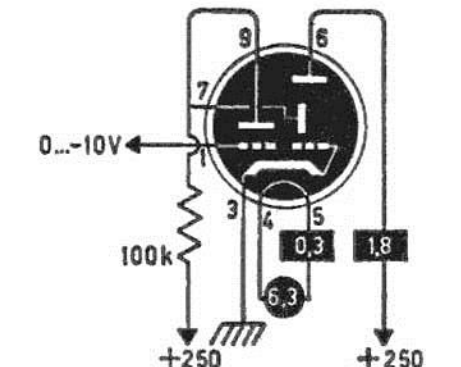
Fluorescent Magic Eye Tubes

© Forrest Cook 2008-2015

EM35- single range (GB) 6U5G CV 2747			 Octal	Warning! This tube has a different base diagram than the better known Telefunken EM35!  www.radiomuseum.org
EM71			 Loctal-8, B8G	EM71  www.radiomuseum.org
EM80 6BR5 6E1P/ (6E1P)			 Noval B9A	 www.radiomuseum.org
E82M 5624 Used in bridge meas- uring units Black screen mask examp.	 		 Noval, B9A	E 82M 

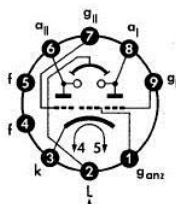
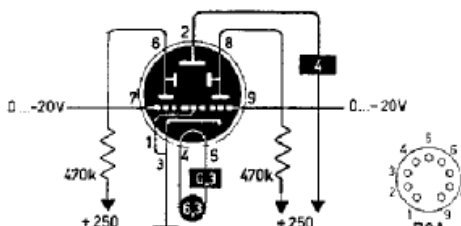
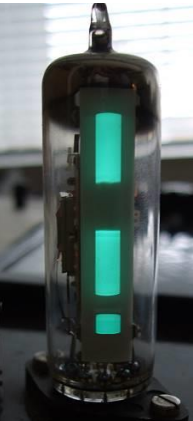
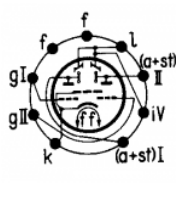
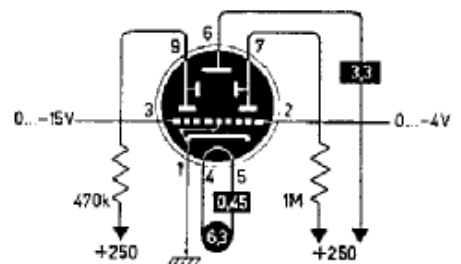
Fluorescent Magic Eye Tubes

© Forrest Cook 2008-2015

EM83 Vf 6,3V UM83 Vf 20V			 EM83 Noval B9A	
EM84 6FG6			 Noval B9A	
EM85 6DU6			 Noval B9A	 www.radiomuseum.org EM85 B9A
EM87 6HU6			 Noval B9A	

Fluorescent Magic Eye Tubes

© Forrest Cook 2008-2015

EMM 801			 Noval B9A	
EMM 803			 Noval B9A	

Fluorescent Tube Types

Type	Display	Socket	Note	V _f
2E5	Top 1 shadow angle	UX6 6-pin	ST bulb	2.5V
6AB5 / 6N5	Top 1 shadow angle	UX6 6-pin		
6AD6	Top 2 shadow angles	Octal		
6AF6 / CV847	Top 2 ranges, 2 shadow angles	Octal	short	
6AL7	Top dual bar	Octal		
6E5 / 6U5 / 6EG5 / 6S5 / VT-215 / 12Z-E8	Top 1 shadow angle	UX6 6-pin	ST bulb or cylinder	
6E5C / 6E5S / 6U5G	Top 1 shadow angle	Octal	cylinder	
6R-E13	Side split bar	Noval, B9A		
6T5	Top circle (ring)	Octal		
6X6	Top 2 shadow angles	Octal	ST bulb	
JAN-CRC-1629 / VT-138	Top 1 shadow angle	Octal		12 V
NU 6355	Top 2 shadow angles	B7G	No amp!	6,3 V
CV51	Top 1 shadow angle	Octal	ST bulb	
DM70 / 1M3 DM71 / 1N3	Side exclamation mark	B8D, wires	miniature	1,4 V
DM160 / 6977 / CV5412	Side exclamation mark	B5B, wires	miniature	1,0 V
E82M / 5624	Side rectangle	Noval, B9A	Dual control	
EAM86/6GX8	Side horizontal split bar	Noval, B9A		

Fluorescent Magic Eye Tubes

© Forrest Cook 2008-2015

Type	Display	Socket	Note	V _f
EFM11	Top 2 shadow angles	Y8A (steel)		
EM1 / ME6 (ME4)	Top 4 shadow angles	P8A (well)		ME4 V _f =4 V
EM2 / C/EM2 / 6E12	Top 2 shadow angles	P8A (well)		
EM3	Top 2 shadow angles	P8A (well)		
EM4	Top 2 ranges, 2 shadow angles	P8A (well)		
EM5 / WE12	Top 2 ranges, 4 shadow angles	P8A (well)	Can replace EM4	
EM11	Top 2 ranges, 4 shadow angles	Y8A (steel)		
EM31 / AW6 / CV1077	Top 4 shadow angles	Octal		
EM34 / 6AF7 / 6CD7 / 6M2	Top 2 ranges, 2 shadow angles	Octal		
EM35	Top 2 ranges, 4 shadow angles	Octal		
EM71 / EM71a (HM71, 12M71)	Top half circle 1 shadow angle	Locktal B8G	UM85 V _f =19 V	HM71 V _f =12,6 V
EM72	Top half circle 2 shadow angles	Locktal B8G	Full or off! Omitted areas!	
EM80 / 6BR5 / 6E1P (UM80/19BR5)	Side fan 2 shadow angles	Noval, B9A		UM8 V _f = 19 V
EM81 / 6DA5	Side fan 2 shadow angles	Noval, B9A	Can replace EM80	
EM83	Side double trapezoids	Noval, B9A		
EM84 / 6FG6 / 6E3P (PM84 / 9FG6) (UM84)	Side bar	Noval, B9A		PM84 V _f = 4,2 V UM84 V _f = 12 V
EM85 / 6DH7 / 6DU6 (HM85) (UM85 / 19DH7)	Side fan 1 shadow angle	Noval, B9A		HM85 V _f =12,6 V UM85 V _f = 19 V
EM87 / 6HU6	Side bar	Noval, B9A		
EM800	Side bar, asymmetric	Noval, B9A		
EM840	Side bar	Noval, B9A		
EMM801	Side double split bars	Noval, B9A		
EMM803	Side split bar w. pilot indicator	Noval, B9A		
ME4 / AM1	Top 1 shadow angle	P8A (well)		V _f = 4 V
ME41 / AW5 / (CV1359)	Top 1 shadow angle	Octal (Mazda)		V _f = 4 V
Y61 (Osram-GB) / (63ME / 6U5G)	Top 1 shadow angle	Octal		V _f = 6,3 V
Y63 (Osram-GB) / (CV1103 / 6G5G)	Top 1 shadow angle	Octal		V _f = 6,3 V