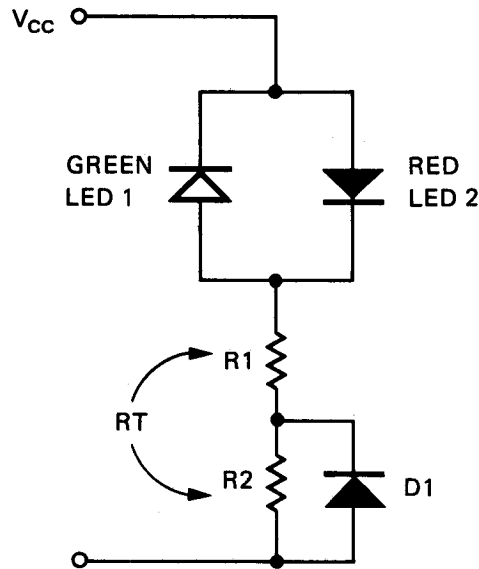### BIASING NETWORK

V_{CC} = 5V

D_1 = 1N914 (or equivalent)

C659

$$R_T = \frac{V_{CC} - V_{LED2}}{I_{LED2}} \qquad R_1 = \frac{V_{CC} - (V_{LED1} + V_{D1})}{I_{LED1}}$$

Example: Match Intensities of both red and green units at 30 mA and 50 mA respectively.

FOR RED:

$$R_T = \frac{V_{CC} - V_{LED2}}{I_{LED2}}$$

$$= \frac{5.0 - 1.63}{0.3}$$

$$= 112\Omega$$

$$R_T - R_1 = R_2$$

$$112 - 34 = 78\Omega$$

FOR GREEN:

$$R_1 = \frac{V_{CC} - (V_{LED1} + V_{D1})}{I_{LED1}}$$

$$= \frac{5.0 - (2.6 + 0.7)}{.05}$$

$$= 34\Omega$$

SUGGESTED RESISTOR COMBINATIONS:

GREEN →	10 mA			20 mA			30 mA			40 mA			50 mA		
RED	R_T	R_1	R_2	R_T	R_1	R_2	R_T	R_1	R_2	R_T	R_1	R_2	R_T	R_1	R_2
10 mA	344	230	114	344	102	242	344	63	281	344	44	300	344	34	310
20 mA	170	230	-60	170	102	68	170	63	107	170	44	126	170	34	136
30 mA	112	230	-118	112	102	10	112	63	49	112	44	68	112	34	78
40 mA	84	230	-146	84	102	-18	84	63	21	84	44	40	84	34	50
50 mA	67	230	-163	67	102	-35	67	63	4	67	44	23	67	34	33
60 mA	55	230	-175	55	102	-47	55	63	-8	55	44	11	55	34	21
70 mA	47	230	-183	47	102	-55	47	63	-16	47	44	3	47	34	13

NOTES: 1) All values are in ohms
2) V_{CC} = 5 volts D.C.
3) Current combinations in shaded area not possible with circuit shown

Note: Values computed are for maximum currents through each diode.