

**GENERAL**  **ELECTRIC**

*Research Laboratory*

**SCHENECTADY, NEW YORK**

# MEMO REPORT

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## COLOR BAR SYSTEM DESIGN FOR T6 OPTICS

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## COLOR BAR SYSTEM DESIGN FOR T6 OPTICS

Several optical systems are possible using the lenticular plates pressed for the T6 Talaria system. While there is little difference in the resolution obtained from the various systems, there is, however, some difference in the ultimate brightness available, and in the color balance.

In this report, the color balance and light output of two systems are analyzed. System A uses orthogonal bars, with green and magenta in separate areas. System B uses a superimposed bar system for the two colors.

It is assumed in the calculations that the dichroic mirrors have a transmission of 80 per cent in their pass band. It is also assumed that the lenticular lenses will focus 60 per cent of the light through the slots in bar system A. In order to analyze bar system B, the output transmission for white must be calculated separately from simply summing separate colors, because of the clear white areas in the bar system. Only magenta, green and white were analyzed. However, since the systems balance quite well between these colors, single colors and other mixtures should also balance well.

A drawing of the two bar systems considered is shown in Fig. 1. A table showing the different losses considered and the final light output is shown in Table I.

Both systems balance almost exactly for the magenta, green and white peak brightness. The "homogenized" bar system B would be harder to make than A but would give a more uniform field (a black-and-white field free of color shading) and about 25 per cent more light output.

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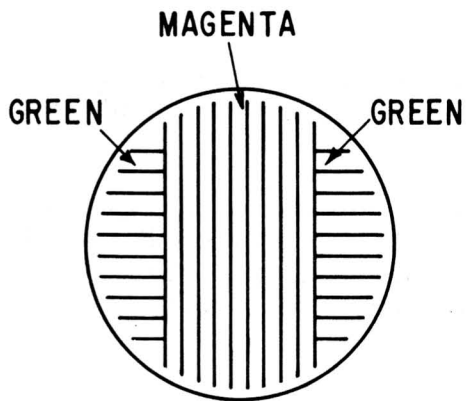
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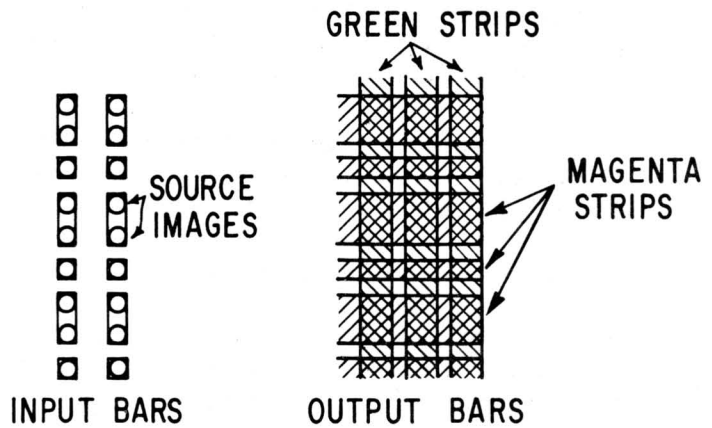
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Table I

System	Color	Input Trans.	Input Area Covered	Output Trans.	Duty Cycle	Output Trans. in White	Relative Luminosity White	Filter Trans.	Lens Trans.	Fraction of Light Input in Output	White Lumens out for 4000 L in
(A)	M	.6	.6	.7	.6	.7	.4	.8	.7	.084	
	G	.6	.4	.7	.9	.7	.6	.8	.7	.084	
	W	0	0	0						.084	340
(B)	M	.45	1	.7	.6	.4	.4	.8	.7	.105	
	G	.45	1	.47	.9	.14	.6	.8	.7	.106	
	W	.45	1	.33	.6		1	1	.7	.106	425



(A)



(B)

FIG. I