

Memo to VLA Optical Processor File

Sept 22, 1976

From: James R. Finney

Subject: Method for imaging both halves of  $u-v$  plane  
on film simultaneously.

Figure 1 shows a setup for imaging both conjugate  
halves of the  $u-v$  plane simultaneously onto the film.

This method would work for all <sup>encoding</sup> methods having

$H(-u, -v) = H(u, v)$  as the transmittance of the transparency.

This is true for the simple carrier method, the Lohmann method,  
and for  $R(u, v)$  of the real-imaginary method (but not for  $I(u, v)$ ).

~~Figure 1~~

Areal image of half of  $H(u, v)$  is formed in plane  $AI1$ .

Lens  $L3$  produces an inverted image  $H(-u, -v)$  in plane  $AI3$   
through the beamplitters  $BS1$  and  $BS2$ . Lens  $L1$  forms  
an inverted image  $H(u, -v)$  in plane  $AI2$ , using light reflected  
from  $BS1$  and mirror  $M1$ . Lens  $L2$  re-images  $AI2$  to  $AI3$   
using reflected light from mirror  $M2$  and beamplitter  $BS2$ ,  
forming an image  $H(u, v)$ . All lenses perform 1:1 magnification  
imaging. Thus, at  $AI3$  appears  $H(u, v) + H(-u, -v)$ , the complete  $u-v$   
plane. Alignment of this optical system can be facilitated by including  
registration marks in the mirror at  $AI1$ .

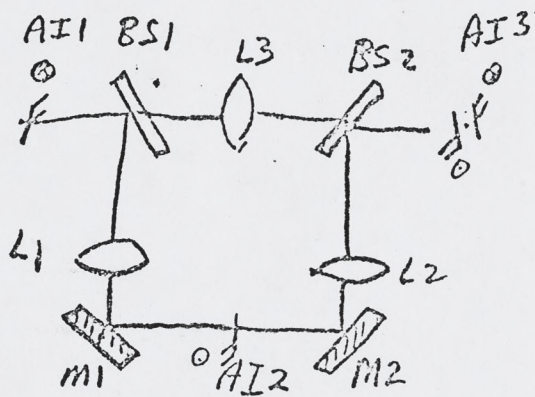


Figure 1.

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