

27 July 1976

MEMORANDUM TO: Ivan Cindrich
FROM: C. Leonard *CL.*
SUBJECT: Proposal for Generating Precision Gratings

I propose to make gratings by the interference patterns of two distant point sources. The pattern would be $20\lambda/\text{mm}$, and the final copy a bleached phase grating on a 649F emulsion with a microflat base. Such a grating would diffract light simultaneously into 20, 40, and $60\lambda/\text{mm}$, since high modulation is possible with such an emulsion. Using the present optical table in room G325, the grating can be made correct to $\lambda/60$ for the first order and $\lambda/20$ for the third order.

I propose to try extending the path of the set-up without mirrors (which would produce slight errors through diffraction-ring patterns), by extending the path off the table. Then a pattern would be recorded from which a contact copy would be made for the desired grating. The expected stability problem resulting from this set-up will be handled either by using the new fast Kodak 131-01 emulsion or by recording a low enough frequency grating to be stable and then frequency doubling, or both techniques. By the path extension with present facilities the errors can be reduced by a factor of four.

The quality of the substrates is usually as good or better than the interferometer used to test them. The major source of error might be expected in the gelatin layer. This

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error is usually characterized by thickness variations near the edge, so that by using only the central area, satisfactory results may be expected.

The following requirements are expected:

2 Man-weeks (A.R.E.)	\$1000
Film { 2 boxes Kodak 649F Microflats	} 250
1 box Kodak 649F .040 Plates	
1 box 131-01 Microflats	
Miscellaneous Chemicals	<u>20</u>
	\$1270

CL:sd

xc: B. J. Chang
J. Fienup