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To: J. O. McDonough and NCMM Programming Personnel
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SUBJECT: MODIFICATION OF THE NCMM TRANSLATION ROUTINE FOR USE WITH
THE G & L MACHINE

The existing translation routine, designed for the MIT Numerically Controlled Milling Machine, will be modified to produce control tapes for the Giddings and Lewis machine. Certain changes in the vocabulary accepted by the translation routine are necessary to adapt it for this use. These changes are described in this memorandum.

Points, Lines, and Circles

The conventions for tagging and using points, lines, and circles are in all respects unchanged.

Cutter Motions

The conventions for cutting instructions are also unchanged.

Special Words

The special words LEFT, RIGHT, TOOL RADIUS, TOLERANCE, and END are used with the same meanings that they have in the NCMM routine.

The word STOP has been eliminated from the vocabulary (see "X-Commands" below).

X-Commands

All X-commands must be typed for the translation routine as an upper-case letter X followed by a small lower-case integer. Initial zeros in this integer are ignored; i.e., X4, X04, and X004 are all synonymous. The routine will always punch a two-digit integer in X-commands. In a tape prepared for the translation routine, the first word must be one of the X-commands: X35, X36, X45, or X46. This will set the columns in which increments will be punched in the G & L tape, in accordance with the following table:

X-Command	Column of G & L Tape					
	1	2	3	4	5	6
X35	Δt	Δx	Δz		Δy	
X36	Δt	Δx	Δz			Δy
X45	Δt	Δx		Δz	Δy	
X46	Δt	Δx		Δz		Δy

t = time

x, y, and z are the NCMM spatial co-ordinates.

The second word in a tape prepared for the translation routine must be one of the X-commands X01, X02, or X04. This will set the minimum permissible Δt throughout the tape.

Symbols from the set X35, X36, X45, X46 or from the set X01, X02, X04 may appear only once in each tape.

The X-commands X00 and X09 replace the word STOP, and may be used at will.

Any other X-commands may be used and will be punched in the control tape as they occur. They will have no other effect on computation.