

## Appendix A. Optical and E-Beam Mask Specifications

Date: August 23, 1978  
 Requestor: Bob Hon 494-4324  
 Project Name: PARC-MPC

### Reticle Specifications

NOTE: Please return all pattern generator output to the customer.

Number of Reticle Sets: 1  
 Number of Reticles per Set: 5  
 Maximum Pattern Dimensions (outside scribes) X: 9348 $\mu$ . Y: 6324 $\mu$   
 Step and Repeat distance X: 9288 $\mu$  Y: 6264 $\mu$   
 Reticle Magnification: 10x  
 Parity Marks on PG Tape? No, please add as needed.  
 Fiducials on PG Tape? No, please add as needed.  
 Blow Backs? Yes (color) Magnification: 150x Number of Sets: 2  
 Please use the following colors:  
 DIF - GREEN  
 IMP - YELLOW  
 POL - RED  
 CUT - BLACK  
 MET - BLUE  
 Black and Clears: Yes (8½" x 11") Number of Sets: 2

### Mask Specifications

Working Plate Material: AR Chrome  
 Working Plate Size: 4"  
 Pattern Size: 3"  
 Number of Working Plates: 2 per level, except 3 of CUT level  
 Master Plate Defect Density: Standard  
 Working Plate Specs: (each reticle has the process step name in upper left corner)

Process Step	Number of Flashes	WP Field	CD digitized width	Tolerance
DIF	41783	OPAQUE	6.0 $\mu$	0.5 $\mu$
IMP	3741	CLEAR	12.0 $\mu$	0.5 $\mu$
POL	54184	OPAQUE	6.0 $\mu$	0.5 $\mu$
CUT	18331	CLEAR	6.0 $\mu$	0.5 $\mu$
MET	29764	OPAQUE	12.0 $\mu$	0.5 $\mu$

**Working Plate Labels:**

<u>Process Step</u>	<u>Working Plate Label (19 characters max)</u>
DIF	PARCMPC 878 DIF
IMP	PARCMPC 878 IMP
POL	PARCMPC 878 POL
CUT	PARCMPC 878 CUT
MET	PARCMPC 878 MET

**PG Tape:**

The files are on the PG tape in Mann 3000 format. The order is: IMP, DIF, POL, CUT, MET. A copy of the directory follows.

Directory (file 0):

```
WHOLECHIPZ0C00010081WHOLECHIPZ1C00020865WHOLECHIPZ2C00031095WHOLECHIPZ3  
C00040342WHOLECHIPZ4C00050636$
```

Overall View of the MET layer

Critical Dimensions are in this area (see closeup on next page)

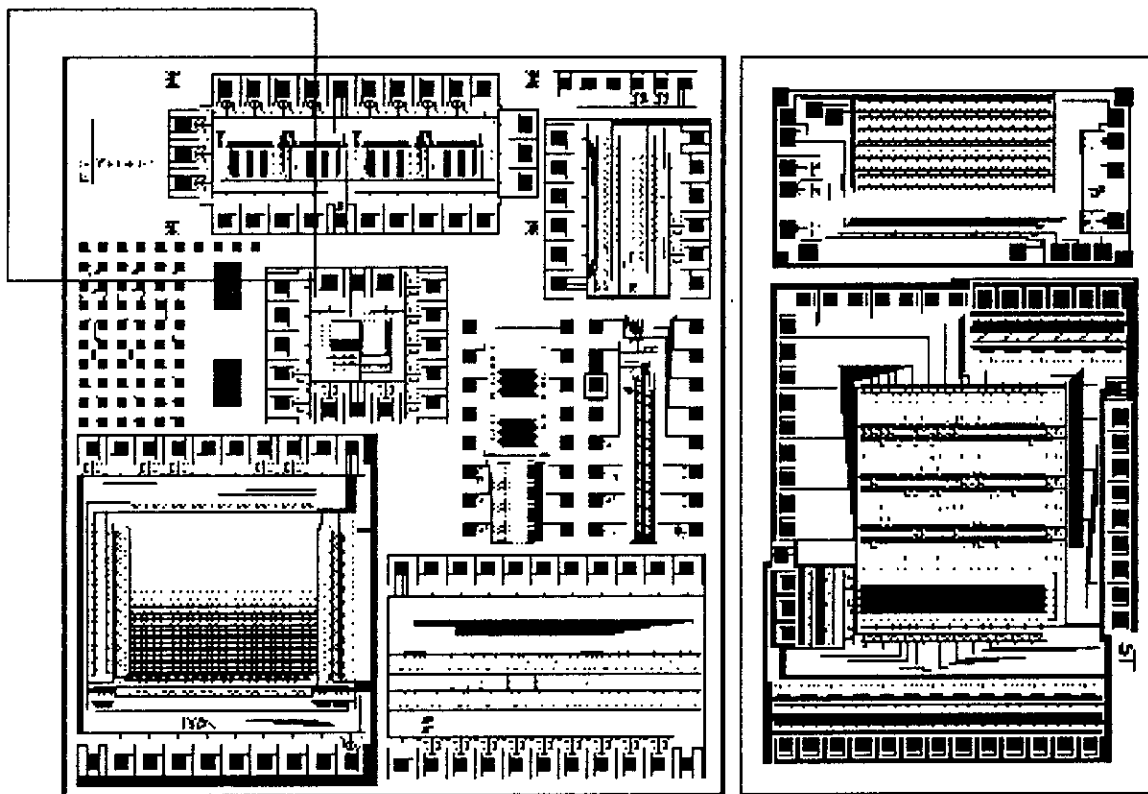


Figure A.1 Diagram of the MET Layer Showing CD Location

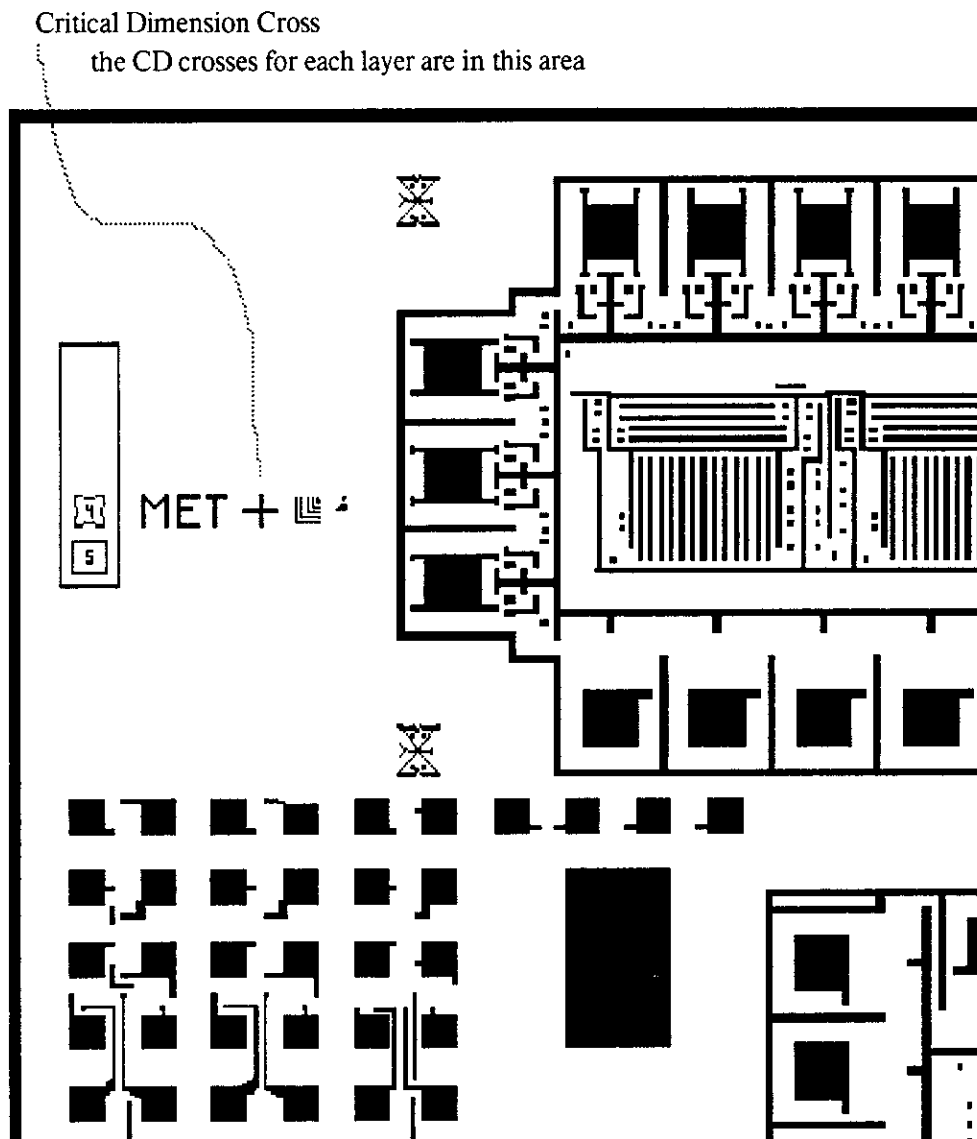


Figure A.2 Close-up of the CD on the MET Layer

Date: May 14, 1979  
 Ordered by: Bob Hon 494-4364  
 Project Name: MPC479

### MEBES Master Plate Specifications

Maximum Pattern Dimensions (outside scribes) X: 6604 $\mu$  Y: 6604 $\mu$   
 Step and Repeat distance X: 6604 $\mu$  Y: 6604 $\mu$   
 E-Beam Spot Size: 0.50 $\mu$   
 Master Plate Defect Density: Standard  
 Number of Plates per Set: 6  
 Plate Material: AR Chrome, L.E. 30  
 Plate Size: 4" x 4" x .090"  
 Pattern Size: 3", Round  
*BlowBacks: Versatec Magnification: 127x Number of Sets: 1*

Device Label (to appear on each plate): "PARC MPC479 A"

Mask Labels:

<u>Process Step</u>	<u>Mask Label</u>
DIF	XEROX DIF 1A
IMP	XEROX IMP 2A
POL	XEROX POL 4A
CUT	XEROX CUT 5A
MET	XEROX MET 6A
PAD	XEROX PAD 7A

**Pattern Specifications:** There are three different project dies (named BARBELL, SQUIGGLE, SQUARE) plus one test pattern die (TP9). All have identical dimensions (6604 $\mu$  x 6604 $\mu$ ). The three project dies are identified by a shape in the upper right hand corner. See the diagrams on the following pages for the location of the CD's and the pattern arrangement on the masks.

**PLEASE** adjust the patterns so that the text on the masks is **WRONG** reading when viewed from the chrome side.

**PG Tapes:** Each project die is on a different mag tape in Mann 3000 metric format (digitized at 10x). The order is: DIF, IMP, POL, CUT, MET, PAD. A copy of the directory for each pattern is given below. The test pattern (TP9) is being sent directly to Micro Mask from Xerox-MEC as an MEBES Format mag tape.

Layers which require line width stretching are marked by a \* below.

### BARBELL

Tape Directory:

BARBELLXXDIF00010459BARBELLXXIMP00020046BARBELLXXPOL00030457BARBELLXXCUTO  
0040338BARBELLXXMET00050358BARBELLXXPAD00060017\$

Process Step	Number of Flashes	Plate Field	CD width as DRAWN	CD width on MASK	Tolerance
DIF	17024	OPAQUE	6.0 $\mu$	8.0 $\mu$ *	+/- 0.25 $\mu$
IMP	1840	CLEAR	6.0 $\mu$	6.0 $\mu$	+/- 0.25 $\mu$
POL	16377	CLEAR	6.0 $\mu$	6.5 $\mu$ *	+/- 0.25 $\mu$
CUT	15653	CLEAR	6.0 $\mu$	6.5 $\mu$ *	+/- 0.25 $\mu$
MET	13409	CLEAR	6.0 $\mu$	7.0 $\mu$ *	+/- 0.25 $\mu$
PAD	687	CLEAR	6.0 $\mu$	6.0 $\mu$	+/- 0.25 $\mu$

### SQUIGGLE

Tape Directory:

SQUIGGLEXDIF00010534SQUIGGLEXPOL00030531SQUIGGLEXCUTO  
0040371SQUIGGLEXPAD00060017\$

Process Step	Number of Flashes	Plate Field	CD width as DRAWN	CD width on MASK	Tolerance
DIF	20247	OPAQUE	6.0 $\mu$	8.0 $\mu$ *	+/- 0.25 $\mu$
IMP	2293	CLEAR	6.0 $\mu$	6.0 $\mu$	+/- 0.25 $\mu$
POL	19855	CLEAR	6.0 $\mu$	6.5 $\mu$ *	+/- 0.25 $\mu$
CUT	17251	CLEAR	6.0 $\mu$	6.5 $\mu$ *	+/- 0.25 $\mu$
MET	15850	CLEAR	6.0 $\mu$	7.0 $\mu$ *	+/- 0.25 $\mu$
PAD	673	CLEAR	6.0 $\mu$	6.0 $\mu$	+/- 0.25 $\mu$

### SQUARE

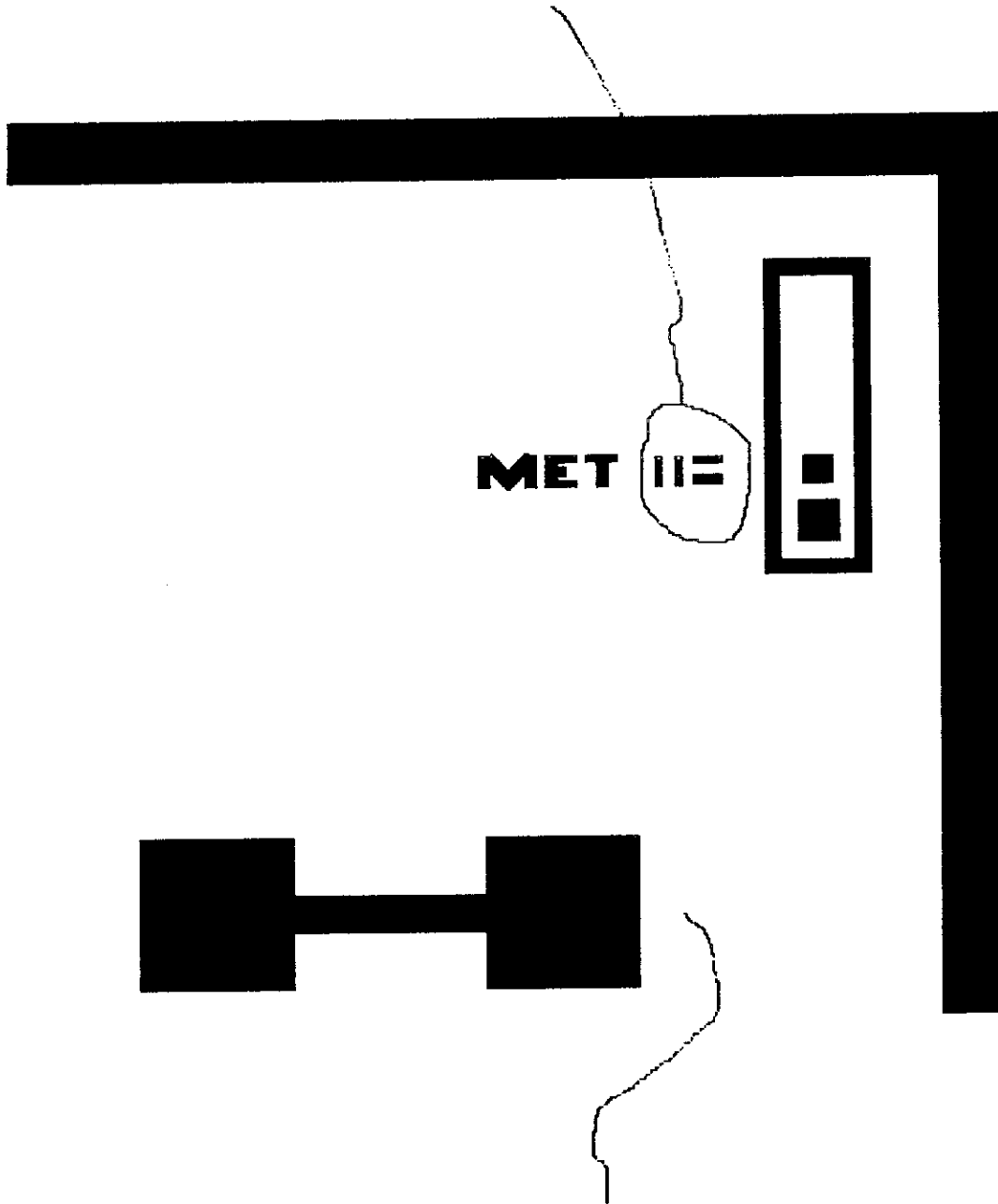
Tape Directory:

SQUAREXXXDIF00010753SQUAREXXXIMP00020058SQUAREXXXPOL00030780SQUAREXXXCUTO  
0040486SQUAREXXXMET00050565SQUAREXXXPAD00060017\$

Process Step	Number of Flashes	Plate Field	CD width as DRAWN	CD width on MASK	Tolerance
DIF	36278	OPAQUE	6.0 $\mu$	8.0 $\mu$ *	+/- 0.25 $\mu$
IMP	2587	CLEAR	6.0 $\mu$	6.0 $\mu$	+/- 0.25 $\mu$
POL	37461	CLEAR	6.0 $\mu$	6.5 $\mu$ *	+/- 0.25 $\mu$
CUT	24314	CLEAR	6.0 $\mu$	6.5 $\mu$ *	+/- 0.25 $\mu$
MET	25842	CLEAR	6.0 $\mu$	7.0 $\mu$ *	+/- 0.25 $\mu$
PAD	669	CLEAR	6.0 $\mu$	6.0 $\mu$	+/- 0.25 $\mu$

CD's are in this loction in all four corners and on all layers.

They are 6 micron bars with 6 micron gaps.



Pattern Identification Shape.

