

1968

# AN-736

Application Note

## LEAD FORMING TOOL FOR PLASTIC MICRO-T DEVICES

*Prepared by:*  
**Chris Field**  
Product Marketing

Motorola plastic Micro-T devices sometimes require formed leads before soldering to a printed circuit board or ceramic substrate. This note contains the mechanical drawings and information necessary to buy or build the tool used to form the leads before assembly.



**MOTOROLA Semiconductor Products Inc.**

# LEAD FORMING TOOL FOR PLASTIC MICRO-T DEVICES

## PLASTIC MICRO-T LEAD FORMING TOOL BLUE PRINT

The following pages show mechanical drawings of a plastic Micro-T lead forming tool. Since the Micro-T leads must remain straight during manufacture and all subsequent electrical testing, this tool is designed to form the leads prior to mounting. Most physical applications of the Micro-T require flush mounting of the package and forming the leads to the mounting plane.

Uniform lead bends for printed circuit boards (one bend) or ceramic substrate (two bends) are obtainable without package damage using this tool. The forming

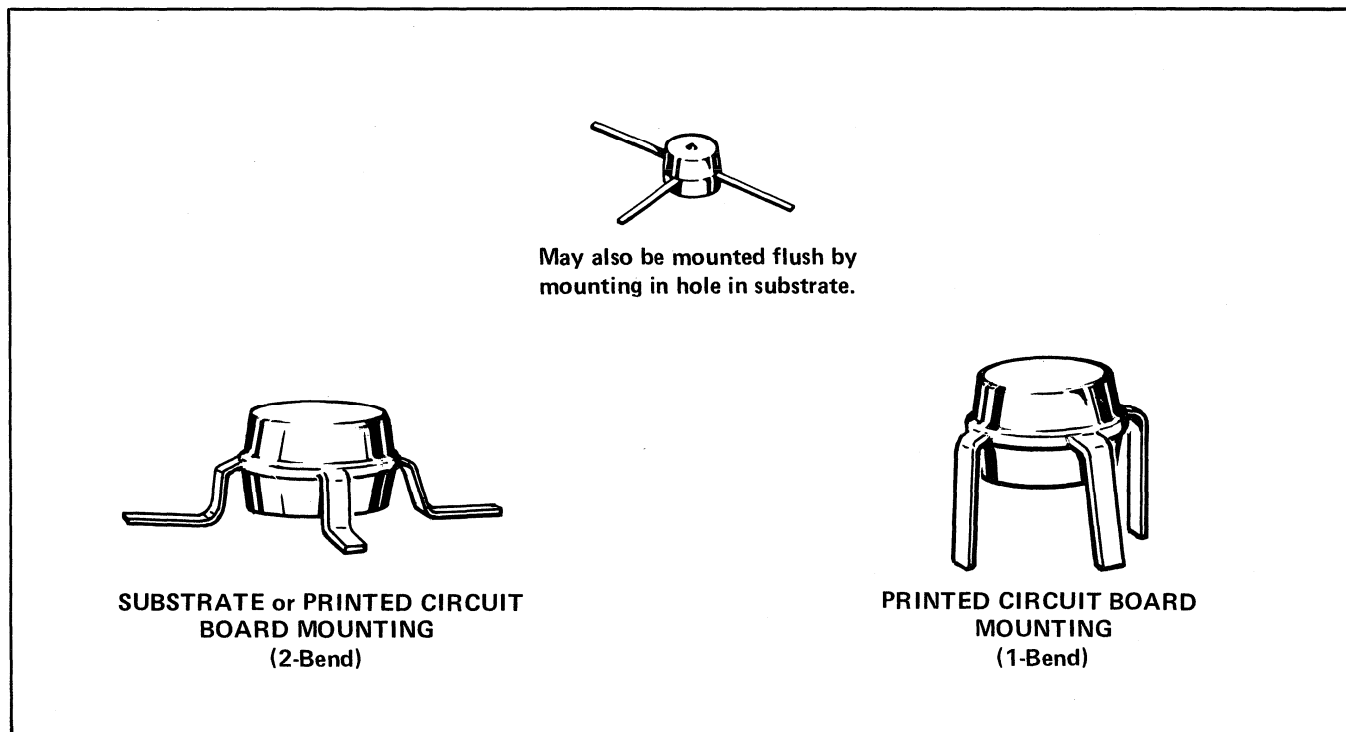
cannot be maintained during shipment of the devices, therefore, the assembler must perform the bending operation. Consult the factory or sales representative for a list of vendors manufacturing this tool.

Plastic Micro-T devices are available as diodes, amplifiers, switches or RF transistors using both bipolar and FET technologies. Ease of handling and 100% electrical testing make these devices superior to chip-and-wire or flip-chip technologies in many applications. Process compatibility with these technologies is retained.

Micro-T devices are listed in the Master Selection Guide, or for additional information, consult your nearest Motorola sales representative.

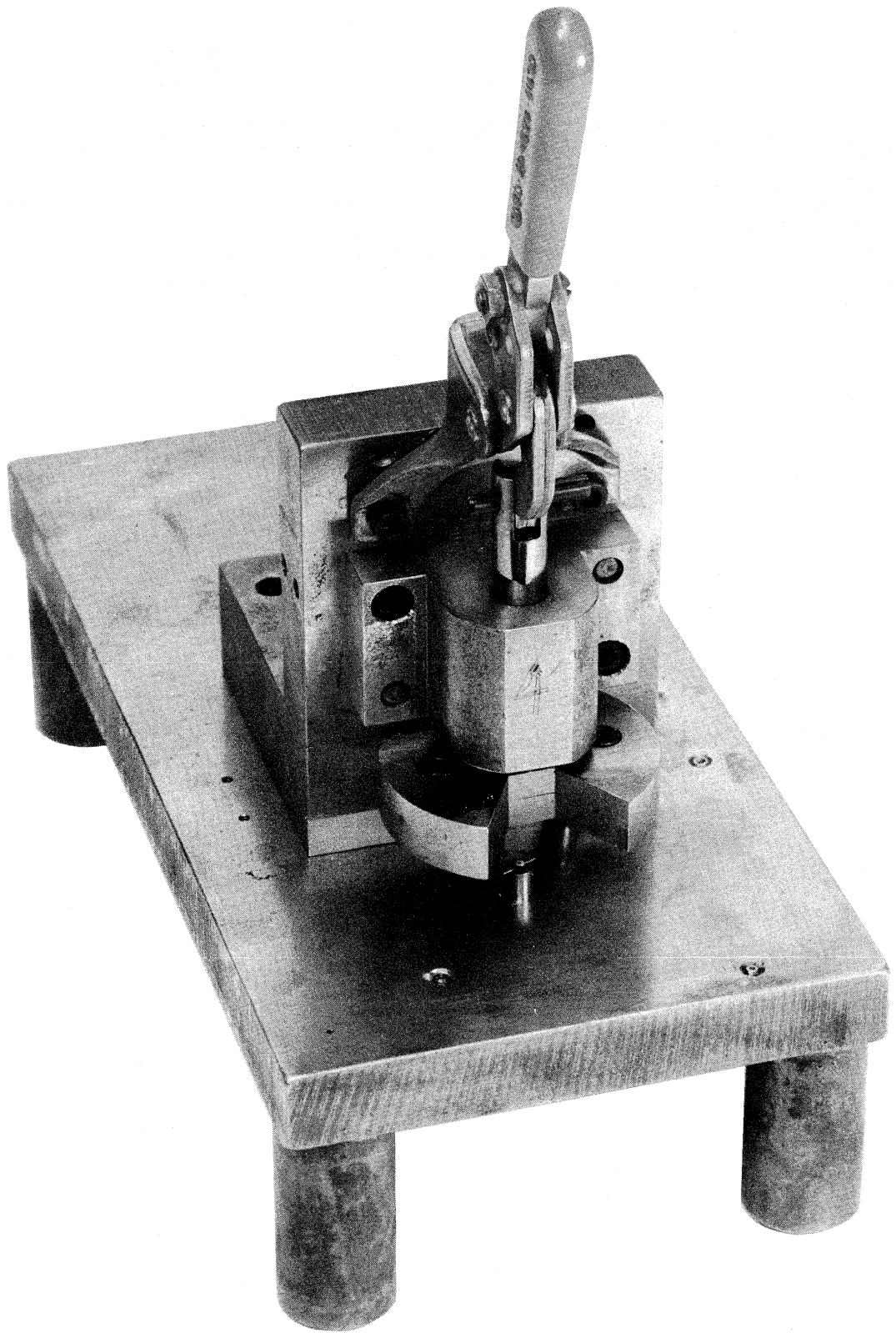
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Micro-T is a Trademark of Motorola Inc.



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Circuit diagrams external to Motorola products are included as a means of illustrating typical semiconductor applications; consequently, complete information sufficient for construction purposes is not necessarily given. The information in this Application Note has been carefully checked and is believed to be entirely reliable. However, no responsibility is assumed for inaccuracies. Furthermore, such information does not convey to the purchaser of the semiconductor devices described any license under the patent rights of Motorola Inc. or others.



**COMPLETED PLASTIC MICRO-T LEAD FORMING TOOL**



**BILL OF MATERIAL FOR MICRO-T DEVICES REQUIRING ONE BEND**

**TITLE: TRIM & FORM DIE**

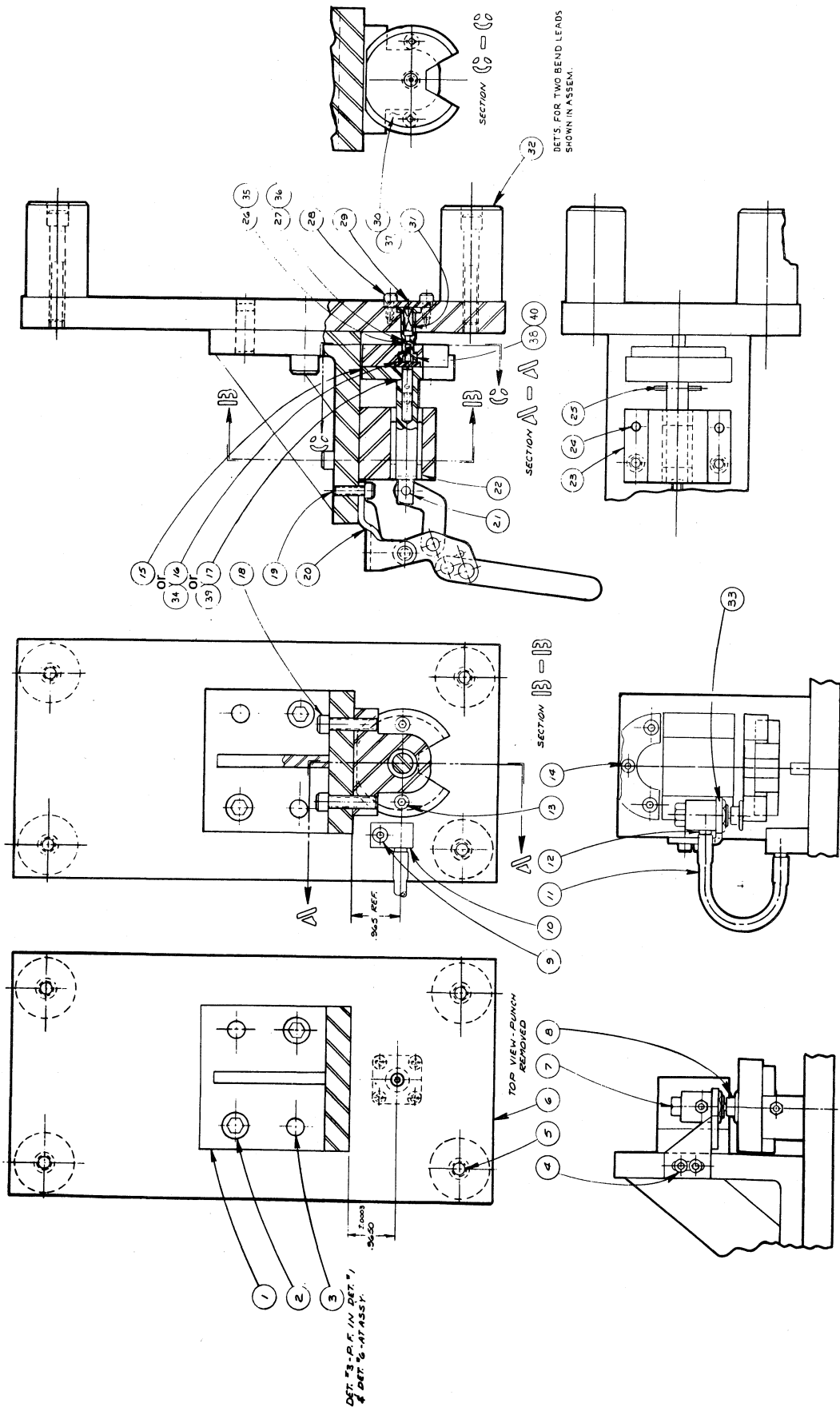
**SUB TITLE: FOR MICRO-T DEVICE**

DET	AMM'T. REQ'D.			NAME - DESCRIPTION	RECOMMENDED SOURCE
	PUR	MOD	FAB		
1		1		GUSSETED ANGLE BRACKET "CARR-LANE" #CL-105-6AB	CARR-LANE - St. Louis, Mo.
2	2			SOC. HD. CAP SCR. 3/8-16 x 1 - LONG	
3	2			DOWEL PIN - 3/8 DIA. x 1 - LONG	
4	2			SOC. HD. CAP SCR. #8-32 x 3/8 - LONG	
5	4			SOC. HD. CAP SCR. - 5/16-18 x 2 - LONG	
6			1	BASE PLATE	
7	1			"CLIPPARD" VALVE #MAV-2	AIRDRAULICS
8	1			"CLIPPARD" MANUEL PUSH BUTTON #11916-1	AIRDRAULICS
9	1			SOC. HD. CAP SCR #8-32 x 1 - LONG	
10			1	BLOCK	
11	1			VINYL HOSE 1/8 I.D. x 1/4 O.D. x 5" - CLIPPARD #3814-1	AIRDRAULICS
12	2			"CLIPPARD" HOSE FITTING #11924 - 10-32 TO 1/8	AIRDRAULICS
13	2			SOC. HD. CAP SCR. #10-32 x 5/16 - LONG	
14	1			SOC. HD. CAP SCR. #8-32 x 3/8 - LONG	
15			1	RAM	
16			1	FORM PUNCH	
17			1	KNOCKOUT	
18	2			SOC. HD. CAP SCR. 1/4-20 x 1 - LONG	
19	2			SOC. HD. CAP SCR. #10-32 x 5/8 - LONG	
20		1		CLAMP - "DE-STA-CO" #605	
21	1			DOWEL PIN - 3/16 DIA. x 1/2 - LONG	
22	2			BEARING, BOST-BRONZE #B710-3	GARRET SUPPLY
23			1	BEARING BLOCK	
24	2			DOWEL PIN - 3/16 DIA. x 1 - LONG	
25	1			DOWEL PIN - 3/32 DIA. x 1 - LONG	DUCOMMUN
26			1	DIE BUTTON	
27			1	PRESSURE PAD	
28	4			SOC. HD. CAP SCR. #8-32 x 3/8 - LONG	
29			1	RETAINER	
30			1	PUNCH PLATE	
31	1			SPRING "LEE" #LE-020 A-0 - 020 WIER 1/8 O.D. 7/8 LONG	LEE SPRING CO.
32	4			DRILL JIG FEET - "CARR-LANE" #CL-4 DJF	CARR-LANE MFG. CO.
33			1	BRACKET	

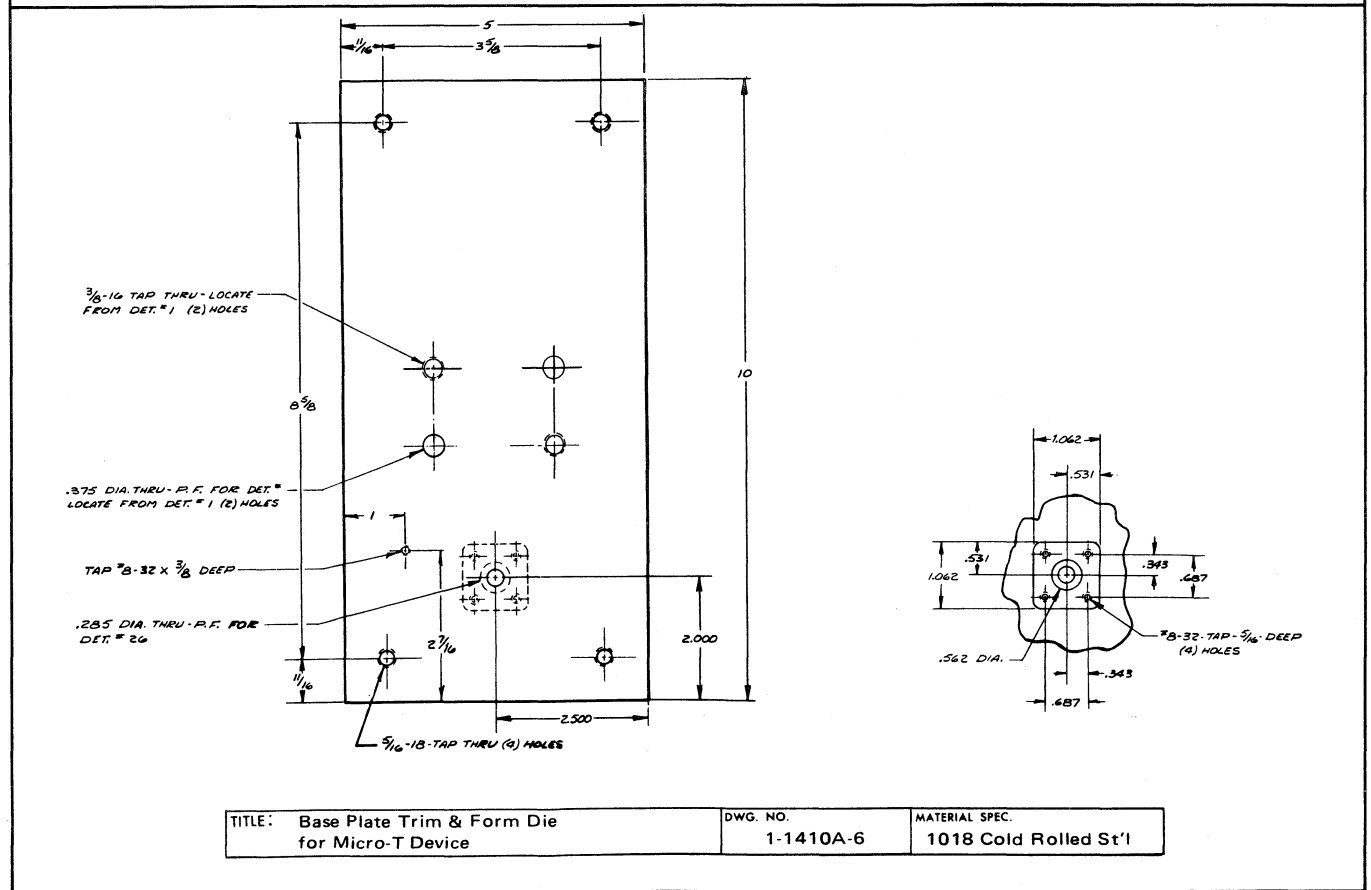
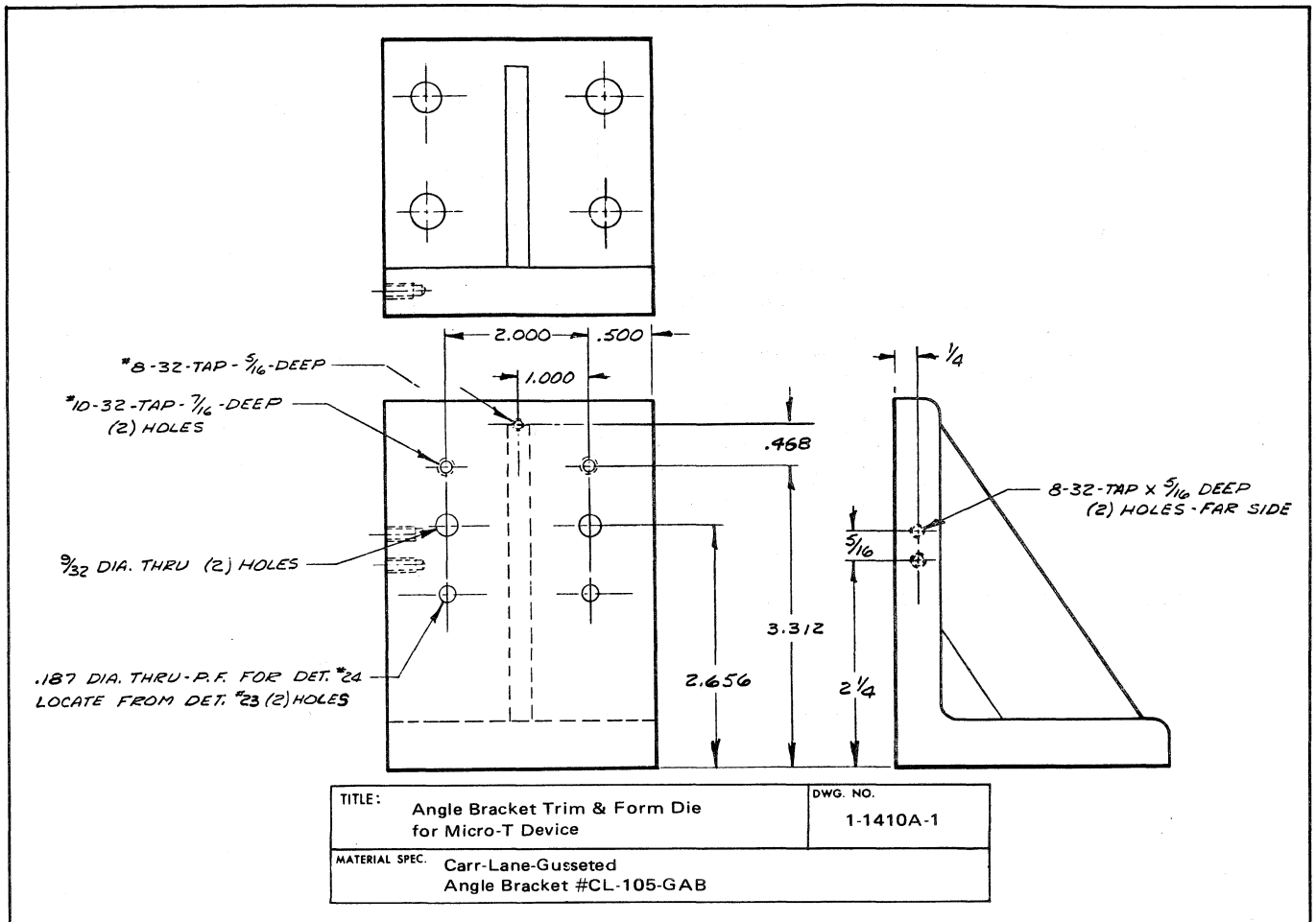


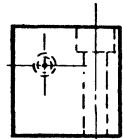
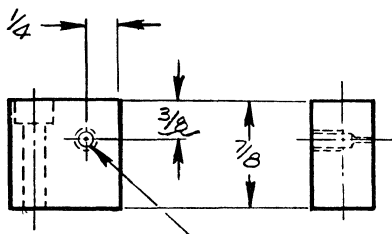
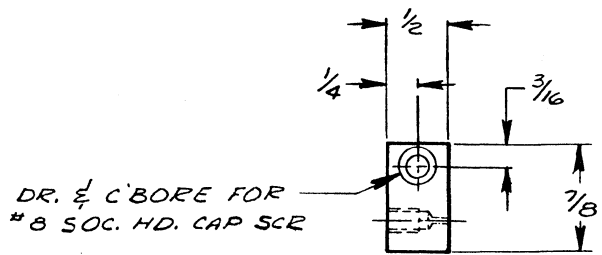
### BILL OF MATERIAL FOR MICRO-T DEVICES REQUIRING TWO BENDS

TITLE: TRIM & FORM DIE					
SUB TITLE: FOR MICRO-T DEVICE					
DET	AMM'T. REQ'D.			NAME - DESCRIPTION	RECOMMENDED SOURCE
	PUR	MOD	FAB		
1		1		GUSSETED ANGLE BRACKET "CARR-LANE" #CL-105-6AB	CARR-LANE - St. Louis, Mo.
2	2			SOC. HD. CAP SCR. 3/8-16 x 1 - LONG	
3	2			DOWEL PIN - 3/8 DIA. x 1 - LONG	
4	2			SOC. HD. CAP SCR. #8-32 x 3/8 - LONG	
5	4			SOC. HD. CAP SCR. - 5/16-18 x 2 - LONG	
6			1	BASE PLATE	
7	1			"CLIPPARD" VALVE #MAV-2	AIRDRAULICS
8	1			"CLIPPARD" MANUEL PUSH BUTTON #11916-1	AIRDRAULICS
9	1			SOC. HD. CAP SCR #8-32 x 1 - LONG	
10			1	BLOCK	
11	1			VINYL HOSE 1/8 I.D. x 1/4 O.D. x 5' - CLIPPARD #3814-1	AIRDRAULICS
12	2			"CLIPPARD" HOSE FITTING #11924 - 10-32 TO 1/8	AIRDRAULICS
13	2			SOC. HD. CAP SCR. #10-32 x 5/16 - LONG	
14	1			SOC. HD. CAP SCR. #8-32 x 3/8 - LONG	
15			1	RAM	
18	2			SOC. HD. CAP SCR. 1/4-20 x 1 - LONG	
19	2			SOC. HD. CAP SCR. #10-32 x 5/8 - LONG	
20		1		CLAMP - "DE-STA-CO" #605	
21	1			DOWEL PIN - 3/16 DIA. x 1/2 - LONG	
22	2			BEARING, BOST-BRONZE #B710-3	GARRET SUPPLY
23			1	BEARING BLOCK	
24	2			DOWEL PIN - 3/16 DIA. x 1 - LONG	
25	1			DOWEL PIN - 3/32 DIA. x 1 - LONG	DUCOMMUN
28	4			SOC. HD. CAP SCR. #8-32 x 3/8 - LONG	
29			1	RETAINER	
31	1			SPRING "LEE" #LE-020 A-O - 020 WIER 1/8 O.D. 7/8 LONG	LEE SPRING CO.
32	4			DRILL JIG FEET - "CARR-LANE" #CL-4 DJF	CARR-LANE MFG. CO.
33			1	BRACKET	
34			1	FORM PUNCH (TWO BEND)	
35			1	DIE BUTTON (TWO BEND)	
36			1	PRESSURE PAD (TWO BEND)	
37			1	PUNCH PLATE (TWO BEND)	
38			1	STRIPPER (TWO BEND)	
39			1	KNOCK-OUT (TWO BEND)	
40	1			SPRING LEE SPRING #LC-016B-2	



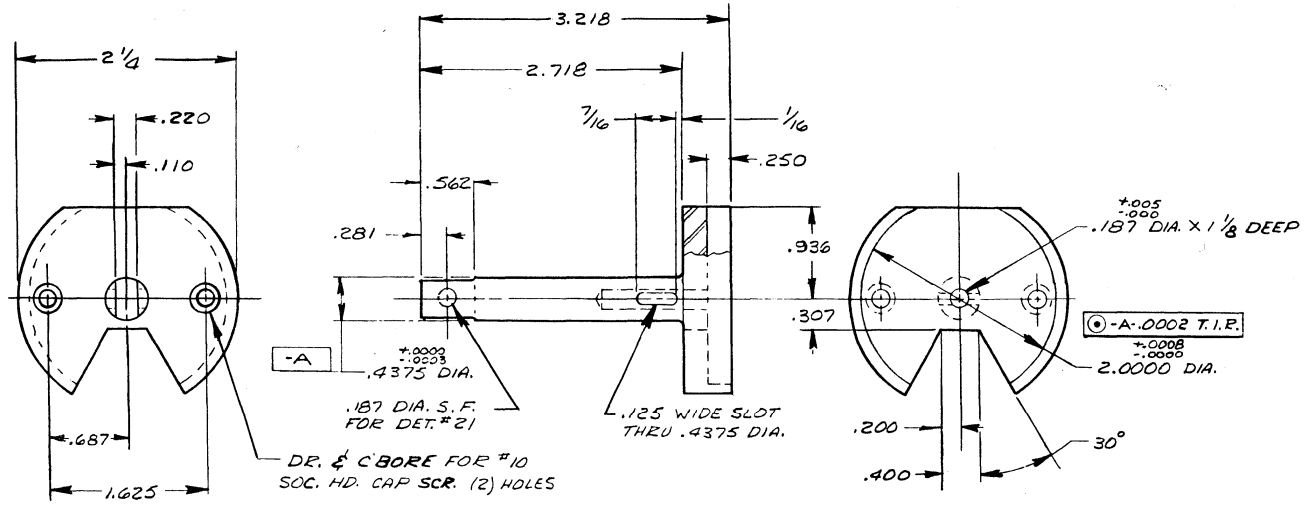
MATERIAL SPECIFICATION LIST	
ITEM	REQ'D
UNLESS OTHERWISE SPECIFIED	
<b>RMS</b> <input checked="" type="checkbox"/> ALL MACHINED SURFACES 1. FRAC. TOL. $\pm 1/4$ 2. DEC. TOL. $\pm .005$ 3. ANGULAR TOL. $\pm$ 4. FEATURE CONTROL SYMBOLS PER MIL-STD-883 CURRENT REV. 5. BREAK ALL SHARP EDGES & CORNERS. REMOVE BURRS. 6. UNDERLINED DIMS NOT TO SCALE 7.	
MATERIAL SPEC.	
HEAT TREAT	
APPLIED FINISH	
DEVISE USED ON	REQ'D
HEAT ASSEMBLY	1
DATE	10-17-68
DRAWN BY	G. ALBEE
CHECKED BY	
DWG. NO.	1-1410A
"ANY SPECIFICATIONS, DRAWINGS OR REPRINTS, OR DATA FURNISHED TO BIDDER OR SELLER SHALL REMAIN MOTOROLA'S PROPERTY. SHALL BE KEPT CONFIDENTIAL. SHALL BE USED FOR THE PURPOSE OF COMPLYING WITH MOTOROLA'S REQUESTS FOR QUOTATION OR WITH MOTOROLA PURCHASE ORDERS AND SHALL BE RETURNED AT MOTOROLA'S REQUEST. PATENT RIGHTS EMBODIED IN DESIGNS, TOOLS, PATTERNS, DRAWINGS, DEVICES, INFORMATION AND EQUIPMENT SUPPLIED BY MOTOROLA PURSUANT TO THIS REQUEST FOR QUOTATION OR PURCHASE ORDER AND EXCLUSIVE RIGHTS FOR THE USE IN REPRODUCTION THEREOF ARE RESERVED BY MOTOROLA."	
<b>MOTOROLA INC.</b> SEMICONDUCTOR PRODUCTS DIVISION 3000 EAST McDOWELL ROAD • PHOENIX 8, ARIZONA	
SCALE	D
DWG. NO.	1-1410A
TITLE TRIM & FORM DIE FOR MICRO-7 DEVICE	





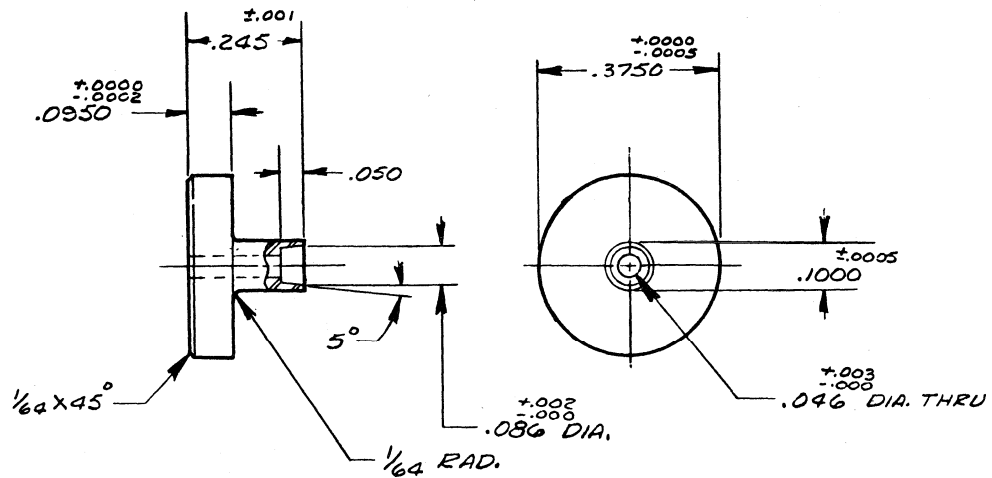
1/32 DIA. THRU - #10-32 TAP 1/4 DEEP

TITLE	DWG. NO.	MATERIAL SPEC.
Block Trim & Form Die for Micro-T Device	1-1410A-10	1018 Cold Rolled St'l.

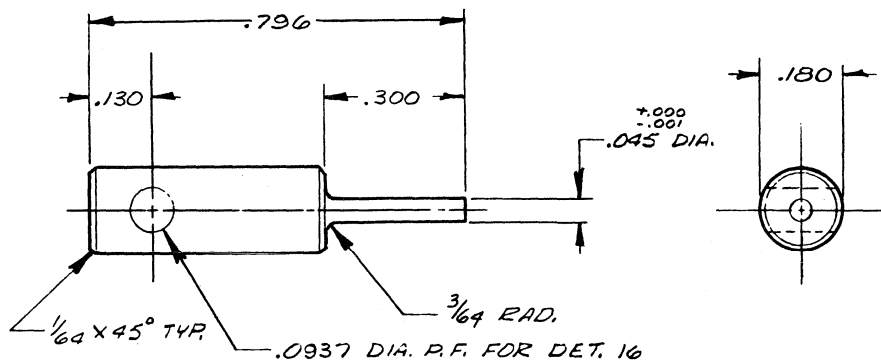


TITLE	DWG. NO.
RAM Trim & Form Die for Micro-T Device	1-1410A-15
MATERIAL SPEC.	HEAT TREAT
KETOS - O.H.T.S.	R/C 55-58
APPLIED FINISH	

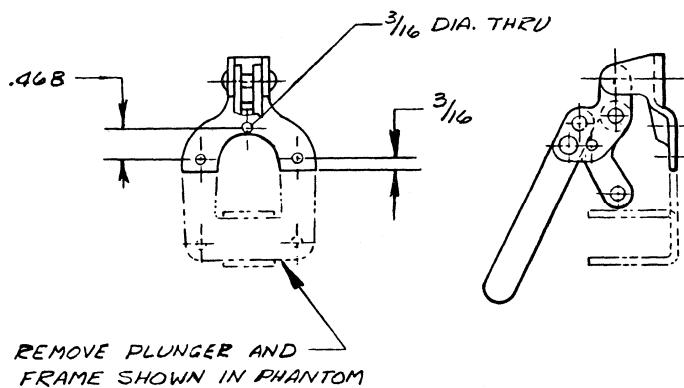




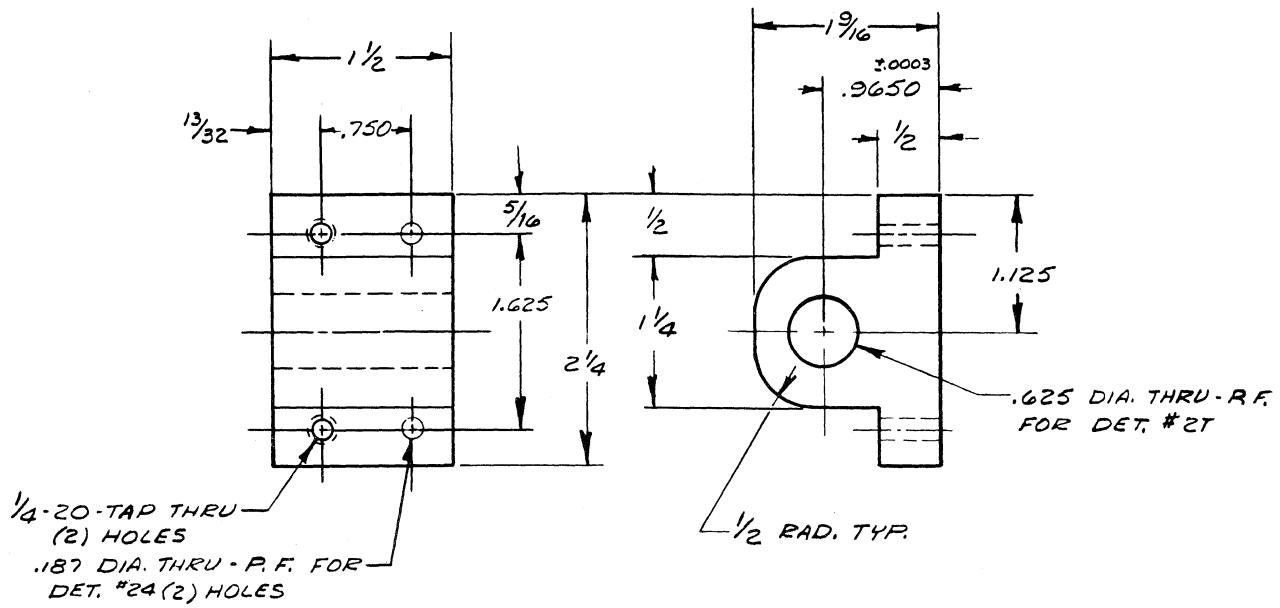
TITLE	Form Punch Trim & Form Die for Micro-T Device	DWG. NO.	1-1410A-16	MATERIAL SPEC.	Carpenter 484	HEAT TREAT	R/C 58-60
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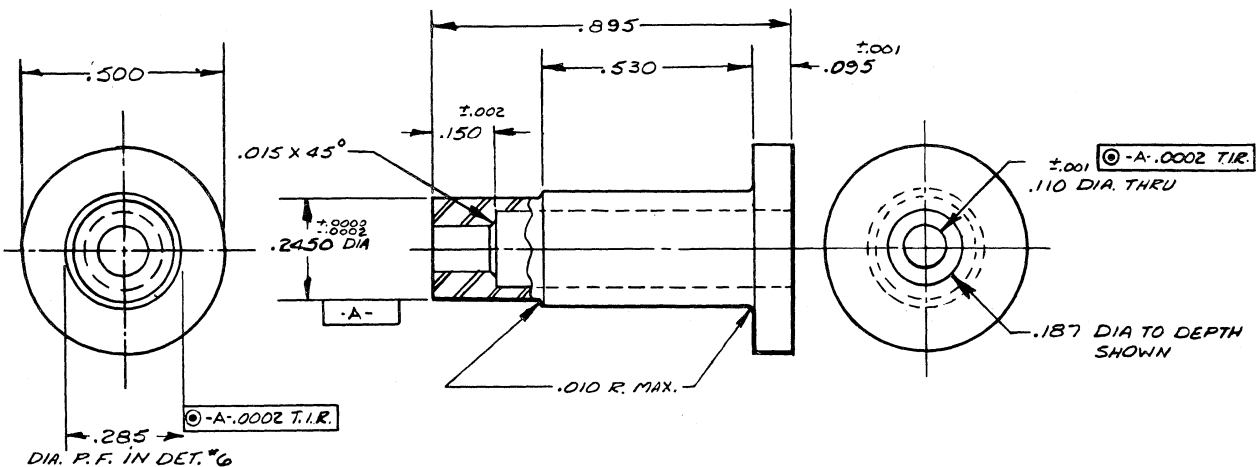
TITLE	Knock Out Trim & Form Die for Micro-T Device	DWG. NO.	1-1410A-17	MATERIAL SPEC.	O.H. Drill Rod	HEAT TREAT	R/C 55-58
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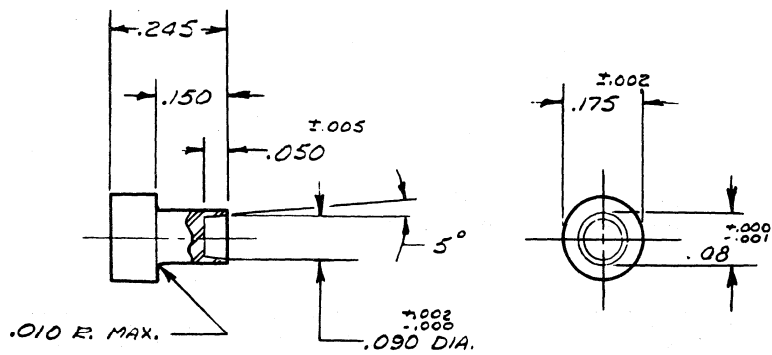
TITLE	Camp-Altered Trim & Form Die for Micro-T Device	DWG. NO.	1-1410A-20	MATERIAL SPEC.	De-Sta-Co-Clamp #605
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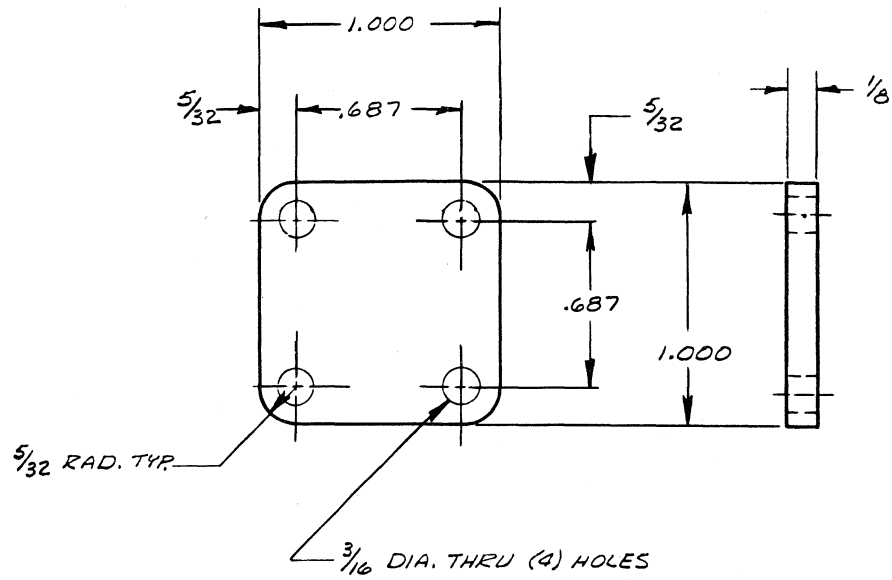
TITLE	Bearing Block Trim & Form Die for Micro-T Device	DWG. NO.	1-1410A-23	MATERIAL SPEC.	1018 Cold Rolled St'l.	APPLIED FINISH	Black Dulite
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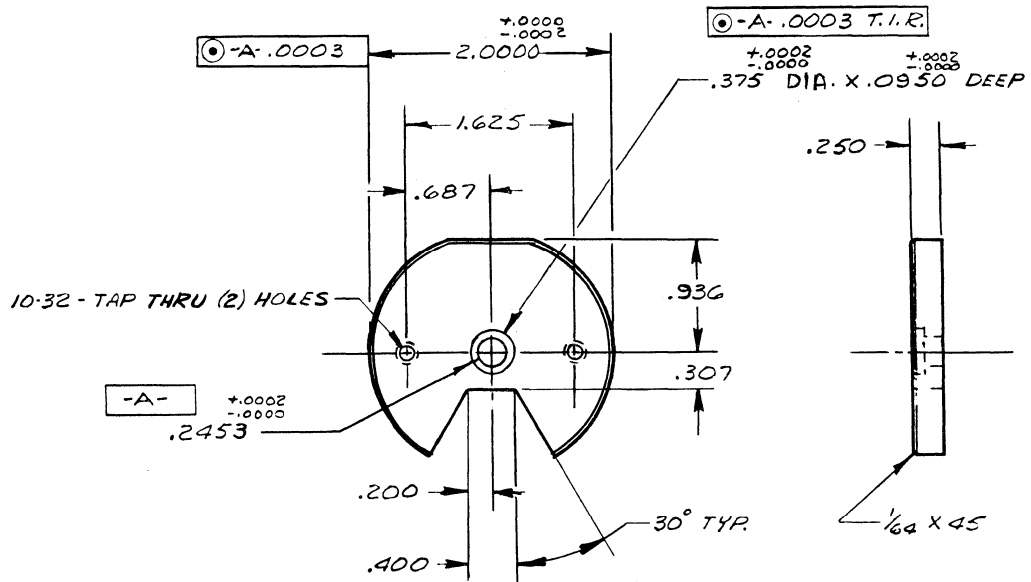
TITLE	Die Button Trim & Form Die for Micro-T Device	DWG. NO.	1-1410A-26	MATERIAL SPEC.	Carpenter 484	HEAT TREAT	R/C 58-60
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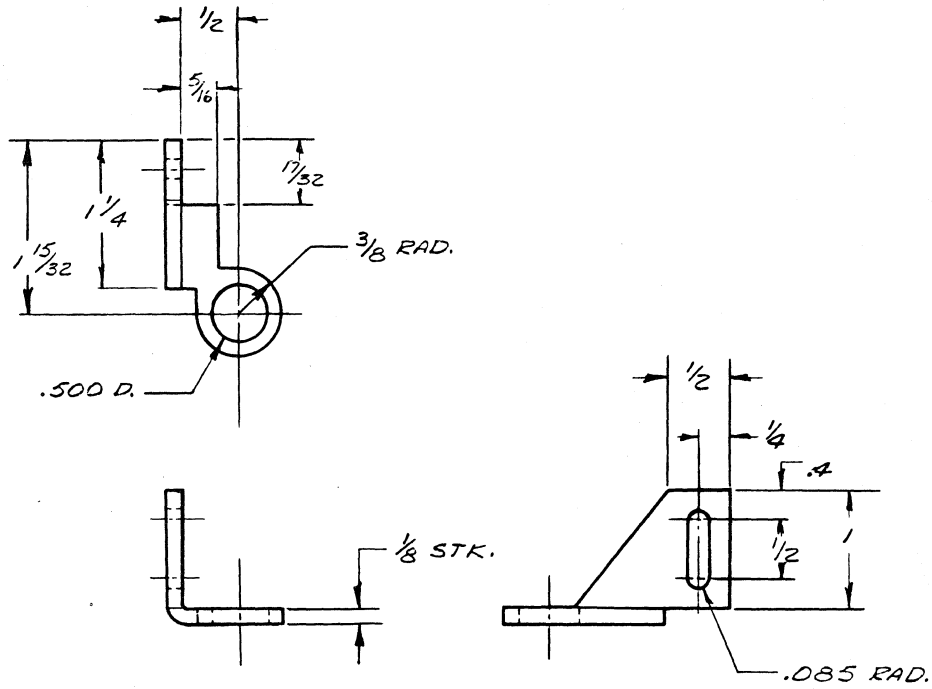
TITLE	Pressure Pad Trim & Form Die for Micro-T Device	DWG. NO.	1-1410A-27	MATERIAL SPEC.	O.H. Drill Rod	HEAT TREAT	R/C 58-60
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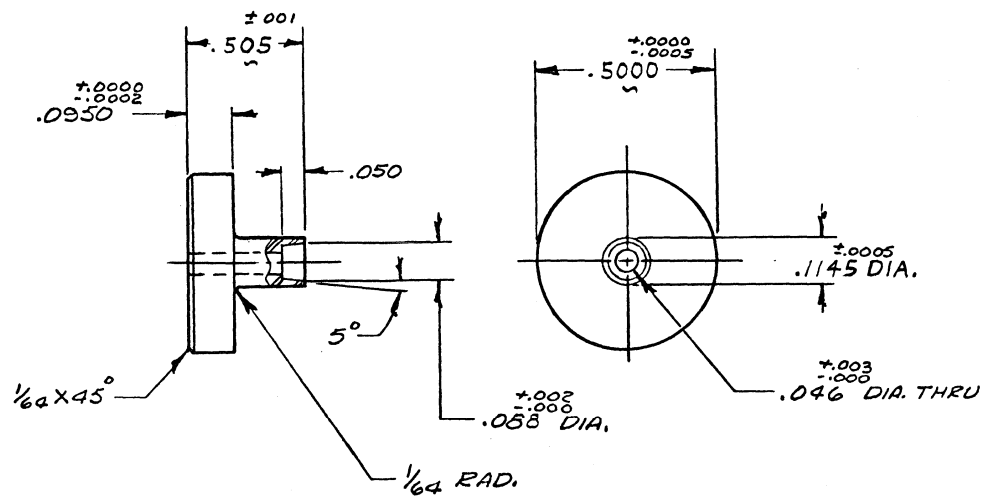
TITLE	Retainer Trim & Form Die for Micro-T Device	DWG. NO.	1-1410A-29	MATERIAL SPEC.	Flat Ground St'k.
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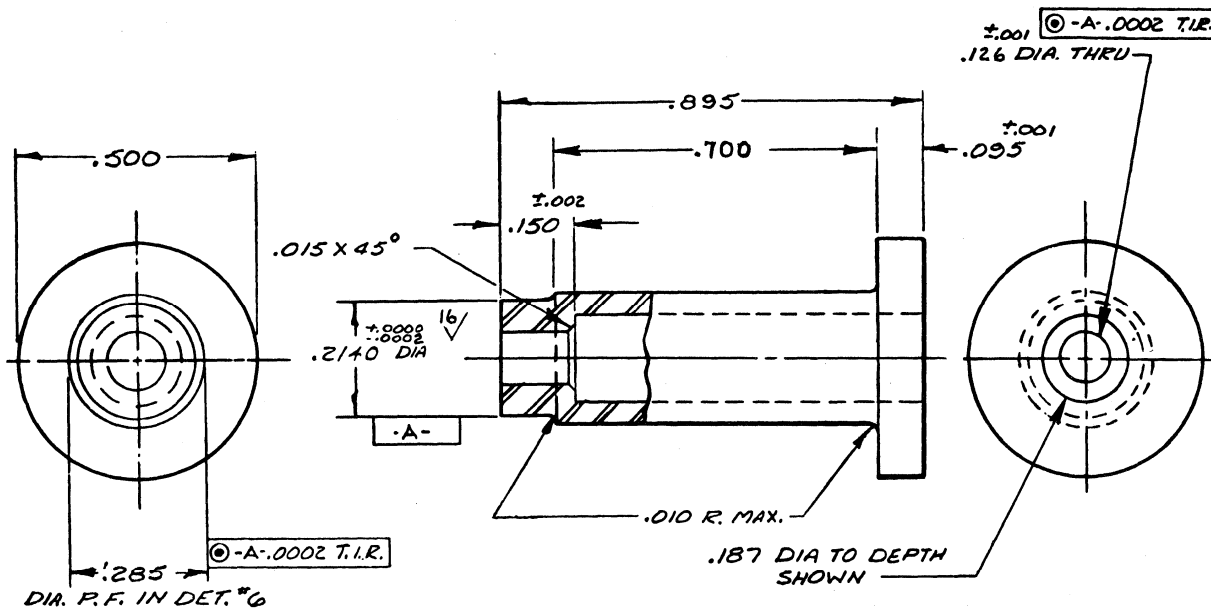
TITLE	Punch Plate Trim & Form Die for Micro-T Device	DWG. NO.	1-1410A-30	MATERIAL SPEC.	Carpenter 484	HEAT TREAT	R/C 58-60
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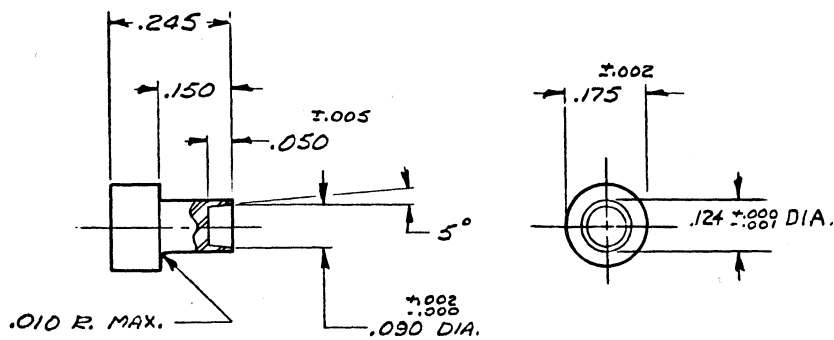
TITLE	Bracket Trim & Form Die for Micro-T Device	DWG. NO.	1-1410A-33	MATERIAL SPEC.	1018 Cold Rolled St'l.
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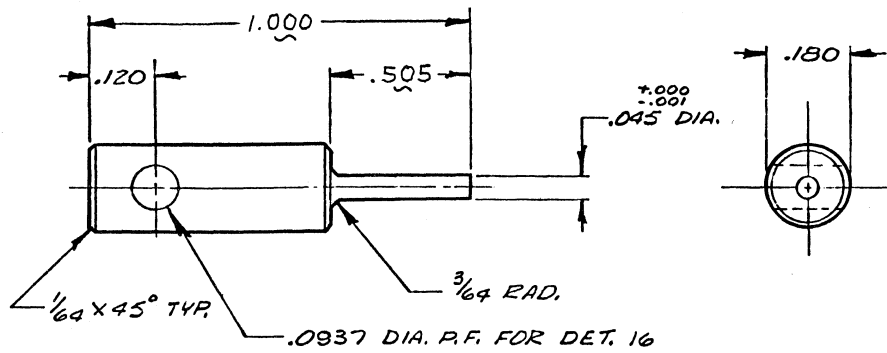
TITLE	Form Punch Form & Trim Die for Micro-T Device Two Bend	DWG. NO.	1-1410A-34	MATERIAL SPEC.	Carpenter 484	HEAT TREAT	R/C 58-60
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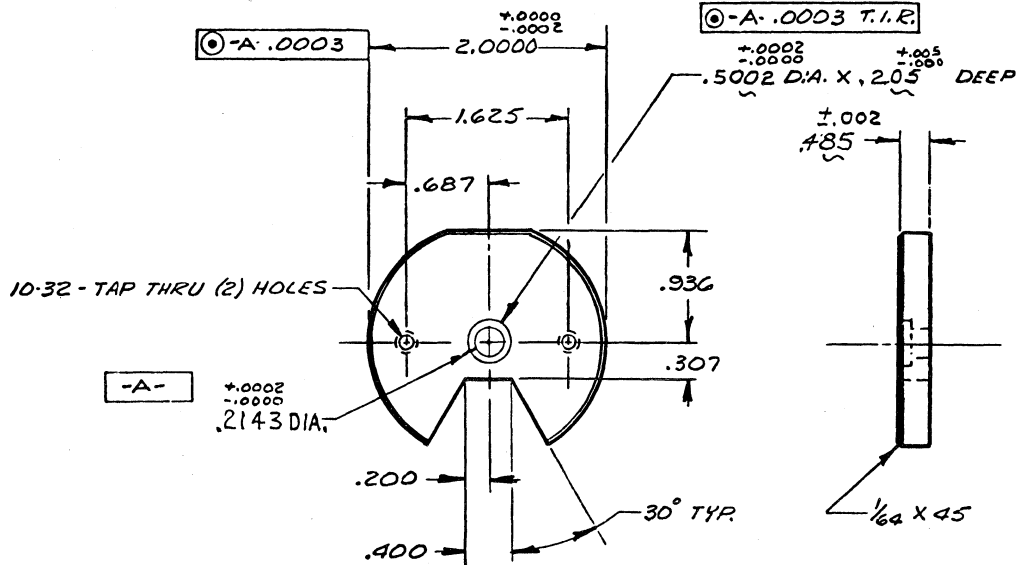
TITLE	Die Button Form & Trim Die for Micro-T Device (Two Bend)	DWG. NO.	1-1410A-35	MATERIAL SPEC.	Carpenter 434	HEAT TREAT	R/C 58-60
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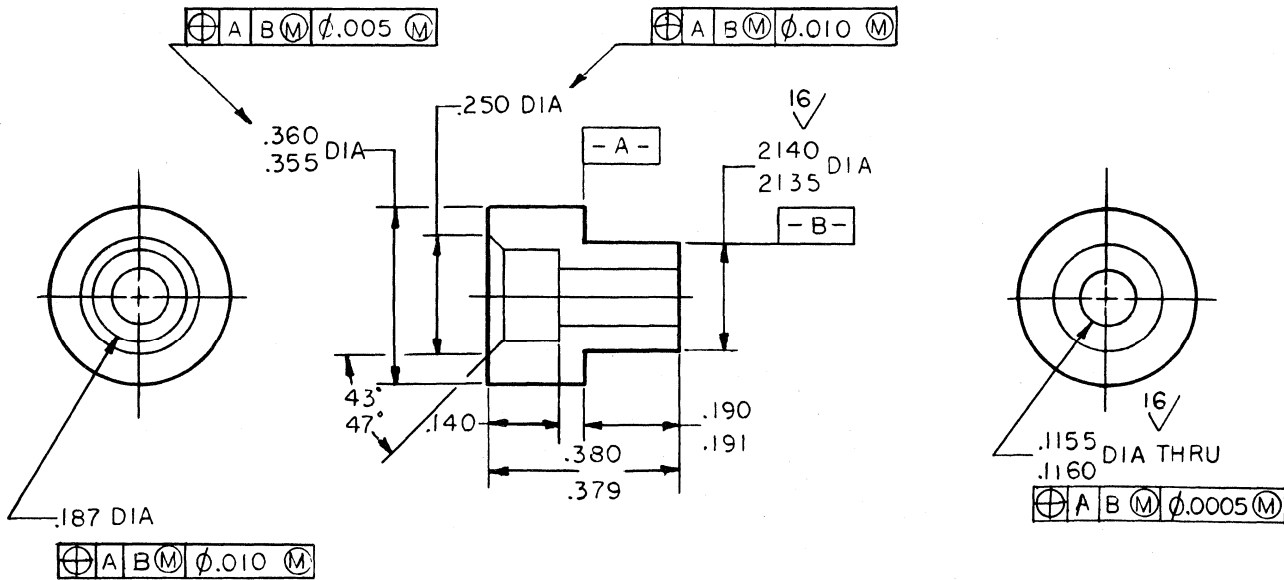
TITLE	Pressure Pad Form & Trim Die for Micro-T Device (Two Bend)	DWG. NO.	1-1410A-36	MATERIAL SPEC.	O.H. Drill Rod	HEAT TREAT	R/C 58-60
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TITLE	Knock Out Form & Trim Die for Micro-T Device (Two Bend)	DWG. NO.	1-1410A-39	MATERIAL SPEC.	O.H. Drill Rod	HEAT TREAT	R/C 55-58
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TITLE	Punch Plate Form & Trim Die for Micro-T Device (Two Bend)	DWG. NO.	1-1410A-37	MATERIAL SPEC.	Carpenter 484	HEAT TREAT	R/C 58-60
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TITLE	Stripper Form & Trim Die for Micro-T Device (Two Bend)	DWG. NO.	1-1014A-38	MATERIAL SPEC.	AISI A2 Carpenter 484	HEAT TREAT	R/C 56-58
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**MOTOROLA Semiconductor Products Inc.**

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