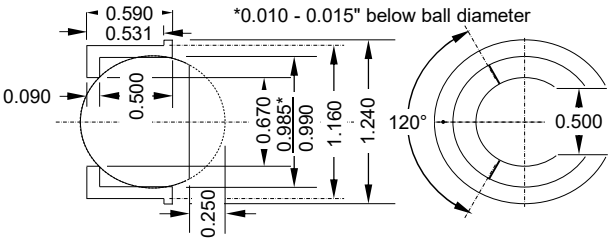
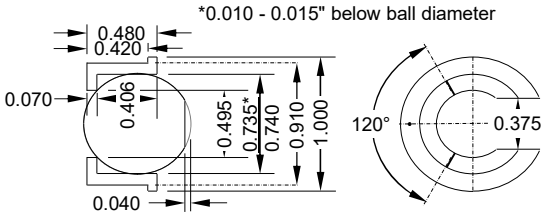
BALL HOLDER FOR FINISHING HANDLE



1. Face end of 1.250"Ø brass bar & turn OD 1.160" X 0.531" long.
2. Drill $^5/_8$"Ø X $^5/_8$" deep full drill dia.
3. Cut off 0.600" long.
4. Reverse in chuck & face end leaving flange $^1/_{16}$" thick. Mark dot on rim aligned with center of jaw 1.
5. Bore $^5/_8$"Ø hole out to 0.670 thru. Bore ID out to 0.985/0.990" x 0.500 deep with flat bottom.
6. Saw out the 0.500" wide slot inside layout lines opposite the dot; then mill slot to width.
7. Make two saw cuts 60° each side of dot to weaken rim.
8. Debur.
9. Snap handle ball into holder, chuck the holder, support plain end of handle with tailstock center & turn handle taper and $^1/_4$"Ø.
10. Rotate handle in holder to nestle shank end between chuck face and one jaw. Face off 0.250", drill, & thread $^1/_2$-20.

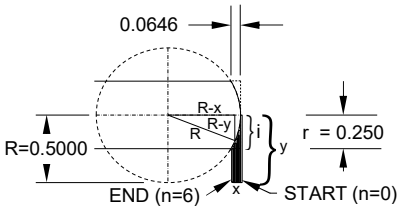
BALL HOLDER FOR FINISHING HANDLE BALL



1. Face end of 1.250"Ø brass bar & turn OD 0.910" X 0.437" long.
2. Drill $^3/_8$"Ø X 0.530" deep full drill dia.
3. Cut off 0.520" long.
4. Reverse in chuck & face end leaving flange $^1/_{16}$" thick. Mark dot on rim aligned with center of jaw 1.
5. Bore $^3/_8$"Ø hole out to 0.495 thru. Bore ID out to 0.735/0.740" X 0.406 deep with flat bottom.
6. Saw out the 0.375" wide slot inside layout lines opposite the dot; then mill slot to width.
7. Make two saw cuts 60° each side of dot to weaken rim.
8. Debur.
9. Snap ball into holder, chuck the holder, support shank end with tailstock center, cut off, & face to length.
10. Drill $^1/_4$"Ø, 0.710" deep.

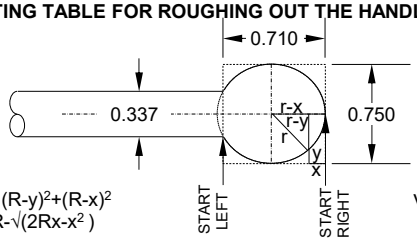
CUTTING TABLE FOR ROUGHING OUT THE 1/2" RADIUS ON TOP END OF THE POST

Ball Radius, **R** = **0.5000**
Post Radius, **r** = **0.2500**
Blank Width, **W** = **0.0646**
No. of steps, $\mathbf{n_{max}}$ = **6**
Step Width, **w** = **0.0100**
Virtual Ball Width, **2R-W** = **0.9354**



	Step No. n	x n*w	y	i r-y
START	0	**0.0000**	0.0000	**0.2500**
	1	**0.0100**	0.0995	**0.1505**
	2	**0.0200**	0.1400	**0.1100**
	3	**0.0300**	0.1706	**0.0794**
	4	**0.0400**	0.1960	**0.0540**
	5	**0.0500**	0.2179	**0.0321**
END	6	**0.0600**	0.2375	**0.0125**

CUTTING TABLE FOR ROUGHING OUT THE HANDLE BALL



$R^2 = (R-y)^2+(R-x)^2$
$y = R-\sqrt{(2Rx-x^2)}$

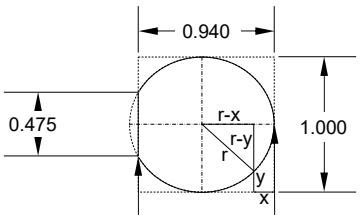
Ball Radius, R = 0.3750
Shank Radius, r = 0.1685
Blank width, W = 0.7100
no. of steps, n_{max} = 71
Step width, w = 0.0100
Virtual ball width, 2R-W = 0.0400

	Step no. n	x n*w	y
END LEFT	37	0.3700	0.0000
	36	0.3600	0.0003
	35	0.3500	0.0008
	34	0.3400	0.0016
	33	0.3300	0.0027
	32	0.3200	0.0041
	31	0.3100	0.0057
	30	0.3000	0.0076
	29	0.2900	0.0098
	28	0.2800	0.0122
	27	0.2700	0.0150
	26	0.2600	0.0181
	25	0.2500	0.0214
	24	0.2400	0.0251
	23	0.2300	0.0292
	22	0.2200	0.0335
	21	0.2100	0.0383
	20	0.2000	0.0433
	19	0.1900	0.0488
	18	0.1800	0.0547
	17	0.1700	0.0610
	16	0.1600	0.0678
	15	0.1500	0.0750
	14	0.1400	0.0828
	13	0.1300	0.0911
	12	0.1200	0.1000
	11	0.1100	0.1097
	10	0.1000	0.1200
	9	0.0900	0.1313
	8	0.0800	0.1435
	7	0.0700	0.1568
	6	0.0600	0.1715
	5	0.0500	0.1879
START LEFT	4	0.0400	0.2065
	3	0.0300	0.2280
	2	0.0200	0.2542
	1	0.0100	0.2890
	0	0.0000	0.3750

Step no. n	x n*w	y	
75	0.7500	0.3750	START RIGHT
74	0.7400	0.2890	
73	0.7300	0.2542	
72	0.7200	0.2280	
71	0.7100	0.2065	
70	0.7000	0.1879	
69	0.6900	0.1715	
68	0.6800	0.1568	
67	0.6700	0.1435	
66	0.6600	0.1313	
65	0.6500	0.1200	
64	0.6400	0.1097	
63	0.6300	0.1000	
62	0.6200	0.0911	
61	0.6100	0.0828	
60	0.6000	0.0750	
59	0.5900	0.0678	
58	0.5800	0.0610	
57	0.5700	0.0547	
56	0.5600	0.0488	
55	0.5500	0.0433	
54	0.5400	0.0383	
53	0.5300	0.0335	
52	0.5200	0.0292	
51	0.5100	0.0251	
50	0.5000	0.0214	
49	0.4900	0.0181	
48	0.4800	0.0150	
47	0.4700	0.0122	
46	0.4600	0.0098	
45	0.4500	0.0076	
44	0.4400	0.0057	
43	0.4300	0.0041	
42	0.4200	0.0027	
41	0.4100	0.0016	
40	0.4000	0.0008	
39	0.3900	0.0003	
38	0.3800	0.0000	END RIGHT

CUTTING TABLE FOR ROUGHING OUT THE HANDLE

Ball Radius, **R** =	**0.5000**
Shank radius, **r** =	**0.2375**
Blank width, **W** =	**0.9400**
no. of steps, $\mathbf{n_{max}}$ =	**94**
Step width, **w** =	**0.0100**
Virtual ball width, **2R - W** =	**0.0600**



$r^2 = (r-y)^2+(r-x)^2$

$y = R - \sqrt{(2Rx-x^2)}$

	Step No. n	x n*w	y	Step No. n	x n*w	y	
END LEFT	50	0.5000	0.0000	100	1.0000	0.5000	**START RIGHT**
	49	0.4900	0.0001	99	0.9900	0.4005	
	48	0.4800	0.0004	98	0.9800	0.3600	
	47	0.4700	0.0009	97	0.9700	0.3294	
	46	0.4600	0.0016	96	0.9600	0.3040	
	45	0.4500	0.0025	95	0.9500	0.2821	
	44	0.4400	0.0036	94	0.9400	0.2625	
	43	0.4300	0.0049	93	0.9300	0.2449	
	42	0.4200	0.0064	92	0.9200	0.2287	
	41	0.4100	0.0082	91	0.9100	0.2138	
	40	0.4000	0.0101	90	0.9000	0.2000	
	39	0.3900	0.0123	89	0.8900	0.1871	
	38	0.3800	0.0146	88	0.8800	0.1750	
	37	0.3700	0.0172	87	0.8700	0.1637	
	36	0.3600	0.0200	86	0.8600	0.1530	
	35	0.3500	0.0230	85	0.8500	0.1429	
	34	0.3400	0.0263	84	0.8400	0.1334	
	33	0.3300	0.0298	83	0.8300	0.1244	
	32	0.3200	0.0335	82	0.8200	0.1158	
	31	0.3100	0.0375	81	0.8100	0.1077	
	30	0.3000	0.0417	80	0.8000	0.1000	
	29	0.2900	0.0462	79	0.7900	0.0927	
	28	0.2800	0.0510	78	0.7800	0.0858	
	27	0.2700	0.0560	77	0.7700	0.0792	
	26	0.2600	0.0614	76	0.7600	0.0729	
	25	0.2500	0.0670	75	0.7500	0.0670	
	24	0.2400	0.0729	74	0.7400	0.0614	
	23	0.2300	0.0792	73	0.7300	0.0560	
	22	0.2200	0.0858	72	0.7200	0.0510	
	21	0.2100	0.0927	71	0.7100	0.0462	
	20	0.2000	0.1000	70	0.7000	0.0417	
	19	0.1900	0.1077	69	0.6900	0.0375	
	18	0.1800	0.1158	68	0.6800	0.0335	
	17	0.1700	0.1244	67	0.6700	0.0298	
	16	0.1600	0.1334	66	0.6600	0.0263	
	15	0.1500	0.1429	65	0.6500	0.0230	
	14	0.1400	0.1530	64	0.6400	0.0200	
	13	0.1300	0.1637	63	0.6300	0.0172	
	12	0.1200	0.1750	62	0.6200	0.0146	
	11	0.1100	0.1871	61	0.6100	0.0123	
	10	0.1000	0.2000	60	0.6000	0.0101	
	9	0.0900	0.2138	59	0.5900	0.0082	
	8	0.0800	0.2287	58	0.5800	0.0064	
	7	0.0700	0.2449	57	0.5700	0.0049	
START LEFT	6	0.0600	0.2625	56	0.5600	0.0036	
	5	0.0500	0.2821	55	0.5500	0.0025	
	4	0.0400	0.3040	54	0.5400	0.0016	
	3	0.0300	0.3294	53	0.5300	0.0009	
	2	0.0200	0.3600	52	0.5200	0.0004	
	1	0.0100	0.4005	51	0.5100	0.0001	**END RIGHT**
	0	0.0000	0.5000				