Partner 6 D-G

Electrical and Mechanical Manual

Milltronics Manufacturing Company
1400 Mill Lane
Waconia, MN USA 55387

952-442-1410

DC Axis servo
drive cards AM-25

All axis thrust bearings BG-01 x 2
All axis radial bearings BG-02
Spindle:
Old short 5HP
Lower thrust BG-22
Upper radial BG-05
Newer 5HP
Lower thrust BG-22
Upper radial BG-05
Top bearing cup BG-12
Newer 7.5 HP
Lower thrust BG-22 and BG-44
Upper thrust BG-45 x 2
Top bearing cup BG-12

MECHANICAL AND ASSEMBLY DRAWINGS

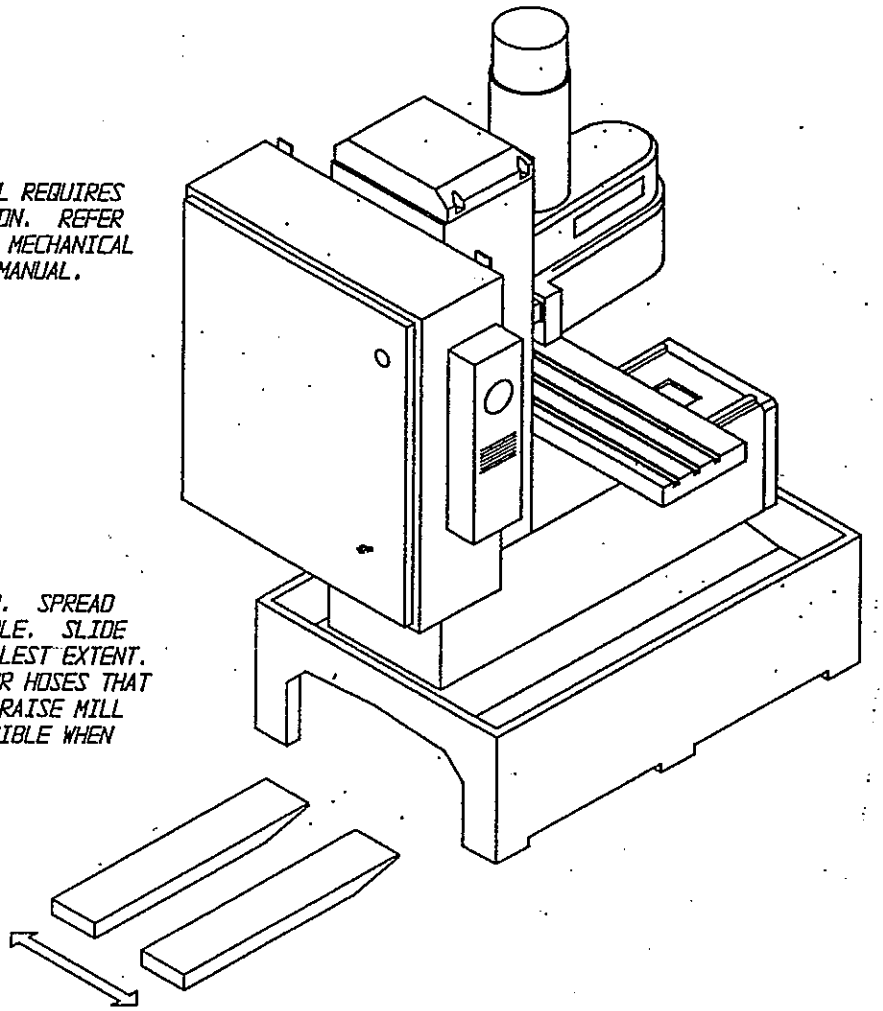
Partner 1E & 6E

1. Rock Base Lifting Instructions
2. BT Flange Retention Knob
3. V Flange Retention Knob
4. Drawbar Assembly Instructions
5. Partner 1 Mill
6. Overall Dimensions with Chip Pan
7. Lubrication
8. Machine Assembly
9. Column Assembly
10. Base Assembly
11. Head Assembly
12. Table and Saddle Assembly
13. Spindle Assembly (1)
14. Spindle Assembly (2)
15. Card Cage Electronics Assembly (1-5)
16. Front Panel Switch and Control
17. Power Supply ±15 and 24 VDC
18. MSI Mag Panel

- IMPORTANT -

FOR CONTINUED PERFORMANCE, MILL REQUIRES REGULAR CLEANING AND LUBRICATION. REFER TO DRAWING No. 6-10-008-008 IN MECHANICAL SECTION OF THE OPERATIONS MANUAL.

APPROACH MILL FROM THE REAR. SPREAD FORKS AS FAR APART AS POSSIBLE. SLIDE FORKS UNDER MILL TO THIER FULLEST EXTENT. BE AWARE OF HARDWARE, CABLES OR HOSES THAT MAY BE UNDER MACHINE BASE. RAISE MILL OFF THE FLOOR AS LOW AS POSSIBLE WHEN MOVING.



MACHINE LIFTING INSTRUCTIONS

REV.	DESCRIPTION	E.C.O. NO.	APP'D BY	DATE
A	REDESIGN LABEL ARTWORK	690	MF	1/92

MATERIAL/FINISH
MATL: 3M/DYNAMARK No. 8130

STOCK/ASSY No. LB-34

TOLERANCE UNLESS SPECIFIED

X.XXX	±	.005
X.XX	±	.010
X.X	±	.030
ANGLE	±	1.0°

MILLTRONICS MANUFACTURING
7870 PARK DRIVE (612) 474-8100
CHANHASSEN, MN 55317

TITLE ROCK BASE LIFTING INSTRUCTIONS

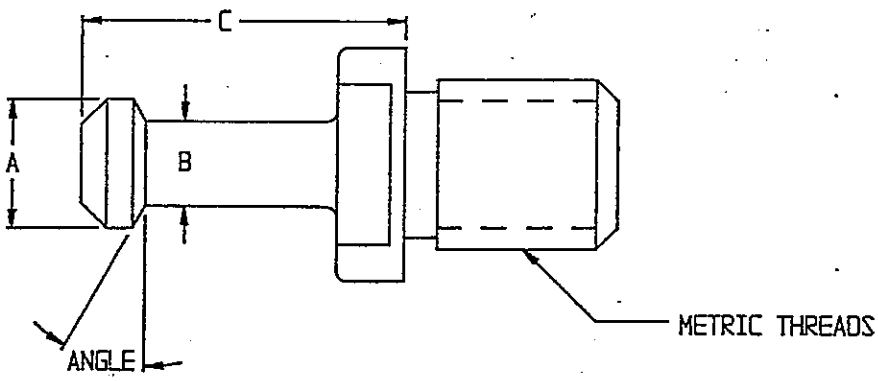
APPLICATION PARTNER I

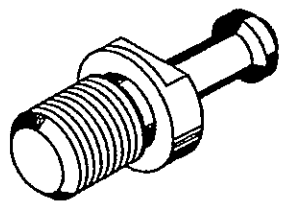
SCALE 1:1 | DWG No 6-08-004-005 | SIZE C

DATE 2 AUG 90 | DRAWN BY REDER | SHEET NO. 1 OF 1

COMMAND RETENTION KNOBS
STYLE BT-FLANGE
JAPANESE

BT-FLANGE TAPER	PART No.	DIMENSIONS A	B	C	ANGLE	MILLTRONICS MACHINE
40	RB4M-0001	.59	.39	1.38	45°	PARTNER VII
	RB4M-0002				60°	PARTNER I, IV & V
45	RB5M-0001	.75	.55	1.57	45°	PARTNER VII





NOTES:

COMMAND CORPORATION
TEL: 1-(800)-328-2197
FAX: 1-(612)-755-1116

REV.	DESCRIPTION	E.C.O. NO.	APP'D BY	DATE

MATERIAL/FINISH

STOCK No.

TOLERANCE UNLESS SPECIFIED
X.XXX ±
X.XX ±
X.X ±
ANGLE ±

MILLTRONICS MANUFACTURING
7870 PARK DRIVE (612) 474-8100
CHANHASSEN, MN 55317

TITLE: BT-FLANGE RETENTION KNOB

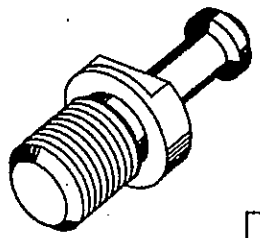
APPLICATION: GENERAL PRODUCTS

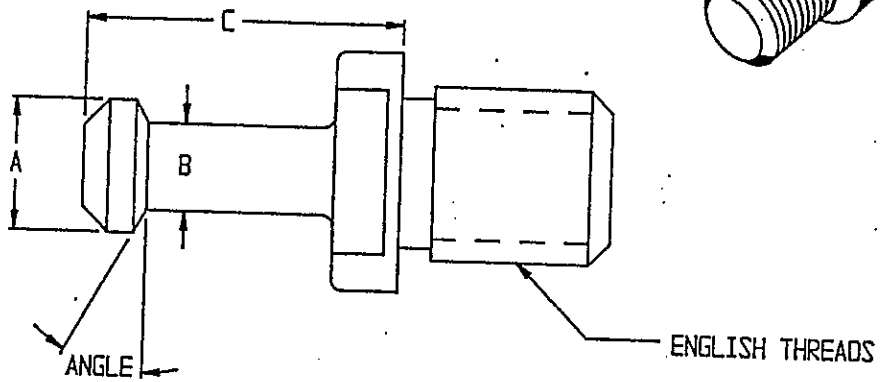
SCALE	DWG NO.	SIZE
1:1	6-00-018-030	B

DATE	DRAWN BY	SHEET NO.
1 FEB 89	REUTER	1 OF 1

RETENTION KNOBS
STYLE V-FLANGE
JAPANESE

V-FLANGE TAPER	DIMENSIONS A	B	C	ANGLE	MILLTRONICS MACHINE	COMMAND PART No.	KENNMETAL PART No.	VALENITE PART No.
40	.59	.39	1.27	45°	PARTNER VII	RB4E-0001		
				60°	PARTNER I, IV & V	RB4E-0002	RK31114A	PT-532-60
30	DWG. No. 6-01-018-010				PARTNER III B	MA-129		





NOTES:

COMMAND CORPORATION
TEL: (800)-328-2197
FAX: (512)-755-1116

30-TAPER RETENTION KNOB

REV.	DESCRIPTION	E.C.O. NO.	APP'D BY	DATE
A	ADD PART #	49	M.F.	8/89

MATERIAL/FINISH

STOCK No.

TOLERANCE UNLESS SPECIFIED
X.XXX ±
X.XX ±
X.X ±
ANGLE ±

MILLTRONICS MANUFACTURING
7870 PARK DRIVE (612) 474-8100
CHANHASSEN, MN 55317

TITLE: V-FLANGE RETENTION KNOB

APPLICATION: GENERAL PRODUCTS

SCALE: 1:1 | DWG NO. 6-00-0[illegible]031 | SIZE: B

DATE: | DRAWN BY [illegible] | SHEET NO.

PARTNER 1 DRAWBAR ASSEMBLY INSTRUCTIONS

1. Install lower guide, springs, and spacer onto the drawbar as shown.

2. Thread the hex nut onto the drawbar approximately 2 turns and lock the set screw.

3. Lower the above assembly into the spindle.

4. Thread the locking cylinder onto the bottom end of the drawbar (1/4" balls included) and tighten all the way. Lock the set screw.

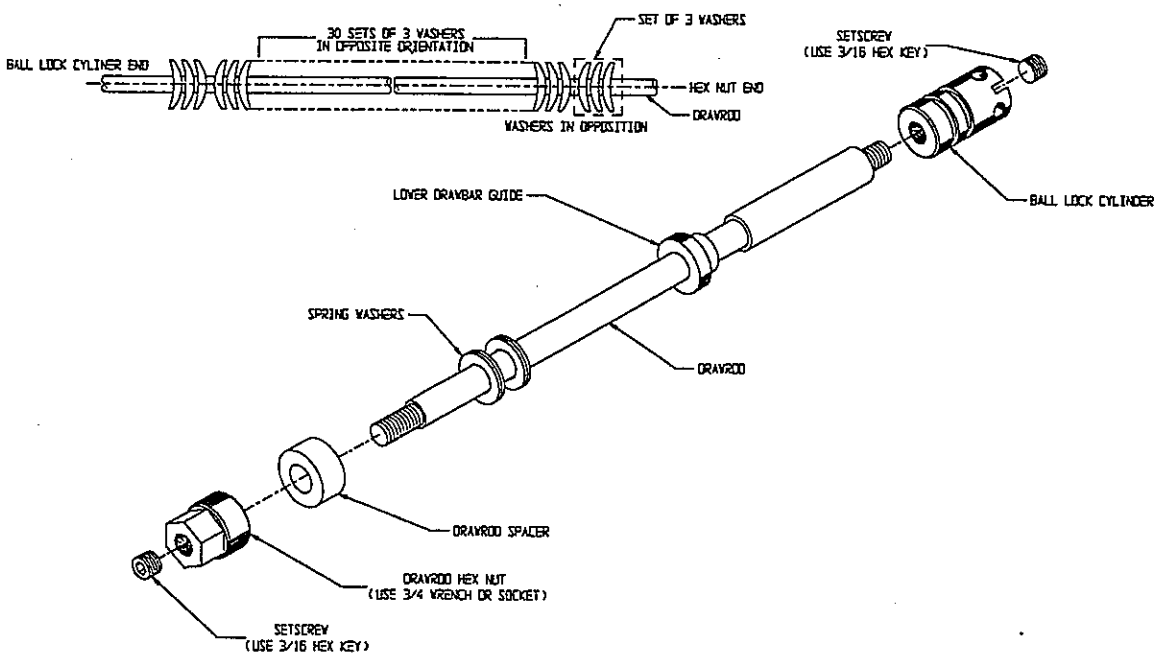
5. Remove the set screw from the top nut, then take up the slack in the springs by adjusting the hex nut clockwise.

6. After the slack is taken up, tighten the hex nut 5½ turns. (This sets the preload on the springs.) Then lock the set screw.

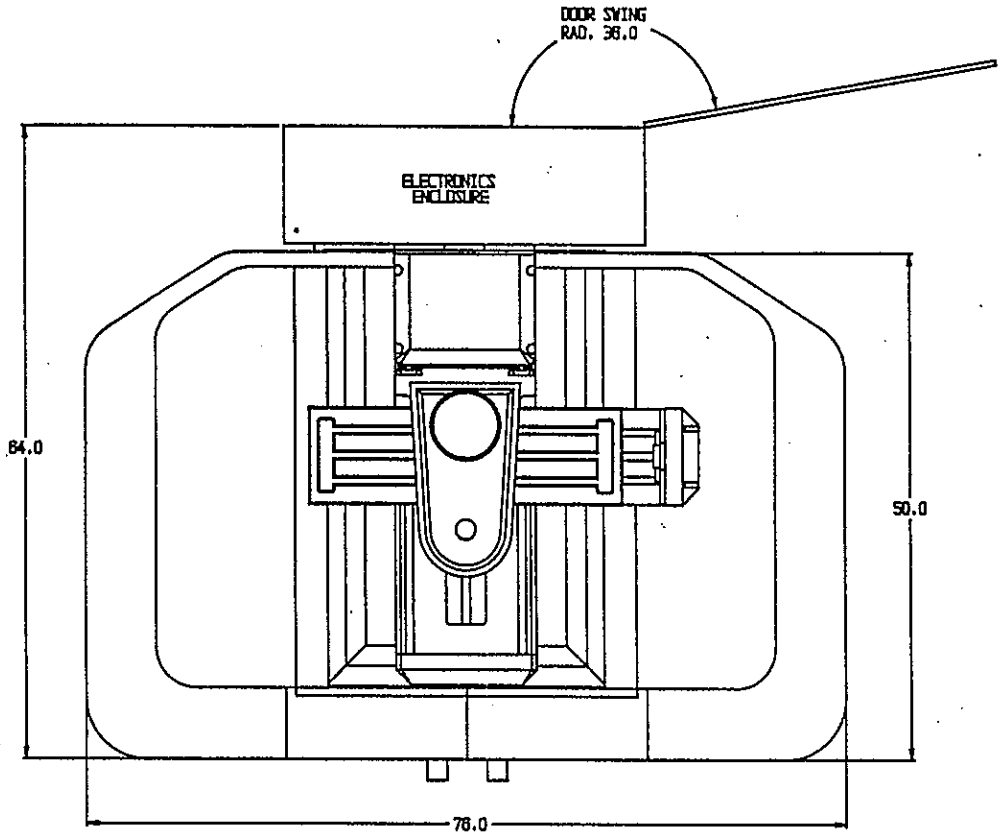
7. Test the drawbar by installing and removing a tool. If the tool does not go in, then see the next step on adjustments.

8. Adjustment of the drawbar is accomplished by changing the length of the standoffs that support the air cylinder. Shortening these will cause more down stroke of the locking cylinder. Adding spacers will cause less.

Note: Be sure the tool is forced out of the taper by holding the tool up in the spindle and pressing the [TOOL OUT] button. The tool should be pushed out about 0.02". Adjust if nec.



PARTNER 1 DRAWBAR ASSEMBLY



REV.	DESCRIPTION	E.C.O. NO.	APP'D BY	DATE
A	CHANGE CHIP PAN	833	M.F.	6/92

MATERIAL/FINISH

STOCK No.

TOLERANCE UNLESS SPECIFIED

X.XXX	±	.005
X.XX	±	.010
X.X	±	.030
ANGLE	±	

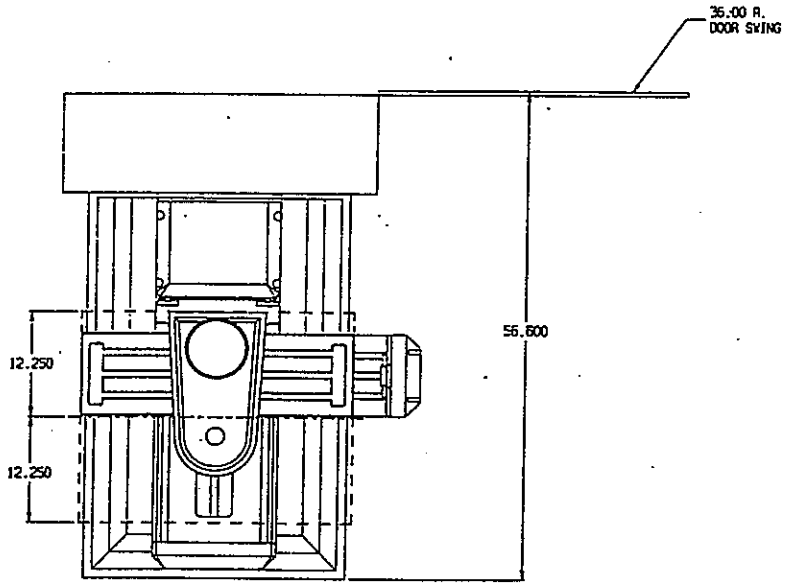
MILLTRONICS MANUFACTURING
7870 PARK DRIVE (612) 474-8100
CHANHASSEN, MN 55317

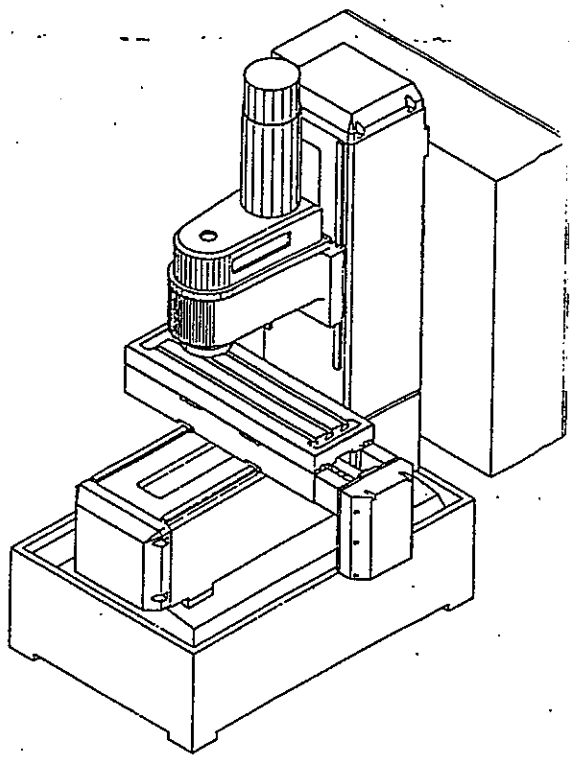
TITLE: D/A DIMENSIONS W/CHIP PAN

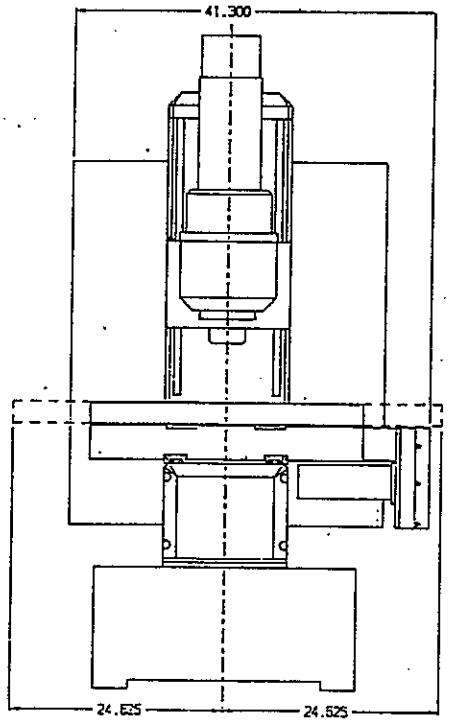
APPLICATION: PARTNER I

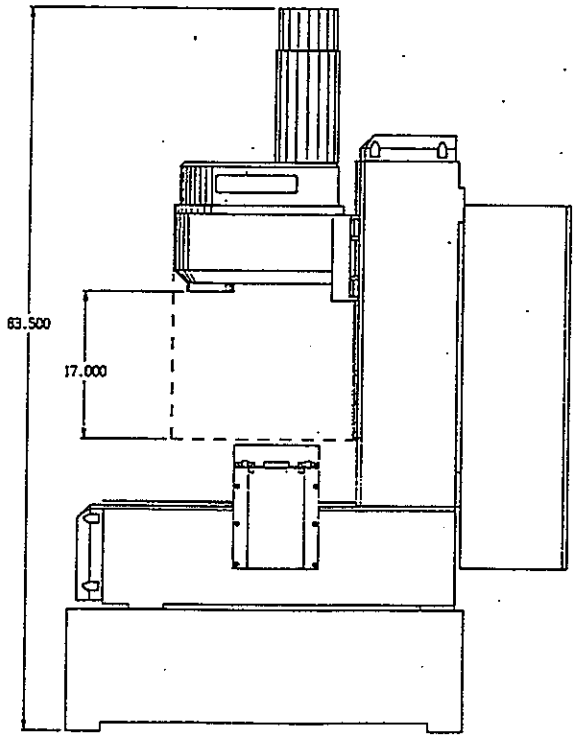
SCALE	DWG NO.	SIZE
12:1	6-10-008-013	B

DATE	DRAWN BY	SHEET NO.
5 FEB 91	REUTER	1 OF 1









REV.	DESCRIPTION	E.C.O. NO.	APP'D BY

MATERIAL/FINISH

STOCK No.

TOLERANCE UNLESS SPECIFIED
X.XXX ±
X.XX ±
X.X ±
ANGLE ±

MILLTRONICS MANUFACTURING
7670 PARK DRIVE (612) 474-81
CHANHASSEN, MN 55317

TITLE: PARTNER I MILL

APPLICATION: PARTNER I

SCALE: 9:1 | DWG NO. 5-10-008-001 | REV.

DATE: 13 FEB 90 | DRAWN BY: THOMPSON | SHEET NO. 1 OF

LUBRICATION OF PARTNER 1

Parts Required: Qty 4 WX-113 3/4" hole plug

It is recommended by the manufacturer that you grease the machine every 500 hours of operation. The manufacturer recommends Mobil HSC PM or Universal Synthetic Grease, or a similar grease compatible with a lithium-type soap base grease #2. Use grade NLGI-1 or something compatible with this grade.

Enclosed is a drawing which shows the location of 12 grease fittings on the Partner 1. There will be four fittings on each axis, one for each of the four bearings.

Y AXIS GREASING

On the Y axis of all machines it will be necessary to lift up the folding way cover in the front and roller shade in the back. Doing this will expose the four fittings for the Y axis.

X AXIS GREASING

To grease the X axis on machines manufactured prior to 4-1-91 it will be necessary to jog the Z axis to the full negative software limit. Once the software limit is reached, E-stop the machine. Lift up the rubber cover and turn the ball screw by hand until it reaches a hard stop. This will expose the grease fittings on the left side, front and back. After greasing the left side it will be necessary to turn the ball screw by hand to a point that is within the mechanical limit switches. Once this is complete, reset the machine and jog to the positive software limit and repeat the procedure for the right side, front and back grease fittings.

On machines manufactured after 4-1-91 it will be necessary to remove the front and rear covers from the table. These covers are 2" wide and run the length of the table. They are attached to the table with four or five 8-32 screws depending on the size of your table. Remove these covers to expose the four grease fittings for the X axis. After greasing **re-install both covers**.

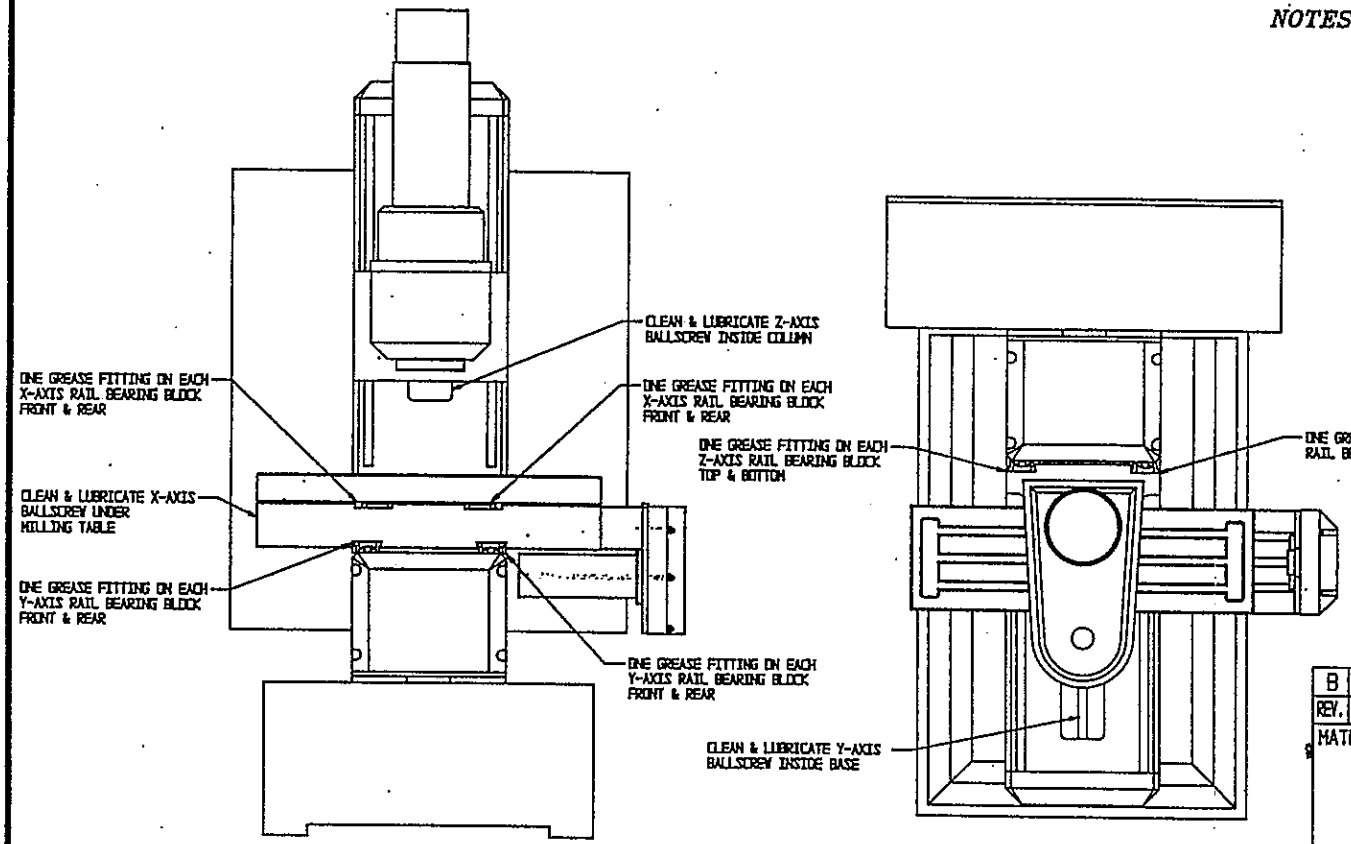
Z AXIS GREASING

The Z axis on the earlier models will have an opening on the roller shade housing at the top and bottom for easy access to the grease fittings with some minor shifting of the rail covers. On later and most recent machines it will be necessary to remove the roller shade housing. This is the sheet metal guard the roller shade and the folding rail covers are mounted to. To remove this housing, you will have to remove the roller shade. Then remove the #2 screws that are holding the upper rail cover on. After this is completed, remove the six screws holding the housing on the head. Once the housing is off, access to the four grease

fittings on the Z axis is accomplished. Before reassembling the housing drill four 3/4" holes through the housing that will allow you access to the fittings the next time the machine needs greasing. After reassembling the housing, install the four hole plugs provided. This will allow easier access for the next time the machine needs to be greased.

BALL SCREW GREASING

To grease the ball screws, move each axis to its home position. Fill the palm of your hand with grease and cover the ball screw as best as can be reached. After this is done, write a program to cycle all three axes through their full travels using a slow feedrate. This way the grease will not fly off the ball screw before it has a chance to run through the ball nut. Cycle each axis three times through the full travel at 5 ipm.



NOTES:

1. REMOVE FRONT AND REAR TABLE PLATES TO GREASE X AXIS BEARINGS.
2. LIFT WAY COVERS TO GREASE Y AXIS BEARINGS.
3. REMOVE SPINDLE MOTOR SHROUD AND HOLE PLUGS TO GREASE Z AXIS BEARINGS.

MILL REQUIRES LUBRICATION EVERY 500 HRS.

USE GRADE NLGI-1 GREASE FOR ALL LUBE POINTS

MANUFACTURER RECOMMENDS
MOBIL UNIVERSAL SYNTHETIC GREASE
MOBILTEMP SHC-32

REV.	DESCRIPTION	E.C.O. NO.	APP'D BY	DATE
B	ADD NOTES	623	M.F.	10/91

MATERIAL/FINISH

STOCK No.

TOLERANCE UNLESS SPECIFIED
X.XXX ±
X.XX ±
X.X ±
ANGLE ±

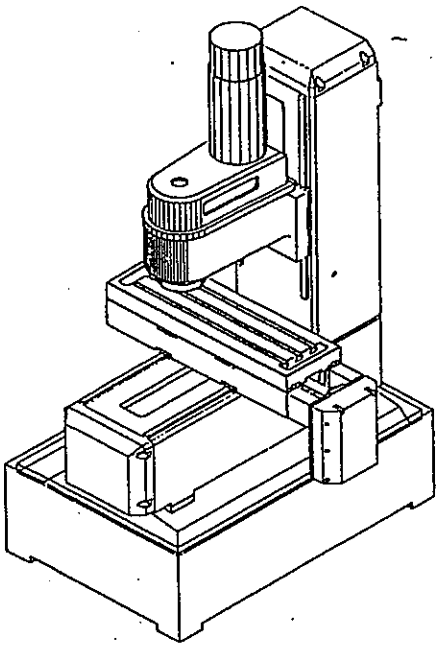
MILLIRONICS MANUFACTURING
7870 PARK DRIVE (612) 474-8100
CHANHASSEN, MN 55317

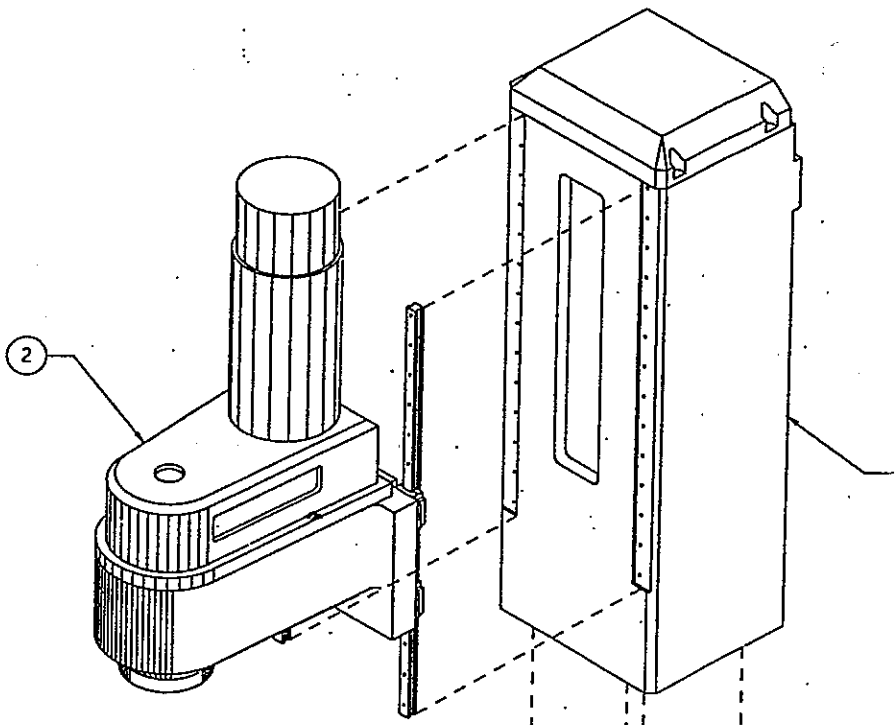
TITLE: LUBRICATION DRAWING

APPLICATION: PARTNER I

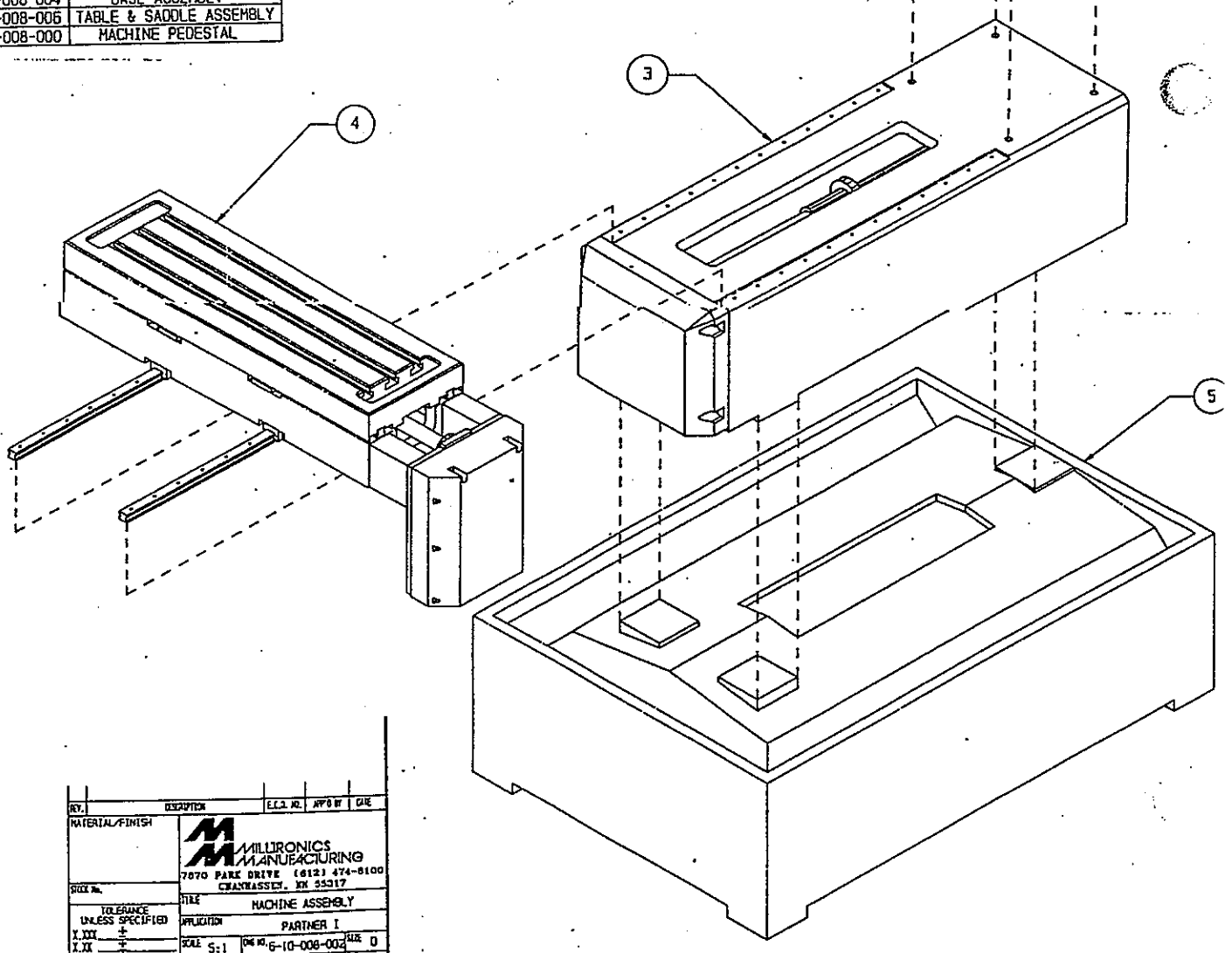
SCALE: 12:1 | DWG NO. 6-10-008-008 | SIZE: B

DATE: 8 JAN 91 | DRAWN BY: REUTER | SHEET NO. 1 OF 1

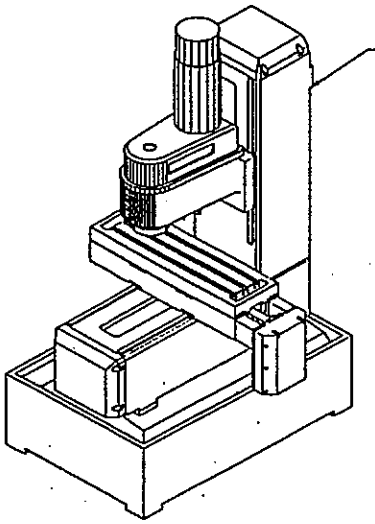




PARTS LIST		
No.	DRAWING No.	DESCRIPTION
1	6-10-008-003	COLUMN ASSEMBLY
2	6-10-008-005	HEAD ASSEMBLY
3	6-10-008-004	BASE ASSEMBLY
4	6-10-008-006	TABLE & SADDLE ASSEMBLY
5	6-01-008-000	MACHINE PEDESTAL



REV.	DESCRIPTION	E.C.O. NO.	APP'D BY	DATE
MATERIAL/FINISH	MILLTRONICS MANUFACTURING 7070 PARK DRIVE (612) 474-8100 CRANBASSET, MN 55317			
SIZE No.	TITLE: MACHINE ASSEMBLY			
TOLERANCE UNLESS SPECIFIED X.XXX ± X.XX ± X.X ± ANGLE ±	APPLICATION: PARTNER I			
	SCALE: 1:1	DWG NO. 6-10-008-002	SIZE: D	
	DATE: 5 FEB 90	DRAWN BY: THOMPSON	SHEET NO. 1 OF 1	



PARTS LIST			
No.	QTY	STOCK No.	DESCRIPTION
1	1	VMI-8	MOTOR PULLEY COVER Y&Z AXIS
2	1	81-09	187L075 TIMING BELT Z
3	1	PY-21	12.075 MOTOR PULLEY
4	1	PY-31	24L075 KF-1 BALLSCREW PULLEY
5	1	MO-52	MOTOR 26" LB W/BRAKE MT3GM4-38
6	1	MPI-01	RP45-8076 X,Y,Z, BALLSCREWS
7	1	VMIC-01	COLUMN
8	3	SW-74	SWITCH 82-28018-A2
9	1	PY-32	1210 5/8 I.D. BUSHING

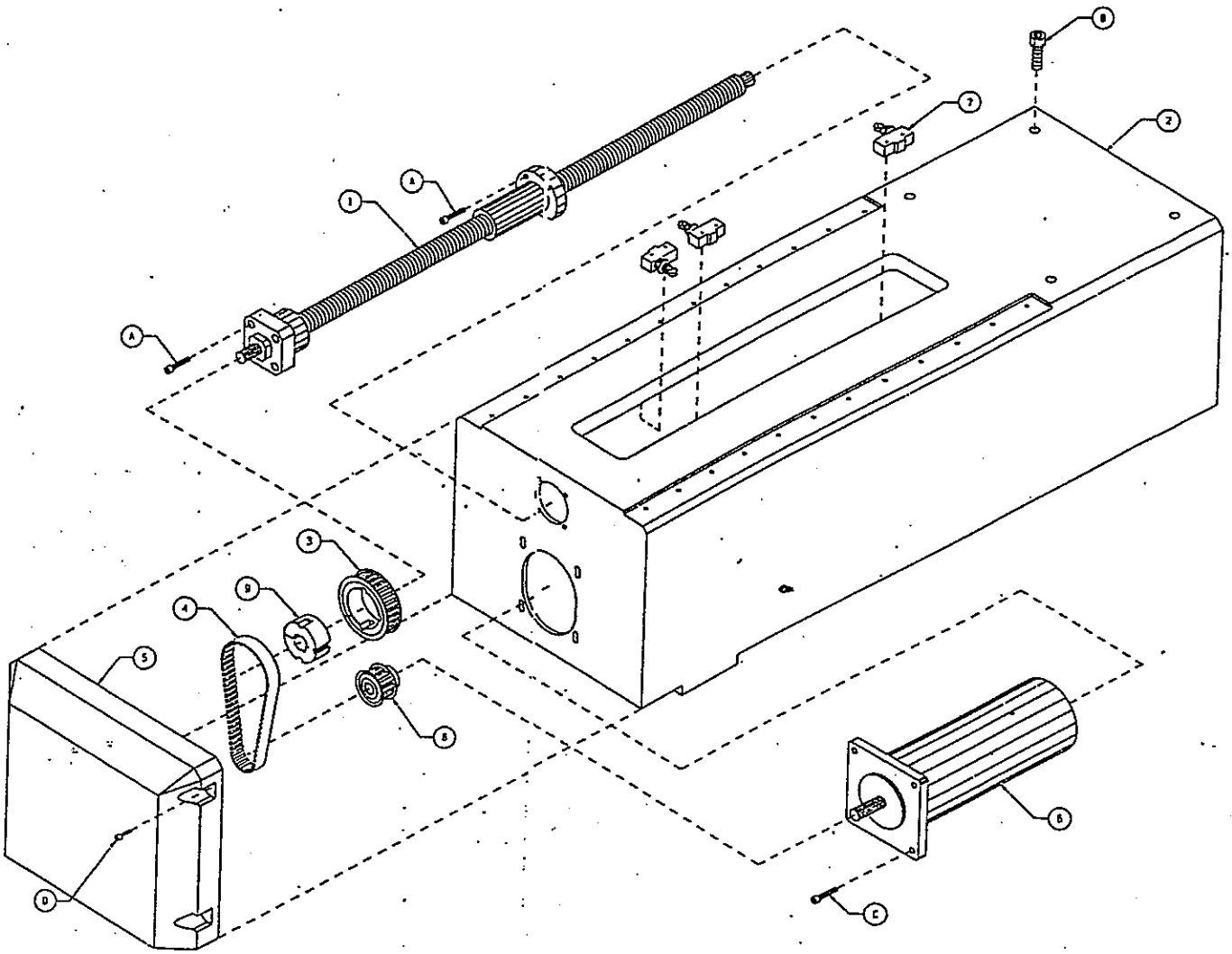
HARDWARE LIST		
No.	QTY	DESCRIPTION
A	10	1/4-20 x 1 UNC
B	4	10-32 x 1 1/2 UNC

REV.	DESCRIPTION	E.C.N. NO.	APP'D BY	DATE
MATERIAL/FINISH				
STOCK NO.				

TOLERANCE UNLESS SPECIFIED	
X.XXX	±
X.XX	±
X.X	±
ANGLE	±

MILLTRONICS MANUFACTURING
7870 PARK DRIVE (612) 474-8100
CHANHASSEN, MN 55317

TITLE	COLUMN ASSEMBLY
APPLICATION	PARTNER I ,
SCALE 2.5:1	DWG NO. 6-10-008-003 SIZE D
DATE 6 FEB 90	DRAWN BY THOMPSON SHEET NO. 1 OF 1

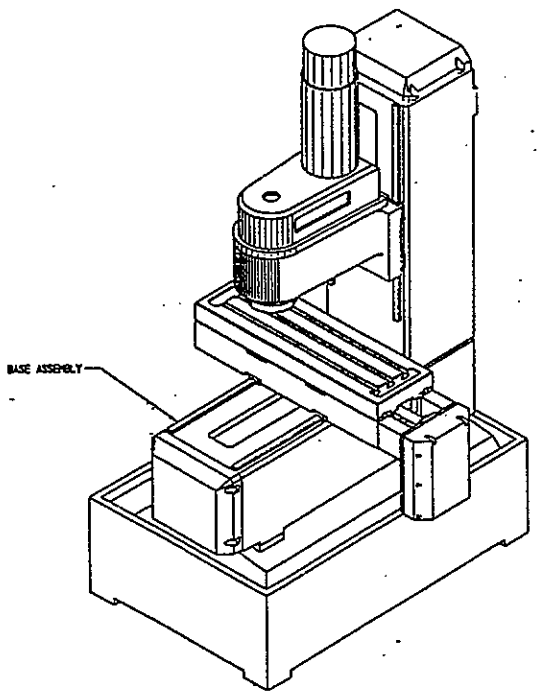


PARTS LIST			
No.	QTY	STOCK No.	DESCRIPTION
1	1	MP1-01	RP45-8076 X,Y,Z BALLSCREWS
2	1	VN18-01	BASE
3	1	PY-31	24L075 KF-1 BALLSCREW PULLEY
4	1	BT-09	187L075 TIMING BELT
5	1	VN1-08	MOTOR PULLEY COVER Y&Z AXIS
6	1	MO-56	MT30F4-25 W/SQ.FACE 13" LG.
7	3	SW-74	SWITCH B2-2R018-A2
8	1	PY-21	12L075 MOTOR PULLEY
9	1	PY-32	1210 5/8 I.D. BUSHING

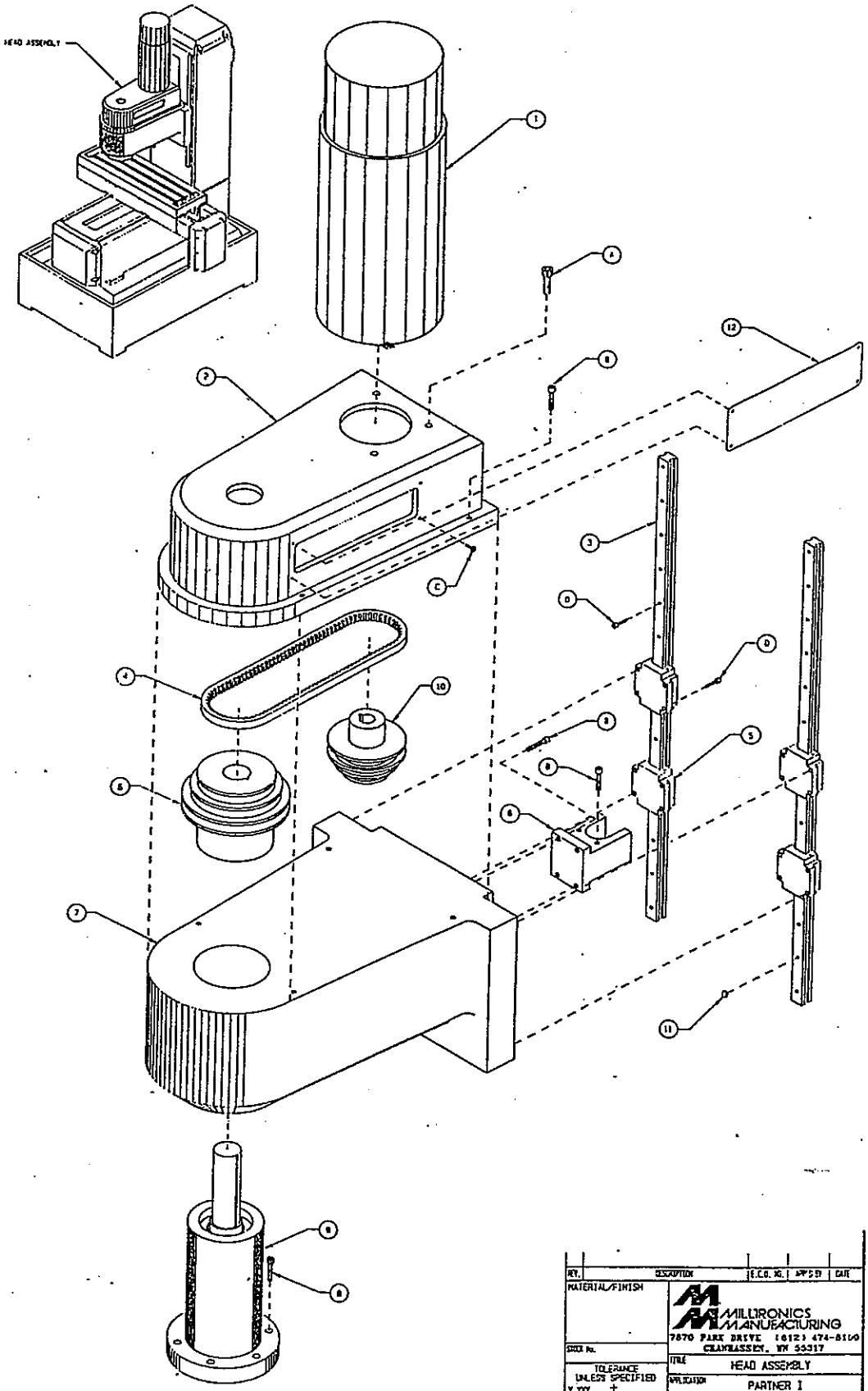
Belt can be BT-14

HARDWARE LIST		
No.	QTY	DESCRIPTION
A	6	1/4-20 x 1 UNC
B	4	1/2-13 x 1 1/2 UNC
C	4	1/4-20 x 1 1/2 UNC
D	4	10-32 x 1 1/4 UNC

Y axis rear waycover bellows MP6-109
Y axis front waycover MP6-03/ MP1-14



REV.	DESCRIPTION	E.C.O. #	APP'D BY
MATERIAL/FINISH			



PARTS LIST			
No.	QTY	STOCK No.	DESCRIPTION
1	1	HO-57	878S4074M 3HP MOTOR W/BRAKE
2	1	VM1-05	SPINDLE MOTOR HOUSING
3	2	MP1-3	RAILS
4	1	BT-22	SPINDLE BELT AX-33
5	2	MP1-3	SPINDLE BEARINGS
6	1	PY-29	SPINDLE PULLEY
7	1	VM1-04	HEAD CASTING
8	1	VM1-11	Z AXIS BALLSCREW CARRIER
9	1	6-10-008-000	SPINDLE ASSEMBLY
10	1	PY-30	SPINDLE MOTOR PULLEY
11	26	MP1-13	HRS20 CAP RAIL
12	1	MP1-20	SPINDLE BELT HOUSING COVER

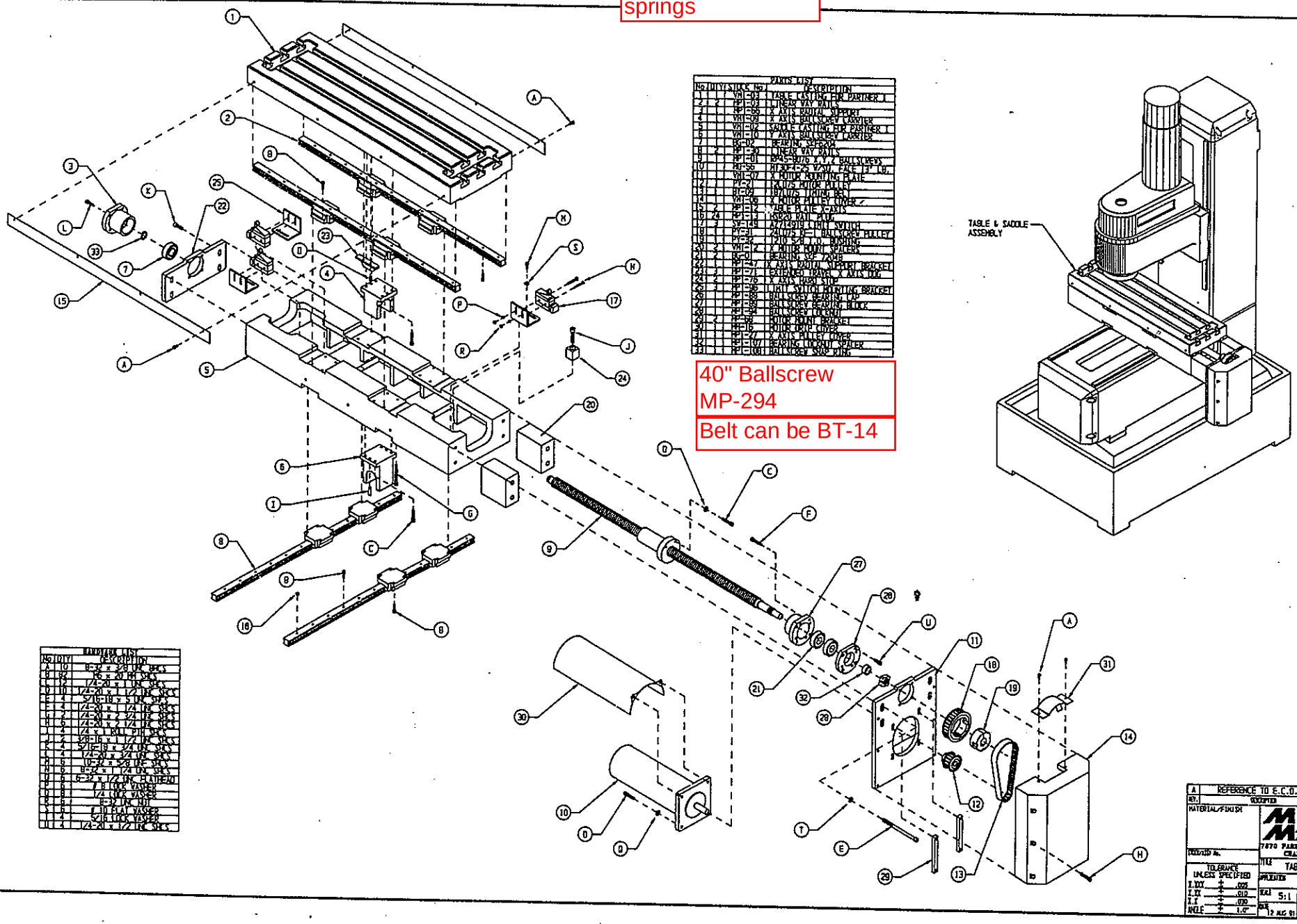
HARDWARE LIST		
No.	QTY	DESCRIPTION
A	4	3/8-16 UNC
B	15	1/4-20 x 1 UNC
C	4	8-32 x 1/2 UNC
D	42	10-32 x 3/4 UNC

REV.	DESCRIPTION	E.C.O. NO.	APP'D BY	DATE
MATERIAL/FINISH				
STOCK No.				
TOLERANCE UNLESS SPECIFIED				
X.XXX ±				
X.XX ±				
X.X ±				
ANGLE ±				

MILLTRONICS MANUFACTURING
7870 PARK DRIVE (612) 474-8100
CHANHASSEN, MN 55317

TITLE	HEAD ASSEMBLY
APPLICATION	PARTNER I
SCALE 2.75:1	DWG NO. 6-10-008-005 SIZE C
DATE 7 FEB 95	DRAWN BY THOMPSON SHEET NO 1 OF 1

HD-33 waycover springs



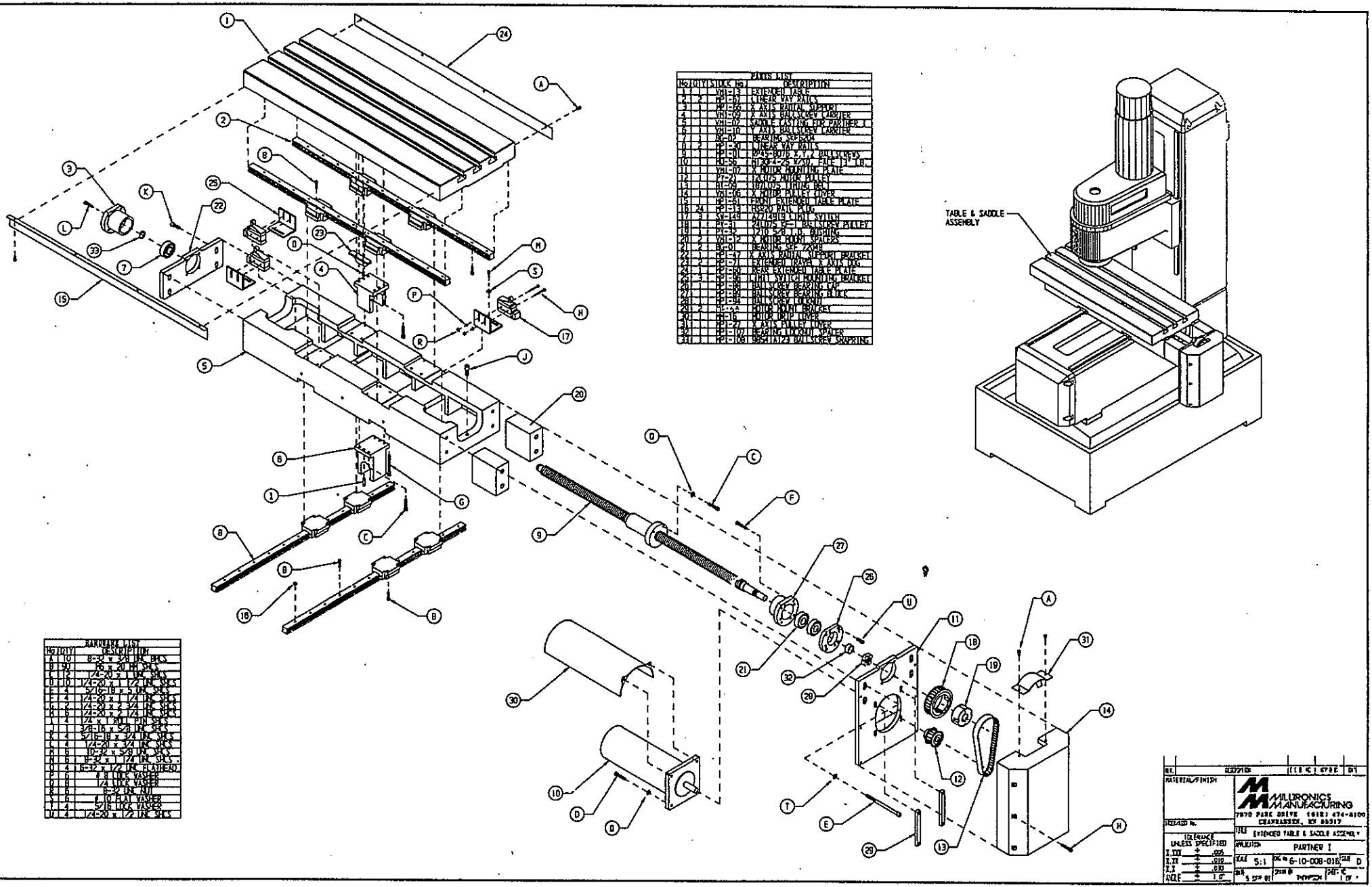
PARTS LIST			
NO.	QUANTITY	STOCK NO.	DESCRIPTION
1	2	YM-03	TABLE CASTING FOR PARTNER I
2	2	MP-03	LINEAR WAY RAILS
3	2	MP-06	X AXIS BEARING SUPPORT
4	1	YM-08	X AXIS BALLSCREW CARRIER
5	1	YM-12	SADDLE CASTING FOR PARTNER I
6	1	YM-16	Y AXIS BALLSCREW CARRIER
7	2	BG-02	BEARING SPACER
8	2	MP-20	LINEAR WAY RAILS
9	3	MP-01	8045-8076 X,Y,Z BALLSCREWS
10	1	MP-55	RT30-4-2G V-BLK, FACE 3" LG.
11	1	YM-07	X MOTOR MOUNTING PLATE
12	1	MP-21	SERVO MOTOR PULLEY
13	1	MP-09	1/2 HTD TIMING BELT
14	1	YM-06	X MOTOR PULLEY COVER
15	1	MP-12	TABLE PLATE X-AXIS
16	24	MP-14	45DEG BALL NUT
17	2	SK-188	3/4 DIGITAL DIAL INDICATOR
18	1	MP-31	Z AXIS BALLSCREW BULLET
19	1	MP-32	Z AXIS BULLET BEARING
20	2	YM-02	Z MOTOR MOUNT SPACERS
21	2	BG-01	BEARING SPACERS
22	1	MP-37	Y AXIS CENTRAL SUPPORT BRACKET
23	1	MP-27	Y AXIS BALLSCREW
24	1	MP-25	Y AXIS FRONT SIDE
25	1	MP-36	LIMIT SWITCH MOUNTING BRACKET
26	1	MP-88	BALLSCREW BEARING CAP
27	1	MP-89	BALLSCREW BEARING BLOCK
28	1	MP-87	BALLSCREW NUT
29	1	MP-90	MOTOR MOUNT BRACKET
30	1	MP-16	MOTOR BELT COVER
31	1	MP-77	Z AXIS PULLEY COVER
32	1	MP-07	BEARING LOCKNUT SPACER
33	1	MP-08	BALLSCREW SNAP RING

40" Ballscrew
MP-294

Belt can be BT-14

HARDWARE LIST		
NO.	QUANTITY	DESCRIPTION
A	10	8-32 x 3/8 LHC SCS
B	2	M6 x .40 HH SCS
C	10	1/4-20 x 1 LHC SCS
D	10	1/4-20 x 1/2 LHC SCS
E	4	5/16-18 x 1 LHC SCS
F	4	1/4-20 x 1/4 LHC SCS
G	12	1/4-20 x 1/4 LHC SCS
H	2	1/4-20 x 1/4 LHC SCS
I	6	1/4-20 x 1/4 LHC SCS
J	4	1/4 x 1 ROLL PIN SCS
K	2	5/16-18 x 1 1/2 LHC SCS
L	4	5/16-18 x 3/4 LHC SCS
M	4	1/4-20 x 3/4 LHC SCS
N	6	10-32 x 5/8 HF SCS
O	8	8-32 x 1/4 LHC SCS
P	6	8-32 x 1/2 LHC FLUTED
Q	6	#8 LOCK WASHER
R	4	1/4 LOCK WASHER
S	4	#10 FLAT WASHER
T	4	5/16 LOCK WASHER
U	4	1/4-20 x 1/2 LHC SCS

A	REFERENCE TO E.C.O.	570	
REV.	DESCRIPTION	E.C.A. NO.	APP'D
MATERIAL/FINISH		MILLERONICS MANUFACTURING 7870 PARK DRIVE (812) 474-1 CHARLESTON, IN 47117	
REMOVED BY		TITLE	TABLE & SADDLE ASSEMBL
TOLERANCE UNLESS SPECIFIED		APPLIES	PARTNER I
X.XX ± .005		SCALE 5:1	DWG NO. 6-10-008-006
X.X ± .010		DATE 12 AUG 91	DRAWN BY THOMSEN
X.X ± .030			SHEET NO. 1 OF
ANGLE ± 1.0°			



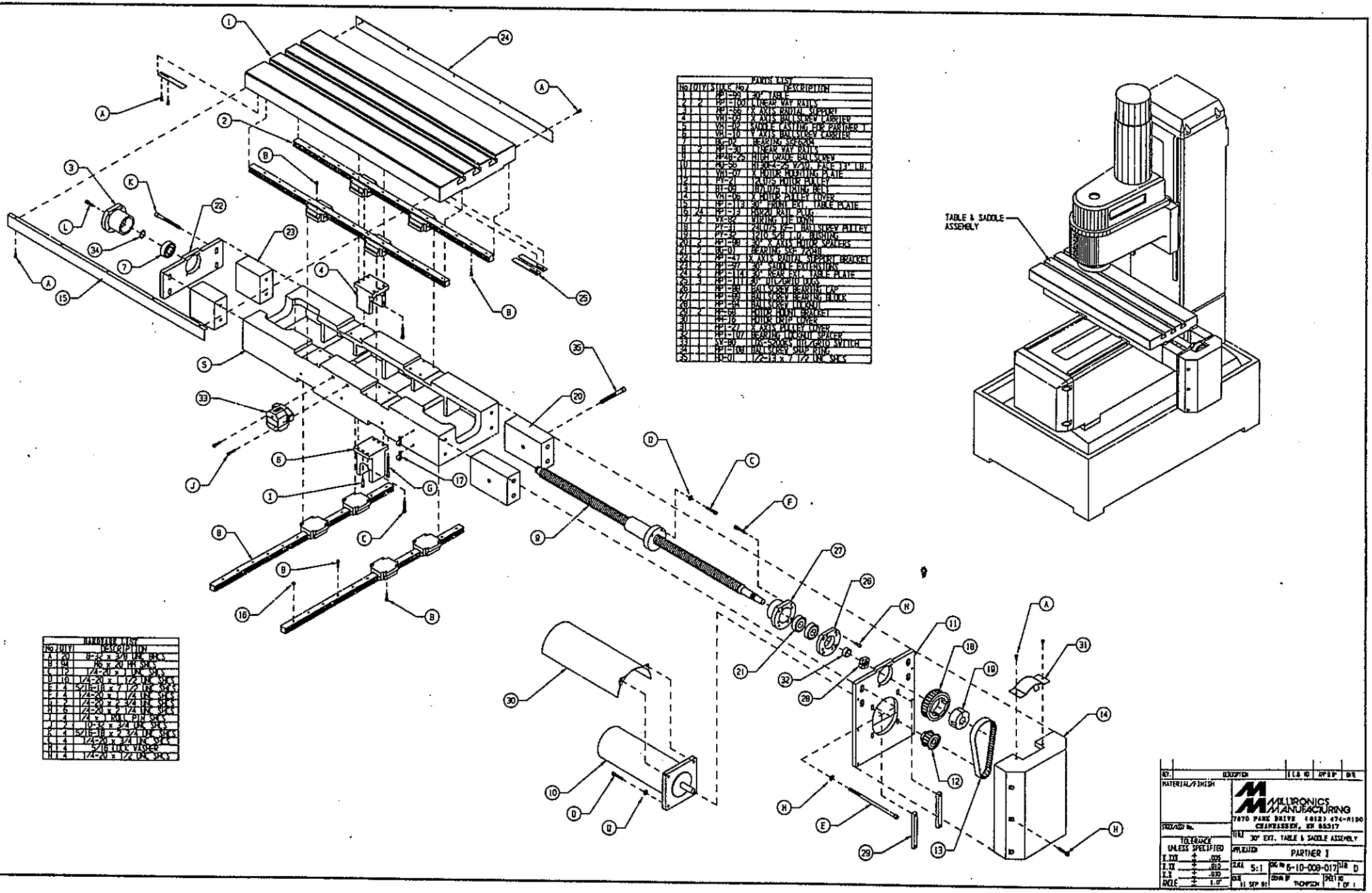
ITEM	QTY	STOCK No.	DESCRIPTION
1	1	VHI-13	EXTENDED TABLE
2	2	HPI-01	LINEAR WAY RAILS
3	1	HPI-06	X AXIS RADIAL SUPPORT
4	1	VHI-09	X AXIS BALLSCREW CARRIER
5	1	VHI-02	SADDLE CASTING FOR PARTNER I
6	1	VHI-10	Y AXIS BALLSCREW CARRIER
7	1	BG-02	BEARING RETAINER
8	2	HPI-20	LINEAR WAY RAILS
9	1	HPI-01	1605-80PD 2.1.2 BALLSCREWS
10	1	BG-56	NTN 4T-25 X/Y/W THRUST LT LD
11	1	VHI-07	X MOTOR MOUNTING PLATE
12	1	HT-23	X AXIS MOTOR PULLEY
13	1	HT-24	TIMING BELT
14	1	VHI-08	X MOTOR PULLEY COVER
15	1	HPI-51	FRONT EXTENDED TABLE PLATE
16	24	HPI-13	M5X20 RAIL BOLTS
17	3	SW-149	A7714919.1 LIMIT SWITCH
18	1	HT-31	24T/HTD 8M-15 BALLSCREW PULLEY
19	1	HT-32	17T/HTD 5/8 I.D. BUSHING
20	2	VHI-12	X MOTOR MOUNT SPACERS
21	2	BG-01	BEARING SET 7206B
22	1	HPI-47	X AXIS RADIAL SUPPORT BRACKET
23	1	HPI-71	EXTENDED (RIGHT) X AXIS DOG
24	1	HPI-50	REAR EXTENDED TABLE PLATE
25	1	HPI-88	LIMIT SWITCH MOUNTING BRACKET
26	1	HPI-89	BALLSCREW BEARING CAP
27	1	HPI-90	BALLSCREW BEARING BLOCK
28	1	HPI-91	BALLSCREW LOCKNUT
29	2	HPI-92	MOTOR MOUNT BRACKET
30	1	HPI-15	MOTOR DRIVE COVER
31	1	HPI-72	Y AXIS PULLEY COVER
32	1	HPI-97	BEARING LOCKOUT SPACER
33	1	HPI-101	9854A124 BALLSCREW WRAPPING

ITEM	QTY	DESCRIPTION
A	10	8-32 x 3/8 LHC SHCS
B	30	M6 x 20 FHC SHCS
C	12	1/4-20 x 1 LHC SHCS
D	10	1/4-20 x 1 1/2 LHC SHCS
E	4	5/16-18 x 1 LHC SHCS
F	2	1/4-20 x 1 1/4 LHC SHCS
G	2	1/4-20 x 1 3/4 LHC SHCS
H	6	1/4-20 x 2 1/4 LHC SHCS
I	1	1/4 x .901 DIA PIN
J	1	1/4 x .901 DIA PIN SHCS
K	4	3/8-16 x 5/8 LHC SHCS
L	4	5/16-18 x 3/4 LHC SHCS
M	4	1/4-20 x 3/4 LHC SHCS
N	5	10-32 x 5/8 LHC SHCS
O	5	8-32 x 1/4 LHC SHCS
P	4	8-32 LHC NUT
Q	4	1/4 LOCK WASHER
R	8	1/4 FLAT WASHER
S	8	8-32 LHC NUT
T	8	#10 FLAT WASHER
U	4	5/16 LOCK WASHER
V	4	1/4-20 x 1/2 LHC SHCS

REV.	DESCRIPTION	DATE	BY
MATERIAL/FINISH			
REVISION No.			
TOLERANCE UNLESS SPECIFIED			
X.XXX	± .005		
X.XX	± .010		
X.X	± .030		
ANGLE	± 1°		

MILLTRONICS MANUFACTURING
7870 PARK DRIVE (812) 474-8100
EVANSVILLE, IN 47715

TITLE: EXTENDED TABLE & SADDLE ASSEMBLY
APPLIES TO: PARTNER I
SCALE: 5:1 DWG No. 6-10-008-018 SIZE: D
DRAWN: 5 SEP 01 CHECKED: DATE:



ITEM	QTY	STOCK NO.	DESCRIPTION
1	1	PT-30	30" TABLE
2	2	PT-10	LINEAR WAY RAILS
3	1	PT-58	X AXIS BALL SCREW SUPPORT
4	1	PT-59	X AXIS BALL SCREW 1 ASSEMBLY
5	1	PT-60	SADDLE CASTING FOR PARTNER 1
6	4	PT-10	AXIS BALL/GUEY CARRIERS
7	1	PT-12	BEARING SPACER
8	2	PT-30	LINEAR WAY RAILS
9	1	PT-25	HIGH LOAD BALL SCREW
10	1	PT-58	X AXIS BALL SCREW SUPPORT
11	1	PT-07	X MOTOR MOUNTING PLATE
12	1	PT-21	AXIS MOTOR PULLEY
13	1	PT-08	AXIS TIMING BELT
14	1	PT-06	X MOTOR PULLEY COVER
15	1	PT-13	X AXIS FRONT END TABLE PLATE
16	24	PT-23	WAY WIPER BLADE
17	2	PT-09	WIPING FELT DOWN
18	1	PT-11	2 AXIS FRONT BALL SCREW PULLEY
19	1	PT-22	2 AXIS SYNC. BUSHING
20	1	PT-61	X AXIS MOTOR SPACERS
21	2	PT-20	BEARING SUPPORT
22	1	PT-47	X AXIS MOTOR SUPPORT BRACKET
23	2	PT-14	30" SADDLE EXTENTION
24	2	PT-14	30" REAR EXT. TABLE PLATE
25	2	PT-11	30" WAY COVER
26	1	PT-28	BALL SCREW NUT
27	1	PT-29	BALL SCREW BEARING BLOCK
28	1	PT-30	BALL SCREW SHAFT
29	1	PT-04	MOTOR MOUNT BRACKET
30	1	PT-16	MOTOR MOUNT COVER
31	1	PT-17	X AXIS PULLEY COVER
32	1	PT-07	BEARING LOCKNUT SPACER
33	1	XY-80	LIMIT SWITCH W/CABLE SWITCH
34	1	PT-18	BALL SCREW SNAP RING
35	1	PT-01	1/2-13 x 1 1/2 LONG SHCS

ITEM	QTY	DESCRIPTION
A	20	8-32 x 3/8 LONG SHCS
B	18	#6 x 20 HW SHCS
C	12	1/4-20 x 1 LONG SHCS
D	10	1/4-20 x 1 1/2 LONG SHCS
E	4	5/16-18 x 2 1/2 LONG SHCS
F	4	1/4-20 x 1 1/4 LONG SHCS
G	2	1/4-20 x 2 3/4 LONG SHCS
H	6	1/4-20 x 2 1/4 LONG SHCS
I	4	1/4 x #41 PIN SHCS
J	2	10-32 x 3/4 LONG SHCS
K	4	5/16-18 x 2 3/4 LONG SHCS
L	4	1/4-20 x 3/4 LONG SHCS
M	4	5/16 LOCK WASHER
N	4	1/4-20 x 1/2 LONG SHCS

REV.	DESCRIPTION	ECO NO	APP'D	DATE
MATERIAL/FINISH				
PROJECT No.				

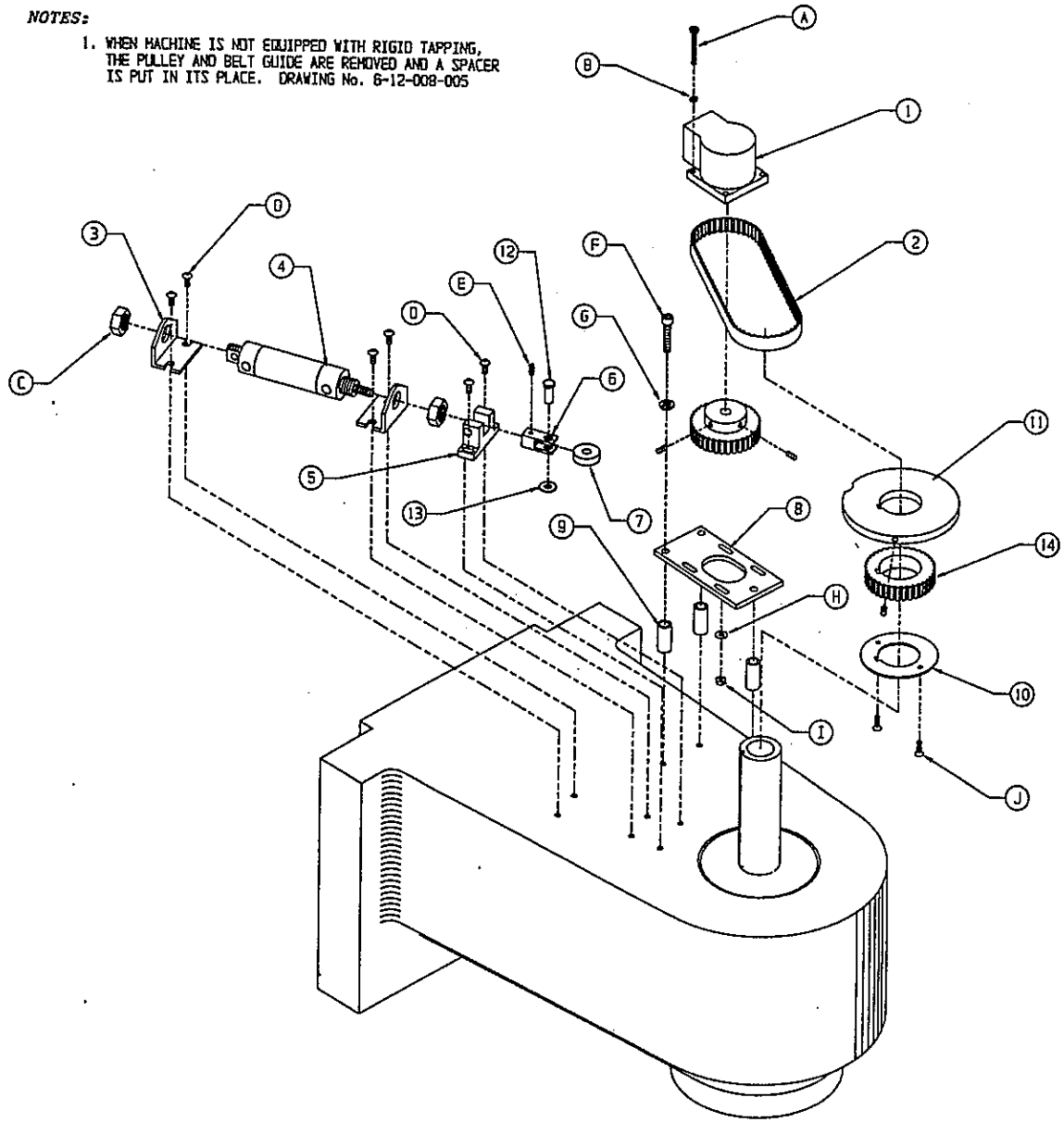
MILLTRONICS MANUFACTURING
7870 PARK DRIVE (812) 474-4100
CRANESSEN, IN 65317

TOLERANCES UNLESS SPECIFIED	
X.XXX	± .005
X.XX	± .010
X.X	± .030
ANGLE	± 1.0°

TITLE: 30" EXT. TABLE & SADDLE ASSEMBLY
APPLICATION: PARTNER 1
SCALE: 5:1
DWG No: 6-10-009-017
SIZE: D
DATE: 01 SEP 95
DRAWN BY: THOMPSON
SHEET: 1 OF 1

NOTES:

1. WHEN MACHINE IS NOT EQUIPPED WITH RIGID TAPPING, THE PULLEY AND BELT GUIDE ARE REMOVED AND A SPACER IS PUT IN ITS PLACE. DRAWING No. 6-12-008-005



PARTS LIST

No.	QTY	STOCK No.	DESCRIPTION
1	1	ED-29	H02F1AE186ST.500 ENCODER
2	1	BT-25	180XL037 BELT
3	2	BR-07	F-11 HUMPHREY CYL. BRACKET
4	1	MJ-02	CYLINDER 6-DP-1
5	1	MP1-90	SPINDLE ORIENT PLUNGER GUIDE
6	1	MD-15	MACHINED CLEVIS
7	1	BG-37	SKF60827 TL CHNGE PUT BEARING
8	1	MP1-84	SPINDLE ENCODER MOUNTING PLATE
9	3	6-12-008-004	RIGID TAPPING BRACKET SPACER
10	2	PY-47	4000.8037 PULLEY
11	1	MP1-93	SPINDLE ORIENT DISC
12	1	MD-13	SPINDLE ORIENT CLEVIS PIN
13	1	MD-14	94807A-030 WASHER
14	1	PY-45	RIGID TAPPING PULLEY BELT GUIDE

HARDWARE LIST

No.	QTY	DESCRIPTION
A	4	8-32 x 3/4 UNC SHCS
B	4	# 8 LOCKWASHER
C	2	5/8-18 UNC NUT
D	8	10-24 x 1/2 UNC BHCS
E	9	10-32 x 3/16 UNF SHSS
F	3	1/4-20 x 1 3/4 UNC SHCS
G	3	1/4 LOCKWASHER
H	4	# 8 FLATWASHER
I	4	8-32 UNC NUT
J	2	6-32 x 1/4 UNC FHMS

REV.	DESCRIPTION	E.C.O. NO.	APP'D BY	DATE

MATERIAL/FINISH

STOCK/ASST No.

TOLERANCE UNLESS SPECIFIED
X.XXX ± .005
X.XX ± .010
X.X ± .030
ANGLE ± 1.0°

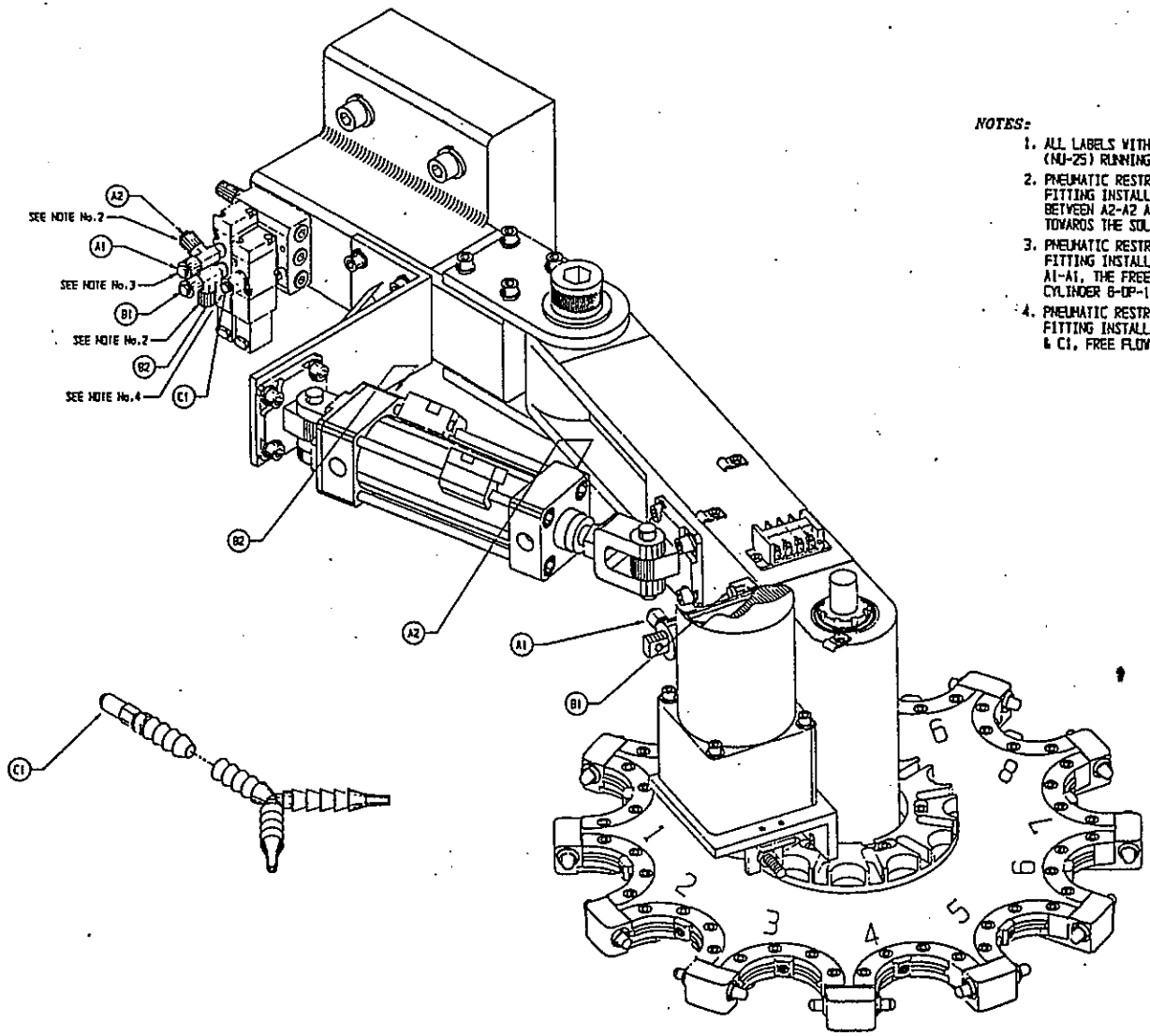
MILLTRONICS MANUFACTURING
7870 PARK DRIVE (612) 474-8100
CHANHASSEN, MN 55317

TITLE SPINDLE ORIENT, RIGID TAPPING ASSY.

APPLICATION PARTNER I

SCALE 3:1 | DWG No. 6-10-008-015 | SIZE C

DATE 31 JUL 91 | DRAWN BY THOMPSON | SHEET NO. 1 OF 1



NOTES:

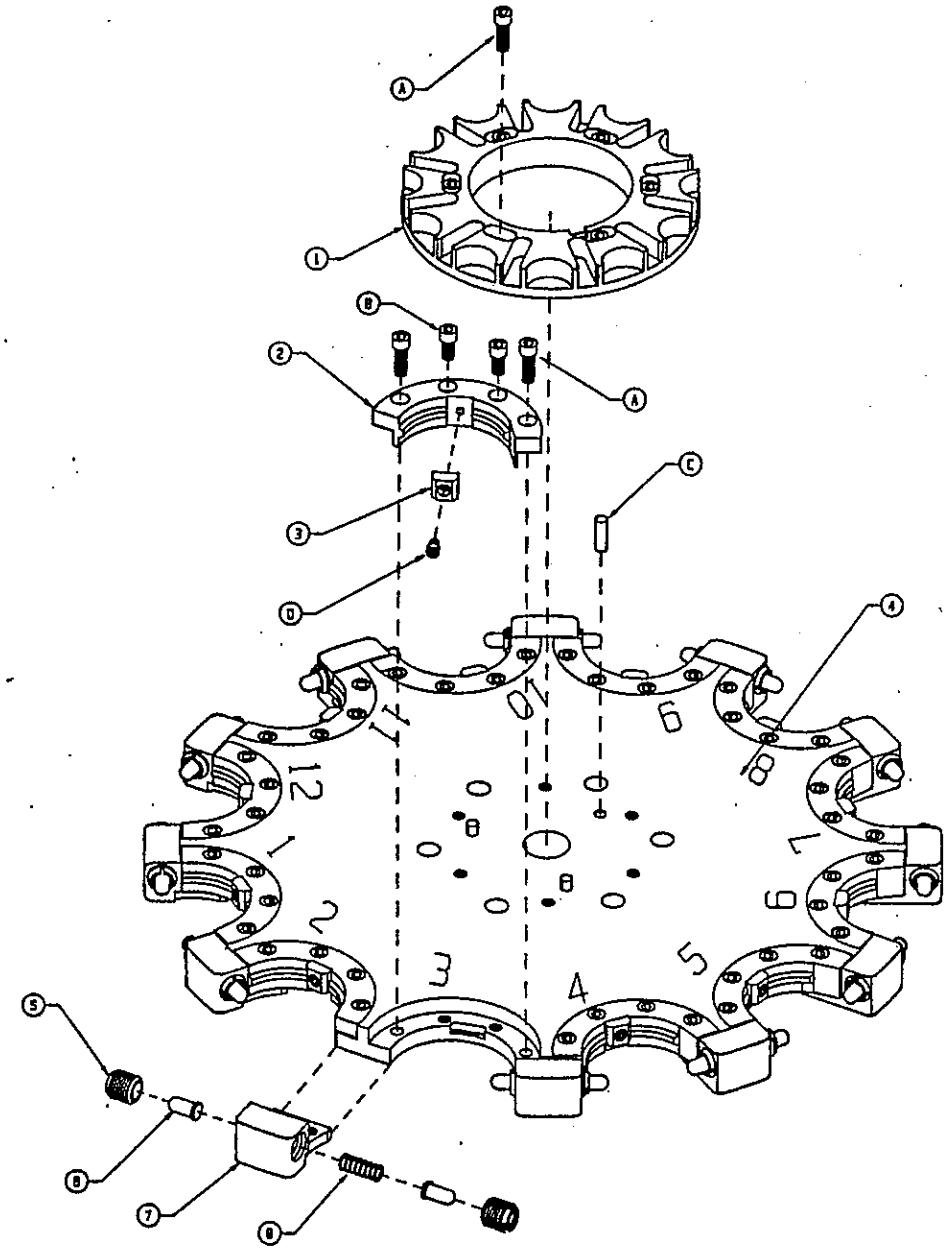
1. ALL LABELS WITH SAME No. WILL HAVE 1/4 AIR TUBING (NU-25) RUNNING BETWEEN THEM.
2. PNEUMATIC RESTRICTOR 1-FC-1 (NU-07), WITH A NU-17 FITTING INSTALLED AT BOTH ENDS, IS CONNECTED BETWEEN A2-A2 AND B2-B2, THE FREE FLOW ARROW POINTS TOWARDS THE SOLENOID (USR540R-N11R4) NU-46.
3. PNEUMATIC RESTRICTOR 1-FC-1 (NU-07), WITH A NU-17 FITTING INSTALLED AT BOTH ENDS, IS CONNECTED BETWEEN A1-A1, THE FREE FLOW ARROW POINTS TOWARD THE CYLINDER 6-DP-1 (NU-02).
4. PNEUMATIC RESTRICTOR 1-FC-1 (NU-07) WITH A NU-17 FITTING INSTALLED AT BOTH ENDS CONNECT BETWEEN C1 & C1, FREE FLOW ARROW POINTS TOWARD THE SOLENOID.

REV.	DESCRIPTION	E.C.O. NO.	APP'D'BY	DATE
MATERIAL/FINISH				
STOCK/ASSY No.				

TOLERANCE UNLESS SPECIFIED
X.XXX ± .005
X.XX ± .010
X.X ± .030
ANGLE ± 1.0°

MILLTRONICS MANUFACTURING
7870 PARK DRIVE (612) 474-8100
CHANHASSEN, MN 55317

TITLE: 12 POCKET ROTARY ATC ASSY.
APPLICATION: PARTNER I
SCALE: 1.75:1 | DWG No. 6-10-008-018 | SIZE: D
DATE: 9 DEC 92 | DRAWN BY: THOMPSON | SHEET NO. 1 OF 9



PARTS LIST			
No.	QTY.	STOCK No.	DESCRIPTION
1	1	MPI-115	GENEVA WHEEL
2	12	MPI-142	V-FLANGE TOOL HOLDER INSERT
3	12	MPI-145	TOOL CHANGE KEY INSERT
4	1	MPI-130	12 POCKET CAROUSEL DISC
5	24	MPI-140	PUSH PIN GUIDE
6	24	MPI-144	PUSH PIN
7	12	MPI-132	12 POCKET LOCKING PIN BLOCK
8	12	MPI-141	COIL SPRING

HARDWARE LIST		
No.	QTY.	DESCRIPTION
A	30	1/4-20 x 3/4 SHCS
B	24	1/4-20 x 1/2 SHCS
C	3	1/4 x 3/4 DOWEL PIN
D	12	8-32 x 1/4 SHCS

CAROUSEL ASSEMBLY

REV.	DESCRIPTION	E.C.N. NO.	APP'D BY	DATE

MATERIAL/FINISH

STOCK/ASSY No.

TOLERANCE UNLESS SPECIFIED
X.XXX ± .005
X.XX ± .010
X.X ± .030
ANGLE ± 1.0°

MILLTRONICS MANUFACTURING
7870 PARK DRIVE (612) 474-8100
CHANHASSEN, MN 55317

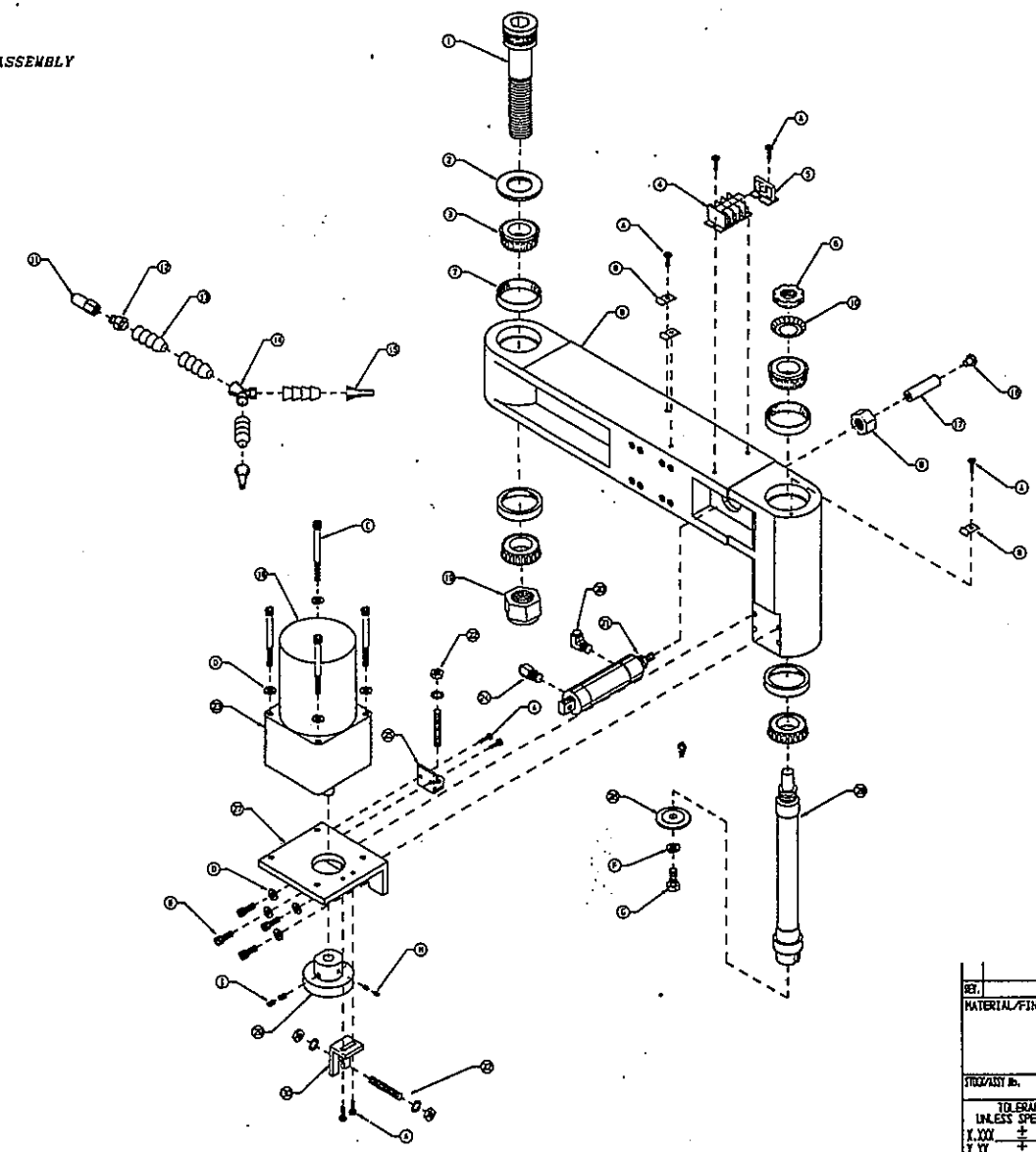
TITLE: 12 POCKET ROTARY ATC ASSY.

APPLICATION: PARTNER I

SCALE: 2:1 | DWG No: 6-10-008-010 | SIZE: C

DATE: 8 DEC 92 | DESIGN BY: THOMPSON | SHEET NO. 2 OF 5

FRONT ARM ASSEMBLY



PARTS LIST			
No.	QTY.	STOCK No.	DESCRIPTION
1	1	HD-09	1"- 8 x 5 1/2 UNC SHCS
2	1	HD-10	1" HARDENED SERIES N WASHER
3	4	BG-33	07100 CONE TAPERED BEARING
4	4	TB-01	TERMINAL BLOCK # 1525
5	1	TB-02	TERMINAL BLOCK # 830
6	1	BG-35	M04 BEARING LOCKNUT
7	4	BG-34	07196 CUP TAPERED BEARING
8	3	MJ-36	CLAMP 5/32 DILER
9	1	MX1-03	FRONT ARM SUPPORT SECTION-MACHINED
10	1	BG-36	W04 BEARING LOCK WASHER
11	1	MJ-118	1/8 NPT 1/4 O.D. FBK. CONNECTOR
12	1	MJ-111	41405 1/4 LOCOLINK 1/8 NPT
13	52	MA-22	LOCOLINK HOSE 48501
14	1	MA-20	48503 1/4 Y FITTING
15	2	MA-21	1/8 NOZZLE 49423
16	1	MX-159	RUBBER BUMPER TIP
17	1	MP	ATC PUSH OFF BAR - 12 POCKET
18	1	MO-72	SM34091-C MOTOR
19	1	MO-07	1"-8 UNC NYLOCK NUT
20	1	MJ-16	1/8 NPT 1/4 O.D. MALE ELBOW
21	1	MJ-02	CYLINDER B-DP-1
22	2	PX-19	SWITCH PROX E57M08T110 NPN-NOB
23	1	MO-71	50:05K GEAR BOX
24	1	MJ-17	1/8 NPT 1/4 O.D. M.S. 56842
25	1	MP1-120	ATC HOME PROX BRACKET
26	1	MO-11	CAROUSEL HARDENED WASHER
27	1	MP1-53	MOTOR MOUNT BRACKET
28	1	MP1-41	CAROUSEL ROTATION SHAFT
29	1	MX1-02	GENEVA WHEEL DRIVE CAM-MACHINED
30	1	MP1-118	GENEVA WHEEL PROX MOUNT

HARDWARE LIST		
No.	QTY.	DESCRIPTION
A	9	8-32 x 3/8 BHCS
B	1	5/8-18 HEX NUT
C	4	1/4-20 x 3 SHCS
D	8	1/4 LOCK WASHER
E	4	1/4-20 x 3/4 SHCS
F	1	5/16 LOCKWASHER
G	1	5/16-18 x 3/4 HHMS
H	2	8-32 x 1/4 SHSS
I	2	1/4-20 x 1/4 SHSS

REV.	DESCRIPTION	E.C.O. NO.	APPROVAL	DATE

MATERIAL/FINISH

STOCK/ASSY No.

TOLERANCE UNLESS SPECIFIED
X.XXX ± .005
X.XX ± .010
X.X ± .030
ANGLE ± 1.0°

MILLTRONICS MANUFACTURING
7870 PARK DRIVE (612) 474-8100
CRANBASSEN, MN 55317

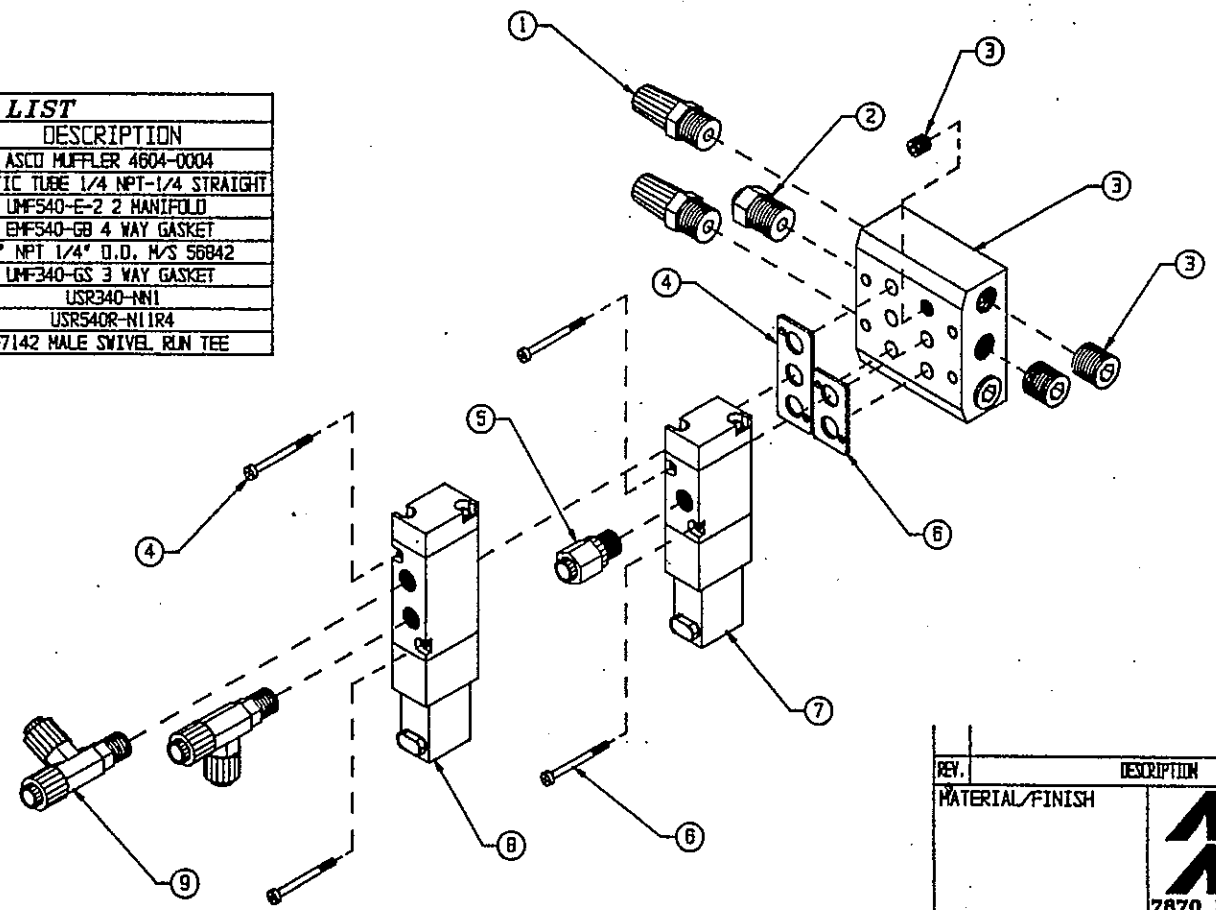
TITLE: 12 POCKET ROTARY ATC ASSY.

APPLICATION: PARTNER I

SCALE: 2.75:1 | DWG No. 6-10-008-018 | SIZE: D

DATE: 8 DEC 92 | DRAWN BY: THOMPSON | SHEET NO. 3 OF 5

PARTS LIST			
No.	QTY	STOCK No.	DESCRIPTION
1	2	NU-79	ASCO MUFFLER 4604-0004
2	1	NU-32	PLASTIC TUBE 1/4 NPT-1/4 STRAIGHT
3	1	NU-89	UMF540-E-2 2 MANIFOLD
4	1	NU-92	EMF540-GB 4 WAY GASKET
5	1	NU-17	1/8" NPT 1/4" O.D. M/S 56842
6	1	NU-91	UMF340-GS 3 WAY GASKET
7	1	NU-10	USR340-NN1
8	1	NU-46	USR540R-N11R4
9	2	NU-106	57142 MALE SWIVEL RUN TEE



REV.	DESCRIPTION	E.C.O. NO.	APP'D BY	DATE

MATERIAL/FINISH

STOCK/ASSY No.

TOLERANCE UNLESS SPECIFIED

X.XXX	±	.005
X.XX	±	.010
X.X	±	.030
ANGLE	±	1.0°

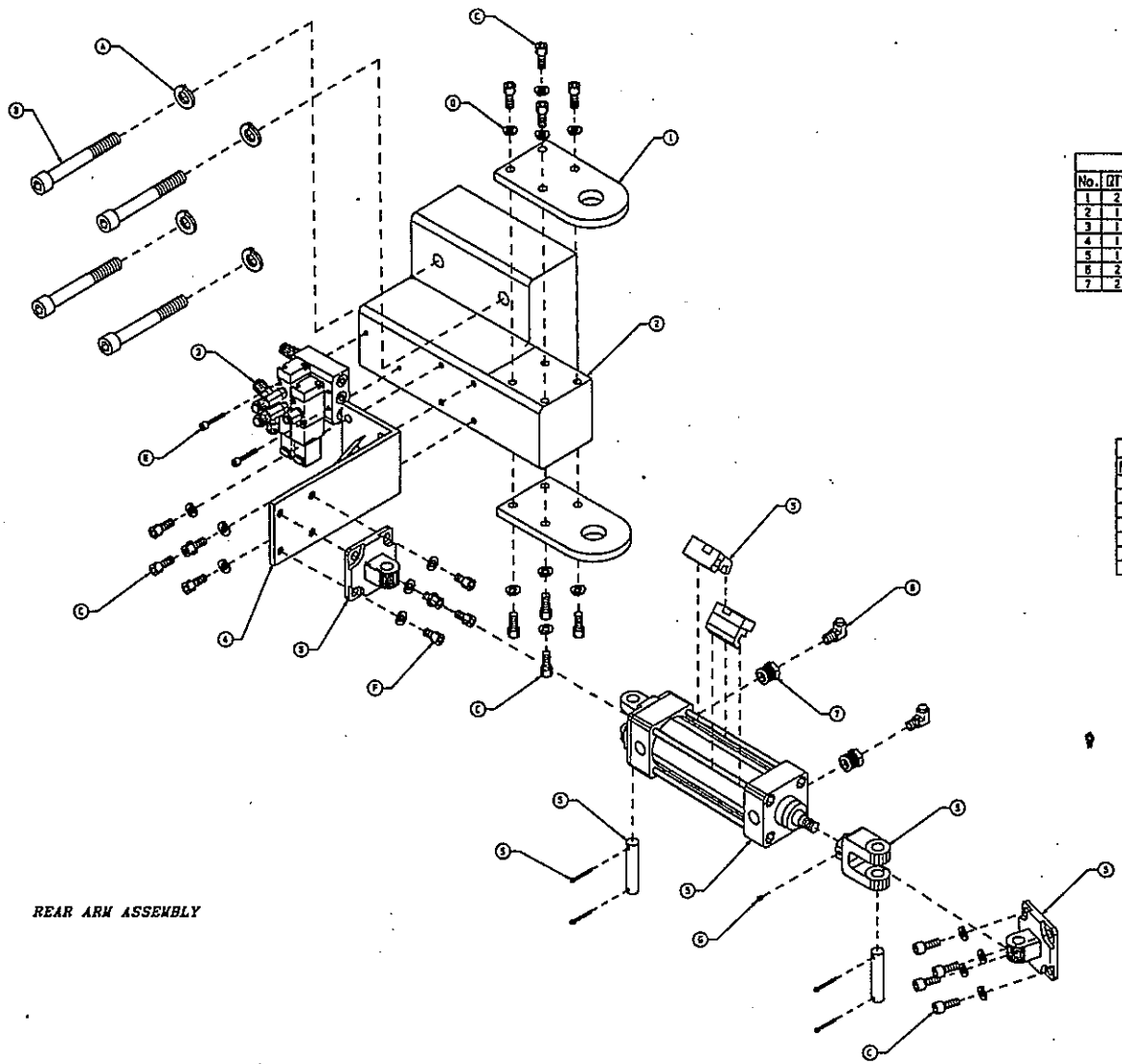
MILLTRONICS MANUFACTURING
7870 PARK DRIVE (612) 474-8100
CHANHASSEN, MN 55317

TITLE: 12 POCKET ROTARY ATC ASSY.

APPLICATION: PARTNER I

SCALE: 2:1 | DWG No. 6-10-008-018 | SIZE: B

DATE: 8 DEC 92 | DRAWN BY: THOMPSON | SHEET NO. 4 OF 5



REAR ARM ASSEMBLY

PARTS LIST			
No.	QTY	STOCK No.	DESCRIPTION
1	2	MP1-34	ARM PIVOT CLEVIS
2	1	MX1-04	REAR ARM SUPPORT SECTION-MACHINED
3	1	—	MANIFOLD ASSEMBLY
4	1	MP1-55	FRONT AIR CYLINDER MOUNT PLATE
5	1	MJ-104	2" AIR CYLINDER
6	2	MJ-33	ELBOW 1/4 PIPE - 1/4 TUBE 90
7	2	MJ-27	REDUCER 3/8 NPT-1/4 NPT BRASS

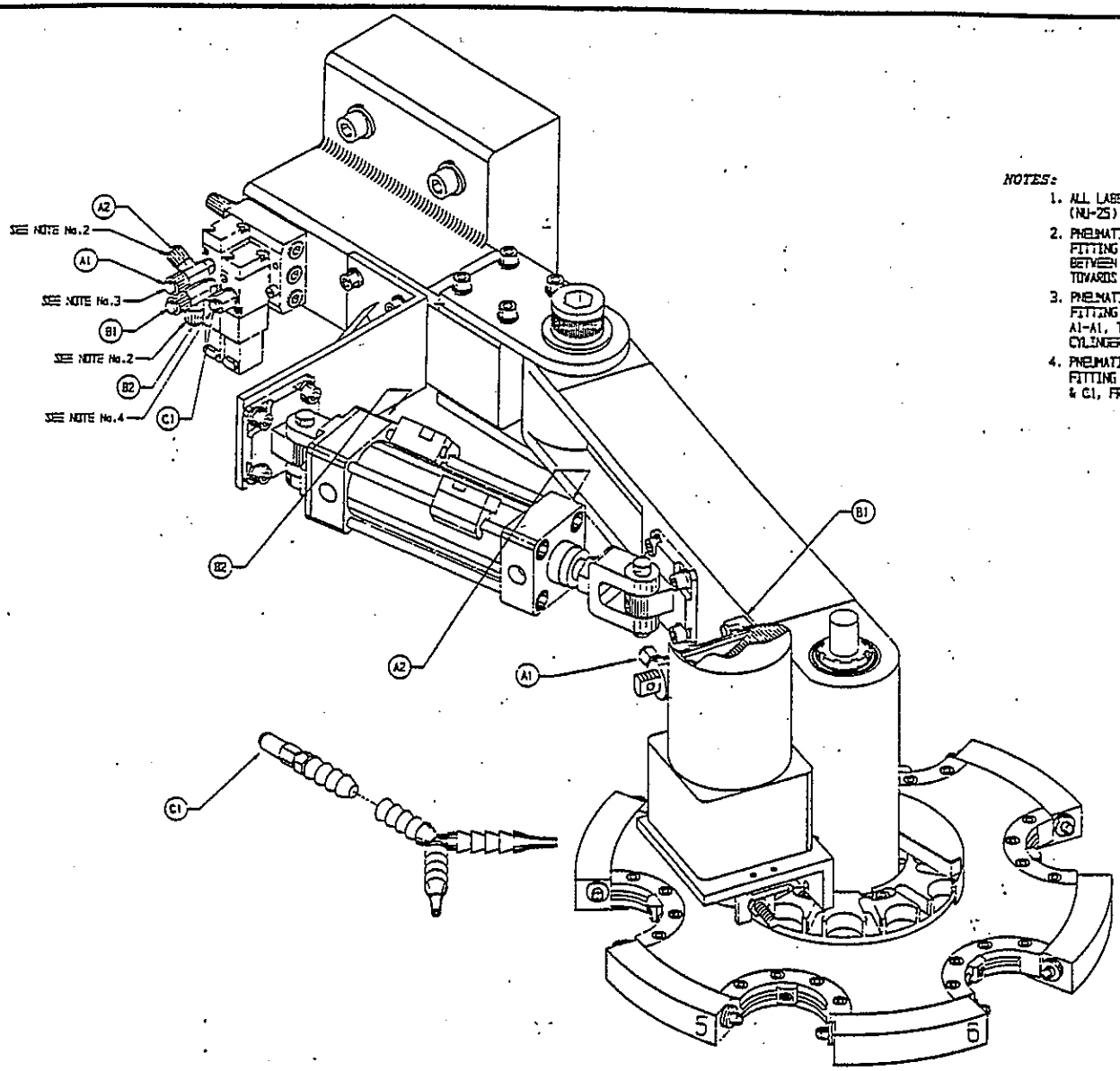
HARDWARE LIST		
No.	QTY	DESCRIPTION
A	4	1/2 LOCKWASHERS
B	4	1/2-13 x 4 UNC SHCS
C	16	5/16-18 x 3/4 UNC SHCS
D	20	5/16 LOCKWASHERS
E	2	8-32 x 1 1/4 UNC SHCS
F	4	5/16-18 x 1/2 UNC SHCS
G	1	10-32 x 3/16 UNF BRASS TIPPED SHCS

REV.	DESCRIPTION	E.C.O. NO.	APP'D BY	DATE
MATERIAL/FINISH				
STOCK/ASSY No.				

TOLERANCE UNLESS SPECIFIED
X.XXX ± .005
X.XX ± .010
X.X ± .030
ANGLE ± 1.0°

MILLTRONICS MANUFACTURING
7570 PARK DRIVE (612) 474-8100
CHANHASSEN, MN 55317

TITLE: 12 POCKET ROTARY ATC ASSY.
APPLICATION: PARTNER I
SCALE: 2.5:1 | DWG No. 6-10-008-018 | SIZE: D
DATE: 8 DEC 92 | DRAWN BY: THOMPSON | SHEET NO. 5 OF 5



NOTES:

1. ALL LABELS WITH SAME No. WILL HAVE 1/4 AIR TUBING (NU-25) RUNNING BETWEEN THEM.
2. PNEUMATIC RESTRICTOR 1-FC-1 (NU-07), WITH A NU-17 FITTING INSTALLED AT BOTH ENDS, IS CONNECTED BETWEEN A2-A2 AND B2-B2. THE FREE FLOW ARROW POINTS TOWARDS THE SOLENOID (USRS40R-N11R4) NU-46.
3. PNEUMATIC RESTRICTOR 1-FC-1 (NU-07), WITH A NU-17 FITTING INSTALLED AT BOTH ENDS, IS CONNECTED BETWEEN A1-A1, THE FREE FLOW ARROW POINTS TOWARD THE CYLINDER 6-DP-1 (NU-02).
4. PNEUMATIC RESTRICTOR 1-FC-1 (NU-07) WITH A NU-17 FITTING INSTALLED AT BOTH ENDS CONNECT BETWEEN C1 & C1, FREE FLOW ARROW POINTS TOWARD THE SOLENOID.

REV.	DESCRIPTION	E.C.O. NO.	APP'D BY	DATE
A	DESIGN CHANGE	775	JJ	6/92

MATERIAL/FINISH

STOCK/ASSY No.

TOLERANCE UNLESS SPECIFIED
X.XXX ± .005
X.XX ± .010
X.X ± .030
ANGLE ± 1.0°

MILLTRONICS MANUFACTURING
7870 PARK DRIVE (612) 474-8100
CHANHASSEN, MN 55317

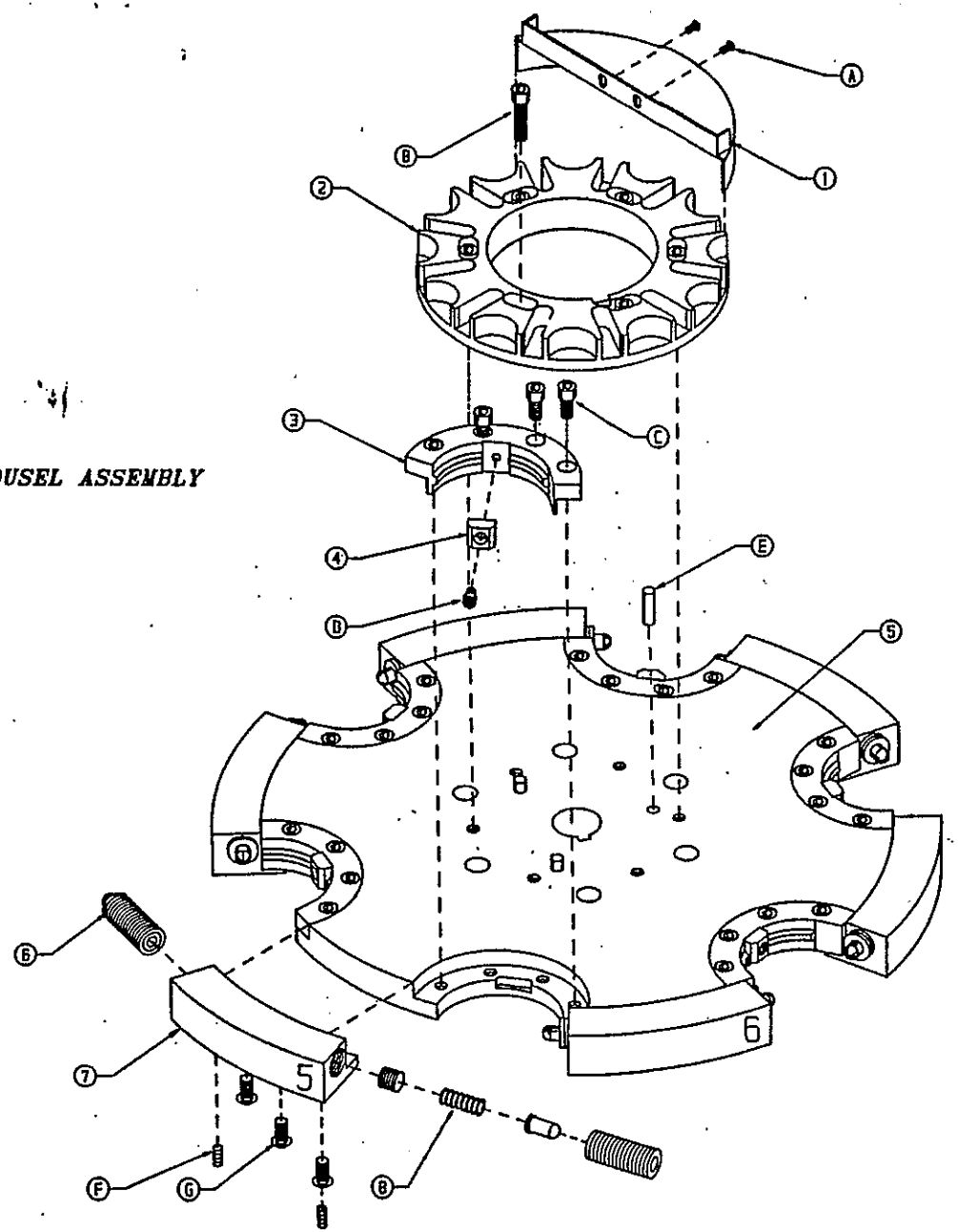
TITLE: 6 POCKET ROTARY ATC ASSY.

APPLICATION: PARTNER I

SCALE: 1.75:1 | DWG No. 6-10-008-010 | SIZE: D

DATE: 10 MAY 91 | DRAWN BY: THOMPSON | SHEET NO. 1 OF 5

CAROUSEL ASSEMBLY



PARTS LIST

No.	QTY.	STOCK No.	DESCRIPTION
1	1	MP1-129	GENEVA WHEEL COVER
2	1	MP1-115	GENEVA WHEEL
3	6	MP1-42	V-FLANGE TOOL HOLDER INSERT
4	6	MP1-45	TOOL CHANGE KEY INSERT
5	1	MP1-43	CAROUSEL DISC
6	12	10-05	NOSE SPRING 5/8-11 x 1 1/2
7	6	MP1-44	LOCKING PIN BLOCK
8	12	MP1-141	COIL SPRING

HARDWARE LIST

No.	QTY.	DESCRIPTION
A	2	8-32 x 3/8 SHCS
B	6	1/4-20 x 3/4 SHCS
C	49	1/4-20 x 1/2 SHCS
D	6	8-32 x 1/4 SHCS
E	3	1/4 x 3/4 DOWEL PIN
F	12	10-32 x 3/16 BRASS TIPPED SHCS
G	18	1/4-20 x 1/2 BHCS

REV.	DESCRIPTION	E.C.N. NO.	APP'D BY	DATE
A	DESIGN CHANGES	775	JH	12/92

MATERIAL/FINISH

STOCK/ASSY No.

TOLERANCE UNLESS SPECIFIED
X.XXX ± .005
X.XX ± .010
X.X ± .030
ANGLE ± 1.0°

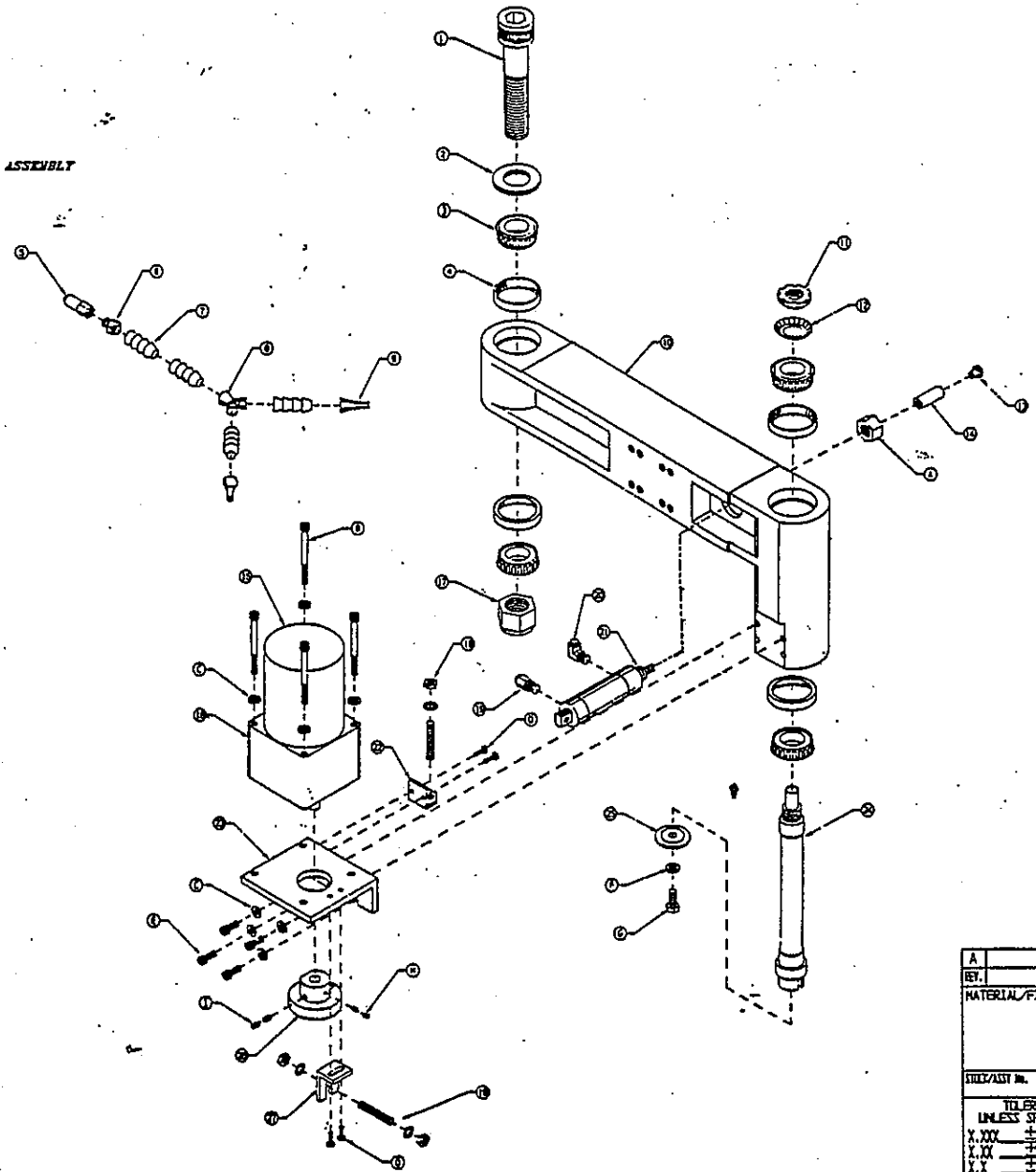
MILLTRONICS MANUFACTURING
7870 PARK DRIVE (612) 474-8100
CHANHASSEN, MN 55317

TITLE: 6 POCKET ROTARY ATC ASSY.
APPLICATION: PARTNER 1
SCALE: 1.75:1
DWG No. 6-10-008-010
SIZE: C
DATE: 25 APR 91
DRAWN BY: THOMPSON
SHEET NO. 2 OF 5

FRONT ARM ASSEMBLY

PARTS LIST			
No.	QTY.	STOCK No.	DESCRIPTION
1	1	HD-09	1"- 8 x 5 1/2 UNC SHCS
2	1	HD-10	1" HARDENED SERIES N WASHER
3	4	BG-33	07100 CONE TAPERED BEARING
4	4	BG-34	07196 CUP TAPERED BEARING
5	1	NU-116	1/8 NPT 1/4 O.D. FEM. CONNECTOR
6	1	NU-111	41405 1/4 LOCKLINK 1/8 NPT
7	S2	HA-22	LOCKLINK HOSE 48501
8	1	HA-20	48503 1/4 Y FITTING
9	2	HA-21	1/8 NOZZLE 49423
10	1	MX1-03	FRONT ARM SUPPORT SECTION-MACHINED
11	1	BG-35	N04 BEARING LOCKNUT
12	1	BG-36	W04 BEARING LOCKWASHER
13	1	VX-159	RUBBER BUMPER TIP
14	1	MP1-137	ATC PUSH OFF BAR
15	1	HD-72	SRX40GH-C MOTOR
16	1	HD-71	SGNGSK GEAR BOX
17	1	HD-07	1"-8 UNC NYLOCK NUT
18	2	PR-19	SWITCH PROX ES7M88T110 NPN-NCB
19	1	NU-17	1/8 NPT 1/4 O.D. N.S. 55842
20	1	NU-16	1/8 NPT 1/4 O.D. MALE ELBOW
21	1	NU-02	CYLINDER B-DP-1
22	1	MP1-120	ATC HOME PROX BRACKET
23	1	MP1-53	MOTOR MOUNT BRACKET
24	1	MP1-41	CAROUSEL ROTATION SHAFT
25	1	HD-11	CAROUSEL HARDENED WASHER
26	1	MX1-02	GENEVA WHEEL DRIVE CAM-MACHINED
27	1	MP1-118	GENEVA WHEEL PROX MOUNT

HARDWARE LIST		
No.	QTY.	DESCRIPTION
A	1	5/8-18 UNF HEX NUT
B	4	1/4-20 x 3 UNC SHCS
C	8	1/4 LOCKWASHER
D	4	8-32 x 3/8 UNC BHCS
E	4	1/4-20 x 3/4 UNC SHCS
F	1	5/16 LOCKWASHER
G	1	5/16-18 x 3/4 UNC HHMS
H	2	8-32 x 1/4 SHSS
I	2	1/4-20 x 1/4 SHSS



REV.	DESCRIPTION	E.C.O. NO.	APP'D BY	DATE
A	DESIGN CHANGE	775	JJ	12/92

MATERIAL/FINISH

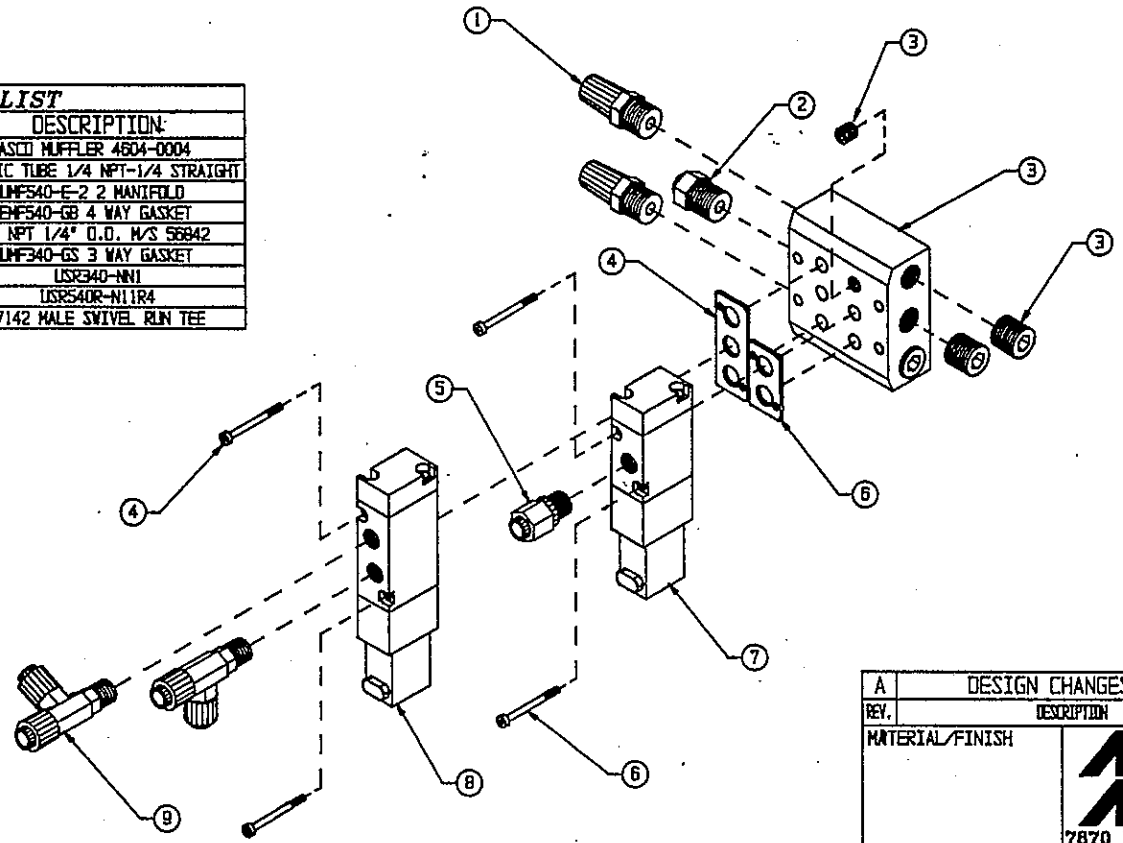
STOCK/ASSY No.

TOLERANCE UNLESS SPECIFIED
X.XXX ± .005
X.XX ± .010
X.X ± .030
ANGLE ± 1.0°

MILLTRONICS MANUFACTURING
7870 PARK DRIVE (612) 474-6100
CHANHASSEN, MN 55317

TITLE: 6 POCKET ROTARY ATC ASSY.
APPLICATION: PARTNER I
SCALE: 2.75:1 | DWG No. 6-10-008-010 | SIZE: D
DATE: 3 MAY 91 | DRAWN BY: THOMPSON | SHEET NO. 3 OF 4

PARTS LIST			
No.	QTY	STOCK No.	DESCRIPTION
1	2	NU-79	ASCO MUFFLER 4604-0004
2	1	NU-32	PLASTIC TUBE 1/4 NPT-1/4 STRAIGHT
3	1	NU-89	UMF540-E-2 2 MANIFOLD
4	1	NU-92	EMF540-GB 4 WAY GASKET
5	1	NU-17	1/8" NPT 1/4" O.D. M/S 56842
6	1	NU-91	UMF340-GS 3 WAY GASKET
7	1	NU-10	USR340-NN1
8	1	NU-46	USR540R-N11R4
9	2	NU-106	57142 MALE SWIVEL RUN TEE



REV.	DESCRIPTION	E.C.O. NO.	APP'D BY	DATE
A	DESIGN CHANGES	775		4/92

MATERIAL/FINISH

STOCK/ASSY No.

TOLERANCE UNLESS SPECIFIED

X.XXX	±	.005
X.XX	±	.010
X.X	±	.030
ANGLE	±	1.0°

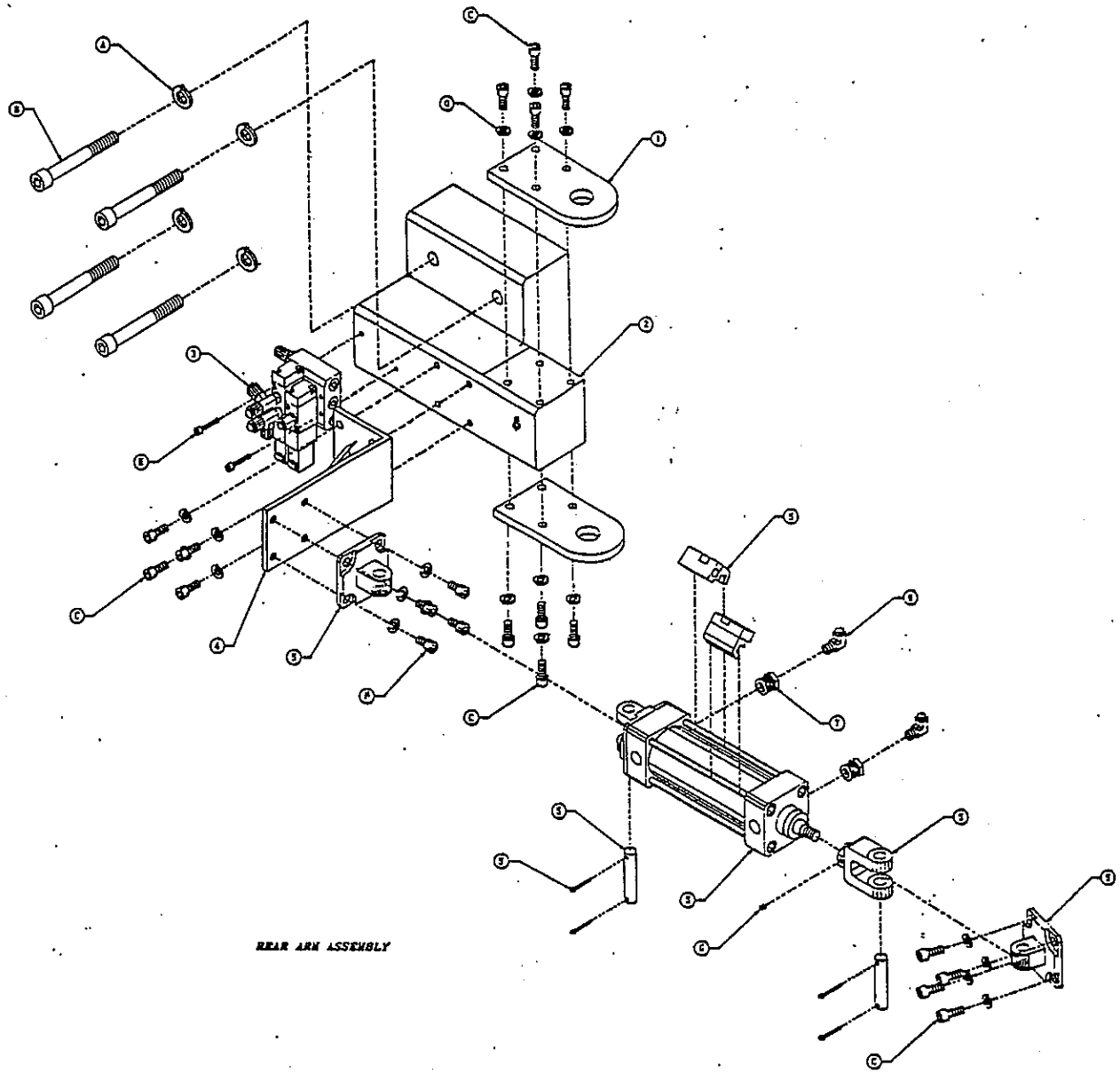
MILLTRONICS MANUFACTURING
7870 PARK DRIVE (612) 474-8100
CHANHASSEN, MN 55317

TITLE: ROTARY TOOL CHANGER

APPLICATION: PARTNER I

SCALE	DWG No.	SIZE
2:1	6-10-008-010	B

DATE	DRAWN BY	SHEET NO.
6 MAY 91	THOMPSON	4 OF 5



REAR ARM ASSEMBLY

PARTS LIST			
No.	QTY	STOCK No.	DESCRIPTION
1	2	MM-34	ARM PIVOT CLEVIS
2	1	MM-04	REAR ARM SUPPORT SECTION-MACHINED
3	1	—	MANIFOLD ASSEMBLY
4	1	MM-58	FRONT AIR CYLINDER MOUNT PLATE
5	1	MM-104	2" AIR CYLINDER
6	2	MM-33	ELBOW 1/4 PIPE - 1/4 TUBE 90
7	2	MM-27	REDUCER 3/8 NPT-1/4 NPT BRASS

HARDWARE LIST		
No.	QTY	DESCRIPTION
A	4	1/2 LOCKWASHERS
B	4	1/2-13 x 4 UNC SHCS
C	18	5/16-18 x 3/4 UNC SHCS
D	20	5/16 LOCKWASHERS
E	2	8-32 x 1 1/4 UNC SHCS
F	4	5/16-18 x 1/2 UNC SHCS
G	1	10-32 x 3/16 UNF BRASS TIPPED SHCS

REV.	DESCRIPTION	E.C.O. NO.	APP'D BY	DATE
A	DESIGN CHANGE	775	JJ/A	/92

MATERIAL/FINISH

STOCK/ASSY No.

TOLERANCE UNLESS SPECIFIED
X.XXX ± .005
X.XX ± .010
X.X ± .030
ANGLE ± 1.0°

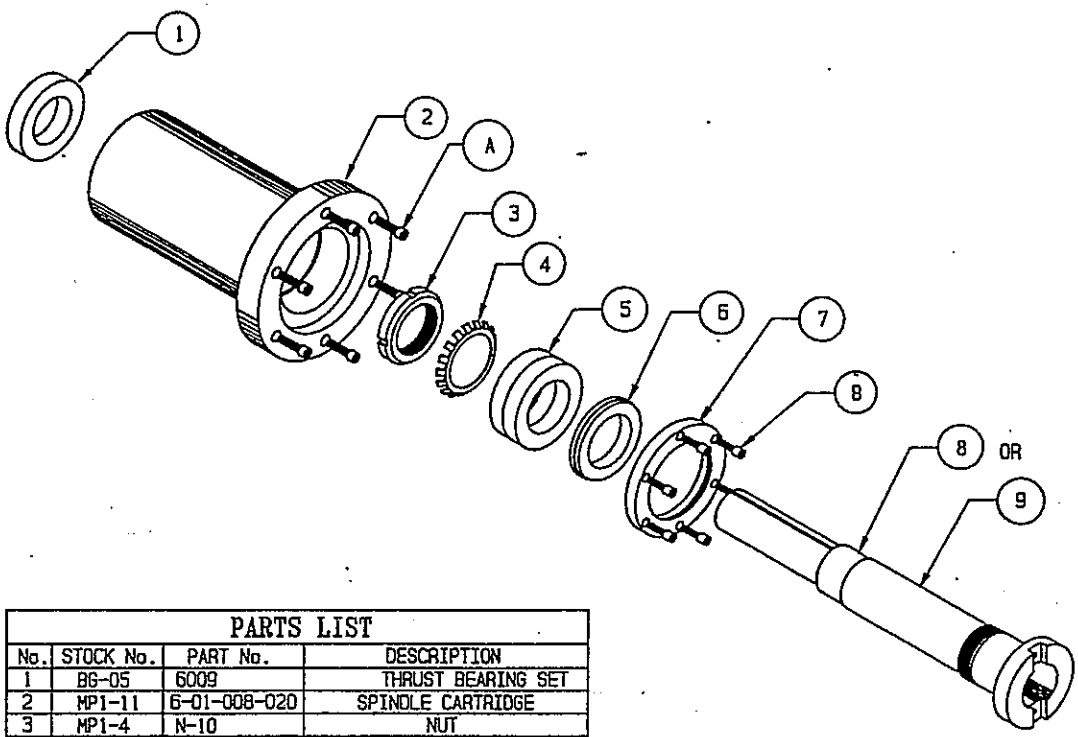
MILLTRONICS MANUFACTURING
7870 PARK DRIVE (612) 474-8100
CHANHASSEN, MN 55317

TITLE 6 POCKET ROTARY ATC ASSY.

APPLICATION PARTNER I

SCALE 2.5:1 | DWG No. 6-10-008-010 | SIZE D

DATE 10 MAY 91 | DRAWN BY THOMPSON | SHEET NO. 5 OF 5



PARTS LIST			
No.	STOCK No.	PART No.	DESCRIPTION
1	BG-05	6009	THRUST BEARING SET
2	MP1-11	6-01-008-020	SPINDLE CARTRIDGE
3	MP1-4	N-10	NUT
4	MP1-5	W-10	WASHER
5	BG-22	7010	RADIAL BEARING
6	MP1-8	6-01-008-023	INSIDE BEARING RETAINER
7	MP1-7	6-01-008-021	BEARING RETAINER
8	MP1-10	6-01-008-016	40 TAPER SPINDLE
9	MP1-9	6-01-008-015	30 TAPER ERICKSON SPINDLE

HARDWARE LIST		
No.	QTY	DESCRIPTION
A	6	1/4-20 x 1 UNC CAPSCREW
B	6	10-32 x 3/4 UNC CAPSCREW

REV.	DESCRIPTION	E.C.O. NO.	APP'D BY	DATE

MATERIAL/FINISH

STOCK No.

TOLERANCE UNLESS SPECIFIED
X.XXX ±
X.XX ±
X.X ±
ANGLE ±

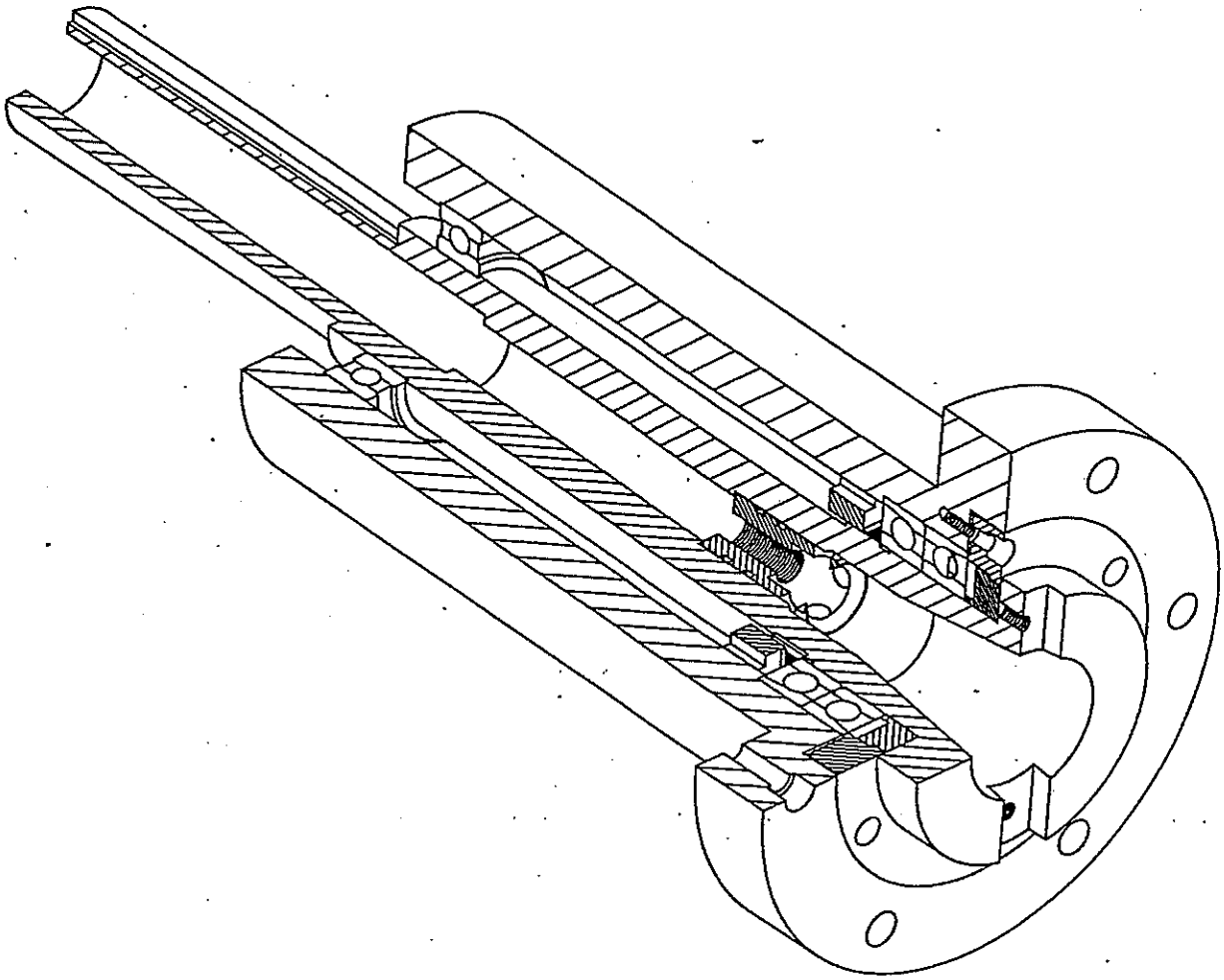
MILLTRONICS MANUFACTURING
7870 PARK DRIVE (612) 474-8100
CHANHASSEN, MN 55317

TITLE: SPINDLE ASSY.

APPLICATION: PARTNER I

SCALE: 5:1 | DWG NO. 6-10-008-000 | SIZE: B

DATE: 20 DEC 89 | DRAWN BY: THOMPSON | SHEET NO. 2 OF 2



REV.	DESCRIPTION	E.C.O. NO.	APP'D BY	DATE

MATERIAL/FINISH

STOCK No.

TOLERANCE UNLESS SPECIFIED
X.XXX ±
X.XX ±
X.X ±
ANGLE ±

MILLTRONICS MANUFACTURING
7870 PARK DRIVE (612) 474-8100
CHANHASSEN, MN 55317

TITLE SPINDLE ASSY.

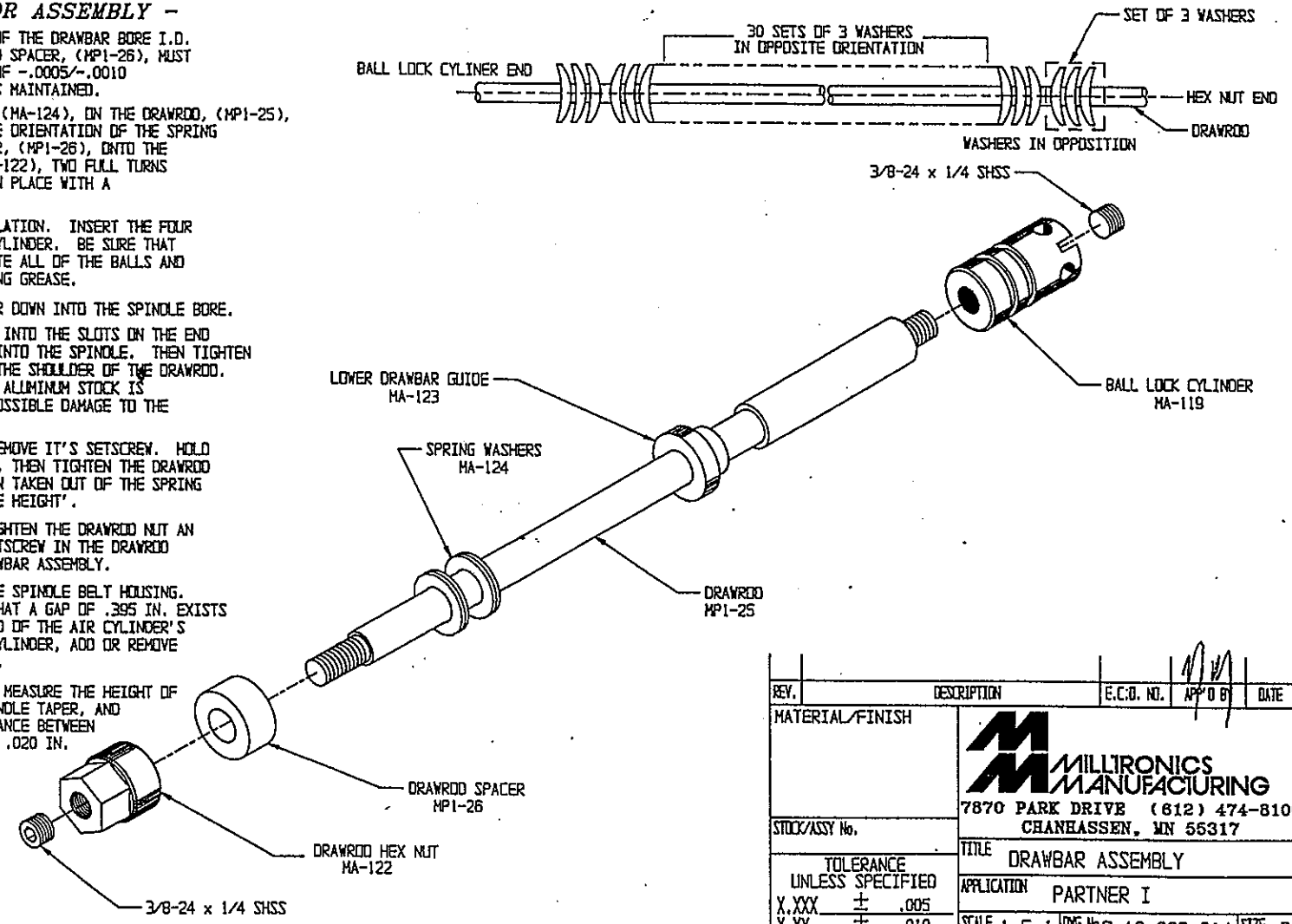
APPLICATION PARTNER I

SCALE 1.5:1 | DWG NO. 6-10-008-000 | SIZE B

DATE 8 JAN 90 | DRAWN BY REUTER | SHEET NO. 1 OF 2

- INSTRUCTIONS FOR ASSEMBLY -

1. EACH SPINDLE VARIES SLIGHTLY IN THE SIZE OF THE DRAWBAR BORE I.D. THE LOWER GUIDE, (MA-123), AND THE DRAWROD SPACER, (MP1-26), MUST FIT IN THE SPINDLE BORE WITH A TOLERANCE OF -.0005/-.0010 TO ENSURE THAT OPERATION OF THE DRAWBAR IS MAINTAINED.
2. SLIDE THE LOWER GUIDE AND SPRING WASHERS, (MA-124), ON THE DRAWROD, (MP1-25), AS SHOWN IN THE ILLUSTRATION. OBSERVE THE ORIENTATION OF THE SPRING WASHERS CLOSELY. SLIDE THE DRAWROD SPACER, (MP1-26), ONTO THE DRAWROD, THEN THREAD THE DRAWROD NUT, (MA-122), TWO FULL TURNS ONTO THE END OF THE DRAWROD AND LOCK IT IN PLACE WITH A 3/8-24 SETSCREW.
3. PREPARE THE BALL LOCK CYLINDER FOR INSTALLATION. INSERT THE FOUR BALLS INTO THE POCKETS ON THE BALL LOCK CYLINDER. BE SURE THAT THEY MOVE FREELY IN THE POCKETS. LUBRICATE ALL OF THE BALLS AND FILL THE GROOVES WITH HIGH PRESSURE BEARING GREASE.
4. LOWER THE ASSEMBLED PORTION OF THE DRAWBAR DOWN INTO THE SPINDLE BORE.
5. INSERT A 1/8 x 7/8 x 6 PIECE OF BAR STOCK INTO THE SLOTS ON THE END OF THE BALL LOCK CYLINDER AND PUSH IT UP INTO THE SPINDLE. THEN TIGHTEN THE BALL LOCK CYLINDER UNTIL IT LANDS ON THE SHOULDER OF THE DRAWROD. LOCK IT IN PLACE WITH A 3/8-24 SETSCREW. ALUMINUM STOCK IS RECOMMENDED FOR THIS PROCEDURE TO AVOID POSSIBLE DAMAGE TO THE SPINDLE.
6. WHILE HOLDING THE DRAWROD NUT IN PLACE, REMOVE IT'S SETSCREW. HOLD THE BALL LOCK CYLINDER WITH THE BAR STOCK, THEN TIGHTEN THE DRAWROD NUT, BY HAND, UNTIL ALL FREE PLAY HAS BEEN TAKEN OUT OF THE SPRING WASHERS. THIS CONDITION IS KNOWN AS 'FREE HEIGHT'.
7. ONCE FREE HEIGHT HAS BEEN ESTABLISHED, TIGHTEN THE DRAWROD NUT AN ADDITIONAL 5-1/2 TURNS AND REPLACE THE SETSCREW IN THE DRAWROD NUT. THIS WILL SET THE PRELOAD TO THE DRAWBAR ASSEMBLY.
8. INSTALL THE AIR CYLINER UNIT ON TOP OF THE SPINDLE BELT HOUSING. ADJUST THE HIGHT OF THE AIR CYLINDER SO THAT A GAP OF .395 IN. EXISTS BETWEEN THE TOP OF THE DRAWBAR AND THE END OF THE AIR CYLINDER'S PISTON. TO ADJUST THE HIGHT OF THE AIR CYLINDER, ADD OR REMOVE STOCK ON THE MOUNTING SPACERS AS REQUIRED.
9. TO TEST THE DRAWBAR FOR PROPER FUNCTION, MEASURE THE HEIGHT OF THE DRAWBAR WITH A TOOL HOLDER IN THE SPINDLE TAPER, AND AGAIN WITH OUT A TOOL HOLDER. THE DIFFERANCE BETWEEN THE TWO MEASUREMENTS MUST BE APROXIMATELY .020 IN.



REV.	DESCRIPTION	E.C.O. NO.	APP'D BY	DATE

MATERIAL/FINISH

STOCK/ASSY No.

TOLERANCE UNLESS SPECIFIED

X.XXX	±	.005
X.XX	±	.010
X.X	±	.030
ANGLE	±	1.0°

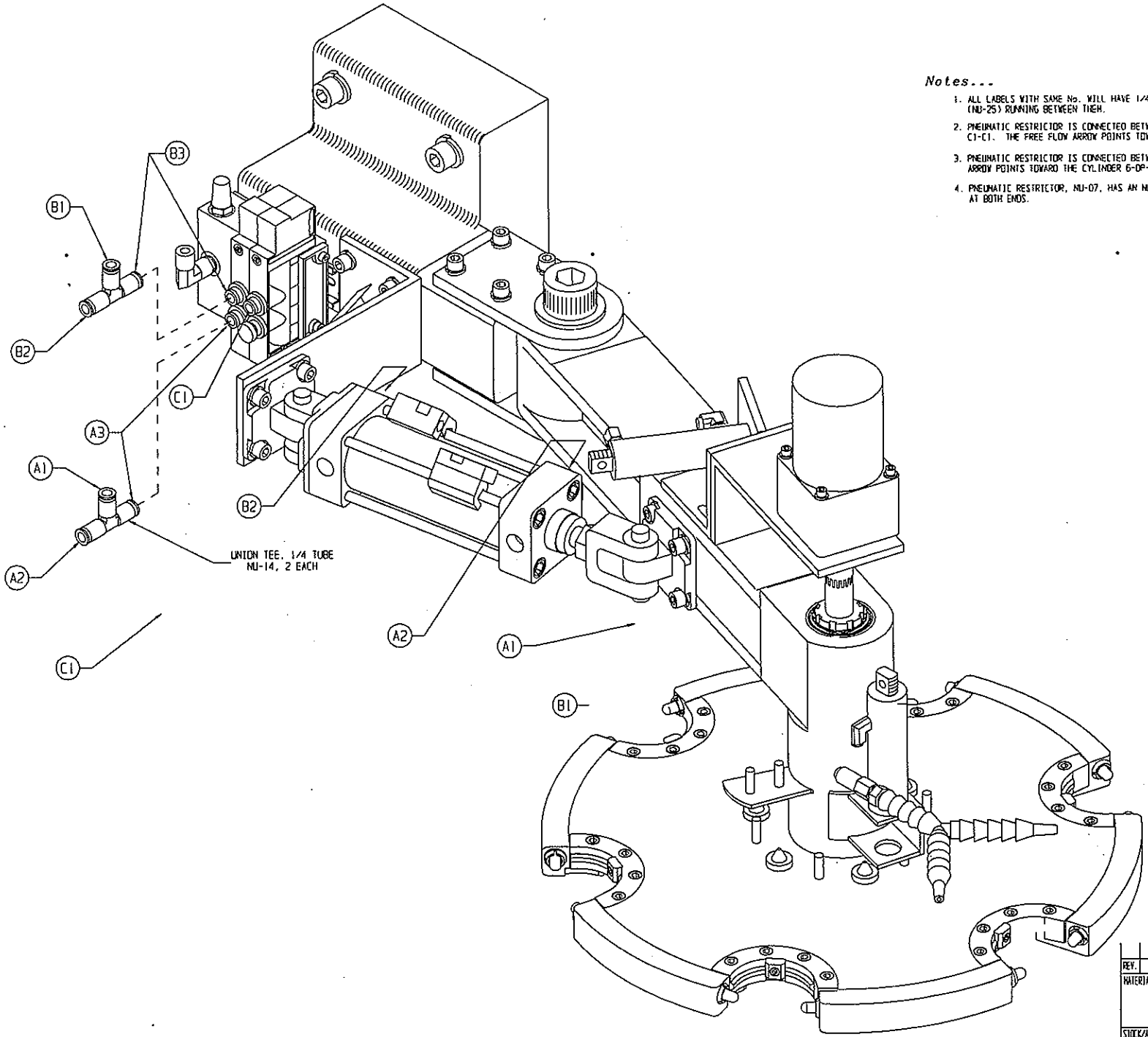
MILLTRONICS MANUFACTURING
7870 PARK DRIVE (612) 474-8100
CHANHASSEN, MN 55317

TITLE: DRAWBAR ASSEMBLY

APPLICATION: PARTNER I

SCALE 1.5:1 | DWG No 6-10-008-014 | SIZE B

DATE 23 APR 91 | DRAWN BY REUTER | SHEET NO. 1 OF 1



Notes...

1. ALL LABELS WITH SAME No. WILL HAVE 1/4 AIR TUBING (NU-25) RUNNING BETWEEN THEM.
2. PNEUMATIC RESTRICTOR IS CONNECTED BETWEEN A2-A2, B2-B2 AND C1-C1. THE FREE FLOW ARROW POINTS TOWARDS THE SOLENOID NU-46.
3. PNEUMATIC RESTRICTOR IS CONNECTED BETWEEN A1-A1. THE FREE FLOW ARROW POINTS TOWARD THE CYLINDER 6-DP-1, (NU-02).
4. PNEUMATIC RESTRICTOR, NU-07, HAS AN NU-17 CONNECTED AT BOTH ENDS.

REV.	DESCRIPTION	E.C.O. NO.	APP'D BY	DATE

MATERIAL/FINISH

STOCK/ASSY No.

TOLERANCE UNLESS SPECIFIED

X.XXX	+/-	.005
X.XX	+/-	.010
X.X	+/-	.030
ANGLE	+/-	1.0°

MILLTRONICS
1400 MILL LANE 612.442.1410
WACONIA, MN 55387 USA

TITLE 6 POCKET ROTARY ATC ASSY.

APPLICATION PARTNER I

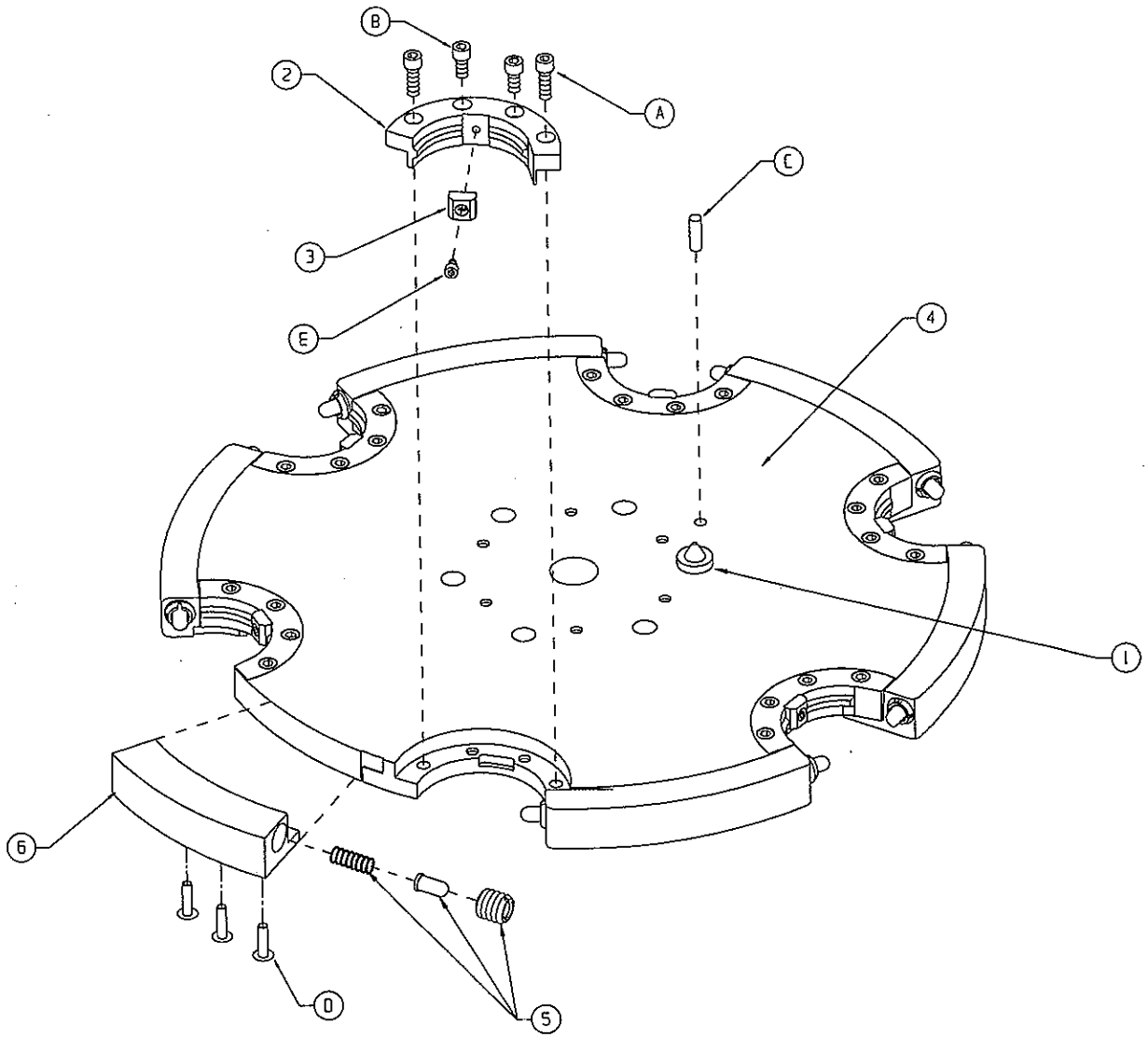
SCALE 2:1 | DWG No. 6-10-008-010 | SIZE C

DATE 8 DEC 92 | DRAWN BY REUTER | SHEET NO. 1 OF 5

CAROUSEL ASSEMBLY

PARTS LIST			
No.	QTY.	STOCK No.	DESCRIPTION
1	6	MPI-55	CL-S-CLP LOCATOR PIN
2	6	MPI-42	V-FLANGE TOOL HOLDER INSERT
3	6	MPI-45	TOOL CHANGER KEY INSERT
4	1	MPI-43	6 POCKET CAROUSEL DISC
5	12	MD-06	NOSE SPRING 5/8-11 x 1-1/2
6	6	MPI-44	6 POCKET LOCKING PIN BLOCK

HARDWARE LIST		
No.	QTY.	DESCRIPTION
A	30	1/4-20 x 3/4 SHCS
B	12	1/4-20 x 1/2 SHCS
C	3	1/4 x 1 DOWEL PIN
D	18	1/4-20 x 1/2 BHCS
E	6	8-32 x 1/4 SHCS



REV.	DESCRIPTION	E.C.O. NO.	APP'D BY	DATE

MATERIAL/FINISH

STOCK/ASSY No.

TOLERANCE UNLESS SPECIFIED

X.XXX	+/-	.005
X.XX	+/-	.010
X.X	+/-	.030
ANGLE	+/-	1.0°

MILLTRONICS
1400 MILL LANE 612.442.1410
WACONIA, MN 55387 USA

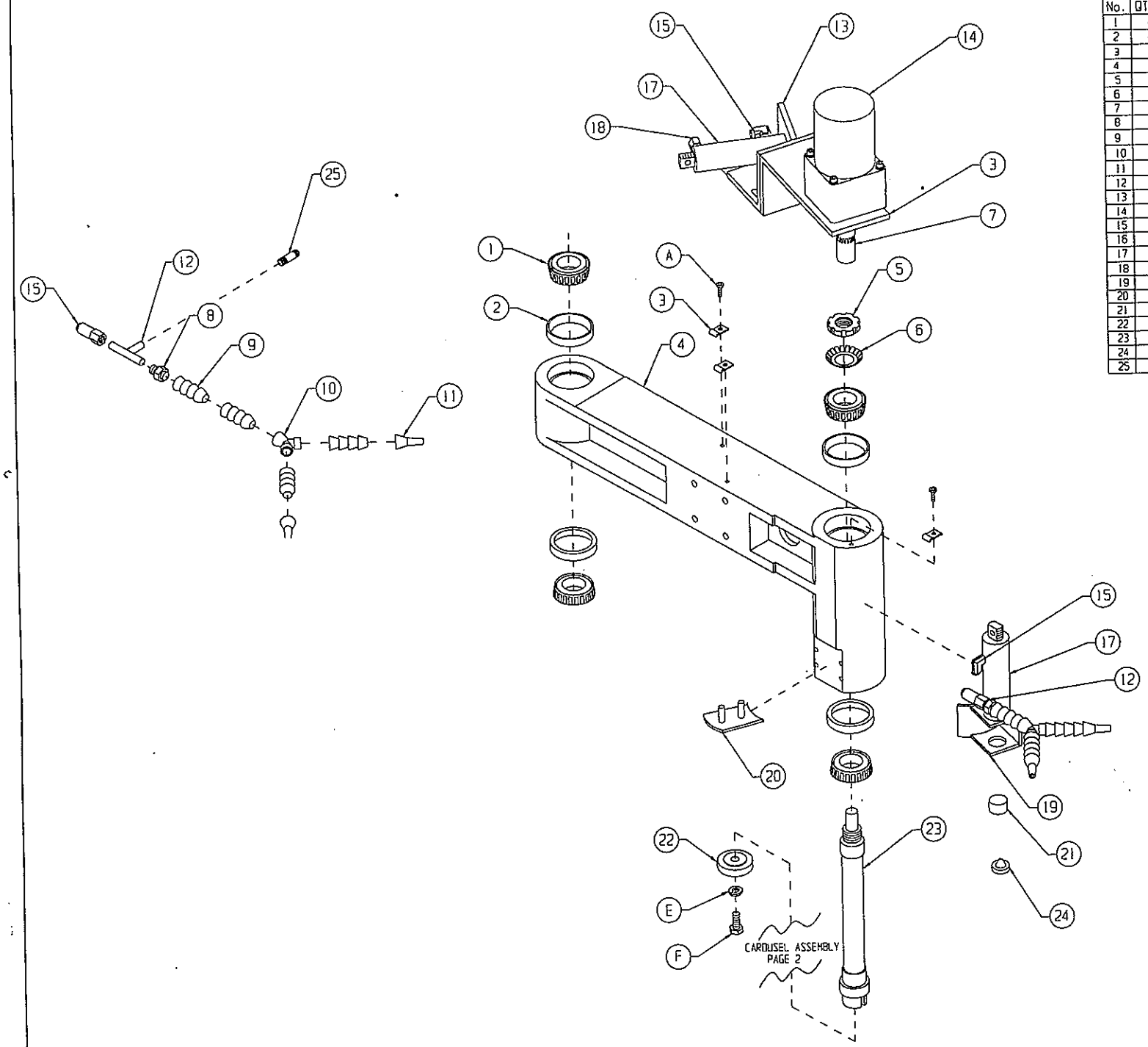
TITLE 6 POCKET ROTARY ATC ASSY.

APPLICATION PARTNER I

SCALE 2:1 | DWG No. 6-10-008-010 | SIZE C

DATE 2 DEC 92 | DRAWN BY REUTER | SHEET NO. 2 OF 5

FRONT ARM ASSEMBLY



PARTS LIST			
No.	QTY.	STOCK No.	DESCRIPTION
1	4	BG-33	07100 CONE TAPERED BEARING
2	4	BG-34	07196 CUP TAPERED BEARING
3	1	MP1-53	MOTOR MOUNT
4	1	MX1-03	FRONT ARM SUPPORT MACHINED
5	1	BG-35	N04 BEARING LOCKNUT
6	1	BG-36	W04 BEARING LOCK WASHER
7	1	EO-26	MOTOR SHAFT COUPLER
8	1	NU-111	1-49425 1/4 LOCKLINK 1/8 NPT
9	52	MA-22	LOCKLINK HOSE 48501
10	1	MA-20	48503 1/4 Y FITTING
11	2	MA-21	1/8 NOZZLE 49423
12	1	NU-05	1/8 NPT FEM UNION 'T'
13	1	MP1-35	PLUNGER MOTOR BRACKET
14	1	MO-60	5RK40GN-C MOTOR
15	2	NU-16	1/8 NPT 1/4 O.D. MALE ELBOW
16	2	PR-19	SWITCH PROX E57M88T110 NPN-NCB
17	1	NU-02	CYLINDER 6-DP-1
18	1	NU-17	1/8 NPT 1/4 O.D. M.S. 56842
19	1	MP1-46	AIR CYL/PROX MOUNT
20	1	MP1-59	PROX SENSOR MOUNT
21	1	MP1-57	LOCKING PIN BUSHING HOLDER
22	1	HD-11	CAROUSEL HARDENED WASHER
23	1	MP1-41	CAROUSEL ROTATION SHAFT
24	6	MP1-54	CLB CONE LOCATING BUSHING
25	1	NU-24	1/8 NPT NIPPLE

HARDWARE LIST		
No.	QTY.	DESCRIPTION
A	7	8-32 x 3/8 BHCS
B	1	5/8-18 HEX NUT
C	4	1/4-20 x 3 SHCS
D	8	1/4 LOCK WASHER
E	1	5/16 LOCKWASHER
F	1	5/16-18 x 1-1/4 SHCS
G	4	1/4-20 x 3/4 SHCS
H	2	8-32 x 1/4 SHSS
I	2	1/4-20 x 1/4 SHSS

REV.	DESCRIPTION	E.C.O. NO.	APP'D BY	DATE

MATERIAL/FINISH

STOCK/ASSY No.

TOLERANCE UNLESS SPECIFIED
X.XXX +/- .005
X.XX +/- .010
X.X +/- .030
ANGLE +/- 1.0°

MILLTRONICS
1400 MILL LANE 612.442.1410
WACONIA, MN 55387 USA

TITLE 6 POCKET ROTARY ATC ASSY.

APPLICATION PARTNER I

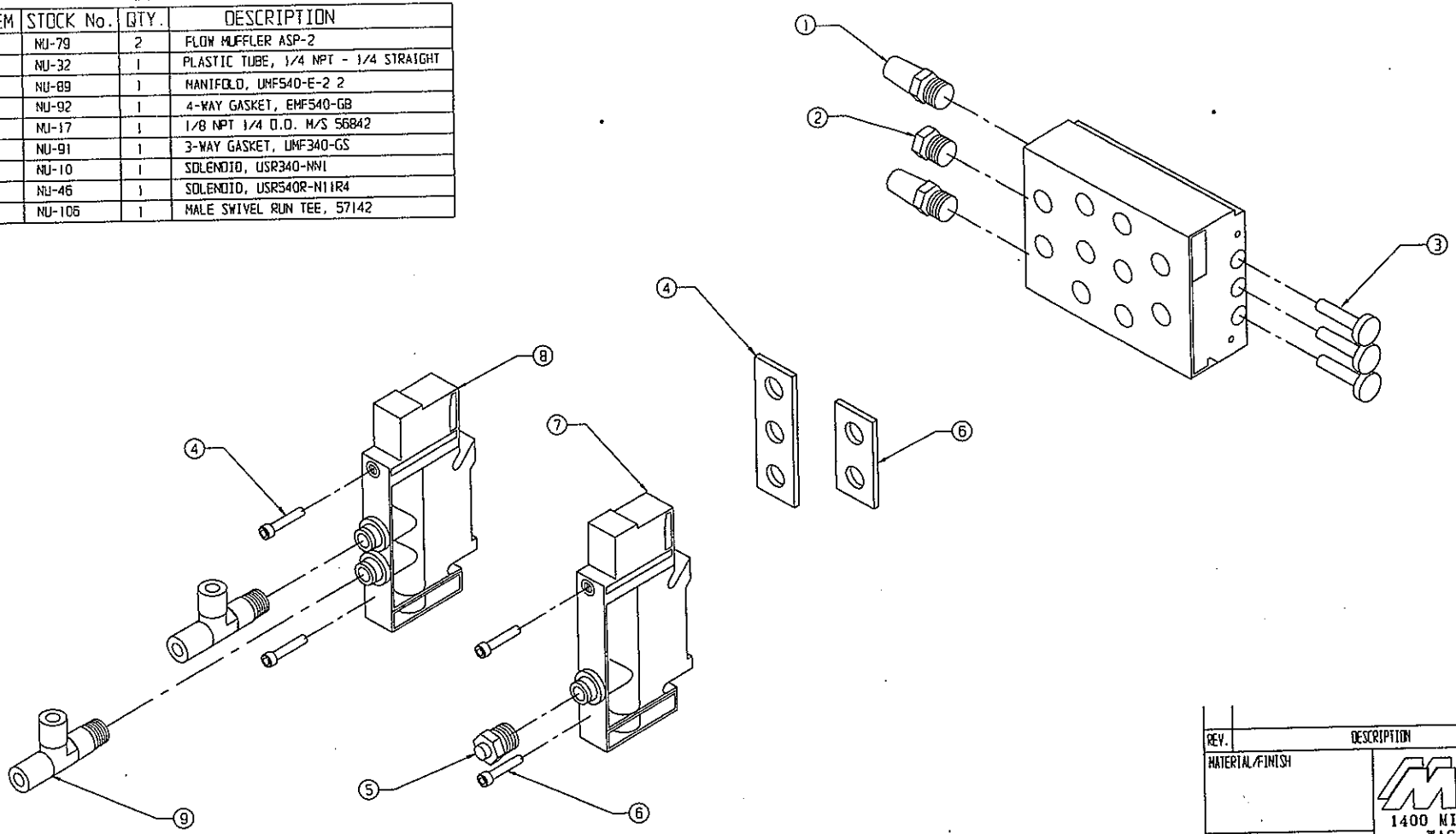
SCALE 3:1 | DWG No 6-10-008-010 | SIZE C

DATE 8 DEC 92 | DRAWN BY REUTER | SHEET NO. 3 OF 5

AIR MANIFOLD SUB ASSEMBLY

PARTS LIST

ITEM	STOCK No.	QTY.	DESCRIPTION
1	NU-79	2	FLOW MUFFLER ASP-2
2	NU-32	1	PLASTIC TUBE, 1/4 NPT - 1/4 STRAIGHT
3	NU-89	1	MANIFOLD, UMF540-E-2 2
4	NU-92	1	4-WAY GASKET, EMF540-GB
*5	NU-17	1	1/8 NPT 1/4 O.D. M/S 56842
6	NU-91	1	3-WAY GASKET, UMF340-GS
7	NU-10	1	SOLENOID, USR340-NN1
8	NU-46	1	SOLENOID, USR540R-N11R4
9	NU-105	1	MALE SWIVEL RUN TEE, 57142



REV.	DESCRIPTION	E.C.O. NO.	APP'D BY	DATE

MATERIAL/FINISH

STOCK/ASSY No.

TOLERANCE UNLESS SPECIFIED

X.XXX	+/-	.005
X.XX	+/-	.010
X.X	+/-	.030
ANGLE	+/-	1.0°

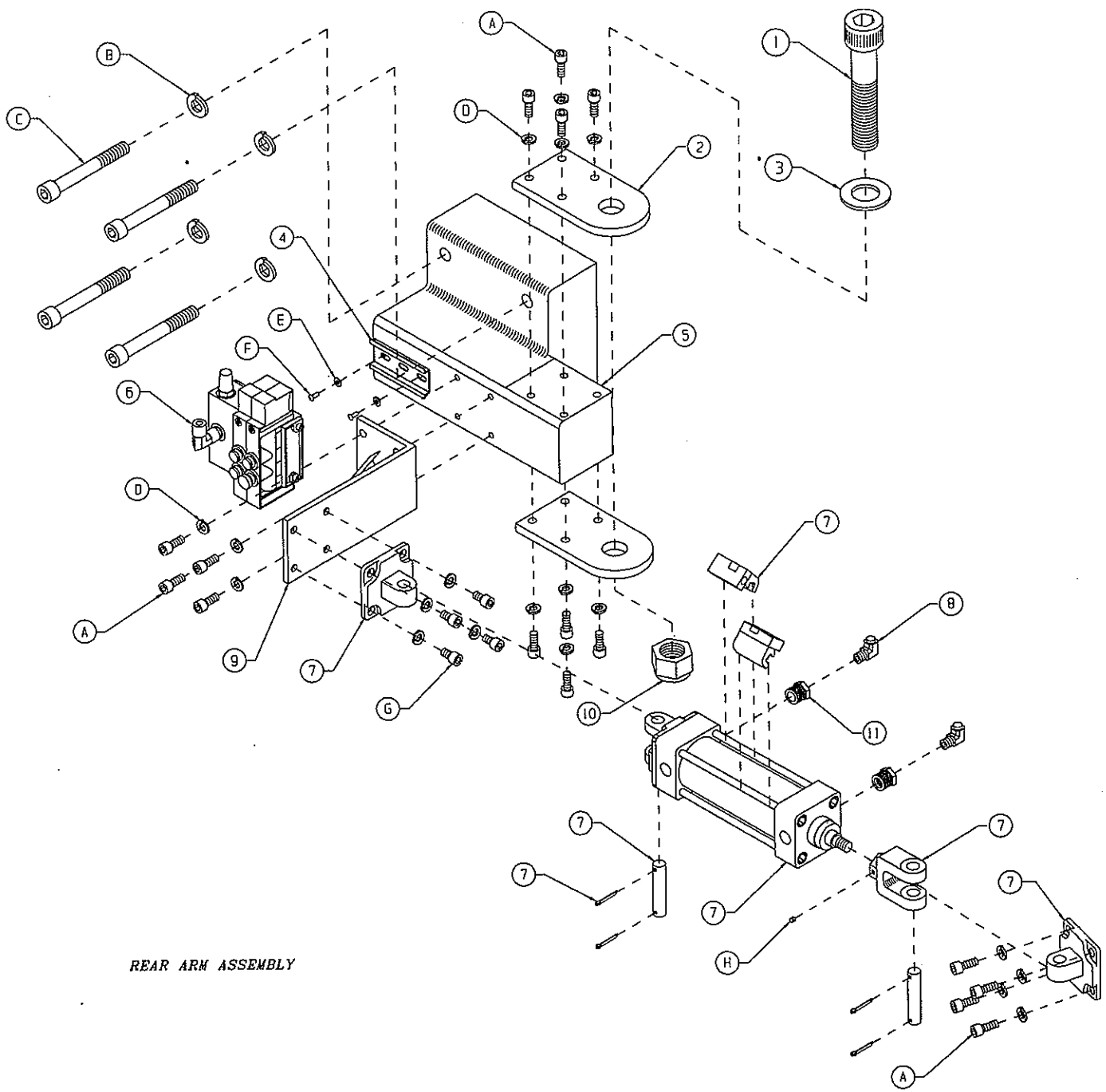
MILLTRONICS
1400 MILL LANE 612.442.1410
WACONIA, MN 55387 USA

TITLE 6 POCKET ROTARY ATC ASSY.

APPLICATION PARTNER I

SCALE 2:1 | DWG No 6-10-008-010 | SIZE B

DATE 8 DEC 92 | DRAWN BY REUTER | SHEET NO. 4 OF 5



REAR ARM ASSEMBLY

PARTS LIST

No.	QTY	STOCK No.	DESCRIPTION
1	1	HD-09	1-8 x 5-1/2 SHCS
2	2	MP1-34	ARM PIVOT CLEVIS *
3	1	HD-10	1 IN. HARDENED SERIES N WASHER
4	1	WX-167	35mm x 7.5 m DIN RAIL
5	1	MX1-04	REAR ARM SUPPORT SECTION - MACHINED
6	1		MANIFOLD ASSEMBLY (PAGE 4)
7	1	NU-104	2 IN. AIR CYLINDER
8	2	NU-33	ELBOW, 1/4 PIPE - 1/4 TUBE 90°
9	1	MP1-56	FRONT AIR CYLINDER MOUNT PLATE
10	1	HD-07	1-8 NYLOCK NUT
11	2	NU-27	REDUCER, 3/8 NPT-1/4 NPT BRASS

HARDWARE LIST

No.	QTY	DESCRIPTION
A	16	5/16-18 x 3/4 SHCS
B	4	1/2 LOCKWASHERS
C	4	1/2-13 x 4 SHCS
D	20	5/16 LOCKWASHERS
E	2	No. 8 FLAT WASHER
F	2	8-32 x 3/8 BHCS
G	4	5/16-18 x 1/2 SHCS
H	1	10-32 x 3/16 BRASS TIPPED SHSS

REV.	DESCRIPTION	E.C.O. NO.	APP'D BY	DATE

MATERIAL/FINISH

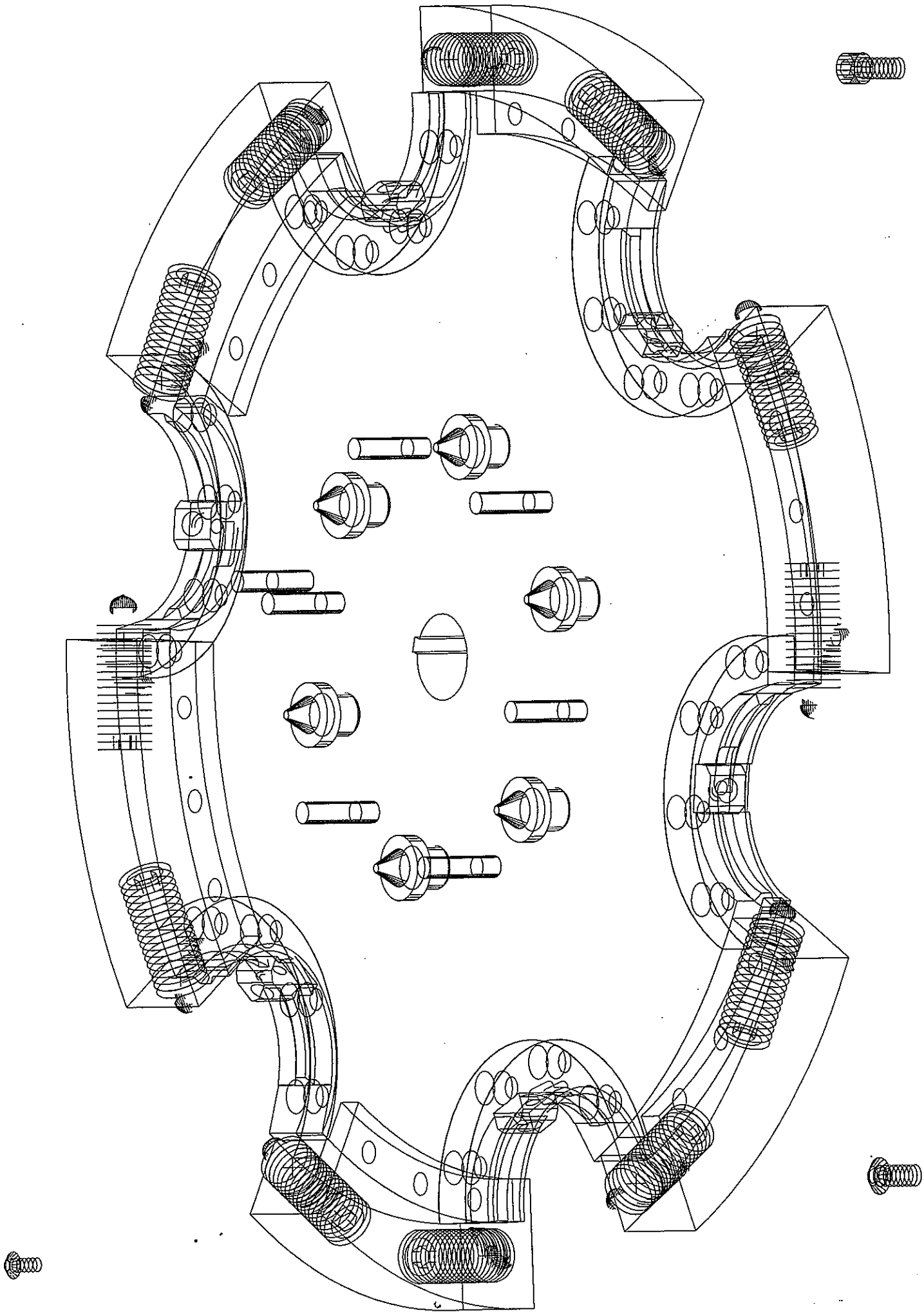
STOCK/ASSY No.

TOLERANCE UNLESS SPECIFIED
X.XXX +/- .005
X.XX +/- .010
X.X +/- .030
ANGLE +/- 1.0°

MILLTRONICS
1400 MILL LANE 812.442.1410
WACONIA, MN 55387 USA

TITLE 6 POCKET ROTARY ATC ASSY.

APPLICATION PARTNER I

SCALE 3:1 | DWG No 6-10-008-010 | SIZE C

DATE 8 DEC 92 | DRAWN BY REUTER | SHEET NO. 5 OF 5