



US Army Corps
of Engineers
Savannah District

Fort Bragg North Carolina

Solicitation Number

DACA21-03-R-0024

SOF Weapons Storage and Training Facility

FY-03, Line Item 43908

Volume II of III - Appendix E

April 2003

**THIS SOLICITATION IS UNRESTRICTED PURSUANT TO THE
"BUSINESS OPPORTUNITY DEVELOPMENT REFORM ACT OF 1988"
(PUBLIC LAW 100-656)**

**U.S. ARMY ENGINEER DISTRICT, SAVANNAH
CORPS OF ENGINEERS
100 WEST OGLETHORPE AVENUE
SAVANNAH, GEORGIA 31401-3640**

APPENDIX E

GOVERNMENT FUNDED CONTRACTOR INSTALLED SHOP EQUIPMENT

The enlarged shop equipment location plans are included in this Appendix and the overall shop equipment layout plan is included in the contract drawings. The Contractor will review and coordinate with the using agency the final location of all shop equipment. The coordination of equipment placement, the required building construction and utility preparation (i.e. power, ventilation, isolation slabs, etc.) is part of the Base Bid. The procurement of the items specified in this Appendix will be accomplished separate from this contract. The installation of these items will be an Option to the Base Bid as indicated in the Bidding Schedule. If awarded, the Contractor shall install the electrical equipment and other related items listed in this Appendix. Installation shall include scheduling shipments from vendors, accepting delivery at the site, unloading, inventorying, securing and installing the items. Refer to Section 01010 for additional information.

Contents:

- Part 1: Shop Equipment List
- Part 2: Point of Contact
- Part 3: Shop Equipment Specifications
- Part 4: Enlarged Shop Equipment Location Plans

SHOP EQUIPMENT LIST

Line Item	Nomenclature	Vendor/Mfr	Qty	Function/ Location	Cost (1ea)	Dimension (WxLxH)	Electric	Ventillation	Compressed Air	Water	Drain	Remarks	Line Item
1	Swiss turning center	ERC Inc. SV32	1	Machine Shop	\$350,000.00	4.6' x 20.7' x 5.5'	230V 3-phase; 8 KVA	no	70-90 psi (6 scfm)	yes	yes	8400 lbs	1
2	CNC turning center, large	Daewoo Puma 300LB	1	Machine Shop	\$185,000.00	194" x 99" x 81"	205-235Volts / 3 phase, 40KVA, 105AMP	no	80 psi	yes	yes	14770 lbs	2
3	CNC turning center, small	Daewoo Puma 200LC	1	Machine Shop	\$90,000.00	64" x 63" x 61"	205-235 Volts / 3 Phase, 40 KVA (63 amps @ 220 Volts)	no	80 psi	yes	yes	7720 lbs	3
4	Vertical machining center	Clausing Shark s1050	1	Machine Shop	\$80,000.00	105" x 105" x 113.3"	230V 3-phase; 50 KVA	no	70-90 psi (6 scfm)	yes	yes	11025lbs	4
5	Engine lathe	Clausing Metosa SM 1440VS	1	Machine Shop	\$24,000.00	58" x 96" x 48"	230V 3-phase; 50 KVA	no	70-90 psi (6 scfm)	yes	yes	2447 lbs	5
		Clausing Metosa SM 1440VS	1	Org. Maintenance	\$24,000.00	58" x 96" x 48"	230V 3-phase; 50 KVA	no	70-90 psi (6 scfm)	yes	yes	2519 lbs	
		Clausing Metosa SM 1440VS	1	Heavy Weapons	\$24,000.00	58" x 96" x 48"	230V 3-phase; 50 KVA	no	70-90 psi (6 scfm)	yes	yes	2519 lbs	
		Clausing Metosa SM 1440VS	1	Light Weapons	\$24,000.00	58" x 96" x 48"	230V 3-phase; 50 KVA	no	70-90 psi (6 scfm)	yes	yes	2519 lbs	
6	Barrel turret lathe	Clausing 8027 Geared lathe	1	Machine Shop	\$48,000.00	40" x 79" x 47"	230V 3-phase; 60 KVA	no	no	yes	yes	1512 lbs	6
7	Surface grinder	Harig 618BW	1	Machine Shop	\$15,000.00	29" x 29"	220Volts, 3 Phase Power, needs a magnetic Chuck	no	no	self-conatined cooling (optional)	no	69" x 45" operating space, 1350 lbs	7
8	Mill	Bridgeport Series1	1	Machine Shop	\$16,000.00	87.6" x 98.4" 81.6"	230V 3-phase; 4 KVA	no	no	yes	yes	2500 lbs	8
9	Horizontal band saw	Kalamazoo 9AW	1	Machine Shop	\$5,800.00	69" x 52" x 63"	115/220Volts 1ph or 208/230/460 3 phase	no	no	no	no	800 lbs	9

10	Vertical band saw	Kalamazoo VF2012	1	Machine Shop	\$10,800.00	41" x 51" x 81"	230/460/60/3 phase	no	no	no	no	1390 lbs	10
11	Oven	Cress C1232D	1	Machine Shop	\$12,000.00	36" x 28" x 56"	Standard Voltage, 206V or 460V option available	no	no	no	no	885 lbs	11
12	Tool & cutter grinder	Victor M40	1	Machine Shop	\$15,000.00	39" x 46" x 62.1"	230V 3-phase; 4 KVA	no	70-90 psi (6 scfm)	no	no	1520 lbs	12
13	Automated mill	Bridgeport EZ Plus	2	Machine Shop	\$34,000.00	87.6" x 98.4" x 81.6"	230V 3-phase; 4 KVA	no	no	yes	yes	2500 lbs	13
14	Automated lathe	Clausing Metosa SM 1440VS	1	Machine Shop	\$48,000.00	58" x 96" x 48"	230V 3-phase; 50 KVA	no	70-90 psi (6 scfm)	yes	yes	2447 lbs	14
15	Automated grinder	Shigiya GP 30/60	1	Machine Shop	\$135,000.00	119" x 79" x 70"	220 V, 3 Phase Power, needs a magnetic Chuck	no	no	no	no	6400 lbs	15
16	Wire EDM	ONA S250	1	Machine Shop	\$130,000.00	97" x 125" x 85"	480 Volts; 3 phase	no	90 psi	Uses three 55 gallons of dianized water self contained	no	5300 lbs	16
17	Sinker EDM	ONA H300	1	Machine Shop	\$140,000.00	97" x 91" x 95"	480 Volts; 3 phase	no	90psi	Uses three 55 gallons of dialectic oil, self contained	no	6000 lbs	17
18	Reverse engineering	Renishaw "Cyclone"	2	Machine Shop	\$48,000.00	50" x 38" x 71"	240/110 V AC 50/50 HZ (auto select) 200W	no	80 psi	no	no	275 lbs	18
19	Coordinate measuring machine	Mitutoyo Bright apex TC 504	1	Machine Shop	\$65,000.00	43" x 42" x 87"	120 Volt Power Single Phase 30Amp outlet	no	58 psi	no	no	1133lbs	19
20	Workbenches		1	Machine Shop	\$800.00	24"x 72"	no	no	no	no	no	Hardwood w/vises	20
			1	Chemical Refinishing	\$800.00	24"x 72"	no	no	no	no	no	Hardwood w/vises	
			1	FSS	\$800.00	24"x 72"	no	no	no	no	no	Hardwood w/vises	

			1	Org. Maintenance	\$800.00	24"x 72"	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	Hardwood w/vises	
			1	X-ray	\$800.00	24"x 72"	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	Hardwood w/vises	
			1	Optical	\$800.00	24"x 72"	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	Hardwood w/vises	
			1	Heavy Weapons	\$800.00	24"x 72"	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	Hardwood w/vises	
	Workbenches (continued)		1	Light Weapons	\$800.00	24"x 72"	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	Hardwood w/vises	
21	Tool cabinets		1	Machine Shop	\$1,900.00	45" x 27" x 38"	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	Holds work centers, casters, 5 drawer, 1 compartment	21
			1	FSS	\$1,900.00	45" x 27" x 38"	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	Holds work centers, casters, 5 drawer, 1 compartment	
			1	Org. Maintenance	\$1,900.00	45" x 27" x 38"	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	Holds work centers, casters, 5 drawer, 1 compartment	
			1	X-ray	\$1,900.00	45" x 27" x 38"	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	Holds work centers, casters, 5 drawer, 1 compartment	
			1	Heavy Weapons	\$1,900.00	45" x 27" x 38"	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	Holds work centers, casters, 5 drawer, 1 compartment	
			1	Light Weapons	\$1,900.00	45" x 27" x 38"	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	Holds work centers, casters, 5 drawer, 1 compartment	
22	Cabinets		1	Machine Shop	\$325.00	48" x 18" x 72"	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	Heavy duty, 5 shelf	22
			3	FSS	\$325.00	48" x 18" x 72"	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	Heavy duty, 5 shelf	
			2	Org. Maintenance	\$325.00	48" x 18" x 72"	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	Heavy duty, 5 shelf	
			2	Magnetic	\$325.00	48" x 18" x 72"	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	Heavy duty, 5 shelf	

23	Shelf units		1	Machine Shop	\$225.00	36" x 18" x 84"	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	Heavy duty, 5 shelf	23		
			1	Chemical Refinishing	\$225.00	36" x 18" x 84"	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	Heavy duty, 5 shelf			
			1	FSS	\$225.00	36" x 18" x 84"	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	Heavy duty, 5 shelf			
			1	Org. Maintenance	\$225.00	36" x 18" x 84"	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	Heavy duty, 5 shelf			
	Shelf units (continued)		1	X-ray	\$225.00	36" x 18" x 84"	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	Heavy duty, 5 shelf			
			1	Optical	\$225.00	36" x 18" x 84"	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	Heavy duty, 5 shelf			
			1	Heavy Weapons	\$225.00	36" x 18" x 84"	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	Heavy duty, 5 shelf			
			1	Light Weapons	\$225.00	36" x 18" x 84"	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	Heavy duty, 5 shelf			
24	Upright drill press	Clausing 1691	1	Machine Shop	\$2,400.00	16" x 28" x 73"	Single Phase Switch installed with 115/230V, 60c OR 3 Phase motor installed with 206/220/440V. (option)			<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	300lbs	24
			1	Org. Maintenance	\$2,400.00	16" x 28" x 73"	Single Phase Switch installed with 115/230V, 60c OR 3 Phase motor installed with 206/220/440V. (option)			<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	300lbs	

			1	Heavy Weapons	\$2,400.00	16" x 28" x 73"	Single Phase Switch installed with 115/230V, 60c OR 3 Phase motor installed with 206/220/440V. (option)	no	no	no	no	300lbs	
			1	Light Weapons	\$2,400.00	16" x 28" x 73"	Single Phase Switch installed with 115/230V, 60c OR 3 Phase motor installed with 206/220/440V. (option)	no	no	no	no	300lbs	
25	Arc welder	Miller Elec. Co.	1	Welding shop	\$9,266.67	19" x 18" x 25"	35-300 amp AC, 35-265 Amp CD	room will require ventillation	no	no	no	360lbs, Dial Arc 250; 35-300 Amp AC, 35-265AmpDC	25
26	MIG machines	Miller Elec. Co.	1	Welding shop	\$5,877.00	23" x 27" x 28"	250A at 35V, 100% duty cycle; 320A at 28V, 60% duty cycle. Requires 3 phase power	room will require ventillation	no	no	no	321lbs, Mod. CP 252TS; 14-40v, requires 3 phase power	26
27	TIG machines	Miller Elec. Co.	1	Welding shop	\$4,541.00	23" x 26" x 40"	200/230/460V, 50/60 Hz.	room will require ventillation	no	self-conatined cooling	no	515lbs, Syncrowave 350 LX; 3-400AMPS	27
28	Plasma cutter	Miller Elec. Co.	1	Welding shop	\$3,870.00	50" x 38" x 71"	230V 3-phase; 30 KVA	room will require ventillation	70 psi (7 scfm)	no	no	470 lbs	28
29	Metal shear	U.S. Industrial Mach.	1	Machine Shop	\$27,900.00	76" x 106" x 62"	220-440V 3 Phase Power	no	no	no	no	Atlantic 10'x1/4", 10500lbs	29
30	deleted												30
31	Sheetmetal former	U.S. Industrial Mach.	1	Machine Shop	\$31,900.00	61" x 109" x 98"	220-440V 3 Phase Power	no	no	no	no	Atlantic press brake, 120 ton x 8', 17000lbs	31
32	Ultrasonic cleaner	I. Shor International	1	Heavy Weapons	\$16,795.00	52" x 36" x 24"	110 Volt 3 Phase Power. Also available in 220 Volt	room will require ventillation	self contained coolant	no	no	Model LE-250, 200+ rifles per day per cleaner	32

			1	Light Weapons	\$16,795.00	52" x 36" x 24"	110 Volt 3 Phase Power. Also available in 220 Volt	room will require ventilation	self contained coolant	no	no	Model LE-250, 200+ rifles per day per cleaner	
33	500kV X-ray, digital	Eastern NDT	1	X-Ray	\$95,000.00	55" x 98" x 84"	208-480 Volts 15% OR 50/60 Hz Single Phase	no	no	no	no	1340lbs, POC Joseph Monroe (GM) 804-458-1661	33
34	Magnetic Inspection	Magnawerks	2	Magnetic	\$90,000.00	12' x 8' x 9' 53"H x 43"W x 132"L	480/240/575 Volts Single Phase	no	70 psi	no	water coolant requires hose attachment to drain	Mod. MDMV2926; Eastern NDT, POC Joseph Monroe (GM) 804-458-1661	34
35	Forklift, electric	Hyster	1	Weapons Vault	\$42,500.00		Runs on Battery Charger is at 480V	no	no	no	no	Hyster: E120XL3, 111" guard, 12k capacity *5 12,000 lb capacity and provide non-marking tires.	35
			1	Inspections Building	\$42,500.00		Runs on Battery Charger is at 480V	no	no	no	no	Hyster: E120XL3, 111" guard, 12k capacity *5 12,000 lb capacity and provide non-marking tires.	
36	Tow motor	Hyster	1	Facility	\$6,500.00		Runs on Battery Charger is at 480V	no	no	no	no	T5XT, 10k towed capacity	36
37	Modular storage bins	Stanley Vidmar	1	Stock Room (ASL)	\$250,000.00	12' to top of cabinet	no	no	no	no	no	Est based on Stanley Vidmar survey for equip. to store current part stockage	37
38	Vault Weapon Modular Storage System (STAKK)	Stanley Vidmar	1	Vault/ Storage Room	\$568,000.00	18' to bottom of top shelf	3 Phase 460 Volts Standard (for each row). Disconnect box on additional 12-15 amps (for each row).	no	no	no	no	Est based on 18' STAKK system, w/ 2x2k rows and 2x4k rows	38
39	deleted												39
40	Laminar flow bench	Technovation/Bio Plus	1	Optical	\$7,000.00	48" x 28" x 85"	350 Watts 150-220 Volts single Phase Power 50/60 Hz	Draws air from room does not need to exhaust it out	no	no	no	Class 1 for unconditioned room	40
41	Environmental chamber	I. Shor-International	4	FSS	\$1,200.00	3' x 4' x 4'							41
	Environmental chamber	I. Shor-International	4	Optical	\$1,200.00	3' x 4' x 4'							

42	Welding table	Weld Plus Inc	1	Welding shop	\$800.00	4' x 16'	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	stand alone table	42
43	Sand blaster, cabinet	Kehm Equipment	1	Refinishing Shop	\$8,600.00	42" x 72" x 82"	<u>230 Volts/60Hz / single Phase</u>	<u>no</u>	<u>100 - 200 psi</u>	<u>no</u>	<u>no</u>	Pro-Former 3642 System; \$3,138.00 associated cost for accessories	43
44	Dust collector	I. Shor International	1	Refinishing Shop	\$3,050.00	25" x 25" x 58"	<u>240 Volts Single Phase</u>	<u>3-5 hoods; 1200 CFM</u>	<u>no</u>	<u>no</u>	<u>no</u>	WhirlWind Mod. 3000; 3 HP, 3-5 hoods, 1200 cfm, 240v 1 phase	44
45	deleted												45
46	deleted												46
47	Heavy work table	A Plus Material Handling	30	Turn-In/Issue	\$424.06	96" x 48"	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	Mod. H193-X2	47
48	Light work table	A Plus Material Handling	9	Machine Shop	\$167.98	48" x 36"	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	Mod. H700-S-436	48
			4	Chemical Refinishing	\$167.98	48" x 36"	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	Mod. H700-S-436	
			6	FSS	\$167.98	48" x 36"	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	Mod. H700-S-436	
			4	Welding shop	\$167.98	48" x 36"	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	Mod. H700-S-436	
			9	Org. Maintenance	\$167.98	48" x 36"	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	Mod. H700-S-436	
			8	X-Ray	\$167.98	48" x 36"	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	Mod. H700-S-436	
			4	Magnetic	\$167.98	48" x 36"	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	Mod. H700-S-436	
			4	Optical	\$167.98	48" x 36"	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	Mod. H700-S-436	
	Light work table (continued)	A Plus Material Handling	6	Heavy Weapons	\$167.98	48" x 36"	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	Mod. H700-S-436	

			6	Light Weapons	\$167.98	48" x 36"	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	Mod. H700-S-436	
			1	Turn-In/Issue	\$167.98	48" x 36"	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	Mod. H700-S-436	
			5	Inspections Building	\$167.98	48" x 36"	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	Mod. H700-S-436	
49	General cabinet	Fed Log Grainger Inc	3	Machine Shop	\$250.00	5' x 2' x 6'	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	Grainger.com	49
			2	Chemical Refinishing	\$250.00	5' x 2' x 6'	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	Grainger.com	
			1	FSS	\$250.00	5' x 2' x 6'	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	Grainger.com	
			1	Welding shop	\$250.00	5' x 2' x 6'	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	Grainger.com	
			3	Org. Maintenance	\$250.00	5' x 2' x 6'	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	Grainger.com	
			3	Heavy Weapons	\$250.00	5' x 2' x 6'	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	Grainger.com	
			3	Light Weapons	\$250.00	5' x 2' x 6'	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	Grainger.com	
50	Book case	Fed Log Grainger Inc	2	Machine Shop	\$200.00	4' x 18" x 6'	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	Grainger.com	50
			1	Chemical Refinishing	\$200.00	4' x 18" x 6'	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	Grainger.com	
			1	FSS	\$200.00	4' x 18" x 6'	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	Grainger.com	
			1	Welding shop	\$200.00	4' x 18" x 6'	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	Grainger.com	
	Book case (continued)	Fed Log Grainger Inc	2	Org. Maintenance	\$200.00	4' x 18" x 6'	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	Grainger.com	

			1	X-Ray	\$200.00	4' x 18" x 6'	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	Grainger.com	
			1	Optical	\$200.00	4' x 18" x 6'	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	Grainger.com	
			2	Heavy Weapons	\$200.00	4' x 18" x 6'	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	Grainger.com	
			2	Light Weapons	\$200.00	4' x 18" x 6'	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	Grainger.com	
			1	Inspections Building	\$200.00	4' x 18" x 6'	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	Grainger.com	
51	Metal storage container	Fed Log Grainger Inc	1	Org. Maintenance	\$600.00	4' x 4' x 6'	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	Grainger.com	51
			1	Heavy Weapons	\$600.00	4' x 4' x 6'	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	Grainger.com	
			1	Light Weapons	\$600.00	4' x 4' x 6'	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	Grainger.com	
52	Welding table	Weld Plus	1	Welding shop	\$1,500.00	84" diameter	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	Mod. 24B3E30-EX, rotating, electric lift, 115v	52
53	Storage rack	Hyster	1	Org. Maintenance	\$641.03	96" x 96" x 48"	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	H 6939, 4 level	53
			1	Heavy Weapons	\$641.03	96" x 96" x 48"	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	H 6939, 4 level	
			1	Light Weapons	\$641.03	96" x 96" x 48"	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	H 6939, 4 level	
54	Storage rack	Hyster	1	Org. Maintenance	\$188.70	22" x 22" x 84"	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	HHSR-2284, 9 level, 2400lbs cap.	54
			1	Heavy Weapons	\$188.70	22" x 22" x 84"	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	HHSR-2284, 9 level, 2400lbs cap.	
	Storage rack (continued)	Hyster	1	Light Weapons	\$188.70	22" x 22" x 84"	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	HHSR-2284, 9 level, 2400lbs cap.	

55	Storage rack	Hyster	1	Org. Maintenance	\$63.99	40" x 40"	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	H13-HSR, 500lbs/opening (36)	55
			1	Heavy Weapons	\$63.99	40" x 40"	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	H13-HSR, 500lbs/opening (36)	
			1	Light Weapons	\$63.99	40" x 40"	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	H13-HSR, 500lbs/opening (36)	
56	deleted						<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>		56
57	deleted						<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>		57
58	deleted						<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>		58
59	deleted						<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>		59
60	Cabinet, fireproof	A Plus Material Handling	1	Welding shop	\$710.00	31 1/4" x 31 1/4" x 65"	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	XD 5038, 2 shelf	60
61	Master mechanic toolkit	GSA	1	Machine Shop	\$1,872.48		<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	5180-00-699-5273	61
			1	Chemical Refinishing	\$1,872.48		<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	5180-00-699-5273	
			1	FSS	\$1,872.48		<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	5180-00-699-5273	
			1	Org. Maintenance	\$1,872.48		<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	5180-00-699-5273	
			1	X-Ray	\$1,872.48		<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	5180-00-699-5273	
			1	Magnetic	\$1,872.48		<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	5180-00-699-5273	
	Master mechanic toolkit (continued)	GSA	1	Heavy Weapons	\$1,872.48		<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	5180-00-699-5273	

			1	Light Weapons	\$1,872.48		<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	5180-00-699-5273	
62	Mobile toolbox	GSA	1	Machine Shop	\$175.63	26 3/8" x 18" x 34"	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	5140-01-010-4776	62
			1	FSS	\$175.63	26 3/8" x 18" x 34"	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	5140-01-010-4776	
			1	Welding Shop	\$175.63	26 3/8" x 18" x 34"	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	5140-01-010-4776	
			1	Org. Maintenance	\$175.63	26 3/8" x 18" x 34"	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	5140-01-010-4776	
			1	Heavy Weapons	\$175.63	26 3/8" x 18" x 34"	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	5140-01-010-4776	
			1	Light Weapons	\$175.63	26 3/8" x 18" x 34"	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	5140-01-010-4776	
63	Weapons cleaning machines	Safety Kleen	2	Machine Shop	\$140.69	24 1/4" x 35 3/4" x 35 3/8"	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	Mod. 34 w/all fluids and service support for HAZMAT removal	63
			1	FSS	\$140.69	24 1/4" x 35 3/4" x 35 3/8"	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	Mod. 34 w/all fluids and service support for HAZMAT removal	
			2	Org. Maintenance	\$140.69	24 1/4" x 35 3/4" x 35 3/8"	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	Mod. 34 w/all fluids and service support for HAZMAT removal	
			1	X-Ray	\$140.69	24 1/4" x 35 3/4" x 35 3/8"	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	Mod. 34 w/all fluids and service support for HAZMAT removal	
			2	Heavy Weapons	\$140.69	24 1/4" x 35 3/4" x 35 3/8"	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	Mod. 34 w/all fluids and service support for HAZMAT removal	
			2	Light Weapons	\$140.69	24 1/4" x 35 3/4" x 35 3/8"	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	Mod. 34 w/all fluids and service support for HAZMAT removal	
	Weapons cleaning machines (cont.)	Safety Kleen	28	Turn-In/Issue	\$140.69	24 1/4" x 35 3/4" x 35 3/8"	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	Mod. 34 w/all fluids and service support for HAZMAT removal	
64	30 gal. Container	McMaster-Carr Supply Co.	6	Machine Shop	\$68.08	18 1/4" x 27 1/2"	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	4482T16; HAZMAT approved, steel	64

			3	FSS	\$68.08	18 1/4" x 27 1/2"	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	4482T16; HAZMAT approved, steel	
			6	Org. Maintenance	\$68.08	18 1/4" x 27 1/2"	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	4482T16; HAZMAT approved, steel	
			3	X-Ray	\$68.08	18 1/4" x 27 1/2"	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	4482T16; HAZMAT approved, steel	
			6	Heavy Weapons	\$68.08	18 1/4" x 27 1/2"	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	4482T16; HAZMAT approved, steel	
			6	Light Weapons	\$68.08	18 1/4" x 27 1/2"	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	4482T16; HAZMAT approved, steel	
			41	Turn-In/Issue	\$68.08	18 1/4" x 27 1/2"	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	4482T16; HAZMAT approved, steel	
65	deleted						<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>		65
66	Secure cabinet	McMaster-Carr Supply Co.	1	Org. Maintenance	\$1,383.05	48" x 19 1/8" x 52"	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	46085T12; 1/8: thick, double deadbolt, 1/2"hasp, lifting lugs	66
			1	X-Ray	\$1,383.05	48" x 19 1/8" x 52"	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	46085T12; 1/8: thick, double deadbolt, 1/2"hasp, lifting lugs	
			1	Optical	\$1,383.05	48" x 19 1/8" x 52"	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	46085T12; 1/8: thick, double deadbolt, 1/2"hasp, lifting lugs	
			1	Heavy Weapons	\$1,383.05	48" x 19 1/8" x 52"	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	46085T12; 1/8: thick, double deadbolt, 1/2"hasp, lifting lugs	
			1	Stock Room	\$1,383.05	48" x 19 1/8" x 52"	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	46085T12; 1/8: thick, double deadbolt, 1/2"hasp, lifting lugs	
	Secure cabinet (continued)	McMaster-Carr Supply Co.	1	Light Weapons	\$1,383.05	48" x 19 1/8" x 52"	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	46085T12; 1/8: thick, double deadbolt, 1/2"hasp, lifting lugs	
67	Surface plate	Mitutoyo 36"	1	Machine Shop	\$2,000.00	36" x 36"x 6"	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	900lbs	67
68	Refinishing tank	custom	5	Refinishing Shop	\$1,000.00	3' x 6' x 3'	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	drain plug 2" off bottom, on legs/stand	68

69	Overhead hoist	Jet/Northern Tools Co.	1	Chemical Refinishing	\$1,399.99	n/a	115/230 Volts	no	no	no	no	1ton cap., 10' lift, 8' control	69
			1	Welding Shop	\$1,399.99	n/a	115/230 Volts	no	no	no	no	1ton cap., 10' lift, 8' control	
70	Package scan X-Ray	1.5M x 1.5M cargo x-ray scanner	1	Inspections Building	\$130,000.00	109"x 286" x 80"	230V 3 phase; 2 KVA	no	no	no	no	3100 lbs	70
71	Metal detectors	PD 6500 walk through detector	1	Weapons Facility Lobby	\$5,000.00	35" x 23" x 87"	240V 1 phase; 5 wat	no	no	no	no	Main entrance and loading dock area; 139 lbs	71
		PD 6500 walk through detector	1	Inspections Building	\$5,000.00	35" x 23" x 87"	240V 1 phase; 5 wat	no	no	no	no	Main entrance and loading dock area; 139 lbs	
72	deleted												72
73	deleted												73
74	Digital profile projector	Mitutoyo QC220	1	Machine Shop	\$7,500.00		no	no	no	no	no	Projector on cart	74
75	Linear height gage	Mitutoyo 518-201	1	Machine Shop	\$2,400.00		no	no	no	no	no		75
76	Indicators	Mitutoyo	8	Machine Shop	\$200.00		no	no	no	no	no	Software	76
77	Post processors	FeatureMILL 3D	1	Machine Shop	\$13,995.00		no	no	no	no	no	Software	77
78	Post processors	SolidM Module 3D	1	Machine Shop	\$1,495.00		no	no	no	no	no	Software	78
79	Post processors	Fetaure TURN	1	Machine Shop	\$4,995.00		no	no	no	no	no	Software	79
80	Post processors	SolidM module 2.5D	1	Machine Shop	\$1,495.00		no	no	no	no	no	Software	80
81	Post processors	FeatureMILL Network	1	Machine Shop	\$3,000.00		no	no	no	no	no	Software	81

82	Tech support/upgrades	FeatureMILL 3D	1	Machine Shop	\$2,695.00		<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	Software	82
83	Micrometer	Mitutoyo 293-369	6	Facility	\$169.00		<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	Software	83
84	Micrometer	Mitutoyo 293-370	4	Facility	\$210.00		<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	Handheld tools	84
85	Micrometer	Mitutoyo 293-371	3	Facility	\$250.00		<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	Handheld tools	85
86	Micrometer	Mitutoyo 293-372	2	Facility	\$270.00		<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	Handheld tools	86
87	Hardness tester	Fowler ARK521	1	Machine Shop	\$10,950.00	8" x 18" x 13"	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	Table top and manually operated	87
88	Hand tools		1	Facility	\$7,000.00		<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	Handheld tools	88
89	End mill set, etc.		1	Machine Shop	\$65,000.00	45" x 28" x 61"	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	Cabinet for tools	89
90	Laser micrometer	Mitutoyo LSM9506	2	Machine Shop	\$10,000.00		<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	Handheld tools	90
91	Overhead electrical hoist	Grainger Inc, Kelly Sales	1	Welding Shop	\$1,200.00		115/230V	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>		91
92	deleted						<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>		92
93	Sheetmetal toolkit	UNICOR	2	Machine Shop	\$1,576.45		<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>		93
94	Welder toolkit	GSA	3	Welding shop	\$405.07		<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>		94
95	Machinist toolbox	GSA	6	Machine Shop	\$119.22		<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>		95
96	Mechanic toolbox, small	GSA	6	Machine Shop	\$96.07		<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>		96

			2	Chemical Refinishing	\$96.07		<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>		
			2	FSS	\$96.07		<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>		
			2	Welding Shop	\$96.07		<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>		
			4	Org. Maintenance	\$96.07		<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>		
			2	X-Ray	\$96.07		<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>		
			2	Magnetic	\$96.07		<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>		
			2	Optical	\$96.07		<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>		
			4	Heavy Weapons	\$96.07		<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>		
			4	Light Weapons	\$96.07		<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>		
97	Weapons storage units		200	Vaults	\$500		<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	97	
98	Arbor press	Dayton	1	Machine Shop	\$227.00	8" x 18" x 13"	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	Table top and manually operated	98
99	Vapor trace machine		-	Inspections Building		-	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	<u>no</u>	Hand held device	99

POINT OF CONTACT

Equipment POC Listing

SUBJECT	ORGANIZATION	POC	PHONE #	EMAIL	REMARKS
Arm. Facility	Facility Manager, SME				
	SOCOM				
	USASOC				
	USASOC Physical Security				
	SPT BN Project Manager				
AIT	Army Logistics Agency (DA); AIT Tech Managers				
	Automated Identification Systems (AIS)	Mike Nolan	800-247-1177; (614)-432-3300; FAX (614)-431-3307	miken@ais-co.com	www.ais-co.com
Modular Storage (STAKK Sys.; Mezzanine Sys.)	Stanley Vidmar	Ryan Schneider	899-523-9482 ext 38556 FAX: 843-388-0209	Rschneider@stanleyworks.com	Facility Uses: Main Vault, Parts Storage room
	TF 180th SOAR, F CO	CW4 Mark Broxterman, SFC Harris	COMM: (270)-798-1082/1251; DSN prefix 635		Arm. Facility Uses: Main Vault, Parts Storage room
Ultra Sonic Weapon Cleaners	I. Shor International	20 Parkway West, Mt. Vernon, NY 10552	(914)-667-1100; FAX (914)-667-0190	shorinternational@attglobal.net	
	Aitronic	Eric Heilbors	(201)-512-8056		
	TEDELLA Inc	Claire Carlson, Tronix Div of TED	(803)-478-8984	eclairsc@yahoo.com	
	Ultrasonics USA	750 Corporate Dr. Mahwah, NJ	1-800-262-6262; FAX (201) 529-2176	sales@ultrasonicsusa.com	
X-Ray	Eastern MTD	Joseph Monroe (GM)	(804)-458-1661		
	TEDELLA Inc	Claire Carlson, Tronix Div of TED	(803)-478-8984	eclairsc@yahoo.com	

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Equipment POC Listing

Magnetic Particle Inspection	Eastern MTD	Joseph Monroe (GM)	(804)-458-1661		
	TEDELLA Inc	Claire Carlson, Tronix Div of TED	(803)-478-8964	eclairsc@yahoo.com	
Heat Treating Ovens	Consolidated Equipment Inc.	PO BOX 415, St Claire, MI 48079	(810)-329-5800; (810)-329-5875		www.consequip.com
	Lucifer Furnace Inc.		1-800-378-0095		2048 Bunnell Rd, Warrington, PA 18976
	Baker Furnace Inc.		1-800-237-5675	sales@bakerfurnace.com	www.bakerfurnace.com
Fork Lift	Gregory Pool Equipment Co.	Kevin Hatfield	(910)-977-3140; FAX (910)-424-0022		Catterpillar Forklifts; Hope Wells, NC
	Hyster	Lacie Taylor	(910) 893-5030 (H)		www.hysterinc.com
Sand Blaster	Trinco Tool Company	34600 Commerce Rd, Fraser, MI 48026	1-800-5-TRINCO		
	I. Shor International	20 Parkway West, Mt. Vernon, NY 10552	(914)-667-1100; FAX (914)-667-0190	shorinternational@attglobal.net	
	Weld Plus	4766 River Rd, Cincinnati, OH 45233	1-800-288-8414; FAX: (513) 467-3585	welplus@weldplus.com	www.weldplus.com
	Thomas Regional	5 Penn Plaza, New York, NY 10552			www.thomasregional.com
	Kehm Equipment Inc.	5415 W. 59th Av, Unit F, Arvada, CO 80003	(303) 422-6000; FAX (303) 422-6023	sales@kehm.com	www.kehm.com
Down Draft Table	Air Flow Systems Down Draft	11370 Pagemill Rd, Dallas, TX 75243-8306	1-800-818-6185; (214) 503-8008		
Tog/Tow Motor	North Western Motor Co Inc.	1125 Starr Av, Egan Claire, WI 54703	(715)-835-3151		
	Hyster	Lacie Taylor	(910) 893-5030 (H)		www.hysterinc.com
Dust Chamber, Environmental Chamber	I. Shor International	20 Parkway West, Mt. Vernon, NY 10552	(914)-667-1100; FAX (914)-667-0190	shorinternational@attglobal.net	
Machine Shop	Bridgeport	Fayetteville, NC			www.bpt.com
	Grainger				www.grainger.com
	Tormax				www.bpt.com (look for a link)
	Penn Tool Co.	1776 Springfield Av., Maplewood, NJ 07040	1-800-526-4956; FAX 973-761-1494	info@penntoolco.com	www.penntoolco.com
	EZPATH				www.bpt.com (look for a link)
	US Industrial Machines				www.usindustrialmachines.com

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Equipment POC Listing

Welding Shop	Weld Plus	4766 River Rd, Cincinnati, OH 45233	1-800-288-9414; FAX: (513) 467-3585	welplus@weldplus.com	www.weldplus.com
	Grainger	Fayetteville, NC			www.grainger.com
	Shop Inc				http://autopen.safeshopper.com
	Thermal Arc				www.thermalarc.com
	Miller Electric Distributing Co.	508 Eastern Blvd., Fayetteville, NC 28311	(910) 483-1451 / 0169		http://miller.info.net; www.millerweids.com
	Victor Equipment				www.victorequip.com
	Stoody				www.stoody.com
Tables, Cabinets, Shelving, Racks, Fittings	A Plus Material Handling				
	Grainger	Fayetteville, NC			www.grainger.com
	Calico	PO BOX 2005, Annapolis Junction, MD 20701	1-800-638-0829; FAX (301) 498-2056		
	Hyster	Lacle Taylor	(910) 893-5030 (H)		www.hystermideast.com
Architects	Knight Architects				
IMO	DCSIM				
DCSENGR	DCSENGR				

DRAFT

SHOP EQUIPMENT SPECIFICATIONS

LINE ITEM #1
SWISS TURNING CENTER

STANDARD MACHINE SPECIFICATIONS:

Max. machining diameter	32mm(1.26")
Max. machining length per chuck	320mm(12.6")
Max. drilling diameter	16mm(0.63")
Max. threading diameter(dap & die)	M12(0.47")
Spindle speed	130-6,000rpm
Spindle speed change	S4-digits direct command
Rotary Spindles:	
Max. drilling dia.	10mm(0.393")
Max. threading dia.	M8(0.315")
Spindle speed	225-4,460rpm (S4-digits direct command)
Backwork:	
Max. chucking dia. of Back spindle	32mm(1.26")
Max. backwork length	320mm(12.6")
Max. drilling dia.	12mm(0.47")
Max. threading dia.	M12(0.47")
Back spindle speed	150-5,000rpm (S4-digits direct command)
Number of tools installable (additional with special multi-tools)	20 (two decagonal turrets) (20 sets each)
Number of turret indexes	10x2 sets/turret
Tool holders	36mm-12mm dia pin positioning
Tool size:	16 x 16 x 90mm
Rapid traverse rate:	
X1 and X2 axes	12 meters(472.44")/minute
Z1 Z2 and Z3 axes	16 meters(630")/minute
Y axis	10 meters(393.7")/minute
C axis	100 rpm
Least input increments:	
X1 and X2 axes	0.001mm(0.0001") dia.
Z1 Z2 and Z3 axes	0.001mm(0.0001")
Y axis	0.001mm(0.0001")
C axis	0.001°
Standard bar length	2,500mm(12')
Center height	1,040mm(40.94")
Motors:	
Main spindle drive	5.5kw(7.5H) AC spindle motor
Back spindle drive	2.2kw(3.0HP) AC spindle motor
Rotary spindle drive (Turret 1)	1.5kw(2.0HP) inverter motor
Rotary spindle drive (Turret 2)	0.75kw(1.0HP) AC spindle motor
Turret indexing	1.0kw(1.4 HP) x 2
Hydraulic power unit	1.5kw(2.0HP)
Coolant	0.4kw(0.54HP)
Lubricant	0.004kw(0.005HP)
Power supply	16KVA
Weight	4,200kg(9240 lbs)

STANDARD ACCESSORIES:

- *Synchronous rotary guide bushing unit
- *Chucking unit
- *Rotary guide bushing drive unit
- *C-axis controlling unit
- *Rotary spindle drive unit for Turret 1
- *Rotary spindle drive unit for Turret 2
- *Back spindle unit
- *Back spindle chucking unit
- *Workpiece separator
- *Coolant unit
- *Hydraulic unit
- *Lubricant unit
- *Door switch

STANDARD CNC FUNCTIONS

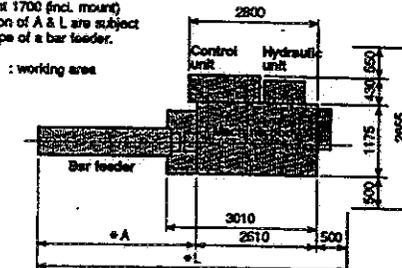
CNC unit:	Cincom SystemIV
Display monitor:	14" color CRT
Number of axes to be controlled:	7 axes (X ₁ , X ₂ , Z ₁ , Z ₂ , Z ₃ , C ₁ , Y)
N. of control lines:	3 lines
Command input:	incremental & absolute
Feed command:	feed per revolution & feed per minute
Tool offsets:	80 pairs
Program memory:	equivalent to 40 meters of tape length
I/O interface:	RS232C

- Chamfering, corner rounding
- Balanced cut
- Simultaneous threading of different pitches
- Cross machining
- Synchronizing controlling axes
- Superimposing controlling axes
- Hobbing cycle (G114.3)
- Polygonal cutting cycle (G114.2)
- Background editing

◆All specifications are subject to change without prior notice.

FLOOR LAYOUT

max. height 1700 (incl. mount)
* Dimension of A & L are subject to the type of a bar feeder.



unit: mm

CITIZEN WATCH CO., LTD.

Precision Machinery Div.

440 Shimotomi, Tokorozawa-shi, Saitama-ken 359-8511, JAPAN Tel: 81-42-942-6268 Fax: 81-42-942-9190

U.S.A. & CANADA MARUBENI CITIZEN-CINCOM INC.

SINGAPORE OFFICE CITIZEN WATCH CO., LTD. SINGAPORE

EUROPE CITIZEN MACHINERY EUROPE GmbH

HONG KONG OFFICE CITIZEN MACHINERY HONG KONG

Tel: 1-201-818-0100

Tel: 65-732-3655

Tel: 49-711-3906-100

Tel: 852-2357-1681

Fax: 1-201-818-1877

Fax: 65-734-8377

Fax: 49-711-3906-106

Fax: 852-2357-1021

All specifications are subject to change without prior notice.

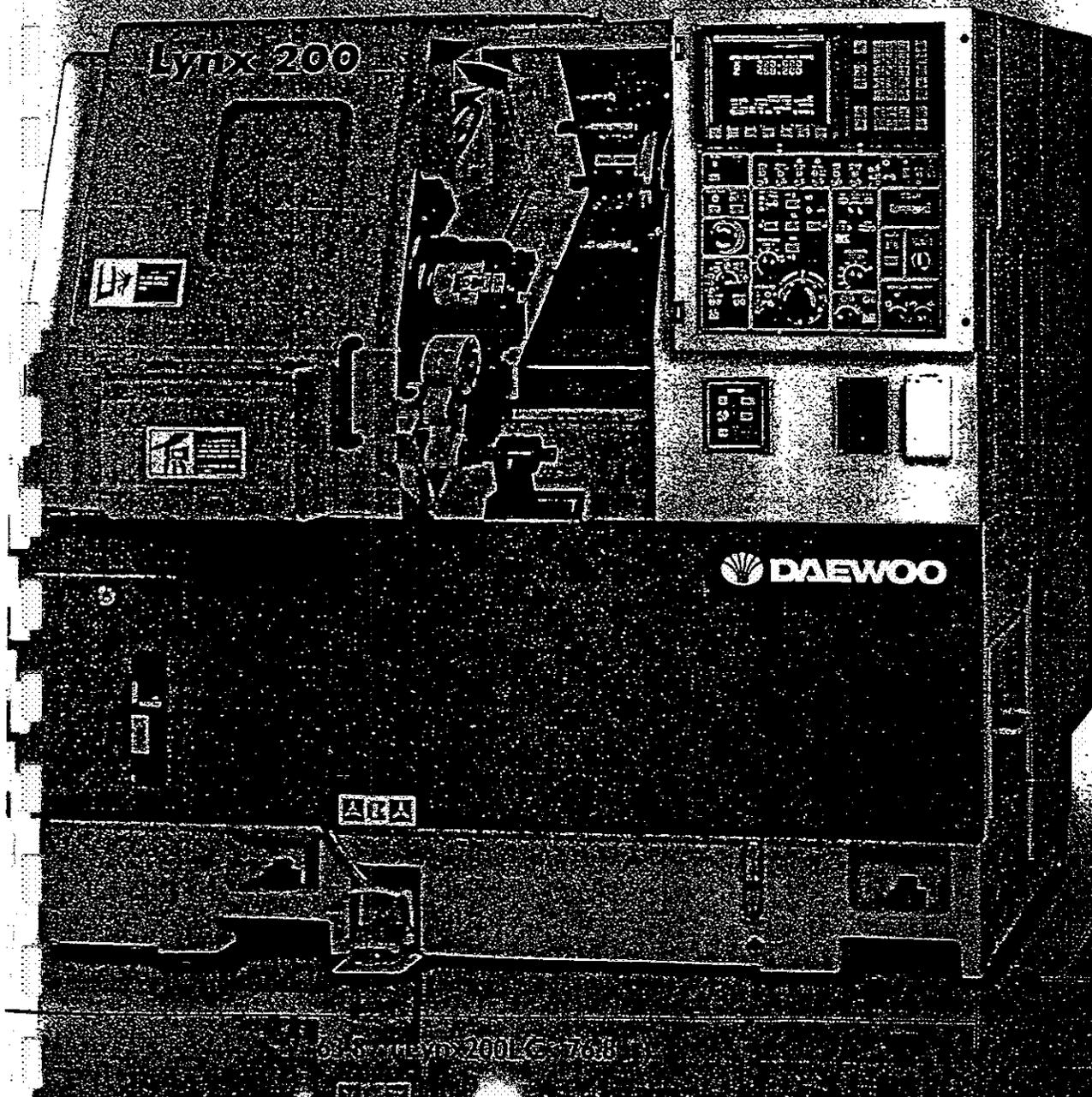
**SOF Weapons Training Facility
Fort Bragg, North Carolina**

DACA21-03-R-0024

**LINE ITEM #2
CNC TURNING CENTER, LARGE**

LINE ITEM #3
CNC TURNING CENTER, SMALL

Requires Little Space...
Acquires Big Productivity!



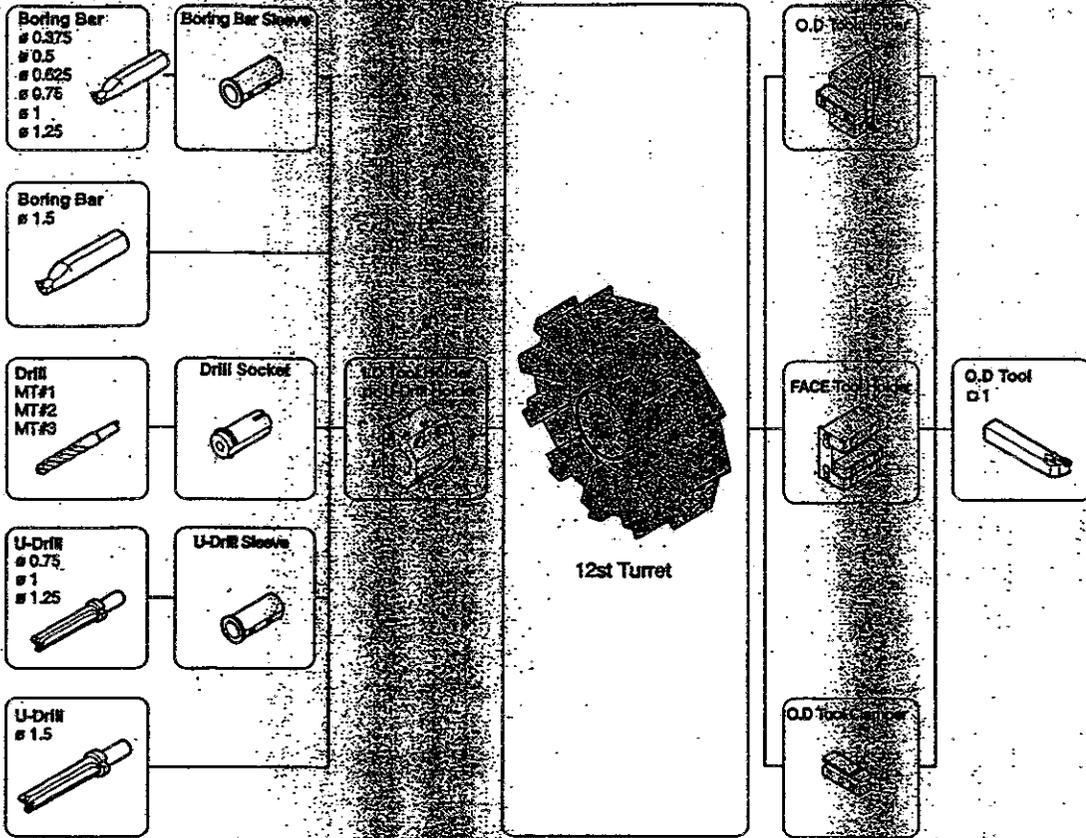
61.0"

DAEWOO Lydex 200 LC 7638

Tooling System

Lynx 200A/B/LC

unit : inch

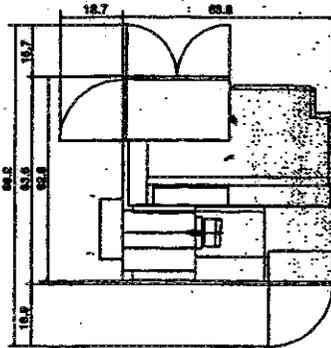


* I.D. Tool holder can easily be converted U-Drill holder by adding a back cover.

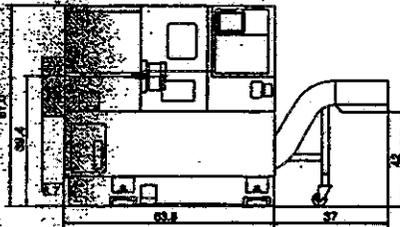
External Dimensions

unit : inch

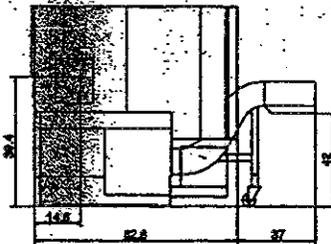
Lynx 200A/B
Top View



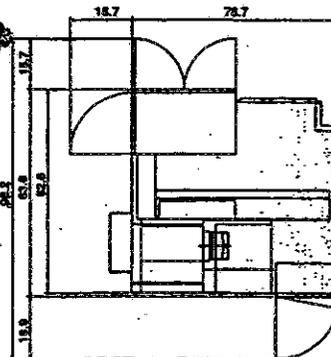
Front View



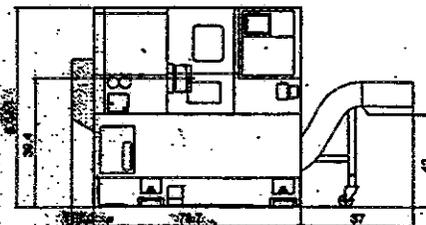
Side View



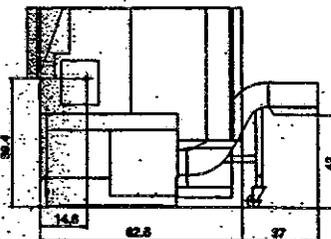
Lynx 200LC
Top view



Front View



Side View



**SOF Weapons Training Facility
Fort Bragg, North Carolina**

DACA21-03-R-0024

**LINE ITEM #4
VERTICAL MACHINING CENTER**

**SOF Weapons Training Facility
Fort Bragg, North Carolina**

DACA21-03-R-0024

**LINE ITEM #5
ENGINE LATHE**

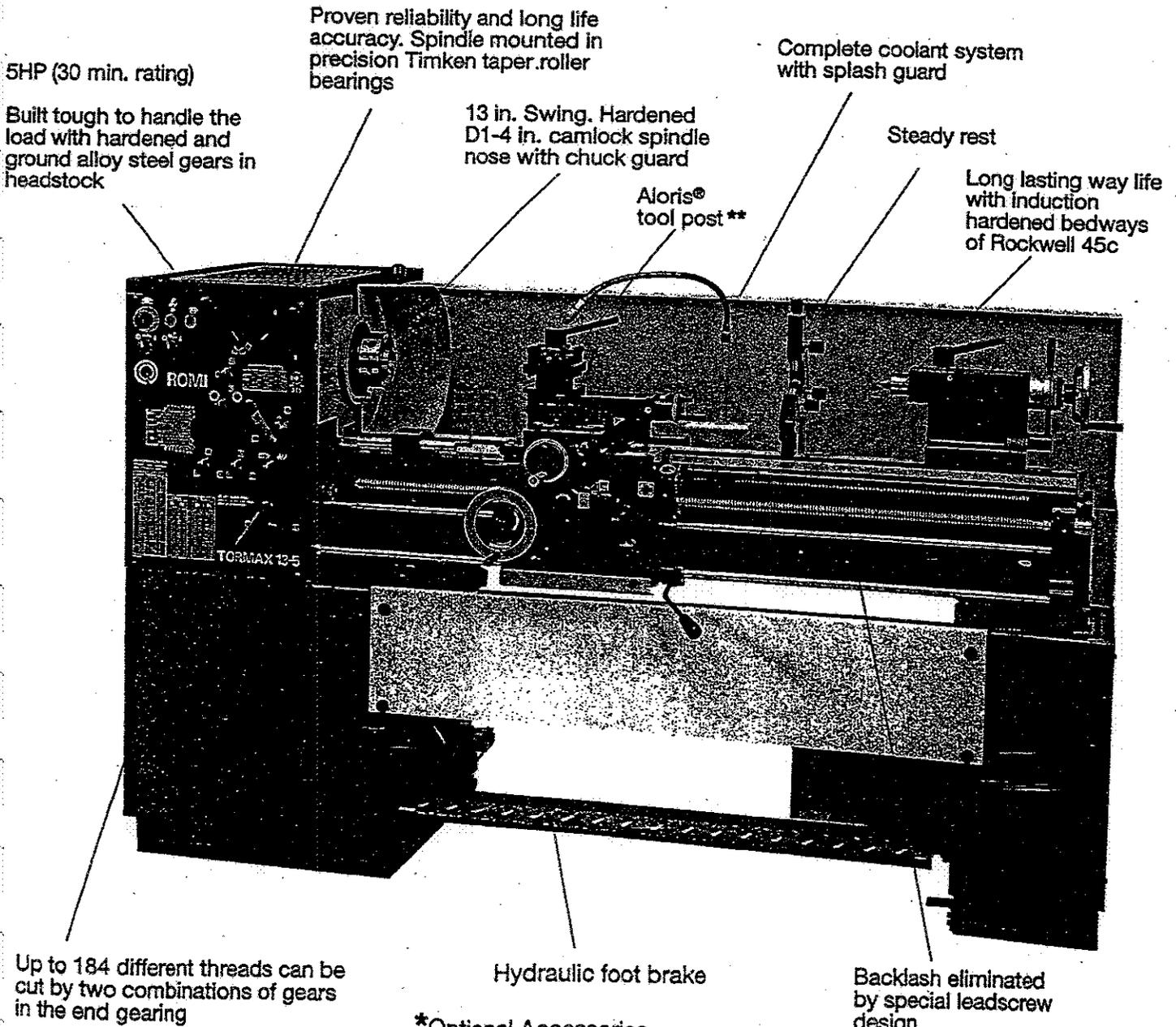
Bridgeport

ROMI TORMAX 13-5 & 16-8 Engine Lathes by Bridgeport

- **Rigid Design**
- **Accurate**
- **Easy to Run**

TORMAX 13-5 (40/60 in. Beds)

- **Quality and workmanship guaranteed.** Final bed alignment and geometry meets ISO/DR 1708 Standards. Built under continuous inspection during manufacturing and assembly. ISO 9001 Certified.
- **Full support.** Bridgeport backs every machine with nationwide parts, accessories, service and application engineering support.



5HP (30 min. rating)

Built tough to handle the load with hardened and ground alloy steel gears in headstock

Proven reliability and long life accuracy. Spindle mounted in precision Timken taper roller bearings

13 in. Swing. Hardened D1-4 in. camlock spindle nose with chuck guard

Complete coolant system with splash guard

Steady rest

Aloris® tool post**

Long lasting way life with induction hardened bedways of Rockwell 45c

Up to 184 different threads can be cut by two combinations of gears in the end gearing

Hydraulic foot brake

Backlash eliminated by special leadscrew design

*Optional Accessories

**Optional Romi Tool Post Shown

SOF Weapons Training Facility
Fort Bragg, North Carolina

DACA21-03-R-0024

LINE ITEM #6
BARREL TURRET LATHE

Built For Speed & Convenience

EZPATH FEATURES:

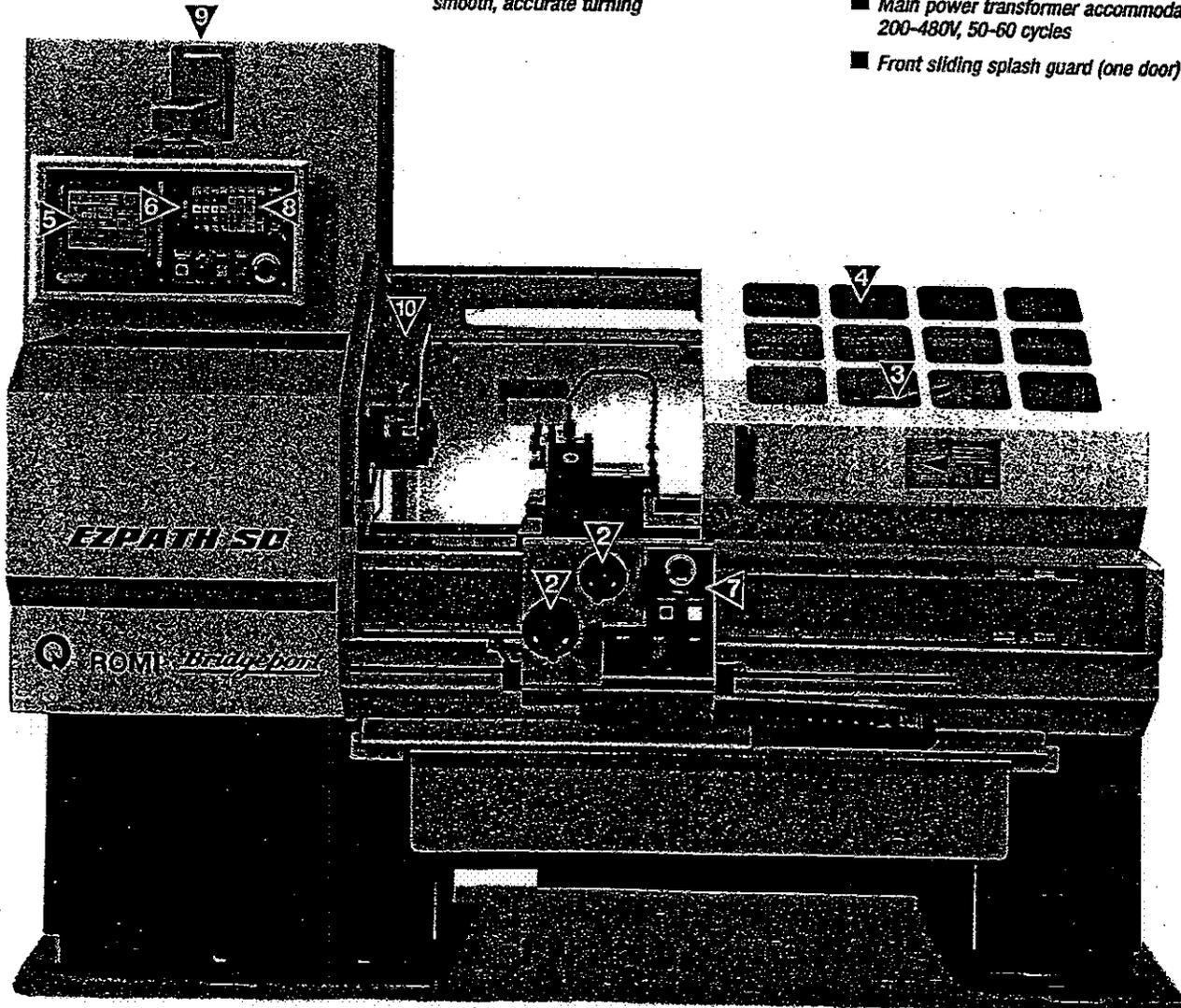
- 1 Two-speed variable AC motor with direct-driven CNC headstock on EZPATH SD & IISD for powerful, smooth and quiet operation
- 2 Dual electronic handwheels can be set to move with the carriage or disengaged to slide on their own track
- 3 Manual tailstock with dual clamps and tang stop for heavy drilling, inch and metric quill graduations
- 4 Standard sliding door is tilted back, with a large window, for a clear view of the work area
- 5 Bridgeport 2-axis control with 9-inch grayscale monitor
- 6 Built-in disk drive and RS-232 port

- 7 Remote operator panel conveniently mounted on the apron
- 8 Sealed keyboard
- 9 Single-unit CNC controller can be removed for easy maintenance
- 10 Chuck guard

Additional Features:

- Spindle control lever with dynamic brake within easy reach
- All cast iron construction
- Optional spindles with large through-holes for EZPATH SD and EZPATH IISD
- Precision ballscrews
- Induction hardened & ground ways with Turcite-coated saddle and cross slide for smooth, accurate turning

- Automatic lubrication system
- CNC headstock features two angular contact spindle bearings in front, one large roller bearing in the rear for precise accuracy and repeatability. All bearings are synthetically greased for life
- Headstock provides a variable speed motor with constant surface speed control
- Coolant system with 3/4 HP (0.54 Kw) pump and 25-gallon (95 liter) tank
- Rear splash guard with removable door
- Removable chip pan for easy cleaning
- Indexable tool post and holder set for square cutting tools and boring bars
- Sealed work-light panel spans the bed length to provide bright illumination of entire turning area
- Main power transformer accommodates 200-480V, 50-60 cycles
- Front sliding splash guard (one door)



Specifications

EZPATH SD

EZPATH IISD

EZPATH IIIS

EZPATH IIISL

CAPACITY	EZPATH SD	EZPATH IISD	EZPATH IIIS	EZPATH IIISL
Height of centers	8.46 in. (215 mm)	10.03 in. (255 mm)	11.41 (290 mm)	13.77 in. (350 mm)
Distance between centers	40 in. (1000 mm)	40, 60 or 80 in. (1000, 1500 or 2000 mm)	40, 80 or 120 in. (1000, 2000 or 3000 mm)	40, 80 or 120 in. (1000, 2000 or 3000 mm)
Swing over bed	17 in. (431 mm)	20 in. (508 mm)	23 in. (584 mm)	27 in. (686 mm)
Swing over cross slide	8 in. (203 mm)	10 in. (254 mm)	12.59 in. (320 mm)	16.53 in. (420 mm)
Swing over carriage wings	15.75 in. (400 mm)	17.7 in. (450 mm)	17.3 (440 mm)	21.25 in. (540 mm)
Cross-slide (X) travel	8.66 (220 mm)	11 in. (280 mm)	12.59 in. (320 mm)	14.96 in. (380 mm)

BED	EZPATH SD	EZPATH IISD	EZPATH IIIS	EZPATH IIISL
Width	12 in. (305 mm)	13.5 in. (340 mm)	15 in. (380 mm)	15 in. (380 mm)
Height	13 in. (332 mm)	12.5 in. (320 mm)	15 in. (380 mm)	15 in. (380 mm)

HEADSTOCK	EZPATH SD	EZPATH IISD	EZPATH IIIS	EZPATH IIISL
Spindle nose	A2-5 ASA	A2-6 ASA	A2-8 ASA	A2-8 ASA
Hole diameter through spindle	2.08 in. (53 mm)	2.5 in. (65 mm)	3.15 in (80 mm)	3.15 in (80 mm)
Range of spindle speeds	50 to 4000 RPM	40 to 3000 RPM	32 to 2500 RPM	25 to 2000 RPM
Range I	50 to 2000 RPM	40 to 1500 RPM	32 to 625 RPM	25 to 500 RPM
Range II	100 to 4000 RPM	80 to 3000 RPM	32 to 1250 RPM	500 to 2000 RPM
Spindle nose - Option 1	A2-6 ASA	A2-8 ASA	■	■
Hole diameter through spindle	2.56 in. (65 mm)	3.15 in. (80 mm)	■	■
Range of spindle speeds	40 to 3000 RPM	20 to 2000 RPM	■	■
Range I	40 to 1500 RPM	20 to 1000 RPM	■	■
Range II	80 to 3000 RPM	40 to 2000 RPM	■	■
Spindle nose - Option 2	D1-6 CAMLOCK	D1-8 CAMLOCK	■	■
Hole diameter through spindle	2.56 in. (65 mm)	3.15 in. (80 mm)	■	■
Range of spindle speeds	40 to 3000 RPM	20 to 2000 RPM	■	■
Range I	40 to 1500 RPM	20 to 1000 RPM	■	■
Range II	80 to 3000 RPM	40 to 2000 RPM	■	■

FEEDS	EZPATH SD	EZPATH IISD	EZPATH IIIS	EZPATH IIISL
Longitudinal rapid traverse (z-axis)	394 ipm (10,000 mmprm)	394 ipm (10,000 mmprm)	394 ipm (10,000 mmprm)	394 ipm (10,000 mmprm)
Cross rapid traverse (x-axis)	295 ipm (7500 mmprm)	295 ipm (7500 mmprm)	295 (7500 mmprm)	295 (7500 mmprm)

TAILSTOCK	EZPATH SD	EZPATH IISD	EZPATH IIIS	EZPATH IIISL
Maximum quill travel	4.7 in. (120 mm)	5.11 in. (130 mm)	7.08 in. (180 mm)	7.08 in. (180 mm)
Quill diameter	2.36 in. (60 mm)	3.15 in. (80 mm)	3.94 in. (100 mm)	3.94 in. (100 mm)
Quill taper hole	4 MT	4 MT	5 MT	5 MT

MOTOR	EZPATH SD	EZPATH IISD	EZPATH IIIS	EZPATH IIISL
Main motor	10 HP (7.3 Kw)	15 HP (11 Kw)	20 HP (15 Kw)	20 HP (15 Kw)

DIMENSIONS AND WEIGHTS	EZPATH SD	EZPATH IISD	EZPATH IIIS	EZPATH IIISL
Footprint space required (approx.)	51" x 98" (1300 x 2500 mm)	60" x 107" (1524 x 2700 mm)	63" x 107" (1600 x 2700 mm)	63" x 107" (1600 x 2700 mm)
Approximate net weight	4000 lbs. (1814 kg)	6284 lbs. (2850 kg)	7040 lbs. (3190 kg)	7040 lbs. (3190 kg)

Dimensions and specifications throughout this booklet subject to change without prior notice

Notice: Bridgeport Machines, Inc. provides instructions for the safe use of this equipment. Operation of this equipment may cause injury if the protective devices are removed. A comprehensive safety manual is included with all machines offered by Bridgeport Machines, Inc. and recommended safe operating procedures must be adhered to.



www.bpt.com

Manufactured by

ROMI

Sales and Service by

Bridgeport

500 Lindley Street • Bridgeport, CT 06606
Call toll-free 1-800-243-4292 • www.bpt.com

**SOF Weapons Training Facility
Fort Bragg, North Carolina**

DACA21-03-R-0024

**LINE ITEM #8
MILL**

Bridgeport

THE SERIES I

Versatile long-term performance from the original all-purpose mill. For over 50 years, the Bridgeport manual mill has been the "original first step" in machining for metalworking shops throughout the world.

3-HP motor, completely balanced. Nickel-plated motor shaft. No lubrication required.

Quill power feed is standard. Quill ($3\frac{1}{8}$ " dia.) is hard chrome-plated, hand lapped for accuracy and long life.

Quick release micrometer adjust.

Spindle taper is ground while on its own ABC Class 7 bearings, eliminating run out.

Ribbed cast table, precision ground, hand spotted.

Multiple, knee, and table locks for high rigidity.

Anti-friction bearings used throughout.

Gibs are full length of saddle and knee.

Bridgeport 50° angular ways, full bearing contact.

Metered one-shot lube system (see illustration, next page).

Bridgeport-patented airflow cooling design uses no external fans (see illustration, next page).

Bull and pinion gear, completely balanced.

Ram and turret are precision ground for superior fit, extra rigidity. No shims or gibs used. Patented ram and turret locks.

Easy-to-read scales on the ram and turret.

EZ Reading dials on the table and cross-slide.

All alignment ways and gibs are completely hand scraped to within tenths of a thousandth, ensuring full bearing support. Single gib screw for easier adjustment.

Optional chrome-plated ways and gibs to ensure long life, an ideal lubricating surface and lowest possible coefficient of friction. Plated to MIL SPEC QQ-C-320 Class 2-A (exceeds Rockwell C-70).

Dished column base.

All Electrical Components



Listed or Recognized

MADE IN THE USA

The Industry Standard ... that keeps getting better.

The Bridgeport Series I Standard Mill is the original milling, drilling and boring machine. It's the mill that's completely manufactured, under strict quality control standards, in Bridgeport, Connecticut. We've built over 350,000 of them, and 50-plus years of experience and on-going refinement ensure that every Series I is the ultimate in rigidity and long life. Our one-piece column and base, integrally cast with added ribs, and our 2J head with its patented airflow cooling system, are just two of these innovations.

The long-term reliability of a Series I mill is the result of its design features, the quality of its components, and the craftsmanship of its hand-scraped ways and precision ground fits. We build every Bridgeport as though we're going to use it ourselves...even the paint finish is scrutinized before we ship it. That's why the resale value of a Bridgeport remains consistently high. The "bargain" imitators can't say that. Our competitive prices are a result of our higher volume...not from building a cheaper machine.

Bridgeport stands behind every Series I Standard Machine with the industry's best warranty: 24 months for parts, and 12 months for labor. Plus nationwide parts, service, and application engineering support are available through our network of select independent distributors and direct sales offices.

Bridgeport Machines, Inc. provides protective devices for the safe use of this equipment. Operation of this equipment may cause injury if the protective devices are removed. A comprehensive safety manual is provided with all machines offered by Bridgeport Machines, Inc. and recommended safe operating procedures must be adhered to.

SERIES I STANDARD

SPECIFICATIONS

Range	
Table travel (X-axis) with 48" table	36 in. (914 mm)
Saddle travel (Y-axis)	12 in.* (305 mm)
Quill travel	5 in. (127 mm)
Quill travel w/3rd axis	4.5 in. (114 mm)
Knee travel (Z-axis)	16 in. (406 mm)
Ram travel	12 in. (305 mm)
Throat distance (min.)	6.75 in. (171 mm)
Throat distance (max.)	18.75 in. (476 mm)
Table to spindle nose gage line (min.)	2.5 in. (64 mm)
Table to spindle nose gage line (max.)	18.25 in. (463 mm)
Max. weight of workpiece	750 lbs. (341 kg)

Table Size	
Standard	48 x 9 in. (1219 x 299 mm)
T-slots	3 @ 2.5 in. (64 mm) centers
T-slot size	0.625 in. (16 mm)
Height above floor (max.)	47.25 in. (1200 mm)

Spindle (2J Head)	
Power rating 30 min duty cycle	3 hp (2.2 kw)
Power rating continuous	2 hp (1.5 kw)

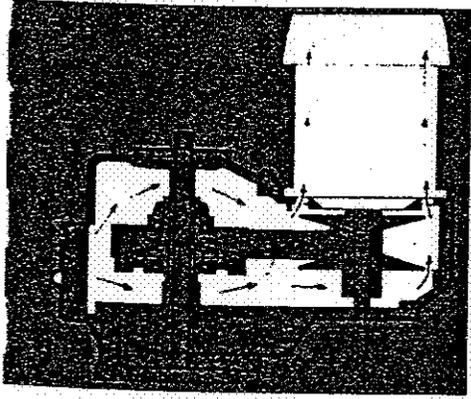
Drilling Capacity	
Power Quill Feed	3/8" Dia.
Manual Drilling Capacity	3/4" Mild Steel
Boring Range	6" Mild Steel
Quill Diameter	3 3/8"

Speed Range	
High (Infinitely Variable)	500 - 4200 rpm
Low	60 - 500 rpm
Power Quill Feed	0.0015 in/rev (0.038 mm)
Manual Adjust	0.003 in/rev (0.152 mm) 0.006 in/rev (0.152 mm)

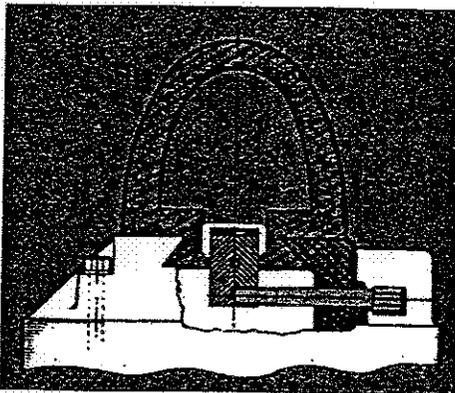
Space and Weight	
Floor Area	8.2 x 5.3 ft. (2.5 x 1.6 m)
Height	6.8 ft. (2.1 m)
Net Weight	2940 lbs. (1061 kg)
Shipping Weight	2900 lbs. (1315 kg)

Power	
Input power:	208/230/460 volts 3 phase, 50/60 cycles
Power Capacity:	4kVA
*Newall DRO 11.25" Travel	

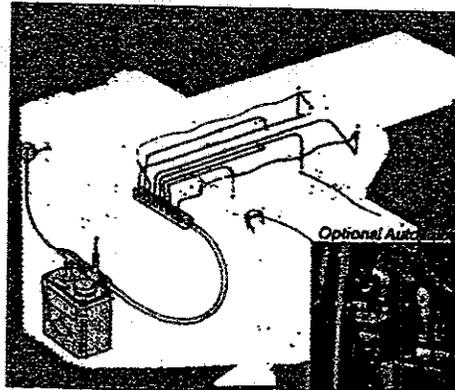
NOTE: Specifications subject to change without notice



Bridgeport's patented airflow cooling on our 2J head uses no external fans. The system prolongs bearing life and prevents expansion caused by heat build-up. No slots in the bearing cap (which can let foreign matter get into the head) are needed.



The ram is positioned on a ground, close fitted dovetail way. Backward and forward movement is through an accurate rack and pinion mechanism. The ram expands into the dovetail way for highly-rigid clamping and reduced vibration. (Clamping method patented.)



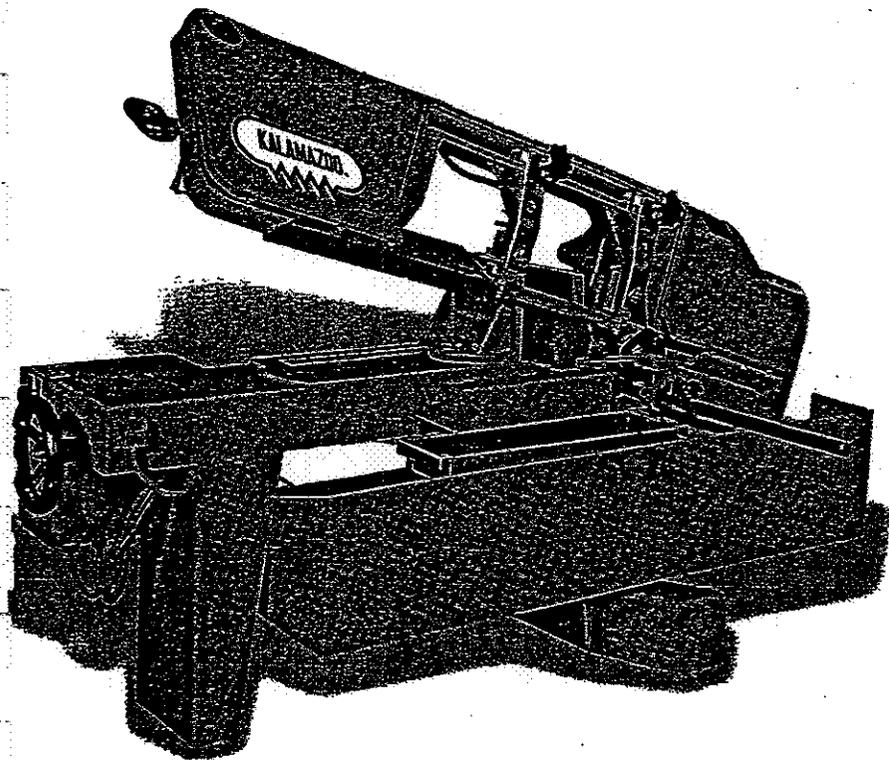
Correct lubrication protects the machine and its accuracy, while reducing maintenance and making the machine easier for the operator to work. Bridgeport's metered, one-shot lubrication system is operated by a single lever (which saves time). A series of metering valves ensures that the slideways and leadscrews get the proper amount of lubrication.

SOF Weapons Training Facility
Fort Bragg, North Carolina

DACA21-03-R-0024

LINE ITEM #9
HORIZONTAL BAND SAW

9" & 13" Wet Cutting Bandsaws



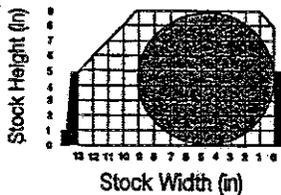
MODELS H9AW & 13AW

Features:

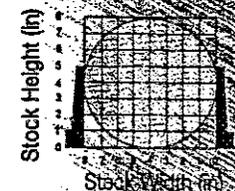
- Variable speed drive
- Quick and easy blade installation
- Rotary wire brush for chip removal to help improve blade life
- Enclosed gear box with gears in an oil bath
- Gravity fed head controlled by counterbalance springs working with a hydraulic cylinder to insure consistent feed pressure on the blade
- Swivel vise enables quick set-up for angle cuts up to 45°
- Two (2) Year Limited Warranty

H9AW Cutting Capacities:

Capacity at 90°



Capacity at 45°

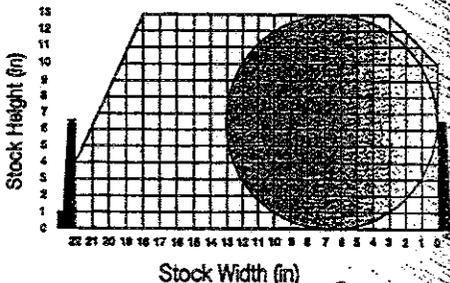


Specifications

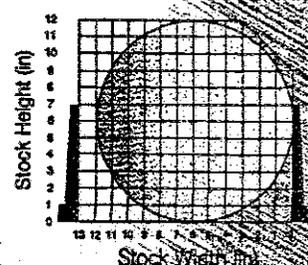
Model	H9AW	13AW
Motor	2 Hp 115/220v 1ph or 208/230/460 3ph	2 Hp 115/220v 1ph or 208/230/460 3ph
Band Wheel Dia.	14"	18"
Blade	1" x .035" x 10'-10 1/2"	1" x .035" x 13'-11"
Bed Height	25 1/2"	25 1/2"
Vise Opening	14"	23"
Blade Speeds	62-390 fpm Variable speed	65-345 fpm Variable speed
90° Cutting Capacity		
Round	9"	13"
Rectangular	5" x 13"	10" x 20"
45° Cutting Capacity		
Round	8"	12"
Rectangular	8" x 8"	9" x 13"
Width	69"	86"
Depth (with stock stop)	46" (51 1/2")	46" (51 1/2")
Height (head-up)	63"	70"
Height (head-down)	43"	38 1/2"
Net Weight	800 lbs.	1150 lbs.

13AW Cutting Capacities:

Capacity at 90°



Capacity at 45°



9" & 13" Wet Cutting Bandsaws

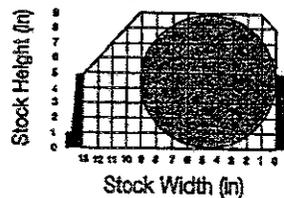
MODELS H9AW & 13AW

Features:

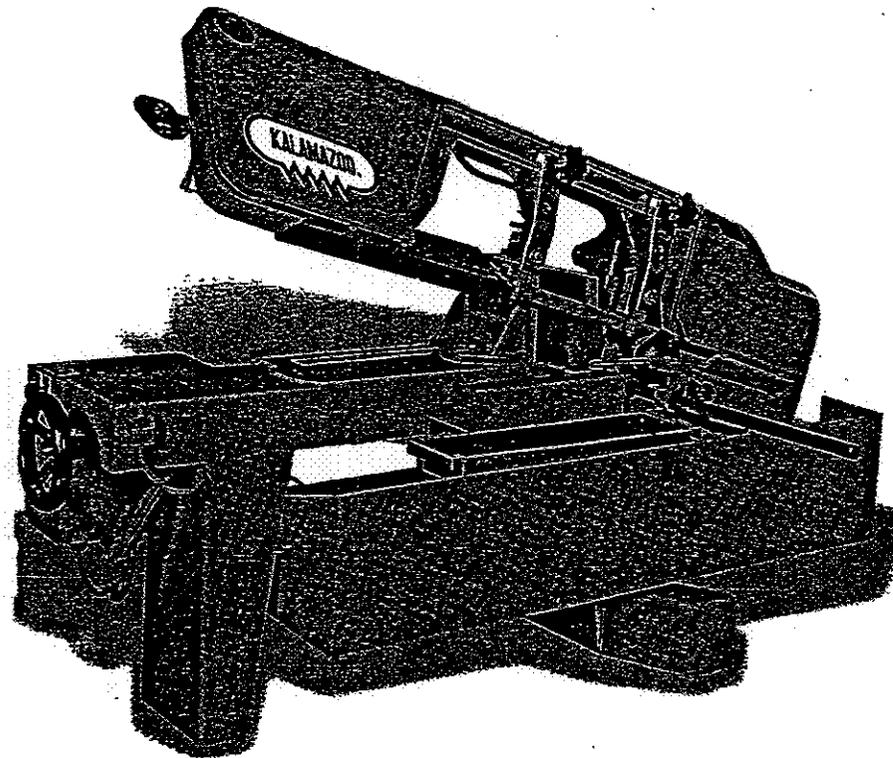
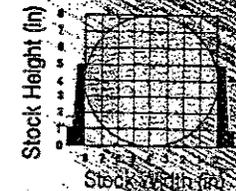
- Variable speed drive
- Quick and easy blade installation
- Rotary wire brush for chip removal to help improve blade life
- Enclosed gear box with gears in an oil bath
- Gravity fed head controlled by counterbalance springs working with a hydraulic cylinder to insure constant feed pressure on the blade
- Swivel vise enables quick set-up for angle cuts up to 45°
- Two (2) Year Limited Warranty

H9AW Cutting Capacities:

Capacity at 90°



Capacity at 45°

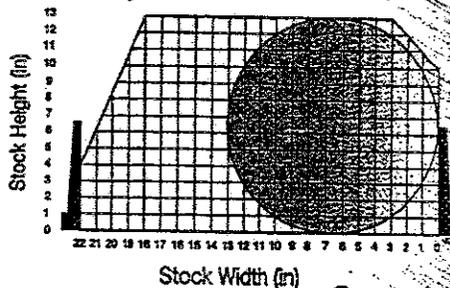


Specifications

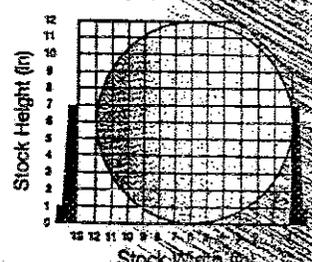
Model	H9AW	13AW
Motor	2 Hp 115/220v 1ph or 208/230/460 3ph	2 Hp 115/220v 1ph or 208/230/460 3ph
Band Wheel Dia.	14"	18"
Blade	1" x .035" x 10'-10 1/2"	1" x .035" x 13'-11"
Bed Height	25 1/2"	25 1/2"
Vise Opening	14"	23"
Blade Speeds	62-390 fpm Variable speed	65-345 fpm Variable speed
90° Cutting Capacity		
Round	9"	13"
Rectangular	5" x 13"	10" x 20"
45° Cutting Capacity		
Round	8"	12"
Rectangular	8" x 8"	9" x 13"
Width	69"	86"
Depth (with stock stop)	46" (51 1/2")	46" (51 1/2")
Height (head-up)	63"	70"
Height (head-down)	43"	38 1/2"
Net Weight	800 lbs.	1150 lbs.

13AW Cutting Capacities:

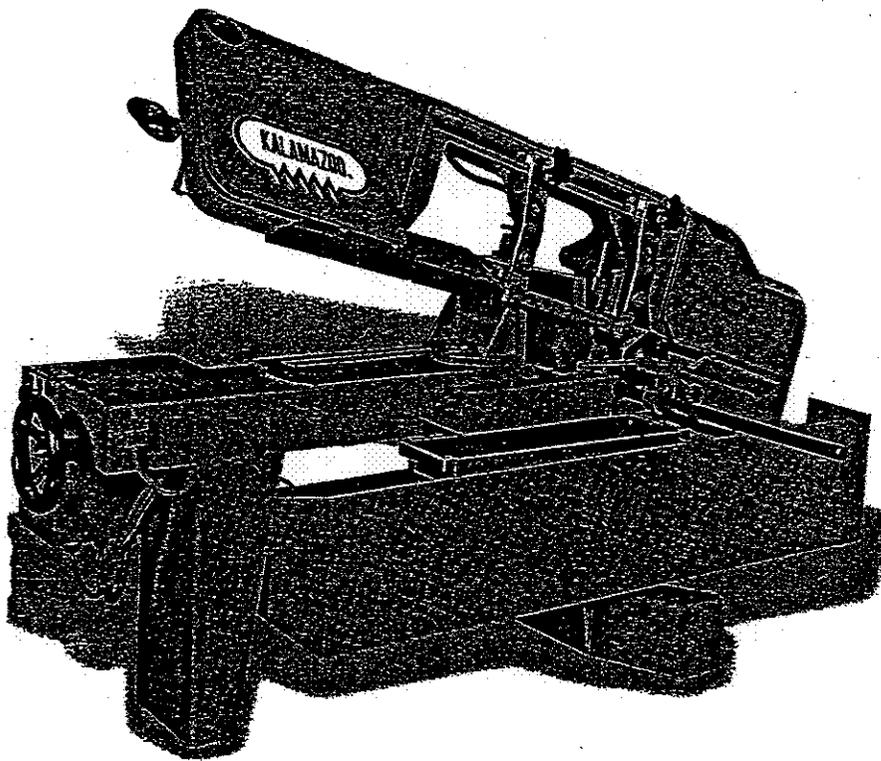
Capacity at 90°



Capacity at 45°



9" & 13" Wet Cutting Bandsaws



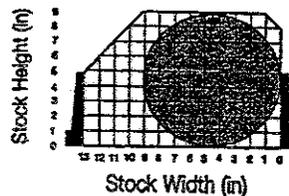
MODELS H9AW & 13AW

Features:

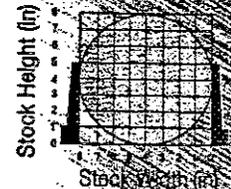
- Variable speed drive
- Quick and easy blade installation
- Rotary wire brush for chip removal to help improve blade life
- Enclosed gear box with gears in an oil bath
- Gravity fed head controlled by counterbalance springs working with a hydraulic cylinder to insure constant feed pressure on the blade
- Swivel vise enables quick setting of angle cuts up to 45°
- Two (2) Year Limited Warranty

H9AW Cutting Capacities:

Capacity at 90°



Capacity at 45°

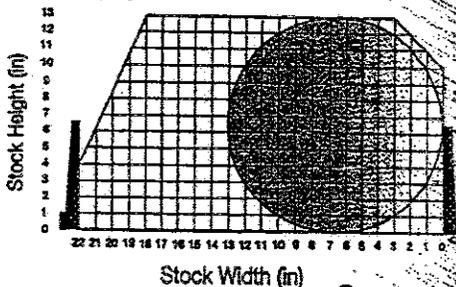


Specifications

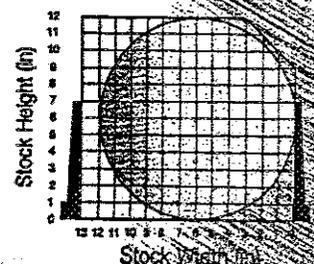
Model	H9AW	13AW
Motor	2 Hp 115/220v 1ph or 208/230/460 3ph	2 Hp 115/220v 1ph or 208/230/460 3ph
Band Wheel Dia.	14"	18"
Blade	1" x .035" x 10'-10 1/2"	1" x .035" x 13'-11"
Bed Height	25 1/2"	25 1/2"
Vise Opening	14"	23"
Blade Speeds	62-390 fpm Variable speed	65-345 fpm Variable speed
90° Cutting Capacity		
Round	9"	13"
Rectangular	5" x 13"	10" x 20"
45° Cutting Capacity		
Round	8"	12"
Rectangular	8" x 8"	9" x 13"
Width	69"	86"
Depth (with stock stop)	46" (51 1/2")	46" (51 1/2")
Height (head-up)	63"	70"
Height (head-down)	43"	38 1/2"
Net Weight	800 lbs.	1150 lbs.

13AW Cutting Capacities:

Capacity at 90°



Capacity at 45°

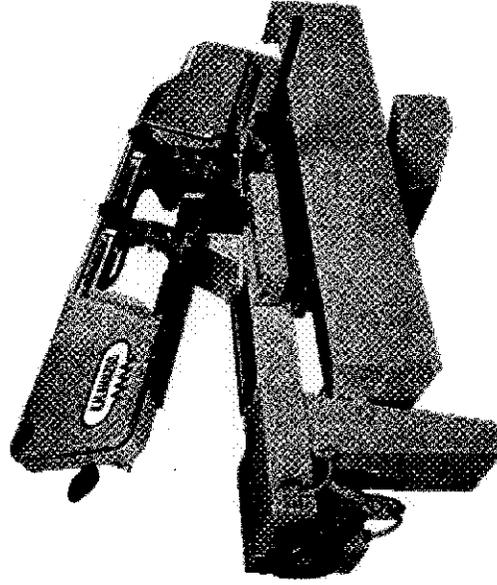




Home	Catalogs		
CNC	Drills	Lathes	Saws
Grinders	Mills	Fabrication	



Models H9AW & 13AW



9" & 13" Wet Cutting Band Saw

Features

Specifications

Cutting Capacity

Accessories

Constructions Features

Features:

- Variable speed drive
- Quick and easy blade installation
- Rotary wire brush for chip removal to help improve blade life
- Enclosed gear box with gears in an oil bath

- Gravity fed head controlled by counterbalance springs working with a hydraulic cylinder to insure constant feed pressure on the blade
- Swivel vise enables quick set-up for angle cuts up to 45°
- Two (2) Year Limited Warranty

[Return to top](#)

Specifications:

Model	H9AW	13AW
Motor	2 Hp 115/220v 1ph or 208/230/460 3ph	2 Hp 115/220v 1ph or 208/230/460 3ph
Band Wheel Dia.	14"	18"
Blade	1" x .035" x 10'-10 1/2"	1" x .035" x 13'- 11"
Bed Height	25 1/2"	25 1/2"
Vise Opening	14"	23"
Blade Speeds	62-390 fpm Variable speed	65-345 fpm Variable speed
90° Cutting Capacity		
Round	9"	13"
Rectangular	8" x 13"	10" x 20"
45° Cutting Capacity		
Round	8"	12"

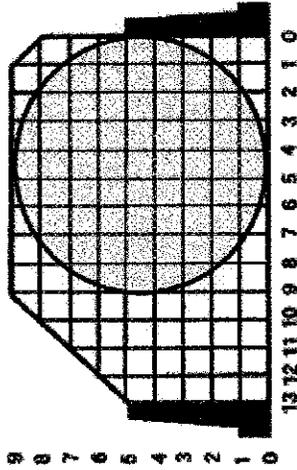
Rectangular	8" x 8"	9" x 13"
Width	69"	86"
Depth (with stock stop)	46" (51 1/2")	46" (51 1/2")
Height (head-up)	63"	70"
Height (head-down)	43"	38 1/2"
Net Weight	800 lbs.	1150 lbs.

Return to top

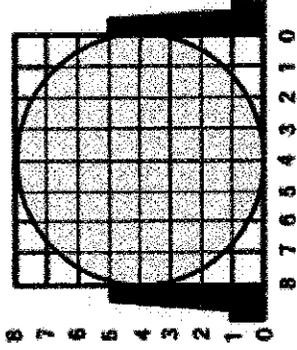
Cutting Capacities:

H9AW

Capacity at 90° (inches)



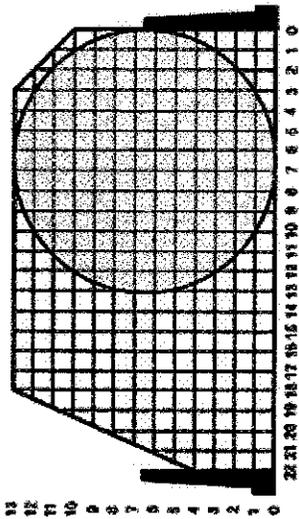
Capacity at 45° (inches)



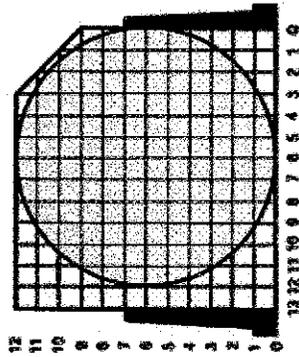
13AW

Capacity at 90° (inches)

Capacity at 45° (inches)



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Accessories:

ACC05	3 Steel-Faced Casters
ACC06	3 Rubber-Faced Casters
BT01	Bandsaw Blade Tension Gauge
DT20	Discharge Tray
P10	Stock Stand Assembly 21" - 30"
RT0516	Roller Table Assembly 5' x 16"
RT1016	Roller Table Assembly 10' x 16"
9A1900C	Set of Carbide Blade Guides - Installed

Return to top

[CNC] [Drills] [Lathes] [Grinders] [Mills] [Saws] [Fabricating]

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Indiana
811 Eisenhower Drive South
Goshen, IN 46526
Phone: 574-533-0371 FAX: 574-533-0403

Last modified: March 19, 2002

**SOF Weapons Training Facility
Fort Bragg, North Carolina**

DACA21-03-R-0024

**LINE ITEM #10
VERTICAL BAND SAW**

Clausing

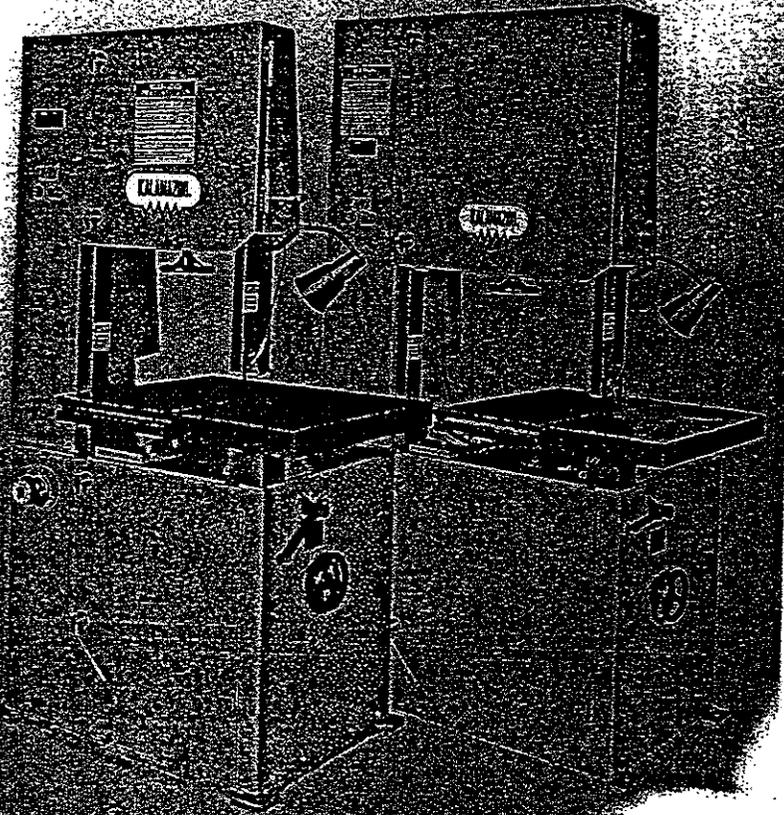
INDUSTRIAL INC.



Vertical Band Saws

Standard Features

- 230/460/60/3 Electricals
- Magnetic Starter with 110V Control Circuit and Overload Protection
- Three (3) H . P. TEFC Motor
- Dual Range Transmission
- 1/2" and 3/4" Chevron type Blade Guides with Back-Up Roller
- 26-3/4" x 29 Heavy Duty Cast Iron Table with two-way tilt (5°L & 45°R)
- 26-3/4" x 29" Heavy Duty Cast Iron Table with two-way tilt (15°L & 45°R) Four (4) T-Slots on Top (Hydraulic table only) Table Travel 13"
- Bonded Rubber Band Wheels
- 110V Work Light
- Built-in Air Chip Blower
- Blade Tension Indicator
- Blade Speed Indicator
- 3/4" Carbon Hardback Blade
- Locking Band Wheel Doors
- Operation and Parts Manual
- Two (2) Year Limited Warranty



Optional Equipment

- 1" Capacity Blade Welder, Shear and Flash Grinder
- Rip Fence
- Miter Gauge
- 1/8", 1/4", 3/8", 1/2" and 5/8" Band
- Chevron Guide Inserts

Specifications	V2012F	V2012H	V2812F	V2812H
Throat	20"	20"	28"	28"
Table Length	125"	125"	125"	125"
Table Width	30"	30"	30"	30"
Blade Length	159"-162"	159"-162"	197"-199"	197"-199"
Blade Width	1/8"-1"	1/8"-1"	1/8"-1"	1/8"-1"
Blade Speed (fpm)	50-5200	50-5200	50-5200	50-5200
Dimensions				
Length	61"	61"	61"	61"
Width	41"	41"	41"	44"
Height	81"	81"	91"	91"
Net Weight (lbs)	1,390	1,500	1,650	1,760
Shipping Weight (lbs)	1,640	1,650	1,800	1,900

Simply the Best

Clausing

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 FAX (616) 345-5900 • Web Site: www.clausing-industrial.com

**SOF Weapons Training Facility
Fort Bragg, North Carolina**

DACA21-03-R-0024

**LINE ITEM #11
OVEN**

The "No Compromise"



Dual Furnace

MODEL C2121

DESIGN—For those who desire a hardening furnace, a direct and in separate furnace for annealing, drawing, all within a minimum floor space. The two chambers allow for immediate temperature drawing after quenching without having to harden furnace to obtain the lower temperature temper.

CONTROLS—Both chambers are equipped with the powerless electric control panel and electric controls. The controls are standard and are of the type used in all Cress furnaces. The controls are of the type used in all Cress furnaces.

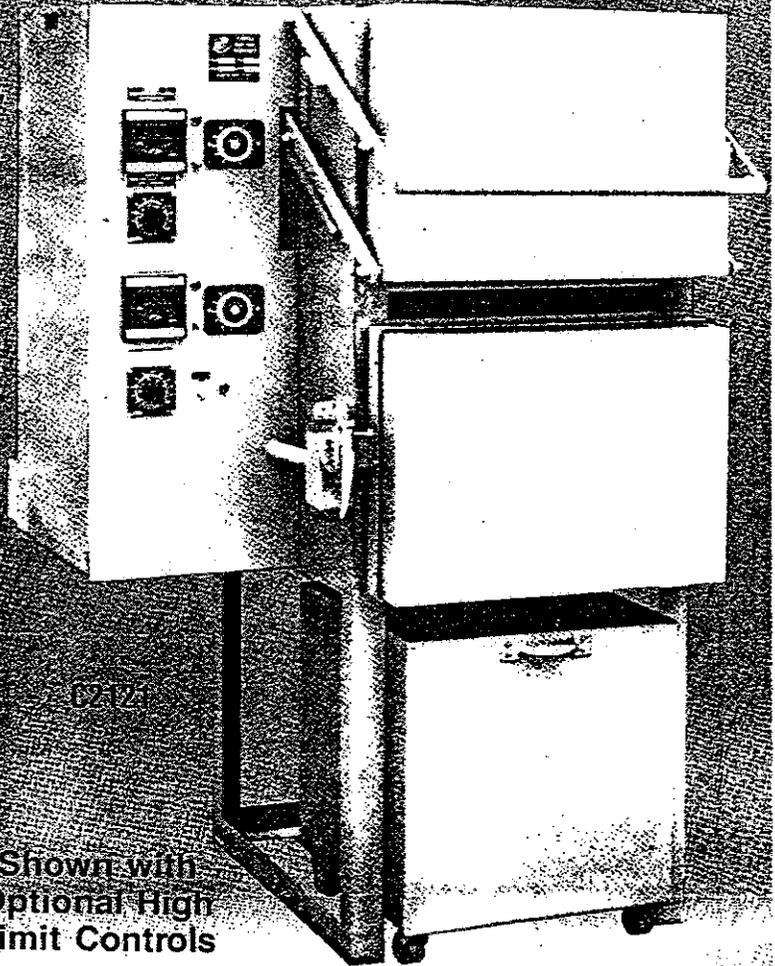
ELEMENTS—High temperature vanadium nitride carbide and vanadium nitride carbide elements are used in both chambers.

GENERAL CONSTRUCTION—The furnace is constructed of heavy steel plate and is mounted on a heavy steel frame. The furnace is constructed of heavy steel plate and is mounted on a heavy steel frame. The furnace is constructed of heavy steel plate and is mounted on a heavy steel frame.

The furnace is constructed of heavy steel plate and is mounted on a heavy steel frame. The furnace is constructed of heavy steel plate and is mounted on a heavy steel frame.

The furnace is constructed of heavy steel plate and is mounted on a heavy steel frame. The furnace is constructed of heavy steel plate and is mounted on a heavy steel frame.

Door Seals are available for inert protective atmosphere.



Shown with Optional High Limit Controls

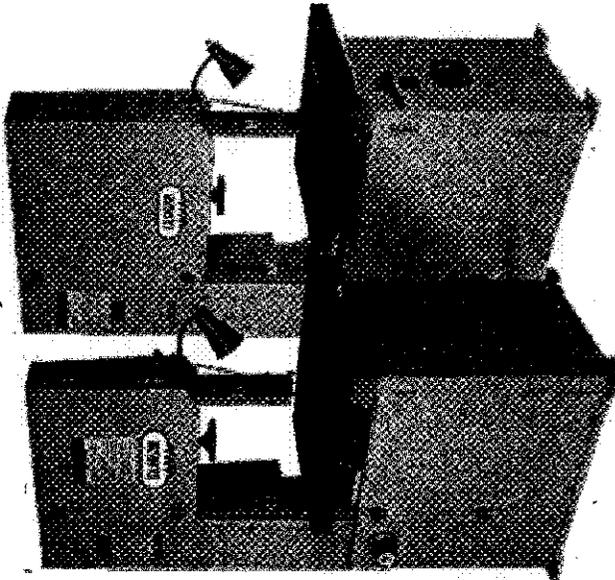
SPECIFICATIONS

MODEL	UPPER CHAMBER		LOWER CHAMBER		OVER ALL		MAXIMUM TEMP		KW INPUT	WGT.
	W	L	H	W	L	H	UPPER	LOWER		
C-2121	36"	36"	56"	36"	36"	56"	2250°F	1250°F	8.5	785
C-2121-10	36"	36"	64"	36"	36"	64"	2250°F	1250°F	8.5	850



- Home
- CNC
- Drills
- Lathes
- Saws
- Grinders
- Mills
- Fabrication
- Catalogs

Models
V2012F, V2012H,
V2812F, V2812H



Four NEW Vertical Band
 Saws
 From KALAMAZOO
 SAW

Features

Specifications

Accessories

Features

- 230/460/60/3 Electrics
- Magnetic Starter with 110V Control Circuit and Overload Protection
- Three (3) H . P. TEFC Motor

- Dual Range Transmission
- 1/2" and 3/4" Carbide-Faced Chevron type Blade Guides with Back-Up Roller
- 26-3/4" x 29 Heavy Duty Cast Iron Table with two-way tilt (15°L & 45°R)
- 26-3/4" x 29" Heavy Duty Cast Iron Table with two-way tilt (15°L & 45°R)
Four (4) T-Slots on Top (Hydraulic table only) Table Travel 13"
- Bonded Rubber Band Wheels
- 110V Work Light
- Built-in Air Chip Blower
- Blade Tension Indicator
- Blade and Speed Selector Chart
- Blade Speed Indicator
- 3/4" Carbon Hardback Blade
- Locking Band Wheel Doors
- Operation and Parts Manual
- Two (2) Year Limited Warranty

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Specifications

	V2012F	V2012H	V2812F	V2812H
Throat	20"	20"	28"	28"
Work Height	12 3/4"	12 3/4"	12"	12"
Drive Motor (Hp)	3	3	3	3
Blade Length	159"-162"	159"-162"	197"-199"	197"-199"
Blade Width	1/8"-1"	1/8"-1"	1/8"-1"	1/8"-1"
Blade Speed (fpm)	50-5200	50-5200	50-5200	50-5200
Dimensions				
Length	51"	51"	61"	61"
Width	41"	44"	41"	44"
Height	81"	81"	91"	91"
Net Weight (lbs.)	1,390	1,500	1,650	1,760
Shipping Weight (lbs.)	1,540	1,650	1,800	1,900

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Accessories

- 1" Capacity Blade Welder, Shear and Flash Grinder

- Rip Fence
- Miter Gauge
- 1/8", 1/4", 3/8", 1/2", 5/8", 3/4" and 1" Chevron Guide Inserts

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[\[CNC\] \[Drills\]](#) [\[Lathes\]](#) [\[Grinders\]](#) [\[Mills\]](#) [\[Saws\]](#) [\[Fabricating\]](#)

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Last modified: February 27, 2002

SOF Weapons Training Facility
Fort Bragg, North Carolina

DACA21-03-R-0024

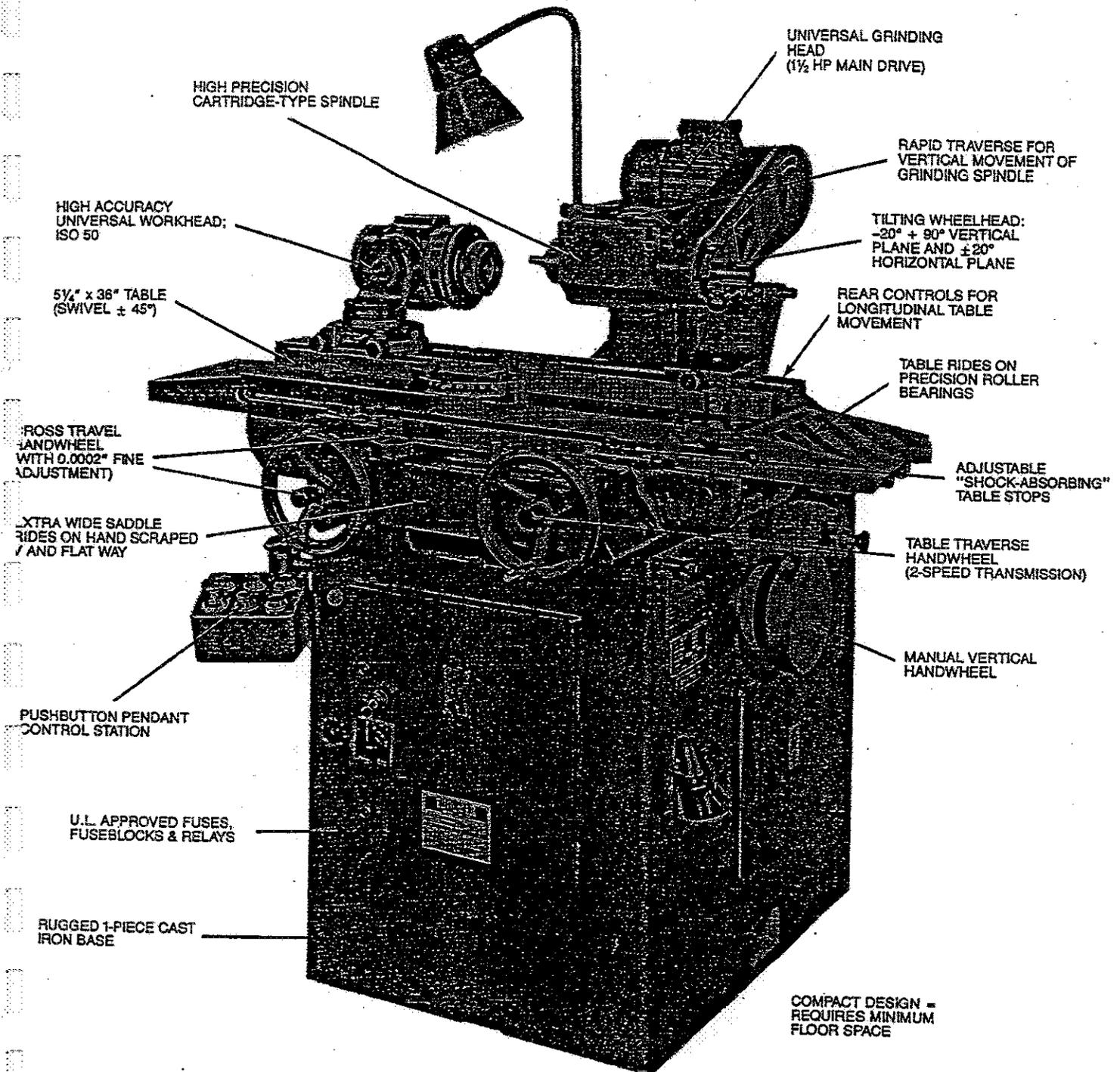
**LINE ITEM #12
TOOL & CUTTER GRINDER**

SOF Weapons Training Facility
Fort Bragg, North Carolina

DACA21-03-R-0024

LINE ITEM #13
AUTOMATED MILL

HANDLE A WIDE VARIETY OF GRINDING AND SHARPENING JOBS WITH BETTER COST EFFICIENCY.



**Here is a precision crafted, compact, rugged, but cost-efficient grinder that can handle a wide range of grinding/sharpening jobs on cutting tools, including milling cutters, taps and reamers. And, with proper selection of attachments, you can use it on cylindrical, internal and surface grinding jobs.

The versatile Kowary Universal Tool and Cutter Grinder, Model NUA-25M, is a proven machine with superb accuracy. Its ruggedness, low investment cost, and ease of operation have earned it wide acceptance in the U.S.A. and around the world.

Longitudinal table travel movement is via roller bearing system with manual feed handwheels located both in front and rear of the machine. Cross travel saddle is supported on a wide base with a V and flat hand scraped ways for superior accuracy.

General Specifications

CAPACITY:

Max. distance between centers.....	.25"
Max. distance between tailstock & workhead.....	.19 1/2"
Universal workhead taper.....	ISO 50
Max. swing b.c.; diameter.....	.9.8"
Max. workpiece weight.....	.88 lbs.

TABLE:

1 T-slot, size.....	.1/2" wide
Working surface (sub-table).....	.36" x 5 1/4" (52" x 9")
Table 2-speed movement.....	.3/4" and 5" /Rev.
Table swivel angle (table ratio setoff).....	.± 45° (± 1:6 thru 1:50 graduation)

RANGE OF MOVEMENT:

Longitudinal movement of table (max.).....	.17"
Cross movement of saddle (graduation 0.001").....	.9 1/2" (.200" Rev.)
Fine graduation cross movement.....	.0.0002" (.004" /Rev.)
Power vertical movement of wheelhead (graduation).....	.10 1/2" (0.0005")
Wheelhead tilts/vertical plane.....	.-20°, +90°
Wheelhead swivels/horizontal plane.....	.180°
From wheel spindle center to table: min./max.....	.3 1/2" / 13 3/4"
Universal Workhead swivel, 2 planes.....	.± 90°
Grinding wheel spindle.....	.4025 & 5635 RPM
Grinding wheel spindle motor.....	.1 1/2 HP
Grinding wheel dia. x width (bore).....	.5 3/4" x 1/2" (1 1/4")

Overall machine dimensions.....	.53" x 50" x 64"H
Net weight of machine.....	.2,255 lbs.

TOOLMEX

Toolmex Corp. Machinery Division is your assurance of quality, designed to meet your toughest requirements . . . Thousands installed in the U.S.A. . . . Computer-multimillion dollar spare parts and options centers . . . Factory service technicians based coast-to-coast . . . Full warranty covering parts and labor . . . Fast deliveries . . . Trade-in and financing available.

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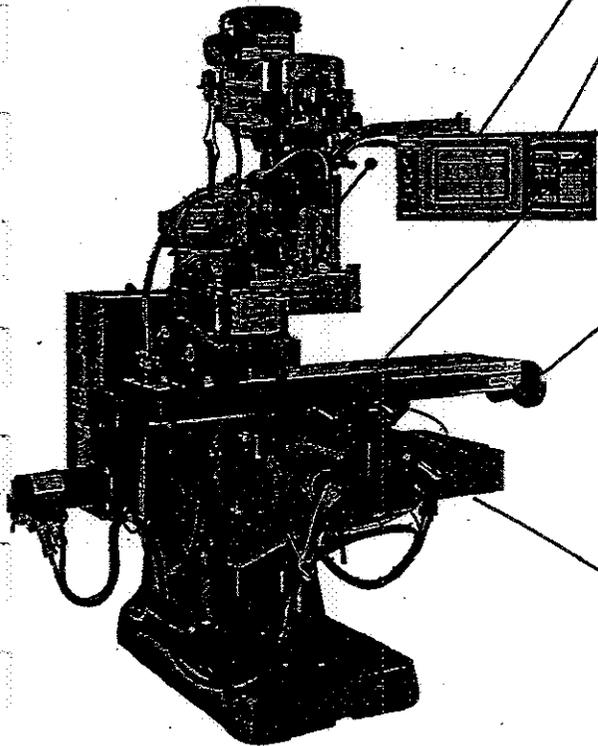
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2015 S. Mitchell Blvd.
Schaumburg, IL 60193
(708) 307-3700

East
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Cinnaminson, NJ 08077
(609) 786-1500

EZTRAK

Factory-fit 2-axis control and power feed. It's the easy and inexpensive "step up" that enhances manual machining. Available with 3rd axis option.

EZTRAK



New operator control station located on the head for ease of operation.

Bridgport's control features a 9" monochrome monitor. Fill-in-the-blank format helps you enter machining data quickly.

Machining data is entered by using a simple keypad.

600 Lb. table load.

300 Lb. table load.

Control stores up to 1000 individual operations, plus you can call up to 10 routine mill and 4 routine drill cycles that are pre-programmed.

Machine operation alternates between automatic and manual at the discretion of the operator.

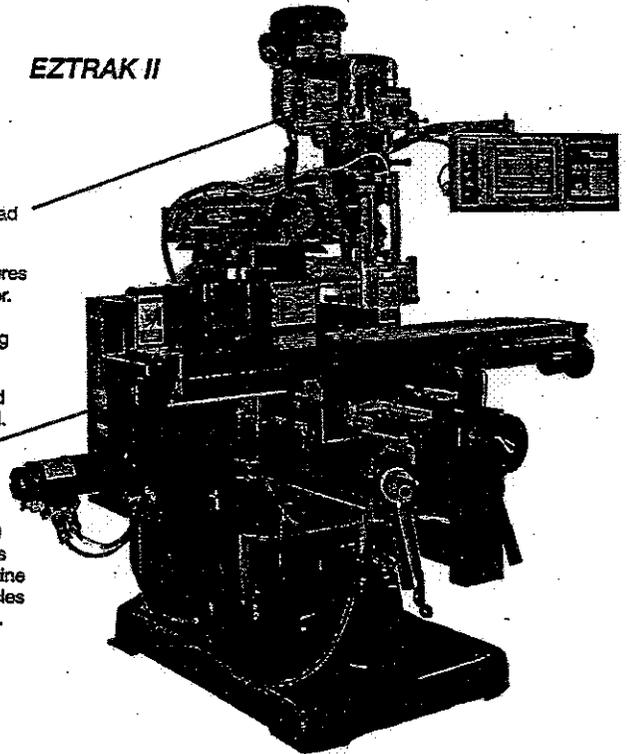
NEMA-12 electrical enclosure to NFPA specifications.
UL Listed

Power feeds for both X-axis (longitudinal) and Y-axis (cross) are infinitely variable for maximum metal-cutting flexibility. Rapid traverse up to 100 ipm. Powerful DC servo motors let you make cuts consistent with 3 HP machining.

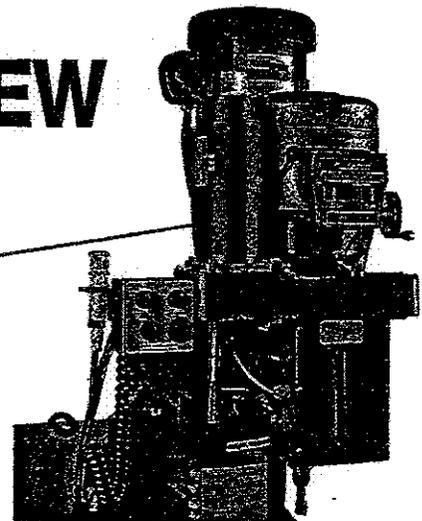
Automatic control of the quill. Full contouring capability for both EZTRAK and EZTRAK II machines. Maintains full manual control of the quill.

All Electrical Components  Listed or Recognized

EZTRAK II



NEW

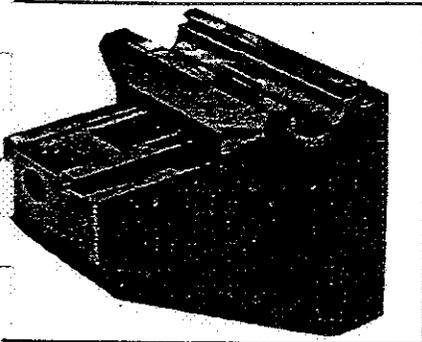


THIRD AXIS OPTION

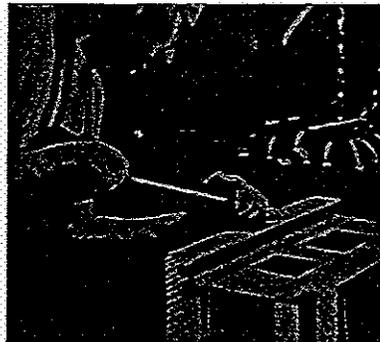
- Full automatic control of the quill for R-8, Erickson 30 Q/C, or Universal spindles
- Full contouring capability for both EZTRAK and EZTRAK II machines.
- Maintains full manual control of the quill.
- The 3rd axis housing contains an integral micro glass scale for manual DRO operation.
- Quill assembly is driven by a 19 in/lb. drive motor, 1:1 pulley and narrow cog-type toothed belt.

Remote Start/Stop control switch is optional.

Installation will reduce Quill travel by 0.5 inches for a total of 4.5 inches, see specifications on back.



chrome-plated ways (standard on EZTRAK) for long life. Surfaces plated to a uniform thickness approximately 0.05 mm (0.002") include top of cross (longitudinal movement), top of knee (cross movement), and cross slide to table gib.



All alignment ways and gibs are completely hand scraped to within tenths of a thousandth, ensuring full bearing support.

EZTRAK[®]

SPECIFICATIONS

Range	SERIES I		SERIES II	
Table travel (X-axis)	30 in. (762 mm)		32 in. (813 mm)	
Saddle travel (Y-axis)	12 in. (305 mm)		14.5 in. (368 mm)	
Quill travel	5 in. (127 mm)		5 in. (127 mm)	
Quill travel w/3rd axis	4.5 in. (114 mm)		4.5 in. (114 mm)	
Knee travel (Z-axis)	16 in. (406 mm)		12 in. (305 mm)	
Ram travel	12 in. (305 mm)		17 in. (432 mm)	
Throat distance (min.)	6.75 in. (171 mm)		8 in. (152 mm)	
Throat distance (max.)	18.75 in. (476 mm)		22 in. (559 mm)	
Table to spindle nose gage line (min.)	2.5 in. (64 mm)		5 in. (127 mm)	
Table to spindle nose gage line (max.)	18.25 in. (463 mm)		17 in. (432 mm)	

Table			
Overall size	48 x 9 in. (1219 x 229 mm)	58 x 11 in. (1473 x 279 mm)	
Working surface	48 x 9 in. (1219 x 229 mm)	58 x 11 in. (1473 x 279 mm)	
Height above floor (max.)	47.4 in. (1204 mm)	47 in. (1194 mm)	
Maximum uniform load	300 lbs. (136 kg)	600 lbs. (272 kg)	
T-slots	3 @ 2.5 in. (64 mm) centers	3 @ 2.5 in. (64 mm) centers	
T-slot size	.625 in. (16 mm)	.625 in. (16 mm)	

Space and Weight			
Floor area (door open)	8.2 x 7.3 ft. (2.5 x 2.2 m)	9 x 7.9 ft. (2.7 x 2.4 m)	
Floor area (door closed)	8.2 x 5.3 ft. (2.5 x 1.6 m)	9 x 5.8 ft. (2.7 x 1.8 m)	
Height	6.8 ft. (2.1 m)	6.9 ft. (2.1 m)	
Net weight	2340 lbs. (1061 kg)	3900 lbs. (1769 kg)	
Shipping weight	2900 lbs. (1315 kg)	4700 lbs. (2132 kg)	

Spindle		SERIES I AND SERIES II	
AC spindle motor rating (continuous)	2 hp (1.5 kw)		
Power rating	3 hp (2.2 kw)		
(Duty cycle)	30 min. duty rated		
Spindle speed Hi	500 - 4200 rpm		
Spindle speed Low	60 - 500 rpm		
Spindle diameter	1.875 in. (48 mm)		
Quill diameter	3.375 in. (86 mm)		

Standard Spindle Taper	
Spindle taper	R-8
Tool holding	R-8 collets

Optional Spindle Taper	
Spindle Taper	#30 ISO
Tool Holder	Erickson Quickchange #30 ISO
Spindle Taper	#200 Universal
Tool Holder	Universal #200 Kwik switch

Ball screws	
Ball diameter	1.25 in. (32 mm)
Pitch	0.200 in. (5.08 mm)

Positioning		
Auto (X,Y)	100 ipm	(2540 mm/min.)
Manual (X,Y)	100 ipm	(2540 mm/min.)
Feedrate range (X,Y)	0.1-100 ipm	(2-2540 mm/min.)
Minimum increment	0.0001 in.	(0.003 mm)

Machine and Control Performance		
Positioning accuracy	± 0.001 in.	(0.025 mm) over saddle
Positioning repeatability	± 0.0008 in.	(0.02 mm) over saddle
Input resolution	0.0001 in.	(0.003 mm)
Servo resolution	0.0001 in.	(0.003 mm)
Display resolution	0.0001 in.	(0.003 mm)

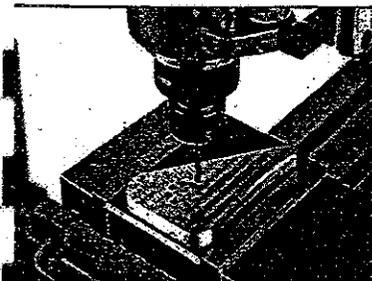
BPC2M PC Control system manufactured by Bridgeport Machines
Full 3-axis DRO
Simultaneous 2-axis linear or 2-axis circular interpolation
9-inch monochrome conversational display
Absolute and incremental programming
Automatic corner rounding
Mathematical help modes
Powerful canned cycles for machining arcs, diagonals, circles, bolt hole patterns, pocket milling and more
Cutter diameter compensation
English/metric conversion
1000 block program storage
Disk storage: (standard) 3.5 in. diskette, HD 1.44 Mb (12,000 ft.)
32MB PC Flashdisk
Maintenance, diagnostic and program error message display
Part program loading: RS-232 bi-directional communication link
Input/Output: 1 RS-232 serial port
Maintenance: Diagnostic routines embedded in system

Power	
Input power:	208/230/460 volts 3 phase, 50/60 cycles
Power capacity:	4kVA

Standard Features	
Chrome plated ways	
Electrics: NFPA/NEMA-12 Standards, UL Listed.	
Color: Machine Tool Gray	

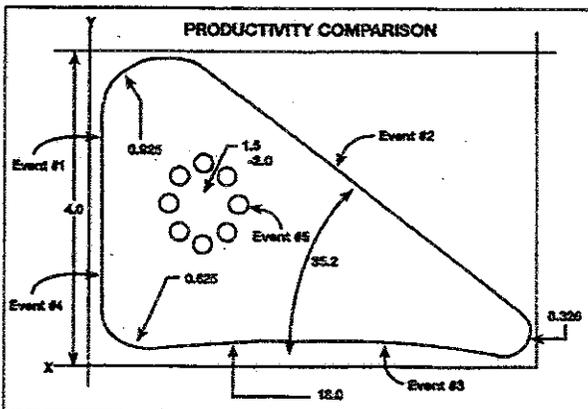
Optional Features	
3rd Axis Control	
Mist or flood coolant system	
4 or 7 inch Riser block	
Automatic centralized lubrication system	
Power drawbar for R-8 or 30 QC Spindle	
Remote start/stop control switch	

NOTE: Specifications Subject to Change Without Notice.
* Knee Travel Reduced by 1" with Flood Coolant.



This part requires milling of 3 radii, an angle, 1 arc...plus a bolt hole pattern with 8 holes. Now you can get it done, without a rotary table, with 5 simple "operations" that are programmed in 8 easy steps. Comparison of setup and machining time:

conventional mill... 107.0 minutes
EZTRAK... 26.5 minutes



**SOF Weapons Training Facility
Fort Bragg, North Carolina**

DACA21-03-R-0024

**LINE ITEM #14
AUTOMATED LATHE**

Built For Speed & Convenience

EZPATH FEATURES:

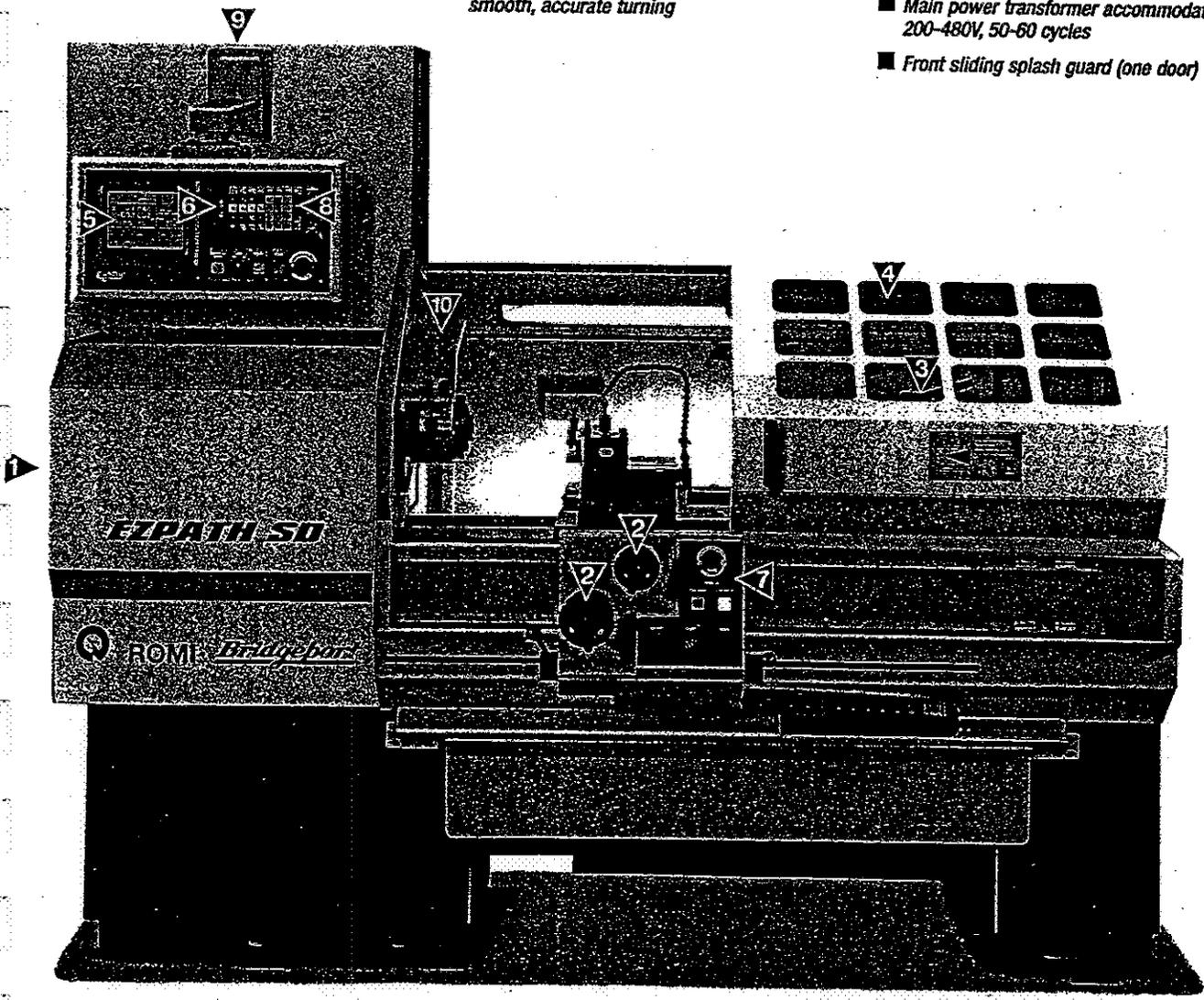
- 1 Two-speed variable AC motor with direct-driven CNC headstock on EZPATH SD & IISD for powerful, smooth and quiet operation
- 2 Dual electronic handwheels can be set to move with the carriage or disengaged to slide on their own track
- 3 Manual tailstock with dual clamps and tang stop for heavy drilling, inch and metric quill graduations
- 4 Standard sliding door is tilted back, with a large window, for a clear view of the work area
- 5 Bridgeport 2-axis control with 9-inch grayscale monitor
- 6 Built-in disk drive and RS-232 port

- 7 Remote operator panel conveniently mounted on the apron
- 8 Sealed keyboard
- 9 Single-unit CNC controller can be removed for easy maintenance
- 10 Chuck guard

Additional Features:

- Spindle control lever with dynamic brake within easy reach
- All cast iron construction
- Optional spindles with large through-holes for EZPATH SD and EZPATH IISD
- Precision ballscrews
- Induction hardened & ground ways with Turcite-coated saddle and cross slide for smooth, accurate turning

- Automatic lubrication system
- CNC headstock features two angular contact spindle bearings in front, one large roller bearing in the rear for precise accuracy and repeatability. All bearings are synthetically greased for life
- Headstock provides a variable speed motor with constant surface speed control
- Coolant system with 3/4 HP (0.54 Kw) pump and 25-gallon (95 liter) tank
- Rear splash guard with removable door
- Removable chip pan for easy cleaning
- Indexable tool post and holder set for square cutting tools and boring bars
- Sealed work-light panel spans the bed length to provide bright illumination of entire turning area
- Main power transformer accommodates 200-480V, 50-60 cycles
- Front sliding splash guard (one door)



Specifications

EZPATH SD

EZPATH IISD

EZPATH IIIS

EZPATH IIISL

CAPACITY				
Height of centers	8.46 in. (215 mm)	10.03 in. (255 mm)	11.41 (290 mm)	13.77 in. (350 mm)
Distance between centers	40 in. (1000 mm)	40, 60 or 80 in. (1000, 1500 or 2000 mm)	40, 80 or 120 in. (1000, 2000 or 3000 mm)	40, 80 or 120 in. (1000, 2000 or 3000 mm)
Swing over bed	17 in. (431 mm)	20 in. (508 mm)	23 in. (584 mm)	27 in. (686 mm)
Swing over cross slide	8 in. (203 mm)	10 in. (254 mm)	12.59 in. (320 mm)	16.53 in. (420 mm)
Swing over carriage wings	15.75 in. (400 mm)	17.7 in. (450 mm)	17.3 (440 mm)	21.25 in. (540 mm)
Cross-slide (X) travel	8.66 (220 mm)	11 in. (280 mm)	12.59 in. (320 mm)	14.96 in. (380 mm)
JED				
Width	12 in. (305 mm)	13.5 in. (340 mm)	15 in. (380 mm)	15 in. (380 mm)
Height	13 in. (332 mm)	12.5 in. (320 mm)	15 in. (380 mm)	15 in. (380 mm)
HEADSTOCK				
Spindle nose	A2-5 ASA	A2-6 ASA	A2-8 ASA	A2-8 ASA
Hole diameter through spindle	2.08 in. (53 mm)	2.5 in. (65 mm)	3.15 in (80 mm)	3.15 in (80 mm)
Range of spindle speeds	50 to 4000 RPM	40 to 3000 RPM	32 to 2500 RPM	25 to 2000 RPM
Range I	50 to 2000 RPM	40 to 1500 RPM	32 to 625 RPM	25 to 500 RPM
Range II	100 to 4000 RPM	80 to 3000 RPM	32 to 1250 RPM	500 to 2000 RPM
Spindle nose - Option 1	A2-6 ASA	A2-8 ASA	■	■
Hole diameter through spindle	2.56 in. (65 mm)	3.15 in. (80 mm)	■	■
Range of spindle speeds	40 to 3000 RPM	20 to 2000 RPM	■	■
Range I	40 to 1500 RPM	20 to 1000 RPM	■	■
Range II	80 to 3000 RPM	40 to 2000 RPM	■	■
Spindle nose - Option 2	D1-6 CAMLOCK	D1-8 CAMLOCK	■	■
Hole diameter through spindle	2.56 in. (65 mm)	3.15 in. (80 mm)	■	■
Range of spindle speeds	40 to 3000 RPM	20 to 2000 RPM	■	■
Range I	40 to 1500 RPM	20 to 1000 RPM	■	■
Range II	80 to 3000 RPM	40 to 2000 RPM	■	■
FEEDS				
Longitudinal rapid traverse (z-axis)	394 ipm (10,000 mm/PM)	394 ipm (10,000 mm/PM)	394 ipm (10,000 mm/PM)	394 ipm (10,000 mm/PM)
Cross rapid traverse (x-axis)	295 ipm (7500 mm/PM)	295 ipm (7500 mm/PM)	295 (7500 mm/PM)	295 (7500 mm/PM)
TAILSTOCK				
Maximum quill travel	4.7 in. (120 mm)	5.11 in. (130 mm)	7.08 in. (180 mm)	7.08 in. (180 mm)
Quill diameter	2.36 in. (60 mm)	3.15 in. (80 mm)	3.94 in. (100 mm)	3.94 in. (100 mm)
Quill taper hole	4 MT	4 MT	5 MT	5 MT
MOTOR				
Spindle motor	10 HP (7.3 Kw)	15 HP (11 Kw)	20 HP (15 Kw)	20 HP (15 Kw)
DIMENSIONS AND WEIGHTS				
Floor space required (approx.)	> 51" x 98" (1300 x 2500 mm)	> 60" x 107" (1524 x 2700 mm)	> 63" x 107" (1600 x 2700 mm)	> 63" x 107" (1600 x 2700 mm)
Approximate net weight	> 4000 lbs. (1814 kg)	> 6284 lbs. (2850 kg)	> 7040 lbs. (3190 kg)	> 7040 lbs. (3190 kg)

NOTE: Dimensions and specifications throughout this booklet subject to change without prior notice

Notice: Bridgeport Machines, Inc. provides instructions for the safe use of this equipment. Operation of this equipment may cause injury if the protective devices are removed. A comprehensive safety manual is provided with all machines offered by Bridgeport Machines, Inc. and recommended safe operating procedures must be adhered to.



Manufactured by

ROMI

Sales and Service by

Bridgeport

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