

LASERDYNE

Laserdyne 780 and 780 BeamDirector™



Multiaxis Laser Machining System

Cutting, Drilling, Welding and Heat Treating of Flat and 3-Dimensional Parts

The Laserdyne 780 is a standard, fully documented multi-axis laser machining center designed for cutting, drilling, welding, and heat treating of a wide range of flat and 3-dimensional parts.

- The basic 780 laser machining center provides 3 axes of laser beam motion for fast accurate processing of flat stock or flat surfaces of formed parts fixtured normal to the vertical axis.
- The 780 Beam-Director™ provides 5 axes of laser beam motion for trimming and cutting of formed, three

dimensional metal and non-metal parts.

- A servo controlled rotary table provides for versatile processing of cylindrical parts such as tubing, rings and spun metal parts.
- The shuttle table (servomotor driven or two position) expands the X-axis to 79 inches of travel.
- Other features include automatic focus control for "hands-off" processing of flat and formed parts.

The modularity of the 780 means that it can be configured initially to handle a wide range of application or expanded as applications change. New features developed by Laserdyne are all designed to be retrofittable to existing systems.

A Parts Manufacturing Problem Solver

That's what the Laserdyne 780 is all about. The 780 is designed for rapid changeover from one part to another and from cutting, drilling, welding and localized heat treating in a wide range of materials. Since the workpiece remains stationary, simplified tooling replaces expensive dies for short run production and prototype fabrication of both flat and formed parts. Furthermore, the high cost of tooling setup and tool maintenance is avoided.

The 780 provides flexibility in part design since the design can be changed in a matter of minutes by simply modifying the part program. The high speed contouring capability of the 780 in up to eight axes supports high cutting, drilling and welding rates while maintaining high accuracy.



Designed for the Industrial Shop Environment

The 780 is designed specifically for laser processing. The system's unique design gives operators easy access to the workpiece. Complete control of the laser processing parameters from within the part program enhances both ease of operation and flexibility.

Additional features such as multiple levels of crash protection, pressurized and sealed beam delivery optics and on board diagnostics promote reliability in an industrial environment.

U.S. Patent #4,555,610
Foreign Patent Pending



Table 1:
Specifications for Model 780 Systems

Workstation

Axis travels

Linear (X-Y-Z)	39 × 27 × 27 inch (991 × 685 × 685 mm)
BeamDirector (C)	± 190°
BeamDirector (D)	± 135°
Shuttle table	40 inch (1016 mm); extends X-axis travel to 79 inch (2006 mm)

Note: The open design of the system also allows for rotary or linear part motion for processing parts substantially larger than that defined by axis travels.

Feedrate

Linear (X-Y)	0-500 ipm (19.7 mm/pm)
(Z)	0-300 ipm (11.8 mm/pm)
BeamDirector (C-D)	0-32 rpm

Positioning Accuracy

Linear (X-Y-Z)	± 0.0015 inch per foot (± 0.038 mm per 305 mm)
BeamDirector (C-D)	± 0.063°

Positioning Repeatability

Linear (X-Y-Z)	± 0.0005 inch (± 0.013 mm)
BeamDirector (C-D)	± 0.02°

CNC

Manufacturer Applications	Laserdyne High speed multiaxis contouring and point to point motion, laser control
Number of Axes	Up to 8
CNC Features	See listed features

Laser

Type	Carbon dioxide (CO ₂) pulsed and continuous wave
Average Power	Up to 3000 Watt

CNC Features

Programming

- Absolute/Incremental
- Inch/Metric
- Linear and Circular Interpolation
- Splining/Smoothing for reducing the number of points required in TEACH Mode
- Orbiting for welding sheetmetal not meeting normal fitup requirements
- Laser Power (continuously variable)
- Laser Pulse Rate (continuously variable)
- Laser Pulse Duration (continuously variable)
- Laser Burst
- PosiPulse™ (laser pulsing as function of distance)
- Laser Power Ramping
- Laser Beam ON/OFF
- Laser Shutter OPEN/CLOSE
- IPM/MMPM Feedrate Programming
- Assist Gas (3) ON/OFF
- Standard and Parametric Subroutines for creating a database of shapes and process conditions
- Axis and Plane Rotation
- Scaling and Mirror Imaging
- Alphanumeric Character Marking and Serializing
- Variables
- Calculator Functions
- Tool Offsets (Kerf Compensation)
- Fixture Offsets
- Part Program Translation and Rotation
- Automatic Power-Feedrate for automatic optimization of laser power and feedrate
- Automatic Focus Control
- Zero Set
- Programmable System Parameter (such as acceleration, gain)
- Optional Stop
- Block Delete
- Dwell
- Message Display
- Power and Feedrate Override Enable/Disable

- Program Jump
- Program Chaining
- Canned Cycles
- Intersecting Cylinders for generating motion paths for cutting intersecting tubing
- HELP File

Editing

- Program Syntax Checking
- Insert
- Modify
- Delete
- Clear Memory
- Search
- Simultaneous Run/Edit
- Dryrun

Program Input, Output, and Storage

- RS232C Interface
- User Memory (64K with battery backup)
- Floppy Disk
- Punched Tape
- Manual Data Input
- DNC Interface

Operation

- Automatic and Single Block Mode
- Jog Mode (Fast and Slow Feedrate in realtime)
- Teach Mode
- Cycle Start/Stop
- Feedhold
- Power Override (0-150%)
- Feedrate Override (0-150%)
- Laser Startup and Power-down
- Laser Power Calibration
- Date and Time Clock

System Protection and Maintenance

- Diagnostics
- Keyboard Lockout
- Emergency Stop
- Software and Hardware Travel Limits
- Axis Position Error Detect
- Watchdog Timer



Laser cutting holes in hydroformed hemisphere. Hole size and location are programmed on off-line programming system.

Features a Complete Line of Programming Options

Laserdyne develops, writes and supports *all* the software for the system. As a result, the 780 features the most complete and versatile programming software available for laser machining systems. This is especially true for 780 Beam-Director™ systems. As indicated in Table 2, part programs may be developed through a wide range of methods developed specifically for laser processing.



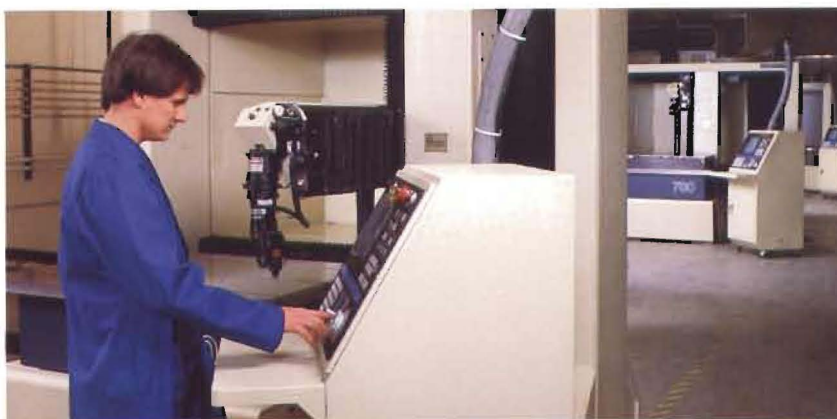
Laser trimmed and cut formed stainless steel part. The cut path is generated through a combination of TEACH mode (for border trim) and on-line programming (holes).

Part programs for the components of this intersecting tubing assembly are generated by special applications software resident in the CNC.



**Table 2:
Programming Methods for Laserdyne Systems**

Features	
On-line NC Programming	Uses conventional NC language with G and M codes. Full edit capabilities including insert, delete, search, syntax checking.
Standalone Off-line Programming System	Programs entered through punched tape, RS-232-C interface or DNC interface
CAD/CAM System with Laserdyne Supplied Post-processor	Programs entered through punched tape, RS-232-C interface or DNC interface
Teaching	Includes: <ul style="list-style-type: none"> • Tool Point Center for positioning the system about the laser beam focal point • Splining (smoothing) in five axes to reduce the number of taught points • Plane Rotation • Automatic Power-Feedrate • Constant Surface Feedrate • Editing Utilities for easily changing the taught path • Teach Pendant
Application Programs	<ul style="list-style-type: none"> • Intersecting Cylinders for tube cutting • Contouring on Spherical Surfaces
Off-line Digitizing	<ul style="list-style-type: none"> • Includes Digitizer Interface for generating complete NC programs off-line





Complete Operator Training and Applications Support

Laserdyne systems come with complete Application and Technical Support services to ensure that they are as productive as possible. This service includes:

- Programming, Operation and Preventive Maintenance Training
- Advanced Operator Training Courses
- Quarterly Users Newsletter
- Users Group Meetings
- Programming and Operation Manuals

And, to get answers to your questions on programming or operation, Laserdyne Technical Support Specialists are only a phone call away.

Complete System Maintenance Support

Laserdyne provides full field service support for the entire system. This is backed up by:

- 24 hour per day National Dispatch Center for dispatching service engineers
- Complete spare parts stocking and distribution
- Maintenance training courses
- Complete Maintenance Documentation

Let Laserdyne Show You What The 780 Can Do

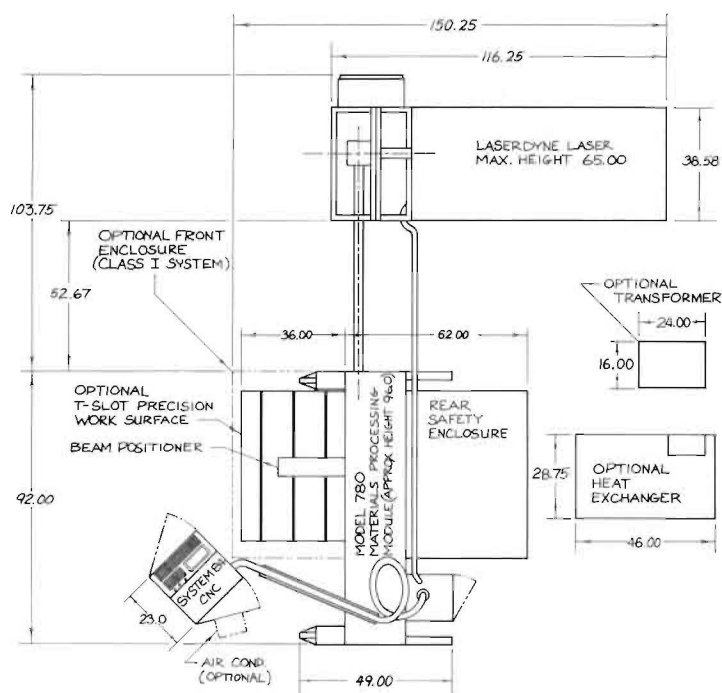
The Laserdyne 780 has a reputation for high performance and reliability. Its applications include:

- cutting low volume or prototype stampings
- hole drilling
- trimming and machining formed metals and non-metals
- cutting intersecting tubing
- welding
- ceramic scribing

Before you buy a Laserdyne 780 system we want to prove to you that what we say is true. You'll have an opportunity to see your part processed on our machine not once but hundreds of times. Bring us your parts and see for yourself.

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The Laserdyne 780 Specifications

ITEM	500 WATT LASER	1200 WATT LASER
Floor Loading	Refer to "Good Practices and Guidelines to Follow for Foundations and Floors When Installing Laserdyne Systems."	
Power Requirements	3 phase, 208 \pm 10% volts 80 Amp 60 HZ*	
Laser Gas Requirements	.422 SCFH Nitrogen .126 SCFH Carbon Dioxide 2.108 SCFH Helium	
Coaxial Gas	Three gases may be used in any combination	
Cooling Requirements—Water	60,000 BTU/HR	
Cooling Requirements—Air	100,000 BTU/HR**	
Fume Removal	A system capable of 500 SCFM flow minimum is recommended	
STD System Weight	10,500 lbs.	

*Optional \pm 10%, 60 Amp, 60 HZ

**The cooling requirement for the water is included

LASERDYNE

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Laserdyne's office is located 20 minutes
from the Mpls/St. Paul Int'l Airport.