Technical Specifications

CRESCENT 30

CRESCENT 40

Laser Imagers

ESCORT 30

Automated Material Transport

414 110 012 Rev. B
January 2000

 Correspondence regarding this publication should be forwarded to:

Engineering Services
Barco
30 South Satellite Road
South Windsor, CT 06074

Printed in the USA

Published by
Barco
Engineering Services Department

CRESCENT 30 / CRESCENT 40 / ESCORT 30
Technical Specifications
Part Number 414 110 012 Rev. B

BARCO

Product List

Products described in this technical specification include the products listed below.

Product name	Part number
CRESCENT/30 Laser Imager	0030NT-01US for US delivery 0030NT-01CN for Canadian delivery
CRESCENT/40 Laser Imager	0040NT-01US for US delivery 0040NT-01CN for Canadian delivery
ESCORT/30 Auto Film Loader and options	0030-879-01US for US delivery 0030-879-01CN for Canadian delivery
CRESCENT/30 HIRes Upgrade Kit	0030-000-000-xx991
CRESCENT HIACCURACY Option	0030-000-805-01 for CRESCENT/30 0040-000-805-01 for CRESCENT/40
PRISM-NT Workstation	
PRISM-NT Software	
PRISM-View Software	

Contents

BARCO

Overview

The Crescent family of laser imagers is the printed wiring board industry's most effective and affordable laser imagers. They are designed for unattended operation. An intuitive, easy to use imager controller — the **PRISM-NT** — gives the CAM station operator complete control over imaging, including image sequence, resolution, polarity, and orientation. The only attention required by the imager may be film loading and unloading which, with addition of the optional **ESCORT/30** Auto Film Loader, is also automated.

CRESCENT/30 with ESCORT/30Film Loader

The Crescent imagers use a field-proven internal drum with laser diode technology that virtually eliminates laser replacement. A parabolic mirror focuses the laser to a precise spot, resulting in excellent line edge acuity. The patented friction drive assures smooth and accurate motion.

The **CRESCENT/30** offers two resolutions:

- 1/4 mil (4,000 dpi) resolution for complex features
- 1/2 mil (2,000 dpi) resolution for production jobs with less critical accuracy

The **CRESCENT/40** offers three resolutions:

- 1/8 mil (8,000 dpi) resolution designed for ultra-precise phototools
- 1/4 mil (4,000 dpi) resolution for complex features
- 1/2 mil (2,000 dpi) resolution for production jobs with less critical accuracy

Options

- **ESCORT/30 Auto film Loader** for automating film loading and unloading.
- **CRESCENT HIACCURACY Option** provides ½ mil (±12.7µ) accuracy over 18" x 24" (457 mm x 610 mm).
- **HIRes CRESCENT/30 Upgrade Kit** converts an installed dual-resolution CRESCENT/30 to a triple-resolution CRESCENT/40.

Specifications

CRESCENT/30

Standard Features

The standard CRESCENT/30 consists of:

- A red laser diode (670 nm wavelength) laser imaging system capable of imaging on red-sensitive film to the specifications listed in Table 1.
- Stationary, internal drum with integral vacuum capable of holding down virtually any size media from 11" x 14" to 24" x 30" without masking.
- PRISM -NT imager controller consisting of an Intel Pentium II-based computer with Windows NT, 128MB RAM, a minimum of 4 GB disc storage.
- PRISM -NT and PRISM -View software for creating composites, viewing, and orienting phototools and for image queue control.
- Physical and software interfaces required to integrate the system into an existing Ethernet network.
- Software, parts, and labor warranty, installation, and training as determined by contract terms.

Table 1 CRESCENT/30 Performance Specifications[1]

Characteristics	*Inches*		*µ-millimeters*	
Resolution *(operator selectable)*	0.00025	0.0005	6.35	12.7
Maximum Media Size	24 x 30		610 x 762mm	
Maximum Plot Area	22 x 28		559 x 711mm	
Media Thickness	0.007		0.18mm	
Plot Time (18" x 24" image)	6 min	3 min	6 min	3 min
Accuracy[2,3]	±0.0008	±0.0008	±20.3	±20.3
Repeatability[4]	±0.0005	±0.0005	±12.7	±12.7
Edge Regularity[5], on axis **off axis**	±0.00013 ±0.00025	±0.00025 ±0.00050	±3.3 ±6.35	±6.35 ±12.7
Line Width & Space Tolerance	±0.0003	±0.0005	±7.62	±12.7
Minimum Line/Space	0.0020	0.0020	50.8	50.8

[1] Based upon operation at 68°F ±1°F (20°C ±0.5°C) ambient temperature, 50% ±5% relative humidity. Measurement of plots on film is subject to the dimensional stability of the film itself.
[2] Accuracy is the ability of an achieved position to fall within the specified tolerance of the commanded position in accordance with Technical Bulletin 111.
[3] Based on film. Barco is not responsible for accuracy effects due to media thickness variations.
[4] Accuracy specification exclusive of 1-inch (25.4mm) border.
[5] Exclusive of media stability.

CRESCENT/40

Standard Features

The standard CRESCENT/40 consists of:

- A red laser diode (670 nm wavelength) laser imaging system capable of imaging on red-sensitive film to the specifications listed in Table 2.
- Stationary, internal drum with integral vacuum capable of holding down virtually any size media from 11" x 14" to 24" x 30" without masking.
- PRISM -NT imager controller consisting of an Intel Pentium II-based computer with Windows NT, 128MB RAM, a minimum of 4 GB disc storage.
- PRISM -NT and PRISM -View software for creating composites, viewing, and orienting phototools and for image queue control.
- Physical and software interfaces required to integrate the system into an existing Ethernet network.
- Software, parts, and labor warranty, installation, and training as determined by contract terms.

Table 2 CRESCENT/40 Performance Specifications[1]

Characteristics	*Inches*			*µ-millimeters*		
Resolution *(operator selectable)*	0.000125	0.00025	0.0005	3.18	6.35	12.7
Maximum Media Size	24 x 30			610 x 762mm		
Maximum Plot Area	22 x 28			559 x 711mm		
Media Thickness	0.007			0.18mm		
Plot Time (18" x 24" image)	12 min	6 min	3 min	12	6 min	3 min
Accuracy[2,3]	±0.0008	±0.0008	±0.0008	±20.3	±20.3	±20.3
Repeatability[4]	±0.0005	±0.0005	±0.0005	±12.7	±12.7	±12.7
Edge Regularity[4,5] **on axis** **off-axis**	±0.0001 ±0.0002	±0.00013 ±0.00025	±0.00025 ±0.00050	±2.5 ±5.1	±3.3 ±6.35	±6.35 ±12.7
Line Width & Space Tolerance	±0.0002	±0.0003	±0.0005	±5.1	±7.62	±12.7
Minimum Line/Space	0.0015	0.0020	0.0020	38.1	50.8	50.8

[1] Based upon operation at 68°F ±1°F (20°C ±0.5°C) ambient temperature, 50% ±5% relative humidity. Measurement of plots on film is subject to the dimensional stability of the film itself.
[2] Accuracy is the ability of an achieved position to fall within the specified tolerance of the commanded position in accordance with Technical Bulletin 111.
[3] Based on film. Barco is not responsible for accuracy effects due to media thickness variations.
[4] Accuracy specification exclusive of 1-inch (25.4mm) border.
[5] Exclusive of media stability.

PRISM-NT Imager Controller

CRESCENT family laser imagers include PRISM -NT and PRISM -View software residing on the PRISM -NT Pentium II-based workstation to provide imager control.

PRISM-NT Software

PRISM-NT software performs two main functions:

- Controls the sequence of phototool output to the Crescent imager in either a manual or automatic mode.
- Prepares ("RIPs") the CAM data for laser imaging by converting it to the format required by the imager.

In addition, PRISM-NT adds the following control features:

- Allows plots to be "RIPped ahead", so jobs can be prepared for imaging in advance or while the imager is busy imaging other jobs. Any number of jobs can be RIPped ahead, subject only to the limitations of disc storage space.
- In automatic mode, PRISM-NT watches specified input directories and automatically RIPs and images jobs appearing there. In manual mode, the operator selects jobs individually to be RIPped or imaged.
- Allows operator to specify scale, mirror, rotation, polarity and number of copies.
- Offers a unique *film optimization* feature, which allows plots or layers to be grouped on a single film, which saves film and setup time and also minimizes the number of film sizes in inventory.
- When used in automatic mode in combination with the optional ESCORT/30 Auto Film Loader, allows completely unattended imaging.
- Automatically saves or deletes files that have already been RIPped or imaged according to a schedule set by the operator, such as delete after imaging, delete after one hour, delete after one day, never delete, etc.
- Monitors and reports disc space utilization.

CAM input formats to PRISM-NT include:

- Gerber RS274-X as described in the *RS274-X User Guide*, part number 414-100-014 (available from Barco).
- Gerber RPD format data generated by the Gerber Plot Control (GPC) system, Valor Genesis 1800 or Genesis 2000, Tibor Darvas Planmaster, CAMPLAN, CAMPLANplus, or Barco UCAM.

PRISM-View Software

PRISM-View is a graphical software package for viewing, editing, and translating data formats running on Windows NT. PRISM-View outputs Gerber RS274-X data for seamless input to PRISM-NT.

Input formats include:

- Gerber RS274-D
- Gerber RS274-X
- Barco DPF
- CSI Fire 9000
- HPGL, HPGL/2
- Universal Aperture Table Converter

Output format is:

- Gerber RS-274X

PRISM-View also supports:

- Compositing/edit tools
- Adding features
- Information and D-code query utilities
- Miscellaneous utilities
- Aperture creation (standard and custom apertures)
- Other PRISM-View features include:
  - Convert draw to flash
  - Input composite positive/negative merges
  - Building composite positive/negative merges
  - View composite positive/negative merges
  - Create over/undersize feature globally
  - Checkplot autofilm
  - Print-screen
  - On-line help
  - Create, record, playback BASIC language macros

Options

ESCORT/30 Auto Film Loader

The ESCORT/30 Auto Film Loader permits a Crescent imager to image files in daylight conditions without operator intervention. The standard ESCORT/30 is equipped with one light-tight load cassette and a film conveyor for connection to a purchaser-supplied film processor. An unload cassette and additional load cassettes are available as options.

Table 3 lists film sizes accepted by the ESCORT/30.

The ESCORT/30 may be retrofitted to an existing imager. It is housed in an enclosure with casters designed for easy maneuverability and mating with the imager.

Table 3 ESCORT/30 Film Specifications

Feature	Specification	
Cycle time (unload + load)	60 seconds	
Media type	polyester-based film	
Media thickness	0.007"	0.178 mm
Size	24" x 30"	610 x 762 mm
	22" x 28"	559 x 711 mm
	20" x 26"	508 x 660 mm
	20" x 24"	508 x 610 mm
	16" x 20"	406 x 508 mm

ESCORT/30 Options

- **Load Cassette** for transporting unexposed film from darkroom to ESCORT/30. It can be configured to accept any of the film sizes shown in Table 3. Use of multiple load cassettes allows the Purchaser to change film sizes without reconfiguring the cassette.
- **Unload Cassette** for transporting exposed film from ESCORT/30 to film processor. The unload cassette allows accumulation of imaged film prior to processing and may be used interchangeably with the conveyor.

CRESCENT/30 HIRes Upgrade Kit

The HIRes Upgrade Kit converts the dual-resolution (1/2 and 1/4 mil) CRESCENT/30 to a triple-resolution (1/2, 1/4, and 1/8 mil) CRESCENT/40.

Note: Systems must be performing to current specification prior to commencement of upgrade. This means that (a) systems presently under

parts and labor maintenance contracts are guaranteed to meet specification at the price shown (there will be no hidden costs) and (b) systems not presently under parts and labor maintenance contract will, prior to commencement, be tested for accuracy and repaired at the Purchaser's expense.

The kit includes:

- PRISM-NT workstation and software, if required to bring the existing workstation up to required performance.
- Installation, warranty, and training according to prevailing terms.

CRESCENT HIACCURACY Option

The CRESCENT HIACCURACY Option provides ½ mil (±12.7 µ) accuracy over 18" x 24" (457 mm 610 mm).

Network Integration

The CRESCENT/30 or CRESCENT/40 can be integrated into existing networks based on the following:

- UNIX workstations
- Windows NT workstations

The following PRISM-NT workstation connectivity is supported:

- PRISM-NT workstation to Windows NT workstation
- PRISM-NT workstation to Windows 95 workstation
- PRISM-NT workstation to Windows for Work Groups workstation
- PRISM-NT workstation to UNIX workstation
  For this configuration, the purchaser must purchase the Intergraph DiskShare Bundle software to be loaded on the PRISM-NT workstation.

The purchaser is responsible for :

- Installing network cable to the workstation
- Providing network hardware and/or software required to complete installation. The PRISM-NT workstation includes connections for thin wire, thick wire, and twisted pair networks in 10BaseT or 100BaseT configurations.
- Providing network addresses as required.
- Providing network personnel to support installation.

Integration into any configuration other than those listed here is the responsibility of the Purchaser.

Note: Although NetWare for Novell networks is installed Windows NT workstations, Barco will not connect the workstation to the Novell network.

Installation Requirements

CRESCENT/30 and CRESCENT/40

Environmental 60 - 80°F (16 - 26°C); 40 - 60% (non-condensing) relative humidity.

Electrical 120 VAC, 50/60Hz, 20 amp dedicated circuit; 9 amp peak draw; 6 amp average operating draw; 720 watts average power consumption. A 1 kva transformer included with the imager accepts 100, 115, 200, or 230 VAC input and provides the required output.

Cabling Cable length between the CRESCENT/30 and the workstation is 12 feet (3.6m).

Heat 2,000 Btu/hr (0.6KW/hr).

Floor Loading Distributed approximately evenly by four casters.

Table 4 CRESCENT/30 and CRESCENT/40 Dimensions

Width		Depth		Height		Weight		Heat	Power	
inches	mm	inches	mm	inches	mm	lbs.	kg	Btu	watts	amps
34	864	48	1,219	64	1,626	825	375	2,000	720	9

Note: A minimum of 3 feet (914 mm) is required on all sides for service.

ESCORT/30

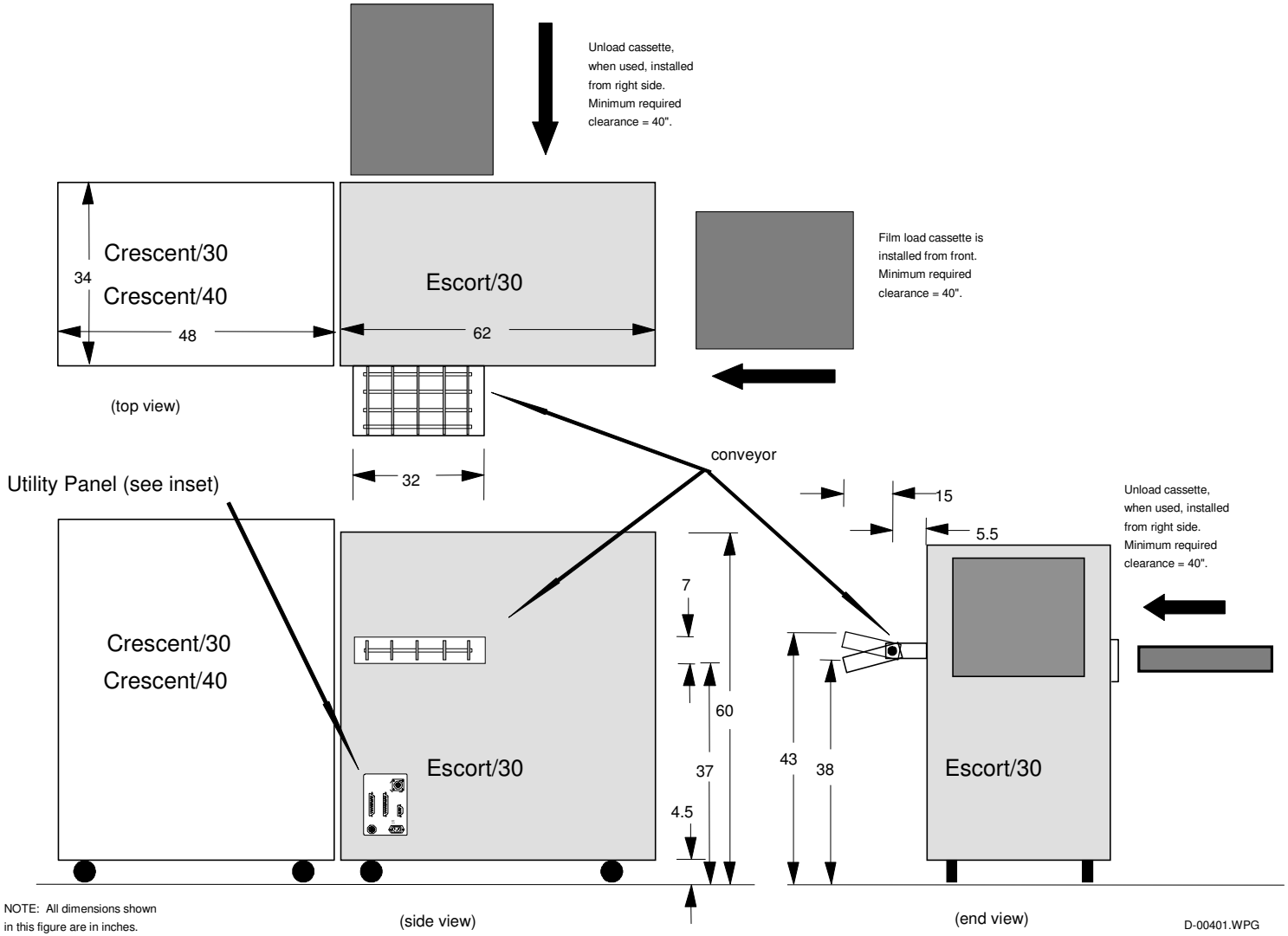
Environmental 60 - 80°F (16 - 26°C); 40 - 60% (non-condensing) relative humidity

Electrical One 120 VAC, 50/60 Hz, 1-phase, 15 amp circuit free of line transients. A 1 kva transformer included with the ESCORT/30 accepts 100, 115, 200, or 230 VAC input and provides the required output.

Air 5 cfm air @ 85 psi filtered to 5µ

Table 5 ESCORT/30 Dimensions

Width		Depth		Height		Weight		Heat	Power	
inches	mm	inches	mm	inches	mm	lbs.	kg	Btu	watts	amps
34	864	62	1,575	60	1,530	400	181	1,230	360	3


Unload cassette, when used, installed from right side. Minimum required clearance = 40".
Crescent/30
Crescent/40
34
48
Escort/30
62
Film load cassette is installed from front. Minimum required clearance = 40".
(top view)
conveyor
32
Utility Panel (see inset)
15
5.5
Unload cassette, when used, installed from right side. Minimum required clearance = 40".
7
60
37
4.5
43
38
Crescent/30
Crescent/40
Escort/30
Escort/30
NOTE: All dimensions shown in this figure are in inches.
(side view)
(end view)
D-00401.WPG

BARCO

Application Information

Imager Media

Crescent laser imagers are designed to utilize a wide variety of photo- and heat-sensitive films. Based upon manufacturer specifications, Barco believes that the media shown below will produce acceptable results for fabrication of phototools.

Table 6 Acceptable Media[1]

Supplier	Media	Comment
DuPont	HTR7[2]	Hi Tech Red Laser
	PRL-7	Red Laser Film
Kodak	ARX-7[2]	Accumax 2000 Film
	ERN-7[2]	Ektaline 2000 Film
	ERF-7[2]	Ektaline 2000 Film
Agfa	RL7	Red Laser Film (Silver Tool family)
	RLS3[2]	Star Line
	HTR3[2]	Rapid Access
Polychrome	PIF-7	
	MLD-7	Millennium 4000 Hard Dot Film
Konica	PCR-7	Use Konica Tetrastige Developer 860

[1]7 mil film only.

[2]Green or cyan light safe only. See manufacturer's recommendations.

Image quality is affected by emulsion and imager setup, as well as by a variety of conditions including media base material, processor type, chemistry type, and age of chemicals. Consult your media supplier for additional information on chemistry and darkroom requirements.

A stable environment is key to achieving quality images. Optimal performance is achieved when the media stored under the same temperature and relative humidity conditions (as the room in which it will be imaged) for at least 8 hours prior to imaging. After processing the imaged film should be stabilized under those same conditions again for at least 8 hours prior to taking measurements.

Note: A change to a different film or chemistry after acceptance of the machine is the customer's responsibility. Any Field Service time spent solving film and chemistry problems will be billed to the customer.