

# REVISIONS

LTR	DASH NO.	DESCRIPTION	DATE	APPROVED
A	9001	PRODUCTION RLSE	<sup>28</sup> MAR 81	

MX

JUN 12 1984

9001

CHECK PRINT  
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**PRODUCTION**  
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	USED ON	1st APPLICATION	DWG APPROVAL DATE	<b>CENTRONICS</b> data computer corp. HUDSON, NEW HAMPSHIRE U.S.A.		
			DWN <i>C. Curtis</i> <sup>28</sup> MAR 81			
			CHK			
			DR MGR			
			DES ENG <i>R. Barlow</i> 3/28/81	TITLE ENGINEERING PRODUCT SPEC 70 YARD RIBBON CASSETTE		
NEXT ASSY			DWG RELEASE DATE	SIZE	NUMBER	REV
			ENG PROG MGR	A	80002151	A
			<i>R. Barlow</i> 3/28/81	SCALE	DO NOT SCALE PRINT	SHEET <u>1</u> OF <u>10</u>
				NONE		

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### 1.0 SCOPE AND DEFINITION

This specification covers the requirements for nylon ribbons used by Centronics 350 Series matrix printers and the method used to determine the end of the useable life.

#### 1.1 DEFINITION OF TERMS USED

- A. Ribbon - Nylon material holding the ink.
- B. Cassette - The container used to hold and dispense the ribbon.
- C. Ribbon Cassette - The cassette with the ribbon.
- D. Ribbon Guide - A plastic guide which snaps on the nose piece of the print head.

### 2.0 APPLICABLE DOCUMENTS

#### 2.1 FUNCTIONAL SPECIFICATIONS

Engineering Product Specification #80002126-9001

Engineering Product Specification #80002149-9001

#### 2.2 PRINT QUALITY SPECIFICATIONS

Specification #80001004-01

### 3.0 REQUIREMENTS

#### 3.1 OPERATION

Each ribbon cassette will be supplied a plastic ribbon guide. This guide will be snapped onto the front of the head after the cassette is in place for a "clean hands" installation.

#### 3.2 VENDORS

Ribbon cassette assemblies will be supplied by CDCC approved vendors only.

#### 3.3 RIBBON CHARACTERISTICS

##### 3.3.1 Material

Nylon 66

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## 3.3.2 Threads

Warp 40D/34F  
Fill 40D/34F

## 3.3.3 Weave

Plain crossweave

## 3.3.4 Count

Warp 172  $\pm$  4 threads/inch  
Fill 117  $\pm$  4 threads/inch  
Round 281 Min.

## 3.3.5 Caliper

0.004"  $\pm$  0.00025" (0.10  $\pm$  0.006 mm)

## 3.3.6 Edging

### 3.3.6.1 Edge

Cut and fused.

### 3.3.6.2 Depth

1 to 2 threads

## 3.3.7 Tensile Strength

33 lbs per 0.5" (15 Kg per 12.7 mm)

## 3.4 RIBBON DIMENSIONS

### 3.4.1 Width

0.472" (12 mm)  $\pm$  0.015" ( $\pm$  0.38

### 3.4.2 Length

70 yards (64 m)  $\pm$  .5 yards endless, 180° Mobius's curve.

## 3.5 RIBBON WELD

### 3.5.1 Seal

Ultrasonic sealed

### 3.5.2 Joint Thickness

0.004 inches  $\pm$  .0004 in. (0.105 mm  $\pm$  0.010 mm)

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### 3.5.3 Joint Width

0.018 in.  $\pm$  006 in. (0.45mm  $\pm$  0.15mm)

### 3.5.4 Joint Angle

30°  $\pm$  3° with the ribbon edge

### 3.5.5 Tensile Strength

5.5 lbs per 0.335" (2.5 Kg per 8.5mm)

### 3.5.6 Weld Quality

No frayed or loose threads at weld site. Weld offset not to exceed .010 to .015 inches (0.25 to 0.38mm).

### 3.6 INK

#### 3.6.1 Name

HPM Ink, approved by CDCC

#### 3.6.2 Color

Black

#### 3.6.3

Ink will not adversely effect the printer mechanism or plastic parts in any way.

#### 3.6.4 Smear

Ink will not smear with normal handling of printed material.

#### 3.6.5 Fading

Printed material will not show marked fading when exposed to fluorescent light or sunlight.

### 3.7 INKED RIBBON

#### 3.7.1 Degree of Inking

20  $\pm$  1% by weight of ink and fabric together.

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### 3.7.2 Ribbon Life

Ribbon life is defined by measuring the reflectance of the printed characters (O, W or E) with an optical densitometer. The readings shall be 92% or  $\pm 2\%$  reflectance at the completion of 10 million characters.

### 3.8 LOT NUMBER

Lot numbers will be shown as follows:

9 01 10 5 (Example)  
year month day coater no.

### 3.9 RIBBON CASSETTE ASSEMBLY

- A. Mobius loop and weld to be inside the cassette.
- B. Ribbon cassette assembly to be marked with the appropriate designations provided by CDCC.
- C. Shelf life to be twelve (12) months from date of delivery to CDCC at  $-22^{\circ}\text{F}$  to  $140^{\circ}\text{F}$  ( $-29^{\circ}\text{C}$  to  $60^{\circ}\text{C}$ ) and 5 to 95% R.H. without ink depletion or running.

### 3.10 CASSETTE

#### 3.10.1 Material

ABS or equivalent qualified by CDCC.

#### 3.10.2 Dimensions (Ref. Drawing #1)

Width	-	8-5/8" (219mm) (Approximate)
Depth	-	6-3/16" (157mm) (Approximate)
Thickness	-	1/2" (Approximate)
Knurled Knob	-	5/16" (12.7mm) diameter 3/8" (9.5mm) height

#### 3.10.3 Torque and Ribbon Speed

Torque of the cassette drive will be 150 gm or less. The ribbon speed can be operated up to 13 inches per second.

### 4.0 PACKAGING

#### 4.1 BOX

Packaged in each box will be one cassette of ribbon (wrapped in one polyethylene envelope).

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### 4.2 CARTON

Packaged 6 boxes per carton.

### 4.3 INSTRUCTION SHEETS

- A. One (1) ribbon card guide attached to cassette polyethylene envelope per Drawing
- B. One (1) instruction sheet packaged in box per Drawing #

### 5.0 END OF USEABLE LIFE DETERMINATION

#### 5.1 EQUIPMENT USED

- A. Moore Model 082A optical character tester.
- B. 180 Series printer (print quality must meet Q.C. requirements).
- C. Fifteen lb. premium bond paper, white (Moore 1411OP-1) or equivalent.

#### 5.2 PROCEDURE

##### 5.2.1 Generation of Print Samples (Rundown Test)

- A. Use spiral pattern.
- B. 100% duty cycle, 132 columns, 6 lpi.
- C. Take an initial sample and then a sample every 10,000 lines.
- D. Run the ribbon until it jams or will not run any longer due to mechanical failure.
- E. Test to be run at 65°-85°F (18-29°C) and 10% - 50% R.H.
- F. Forms thickness control must be set for single part paper.

##### 5.2.2 Print Density Measurement (Ref: Model 082A Manual)

- A. Warm up to be at least 30 minutes.

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B. Machine set up:

Power on  
Visible/IR on Visible  
Refl./PCS on Refl.  
Sensitivity = .1  
Magnification = 1X  
Filter = Neutral Visible

C. Calibrate using calibration disc and procedure in manual to insure proper operation of the instrument.

D. Using a piece of flat black paper, or other light absorbing material as a backing for the sample being measured, measure reflected light from a blank sheet of paper and recalibrate the densitometer using that reading as a 100% reflection factor.

E. Use two (2) test characters: 2E<sub>H</sub>, zero (0) 20<sub>H</sub>, and W 57<sub>H</sub> and measure by placing the 160 mil aperture over the character and determine the amount of light reflected.

F. Measure each of the test characters in two (2) areas of the printed page by effectively dividing the page vertically into two (2) equal areas.

1. Density measurements must not vary by more than 3% from right-to-left across the page for similar characters and the two (2) averaged together.
2. No measurements should be made closer than one (1) inch to the perforation.

G. Average the readings for the two (2) characters from the two (2) zones of the samples.

H. Repeat the procedure for each 10,000 line sample.

## 5.3 PRINT DENSITY REQUIREMENTS

### 5.3.1 Initial Density

The reflected light from the averaged test characters on the initial (0 lines) sample must meet 60% maximum.

### 5.3.2 EOL Density

When more than 92% of the light is reflected from the averaged test characters, the ribbon is considered to have reached the End of Useable Life.

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## 6.0 MECHANICAL LIFE

A sample of at least twelve (12) ribbons must be run to determine that the ribbon will continue to operate mechanically to a line count 25% beyond the End of Life point.

## 7.0 MINIMUM USEABLE LIFE OF RIBBON

Minimum useable life of ribbon at 100% duty cycle is to be 10 million characters.

## 8.0 RIBBON CASSETTE ASSEMBLY ACCEPTANCE AND QUALIFICATION

- A. Must meet initial density requirements and useable life as defined by the end of life procedure.
- B. Must maintain print quality specification.
- C. Chaff build-up of not more than two (2) grams/ribbon.
- D. Must not adversely affect any part of the printer (ribbon rollers, print band, etc.).
- E. Printer must still meet its functional specification, MTBF, enviromental, etc.
- F. Print out must remain relatively black for the life of the ribbon. Rundown color changes must meet CDCC approval.

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