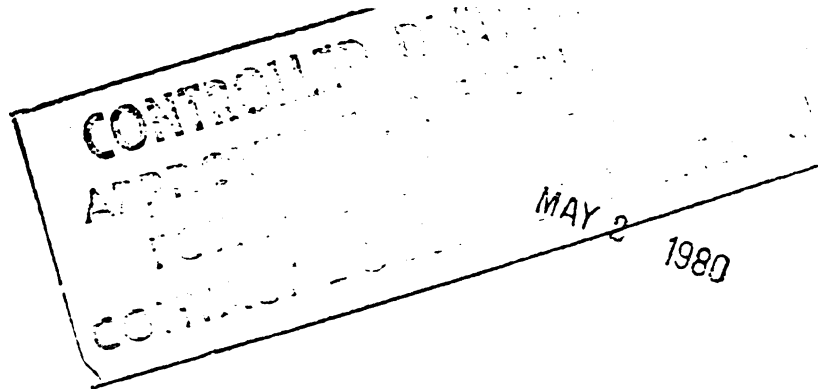


REVISIONS

LTR	DASH NO.	DESCRIPTION	DATE	APPROVED
N	9001	REVISED PER ECO 73700794	1-18-80	DDN [Signature]
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MODEL 703
#80001059-9001



9001

REP 3/1

703	USED ON	1st APPLICATION	DWG APPROVAL DATE	<div style="text-align: right; margin-bottom: 10px;"> CENTRONICS data computer corp. <small>HUDSON, NEW HAMPSHIRE U.S.A.</small> </div> <div style="text-align: center;"> <p style="font-size: 1.2em;">FUNCTIONAL SPEC</p> <p style="font-size: 1.2em;">MODEL 703</p> </div>
	NEXT ASSY		TITLE	
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			ENG PROG MGR	
			MFG ENG	
			QA	
		SIZE	NUMBER	REV
		A	80001059	0
		SCALE	DO NOT SCALE PRINT	
		SHEET <u>1</u> OF <u>34</u>		

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1.0 SCOPE

1.1 DEFINITION

This specification defines the functional characteristics and requirements applicable to the design and construction of a serial printer mechanism and control electronic identified as a Model 703 Serial Printer.

2.0 RELATED DOCUMENTS

2.1 SPECIFICATIONS

- | | | |
|-----|---------------|--|
| (A) | 80001005-9001 | Ribbon Specification, Inked Nylon |
| (B) | 80001004-01 | Print Quality Specification, Line Printer Matrix |
| (C) | 80001003-01 | Paper Specification, Line Printer, Matrix |
| (D) | B3.2 | Product Test Specification |

2.2 DRAWINGS

- | | | |
|-----|----------|-----------------------|
| (A) | 35578708 | Character Sets, ROM's |
|-----|----------|-----------------------|

3.0 REQUIREMENTS

The standard unit shall be capable of printing all 64 characters from the USASCII code chart, columns 2 thru 5, as shown in Figure 2. The printer shall also respond to certain control codes as described in Section 3.2.4.

3.1 PHYSICAL CHARACTERISTICS

3.1.1 Description

The Model 703 is a single head, 132 column, 7x7 dot matrix, 180 cps, serial, impact, bidirectional printer utilizing microprocessor and stepper motor technology. Bidirectional printing, coupled with the ability to logically seek the shortest path in the printing of successive lines of data, permits maximum throughput printing rate. Print speed shall be 165 characters per second with optional 9x7 dot matrix.

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The printer mechanism shall be of both a rear and bottom paper load design capable of handling single thru six-part forms (per specification #80001003-01), at the slew rate of 15 IPS with standard tractor paper feed. Pin feed platen with 8 IPS paper feed, and independent front feed device for ledger cards and cut forms are optional forms handling modules. Standard vertical line spacing is 6 lines per inch.

3.1.2 Size

The basic printer dimensions shall not exceed 9 inches (229mm) in height, 25 inches (635mm) in width, and 19.5 inches (495mm) in depth.

3.1.3 Weight

The weight of the basic printer shall not exceed 75 lbs (34 kg).

3.1.4 Finish

All metal parts shall have appropriate finishes to prevent corrosion from having an adverse effect upon the operation of the unit.

3.2 ELECTRICAL DESIGN

3.2.1 Interface

To facilitate compatibility with existing product lines and interfaces, the printer shall present a parallel interface via an Amphenol 57 Series, 36-pin connector.

As an option, the Model 703 will be capable of accepting Centronics' optional interfaces that conform with the physical outline of the Centronics interface design package convention, 62000215, and with the connector signal assignment on sheet 11 of this functional specification.

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AMPHENOL 57 SERIES PIN OUT

<u>PIN</u>	<u>SIGNAL</u>	<u>PIN</u>	<u>SIGNAL</u>
1	DATA STROBE	19	TWISTED PAIR GND.
2	DATA BIT 1	20	TWISTED PAIR GND.
3	DATA BIT 2	21	TWISTED PAIR GND.
4	DATA BIT 3	22	TWISTED PAIR GND.
5	DATA BIT 4	23	TWISTED PAIR GND.
6	DATA BIT 5	24	TWISTED PAIR GND.
7	DATA BIT 6	25	TWISTED PAIR GND.
8	DATA BIT 7	26	TWISTED PAIR GND.
9	DATA BIT 8	27	TWISTED PAIR GND.
10	ACKNOWLEDGE (ACKNLG)	28	TWISTED PAIR GND.
11	BUSY	29	TWISTED PAIR GND.
12	PAPER OUT (PE)	30	<u>INPUT PRIME</u> RETURN
13	SELECT (SLCT)	31	<u>INPUT PRIME</u>
14	GROUND	32	FAULT
15	OSCILLATOR (OSCXT)	33	GROUND
16	GROUND	34	NOT USED
17	CHASSIS GROUND	35	NOT USED
18	+5V	36	NOT USED

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PRINTER INTERFACE CONNECTOR PIN OUT

<u>CONNECTOR PIN NO.</u>	<u>CONN. A</u>	<u>CONN. B</u>
1		Not Used
2		Not Used
3		Busy
4	-12 VDC @ 200 ma + 10%	
5	+12 VDC @ 200 ma + 10%	
6		+15 VDC @200 ma
7		+OV
8		
9		<u>PE</u>
10		Input Prime Ret.
11		Data 6
12		Data 8
13		+5 VDC
14		
15		Data 5
16		Data 2
17		Data 3
18		Data 1
19		Data 7
20		Data 4
21		Data Strobe
22	+5 VDC @ 800 ma + 5%	ACKNLG
A		+OV
B		+OV
C		Busy Ret.
D		Not Used
E		
F		SLCT
H		OSCXT
J		
K		Not Used
L		Input Prime
M		Fault
N		Data 6 Ret.
P		Data 8 Ret.
R		
S		Data 5 Ret.
T		Data 2 Ret.
U		Data 3 Ret.
V		Data 1 Ret.
W		Data 7 Ret.
X		Data 4 Ret.
Y		Data Strobe Ret.
Z		ACKNLG Ret.

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3.2.2 Externally Generated Signal Description

A timing diagram of the interface control signal is shown in Figure 1.

3.2.2.1 Data Strobe

This negative going pulse is used to transfer the incoming data into the electronics circuitry of the printer. The pulse duration must be a minimum of 1.0 microsecond. The relationship of the leading and trailing edges of the data strobe with the data lines is described in the Data Line section. (See Options, Paragraphs 6.10 and 6.11).

This signal drives TTL logic and is terminated by a 470 ohm resistor to +5 volts.

3.2.2.2 Data Lines

The eight data lines drive TTL logic and are terminated by a 1K ohm resistor to +5 volts. The high logic level of each data line must be settled at least 1.0 microsecond before the leading edge of the strobe pulse and remain at its logic level until at least 1.0 microsecond after the trailing edge of the strobe pulse.

3.2.2.3 Input Prime

The signal causes the head to return to the left margin, and the printer logic to be reset after the trailing edge, and is terminated by a 470 ohm resistor.

3.2.3 Printer Generated Signal Description

3.2.3.1 Acknowledge

This negative going signal is used to verify the transfer of incoming data or to signify the end of a functional operation. Once a code is sent to the printer, an acknowledge pulse must be received before a new code can be sent (See Options, paragraphs 6.10 and 6.11). The acknowledge is sourced from TTL logic circuit.

3.2.3.2 Busy Line

This high going signal is used to give a positive DC level signal indication during the time the printer cannot receive data. It is also positive when the paper empty or the fault status line is true.

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During the transfer of any printable character into the printer buffer, the line will not go to a positive level. The busy line is sourced from the output of a TTL logic circuit.

3.2.3.3 External Oscillator

The external oscillator (OSCXT) is a 90-200 KHZ oscillator that is sourced from TTL logic. It is used for external interface timing.

3.2.3.4 Paper Empty (PE)

A high level that indicates the printer is out of paper.

3.2.3.5 Select (SLCT)

A high level indicates the select button has been depressed or a select code has been received, and the printer is available for data transfer.

3.2.4 Program Control Codes

3.2.4.1 Line Feed Code (Octal 012)

If the printer is in the select mode, receipt of the line feed code will cause immediate advance of one line.

3.2.4.2 Carriage Return Code (Octal 015)

If the printer is in the select mode and printable characters have been received, receipt of the carriage return code will cause immediate printing. A carriage return is not acknowledged when the printer is in the deselected mode. If the printer is in the selected mode, data will be accepted by the printer until the carriage return character or a full buffer of printable characters have been received. In either case, the printer automatically prints the characters received. When printing is complete, an auto line feed is begun unless optionally disabled.

3.2.4.3 DC1 Code (Octal 021)

Receipt of this code will allow the printer to be selected, independent of the operator control panel.

3.2.4.4 DC3 Code (Octal 023)

Receipt of this code will allow the printer to be deselected, independent of the operator control panel.

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3.2.4.5 Vertical Tab (VT) (Octal 013)

If the vertical tab code is received by the printer while selected, the code is processed and then acknowledged. The vertical tab will not be acknowledged or processed while the printer is deselected.

If VFU data is loaded in RAM, receipt of VT code will cause paper to advance to the next sequential vertical tab location.

If VFU data is not loaded in RAM, receipt of a VT code will cause paper to advance to a pre-set default VT location. Default VT locations are located in 6-line increments.

3.2.4.6 FF Code (Octal 014)

If the form feed code is received by the printer while selected, the code is processed and then acknowledged. The form feed will not be acknowledged or processed while the printer is deselected.

If VFU data is loaded in RAM, receipt of FF code will cause paper to advance to the next sequential form feed (top-of-form) location.

If VFU data is not loaded in RAM, receipt of a FF code will cause paper to advance to a pre-set default FF location. Default FF locations are located in 66 or 72-line increments.

3.2.4.7 DEL Code (Octal 177)

If the DEL code is received when the printer is in the select mode, the printer logic will be reset to zero.

3.2.4.8 SO Code (Octal 016)

If the printer is selected and receives the "SO" code, the printer will print characters from the print buffer in expanded characters. This mode will be cancelled by the receipt of a DEL code, an end of print command, or an input prime.

The number of elongated characters allowed per printable line shall not exceed one half the buffer size.

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3.2.4.9 BEL Code (Octal 007)

Receipt of this code with the printer in the select mode shall cause the optional speaker to sound a tone for approximately 2 seconds.

3.2.5 AC Voltage and Frequency

The printer mechanism and power supply shall be capable of operating on 60 Hz \pm 1 Hz or 50 Hz \pm 1 Hz with voltage limits of +10%, -15% of nominal and with the following AC input transformers available:

<u>AC INPUT VOLTAGE (Nominal)</u>	<u>FREQUENCY</u>
115 VAC	60 Hz \pm 1 Hz
230 VAC	50 Hz \pm 1 Hz

3.2.6 DC Power Supply Voltage

The power supply shall have available to the interface the following DC voltages:

- (A) +5 volts \pm 5% at 800 ma, ripple not to exceed \pm 2%
- (B) +12 volts \pm 10% at 200 ma, ripple not to exceed \pm 2%
- (C) -12 volts \pm 10% at 200 ma, ripple not to exceed \pm 2%

3.2.7 Overload Protection

- (A) Primary circuit protection shall be provided internal to the printer outline.
- (B) Secondary circuit protection shall be provided to all secondary supplies.

3.2.8 Power Cord

The power cord, which shall include a good mechanical and electrical ground connection, shall not be less than 12 feet (3.7m) long. All domestic units shall have cords that meet all UL and CSA standards. All international units shall have cords that meet the CEE recommendations and minimum VDE safety requirements.

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3.2.9 Electrical Bonding

Non-conductive finishes shall be omitted or removed at those points where electrical bonding is required.

3.2.10 Internal Wiring & Cabling

(A) Hold Down Devices

Clamps shall be provided and loose wires laced together as required to prevent abrasion or interference with the mechanism.

(B) Cables & Wire Slack

In cases of parts soldered to wires or cables, sufficient slack shall be provided for at least two replacements of each part before the entire wire or cable must be replaced.

3.3 CONTROLS, INDICATORS, AND PANEL LAYOUT

All switches and indicators shall be UL and CSA approved when required.

The control panel layout is shown in Figure 3.

The function of the switches and indicators shall be as follows:

3.3.1 Power

The circuit breaker located at the rear of the unit shall turn power on or off, when activated. On power on, a prime will be generated. A power-on indicator will be located on the control panel.

3.3.2 Printer Select

If in the deselect mode (non-illuminated), the printer shall not respond to a data strobe signal from the interface unless the DCI-Code is received; operation of this switch shall put the unit in the deselect mode if the printer was previously in the select mode.

If the select switch is operated when the printer has data in its buffer, the unit shall stay selected until the line currently being received is complete or the control code currently being received is executed. The unit will deselect after printing received data.

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3.3.3 Line Feed

When the printer is not selected and this is depressed, one line feed will take place.

3.3.4 Top of Form

This switch is operational when the printer is deselected. With standard configuration and TOF depressed, forms will advance to top of an eleven (11") at 6 lines per inch form or 297mm form (European standard). With the optional 2/8/12 channel electronic VFU, forms will advance as defined by VFU RAM data.

3.3.5 Forms Override (Option)

While depressed and the printer is re-selected, this function enables the printer to continue to print even though there is a paper empty condition.

3.3.6 Self-Test Capability

A self-test feature is operated by activating the forms override switch while the printer is deselected and loaded with paper. The test will print out the entire character set(s) and the option P-ROM configuration. If the forms override switch is held depressed, test data is continuously printed.

3.3.7 Single/Double Line Feed Switch (Option)

An operator selectable switch which allows one or two line feeds to occur.

3.3.8 6/8 Lines Per Inch Option

An operator selectable switch which allows 6 or 8 lines per inch operation.

3.4 MECHANICAL DESIGN

3.4.1 Mechanical Construction

3.4.2 Mechanical Operation

All moving parts shall operate smoothly and quietly. The noise level, under all printing conditions, shall not exceed 75 DBA at 3 feet from the printer, using a 700 Series cover.

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3.4.3 Vibration

The printer shall be operable after 2 hours in an environment with a frequency of vibration from 5 to 300 cycles/second displacement amplitude that will not exceed 1G.

3.4.4 Shock

The printer shall be operable after being subjected to a minimum of three shocks in each axis (X, Y, Z). The shock level will have a magnitude of 3 "G"s for 10-20 msec.

3.4.5 Adjustments

Adjustments shall not be required at a frequency of occurrence less than occurrence of mean time between scheduled maintenance and shall not exceed mean time to repair.

3.4.6 Options

Installation of options shall not exceed mean time to repair.

3.5 THERMAL DESIGN

The unit shall be provided with air cooling of sufficient capacity to maintain the ambient air temperature surrounding the electronics to 32.3°C (58°F) maximum, above the maximum specified operating ambient of Section 3.7. The temperature surrounding the motors, and transformers shall not exceed 55°C (99°F) above the maximum operating ambient.

3.6 IDENTIFICATION AND INSTRUCTION PLATES

3.6.1 Identification

This plate shall identify the item by name, serial number, and model number.

3.6.2 Instruction - Ribbon Change

An instruction plate shall be used to assist the operator in changing the printer ribbon.

3.7 ENVIRONMENTAL CHARACTERISTICS

3.7.1 Operating Conditions

The printer mechanism and electronics shall be designed such that it will operate in a reliable manner under the following ambient conditions:

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(A) Temperature - +40°F to +100°F (4.4°C to 37.7°C)

Rate of change not to exceed 20°F/hour.

(B) Relative Humidity (Without Condensation)

20% to 90% RH

(C) Altitude

-1,000 feet to 10,000 feet (-305m to 3,048m).

3.7.2 Storage Conditions

When not operating and in storage, the printer shall withstand the following temperature and humidity ranges:

(A) Temperature - 35°F to 130°F (-37.2°C to 54.4°C)

Rate of change not to exceed 60°F (33.8°C)/hour.

(B) Humidity (Without Condensation)

5% to 95% RH

(C) Altitude -

-1,000 feet to 40,000 feet (-305 m to 12,192m). Limit storage time to 8 hours above 10,000 feet (3,048m).

3.7.3 Conducted Power Line Transients

The printer shall operate during and after being subjected to power line transients of plus or minus 250 volts peak amplitude with a duration of not greater than ten microseconds (at the base of the pulse). The transients are first synchronized with the power line fundamental and positioned 360 degrees thru the waveform. The transient rate is then established at approximately 400 pps and allowed to occur randomly on the 50 to 60 Hz waveform.

A second test will include charging a .05 microfarad capacitor to 500 volts, and electro-mechanically discharging the capacitor directly to the power plug of the printer, each line to ground.

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3.7.5 Shipment

The unit shall be so designed that with a suitable shipping container, the unit can be successfully tested to the National Safe Transit Committee's (NSTC) preshipment test.

3.8 RELIABILITY

3.8.1 MTBF

The minimum acceptable MTBF of the Model 703 shall be 1,200 hours. This is based on a 25% duty cycle and 50% print column density.

This duty cycle implies that, on the average, all Model 703's will be on for 1,200 hours before a failure will occur which will prohibit further use of the mechanism on a functional basis.

3.8.2 Reliability Characteristics

3.8.2.1 Definition of a Failure

A failure is any malfunction of electrical or mechanical hardware which prevents full use of the machines, or any non-scheduled interruptions, if the cause of the interruption is not an operator function. Malfunctions caused by neglect of scheduled preventive maintenance, defective ribbon or paper, or improper operator performance shall not be considered as printer failures.

Failures can be grouped into two categories:

(A) Inconvenient Failure

An inconvenient failure is any failure which can, with relative ease and speed, be traced and corrected by the operator without the presence of a serviceman.

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(B) Critical Failure

A critical failure is defined as:

1. Any failures or combination of failures that prohibits use of the printer.
2. Any failure that results in repeated incorrect print.
3. Rate of Inconvenient Failures

The allowable rate for inconvenient failures is 4 failures per 100 hours of printer operation.

The following lists a few failures and their classifications. Failures not listed are assumed to be easily classified.

	Inconvenient	Critical
Print Error		X
Paper Jam	X	
Cabinet (Loose Covers, etc.)	X	
Paper Advance (Repeated Failure)		X
Ribbon Jam	X	
Vertical Format Unit Tape Breakage	X	

3.9 MAINTAINABILITY

- (A) Time to repair (average hours) shall be 0.75 hours - longest time not to exceed 2.0 hours.
- (B) Spare parts - the design shall allow the availability of spare parts for a period of five years from the date of sale of each printer.
- (C) Scheduled maintenance - scheduled maintenance shall be once every 1,000 hours per usage factor of Section 3.10.
- (D) The life of the printer shall be 20 million print lines without major overhaul. Major overhaul is defined as replacement of parts exceeding 50% of the total dollar value of the printer.
- (E) Provide for maximum accessibility to enable rapid removal and replacement of assemblies and/or subassemblies (i.e., no captured belts).

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3.10 MTBSC CALCULATIONS

3.10.1 Usage Factor

A usage factor of 25% and a monthly power on time of 217 hours (50 hours/week) is assumed in the calculations.

3.10.2 Monthly MTBSC

The monthly MTBSC is calculated using the formula:

$$\text{MTBSC} = \frac{217 \times \text{number of units in population in month}}{\text{number of service calls in month}}$$

3.10.3 Actual MTBSC

To eliminate infancy failures in the MTBSC calculations, the actual MTBSC shall be the average of the current and five preceding months' MTBSC.

4.0 PERFORMANCE CHARACTERISTICS

4.1 PRINTING RATE

4.1.1 Head Speed

Model 703 - The printer shall have a head speed of 16.5 ips to 18 ips and be capable of printing 165 characters per second at 10 characters per inch (9x7 Dot Matrix). The printer thruput is of 70 to 370 lines/minute with standard 7x7 matrix, for 132 or 10 column lines, respectively, depending on line length and data format.

4.2 CHARACTER SETS

All printer models shall be capable of printing 64 characters as represented by the USASCII chart, columns 2-5.

By program option, if data bit 7 is high with the 96 printable characters, the printer will allow the characters represented by the USASCII chart, columns 4 and 5, to be printed as the characters represented by the USASCII chart, columns 6 and 7.

In place of the standard 64 character set, a 64, 96, 128, 160, or 192 (7x7, 9x7; 9x9, 7x9, 5x7) character set may be selected.

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4.2.1 Full Line Character Elongation

A full line of characters may be elongated by a code control. Character elongation will stop after a print command, delete code, or input prime signal.

4.2.2 Character Structure

The standard 7x7 character structure may be replaced with 5x7, 7x9, 9x9, or 9x7 structure.

4.3 PAPER MEDIA

4.3.1 Fan Fold Paper

The tractor feed assembly will accept fan fold paper 4" (101mm) to 17.3" (439mm) wide. The pin feed can accept single ply up to 2-ply paper (total thickness not to exceed .030"/.75mm), conforming to paper specification #80001003-01, Rev. C or higher. Form lengths from 3" (76mm) to 14" (355mm) are accepted; 11" (279mm) long forms are recommended for optimum refold.

4.4 PAPER MOVEMENT

To move the paper, the printer electronics activates a stepper, form feed motor that is mechanically linked to the paper feed sprockets.

4.5 PAPER OUT STATUS

A sensor shall be provided in the paper path (rear and bottom feed) to provide a visual and interface signal indication of paper presence. It will cause an alert condition.

4.6 OPTICAL LIGHT SOURCE

All lamps that can cause a printer failure or operator confusion shall have an average of 20,000 hours.

4.7 RIBBON LIFE

Ribbon life for a 70-yard cassette ribbon shall be a minimum of 7,000,000 characters for the operating environment as specified in Section 3.7. A 15-yard zip-pack ribbon with minimum life of 1,500,000 characters is available as an option.

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4.8 PENETRATION CONTROL

A penetration control shall be provided to enable the printer to produce the specified print quality of forms as defined in Section 2.1 (C).

4.9 PRINT QUALITY

The printer shall meet the print quality standards per Paragraph 2.1 (B).

4.10 COLUMN SCALE/TEAR BAR

A plastic bar will act as a tear bar and column scale indicator. The tear bar does not include a scale on printers with condensed print option.

5.0 TESTS AND TEST PROCEDURES

See specifications listed in Paragraph 2.1 (D) for test procedures.

(A) Test Definition -

Prior to shipment, each printer shall pass a non-interrupted minimum acceptance test. This test shall be jointly written by Engineering and Quality with the approval of the Director of Product Planning. For the printer to be acceptable, it must meet all of the performance criteria of this specification.

(B) Test Revision -

The testing period may be shortened by the mutual consent of Engineering, Quality, Service, and Manufacturing with final approval of the Director of Product Planning. Such shortening will be considered if evidence of a low early failure rate has been achieved.

5.1 "A" TEST

This is an Engineering Qualification Test conducted by Engineering on a minimum of three units. The range of the test shall include:

- (A) Functional performance tests of all functions or combinations of functions as specified herein.

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- (B) Tests to measure the product against all operating and environmental conditions as specified herein.
- (C) Reliability testing of the product to the MTBF as specified herein and life testing of critical components. The performance of the "A" test units must be equal to or better than one half the MTBF as specified in Section 3.8.1.

5.2 "B" TEST

This is a verification by the design productions based on analysis of a successful "A" test performance.

This test will encompass the following:

- (A) Functional performance.
- (B) Operating and environmental condition tests.
- (C) Reliability test.

Successful completion of "B" test will be met when the MTBF performance of the test units is equal to or better than the MTBF as specified in Section 3.8.1.

Successful completion of "B" test performance is a prerequisite for an Engineering release to Manufacturing.

5.3 "C" TEST

These tests are primarily Manufacturing qualification tests, (i.e., They are verification of the appropriate manufacturing implementation of the design qualified in the "B" test). Successful "C" test completion is based on a test performance that is equal to or better than the MTBF as specified in Section 3.8.1.

5.4 PRODUCTION INSPECTION AND TEST PROCEDURE

Any production unit, if selected for testing and examination, must be capable of passing the following:

- (A) Surface examination - The item shall be examined for the following: workmanship, assembly and fit, mechanical and electrical, safety, finish, and markings.

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- (B) Operating test - The item shall be energized and subject to an operating test to insure qualitatively the proper functioning of the item, including all operating controls and conformance with the safety requirements.
- (C) Supply line voltage and frequency - The unit shall be tested for operation over the steady state voltage and frequency as specified in Paragraph 3.2.5.
- (D) Temperature and humidity - The unit shall be tested for operation and storage over the temperature ranges as listed in Paragraph 3.7.
- (E) Reliability - Verification of reliability requirements shall be performed.
- (F) Dielectric breakdown test - Verification that UL and CSA dielectric tests are met.

5.5 PRODUCT SERVICEABILITY REVIEW

A product serviceability review will be conducted prior to "A" testing, and during "B" testing.

6.0 OPTIONS

6.1 MANUAL FORMS CONTROL

The top-of-forms switch and the line feed switch will be operable when the printer is selected.

6.2 CONDENSED PRINT

Fixed - 12 or 15 CPI printing at 180 cps at 7x7 matrix (or 165 cps at 9x7 matrix) may be selected in place of 10 CPI.

6.3 VFU (VERTICAL FORMAT UNIT)

A 2, 8, or 12 channel electronic VFU, which utilizes either a paper tape or software commands for initial loading.

6.4 AUTO LF ON CR DISABLED

Upon detection of carriage return (CR) character, previously received data will be printed, but a line feed function will not be performed.

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6.5 ELAPSED PRINT TIME INDICATOR

An indicator showing up to 1,000 hours of print time before it has to be reset.

6.6 AUDIO ALARM

In response to a BEL code (Octal 007) or a paper empty condition, an audible alarm will be generated for approximately 2 seconds.

6.7 INHIBIT PRIME ON SELECT

This feature prevents the logic and the buffer from being reset when the printer is selected.

6.8 INHIBIT PRIME ON DELETE

This feature prevents a delete code (Octal 177) from resetting the printer buffer. It allows the delete code to be used as a pad character.

6.9 INVERTED DATA STROBE

This feature allows data strobe to be electrically active either high for control function definition and data loading.

6.10 GATED DATA STROBE

This feature prevents the printer from accepting new data without the previous character being acknowledged. Non-gated strobe should be enabled when using a communications interface. Data transmission rate in non-gated environment shall not exceed 75,000 cps.

6.11 6/8 LPI

This option will allow, by operator selection, printing at 6 LPI or 8 LPI.

6.12 ESCAPE CONTROL OF BIT 8

This feature enables software sequence of ESC (Octal 033), Numeric 3 (Octal 063), and ESC (Octal 033) Numeric 4 (Octal 064) to control the active state of Bit 8.

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6.13 AUTO PRINT ON PAPER MOTION COMMAND

This feature generates a carriage return upon receipt of a line feed, vertical tab, or top of form command, causing the line of data to be printed before the normal function is performed.

6.14 DATA BIT 8 ADDRESS

- (A) Secondary character set can be accessed by bit 8 High or Low.
- (B) Single elongated character can be controlled by bit 8 High or Low.

NOTE: Only a or b can be selected.

6.15 FORMS RECEIVING TRAY

May be chosen for table-top operation (it is standard when the printer stand option is chosen).

6.16 PRINTER STAND

This stand enables use of printer as free standing printer.

7.0 FORMS HANDLING MODULES (OPTION)

7.1 TYPES OF FORMS HANDLING MODULES

- (A) Pin Feed Platen
- (B) Independent Front Feed Device (IFF)

This device shall be capable of printing a line of data 1.2"/30.5mm from the top of the form and 1.2"/30.5mm from the bottom of the form. It shall have a form slew rate of 10 IPS. It shall be capable of being used in conjunction with the 703 standard forms tractors.

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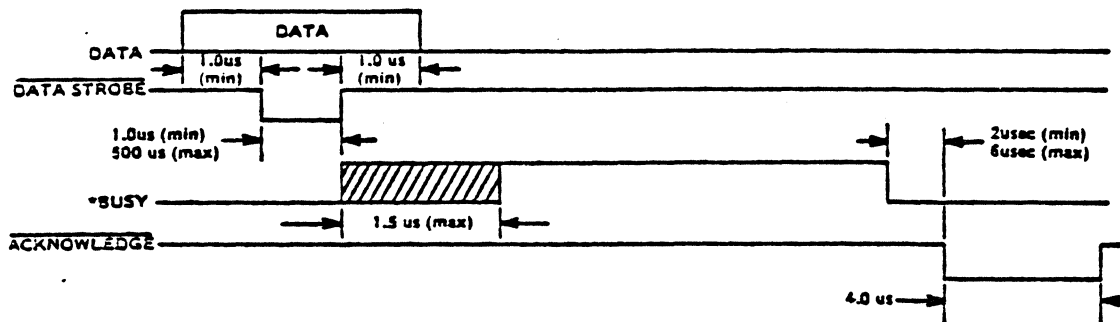
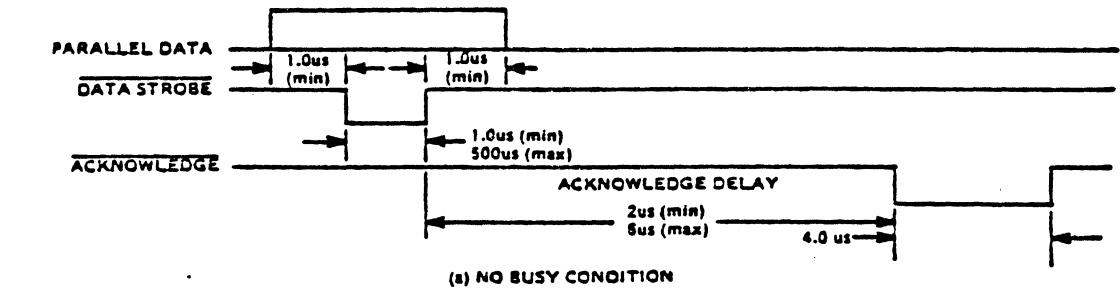
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7.2 CONFIGURATION FOR IFF

- (A) Single IFF in front position.
- (B) Single IFF in front position and standard tractors.



Any printable character (except 132nd character on a line)	No Busy
Line Feed	32 msec
Vertical Tab (1 inch)	95 - 105 msec
Form Feed (11 inches)	855 - 865 msec
Delete	160 - 400 usec
Bell	No Busy
Select	0 - 1.5 usec
Deselect	Until printer is selected
Print (CR or last character)	5 - 55 msec per character plus 107 msec non-printing time-per line.

(b) Busy Condition

Figure 1. INTERFACE TIMING DIAGRAM

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USASCII CODE

- Notes:
- Indicates control codes recognized by Centronics printers
 - Underscore (octal 137) is replaced by a back-arrow in the standard 9 x 7 matrix

b7b6b5 Bits					→ → →	000	001	010	011	100	101	110	111
b4	b3	b2	b1	Row	Column	0	1	2	3	4	5	6	7
0	0	0	0	0	NUL	DLE	SP	0	@	P	\	p	
0	0	0	1	1	SOH	DC1	!	1	A	Q	a	q	
0	0	1	0	2	STX	DC2	"	2	B	R	b	r	
0	0	1	1	3	ETX	DC3	#	3	C	S	c	s	
0	1	0	0	4	EOT	DC4	\$	4	D	T	d	t	
0	1	0	1	5	ENQ	NAK	%	5	E	U	e	u	
0	1	1	0	6	ACK	SYN	&	6	F	V	f	v	
0	1	1	1	7	BEL	ETB	'	7	G	W	g	w	
1	0	0	0	8	BS	CAN	(	8	H	X	h	x
1	0	0	1	9	HT	EM	)	9	I	Y	i	y
1	0	1	0	10	LF	SUB	*	:	J	Z	j	z	
1	0	1	1	11	VT	ESC	+	;	K	[	k	{
1	1	0	0	12	FF	FS	,	<	L	\	l	|	
1	1	0	1	13	CR	GS	.	=	M	]	m	}
1	1	1	0	14	SO	RS	.	>	N	^	n	~	
1	1	1	1	15	SI	US	/	?	O	_	o	DEL	

CONTROL CODES
STANDARD
OPTIONAL

Figure 2. USASCII CODE CHART

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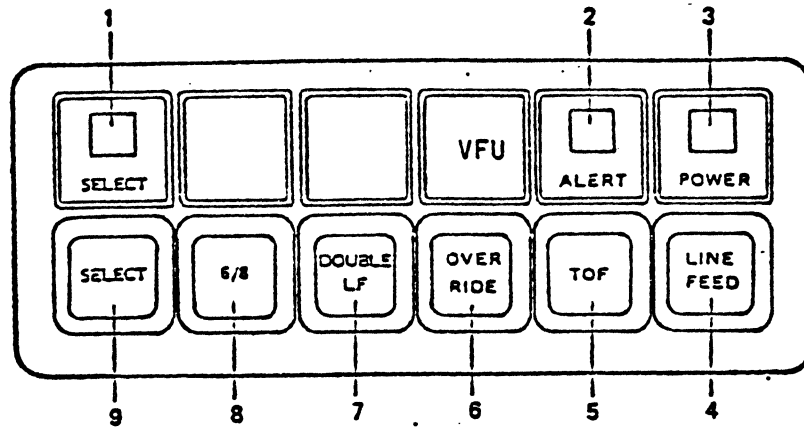
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Figure 3. CONTROL PANEL



INDEX NUMBER	CONTROL OR INDICATOR	FUNCTION
1	SELECT lamp	When lit, indicates printer is selected.
2	ALERT lamp	When lit, indicates error condition that is operator correctable, such as paper empty.
3	POWER lamp*	When lit, indicates power is applied.
4	LINE FEED switch	When depressed, causes paper to advance one line.
5	TOF switch	When depressed, will advance to top of 11" (297mm) form at 6 lines per inch. With optional VFU forms, will advance as defined by Vertical Format Unit (VFU) tape.
6	OVERRIDE switch	While depressed and printer reselected after ALERT lamp lights, overrides internal paper out switch and allows last form to be printed. While depressed after the printer has been deselected, the self-test data will print.
7	DOUBLE LF switch	Permits single or double line feed spacing (optional).
8	6/8 LPI switch	Permits selection of 6 or 8 LPI vertical spacing (optional).
9	SELECT switch	When depressed, selects or deselects printer as indicated by SELECT lamp. If printer is deselected while line of data is being received, printer will not deselect until line of data has been printed.

* The power switch is located on the rear of the printer by the power cord.

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7 x 7 CHARACTER SET PERFORMANCE RANGE

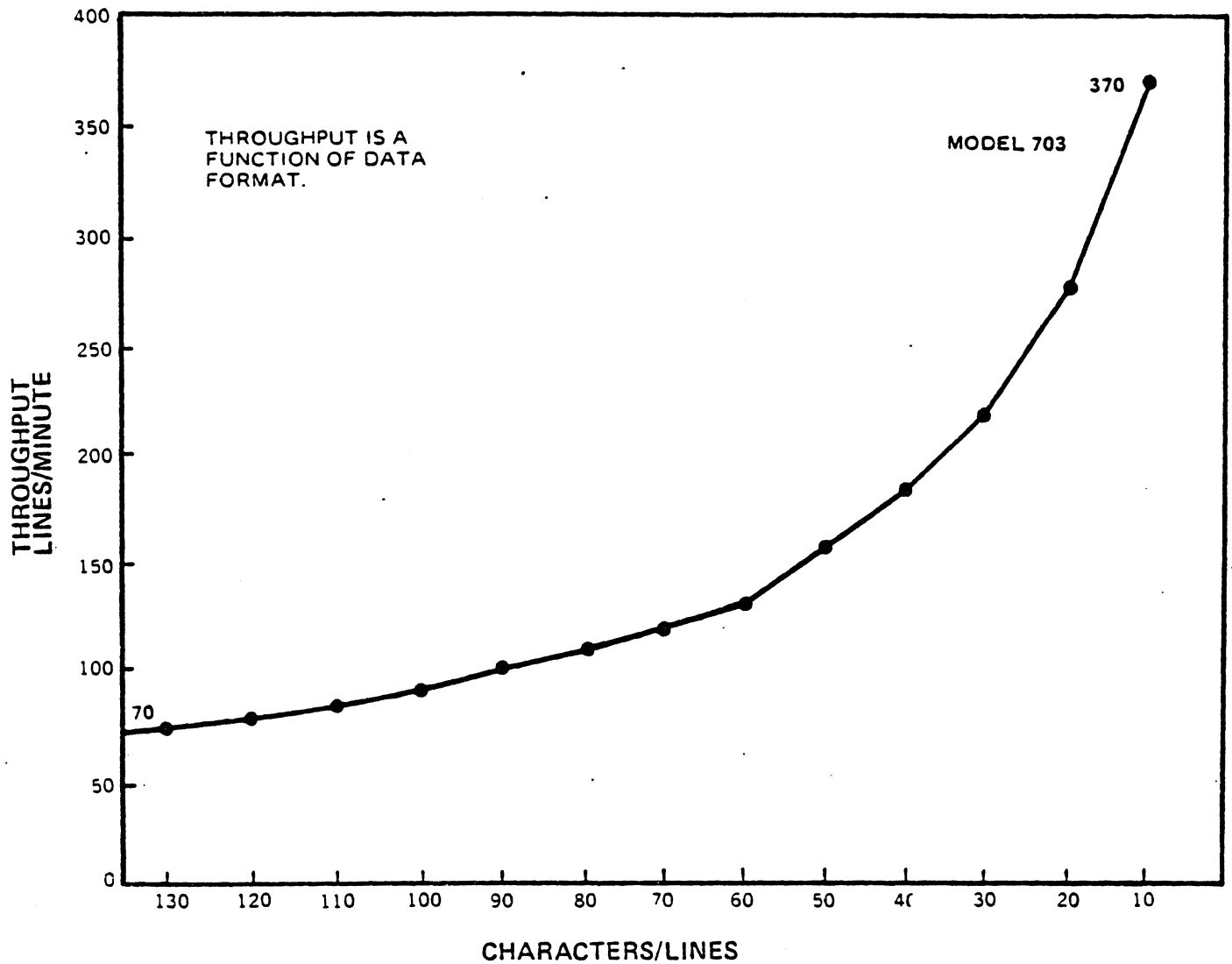


Figure 4A. PRINT SPEEDS (7x7)

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9 x 7 CHARACTER SET PERFORMANCE RANGE

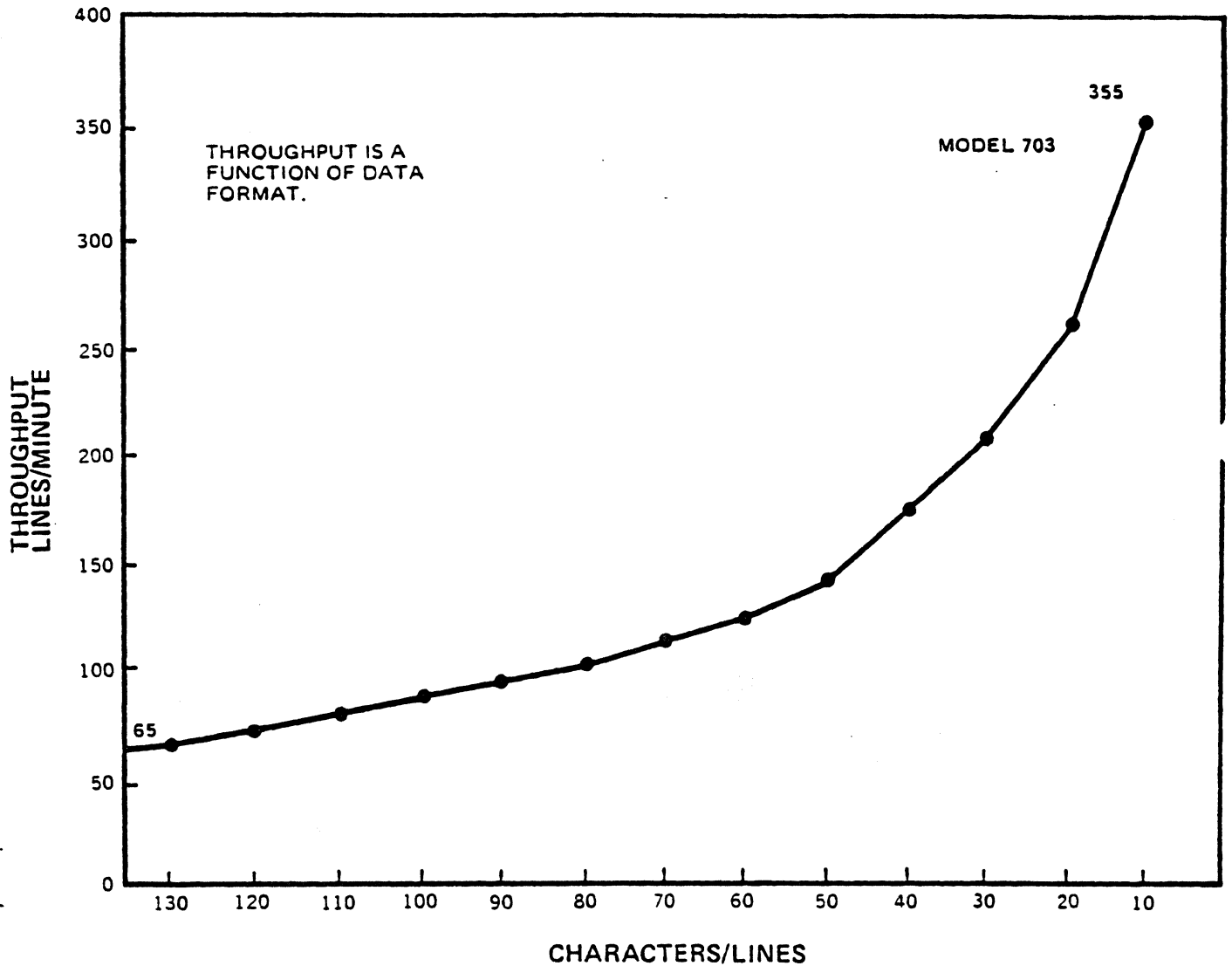


Figure 4B. PRINT SPEEDS (9x7)