



# Technical Newsletter

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**Prerequisite Newsletters** This obsoletes GN24-0966

## **IBM Form Design Reference Guide for Printers**

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This Technical Newsletter provides replacement pages for the subject publication. These replacement pages remain in effect for subsequent versions unless specifically altered. Pages to be inserted and/or removed are:

Front Cover, Preface  
3, 4  
83, 83.1  
83.2, 84  
115, Back Cover

If you are inserting pages from different Newsletters and *identical* page numbers are involved, always use the page with the latest date (shown in the change-page notice at the top of the page). The page with the latest date contains the most complete information.

A change to the text or to an illustration is indicated by a vertical line to the left of the change.

### **Summary of Amendments**

This TNL changes form design information for the IBM 4248 Printer and also obsoletes TNL GN24-0966.

**Note:** Please file this cover letter at the back of the manual to provide a record of changes.

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GA24-3488-18  
File No. GENL-03

**Systems**

**Form Design Reference Guide  
for Printers**

**IBM**

## Preface

This publication contains information to be considered by personnel designing, ordering, or using forms for the printers listed below.

This manual has two sections: general forms-design information applicable to these printers, and specific information (Appendix) for particular printers. The general information relates to items such as form length, width, weight, fastenings, and other forms-related items that must be considered and/or met when forms are designed for printers. Form sets should comply with national standards specifications and ISO Recommendation No. 2784. The specifications are not intended to be restrictive, but to permit the customer to purchase continuous forms from the manufacturer of his choice.

For detailed information on forms feeding and operating procedures, see the appropriate component description and operating procedures manuals for the particular printer or system.

Companion publications useful in designing forms are:

*American National Standard Character Set and Print Quality for Optical Character Recognition (OCR-A)*  
ANSI X3.17-1974

*Print Chart (Six Lines per Inch)*, GX20-1816

*Print Chart (Eight Lines per Inch)*, GX20-1818

*Form Design Reference Guide for the IBM 3800 Printing Subsystem*, GA26-1633.

Another publication which is not an IBM publication but may be helpful in designing forms and for comparison purposes is *International Standard ISO, 2784*. Dimensions in this manual are to this standard.

IBM printers included are:

1132	3211	3610	3736	4710	5211
1403	3213	3611	3767	4973	5225
1404	3215	3612	3771	4974	5241
1443	3262	3615	3773	4975	5242
2203	3268	3616	3774	5024	5256
2213	3284	3618	3775	5103	5320
2222	3286	3642	3776	5203	7436
2780	3287	3645	3780	5211	
3102	3288	3713	3784	5213	
3203	3289	3715	4245	5222	
3210	3608	3717	4248	5224	

Line Printer Feature (155 lpm maximum) for 3791 and 3792

Line Printer Feature (410 lpm maximum) for 3791

**Note:** Use the index to locate page numbers of the above printers.

### Nineteenth Edition, November 1983

This is a major revision of, and obsoletes, GA24-3488-16, GA24-3488-17 and Technical Newsletters GN24-0941 (31 Oct 1982), GN24-0948 (31 May 1983), and GN24-0954 (30 June 1983). Technical changes to text or illustrations are indicated by a line to the left of the change.

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## 4245 Form Specifications (Part 2 of 2)

### Notes and Recommendations

1. Form Feeding:
  - a. Form lengths greater than 356 mm (14 in) require that the acoustic enclosure remain open.
  - b. Form lengths greater than 432 mm (17 in) require that the front door remain open.
  - c. For effective stacking, the recommended flat-fold length is 203 to 305 mm (8 to 12 in). Short forms should be grouped to improve stacking efficiency.
  - d. The printer is program-controlled and can print at either 6 or 8 lines-per-inch.
  - e. No printing may occur within 12.7 mm (.5 in) of the horizontal perforation.
2. Multiple-part forms should be fastened securely on both sides and only in the margin areas. Single-side fastening is not recommended; however, if this method is used, the fastening must be on the right side. Carbons must also be fastened on the right-hand side.

Multiple-part forms of three or more parts intended for use in relative humidity near 80% should be fastened on both margins, with four elements per form.
3. Forms should be free of margin-hole chad.
4. No hard or metallic fasteners are permitted.
5. Composite form set thickness should not exceed 0.51 mm (.02 in). The 4245 prints on continuous forms consisting of one to four parts (copies). Forms consisting of more than four parts should be tested under operating conditions to determine acceptability. Satisfactory legibility may require adjustment of the paper and carbon specifications with regard to weight and smoothness. Lighter weight forms and carbon paper result in better performance.

Ribbon smudging may occur as form set approaches maximum thickness.

6. A leader is normally required for prenumbered forms.
7. Forms with labels are permitted as long as the adhesive is completely covered by the label.

These forms must be tested to ensure proper feeding without label peeling.
8. For best results with 5- and 6-part forms, carbonless paper is recommended.

Carbonless forms:

Paper weight:

Top sheet:	56 g/m <sup>2</sup> (15 lbs./17 x 22 inch — 500-sheet ream)
Inner sheets:	43 g/m <sup>2</sup> (11.5 lbs./17 x 22 inch — 500-sheet ream)
Last sheet:	56-58 g/m <sup>2</sup> (15-15.5 lbs./17 x 22 inch — 500-sheet ream)

Maximum thickness: 0.38 mm (.015 in)

Form type: Coated back/Coated front (CB-CF)

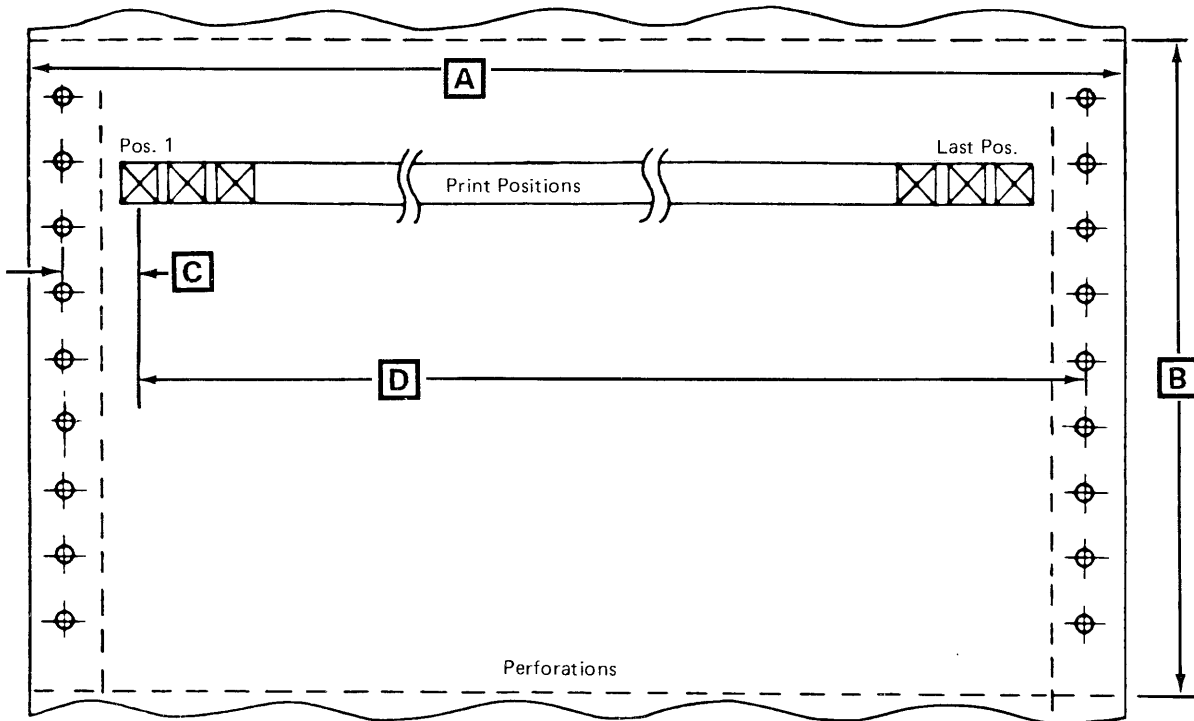
Forms fastening: Forms must be fastened so that individual forms do not separate while feeding through the printer.

9. Single-part form weight:

Maximum:	130 g/m <sup>2</sup> (35 lbs./17 x 22 inch — 500-sheet ream)
Minimum:	55 g/m <sup>2</sup> (14.8 lbs./17 x 22 inch — 500-sheet ream)
10. Perforated card stock weight:

Recommended:	160 g/m <sup>2</sup> (99 lbs./24 x 36 inch — 500-sheet ream)
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### 4248 Model 1 Form Specifications (Part 1 of 2)



	<i>Maximum</i>	<i>Minimum</i>
<b>A</b> Form Width	476.3 mm (18.75 in)	88.9 mm (3.5 in)
<b>B</b> Form Length	431.8 mm (17 in), forms greater than 355.6 mm (14 in) in length may require operator attention to assure proper stacking.	152.4 mm (6 in) (Fold to Fold)
<b>C</b> First Print Position		
Form width up to 462.2 mm (18.19 in):	69.9 mm (2.75 in)	6.4 mm (.25 in)
Form width 476.3 mm (18.75 in)	69.9 mm (2.75 in)	20.5 mm (.81 in)
<b>D</b> The maximum distance from center of the first print position to the centerline of the right margin holes is 443.8 mm (17.47 in).		

For general forms design considerations, see pages 5 to 10.



## 4248 Model 1 Form Specifications (Part 2 of 2)

### Recommendations

1. Prenumbered documents should have leaders.
2. Margin holes should be free of chad to avoid false form checks and form jams.
3. Multiple Parts:
  - a. Should be securely fastened on both edges — preferably, with a four-element fastening arrangement. Single-side fastening is not recommended. However, if this method is used, fastening must be on the right side.
  - b. Carbons should be fastened on both sides. If single-side fastening is used, carbons must be fastened on the right side.
  - c. No metallic or hard fasteners permitted.
  - d. Maximum form set thickness is 0.5 mm (.02 in). Ribbon smudging may occur as form set approaches maximum thickness.
4. Before use, forms should be conditioned for a minimum of 48 hours in an atmosphere similar to that of the intended working humidity.
5. Paper colors vary in reflectivity; this reflectivity can reduce the contrast between paper and the absence of paper. This contrast is required for a photosensitive, form-motion detection device. Relatively nonreflective colors (such as dark gray, dark blue, etc.), markings, or printing must not be used on the back side of the left tear strip (or the area around pin feed holes), or false form checks may result.

Relatively nonreflective colors, markings, etc., and cutouts with lengths greater than 13 mm (.51 in) are not permitted 31 to 36 mm (1.22 to 1.417 in) from the center of the left margin holes, or a false end-of-forms indication may result.

6. Card Stock
  - a. Single-part, fanfold card forms not exceeding a weight of 162.7 g/m<sup>2</sup> and 0.23 mm (.009 in) may be used.
  - b. Operator attention may be required to assure proper stacking of card stock forms.
7. Minimum weight for single-part forms is 56 g/m<sup>2</sup> (15 lb/ream 17" x 22").
 

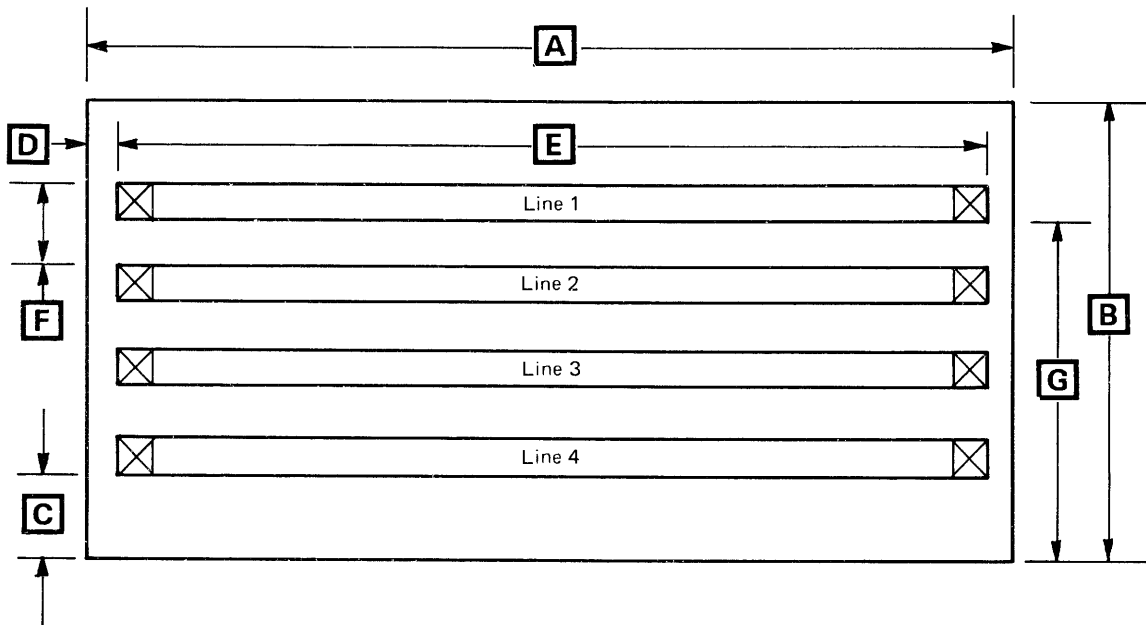
Form stacking may degrade when operating in high-humidity environment. Heavier weight paper will improve stacking performance. For environment exceeding 21°C (70°F) and 40% relative humidity, 68 g/m<sup>2</sup> (18 lb/ream 17" x 22") paper is recommended.
8. Avoid printing on horizontal perforations. Print quality may deteriorate when printing occurs within 12.7 mm (.5 in) of horizontal perforations.
9. Print quality, form feeding, and form stacking are affected by variance in card, paper stock, and environment (temperature and humidity). Also, the high-performance carriage accelerates and decelerates the forms at very high rates, and increases the susceptibility of the forms to pin-feed hole damage and forms separation. Maximum of two-part form set recommended in high-speed mode.

Although most forms can be processed satisfactorily, all forms should be tested under operating conditions to ensure acceptable printer processing before ordering large quantities.

Modifications to form fastening techniques, perforations, stiffness, and paper quality can often overcome form processing difficulties.

# 4710 Form Specifications

## Cut Forms (Part 1 of 2)



	<i>Maximum</i>	<i>Minimum</i>
<b>A</b> Form Width	229 mm (9 in)	74 mm (2.9 in)
<b>B</b> Form Length	152 mm (6 in)	68 mm (2.7 in)
<b>C</b> Bottom margin is 20 mm (.79 in) minimum.		
<b>D</b> Document edge to edge of first character is 6.4 mm (.25 in) minimum.		
<b>E</b> Maximum line length is 102 mm (4 in)		
Print positions:	40 at 10 cpi	48 at 12 cpi
<b>F</b> Nominal line spacing at 6 lines per inch is 4.3 mm (.17 in).		
<b>G</b> Bottom of form to bottom of line 1 is 33 mm (1.3 in) nominal.		

For general forms design considerations, see pages 5 to 10.

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