

# BJC-7100

# SERVICE MANUAL

REVISION 0

**Canon**

OCT. 1998

**QY8-1360-000**

1098 AB 5.00-0

# BJC-7100

# SERVICE MANUAL

**Canon**

## **Target Readers**

This manual is published by Canon Inc. for qualified persons and contains the necessary technical information for technical theory, installation, maintenance, and repair of products. This manual covers all localities where the products are sold. For this reason, it may contain information that does not apply to your locality.

## **Revisions**

This manual may include technical inaccuracies or typographical errors due to improvements or changes in the products. When amendments are made to the content of this manual, Canon will issue technical information as the need arises. In the event of major alterations to the content of this manual over a long or short period, Canon will publish a revised version of the manual.

**The following paragraph does not apply to any countries where such provisions are inconsistent with the local law.**

## **Trademarks**

The product names and company names appearing in this manual are the registered trademarks or trademarks of the individual companies.

## **Copyright**

This manual is copyrighted and all rights reserved. Under the copyright laws, this manual may not be copied, reproduced, or translated into other languages, in whole or in part, without the express written consent of Canon Inc. except in the case of internal business use.

**Copyright © 1998 by Canon Inc.**

**CANON INC.**

**BJ Products Quality Support Dept.**

**16-1, Shimonoge 3-chome, Takatsu-ku, Kawasaki, Kanagawa 213, Japan**

This manual was produced on an Apple Macintosh™ Power Mac 7300/180 personal computer and Apple LaserWriter™ II NTX-J laser beam printer; final pages were printed on Agfa SelectSet Avantra 25.

A YANO 640MO drive system NJ640MO with MITSUBISHI MO disk cartridge MR230M1 were used for storing large volumes of page layout and graphic data for this manual.

All graphics were produced with MACROMEDIA FREEHAND™ 7.0J.

All documents and all page layouts were created with QuarkXPress™ 3.3J.

# I. ABOUT THIS MANUAL

This manual is divided into five parts containing the information required for servicing the BJC-7100 printer.

## *Part 1: Safety and Precautions*

This part contains information on how to service the unit safely. It is very important, and must be read.

## *Part 2: Product Specifications*

This part outlines the product and its specifications.

## *Part 3: Operating Instructions*

This part explains how to operate the unit properly, how it is installed, and how to use the service mode.

## *Part 4: Technical Reference*

This part outlines the unit operation giving a technically.

## *Part 5: Maintenance*

This part explains maintenance of the unit. It includes details of disassembly/assembly, adjustments required when assembling, troubleshooting procedures, and wiring/circuit diagrams, etc.



---

This manual does not contain complete information required for disassembling and assembling the BJC-5500 printer. Please also refer to the separate Parts Catalog.

---

## II. TABLE OF CONTENTS

	<i>Part 1: SAFETY AND PRECAUTIONS</i>
1 - 1	1. SAFETY PRECAUTIONS
1 - 1	1.1 Moving Parts
1 - 2	1.2 Front Cover
1 - 3	1.3 Ink Stains
1 - 3	1.3.1 Ink path
1 - 4	1.3.2 Ink mist
1 - 5	1.4 Live Parts
1 - 6	1.5 BJ Cartridge Metal Plate
1 - 7	2. MACHINE PRECAUTIONS
1 - 7	2.1 BJ Cartridge Handling
1 - 7	2.1.1 Unpacking the BJ cartridge
1 - 7	2.1.2 BJ cartridge protection
1 - 8	2.1.3 Power on/off
1 - 8	2.1.4 When not using the printer
1 - 9	2.1.5 Ink electroconductivity
1 - 9	2.2 Ink Tank Handling
1 - 9	2.2.1 Unpacking the ink tank
1 - 9	2.2.2 Preventing clogging
1 -10	2.3 Printer Handling
1 -10	2.3.1 Spurs
1 -10	2.3.2 Damage due to static electricity
1 -11	2.3.3 Ink Leakage and dry-out
1 -11	2.3.4 Carrying the printer
1 -12	3. NOTES ON SERVICING
1 -12	3.1 EEPROM Data
1 -13	3.2 Service Mode of Printer Driver
1 -13	3.3 Protecting the Power Supply
1 -14	3.4 Static Electricity
1 -15	3.5 Disassembly and Assembly
1 -15	3.5.1 Parts that cannot be disassembled
1 -15	3.5.2 Parts requiring careful attention during disassembly and assembly
1 -15	3.6 Self-Diagnosis
	<i>Part 2: PRODUCT SPECIFICATIONS</i>
2 - 1	1. PRODUCT OUTLINE
2 - 1	1.1 Outline
2 - 2	1.2 Features
2 - 3	1.3 BJ Cartridge
2 - 3	1.3.1 Black BJ cartridge (BC-60)
2 - 4	1.3.2 Photo BJ cartridge (BC-62e Photo)
2 - 5	1.3.3 Color BJ cartridge (BC-61)
2 - 5	1.3.4 BJ cartridge vs print mode
2 - 6	1.4 SB-60 BJ Cartridge Container
2 - 6	1.5 Consumables
2 - 6	1.5.1 BJ cartridge
2 - 6	1.5.2 Ink tank
2 - 7	2. SPECIFICATIONS
2 - 7	2.1 General Specifications
2 -10	2.2 Paper Specifications
2 -10	2.2.1 Paper types

Page	
2 -11	2.2.2 Printing range
2 -12	2.3 Interface Specifications

### ***Part 3: OPERATING INSTRUCTIONS***

3 - 1	1. PRINTER SETUP
3 - 1	1.1 Unpacking
3 - 2	1.2 Installation Location
3 - 3	1.3 Installation
3 - 3	1.3.1 Connecting the interface cable
3 - 3	1.3.2 Connecting the power supply
3 - 4	1.3.3 Installing the BJ cartridge
3 - 6	1.3.4 Replacing the ink tanks
3 - 7	1.3.5 Cartridge container [SB-60]
3 - 8	1.4 Turning Printer Power On and Off
3 - 8	1.4.1 Turning the power on
3 - 8	1.4.2 Turning the power off
3 - 9	1.5 Loading Printer Paper
3 -10	1.6 Names of Parts and Their Functions
3 -12	2. TRANSPORTING THE PRINTER
3 -12	2.1 Transporting the Printer
3 -13	2.2 Manual Capping
3 -14	3. PRINTER SERVICING FUNCTIONS
3 -14	3.1 Error Indications
3 -14	3.1.1 Operator call errors
3 -15	3.1.2 Service calls
3 -16	3.2 Warning Indications
3 -17	3.3 Function Settings
3 -17	3.3.1 Items set by control function
3 -18	3.3.2 Service mode of printer driver
3 -19	3.4 EEPROM
3 -19	3.5 Cleaning the BJ Cartridge
3 -20	3.6 Test Printout
3 -20	3.7 Pickup Roller Cleaning Function (HR-101)
3 -21	3.8 Service Mode
3 -22	3.8.1 Final factory test pattern
3 -22	3.8.2 Resetting EEPROM data
3 -23	3.8.3 Printing EEPROM data
3 -23	3.8.4 Setting destination country
3 -24	3.8.5 Other Function

### ***Part 4: TECHNICAL REFERENCE***

4 - 1	1. OVERVIEW
4 - 1	1.1 Printer Block Diagram
4 - 2	1.2 Initial Flowchart
4 - 3	1.3 Print Signal Sequence
4 - 4	1.4 BJ Cartridge Drive
4 - 4	1.4.1 Print drive control
4 - 5	1.5 Power-Off Sequence Flowchart
4 - 6	2. FIRMWARE
4 - 6	2.1 Interface
4 - 6	2.1.1 Compatible mode
4 - 7	2.1.2 Nibble mode
4 - 7	2.1.3 ECP mode

Page	
4 - 8	2.2 Print Modes
4 - 9	2.2.1 Plain paper optimized printing mode (P-POP)
4 - 9	2.2.2 Economy print mode (Draft mode)
4 - 9	2.2.3 Standard mode
4 - 9	2.2.4 High quality and fine mode
4 -10	2.2.5 Print mode settings
4 -11	2.3 Smoothing Function
4 -11	2.4 Print Optimization Controls
4 -11	2.4.1 Power monitor
4 -11	2.4.2 Head sticking prevention
4 -11	2.4.3 Ink smear prevention
4 -12	2.5 Head Overheat Protection
4 -13	3. PRINTER'S MECHANICAL SYSTEM
4 -13	3.1 Overview
4 -14	3.1.1 Structure of printer's mechanical system
4 -15	3.2 BJ Cartridge
4 -15	3.2.1 BJ Cartridge structure
4 -19	3.2.2 Structure of BJ head unit
4 -21	3.2.3 Nozzle arrays
4 -22	3.2.4 Signal contacts
4 -24	3.2.5 Drive circuit
4 -28	3.2.6 BJ cartridge detection
4 -29	3.3 Purge Unit
4 -29	3.3.1 Function of purge unit
4 -30	3.3.2 Structure of purge unit
4 -33	3.4 Carriage
4 -33	3.4.1 Carriage functions
4 -34	3.4.2 Carriage structure
4 -36	3.5 Paper Feed/Sheet Feeder Mechanism
4 -36	3.5.1 Paper feed/sheet feeder mechanism functions
4 -38	3.5.2 Paper feed/sheet feeder mechanism structure
4 -39	4. PRINTER ELECTRICAL SYSTEM
4 -39	4.1 Overview of Printer Electrical System
4 -40	4.2 Logic
4 -40	4.2.1 Logic block diagram
4 -41	4.2.2 Logic components
4 -45	4.3 Electrical System
4 -45	4.3.1 Input power supply (AC adaptor)
4 -45	4.3.2 Output voltages
4 -46	5. DETECTION FUNCTIONS
4 -46	5.1 Sensor-based Detection Functions
4 -48	5.2 Miscellaneous Detection Functions
4 -48	5.2.1 Waste-ink amount detection
4 -48	5.2.2 BJ cartridge detection
4 -48	5.2.3 Ink-out detection

## *Part 5: MAINTENANCE*

5 - 1	1. MAINTENANCE
5 - 1	1.1 Parts for Periodic Replacement
5 - 1	1.2 Consumable Parts
5 - 1	1.3 Consumables
5 - 1	1.4 Periodic Maintenance
5 - 2	2. SERVICING TOOLS



Page	
5 - 2	2.1 List of Tools
5 - 3	3. APPLYING GREASE
5 - 4	4. DISASSEMBLY AND REASSEMBLY
5 - 4	4.1 Disassembly and Reassembly
5 - 4	4.2 Notes on Disassembly and Reassembly
5 - 4	4.2.1 Main cover
5 - 4	4.2.2 Carriage unit
5 - 5	4.2.3 Bearings at ends of support shaft
5 - 5	4.2.4 Purge unit and bottom case assembly
5 - 5	4.2.5 Securing idler pulley assembly screw
5 - 6	4.3 Waste Ink Absorbers
5 - 7	4.4 Assembling the Chassis
5 - 8	5. ADJUSTMENTS
5 - 8	5.1 Adjustment Locations
5 - 8	5.1.1 Adjusting registration
5 - 8	5.1.2 Checking and adjusting the head gap
5 -13	6. TROUBLESHOOTING
5 -13	6.1 Troubleshooting Overview
5 -13	6.1.1 Overview
5 -13	6.1.2 Troubleshooting cautions
5 -14	6.2 Diagnosis
5 -14	6.2.1 Diagnostic flow
5 -16	6.2.2 Action
5 -37	7. CONNECTOR LAYOUT AND SIGNAL ASSIGNMENT
5 -37	7.1 Logic Board
5 -39	7.2 Carriage Board
5 -44	8. CIRCUIT DIAGRAMS
5 -44	8.1 Parts Layout
5 -44	8.1.1 Logic board
5 -45	8.1.2 Carriage board
5 -47	8.2 Circuit Diagrams
5 -47	8.2.1 Logic board

## III. ILLUSTRATION INDEX

	<b><i>Part 1: SAFETY AND PRECAUTIONS</i></b>	
1 - 1	Figure 1 - 1	The Printer's Moving Parts
1 - 2	Figure 1 - 2	Front Cover
1 - 3	Figure 1 - 3	Ink Path
1 - 4	Figure 1 - 4	BC-62e Photo and BC-61
1 - 4	Figure 1 - 5	Ink Mist
1 - 5	Figure 1 - 6	AC Adapter
1 - 6	Figure 1 - 7	BJ Cartridge Metal Plate
1 - 7	Figure 1 - 8	Removing the BJ Cartridge Cap and Tape
1 - 8	Figure 1 - 9	BJ Cartridges
1 - 9	Figure 1 -10	Removing the Ink Tank Cap
1 - 9	Figure 1 -11	The Ink Outlets on Ink Tank
1 -10	Figure 1 -12	Spurs
1 -10	Figure 1 -13	Contacts
1 -11	Figure 1 -14	Capping Position
1 -11	Figure 1 -15	Carrying the Printer
1 -13	Figure 1 -16	Protecting the Power Supply
1 -14	Figure 1 -17	Electrical System of Printer
1 -15	Figure 1 -18	Parts that Cannot be Disassembled
	<b><i>Part 2: PRODUCT SPECIFICATIONS</i></b>	
2 - 1	Figure 2 - 1	Printer Appearance
2 - 3	Figure 2 - 2	Black BJ Cartridge (BC-60)
2 - 4	Figure 2 - 3	Photo BJ Cartridge (BC-62e Photo)
2 - 5	Figure 2 - 4	Color BJ Cartridge (BC-61)
2 - 6	Figure 2 - 5	BJ Cartridge (SB-60)
2 - 6	Figure 2 - 6	Ink Tanks
2 -11	Figure 2 - 7	Printing Area
2 -18	Figure 2 - 8	Compatible Mode
2 -18	Figure 2 - 9	Nibble Mode
2 -18	Figure 2 -10	ECP Mode
	<b><i>Part 3: OPERATING INSTRUCTIONS</i></b>	
3 - 1	Figure 3 - 1	Packaging
3 - 2	Figure 3 - 2	Printer Dimensions
3 - 3	Figure 3 - 3	Connecting the Interface Cable
3 - 3	Figure 3 - 4	Connecting the Power Supply
3 - 4	Figure 3 - 5	Removing Cap and Tape from BJ Cartridge
3 - 4	Figure 3 - 6	Installing BJ Cartridges
3 - 5	Figure 3 - 7	Checking Print Head Alignment
3 - 6	Figure 3 - 8	Replacing the Ink Tank
3 - 6	Figure 3 - 9	Removing Protective Cap from Ink Tank
3 - 7	Figure 3 -10	Cartridge Container SB-60
3 - 8	Figure 3 -11	Incorrect Method of Powering Off
3 - 9	Figure 3 -12	Paper Settings
3 -10	Figure 3 -13	Names of Parts and Their Functions (1)
3 -11	Figure 3 -14	Names of Parts and Their Functions (2)
3 -12	Figure 3 -15	Transporting the Printer
3 -13	Figure 3 -16	Manual Capping Method
3 -14	Figure 3 -17	Control Panel
3 -17	Figure 3 -18	Windows 95 Driver Control Sheet (Sample)

Page		
3 -18	Figure 3 -19	Hidden Control Sheet (Sample)
3 -20	Figure 3 -20	Nozzle Check Pattern (Sample)
3 -22	Figure 3 -21	Service Mode Test Print (Sample)
3 -23	Figure 3 -22	EEPROM Data Print (Sample)

#### *Part 4: TECHNICAL REFERENCE*

4 - 1	Figure 4 - 1	Printer Block Diagram
4 - 2	Figure 4 - 2	Flowchart of Initialization Sequence
4 - 3	Figure 4 - 3	Print Signal Sequence
4 - 5	Figure 4 - 4	Power-Off Sequence Flowchart
4 - 6	Figure 4 - 5	Bidirectional Centronics Specifications Selection Sequence
4 - 6	Figure 4 - 6	Interface Timing (Compatible Mode)
4 - 7	Figure 4 - 7	Interface Timing (Nibble Mode)
4 - 7	Figure 4 - 8	Interface Timing (ECP Mode)
4 - 9	Figure 4 - 9	Photo Print Mode (Image)
4 -10	Figure 4 -10	Print Mode Main Sheet (Sample)
4 -11	Figure 4 -11	Print Mode Detail Quality Sheet (Sample)
4 -13	Figure 4 -12	Printer's Mechanical System
4 -15	Figure 4 -13	Structure of BC-60
4 -16	Figure 4 -14	Structure of BC-61
4 -17	Figure 4 -15	Structure of BC-62e Photo
4 -19	Figure 4 -16	Structure of BC-60 BJ Head Unit
4 -19	Figure 4 -17	Structure of BC-61 BJ Head Unit
4 -20	Figure 4 -18	Structure of BC-62e Photo BJ Head Unit
4 -21	Figure 4 -19	Nozzle Arrays
4 -22	Figure 4 -20	Signal Contacts
4 -24	Figure 4 -21	Block Diagram of BC-60 Drive Circuit
4 -25	Figure 4 -22	Block Diagram of BC-61/BC-62e Photo Drive Circuit
4 -32	Figure 4 -23	Purge Unit
4 -33	Figure 4 -24	Carriage
4 -35	Figure 4 -25	Paper Feed Motor Drive Switching
4 -36	Figure 4 -26	Auto Platen-Head Gap Adjustment
4 -37	Figure 4 -27	Paper Feed Mechanism
4 -38	Figure 4 -28	Paper Separator
4 -39	Figure 4 -29	Printer Electrical System
4 -40	Figure 4 -30	Logic Board Block Diagram
4 -43	Figure 4 -31	Printer Block Diagram
4 -44	Figure 4 -32	Motor Drive Circuit
4 -45	Figure 4 -33	AC Adaptor Output Voltages
4 -46	Figure 4 -34	Sensor Positions

#### *Part 5: MAINTENANCE*

5 - 3	Figure 5 - 1	Grease Points
5 - 4	Figure 5 - 2	Main Cover and Connector Cover
5 - 4	Figure 5 - 3	Releasing the Carriage Lock
5 - 5	Figure 5 - 4	Bearings at Ends of Support shaft
5 - 5	Figure 5 - 5	Purge Unit and Bottom Case Assembly
5 - 5	Figure 5 - 6	Tightening Idler Pulley Assembly Screw
5 - 6	Figure 5 - 7	Maintenance Jet and Waste Ink Absorbers
5 - 7	Figure 5 - 8	Tightening the Chassis Fixing Screws
5 - 8	Figure 5 - 9	Screws Influencing Head Gap
5 - 9	Figure 5 -10	Measuring Sheet Setting 1
5 - 9	Figure 5 -11	Measuring Sheet Setting 2

Page		
5 -10	Figure 5 -12	Thickness Gauge Setting
5 -10	Figure 5 -13	Check the Head Gap
5 -11	Figure 5 -14	Adjust the Head Gap 1
5 -12	Figure 5 -15	Adjust the Head Gap 2
5 -37	Figure 5 -16	Logic Board
5 -39	Figure 5 -17	Carriage Board
5 -44	Figure 5 -18	Logic Board (Face)
5 -44	Figure 5 -19	Component Board (Back)
5 -45	Figure 5 -20	Carriage Board (Face)
5 -45	Figure 5 -21	Carriage Board (Back)

## IV. TABLE INDEX

	<b><i>Part 2: PRODUCT SPECIFICATIONS</i></b>		
Page			
2 - 5	Table 2- 1	BJ Cartridge vs Print Mode	
2 -10	Table 2- 2	Paper Specifications	
2 -12	Table 2- 3	IO Signals Compatible Mode	
2 -13	Table 2- 4	IO Signals in Nibble Mode	
2 -13	Table 2- 5	IO Signals in ECP Mode	
	<b><i>Part 3: OPERATING INSTRUCTIONS</i></b>		
3 - 9	Table 3- 1	Printer Paper Settings	
3 -14	Table 3- 2	Operator Calls	
3 -15	Table 3- 3	Service Calls	
3 -21	Table 3- 4	Service Mode	
	<b><i>Part 4: TECHNICAL REFERENCE</i></b>		
4 - 8	Table 4- 1	Number of Passes vs Number of Operational Head Nozzles	
4 -10	Table 4- 2	Main Default Print Mode Settings	
4 -22	Table 4- 3	BJ Head Input and Output Signals	
4 -27	Table 4- 4	AND Gate Contacts and IDATA Order	
4 -27	Table 4- 5	Electrode Connection Pins	
4 -28	Table 4- 6	Index Connections	
4 -28	Table 4- 7	Index Sensor Signals and BJ Cartridge Detection	
4 -30	Table 4- 8	Cleaning Conditions and Ink Consumption (Average)	
4 -48	Table 4- 9	Ink-out Detection Timing	
	<b><i>Part 5: MAINTENANCE</i></b>		
5 -39	Table 5- 1	Contacts (DARK COL and LIGHT COL)	