BJC-85
BJ M70

REFERENCE MANUAL

Canon

Oct. 1999

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1. PRODUCT OUTLINE

The BJ M70 and the BJC-85 are portable, color BJ printers targeting the personal use market. As successive models of the BJC-80/80v, the following functions have been added, the ease of connection has been improved, and the functions as a portable space-saving printer has been strengthened.

(1)   The high-speed IrDA (Ver.1.1) enables the printer to attain print speed comparable to that of the Centronics interface.
(2)   Direct printing from digital cameras by the new standards of IrTran-P.
(3)   Support of the USB I/F function.
(4)   Photo printing function is added.

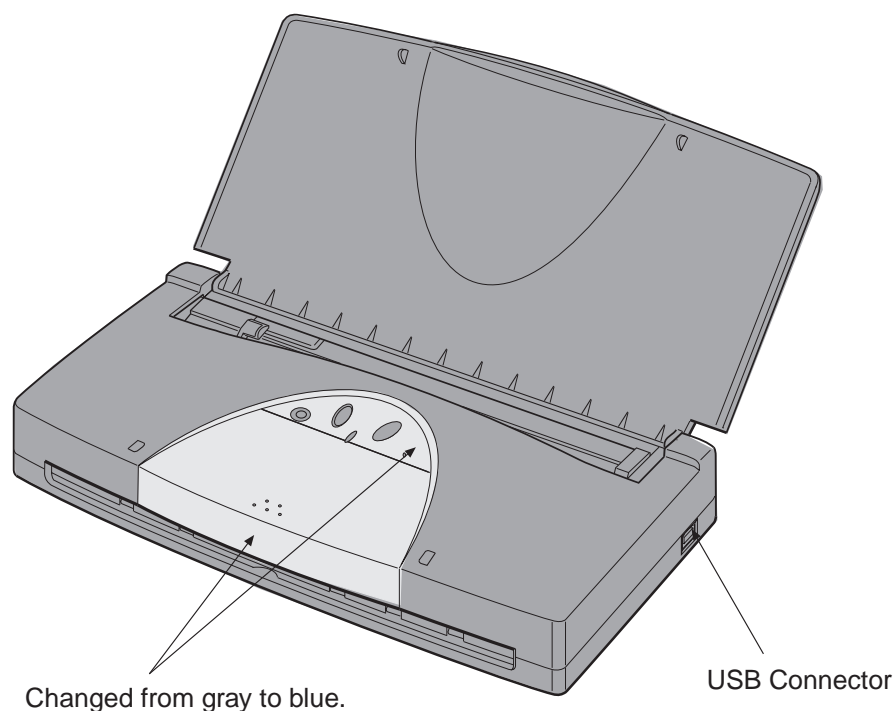## 2. CHANGES FROM THE BJC-80/80v

1)   New adoption of the photo cartridge (Photo printing function is added.)
2)   The IrDA version upgrade from Ver. 1.0 to 1.1 has enabled faster transmission.
3)   New adoption of IrTranP (Direct printing from digital cameras, enabled only in BJ M70).
4)   New adoption of USB I/F
5)   One emulation (BJC-85: LQ mode / BJ M70: BJ mode)
6)   Button reset of the ink low warning is added.
7)   Various specifications / Circuit diagram
8)   Special tool (spur cleaner) is added.

3. EXTERNAL APPEARANCE

The BJ M70 and the BJC-85 have the same appearance as the BJC-80/80v, except for the following:

(1) The USB I/F connector has been added to the right side of the printer.
(2) The color of the panel cover and inner cover has been changed from gray to blue.

Changed from gray to blue.

USB Connector

4. SPECIFICATIONS

4-1. PRIINTER SPECIFICATIONS

Type	Portable serial color bubble jet printer
Paper feeding method	Auto sheet feed

Printing speed	Burst HS: 434cps HQ: 346cps (when using the BC-10)
	Throughput:
	  BC-10
	    New monochrome pattern (E) 5 ppm(HS) 3.9 ppm(Standard)
	    New monochrome pattern (J) 5 ppm(HS) 4.3 ppm(Standard)
	  BC-11e
	    New color pattern (E) 2 ppm(HS) 1.6 ppm(Standard)
	    New color pattern (J) 2 ppm(HS) 1.7 ppm(Standard)
	  BC-12e
	    A4 full address 1.0ppm (HQ)

Printing direction	Unidirectional (automatically selected according to the print data)
Max. Print Width	203 mm
Line feed pitch	136 ms/line (128" /360" line feed)
Built-in print control mode	LQ mode: BJC-85 only BJ mode: BJ M70 only Native mode BJL command
Detection functions	Presence of paper: Available Presence of BJ cartridge: Available Waste ink amount: Available Paper width: Not available Distinction of BJ cartridge: Available Ink low: Available (by using the dot-count)
Noise	Sound pressure level: conforms to ISO9296 Approx. 45 dB (A) or less during operation (HQ/HS mode)

Environmental requirements	During operation Temperature 5°C to 35°C (41°F to 95°F)
	                      Humidity 10%RH to 90%RH (no condensation)
	Non operation Temperature 0°C to 35°C (32°F to 95°F)
	                      Humidity 5%RH to 95%RH (no condensation)

Power supply	Input voltage/Frequency: AC100 V, 50/60 Hz AC120 V, 60 Hz AC230 V, 50 Hz AC240 V, 50 Hz Power consumption Printing status Standby status Soft power off Max. 30 W 3 W 2 W
External dimensions	300 mm (W) x 157.6 mm (D) x 57 mm (H)
Weight	Approx. 1.4 Kg (including BJ cartridge)

4-2. INTERFACE SPECIFICATIONS

The interface specifications of this printer is shown below.
1)   Bidirectional Centronics Interface (IEEE1284 compatible)
2)   Infrared Interface
                IrDA Interface Ver. 1.1 / IrTranP
                ASK Interface
3)   USB Interface

<Difference from the BJC-80/80v>
1)   The specified version of IrDA is changed from Ver. 1.0 to 1.1.
2)   IrTranP compliant.
3)   USB interface compliant.

IrDA Ver. 1.1 and USB I/F compliancy for preinstalled Windows 98 PCs.
Windows 95 PCs comply with IrDA Ver. 1.0.

The specifications of IrDA Ver. 1.1 and USB I/F are explained below. See the BJC-80/80v
Service Manual for details regarding the bidirectional interface/ASK interface.

4-2-1. IrDA Interface
1)   Interface
        IrDA Version 1.1 compatible

2)   Optical specifications

        Light generation
        Wavelength: 0.85 to 0.90 µm
        Intensity: 100 to 500 m W/Sr
        Light angle: ±15° (along optical axis)

        Light interception
        Wavelength: 0.85 to 0.90 µm
        Intensity: 4µ W/cm^2 to 500m W/cm^2
                            10µ W/cm^2 to 500m W/cm^2
                            (when the communication speed is more than 0.576 MHz.)
        Light angle: Max. ±15° (along optical axis)

3)   Transfer speed   9600/19200/38400/57600/115.2k/576k/1.152M/4M bps

4)   Communication   Half duplex, start/stop system (bidirectional):
        method   when the transfer speed is less than 115.2kbps
                            Half duplex, frame synchronization system (bidirectional):
                            when the transfer speed is more than 0.576Mbps

5)   Communication   0 to 1m: when the transfer speed is less than 115.2kbps
        distance   0 to 0.8m: when the transfer speed is more than 0.576Mbps

| 6) | Maximum received data size | 2048 byte/packet |

7) Modulation method   3/16 RZI (Return to Zero Invert):
   when the transfer speed is less than 115.2kbps
   1/4 RZI (Return to Zero Invert):
   when the transfer speed is 0.576Mbps and 1.152Mbps
   4 PPM (Pulse Position Modulation):
   when the transfer speed is 4Mbps

4-2-2. USB Interface

<Specifications>
1) Device structure   Self-powered device

2) Data transfer method   Half duplex serial interface
   Universal Serial Bus Specification Revision 1.0 compatible
   Universal Serial Bus Device Class Definition for printing
   Device Version 1.0 compatible
   Signal rate: 12Mbps (full speed)
   Transfer type: Control transfer/Bulk transfer

3) Input/output circuit

No.	Signal name	
1	Vcc	
2	-Data	Data signal line
3	+Data	Data signal line
4	GND	

Series B
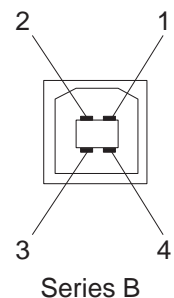
<Signal level>
Vcc: "H" level input voltage: +2.0V to +5.5V
     "L" level input voltage: +0.0V to +0.8V
-Data, +Data: Differential input sensitivity
          "H" level input voltage: +2.8V to +3.6V
          "L" level input voltage: +0.0V to +0.3V

4) Interface cable   Material: AWG No.28 or larger
   Full speed device cable (with twisted-pair shield)
   Less than 5 mm

5) Interface connector   Printer-side: USB standard, Series B receptacle
   Cable-side: USB standard, Series B plug

<Technical explanation>

USB is a serial interface which connects up to 127 peripheral devices to a host computer, and transmits data at a high-speed rate of 12Mbps. Hot plugging, in which connecting/disconnecting devices while the host or the printer is in use, is supported. Each device is connected to a hub's port, where each port's detection/disconnection status is returned to the host.

Data transfer

The data transfer in USB is executed in terms of the transfer unit called a frame, a time frame of approximately 1ms, into which the data is divided. Data is transferred by piling up these frames.

All packets begin with a SYNC (synchronizing) field to synchronize with the local clock, and are separated with an EOP (End of Packet) field.

Frame lines begin with an SOF (Start of Frame) packet. An SOF is composed of a PID (Packet Identification Field) that represents the type of the packet and the direction, frame number, and a CRC (Cyclic Redundancy Check) used for error-check.

Inside a frame is a packet line containing a token packet, data packet and a handshake packet, which indicates the status of the flow control.

A token packet is composed of a PID, an address field which can specify up to 128 addresses, an ENDP (endpoint) field, and a CRC.

Inside a data packet are a PID, data field, CRC, and EOP.

Only a PID is present inside the handshake packet.
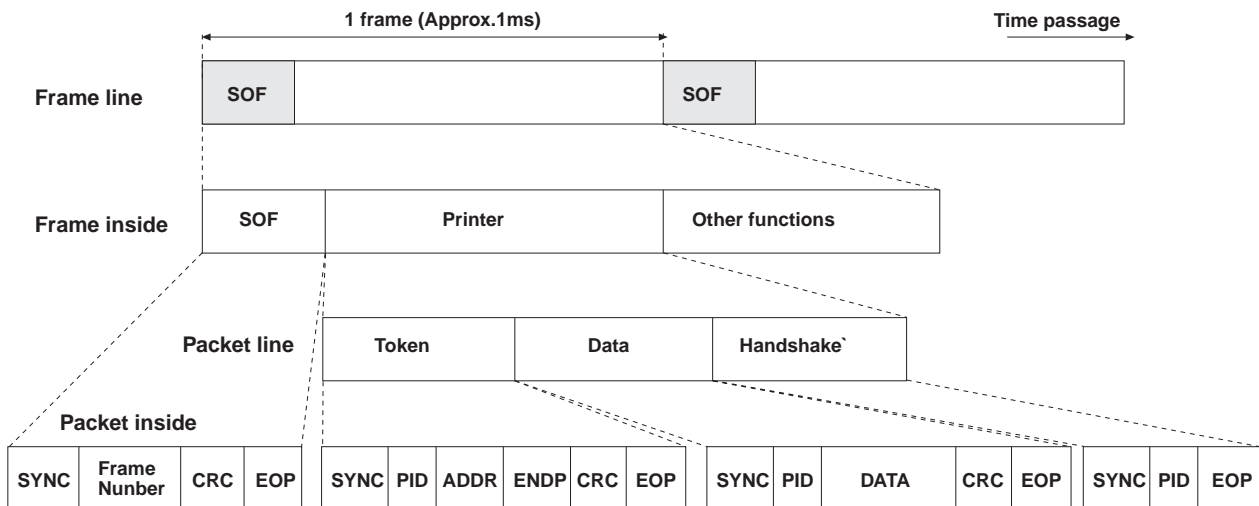
Encoding/Decoding the Data

In USB, data transfer lines are ultimately encoded with NRZI (Non Return to Zero Invert) method. When the original data bit is 0, sent data bits are inverted; when the original data bit is 1, the value is retained.

However, if the level of the transferred data remain unchanged for a certain period of time, the receiving side may not be able to synchronize with the data sample position, which will result in data bits being out of phase. This is prevented by a method called bit stuffing; when data bit 1 is repeated 6 times, one 0 bit is added to the original data before encoding with NRZI.
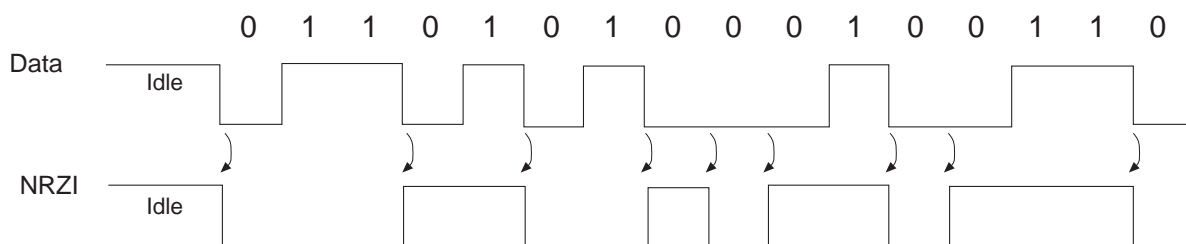
4-3. PAPER SPECIFICATIONS

Plain paper (Weight: 64 to 90g / m^2)
Government postcard (Weight: 90g / m^2, Thickness: 0.23 mm)
Coated paper (Canon coated paper LC-301, A4/LTR)
High resolution paper (Canon high resolution paper HR-101, A4/LTR)
Glossy paper (Canon glossy paper GP-301, A4/LTR)
Transparency film (Canon transparency film CF-102, A4/LTR)
BPF (Canon back print film BF-102, A4/LTR)
Glossy film (Canon glossy film HG-101, A4/LTR)
T-shirt transfer (Canon T-shirt transfer TR-201, A4/LTR)
Fabric sheet (Canon fabric sheet FS-101, A4/LTR)
Glossy postcard (Canon glossy postcard KH-201)
Photo glossy postcard (Canon photo glossy postcard FM-101)
Envelope (Size 4, size 6, COM #10, DL)
Note: Printing on fanfold paper and labels is not supported.

Type	Paper	Size	Remarks
Plain paper[1]	PB (SK/DK)	A4, B5, A5	Suggested paper
	Kangas	A4	
	Neusiedler	A4	See [1]
	Boise Cascade	LTR, LGL	
	XX4024(75g/m^2)	LTR, LGL	
	XX4024(95g/m^2)	LTR, LGL	
	Fox River Bond	LTR	
Color BJ plain paper	LC-301	A4, LTR	See [1]
High resolution paper[2]	HR-101	A4, LTR	See [2]
Glossy paper[2]	GP-301	A4, LTR	See [2]
Transparency film[2]	CF-102	A4, LTR	See [2], Note 1)&2)
BPF[3]	BF-102	A4, LTR	See [3], Note 2)
Glossy film[2]	HG-101	A4, LTR	See [2], Note 2
T-shirt transfer	TR-201	A4, LTR	See [3]
Fabric sheet[3]	FS-101	A4, LTR	See [3], Note 1)
Government postcard[2]	----------	100 x 148*	See [2]
Glossy postcard[2]	KH-201	100 x 148*	See [2]
Photo glossy postcard	FM-101	215.9 x 119.6*	See [3]
Envelope[4]	Size 4	235 x 105*	See [4]
	Size 6	190 x 98*	
	COM #10	241 x 106*	
	DL	220 x 110*	
Thick paper	91 to 105g / m^2		

*: Unit: mm
[1]:Stackable up to 3 mm (Approx. 30 sheets). For legal size paper, feeds single sheet.
[2]: Stackable up to 10 sheets   [3]: Single paper feeding   [4]: Stackable up to 5 sheets
Note 1): A plain sheet of paper should be set under the back print film, fabric sheet, and T-shirt transfer.
Note 2) Transparency film, back print film, and Glossy film are usable when the humidity is 70 % or less.

4-4. PHOTO BJ CARTRIDGE SPECIFICATIONS

Photo cartridge BC-12e

BJ cartridge BC-12e:	Ink cartridge replaceable type of color BJ cartridge (drop modulation adopted)
Ink cartridge BCI-12Bk:	Black (64 nozzles)
Ink cartridge BCI-12Color:	Yellow, Magenta, Cyan (24 nozzles x 3)

No. of pages printed	Approx. 20 pages : reference value (in the HR-Fine mode, 7.5% duty pattern per color (A4) : calculated value)
Weight	Approx. 29 g (including both ink cartridges)
Print speed	Approx. 0.1 pp : reference value (A4 full address printing pattern)
Nozzle check pattern	Same as the BC-11e

HR-Fine mode

Carriage motion:	3 pass
Printing nozzle:	8 nozzle
Resolution:	360 dpi
Carriage driving frequency:	5.00 kHz

Photo print mode can be used to obtain high level gradation print quality when using the Photo BJ cartridge. These cartridges contain light density ink which achieves a rich gradation and reduced graininess by printing several times over the same dot.
The printer driver divides the pixel data into a maximum of 4-values (not printed, print 1 dot, print 2 dots and print 3 dots) enabling each pixel to be printed in up to 4 gradations. The printer therefore makes three passes using a maximum of 150% more ink than usual. This Photo cartridge adopts drop modulation, decreasing granularity of the light density parts by efficiently ejecting large and small ink droplets.

Head ID

Head		Carriage ribbon cable contact part pin No. / Signal name		
		11/ID0	12/ID1	13/HCONT
	BC-10	L	L	H
	BC-11e	H	L	L
	BC-12e	H	H	L
	No head installation error	H	H	——

The printer has no detection function of the ink cartridge type, and for the BC-11e and BC-12e, the ink cartridges to be installed are not incompatible, therefore, the following mistaken installation may occur. In case the BCI-12 Bk/Color are installed in the print head of the BC-11e, as the printer recognizes that the color cartridge (BC-11e) has been installed in spite of light density photo ink cartridge installation, low density imaging is produced. In case of the installation of the BCI-11 Bk/Color in the print head of the BC-12e, in reverse, high density colored imaging is produced.

5. OPERATION

5-1. FUNCTION SETTING

Default setting
The default setting can be set by button operation when the power is turned on. When the printer is turned on, hold down the POWER button until the beeper sounds the specified number of times for the desired function setting, and release the POWER button to set.

Function Setting

Mode	Beeper	Remark
Table 1	7 times	Factory default setting
Table 2	8 times	
Table 3	9 times	
Table 4	10 times	
Table 5	11 times	

<Difference from the BJC-80>
BJC-85
1) No setting regarding the BJ mode
2) The setting to enable/disable the ink low warning is added.
3) The setting of Euro font is added.

	Table 1	Table 2	Table 3	Table 4	Table 5
Print mode	HQ	HQ	HQ	HQ	HQ
Left margin	LTR	LTR	A4	A4	A4
Text scale mode	Disable	Disable	Disable	Disable	Disable
Paper feed position	8.5 mm	8.5 mm	8.5 mm	8.5 mm	8.5 mm
Smoothing	Disable	Disable	Disable	Disable	Disable
Reduction	1/1	1/1	1/1	1/1	1/1
Automatic power off	Disable	Disable	Disable	Disable	Disable
Font	Roman	Roman	Roman	Roman	Roman
Font lock	Disable	Disable	Disable	Disable	Disable
Input/download buffer	25 kB/0 kB	25 kB/0 kB	25 kB/0 kB	25 kB/0 kB	25 kB/0 kB
Automatic line feed	CR	CR	CR	CR	CR
International character set	USA	USA	USA	USA	USA
Character set	Italics	Italics	Italics	Italics	Graphics
Code page	437	437	437	437	858
Ink low warning	Disable	Enable	Disable	Disable	Disable

When the printer is turned on, hold down the POWER button until the beeper sounds 12 times to change "Code Page" in the following table to "858," "Character Set" to"Graphics." Other items will not be changed.

<Difference from the BJC-80v>
BJ M70
1) No setting regarding the LQ mode
2) The setting to enable/disable the ink low warning is added.

	Table 1	Table 2	Table 3	Table 4	Table 5
Operation mode change	BJ	BJ			
Print mode	HQ	HQ			
Automatic power off	Disable	Disable			
Smoothing	Disable	Disable			
Remaining ink	Disable	Enable	Same as	Same as	Same as
Reduction	1/1	1/1	Table 1	Table 1	Table 1
BJ Paper feed position	8.5 mm	8.5 mm			
BJ receive buffer	23 kB	23 kB			
BJ ANK character quality	Normal	Normal			
BJ ANK character set	Katakana	Katakana			
BJ CR function (+LF)	CR only	CR only			
BJ ANK international character	Japan	Japan			

5-2. ERROR INDICATIONS

<Difference from the BJC-80/80v>

	Beeper	
	BJC-80/80v	**BJC-85/BJ M70**
Waste ink warning	4 times	5 times
Low battery warning	3 times	4 times
Ink low warning	Once	Twice
Cartridge replacement compulsory completion warning	Twice	3 times
Diode sensor error	9 times	------[1]

[1]: Eliminated

<BJC-85/BJ M70 error indications>

Error condition	Error LED	Power LED	Beeper
[Recoverable by customers]	(Orange)	(Green)	
Paper pick-up error	Lights	Lights	Once
Paper delivery error	Lights	Lights	Twice
BJ cartridge check	Lights	Lights	3 times
Cartridge mis-match	Lights	Lights	4 times
Ink low warning[1]	Blinks	Lights	Twice
Cartridge replacement compulsory completion warning	Blinks	Lights	3 times
Low battery warning	Blinks	Lights	4 times
Waste ink warning	Blinks	Lights	5 times
Low battery error (with battery)	Blinks	Blinks	Long, then short
[Unrecoverable by customers]			
ROM error	Blinks	Blinks	Once
RAM error	Blinks	Blinks	Twice
No head installation error	Blinks	Blinks	3 times
HP sensor error	Blinks	Blinks	4 times
Waste ink full error	Blinks	Blinks	5 times
Internal temperature error	Blinks	Blinks	6 times
Print position detection error	Blinks	Blinks	7 times
Abnormal temperature rise error	Blinks	Blinks	8 times
EEPROM error	Blinks	Blinks	11 times
Low battery error (with AC adapter)	Blinks	Blinks	Long, then short

[1]: Ink low warning is enabled only when the ink low warning selection is set to on.

5-3. INK LOW WARNING RESET BY BUTTON OPERATION

Ink low warning
This printer detects the remaining ink level by counting the number of ejected ink dots in the same way as the BJC-80/80v. When the setting of the ink low warning is enabled, and the remaining ink gets low, the beeper sounds twice, and the ERROR LED blinks.
Pressing the cartridge replacement button will sound the beeper and move the carriage to the center, and the ERROR LED indicates the ink cartridge for which the remaining ink is low as shown below.

Blinks once: when the remaining ink of the BCI-10 / BCI-11Bk / BCI-12Bk is little

Blinks twice: when the remaining ink of the BCI-11Color / BCI-12Color is little

Blinks 3 times: when the remaining ink of the BCI-11 BK & Color / BCI-12 BK & Color is little

The ink low warning reset function by button operation is added to this printer. The button operation procedures are shown below. (The ink low warning of the BJC-80/80v can be reset from the host computer only.)

Operation
1) Turn on the printer.

2) Press the cartridge replacement button to move the carriage to the center.
    If the carriage was moved to the center by signals from the PC, the reset operation
    by the cartridge replacement button is not possible.

3) Make sure that the proper cartridge is installed in the carriage. If not, install the proper
    one. (The ink dot counter reset is effective only to the ink cartridge type installed in
    the carriage.)

4) Press and hold the *RESUME* button for the number of beeps corresponding to the
    warned ink type to select the ink type for which the dot counter is to be reset, and
    release the *RESUME* button. The number of beeper sounds is as follows:

    Once: The dot counter of the BCI-10/BCI-11Bk/BCI-12Bk is reset.
    Twice: The dot counter of the BCI-11Color/BCI-12 Color is reset.
    3 times: The dot counter of the BCI-11Bk&Color/BCI-12Bk&Color is reset.
    4 times: The selected ink type is canceled.

5) Press the cartridge replacement button.
    The ink dot counter selected in the procedure 4) and the ink low warning are reset, and
    at the same time, the carriage returns to the home position.

5-4. DIRECT PRINTING FUNCTION OF THE IMAGE FROM DIGITAL CAMERAS (BJ M70 only)

<Difference from the BJC-80/80v>
The new adoption of IrTranP has enabled the printing of data directly sent from digital cameras compliant to IrTranP standards, not through the host computer, but via IrDA communication.

Specifications

Data communication form:	IrTranP standards compatible
Input image size:	640 x 460 pixels
Input image capacity:	128 Kbyte or less
Output image size:	Landscape: 90 x 68 mm
	Portrait: 77 x 103 mm
	Seal printing: 19 x 26 mm x 16 images
Paper size:	Postcard

Operation

<Image printing>
After receiving the data, the image data is output by pressing the *RESUME* button, and releasing before the beeper sounds. This is not effective when an error has occurred or paper is fed.

<Reprinting>
The image data is also maintained in the memory after printing, and will not be abandoned until new image data is received from the digital camera, or print data is input from the host computer. Reprinting of data is possible by pressing the *RESUME* button (and releasing before the beeper sounds).

<Printing cancellation>
During the printing of image data, printing is cancelled by pressing the *RESUME* button until the beeper sounds once, then releasing. In this case paper is delivered. The remaining data halfway through printing is abandoned. (As the image data has been maintained, it is possible to reprint the data, without resending the data from the digital camera.)

<Printing position definition>
To select the printing position, press the POWER button and cartridge replacement button simultaneously when the power is on, and release the buttons after the beeper sounds the number of times applicable to the printing position to be selected. This setting returns to the default (Landscape) by powering off. The number of beeper sounds is as follows:

Once:	Portrait
Twice:	16-image seal printing
3 times:	Photo glossy card landscape
4 times:	Photo glossy card portrait
5 times:	Setting completed. (The power is normally turned on.)

6. SPECIAL TOOLS

Clean spurs by using the spur cleaner in case spur marks are left on the print images.

Special tool (part number)   **Remarks**
Spur cleaner (QY9-0055-000)   For cleaning spurs

Usage
1) Moisten the fabric part of the spur cleaner with approx. 5 cc of water.
   Moisten the fabric with the water, as shown below, so that the fabric absorbs the water from end to end.
   Be careful not to moisten the fabric with too much water. In case too much water is used, there is the possibility that water will be wrung from the spur cleaner when passing through the paper feed roller, spread inside the printer, and cause failure.
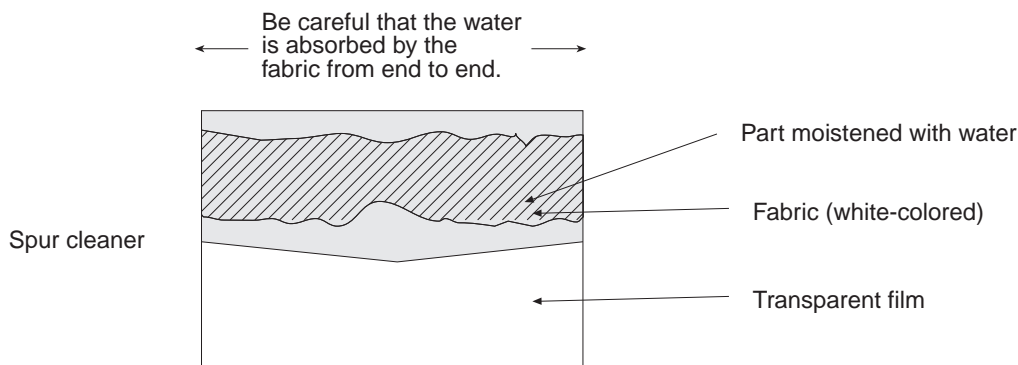
2) Turn on the power of the printer. Remove the paper from the ASF to set the spur cleaner with the fabric-affixed part of the cleaner face-up and to the top.
3) Press the *RESUME* button, and release it after the beeper sounds once. The spur cleaner is fed and stops at the print start position.
4) Press the *RESUME* button again, and release it after the beeper sounds once. The spur cleaner is delivered. Repeat procedures 3) to 4) approx. 5 times in case of heavy soiling.
5) Set a single sheet of paper to the ASF to repeat procedures 3) and 4). (To remove the moisture remaining in the paper feeding path.)

13
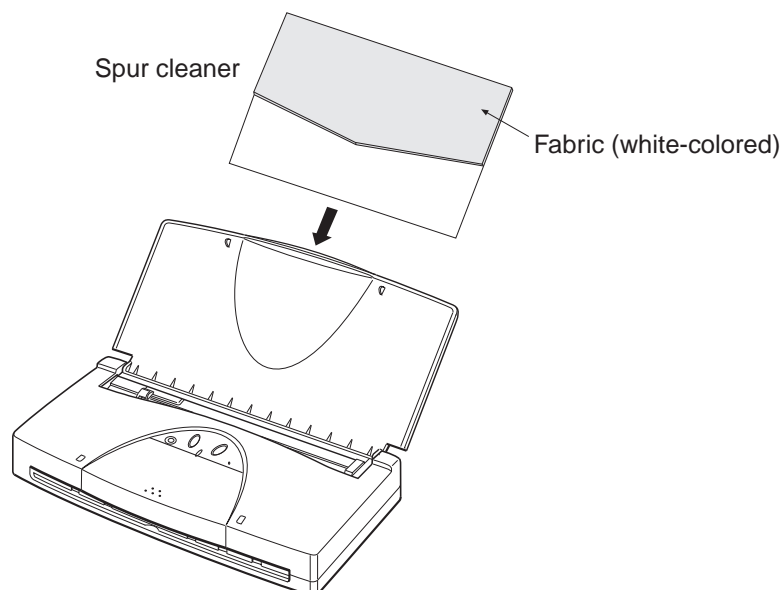
7. PARTS LIST

	BJC-85	BJ M70
COVER, INNER	QB1-4449	QB1-4450
COVER, PANEL	QB1-4451	QB1-4452
CONTROL PCB ASS'Y	QG2-3096	QG2-3097
CHASSIS PLATEN UNIT	QG5-1476	QG5-1481
FLASH-ROM	QH8-0258	QH8-0259

Service parts other than the above are common for BJC-85 and BJ M70.
See the BJC-85 and BJ M70 Parts Catalog for details.

8. CIRCUIT DIAGRAM (Common for BJC-85 and BJ M70)

CONTROL PCB ASS'Y 02

To BJ cartrige

16

CONTROL PCB ASS'Y 03

17

To PANEL BOARD

To IrDA UNIT

CNP1

Vcc3 Vcc1

22
21
20
19
18
17
16
15
14
13
12
11
10
9
8
7
6
5
4
3
2
1

Vcc1

R511 10K,1/16W
R520 10K,1/16W
R521 10K,1/16W

C521 0.01μ,50V
C522 0.01μ,50V
C523 0.01μ,50V

R515 100,1/16W
R516 100,1/16W
R517 100,1/16W
R518 300,1/16W
R519 300,1/16W

R512 100,1/16W
R513 100,1/16W
R514 100,1/16W

R532 68,1/16W

BZOUT <02-A3>
PES <02-A3>
HPS <02-A3>
PWI-LED <02-G3>
ERR-LED <02-G3>

PWRON <02-G2>

CC-SW <02-G3>

RCV-SW <02-G3>

FRXD <02-G1>
RXD <02-G1>
TXD <02-G3>
MODE <02-G2>

STB <02-G4>

IFD0 <02-G4>
IFD1 <02-G4>
IFD2 <02-G4>
IFD3 <02-G4>
IFD4 <02-G4>
IFD5 <02-G4>
IFD6 <02-G4>
IFD7 <02-G4>

AUTXT <02-G4>
ACK <02-G4>
BUSY <02-G4>
PE <02-G4>
SLCT <02-G4>
INIT <02-G4>
FAULT <02-G4>

SELIN <02-G3>

C509 1000p, 50V
C508 1000p, 50V
C507 1000p, 50V
C506 1000p, 50V
C505 1000p, 50V
C504 1000p, 50V
C503 1000p, 50V
C502 1000p, 50V

C501 1000p,50V

R505 1K,1/16W
R504 100,1/16W

C515 1000p, 50V
C514 1000p, 50V
C513 1000p, 50V
C512 1000p, 50V
C511 1000p, 50V
C516 0.01μ, 50V

R509 1K,1/16W
R506 100,1/16W
R507 1K,1/16W
R508 1K,1/16W

RA1
RA2
RA3
RA4

Vif

R503 1K, 1/16W
R502 1K, 1/16W
R501 390, 1/8W

Vcc3

R510 5.6K,1/16W

Vcc3

Vcc1

TH1

R531 47K,1/16W

THLVL <03-D2>

Parallel Interface

CNIF1

1	STROBE
2	DATA1
3	DATA2
4	DATA3
5	DATA4
6	DATA5
7	DATA6
8	DATA7
9	DATA8
10	ACK
11	BUSY
12	PE
13	SLCT
14	AUTXT
15	NC
16	S-GND
17	F-GND
18	+5V
19	S-GND
20	S-GND
21	S-GND
22	S-GND
23	S-GND
24	S-GND
25	S-GND
26	S-GND
27	S-GND
28	S-GND
29	S-GND
30	S-GND
31	INPRM
32	FALT
33	S-GND
34	NC
35	+5V
36	SELIN
	FG1
	FG2

18

Timer IC

vdd 8
sio 7
SGK 6
cs   5
tpout 1
xout 2
xin   3
vss   4

X2

R612
10K,1/16W

Vcc1

BATT1
D5

T-OE <02-F3>

EEPROM(2K) IC9

NC1 1
Vcc 2
CS   3
SK   4
NC2 8
GND 7
DO   6
DI   5

Vcc1

R609
0.01μ,50V

R613
5.6K,1/16W

E-OE <03-F4>
TE-CLK <03-C3>
TE-DIO <03-F3>

R614
10K,1/16W

E-DO <03-D2>

Vcc1

CP2
CP1

USB Interface

CNUS1

PWR 1
GND 4
D-   2
D+   3

DA6 4
HZM6.8FA
DA6 5
HZM6.8FA

R9
10K,1/16W

R11
47K,1/16W

R5
47K,1/16W

R6
1.5K,1/16W

Q1

3/CC

PLUG 1
PULLUP
USBD-
USBD+

R7
24,1/16W
R8
24,1/16W

PLUG <02-D1>
PULLUP <02-D1>
USBD- <02-D1>
USBD+ <02-D1>

Carriage Motor

CNCR1

4 A
3 Ā
2 B
1 B̄

approx.8.3 /phase

CRREF2 <03-F3>
BCRM <03-C2>
BCRM <03-C2>

Carriage Motor Driver IC10

OA   1
ŌA   2
SGA 3
Sen.A 4
GND 5
GND 6
VrefA 7
PhA 10
VM   20
OB   19
ŌB   18
SGB 17
GND 15
GND 13
Sen.B 12
VrefB 11

R607 0.39,1/2W
R608 0.39,1/2W
R609 10K,1/16W
C604 0.1μ,25V

R606 1.6K,1/16W
C607 0.01μ,50V

C606 33μ,25V
R610 15K,1/16W

C605 0.1μ,25V

Vpp

R602 0.39,1/2W
R603 0.39,1/2W
R604 1.6K,1/16W
C601 0.1μ,25V
C603 0.1μ,25V

R605 15K,1/16W
C602 0.01μ,50V

R601 10K,1/16W
Q12
Q19

CRREF1
ACRM
ACRM
MTSTB

Vcc1

CRREF1 <03-F3>
ACRM <03-C2>
ACRM <03-C2>
MTSTB <02-A3>

Paper Feed Motor

CNUF1

5 COM
4 A
2 Ā
3 B
1 B̄

approx.69.5 /phase

VH

Paper Feed Motor Driver IC11

I1 1
I2 2
I3 3
I4 4
I5 5
I6 6
I7 7
GND 8
O1 16
O2 15
O3 14
O4 13
O5 12
O6 11
O7 10
COM 9

W-HT
MCH1
MCH0

VH
ZD4

VH

<02-C7>
<02-B7>
<02-B7>

R611
0.68,1/2W

D6

C608
1μ,50V

WHEAT
MCHE1
MCHE0
ALRM
BLRM
LF-PRT

<02-A3>
<02-A3>
<02-A3>
<03-C1>
<03-C2>
<01-D10>

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