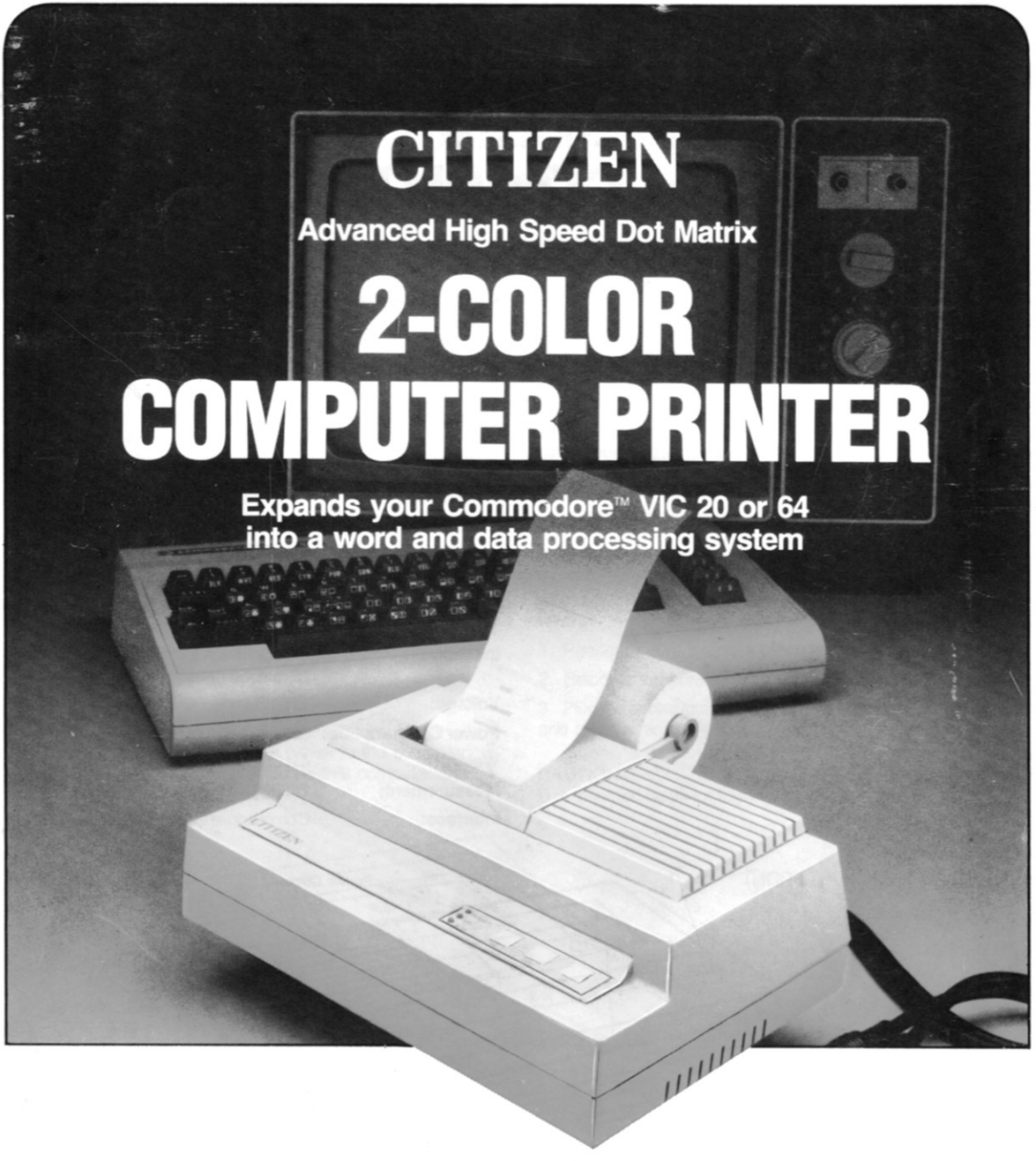


INSTRUCTION MANUAL

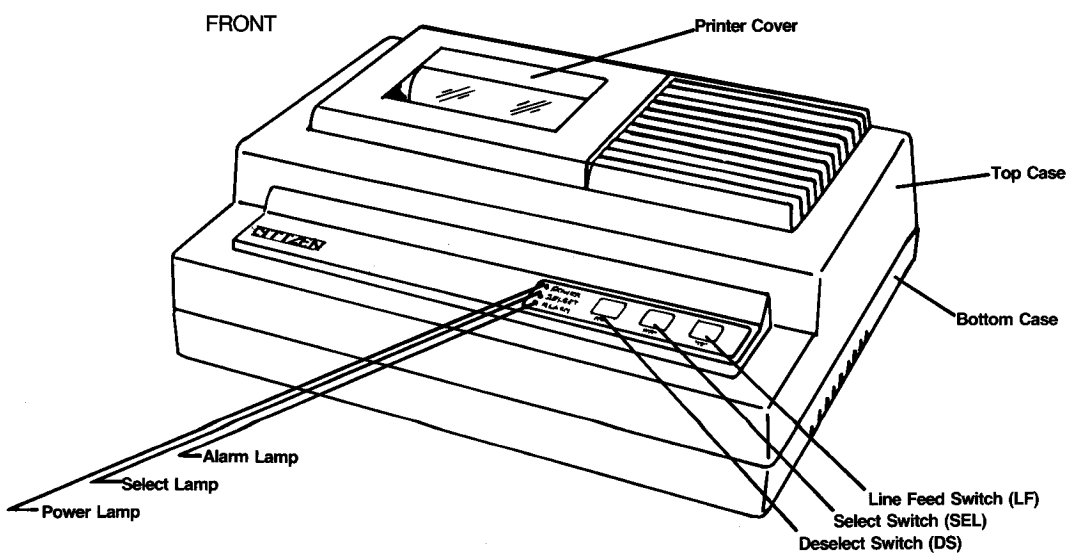
CITIZEN

Advanced High Speed Dot Matrix

TWO COLOR COMPUTER PRINTER

Specifications

Print Method:	Serial Impact Dot Matrix
Print Speed:	65 CPS (48 LPM with 40 Column) (128 LPM with 5 Column)
Character:	5 (W) x 7 (H) Dots Size; 2.75mm(H) x 1.25mm(W)
Graphic:	6(W) x 7(H) Dots
Column Capacity:	40 character per line
Line Spacing:	5.5mm (character) 2.75mm (graphic mode)
Character Cords:	Refer to page
Paper:	69 ± 1 mm, 80(ø)mm (2¾" Adding Machine Roll)
Ink Ribbon:	2 Color (Black & Red) 13 mm, 30 or 35 (ø) mm
Voltage:	115V ± 10% 60Hz (USA)
Power Consumption:	32W (Maximum), Below 0.5A
Weight:	4.4 Lbs.
Measurement:	240(W) x 176(D) x 81.5(H) mm
Interface:	Commodore Compatible



COMPUTER PRINTER FEATURES

Power Cord:
Connected directly to the printer, use only the voltage specified on the printer.

Power Switch:
Turns the power on and off. When the power is turned on, the printer head returns to the left margin (home) position.

Power Lamp:
Lights up when the power switch is turned on.

Alarm Lamp (ALM):
Lights up as an indication that there is some mal-function with the printer (printer mechanism has jammed, printer head has not returned to home position, etc.). The Alarm Lamp may be turned off by pressing the Deselect Switch or by turning off the power switch.

Line Feed:
Paper feed function.

Select Switch (SEL):
Instructs printer to go on-line.

Deselect Switch (DS):
Instructs printer to go off-line. If this switch is pressed while the printer is operating, it will print one line then stop.

Printer Cover:
Protects the printer from dust and dirt.

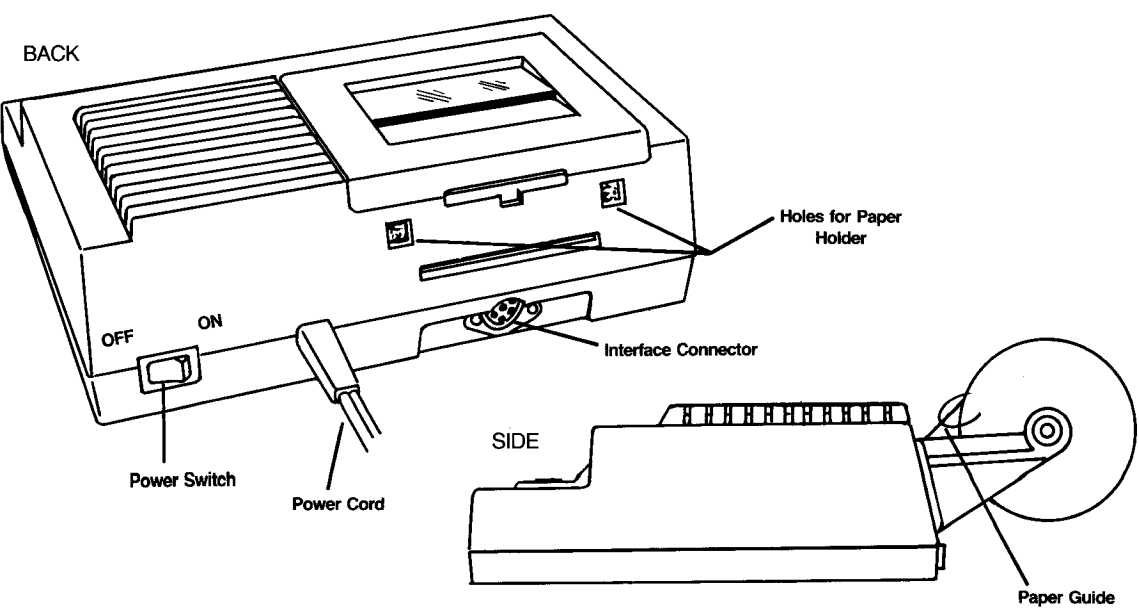
Interface Connector:
This included cable connects the printer to the computer. Be sure when making the connection that computer and printer power are both turned off.

IMPORTANT:

This equipment generates and uses radio frequency energy which may cause interference to radio and TV reception. It has been type tested and found to comply with the limits from a Class B computing device in accordance with the specifications in Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference in residential installation. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause interference to radio or TV reception, certain corrective measures may be taken.

1. Reorient the receiving antenna.
2. Relocate the printer further away from the antenna.
3. Plug the printer into a different outlet so that the printer and receiver are on different branch circuits.

CAUTION:
Use shielded cable for this equipment.



HOW TO SET UP THE PRINTER

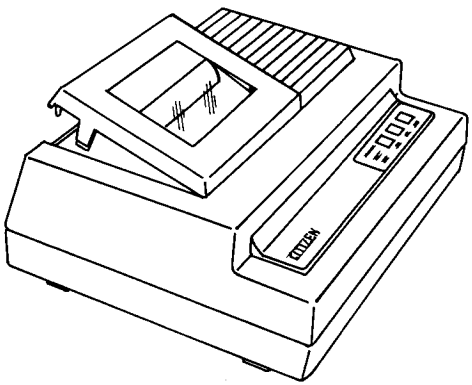
After unpacking your printer, take out the cushion between the ink ribbon and printer cover. Tear off the tape on the ink ribbon. Make a final check to see that the ink ribbon is set properly.

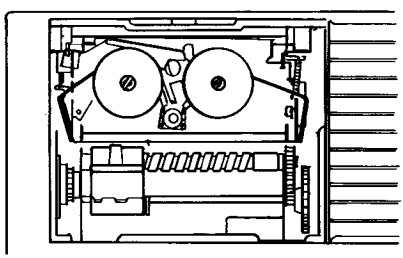
HOW TO LOAD THE PAPER

Insert and feed the paper into the printer. Place the paper roll on the paper holder. Set the guide...it prevents paper jams. NOTE: Never pull back on the paper after it's loaded.

HOW TO SET THE INK RIBBON

Make sure the power to the printer is turned off. Set the ink ribbon as shown in the diagram. NOTE: after continuous use, do not touch the printer head when replacing the ribbon for it may be hot.





SET THE RIBBON AS SHOWN ABOVE

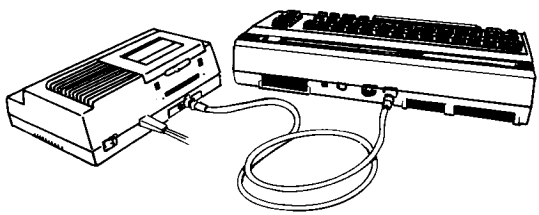
HOW TO TEST YOUR PRINTER

NOTE: Never use your printer without any paper in it as it may result in damage to the head.

1. Turn off the power switch.
2. While pressing the LF Switch, turn on the power switch. Now release the LF Switch.
3. Printer will begin printing a Self Print Pattern
4. To stop the Self Print Pattern, turn the power switch off.

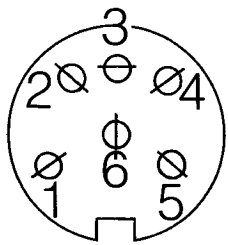
HOW TO HOOK UP THE INTERFACE

Connect the printer to the computer as shown below. When you make the connection, be sure that all power is turned off.



Commodore 64
VIC-20

Connector



Pin No.	Signal
1	Serial SRQ
2	GND
3	Serial ATN
4	Serial CLK
5	Serial DATA
6	RES

HOW TO KEEP YOUR PRINTER IN GOOD OPERATING CONDITION

1. Never operate the printer without paper.
2. Change the ink ribbon before it is dry.
3. Take care not to drop any foreign objects into the printer.
4. Do not put anything on top of the printer.
5. Place the printer on a flat and stable surface.
6. Keep the printer in a properly ventilated room. Excessive heat, cold or humidity will damage the printer.
7. Make sure the power to the printer is turned off before replacing the ribbon or attempting to remove any object which may have accidentally been dropped into the printer.

HOW TO USE YOUR PRINTER

Now you are ready to begin to use your printer. Before you start, be sure that you know how to do the following.

1) Operate your Commodore computer.
2) Do elementary programming in BASIC.
3) Read and write files to and from peripheral device such as Tape Cassette Recorder or Floppy Disk Drive.
4) Open and close files.

If you are not familiar with the above procedures, refer to your Commodore computer's USER'S MANUAL for all information you may need.

COMMANDS

In order to print something on your printer, you have to transfer the video screen function to the printer. You can do this with a few special commands. The following is the explanation of those commands. Remember to hit Return-Key always after you type command.

THE OPEN COMMAND

The syntax of the open command is; OPEN lfn, dn, sa
This command sets a correspondence between a file number and physical device.

lfn: Logical file number
Logical file number can be any number from 1 to 255 to assign your file.

dn: Device number
Device number of this iDP-560 printer is 4.

sa: Secondary address
Secondary address (sa) could be eliminated, however, in this case, Secondary address is realized as 0.
For details of secondary address, refer to page 6.

THE CMD COMMAND

The syntax of this command is; CMD lfn

This command makes printer listner state and transfer control from the computer to printer. Logical file number (lfn) must be same as one used in OPEN COMMAND. When you give CMD COMMAND, printer prints READY and waiting for further instructions.

If CMD COMMAND is given with PRINT and/or LIST COMMAND, the output is directed to the printer.

THE PRINT# COMMAND

The syntax of the PRINT# COMMAND is; PRINT# lfn, data

When printer is not listner state, this command directs the output to the printer instead of video screen. Logical file number must be same as one used in OPEN COMMAND and has been opened by device number 4.

If you have used CMD COMMAND, it is necessary to follow with a PRINT# COMMAND in order to close connection between printer and computer.

CLOSE COMMAND

The syntax of this command is; CLOSE lfn

This command closes files.
In order to keep the maximum number of files always available, you should close a file always after printing from it.
As you have learned, (lfn) Logical file number must be same as one used in OPEN COMMAND.

SAMPLE PROGRAM (DIRECT MODE)

Note: Before you type, make sure that your printer is Select State (Check SEL Lamp, This lamp should be on).

1. OPEN 5, 4
   PRINT# 5, "HELLO CATHY"
   CLOSE 5

   Result in:
   HELLO CATHY

2. OPEN 3, 4
   CMD 3
   PRINT "HELLO CATHY"
   PRINT#3: CLOSE 3

   HELLO CATHY

LIST PRINTING

To have list printing, you have to type in the following program:

```
  10 A=20
  20 B=40
  30 C=A+B
  40 PRINT C
OPEN 1, 4
CMD 1
LIST
```

Result in:

```
READY.

10 A=20
20 B=40
30 C=A+B
40 PRINT C

READY.
```

PROGRAM MODE PRINTING

You can also allow printing with program mode.
For instance:

```
10 OPEN 2, 4
20 PRINT "PRINTER TEST"
30 CMD 2
40 PRINT "PRINTER TEST"
50 LIST
```

Make sure after printing, type PRINT# 2 and CLOSE 2.

If you run the program after typing the above, PRINTER TEST is displayed on CRT and same PRINTER TEST is printed on printer.

```
PRINTER TEST
10 OPEN 2,4
20 PRINT "PRINTER TEST"
30 CMD 2
40 PRINT"PRINTER TEST"
50 LIST

READY.
```

SECONDARY ADDRESS

You can enter the following secondary address in your OPEN COMMAND.
These are;

- 0 Print data exactly as received.
- 3 Set the number of lines per page to be printed.
- 5 Define a programmable character.
- 6 Set spacing between lines.
- 7 ASCII Mode character (Character set 2).
- 8 GRAPHIC Mode character (Character set 1).
- 10 Reset Printer.

After the appropriate OPEN statement has been transmitted, a PRINT# statement is required to transmit the secondary address information to the specified device (In this case your printer).

Remember that it is possible to have as many as 7 files open simultaneously. This allows you to perform several formatting functions at one time on the data in the computer's memory. Do not use any secondary address other than listed above. Any other numbers are ignored by printer.

Print Data Exactly As Received: sa=0

With this secondary address, printer prints data exactly as received.

Up to 40 characters are printed on each line and if the next character is not a Carriage Return, a Carriage Return is performed automatically and overflow characters are printed on the next line.

Setting the Number Of Lines Per Page: sa=3

With this secondary address, you can vary the number of lines per page in order for this paging option to take effect, you must turn paging on with the special paging character described on page 9.

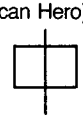
When paging is on and the paging secondary address is not implemented, the default number of lines per page is 66 including 3 blank lines at the top of the page and 3 blank lines at the bottom of the page. The number of lines including 3+3 blank lines (n) is for $14 \leq n \leq 120$.

Example:

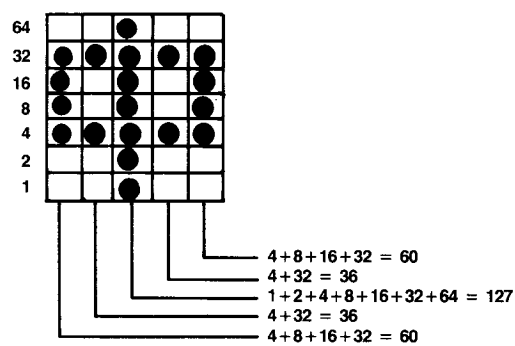
```
10 OPEN 1, 4, 3                    1  (LINE)
20 OPEN 2, 4                       /  (LINES)
30 PRINT#1, CHR$ (36)              30 (LINE)
40 PRINT#2, CHR$ (147)                (6 LINES BLANK)
50 FOR A=1 TO 60                   31 (LINE)
60 PRINT#2, A                      /  (LINES)
70 NEXT A                          60 (LINE)
80 CLOSE 1:CLOSE 2
```

Programmable Character: sa=5

You can create a customs character of your own with this secondary address. This programmable character is initialized with this secondary address.
Suppose you want to program the special symbol in Chinese or Japanese letter (You may be familiar with the TV program, American Hero) which is:



Lay out a 7 x 5 matrix (the same matrix as is on the print head). To the left of the matrix, write the binary bit value of each line. Use dots one per square to create your character. Then add up the binary bits indicated by your dots in each column. These totals are used in the DATA statement in your program.



The DATA statement in your program will read:
DATA 60, 36, 127, 36, 60

The program shown in the printout in the following example writes the Chinese letter. It creates a string with the CHR$ value of the column totals and passes the string to the printer with sa 5.
To achieve upper and lowercase characters, use the CRSR Up (Cursor Up) for uppercase characters and CRSR Down (Cursor Down) for lowercase characters.

EXAMPLE

```
READY.
10 OPEN 40,4
20 OPEN 45,4,5
30 DATA 60,36,127,36,60
40 FOR I=1 TO 5:READ A:PT$=PT$+CHR$(A):N
EXT I
50 PRINT#45,PT$
60 FOR S=1 TO 20
70 PRINT#40,CHR$(254)" ";
80 NEXT S
90 CLOSE 40:CLOSE 45
READY.
```

The following is a description of the program shown above.

20 OPEN 45,4,5 Communicates to the printer what function you want executed a secondary address of 5 indicates that you want something stored in the printer memory.
- The device number (the printer's)
- The logical file number

30 DATA Statement in your program.

40 The FOR NEXT loop contained in this line reads the data contained in line 30 and constructs a string PT$. PT$ contains the necessary information to print the Chinese letter ▮ .

50 Stores PT$ in printer memory

60-80 Prints the Chinese letter.
PRINT# Prints to the printer.
CHR$ Prints the programmed character (Chinese letter ▮).

90 Closes two files opened by the program.

After typing RUN, you get this result.

▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮

Note: Multiple programmable characters in the same line can only be made by overprinting. The programmable character can not be changed when a line wraps around to the next line.

SETTING SPACING BETWEEN LINES: sa=6

This special secondary address enables you to delete the spacing between lines. This can be set by the special spacing character described on page 9.

EXAMPLE: RESULT IN:

```
READY.
10 OPEN 4,4
20 OPEN 6,4,6
30 PRINT#6,CHR$(0)
40 FOR A=1 TO 5
50 PRINT#4,"HHHH"
60 NEXT A
70 CLOSE 4:CLOSE 6
READY.
```

SELECTING ASCII MODE CHARACTER (CHARACTER SET 2): sa=7

GRAPHIC MODE CHARACTER (CHARACTER SET 1): sa=8

You can change character set (from 1 to 2 or from 2 to 1) with these secondary addresses (sa=7 & 8).

sa=7 Change character to ASCII MODE CHARACTER (CHARACTER SET 2)

sa=8 Change character to GRAPHIC MODE CHARACTER (CHARACTER SET 1)

EXAMPLE: RESULT IN:

```
READY.
10 OPEN 3,4
20 A$="PRINTER"
30 PRINT#3,A$
40 OPEN 4,4,7:PRINT#4:CLOSE 4
50 PRINT#3,A$
60 OPEN 5,4,8:PRINT#5:CLOSE 5
70 PRINT#3,A$
80 CLOSE 4:CLOSE 3
READY.
```

PRINTER
printer
PRINTER

RESETTING THE PRINTER: sa=10

To reset the printer, you will send a secondary address of 10.

```
EXAMPLE: 10 OPEN20,4,10
         20 PRINT#20
         30 CLOSE20
```

SPECIAL CHARACTER FUNCTIONS

Special control characters can be used to change the mode of printing within a single line. Table 1 (Page 9) contains a summary of the special control characters. The table is followed by a brief description of each function.

ENHANCED CHARACTERS

You can print any character double its width. While characters are normally printed in a 7-row by 6-column matrix, enhanced characters appear in a 7-row by 12-column matrix. The example below shows how to enhance characters and how to set it back to normal width.

EXAMPLE: RESULT IN:

```
READY.
10 OPEN 4,4
20 PRINT#4, "H"CHR$(1)"ELL"CHR$(129)"O"
30 CLOSE 4
READY.
```

HELLO

PAGING ON/OFF

Paging must be turned on in your program by means of the code as keyboard entry shown in Table 1. Otherwise printing is continuous. The paging function provides for 66 lines per page including 3 blank lines at the top of the page and 3 blank lines at the bottom. The number of lines per page may be altered by using the secondary address 3 option. When paging is in effect, the paging off character performs a top-of form function. For instance, you transmit CHR$ (147), printer does paging with the lines you have set, then if you transmit CHR$ (147) again, paging function is reset. To set paging function off, use CHR$ (19). Refer to the Table 1.

SPECIFYING INDIVIDUAL ASCII MODE AND GRAPHIC MODE CHARACTERS

The printer default character set is Graphic Mode character when power is first applied to the printer. You can shift ASCII MODE and GRAPHIC MODE characters on the same line. To shift ASCII MODE and GRAPHIC MODE characters, use CHR$ (17) and to reset, use CHR$ (145).

EXAMPLE: RESULT IN:

```
READY.
10 OPEN 4,4
20 PRINT#4, CHR$(145)"H"CHR$(17)"ELLO"
30 CLOSE 4
READY.
```

Hello

RED CHARACTERS

You can print in Red with special control code CHR$ (20). However, it is not possible to print Black and Red in one line. This function is reset automatically by changing line.

EXAMPLE: RESULT IN:

```
READY.
10 OPEN 4,4
20 PRINT#4,CHR$(20)"HELLO"
30 CLOSE 4
READY.
```

HELLO

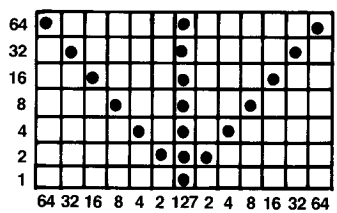
BIT IMAGE CHARACTER

This special control code enables you to print each dot (Bit image printing). A line constructed vertical 7 dots and horizontal 240 dots.
Input bit image code CHR$ (27) and graphic code CHR$ (75) first, then input data which fix the print position. First data is up to where you want to print counting from home position (counting each dot, maximum 240 dots). CHR$ (n); $1 \leq n \leq 240$

The following data (second data) is dummy data. Input CHR$ (0).

CHR$ (27) + CHR$(75) + CHR$(n) + CHR$(0)

Then type Graphic Print Data. As it is shown below, the Graphic Print Data is counted in same way like Programmable Character (sa = 5).



EXAMPLE: RESULT IN:

```
READY.
10 OPEN 10,4
20 A$ = CHR$(27) + CHR$(75) + CHR$(13) + CHR$(0)
30 DATA 64,32,16,8,4,2,127,2,4,8,16,32,6
4
40 FOR A = 1 TO 13
50 READ D:B$ = B$ + CHR$(D)
60 NEXT A
70 PRINT#10,A$;B$
80 CLOSE 10
READY.
```

HOW TO REVERSE A FIELD

With this function, you can invert the dot matrix to produce the effect of white on black. We do not suggest using this mode of printing for more than five consecutive lines since extended printing in this mode may damage the print head. Use control code CHR$ (18) & CHR$ (146).

CHR$ (18) To reverse a field.

CHR$ (146) To set it back to normal mode.

EXAMPLE:

```
READY.
10 OPEN 7,4
20 PRINT#7,CHR$(18)"♦♦♦"CHR$(146)"♦♦♦"
30 CLOSE 7
READY.
```

RESULT IN:

Table 1. SPECIAL CONTROL CHARACTER SUMMARY

PRINTER FUNCTION	CODE	ASCII	KEYBOARD
ENHANCE	CHR$ (1)	SOH	NA
UNENHANCED	CHR$ (129)		NA
PAGING ON/RESET	CHR$ (147)		SHIFT & CLR HOME
PAGING OFF	CHR$ (19)	DC3	CLR HOME
RVS ON	CHR$ (18)	DC2	ON RVS
RVS OFF	CHR$ (146)		OFF RVS
CARRIAGE RETURN	CHR$ (13)	CR	RETURN
LINE FEED	CHR$ (10)	LF	NA
UPPERCASE	CHR$ (145)		SHIFT & CURSOR UP
LOWERCASE	CHR$ (17)		NA
BIT IMAGE	CHR$ (27)	ESC	NA
SPACING	CHR$ (128)		NA
UNSPACING	CHR$ (0)	NUL	NA

GRAPHIC MODE (UPPER CASE)

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	0	16	32	48	64	80	96	112	128	144	160	176	192	208	224	240
1	1	17	33	49	65	81	97	113	129	145	161	177	193	209	225	241
2	2	18	34	50	66	82	98	114	130	146	162	178	194	210	226	242
3	3	19	35	51	67	83	99	115	131	147	163	179	195	211	227	243
4	4	20	36	52	68	84	100	116	132	148	164	180	196	212	228	244
5	5	21	37	53	69	85	101	117	133	149	165	181	197	213	229	245
6	6	22	38	54	70	86	102	118	134	150	166	182	198	214	230	246
7	7	23	39	55	71	87	103	119	135	151	167	183	199	215	231	247
8	8	24	40	56	72	88	104	120	136	152	168	184	200	216	232	248
9	9	25	41	57	73	89	105	121	137	153	169	185	201	217	233	249
A	10	26	42	58	74	90	106	122	138	154	170	186	202	218	234	250
B	11	27	43	59	75	91	107	123	139	155	171	187	203	219	235	251
C	12	28	44	60	76	92	108	124	140	156	172	188	204	220	236	252
D	13	29	45	61	77	93	109	125	141	157	173	189	205	221	237	253
E	14	30	46	62	78	94	110	126	142	158	174	190	206	222	238	254
F	15	31	47	63	79	95	111	127	143	159	175	191	207	223	239	255

ASCII MODE (LOWER CASE)

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	0	16	32	48	64	80	96	112	128	144	160	176	192	208	224	240
1	1	17	33	49	65	81	97	113	129	145	161	177	193	209	225	241
2	2	18	34	50	66	82	98	114	130	146	162	178	194	210	226	242
3	3	19	35	51	67	83	99	115	131	147	163	179	195	211	227	243
4	4	20	36	52	68	84	100	116	132	148	164	180	196	212	228	244
5	5	21	37	53	69	85	101	117	133	149	165	181	197	213	229	245
6	6	22	38	54	70	86	102	118	134	150	166	182	198	214	230	246
7	7	23	39	55	71	87	103	119	135	151	167	183	199	215	231	247
8	8	24	40	56	72	88	104	120	136	152	168	184	200	216	232	248
9	9	25	41	57	73	89	105	121	137	153	169	185	201	217	233	249
A	10	26	42	58	74	90	106	122	138	154	170	186	202	218	234	250
B	11	27	43	59	75	91	107	123	139	155	171	187	203	219	235	251
C	12	28	44	60	76	92	108	124	140	156	172	188	204	220	236	252
D	13	29	45	61	77	93	109	125	141	157	173	189	205	221	237	253
E	14	30	46	62	78	94	110	126	142	158	174	190	206	222	238	254
F	15	31	47	63	79	95	111	127	143	159	175	191	207	223	239	255

90 DAY
LIMITED WARRANTY

Rims International Inc. warrants to the original purchaser of this product that it will be free of defects in material and workmanship for 90 days from the date of original purchase.

During this warranty period, it will be either repaired or replaced at our option, and without charge.

The original consumer must return it with proof of the date of original purchase, to the dealer or mail it, properly packed, prepaid, and insured, to:

Rims International (Service Center)
8 West 37th Street 4th Floor
New York, N.Y. 10018
Tel: 212-564-2943

If you return it after the 90 day warranty period, it will be repaired or replaced at our option for a $30.00 service charge. Please enclose check or money order, when you carefully pack it to return to us. Please also include your name, address, city, state and zip code.

Damage caused in transit, by abuse, accident, negligence or through repairs made by others are not covered by this Warranty.

This Warranty gives you specific legal rights and you may have other rights which may vary from state to state.

MODEL NO. IDP-560

WARRANTY SERVICE INSTRUCTIONS

If it becomes necessary to return this unit for service, pack it securely (Preferably in the original carton or double-packed). Enclose a letter describing the problem and include your name and address. Also include proof of purchase. Deliver to or ship PREPAID (UPS preferred) to the factory service department:

Rims International (Service Center)
8 West 37th Street 4th Floor
New York, N.Y. 10018
Tel: 212-564-2943

CITIZEN