HEWLETT PACKARD

HCMS-29XX LED Displays Character Set (ASCII and Katakana)

Application Brief D-003

Introduction

The HCMS-29XX alphanumeric displays have a single data line that accepts data inputs serially. Each character is formed out of a 5 x 7 pixel array by shifting bits into each pixel position (1 = on, 0 = off). The eighth row does not consist of LEDs, but is a pixel position and must be considered a data position when encoding a character to be displayed. Thus, each character's information content can be stored and accessed as five bytes (40 bits) of information, with each byte representing a column of data. To properly implement the character coding given here, input the most significant bit first (i.e. least significant bit last). The most significant bit of each byte is a "don't care" since there are no LEDs in the eighth row.

Codes

The symbol codes in Table 1 represent the ASCII characters shown there and in Table 3. The symbol codes in Table 2 represent the characters shown in Table 4, the Katakana character set. The column and row values for each symbol are shown in the appropriate character set (columns D4 - D7, rows D0 - D3). Ignore the user defined section of each character set (relates to HP smart displays that have an internal ASCII decoder). Columns 0, 1, 6, and 7 of the Katakana character set are encoded in the ASCII character set. Please see page 4-138 in the *1993 HP Optoelectronics Designer's Catalog* for another copy of Tables 3 and 4.

Further applications information on the HCMS-29XX alphanumeric displays is available. Please contact your local Hewlett-Packard sales office for copies of the literature.

Table 1. Encoded Data for ASCII Symbols

CHARACTER	SYMBOL CODE	COLUMN CODE				
◀	00	08	1C	3E	7F	00
¿	01	30	45	48	40	30
¡	02	45	29	11	29	45
Ñ	03	7D	09	11	21	7D
ñ	04	7D	09	05	05	79
α	05	38	44	44	38	44
β	06	7E	01	29	2E	10
δ	07	30	4A	4D	49	30
Δ	08	60	50	48	50	60
η	09	1E	04	04	38	40
θ	0A	3E	49	49	49	3E
λ	0B	62	14	08	10	60
μ	0C	40	3C	20	20	1C
π	0D	08	7C	04	7C	02
σ	0E	38	44	44	3C	04
Σ	0F	41	63	55	49	41

Table 1. (continued)

CHARACTER	SYMBOL CODE	COLUMN CODE				
τ	10	10	08	78	08	04
φ	11	18	24	7E	24	18
Ω	12	5E	61	01	61	5E
Å	13	78	14	15	14	78
å	14	38	44	45	3C	40
Ä	15	78	15	14	15	78
ä	16	38	45	44	3D	40
Ö	17	3C	43	42	43	3C
ö	18	38	45	44	45	38
Ü	19	3C	41	40	41	3C
ü	1A	38	42	40	42	38
→	1B	08	08	2A	1C	08
√	1C	20	7E	02	02	02
²	1D	12	19	15	12	00
£	1E	48	7E	49	41	42
¥	1F	01	12	7C	12	01
(space)	20	00	00	00	00	00
!	21	00	5F	00	00	00
"	22	00	03	00	03	00
#	23	14	7F	14	7F	14
$	24	24	2A	7F	2A	12
%	25	23	13	08	64	62
&	26	36	49	56	20	50
'	27	00	0B	07	00	00
(	28	00	00	3E	41	00
)	29	00	41	3E	00	00
*	2A	08	2A	1C	2A	08
+	2B	08	08	3E	08	08
,	2C	00	58	38	00	00
-	2D	08	08	08	08	08
.	2E	00	30	30	00	00
/	2F	20	10	08	04	02
0	30	3E	51	49	45	3E
1	31	00	42	7F	40	00
2	32	62	51	49	49	46
3	33	22	41	49	49	36
4	34	18	14	12	7F	10
5	35	27	45	45	45	39
6	36	3C	4A	49	49	30

Table 1. (continued)

CHARACTER	SYMBOL CODE	COLUMN CODE				
7	37	01	71	09	05	03
8	38	36	49	49	49	36
9	39	06	49	49	29	1E
:	3A	00	36	36	00	00
;	3B	00	5B	3B	00	00
<	3C	00	08	14	22	41
=	3D	14	14	14	14	14
>	3E	41	22	14	08	00
?	3F	02	01	51	09	06
@	40	3E	41	5D	55	1E
A	41	7E	09	09	09	7E
B	42	7E	49	49	49	36
C	43	3E	41	41	41	22
D	44	7F	41	41	41	3E
E	45	7F	49	49	49	41
F	46	7F	09	09	09	01
G	47	3E	41	41	51	32
H	48	7F	08	08	08	7F
I	49	00	41	7F	41	00
J	4A	20	40	40	40	3F
K	4B	7F	08	14	22	41
L	4C	7F	40	40	40	40
M	4D	7F	02	0C	02	7F
N	4E	7F	04	08	10	7F
O	4F	3E	41	41	41	3E
P	50	7F	09	09	09	06
Q	51	3E	41	51	21	5E
R	52	7F	09	19	29	46
S	53	26	49	49	49	32
T	54	01	01	7F	01	01
U	55	3F	40	40	40	3F
V	56	07	18	60	18	07
W	57	7F	20	18	20	7F
X	58	63	14	08	14	63
Y	59	03	04	78	04	03
Z	5A	61	51	49	45	43
[	5B	00	00	7F	41	41
\	5C	02	04	08	10	20
]	5D	41	41	7F	00	00
↑	5E	04	02	7F	02	04
_	5F	40	40	40	40	40
`	60	00	07	0B	00	00
a	61	38	44	44	3C	40
b	62	7F	48	44	44	38
c	63	38	44	44	44	44
d	64	38	44	44	48	7F
e	65	38	54	54	54	08
f	66	08	7E	09	02	00
g	67	08	14	54	54	3C
h	68	7F	08	04	04	78
i	69	00	44	7D	40	00
j	6A	20	40	44	3D	00
k	6B	00	7F	10	28	44
l	6C	00	41	7F	40	00
m	6D	78	04	18	04	78
n	6E	7C	08	04	04	78
o	6F	38	44	44	44	38
p	70	7C	14	24	24	18
q	71	18	24	14	7C	40

Table 1. (continued)

CHARACTER	SYMBOL CODE	COLUMN CODE				
r	72	00	7C	08	04	04
s	73	48	54	54	54	20
t	74	04	3E	44	20	00
u	75	3C	40	40	20	7C
v	76	1C	20	40	20	1C
w	77	3C	40	30	40	3C
x	78	44	28	10	28	44
y	79	04	48	30	08	04
z	7A	44	64	54	4C	44
{	7B	00	08	36	41	00
|	7C	00	00	77	00	00
}	7D	00	41	36	08	00
~	7E	08	04	08	10	08
▒	7F	2A	55	2A	55	2A

Table 2. Encoded Data for Katakana Symbols

SYMBOL CODE	COLUMN CODE				
20	00	00	00	00	00
21	70	50	70	00	00
22	00	00	0F	01	01
23	40	40	78	00	00
24	10	20	40	00	00
25	00	18	18	00	00
26	0A	0A	4A	2A	1E
27	04	44	34	14	0C
28	20	10	78	04	00
29	18	08	4B	48	38
2A	48	48	78	48	48
2B	48	28	18	7C	08
2C	08	7C	08	28	18
2D	40	48	48	78	40
2E	54	54	54	7C	00
2F	18	00	58	40	38
30	08	08	08	08	08
31	01	41	3D	09	07
32	10	08	7C	02	01
33	0E	02	43	22	1E
34	42	42	7E	42	42
35	22	12	0A	7F	02
36	42	3F	02	42	3E
37	0A	0A	7F	0A	0A
38	08	46	42	22	1E
39	04	03	42	3E	02
3A	42	42	42	42	7E
3B	02	4F	22	1F	02
3C	4A	4A	40	20	1C
3D	42	22	12	2C	46
3E	02	3F	42	4C	46
3F	06	48	40	20	1E

Table 2. (continued)

SYMBOL CODE	COLUMN CODE				
40	08	46	4A	32	1E
41	0A	4A	3E	09	08
42	0E	00	4E	20	1E
43	04	45	3D	05	04
44	00	7F	08	10	00
45	04	44	3F	04	04
46	40	42	42	42	40
47	42	2A	12	2A	06
48	22	12	7B	16	22
49	00	40	20	1F	00
4A	78	00	02	04	78
4B	3F	44	44	44	44
4C	02	42	42	22	1E
4D	04	02	04	08	30
4E	3A	02	7F	02	3A
4F	02	12	22	52	0E
50	00	2A	2A	2A	40
51	38	24	22	20	70
52	40	28	10	28	06
53	0A	3E	4A	4A	4A
54	04	7F	04	14	0C
55	40	42	42	7E	40
56	4A	4A	4A	4A	7E
57	04	05	45	25	1C
58	0F	40	20	1F	00
59	7C	00	7E	40	30
5A	7E	40	20	10	08
5B	7E	42	42	42	7E
5C	0E	02	42	22	1E
5D	42	42	40	20	18
5E	01	02	01	02	00
5F	02	05	05	02	00

NOTE: # Columns 0, 1, 6 and 7 may be found in Table 1.

Table 3. ASCII Graphic Character Set

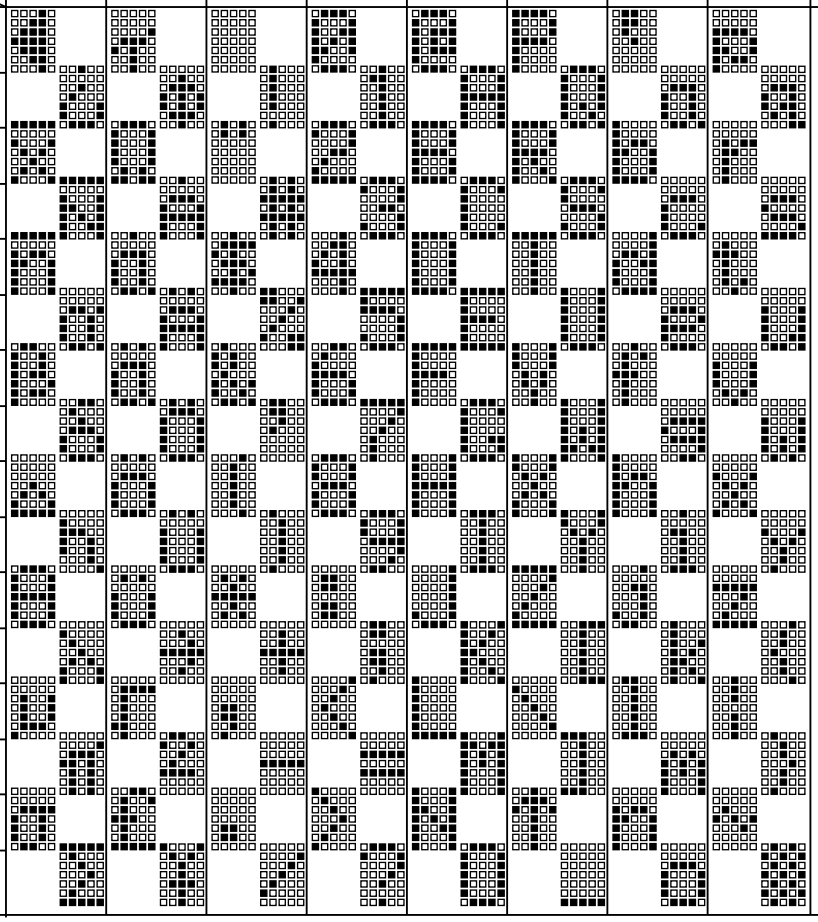
D7	0	0	0	0	0	0	0	0	1
D6	0	0	0	0	1	1	1	1	X
D5	0	0	1	1	0	0	1	1	X
D4	0	1	0	1	0	1	0	1	X
BITS D3 D2 D1 D0 / COLUMN → / ROW ↓	0	1	2	3	4	5	6	7	8-F
0000	0								16 USER DEFINED CHARACTERS
0001	1								
0010	2								
0011	3								
0100	4								
0101	5								
0110	6								
0111	7								
1000	8								
1001	9								
1010	A								
1011	B								
1100	C								
1101	D								
1110	E								
1111	F								

Table 4. Katakana Graphic Character Set

BITS D3 D2 D1 D0	ROW	COLUMN 0	1	2	3	4	5	6	7	8-F
		D7 D6 D5 D4 → 0 0 0 0	0 0 0 1	0 0 1 0	0 0 1 1	0 1 0 0	0 1 0 1	0 1 1 0	0 1 1 1	1 X X X
0000	0									16 ユーザ定義文字
0001	1									
0010	2									
0011	3									
0100	4									
0101	5									
0110	6									
0111	7									
1000	8									
1001	9									
1010	A									
1011	B									
1100	C									
1101	D									
1110	E									
1111	F									

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Data Subject to Change

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