SAMSUNG
SHANGHAI SAMSUNG VACUUM DEVICES

Model	HNA-12LS07T	Rev.③ 02-Aug-2005
Application	AUDIO	
Color of Illumination #6)	GREEN (G. : x=0.250, y=0.439) Cd-free ORANGE (Cd-free O. : x=0.56, y=0.42) Cd-free REDDISH ORANGE(Cd-free Rsh.O. : x=0.62, y=0.37) SKY BLUE(S.B. : x=0.150, y=0.176)	

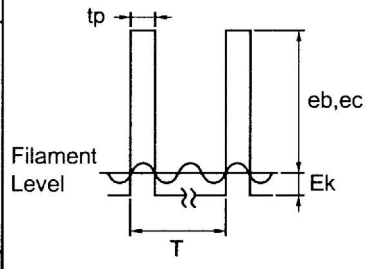
ABSOLUTE MAXIMUM RATINGS #4)

Item	Symbol	Min.	Max.	Unit	Condition
Filament Voltage #2)	Ef	2.56	3.84	Vac	eb,ec = Typ.
Anode Voltage	eb	—	44.0	Vp-p	Ef=Typ.
Grid Voltage	ec	—	44.0	Vp-p	
Operating Temperature	Topr	-40	+85	℃	—

RECOMMENDED OPERATING CONDITION #5)

Item	Symbol	Min.	Typ.	Max.	Unit
Filament Voltage #2)	Ef	2.88	3.2	3.52	Vac
Peak Anode Voltage	eb	33.0	37.0	41.0	Vp-p
Peak Grid Voltage	ec	33.0	37.0	41.0	Vp-p
Cut-Off Bias Voltage	Ek	5.2	—	7.8	Vdc
Duty Factor	Du	—	1/13	—	—
Pulse Width	tp	—	100	—	μs
Operating Temperature	Topr	-20	—	+70	℃
Storage Temperature	Tstg	-55	—	+85	℃

ELECTRICAL CHARACTERISTICS

Item	Test Condition	Symbol		Min.	Typ.	Max.	Unit
Filament Current	Ef= 3.2 Vac ,eb=ec=0	If		360	400	440	mAac
Anode Current #1)	Ef= 3.2 Vac eb= 37.0 Vp-p ec= 37.0 Vp-p	ib	6G~12G	—	5.0	10.0	mAp-p
			2G,3G	—	11.0	22.0	
			4G	—	24.0	43.0	
			1G,5G	—	35.0	50.0	
Grid Current #1)	Duty= 1/13 tp= 100 μs tb= 0 μs	ic	6G~12G	—	5.0	10.0	mAp-p
			2G,3G	—	11.0	22.0	
			4G	—	24.0	48.0	
			1G,5G	—	38.0	57.0	
Brightness		GREEN		102	204	—	ft-L
		Cd-free Rsh.O.		20	41	—	
		Cd-free ORANGE		11	23	—	
		S.B.		5	10	—	
Brightness Ratio Between Digits	(All Segs are lit)	L(Max.) / L(Min.)		—	—	2	
Grid Cut-Off Voltage #3)	Ef= 3.2 Vac Eb= 37.0 Vdc, Ec=Vary	Ecco		(-5.2)	—	—	Vdc
Anode Cut-Off Voltage #3)	Ef= 3.2 Vac, Du= 1/13 ec= 37.0 Vp-p, Eb= Vary	Ebco		(-5.2)	—	—	Vdc

#1. Unless otherwise specified, the anode and the grid current should be measured for each grid when all anodes turn on.
#2. AC 50~60Hz Effective Values.
#3. The cut-off voltage should be measured under the condition of the center-tab ground.
#4. Absolute Maximum Ratings : The value should not be exceeded in any conditions.
If a user don't keep this condition, then VFD may be permanently damaged.
#5. Recommended Operating Condition : Quality can be assured within this condition.
Typical rating is the most optimized value on the life time
#6. All phosphor is Cd-free phosphor.

OUTER DIMENSIONS

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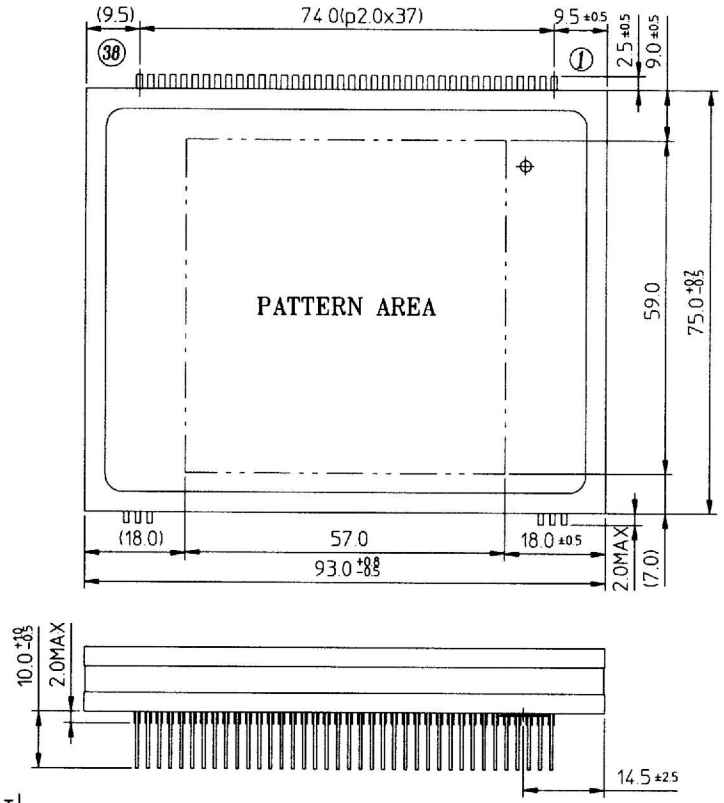

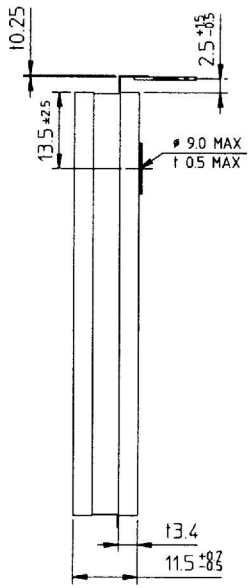

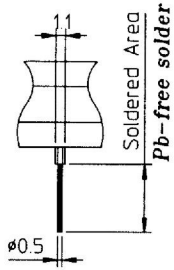

LEAD DETAILS

PIN CONNECTION

PIN NO.	38	37	36	35	34	33	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
CONNECTION	F2	F2	F2	12G	11G	10G	9G	8G	7G	6G	5G	4G	3G	2G	1G	P20	P19	P18	P17	P16	P15	P14	P13	P12	P11	P10	P9	P8	P7	P6	P5	P4	P3	P2	P1	F1	F1	F1

◉ *Note* ◉
1) Fn : Filament pin
2) nG : Grid pin
3) Pn : Anode pin

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PATTERN DETAILS (1)

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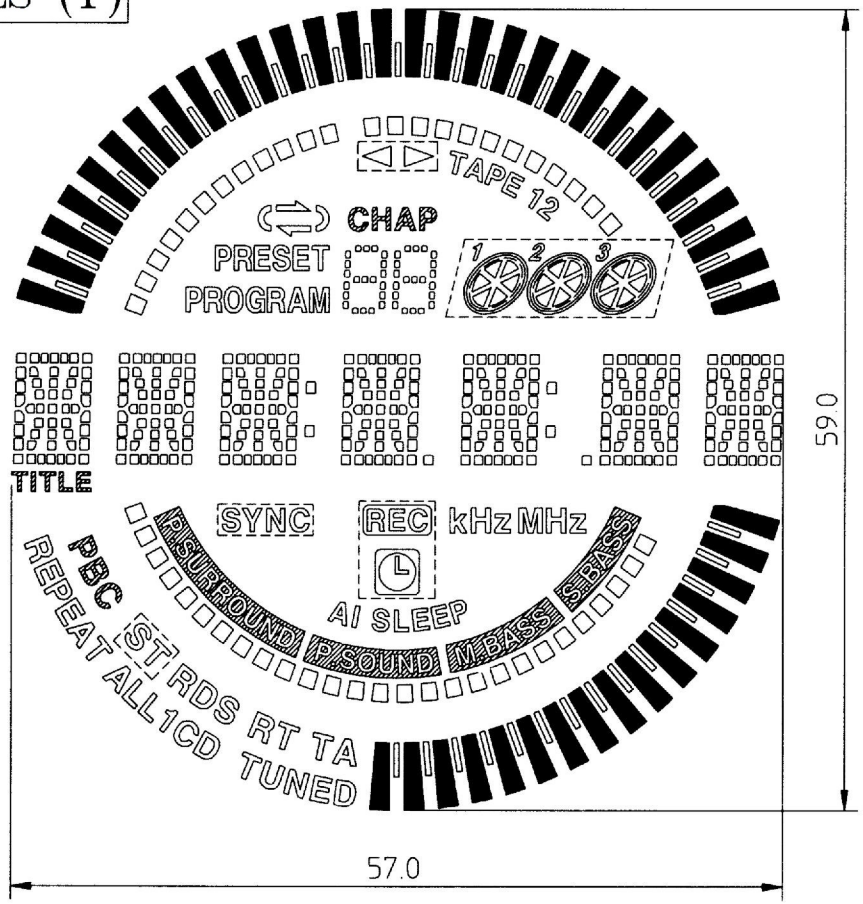

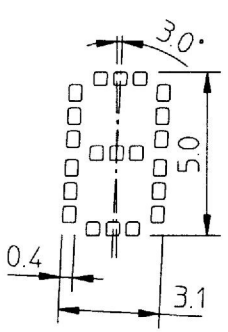

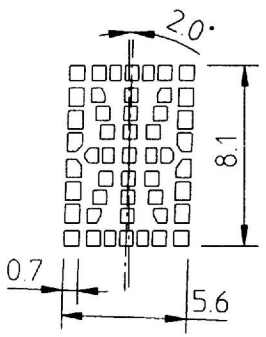

◎ *Color of Illumination* ◎

- *Cd-free Reddish Orange (Cd-free Rsh.O. x=0.62,y=0.37) --- Patterns within the dotted line .*
- *Sky Blue (S.B. x=0.150,y=0.176) --- Hatched Patterns .* ■
- *Cd-free Orange (Cd-free O. x=0.56,y=0.42) --- Hatched Patterns .* ▨
- *Green (G. x=0.250,y=0.439) --- Others.*

* *Negative Patterns. ---* REC S.BASS M.BASS P.SOUND P.SURROUND

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PATTERN DETAILS (1)
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PATTERN DETAILS (2)

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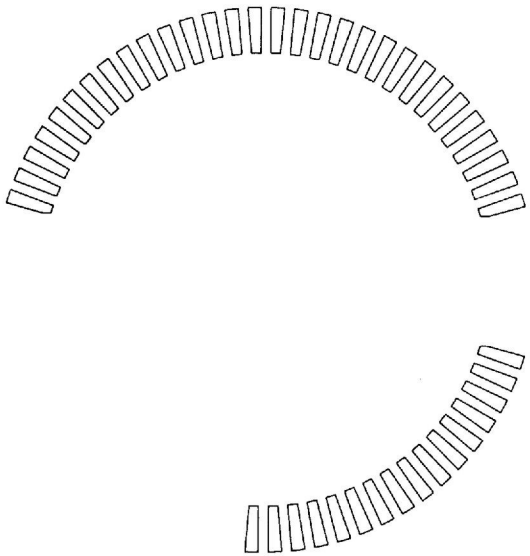
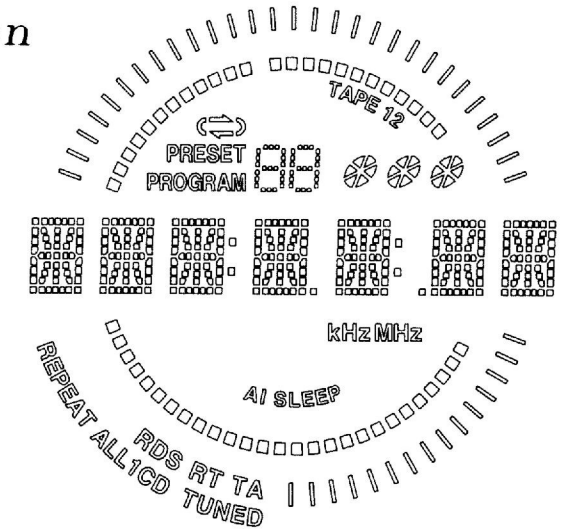
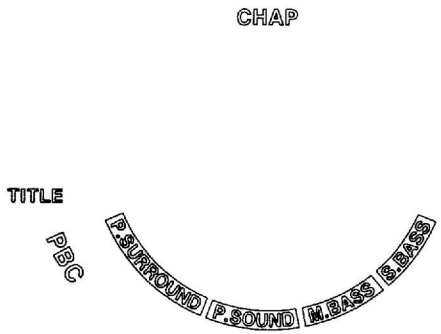
Sky Blue



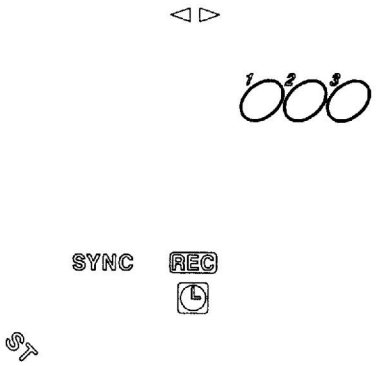
Green



Cd-free Orange



Cd-free Reddish Orange



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GRID ASSIGNMENT (1)

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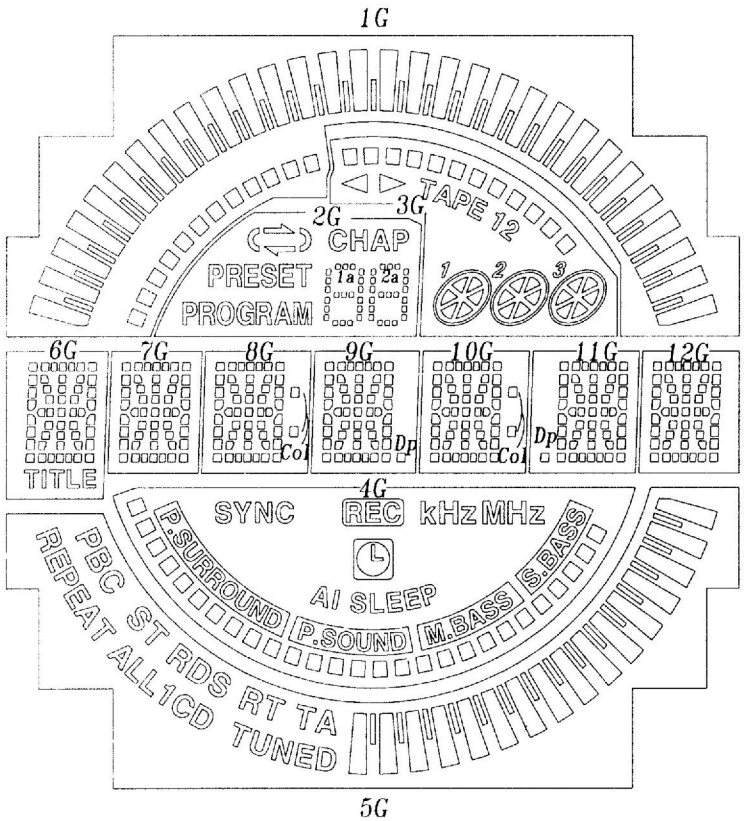
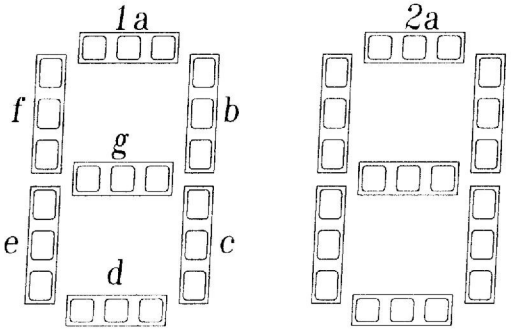
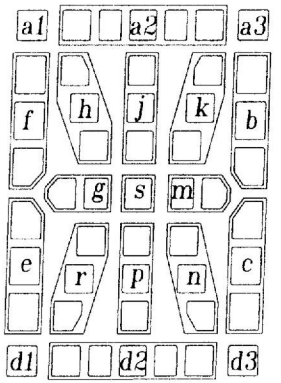
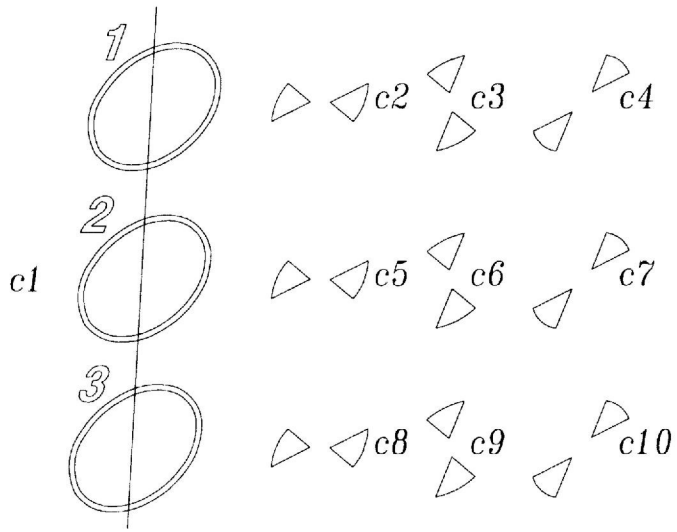




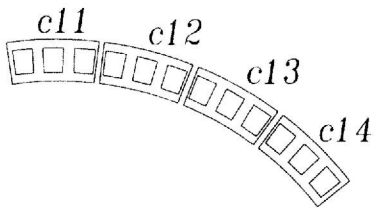
(2G)



(6G-12G)



(3G)



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GRID ASSIGNMENT (1)
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GRID ASSIGNMENT (2)

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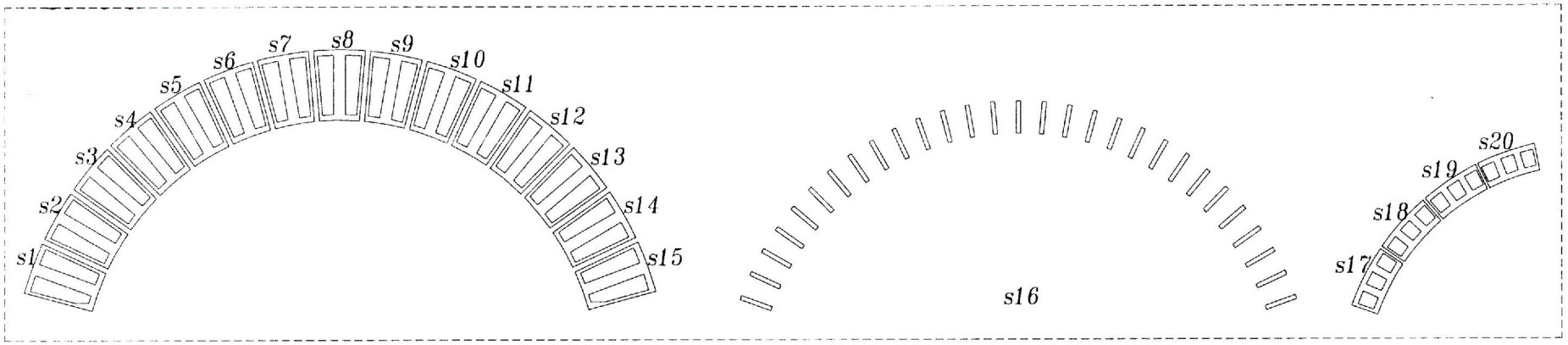
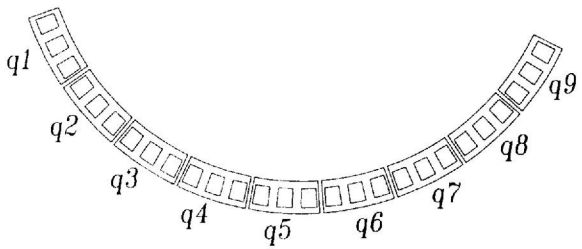
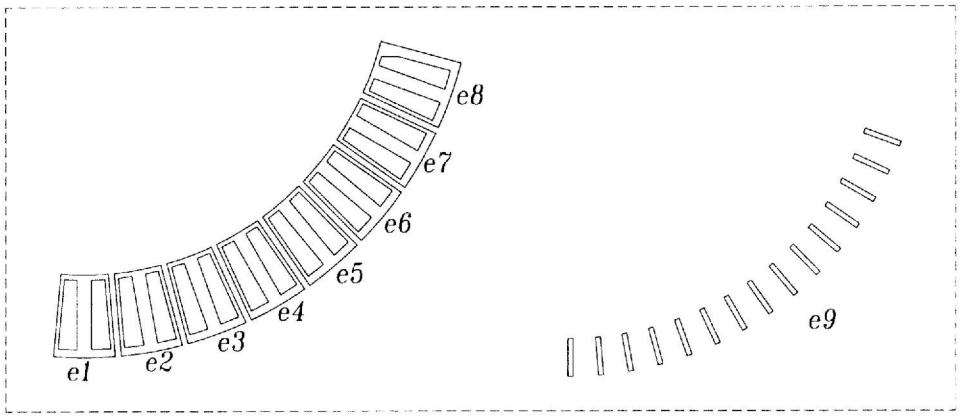


(1G)



(4G)



(5G)

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ANODE CONNECTION

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	1G	2G	3G	4G	5G	6G	7G	8G	9G	10G	11G	12G
P1	s1	1a	c1	q1	e1	a1	a1	a1	a1	a1	a1	a1
P2	s2	1f	c2	q2	e2	a2	a2	a2	a2	a2	a2	a2
P3	s3	1b	c3	q3	e3	a3	a3	a3	a3	a3	a3	a3
P4	s4	1g	c4	q4	e4	f	f	f	f	f	f	f
P5	s5	1e	c5	q5	e5	h	h	h	h	h	h	h
P6	s6	1c	c6	q6	e6	j	j	j	j	j	j	j
P7	s7	1d	c7	q7	e7	k	k	k	k	k	k	k
P8	s8	2a	c8	q8	e8	b	b	b	b	b	b	b
P9	s9	2f	c9	q9	e9	g	g	g	g	g	g	g
P10	s10	2b	c10	SYNC	PBC	s	s	s	s	s	s	s
P11	s11	2g	c11	REC	ST	m	m	m	m	m	m	m
P12	s12	2e	c12	kHz	RDS	e	e	e	e	e	e	e
P13	s13	2c	c13	MHz	RT	r	r	r	r	r	r	r
P14	s14	2d	c14	◷	TA	p	p	p	p	p	p	p
P15	s15	CHAP	◁	AI	REPEAT	n	n	n	n	n	n	n
P16	s16	⇆	▷	SLEEP	ALL	c	c	c	c	c	c	c
P17	s17	☾	TAPE	P.SURROUND	1	d1	d1	d1	d1	d1	d1	d1
P18	s18	☽	1	P.SOUND	CD	d2	d2	d2	d2	d2	d2	d2
P19	s19	PRESET	2	M.BASS	TUNED	d3	d3	d3	d3	d3	d3	d3
P20	s20	PROGRAM		S.BASS		TITLE		Col	Dp	Col	Dp	

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