

**UNE- Armory Building
Portland, Maine
Booster Power Supply Standby Battery Calculations**

BPS10A Strobe Booster Panel BPS #1

	G4HFWF-S7VMC (Wall Mount Speaker/Strobe)				G1F-VM (Strobe Only)		GCHF WF-S7VMC (Ceiling Mount Speaker/Strobe)				Quiescent Current	Alarm Current	Remaining % of Ckt Capacity
	15cd	30cd	75cd	110cd	15cd	75cd	15cd	30cd	75cd	95cd			
	55	78	153	196	59	152	109	151	281	318			
Panel											0.0700	0.2700	
Circuit 1	8	4			1							0.8110	67.56 %
Circuit 2	12	1										0.7380	70.48 %
Circuit 3	8	1			2		2					0.8540	65.84 %
Circuit 4	1			3	1		1	5		1		1.8840	24.64 %
											0.0700	4.5570	
											Total Quiescent	Total Alarm	54.43 %

All currents are expressed as mA.
Max current per ckt = 2.5 Amps. Max current per panel = 10.0 Amps.

Total Quiescent Amp x Time Required (60 Hours) 4.200 AmpHr
 Total Alarm Amp x Time Required (10 Minutes) 0.760 AmpHr
 Total Battery Required 4.960 AmpHr
 Total Battery Required + 20% Battery Supplied **5.951 AmpHr**
7.2 AmpHr

NAC Circuit Voltage Drop/Maximum Length Calculations

Formulas Used:

$$R_t = (D) \times (R_w) / 1000'$$

$$V_d = (R_t) \times (I_t)$$

Substitute for (R_t) and solve for D

$$D = ((4.0) \times (1000)) / ((R_w) \times (I_t))$$

R_t = Total Circuit Resistance
D = Total Circuit Length (Feet)
R_w = Wire Resistance (Ω) per 1000' Pair (Ohms)
V_d = Circuit Voltage Drop (Max allowed is 4.0Vdc)
I_t = Total Circuit Current

Notes:

- 1 BPS Power supply terminal voltage 24Vdc.
- 2 A maximum allowable voltage drop of 4Vdc will provide a minimum of 20 Vdc per circuit.
- 3 Current values listed per device are based on 24Vdc.

STROBE CIRCUIT MAX WIRE LENGTH CALCULATION

	G4HFWF-S7VMC (Wall Mount Speaker/Strobe)				G1F-VM (Strobe Only)		GCHF WF-S7VMC (Ceiling Mount Speaker/Strobe)				Total Circuit Current	Ω per 1000' Pair	
	15cd	30cd	75cd	110cd	15cd	75cd	15cd	30cd	75cd	95cd		12AWG (3.5)	14AWG (5.2)
	55	78	153	196	59	152	109	151	281	318			
Panel											Amp	Max Length (Ft)	Max Length (Ft)
Circuit 1	8	4	0	0	1	0	0	0	0	0	0.8110	1409.19	948.50
Circuit 2	12	1	0	0	0	0	0	0	0	0	0.7380	1548.59	1042.32
Circuit 3	8	1	0	0	2	0	2	0	0	0	0.8540	1338.24	900.74
Circuit 4	1	0	0	3	1	0	1	5	0	1	1.8840	606.61	408.30

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BPS10A Strobe Booster Panel BPS #2

Panel	G4HFWF-S7VMC (Wall Mount Speaker/Strobe)				G1F-VM (Strobe Only)		GCHF WF-S7VMC (Ceiling Mount Speaker/Strobe)				Quiescent Current	Alarm Current	Remaining % of Ckt Capacity
	15cd	30cd	75cd	110cd	15cd	75cd	15cd	30cd	75cd	95cd			
	55	78	153	196	59	152	109	151	281	318			
											0.0700	0.2700	
Circuit 1	1	1		1	5			5				1.3790	44.84 %
Circuit 2	4	2	1		1		1	4				1.3010	47.96 %
Circuit 3				3								0.5880	76.48 %
Circuit 4				3								0.5880	76.48 %
											0.0700	4.1260	58.74 %
											Total Quiescent	Total Alarm	

All currents are expressed as mA.
Max current per ckt = 2.5 Amps. Max current per panel = 10.0 Amps.

Total Quiescent Amp x Time Required (60 Hours) 4.200 AmpHr
 Total Alarm Amp x Time Required (10 Minutes) 0.688 AmpHr
 Total Battery Required 4.888 AmpHr
 Total Battery Required + 20% Battery Supplied **5.865 AmpHr**
7.2 AmpHr

NAC Circuit Voltage Drop/Maximum Length Calculations

Formulas Used:

$$R_t = (D) \times (R_w) / 1000'$$

$$V_d = (R_t) \times (I_t)$$

Substitute for (R_t) and solve for D

$$D = ((4.0) \times (1000)) / ((R_w) \times (I_t))$$

R_t = Total Circuit Resistance
D = Total Circuit Length (Feet)
R_w = Wire Resistance (Ω) per 1000' Pair (Ohms)
V_d = Circuit Voltage Drop (Max allowed is 4.0Vdc)
I_t = Total Circuit Current

Notes:

- 1 BPS Power supply terminal voltage 24Vdc.
- 2 A maximum allowable voltage drop of 4Vdc will provide a minimum of 20 Vdc per circuit.
- 3 Current values listed per device are based on 24Vdc.

STROBE CIRCUIT MAX WIRE LENGTH CALCULATION

Panel	G4HFWF-S7VMC (Wall Mount Speaker/Strobe)				G1F-VM (Strobe Only)		GCHF WF-S7VMC (Ceiling Mount Speaker/Strobe)				Total Circuit Current	Ω per 1000' Pair	
	15cd	30cd	75cd	110cd	15cd	75cd	15cd	30cd	75cd	95cd		12AWG (3.5)	14AWG (5.2)
	55	78	153	196	59	152	109	151	281	318		Max Length (Ft)	Max Length (Ft)
Circuit 1	1	1	0	1	5	0	0	5	0	0	1.3790	828.76	557.82
Circuit 2	4	2	1	0	1	0	1	4	0	0	1.3010	878.45	591.26
Circuit 3	0	0	0	3	0	0	0	0	0	0	0.5880	1943.63	1308.22
Circuit 4	0	0	0	3	0	0	0	0	0	0	0.5880	1943.63	1308.22

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BPS10A Strobe Booster Panel BPS #3

	G4HFWF-S7VMC (Wall Mount Speaker/Strobe)				G1F-VM (Strobe Only)		GCHFWF-S7VMC (Ceiling Mount Speaker/Strobe)				Quiescent Current	Alarm Current	Remaining % of Ckt Capacity
	15cd	30cd	75cd	110cd	15cd	75cd	15cd	30cd	75cd	95cd			
	55	78	153	196	59	152	109	151	281	318			
Panel											0.0700	0.2700	
Circuit 1	1				2		3		5			1.9050	23.80 %
Circuit 2	5								5			1.6800	32.80 %
Circuit 3	2	5	1		6							1.0070	59.72 %
Circuit 4												0.0000	100.00 %
											0.0700	4.8620	
											Total Quiescent	Total Alarm	51.38 %

All currents are expressed as mA.
Max current per ckt = 2.5 Amps. Max current per panel = 10.0 Amps.

Total Quiescent Amp x Time Required (60 Hours) 4.200 AmpHr
Total Alarm Amp x Time Required (10 Minutes) 0.810 AmpHr
Total Battery Required 5.010 AmpHr
Total Battery Required + 20% Battery Supplied **6.012 AmpHr**
7.2 AmpHr

NAC Circuit Voltage Drop/Maximum Length Calculations

Formulas Used:

$$R_t = (D) \times (R_w) / 1000'$$

$$V_d = (R_t) \times (I_t)$$

Substitute for (R_t) and solve for D

$$D = ((4.0) \times (1000)) / ((R_w) \times (I_t))$$

R_t = Total Circuit Resistance
D = Total Circuit Length (Feet)
R_w = Wire Resistance (Ω) per 1000' Pair (Ohms)
V_d = Circuit Voltage Drop (Max allowed is 4.0Vdc)
I_t = Total Circuit Current

Notes:

- 1 BPS Power supply terminal voltage 24Vdc.
- 2 A maximum allowable voltage drop of 4Vdc will provide a minimum of 20 Vdc per circuit.
- 3 Current values listed per device are based on 24Vdc.

STROBE CIRCUIT MAX WIRE LENGTH CALCULATION

	G4HFWF-S7VMC (Wall Mount Speaker/Strobe)				G1F-VM (Strobe Only)		GCHFWF-S7VMC (Ceiling Mount Speaker/Strobe)				Total Circuit Current	Ω per 1000' Pair	
	15cd	30cd	75cd	110cd	15cd	75cd	15cd	30cd	75cd	95cd		12AWG (3.5)	14AWG (5.2)
	55	78	153	196	59	152	109	151	281	318			
Panel											Amp	Max Length (Ft)	Max Length (Ft)
Circuit 1	1	0	0	0	2	0	3	0	5	0	1.9050	599.93	403.80
Circuit 2	5	0	0	0	0	0	0	0	5	0	1.6800	680.27	457.88
Circuit 3	2	5	1	0	6	0	0	0	0	0	1.0070	1134.91	763.88
Circuit 4	0	0	0	0	0	0	0	0	0	0	0.0000	#DIV/0!	#DIV/0!