

830B NETWORK

INSTALLATION AND PRESCRIPTION SETTINGS

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1. GENERAL

1.01 This section gives the installation procedure and prescription settings for the 830B network which is used in either a terminal or intermediate repeater to build out the input impedance of low-capacitance, 19- or 24-gauge cable with H88 loading or of high-capacitance 19-, 22-, or 24-gauge cable with D88 loading to match the image impedance of the E6 repeater gain unit (900 ohms in series with 2.16 μ F). These settings are also found in Section 851-300-101.

1.02 The description of the 830B network is found in Section 332-206-122.

2. INSTALLATION

2.01 The 830B network is mounted in the line side of the E6 repeater chassis and is secured by four screws on the chassis connector block. These screws also make the required electrical connections between the network and the repeater.

3. PRESCRIPTION SETTINGS

3.01 Table A shows the building-out capacitance (BOC) for equivalent end-section length in feet and miles for H88 low-capacitance cable of 19-, and 24-gauge. Table B shows the building-out

resistor (BOR) adjustment versus resistance of endsection for H88 low-capacitance cable of 19-, 22-, and 24-gauge. Tables C and D show the BOC for equivalent endsection length (in feet and miles respectively) for D88 high-capacitance cable of 19-, 22-, and 24-gauge. Table E shows the BOR adjustment versus resistance of endsection for D88 high-capacitance cable of 19-, 22-, and 24-gauge.

3.02 For mixed gauges on loaded 2-wire facilities, the prescription settings are based on the controlling gauge in the adjacent endsection. The prescription settings are determined as follows:

- (1) Determine the length of each segment of continuous gauge. (Start at the network, ignoring all segments of 500 feet or less.)
- (2) The controlling gauge is the gauge of the segment having at least 1 dB attenuation at 1 kHz.
- (3) **GA Screws:** Use the controlling gauge setting determined in (1) and (2). For 26-gauge cable, use 24-gauge settings on the 830A network if no 26-gauge LBO is available.
- (4) **BOC Screws:** Use BOC settings for gauge selected in (3).
- (5) **BOR Screws:** Use BOR settings for gauge selected in (3).

3.03 Where plant records are accurate, prescription settings of the 830B network should provide the required performance. If the plant records are inaccurate, or where there is a complicated mixture of gauges, the network should be touched up as explained in the lineup section.

TABLE A
830B NETWORK
BUILDING-OUT CAPACITOR ADJUSTMENT
VERSUS EQUIVALENT END-SECTION LENGTH FOR
H88 LOW-CAPACITANCE CABLE

EQUIVALENT* END SECTION LENGTH (FEET)	19 GA		24 GA		EQUIVALENT* END SECTION LENGTH (MILES)	19 GA		24 GA	
	BOC (μ F)	SCREWS DOWN	BOC (μ F)	SCREWS DOWN		BOC (μ F)	SCREWS DOWN	BOC (μ F)	SCREWS DOWN
0	.072	ABDEG	.067	ACEG	0.00	.072	ABDEG	.067	ACEG
200	.070	ADEG	.065	ABEG	.05	.069	DEG	.064	BEG
400	.067	ACEG	.063	AEG	.10	.066	CEG	.061	ACDG
600	.065	ABEG	.061	ACDG	.15	.063	AEG	.058	BDG
800	.063	AEG	.059	ABDG	.20	.059	ABDG	.054	ACG
1000	.060	CDG	.057	ADG	.25	.056	DG	.051	BG
1200	.058	BDG	.055	BCG	.30	.053	CG	.048	ABDEF
1400	.056	DG	.053	CG	.35	.050	AG	.045	DEF
1600	.053	CG	.050	AG	.40	.047	BDEF	.042	CEF
1800	.051	BG	.048	ABDEF	.45	.044	BCEF	.039	AEF
2000	.048	ABDEF	.046	ADEF	.50	.040	BEF	.036	CDF
2200	.046	ADEF	.043	ACEF	.55	.037	ACDF	.033	ADF
2400	.044	BCEF	.041	ABEF	.60	.034	BDF	.030	ACF
2600	.041	ABEF	.038	EF	.65	.031	BCF	.027	BF
2800	.039	AEF	.036	CDF	.70	.028	ABF	.024	CDE
3000	.036	CDF	.034	BDF	.75	.025	F	.021	ADE
3200	.034	BDF	.032	DF	.80	.021	ADE	.017	CE
3400	.032	DF	.029	CF	.85	.018	ACE	.014	AE
3600	.029	CF	.026	AF	.90	.015	BE	.011	CD
3800	.027	BF	.023	ABDE	.95	.012	ACD	.008	AD
4000	.024	CDE	.021	ADE	1.00	.009	BD	.005	AC
4200	.022	BDE	.018	ACE					
4400	.020	DE	.016	ABE					
4600	.017	CE	.013	E					
4800	.015	BE	.011	CD					
5000	.012	ACD	.009	BD					
5200	.010	ABD	.006	BC					
5400	.008	AD	.004	C					
5600	.005	AC	.002	B					
5800	.003	AB	.001	A					
6000-up	0.000	—	0.000	—					

Note:

- * The equivalent end-section length is made up of the actual length of outside cable in the end section (including bridged taps) plus a fictitious length that would have the same capacitance as the rest of the wiring to the network (tip cable, cross-connections, office wiring, etc.). For mixed gauges, use the rules given in paragraph 3.02.

TABLE B
830B NETWORK
BUILDING-OUT RESISTOR ADJUSTMENT
VERSUS RESISTANCE OF END SECTION
FOR H88 LOW-CAPACITANCE CABLE

RESISTANCE OF OUTSIDE END SECTION PLUS OFFICE CABLING (OHMS)	BOR (OHMS)	SCREWS DOWN	LBO LOSS (DB)
GA SCREWS SET AT 19 GA			
0-8	56	1, 3 & 1, 3	1.2
9-30	28	1, 2 & 1, 2	1.1
31-97	0	All	1.0
GA SCREWS SET AT 22 GA FOR 24-GA CABLE			
0-21	198	—	1.7
22-49	168	3 & 3	1.6
50-70	140	2 & 2	1.5
71-96	112	2, 3 & 2, 3	1.4
97-112	84	1 & 1	1.3
113-132	56	1, 3 & 1, 3	1.2
133-164	28	1, 2 & 1, 2	1.1
165-up	0	All	1.0

Notes:

1. For mixed gauges, use category for which the GA screw was chosen. See paragraph 3.02.
2. Resistor screws must always be adjusted in pairs, viz. 1 & 1, 2 & 2, 3 & 3, never singly.

TABLE C
830B NETWORK
BUILDING-OUT CAPACITOR ADJUSTMENT
VERSUS EQUIVALENT END-SECTION LENGTH IN FEET
OF D88 HIGH-CAPACITANCE CABLE

EQUIVALENT* END SECTION LENGTH (FEET)	19 GA		22 GA		24 GA	
	BOC (μ F)	SCREWS DOWN	BOC (μ F)	SCREWS DOWN	BOC (μ F)	SCREWS DOWN
0	.073	CDEG	.071	BDEG	.068	BCEG
200	.070	ADEG	.068	BCEG	.066	CEG
400	.067	ACEG	.065	ABEG	.063	AEG
600	.063	AEG	.062	EG	.060	CDG
800	.060	CDG	.059	ABDG	.057	ADG
1000	.057	ADG	.056	DG	.054	ACG
1200	.053	CG	.053	CG	.051	BG
1400	.050	AG	.050	AG	.048	ABDEF
1600	.047	BDEF	.047	BDEF	.045	DEF
1800	.044	BCEF	.043	ACEF	.042	CEF
2000	.041	ABEF	.040	BEF	.039	AEF
2200	.038	EF	.037	ACDF	.036	CDF
2400	.034	BDF	.034	BDF	.033	ADF
2600	.031	BCF	.031	BCF	.030	ACF
2800	.028	ABF	.028	ABF	.027	BF
3000	.025	F	.025	F	.024	CDE
3200	.022	BDE	.022	BDE	.021	ADE
3400	.019	BCE	.019	BCE	.019	BCE
3600	.016	ABE	.016	ABE	.016	ABE
3800	.012	ACD	.013	E	.013	E
4000	.009	BD	.010	ABD	.010	ABD
4200	.006	BC	.007	D	.007	D
4400	.003	AB	.005	AC	.004	C
4600	0.000	—	.002	B	.002	B
4800-up	—	—	0.000	—	0.000	—

* The equivalent end-section length is made up of the actual length of outside cable in the end section (including bridged taps) plus a fictitious length that would have the same capacitance as the rest of the wiring to the network (tip cable, cross-connections, office wiring, etc.) For mixed gauges, use the rules given in paragraph 3.02.

TABLE D
830B NETWORK
BUILDING-OUT CAPACITOR ADJUSTMENT
VERSUS EQUIVALENT END-SECTION LENGTH IN MILES
OF D88 HIGH-CAPACITANCE CABLE

EQUIVA- LENT* END SECTION LENGTH (MILES)	19 GA		22 GA		24 GA	
	BOC (μ F)	SCREWS DOWN	BOC (μ F)	SCREWS DOWN	BOC (μ F)	SCREWS DOWN
0.00	.073	CDEG	.071	BDEG	.068	BCEG
.05	.069	DEG	.067	ACEG	.065	ABEG
.10	.064	BEG	.063	AEG	.061	ACDG
.15	.060	CDG	.059	ABDG	.057	ADG
.20	.056	DG	.055	BCG	.053	CG
.25	.052	ABG	.051	BG	.049	G
.30	.047	BDEF	.047	BDEF	.045	DEF
.35	.043	ACEF	.043	ACEF	.041	ABEF
.40	.039	AEF	.039	AEF	.037	ACDF
.45	.034	BDF	.035	ABDF	.033	ADF
.50	.030	ACF	.031	BCF	.029	CF
.55	.026	AF	.027	BF	.025	F
.60	.022	BDE	.023	ABDE	.021	ADE
.65	.017	CE	.020	DE	.018	ACE
.70	.013	E	.016	ABE	.014	AE
.75	.009	BD	.012	ACD	.010	ABD
.80	.004	C	.008	AD	.006	BC
.85	.000	—	.004	C	.002	B
.90	.000	—	.000	—	.000	—
.95	.000	—	.000	—	.000	—
1.00	0.000	—	0.000	—	0.000	—

* The equivalent end-section length is made up of the actual length of outside cable in the end section (including bridged taps) plus a fictitious length that would have the same capacitance as the rest of the wiring to the network (tip cable, cross-connections, office wiring, etc.) For mixed gauges, use the rules given in paragraph 3.02.

TABLE E
830B NETWORK
BUILDING-OUT RESISTOR ADJUSTMENT
VERSUS RESISTANCE OF END SECTION
FOR D88 HIGH-CAPACITANCE CABLE

RESISTANCE OF OUTSIDE END SECTION PLUS OFFICE CABLING (OHMS)	BOR (OHMS)	SCREWS DOWN	LBO LOSS (DB)
GA SCREWS SET AT 19 GA			
0-up	0	All	1.0
GA SCREWS SET AT 22 GA			
0-16	56	1, 3 & 1, 3	1.2
17-42	28	1, 2 & 1, 2	1.1
43-up	0	All	1.0
GA SCREWS SET AT 22 GA FOR 24-GA CABLE			
0-10	112	2, 3 & 2, 3	1.4
11-39	84	1 & 1	1.3
40-69	56	1, 3 & 1, 3	1.2
70-83	28	1, 2 & 1, 2	1.1
84-up	0	All	1.0

Notes:

1. For mixed gauges, use category for which the GA screw was chosen. See paragraph 3.02.
2. Resistor screws must always be adjusted in pairs, viz. 1 & 1, 2 & 2, 3 & 3, never singly.