

GainMaker Amplifier Accessories

The GainMaker amplifier accessories are plug-in devices common to all GainMaker System Amplifiers and Line Extenders. They are typically field-installed in accordance with system design. The accessories specified in this document are listed below.

Figure 1. GainMaker Amplifier Accessories



**Forward
Equalizers**



**Inverse
Equalizers**



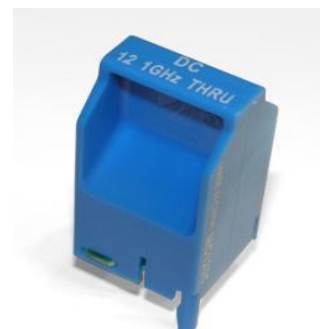
**Pads
(attenuators)**



**Reverse
Equalizers**



**Signal
Directors**



Forward Cable Equalizers

Forward cable equalizers produce a tilted frequency response opposite of that produced by coaxial cable. They are normally used during station balancing to counteract the tilt produced by coaxial cable, in order to achieve the desired output tilt. An equalizer's "dB value" indicates the equivalent length of cable (in dB, at rated high frequency) that the equalizer is designed to offset. The dB value and rated high frequency (750, 870, or 1002 MHz) are printed on the top of each equalizer. The amount of tilt (in dB) that the equalizer produces from low to high frequency is printed on the side of each equalizer.

Table 1. Forward Cable Equalizers - 1002 MHz (blue cover)

EQ Value (dB)	Part Number	Typical Insertion Loss (dB) at Various Frequencies (MHz)								
		52	70	86	550	600	650	750	870	1002
0	4007228	-	-	-	-	-	-	-	-	-
1.5	4007229	2.2	2.2	2.1	1.4	1.4	1.3	1.2	1.1	1.0
3.0	4007230	3.4	3.3	3.2	1.9	1.8	1.7	1.5	1.2	1.0
4.5	4007231	4.6	4.4	4.3	2.3	2.1	2	1.7	1.4	1.0
6.0	4007232	5.8	5.6	5.4	2.7	2.5	2.3	1.9	1.5	1.0
7.5	4007233	7.0	6.7	6.5	3.2	2.9	2.6	2.1	1.6	1.0
9.0	4007234	8.2	7.9	7.7	3.6	3.3	3.0	2.4	1.7	1.0
10.5	4007235	9.4	9.0	8.8	4.0	3.7	3.3	2.6	1.8	1.0
12.0	4007236	10.6	10.2	9.9	4.5	4.0	3.6	2.8	1.9	1.0
13.5	4007237	11.8	11.3	11.0	4.9	4.4	3.9	3.1	2.0	1.0
15.0	4007238	13.0	12.5	12.1	5.3	4.8	4.3	3.3	2.2	1.0
16.5	4007239	14.2	13.6	13.2	5.8	5.2	4.6	3.5	2.3	1.0
18.0	4007240	15.4	14.8	14.3	6.2	5.5	4.9	3.7	2.4	1.0
19.5	4007241	16.6	15.9	15.4	6.6	5.9	5.3	4.0	2.5	1.0
21.0	4007242	17.8	17.1	16.5	7.1	6.3	5.6	4.2	2.6	1.0
22.5	4007243	19.5	18.7	18.1	8.0	7.2	6.4	4.9	3.2	1.5
24.0	4007244	20.7	19.9	19.2	8.4	7.6	6.7	5.2	3.4	1.5
25.5	4007245	21.9	21.0	20.3	8.8	7.9	7.1	5.4	3.5	1.5
27.0	4007246	23.1	22.2	21.5	9.3	8.4	7.4	5.6	3.6	1.5
28.5	4007247	24.3	23.3	22.6	9.7	8.7	7.7	5.8	3.7	1.5
30.0	4007248	25.5	24.5	23.7	10.1	9.1	8.0	6.1	3.8	1.5

Note: Unless otherwise noted, all specifications reflect typical performance and are referenced to 68°F (20°C). Specifications are based upon measurements made in accordance with SCTE/ANSI standards (where applicable), using standard frequency assignments.

Forward Cable Equalizers, continued

Table 2. Forward Cable Equalizers - 870 MHz (yellow cover)

EQ Value (dB)	Part Number	Typical Insertion Loss (dB) at Various Frequencies (MHz)							
		52	70	86	550	600	650	750	870
0	589260	-	-	-	-	-	-	-	-
1.5	589261	2.2	2.1	2.1	1.3	1.3	1.2	1.1	1.0
3.0	589262	3.3	3.2	3.2	1.7	1.6	1.5	1.2	1.0
4.5	589263	4.5	4.4	4.2	2.0	1.9	1.7	1.4	1.0
6.0	589264	5.7	5.5	5.3	2.4	2.1	1.9	1.5	1.0
7.5	589265	6.9	6.6	6.4	2.7	2.4	2.1	1.6	1.0
9.0	589266	8.0	7.7	7.5	3.1	2.7	2.4	1.7	1.0
10.5	589267	9.2	8.8	8.5	3.4	3.0	2.6	1.9	1.0
12.0	589268	10.4	10.0	9.6	3.7	3.3	2.8	2.0	1.0
13.5	589269	11.6	11.1	10.7	4.1	3.6	3.1	2.1	1.0
15.0	589270	12.8	12.2	11.8	4.4	3.9	3.3	2.2	1.0
16.5	589271	13.9	13.3	12.8	4.8	4.1	3.5	2.3	1.0
18.0	589272	15.1	14.4	13.9	5.1	4.4	3.7	2.5	1.0
19.5	589273	16.3	15.5	15.0	5.5	4.7	4.0	2.6	1.0
21.0	589274	17.4	16.7	16.1	5.8	5.0	4.2	2.7	1.0
22.5	589275	18.6	17.8	17.2	6.1	5.3	4.4	2.8	1.0
24.0	589276	19.8	18.9	18.2	6.5	5.6	4.7	2.9	1.0
25.5	589277	21.0	20.0	19.3	6.8	5.8	4.9	3.1	1.0
27.0	589278	22.1	21.1	20.4	7.2	6.1	5.1	3.2	1.0

Table 3. Forward Cable Equalizers - 750 MHz (yellow cover)

EQ Value (dB)	Part Number	Typical Insertion Loss (dB) at Various Frequencies (MHz)						
		52	70	86	550	600	650	750
0	589260	-	-	-	-	-	-	-
1.5	589306	2.1	2.1	2.0	1.2	1.2	1.1	1.0
3.0	589307	3.3	3.2	3.1	1.5	1.4	1.2	1.0
4.5	589308	4.4	4.3	4.2	1.7	1.5	1.4	1.0
6.0	589309	5.6	5.3	5.2	2.0	1.7	1.5	1.0
7.5	589310	6.7	6.4	6.2	2.2	1.9	1.6	1.0
9.0	589311	7.9	7.5	7.2	2.4	2.1	1.7	1.0
10.5	589312	9.0	8.6	8.3	2.7	2.2	1.8	1.0
12.0	589313	10.2	9.7	9.3	2.9	2.4	1.9	1.0
13.5	589314	11.3	10.8	10.3	3.2	2.6	2.1	1.0
15.0	589315	12.4	11.9	11.4	3.4	2.8	2.2	1.0
16.5	589316	13.6	12.9	12.4	3.6	3.0	2.3	1.0
18.0	589317	14.7	14.0	13.5	3.9	3.1	2.4	1.0
19.5	589318	15.9	15.1	14.5	4.1	3.3	2.5	1.0
21.0	589319	17.0	16.2	15.5	4.4	3.5	2.6	1.0
22.5	589320	18.2	17.3	16.6	4.6	3.7	2.8	1.0
24.0	589321	19.3	18.4	17.6	4.9	3.8	2.9	1.0
25.5	589322	20.5	19.4	18.6	5.1	4.0	3.0	1.0
27.0	589323	21.6	20.5	19.7	5.3	4.2	3.1	1.0

Forward Linear Equalizers

Forward linear equalizers produce linear tilt. A linear equalizer should be used in the plug-in input or interstage equalizer location if a node output tilt does not have the desired station output tilt. The EQ value is the amount of tilt from lowest to highest frequency (52 – 1002 MHz).

Table 4. Forward Linear Equalizers – 1002 MHz (blue cover) *(used in Node only)*

EQ Value (dB)	Part Number	Typical Insertion Loss (dB) at Various Frequencies (MHz)								
		52	70	86	550	600	650	750	870	1002
0	4007228	-	-	-	-	-	-	-	-	-
1.5	4008778	2.5	2.5	2.4	1.7	1.6	1.6	1.4	1.2	1.0
3.0	4008779	4.0	3.9	3.9	2.4	2.3	2.1	1.8	1.4	1.0
4.5	4008780	5.5	5.4	5.3	3.1	2.9	2.7	2.2	1.6	1.0
6.0	4008781	7.0	6.9	6.8	3.8	3.5	3.2	2.6	1.8	1.0
7.5	4008782	8.5	8.4	8.2	4.6	4.2	3.8	3.0	2.0	1.0
9.0	4008783	10.0	9.8	9.7	5.3	4.8	4.3	3.4	2.2	1.0
10.5	4008784	11.5	11.3	11.1	6.0	5.4	4.9	3.8	2.4	1.0
12.0	4008785	13.0	12.8	12.6	6.7	6.1	5.4	4.2	2.6	1.0
13.5	4008786	14.5	14.2	14.0	7.4	6.7	6.0	4.6	2.9	1.0
15.0	4008787	16.0	15.7	15.5	8.1	7.3	6.5	5.0	3.1	1.0
16.5	4019258	17.5	17.2	16.9	8.9	8.0	7.1	5.4	3.3	1.0
18.0	4019259	19.5	19.2	18.9	10.1	9.1	8.2	6.3	4.0	1.5
19.5	4019260	21.0	20.6	20.3	10.8	9.7	8.7	6.7	4.2	1.5
21.0	4019261	22.5	22.1	21.8	11.5	10.2	9.2	7.1	4.4	1.5

Inverse Equalizers

Forward inverse equalizers produce cable equivalent tilt. An inverse equalizer is normally used in place of a forward input equalizer during station balancing when an amplifier is short spaced to achieve the desired output tilt. An inverse equalizer's "dB value" indicates the amount of tilt (in dB) that would produce similar tilt (loss differential from low to high frequency). As with other equalizers, the 750, 870, and 1002 MHz inverse equalizer values are printed on the top of each inverse equalizer.

Table 5. Inverse Equalizers - 1002 MHz (blue cover)

EQ Value (dB)	Part Number	Typical Insertion Loss (dB) at Various Frequencies (MHz)								
		52	70	86	550	600	650	750	870	1002
1.6	4007486	1.0	1.1	1.1	1.8	1.9	1.9	2.1	2.2	2.3
3.3	4007487	1.0	1.1	1.2	2.7	2.8	2.9	3.1	3.3	3.6
4.9	4007488	1.0	1.2	1.3	3.5	3.7	3.8	4.2	4.5	4.9
6.5	4007489	1.0	1.2	1.4	4.3	4.6	4.8	5.2	5.7	6.2
8.1	4007490	1.0	1.3	1.5	5.2	5.4	5.7	6.3	6.9	7.5
9.8	4007491	1.0	1.3	1.6	6.0	6.3	6.7	7.3	8.0	8.8
11.4	4007492	1.0	1.4	1.7	6.8	7.2	7.6	8.4	9.2	10.1
13.0	4007493	1.0	1.4	1.8	7.6	8.1	8.6	9.4	10.4	11.4
14.6	4007494	1.0	1.5	1.9	8.5	9.0	9.5	10.5	11.6	12.7
16.2	4007495	1.0	1.5	2.0	9.3	9.9	10.4	11.5	12.7	14.0

Table 6. Inverse Equalizers 750 & 870 MHz (yellow cover)

Inverse EQ Value (dB) 870	Inverse EQ Value (dB) 750	Part Number	Typical Insertion Loss (dB) at Various Frequencies (MHz)							
			52	70	86	550	600	650	750	870
1.5	1.4	589325	1.0	1.1	1.1	1.8	1.9	1.9	2.1	2.2
3.0	2.9	589326	1.0	1.1	1.2	2.7	2.8	2.9	3.1	3.3
4.5	4.2	589327	1.0	1.2	1.3	3.5	3.7	3.8	4.2	4.5
6.0	5.5	589328	1.0	1.2	1.4	4.3	4.6	4.8	5.2	5.7
7.5	6.9	589329	1.0	1.3	1.5	5.2	5.4	5.7	6.3	6.9
9.0	8.4	589330	1.0	1.3	1.6	6.0	6.3	6.7	7.3	8.0
10.5	9.8	589331	1.0	1.4	1.7	6.8	7.2	7.6	8.4	9.2
12.0	11.1	589332	1.0	1.4	1.8	7.6	8.1	8.6	9.4	10.4
13.5	12.6	589333	1.0	1.5	1.9	8.5	9.0	9.5	10.5	11.6
15.0	13.8	589334	1.0	1.5	2.0	9.3	9.9	10.4	11.5	12.7

Reverse Equalizers

Reverse equalizers produce a tilted frequency response opposite of that produced by coaxial cables. They are normally used during station balancing to counteract the tilt produced by coaxial cables, in order to achieve desired tilt. An equalizer's "dB value" indicates the amount of tilt (in dB at rated high frequency) the equalizer is designed to offset. The dB value and rated high frequency (40, 42, 55, or 65 MHz) are printed on the top of each equalizer. The amount of tilt (in dB) that the equalizer produces from low to high frequency is printed on the side of each equalizer.

Table 7. Reverse Equalizers - 42 MHz EQs are used in GainMaker amplifiers with either a 40/52 or 42/54 MHz reverse/forward bandsplit. Both the 42 MHz and the 40 MHz EQ values are printed on the top of each 42 MHz reverse equalizer.

EQ Value (dB) 40 MHz	EQ Value (dB) 42 MHz	Part Number	Typical Insertion Loss (dB)		
			5 MHz	40 MHz	42 MHz
0	0	712719	-	-	-
1	1	589628	1.7	1.0	1.0
2	2	589629	2.3	1.0	1.0
3	3.1	589630	3.0	1.0	0.9
4	4.1	589631	3.6	1.0	0.9
5	5.1	589632	4.3	1.0	0.9
6	6.1	589633	4.9	1.0	0.9
7	7.2	589634	5.6	1.0	0.8
8	8.2	589635	6.2	1.0	0.8
9	9.2	589636	6.9	1.0	0.8
10	10.2	589637	7.5	1.0	0.8
11	11.3	589638	8.2	1.0	0.7
12	12.3	589639	8.9	1.0	0.7

Table 8. Reverse Equalizers - 55 MHz EQs are used in GainMaker amplifiers with a 55/70 MHz reverse/forward bandsplit.

EQ Value (dB)	Part Number	Typical Insertion Loss (dB)	
		5 MHz	55 MHz
0	712719	-	-
1	712679	1.7	1.0
2	712680	2.4	1.0
3	712681	3.1	1.0
4	712682	3.8	1.0
5	712683	4.5	1.0
6	712684	5.2	1.0
7	712685	5.9	1.0
8	712686	6.7	1.0
9	712687	7.4	1.0
10	712688	8.1	1.0
11	712689	8.8	1.0
12	712690	9.5	1.0

Table 9. Reverse Equalizers - 65 MHz EQs are used in GainMaker amplifiers with a 65/86 MHz reverse/forward bandsplit.

EQ Value (dB)	Part Number	Typical Insertion Loss (dB)	
		5 MHz	65 MHz
0	712719	-	-
1	589736	1.7	1.0
2	589737	2.5	1.0
3	589738	3.2	1.0
4	589739	3.9	1.0
5	589740	4.7	1.0
6	589741	5.4	1.0
7	589742	6.1	1.0
8	589743	6.9	1.0
9	589744	7.6	1.0
10	589745	8.3	1.0
11	589746	9.0	1.0
12	589747	9.8	1.0

Table 10. Reverse Equalizers - 85 MHz EQs are used in GainMaker amplifiers with a 85/86 MHz reverse/forward bandsplit.

EQ Value (dB)	Part Number	Typical Insertion Loss (dB)	
		5 MHz	65 MHz
0	712719	-	-
1	4036769	1.8	1.0
2	4036770	2.5	1.0
3	4036771	3.3	1.0
4	4036772	4.1	1.0
5	4036773	4.8	1.0
6	4036774	5.6	1.0
7	4036775	6.4	1.0
8	4036776	7.1	1.0
9	4036777	7.9	1.0
10	4036778	8.7	1.0
11	4036789	9.4	1.0
12	4036780	10.2	1.0

Table 11. Reverse Thermal Equalizers can be used in GainMaker amplifiers with either a 40/52 or 42/54 MHz reverse/forward bandsplit. Reverse thermal equalizers compensate for variations in cable loss due to changes in temperature.

EQ Value (dB)	Inverse EQ Value (dB) 750	Part Number	Typical Insertion Loss (dB)*		
			5 MHz	40 MHz	42 MHz
1	1	748376	2.3	1.8	1.6
2	2	748377	3.0	1.8	1.7
3	3.1	748378	3.9	1.8	1.8
4	4.1	748379	4.6	1.8	1.9
5	5.1	748380	5.2	1.8	1.8
6	6.1	748381	5.8	1.8	1.8
7	7.2	748382	6.5	1.8	1.7
8	8.2	748383	7.2	1.8	1.8

* Reverse Thermal Equalizer specifications reflect typical performance and are referenced to 77° F (25°C).

Signal Directors

Signal directors are used in the High Gain Dual and Low Gain Dual system amplifiers only. One signal director is required per amplifier to route and/or split forward RF signal to the Auxiliary output port(s). The signal director is available in splitter, DC-8, or DC-12 configurations for splitting the Auxiliary path signal to feed both Auxiliary ports, or as a jumper for routing all signals to a selected port.

Table 12. Signal Directors – 1002 MHz (blue cover)

Type	Part Number	Tap/ Thru Leg	Typical Insertion Loss (dB) at Various Frequencies (MHz)								
			52	70	86	550	600	650	750	870	1002
Jumper	4008208	Aux 2	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.3
		Aux 1	0.1	0.1	0.1	0.4	0.4	0.5	0.5	0.6	0.7
2-way splitter	4008364	-	3.4	3.4	3.4	3.8	3.9	3.0	4.0	4.1	4.2
DC-8	4008365	Thru	1.7	1.8	1.8	2.1	2.1	2.1	2.1	2.2	2.3
		Tap	8.3	8.3	8.3	8.2	8.3	8.2	8.1	8.0	8.0
DC-12	4008366	Thru	1.1	1.1	1.1	1.2	1.2	1.3	1.3	1.4	1.5
		Tap	12.4	12.4	12.4	11.8	11.8	11.7	11.7	11.7	11.8

Table 13. Signal Directors – 870 MHz (blue cover)

Type	Part Number	Tap/ Thru Leg	Typical Insertion Loss (dB) at Various Frequencies (MHz)							
			52	70	86	550	600	650	750	870
Jumper	589281	-	0.1	0.1	0.1	0.2	0.2	0.2	0.3	0.3
2-way splitter	589357	-	3.7	3.7	3.7	3.7	3.7	3.7	3.8	4.0
DC-8	589363	Thru	1.7	1.7	1.7	1.8	1.9	1.9	1.9	2.0
		Tap	8.3	8.3	8.3	8.3	8.2	8.2	8.1	8.1
DC-12	589367	Thru	1.0	1.0	1.0	1.2	1.2	1.3	1.4	1.6
		Tap	12.1	12.1	12.1	11.7	11.6	11.6	11.6	11.6

Note: The GainMaker plug-in signal director produces loss in the forward signal path only. The signal director is physically located inboard of the forward/reverse duplex filters in the forward path of the amplifier. Therefore, there are no reverse path losses associated. Auxiliary port reverse input pad values must be selected accordingly during system design when using the splitter, DC-8, or DC-12 signal director in a station.

System Trim

A plug-in system trim may be used to counter the frequency response effects of some passive devices in the coaxial plant. A mid frequency, single dip trim (Model MSD-1NGF) is available for all 870 MHz GainMaker amplifiers. The System Trim part number is 714446.

Table 14. Fuse Kits /Surge Protectors

System Amplifier	Part Number
Slow Blow Fuse Kit, 4 amp (contains 4 fuses)	735628
Slow Blow Fuse Kit, 8 amp (contains 4 fuses)	735630
Slow Blow Fuse Kit, 15 amp (contains 4 fuses)	735632
Crowbar Surge Protector	715973

Line Extender	Part Number
Slow Blow Fuse Kit, 4 amp (contains 2 fuses)	735629
Slow Blow Fuse Kit, 8 amp (contains 2 fuses)	735631
Slow Blow Fuse Kit, 15 amp (contains 2 fuses)	735633
Crowbar Surge Protector	715973

Table 15. Test Point Adapter

Description	Part Number
Long Reach Test Point Adapter	562580

Pads (attenuators)

Plug-in pads produce flat (even) loss across the forward and reverse frequency spectrums. Pads are used during station balancing to adjust signal levels as needed. The (dB) loss produced is equal to the pad value printed on the top of the pad. The pads listed below are rated for operation to 1 GHz. The Pad with “75 Ω ” printed on the top will work as a 75 Ohm terminator.

Table 16. Pads (attenuators)

Pad Value (dB)	Part Number	Pad Value (dB)	Part Number
0	589693	0.5	589694
1	589695	1.5	589696
2	589697	2.5	589698
3	589699	3.5	589700
4	589701	4.5	589702
5	589703	5.5	589704
6	589705	6.5	589706
7	589707	7.5	589708
8	589709	8.5	589710
9	589711	9.5	589712
10	589713	10.5	589714
11	589715	11.5	589716
12	589717	12.5	589718
13	589719	13.5	589720
14	589721	14.5	589722
15	589723	15.5	589724
16	589725	16.5	589726
17	589727	17.5	589728
18	589729	18.5	589730
19	589731	19.5	589732
20	589733	20.5	589734
		75 ohm terminator	589735



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