Flex Max901e 1 GHz Trunk Amplifiers Technical Specification

Flex Max901e Trunk, 1002 MHz, 42/54 Split, 33 dB Spaced, Different Tilt Trunk and Bridger

Characteristic	FORWARD		RETURN
	Trunk	2 O/P Bridger	Trunk & 2 O/P Bridger
General			
Passband, MHz	54–1002		5–42
Housing, MHz	1002		—
AC Current Passing, A			
Ports 1, 3, 4, 6	15		15
Ports 2, 5 (“H” and “P” options)	13		13
Typical Operating Conditions			
Operational Gain, dB[1, 2]	33	43	18
Channels, Number of NTSC[3]	79	79	6
Operating Levels (recommended)			
Frequency, MHz	1002/870/750/550/54		42/5
Input, dBmV, min.[4]	9.0/8.4/8.4/7.6/9.2		17/17
Output, dBmV[5, 6]	42/40.5/39.5/37/32	52/49.5/47.5/44/35	35/35
Performance Specifications @ Recommended Levels (Temperature Range: –40 to 60°C)			
Carrier-to-Interference Ratio, dB[7]			
Composite Triple Beat	84	75	80
Cross Modulation (per NCTA std.)[8]	76	67	74
Composite 2IM	79	73	82
Composite Intermodulation Noise CIN[9]	80	66	—
Composite Intermodulation Noise CIN[10]	86	72	—
Noise, 4 MHz, 75 Ohms[2]	59/59.4/59.4/57.6/57.2		62
Noise Figure, dB (without EQ)[11]	8/7/7/8/10		14
Full Gain, dB (without EQ and ALC)	38	48	19
Factory Alignment (with ALC Reserve, without EQ)			
Cable Loss, dB @ 1002 MHz	13	13	—
Linear Equalization[12]	—	8	—

Technical Specifications

Flex Max901e Trunk, 1002 MHz, 42/54 Split, 33 dB Spaced, Different Tilt Trunk and Bridger

Characteristic	FORWARD		RETURN	
	Trunk	2 O/P Bridger	Trunk & 2 O/P Bridger	
Flat Loss, dB[13]	21	31	19	
Gain Slope, dB, typical[14]	–0.4 to 0.4	0.0 to 1.25	—	
Flatness (@ Gain Slope), ±dB [15, 16]	0.75 P-V	1.5 P-V	0.5	
Return Loss, dB min., All Entry Ports	16	16	16	
Testpoint Accuracy[17]				
–20 or –25 dB Forward Input TP, dB	±1.0		—	
–20 or –25 dB Fwd Output TP, dB (MHz)	±0.5 (54 to 550), ±1.0 (551 to 1002)		—	
–20 or –25 dB Return In and Out TP, dB	—		±0.5	
Powering Requirements, Max./Typ.[18]			**With Active Return**	
AC Voltage, 60 Hz			@ 90 V	@ 60 V
AC Power, Watts			53.5/49	53/48
AC Current, mA			735/700	970/880
DC Current, mA @ 24 V ± 0.5 V			1955/1775	
Level Control				
Range, dB @ 1002 MHz	+4/–5 dB		—	
Accuracy (–40 to 60°C)	±0.5 dB		—	
Pilot Level Range[19] (from nominal)	+5/–3 dB		—	
Pilot Frequency Band[20] (recommended)	499.25 MHz (Single Channel)		—	
Gain Control				
Plug-in PAD[21]	NPB–XXX		NPB–XXX	
Equalization to Compensate for Cable Loss				
Plug-in Equalizers for Additional Equalization	SEQ–1G–XX		MEQ–42–XX	
Chrominance/Luminance Delay, Max.				
Channel 2, ns/3.58 MHz	33		—	
Channel 3, ns/3.58 MHz	14		—	
Channel 4, ns/3.58 MHz	7		—	
Channel 5, ns/3.58 MHz	3.6		—	
Return Group Delay, Max.				
5.5–7 MHz, ns	—		52	
10–11.5 MHz, ns	—		6	
35–36.5 MHz, ns	—		10	
38.5–40 MHz, ns	—		19	
Hum Modulation (Time Domain @ 15 A)				
5–10 MHz, –dBc	—		55	
11–750 MHZ, –dBc	60		60	
751–1002 MHz, –dBc	55		—	

Specification Document Number 1502212 Rev D

1. Spacing at highest frequency with SEQ–1G–XX installed. Return spacing includes losses due to housing, diplex filters, and MEQ–42–X.
2. The specifications are based on the amplifier configured (with two SPB–0) as a 2–output bridger with distribution outputs on Ports 3 and 6. When using distribution plug-ins SS–1000–2, SDC–1000–8, or SDC–1000–12, levels should be derated accordingly based on the accessory specifications.
3. NTSC video channels occupying the appropriate frequency spectrum per specified number of channels.

4. Recommended minimum forward input levels at 1002 MHz including loss due to equalizer.
5. Recommended maximum return output level at 42 MHz including loss due to equalizer.
6. Bridger output: At specified operational tilt, the maximum output level for 870 MHz or 1002 GHz loading is 56.5 dBmV @ HF.
7. Distortion performance is derated accordingly to take into account the influence of the digitally compressed channels operating at levels 6 dB below equivalent video channels.
8. Cross modulation specification number indicates typical cascade performance.
9. Systems operating with digitally compressed channels or equivalent broadband noise from 550 to 1002 MHz at levels 6 dB below equivalent video channels will experience a composite distortion (CIN) appearing as noise in the 54 to 550 frequency spectrum.
10. Systems operating with digitally compressed channels or equivalent broadband noise from 550 to 870 MHz at levels 6 dB below equivalent video channels will experience a composite distortion (CIN) appearing as noise in the 54 to 550 MHz frequency spectrum.
11. The Noise Figure and C/N specifications are typical within specified passband.
12. Difference in linear loss between 54 MHz and 1002 MHz.
13. Total flat loss at 1002 MHz which includes insertion loss of linear EQ.
14. 'Typical' for the forward bridger ports is measured without reference to the trunk port (i.e. from input port to bridger port). Forward trunk port 'worst case' slope is –0.5 to 1.0 dB. Forward bridger port 'worst case' slope is –1.0 to 1.0 dB as referenced to trunk port. Return trunk port 'worst case' slope is –0.5 to 0.5 dB. Return bridger port 'worst case' slope is –1.0 to 1.0 dB as referenced to the trunk port.
15. The forward bridger port 'worst case' flatness is ±1.0 dB as referenced to the trunk port. The 'worst case' trunk port flatness is ±0.75 dB. All measurements are with an NPB-000 installed in the Bridger EQ/PAD location.
16. The return bridger port 'worst case' flatness is ±0.5 dB as referenced to the trunk port. The 'worst case' trunk port flatness is ±0.5 dB.
17. All testpoints are directional and referenced to their associated RF port. For "H" output option, all forward and return testpoints are internal and only accessible with the housing lid open. For "P" output option, all forward testpoints are external and all return testpoints are internal.
18. Power requirements indicated are with the HEPS790–2.3 power supply 122027–05. See 333995–17 for additional information. For 60VAC Powering: AC Power consumption in Watts divided by a factor of 43 = Amps required. For 90VAC Powering: For ≤ 67VAC, 1.03 x (AC Power consumption in watts divided by voltage) = Amps required. For 67 - 90VAC, AC Power consumption in watts divided by 65 = Amps required.
19. ALC pilot level range is based on a nominal pilot level of 37 dBmV for pilot frequencies ≤ 499.25 MHz or 32 dBmV for pilot frequencies > 499.25 MHz. ARRIS recommends that if the pilot level, from a design standpoint, is more than +2/-1 dBmV from nominal, the ALC PAD should be changed to optimize the ALC pilot level range. This should alleviate any possible ALC setup and/or operation issues due to typical system level variations caused by system components flatness characteristics. See the equipment manual (P/N 1502154) for correct selection of ALC PAD value to ensure proper ALC setup and operation.
20. For ALC pilot frequencies of ≤ 499.25 MHz, the ALC pilot filter is a single channel device. This means that the adjacent channels will have no affect on the RF power level that the RF detector is measuring. For ALC pilot frequencies > 499.25 MHz, the ALC pilot filter is not a single channel device. This means that the adjacent QAM channels will have an affect on the RF power level that the RF detector is measuring. ARRIS recommends that the adjacent QAM channels be present on the system before the ALC system of the amplifier station is balanced. This will avoid station re-balance in the future when those QAM channels would be added to the system.
21. ARRIS accessories should be used for guaranteed performance; using third party accessories may result in degraded and/or intermittent performance.

Flex Max901e Trunk, 1002 MHz, 42/54 Split, 32 dB Spaced, Same Tilt Trunk and Bridger

Characteristic	FORWARD		RETURN
	Trunk	2 O/P Bridger	Trunk & 2 O/P Bridger
General			
Passband, MHz		54–1002	5–42
Housing, MHz		1002	—
AC Current Passing, A			
Ports 1, 3, 4, 6		15	15
Ports 2, 5 ("H" and "P" options)		13	13
Typical Operating Conditions			
Operational Gain at 1002/870 MHz, dB[1, 2]	32/30	41/39	18
Channels, Number of NTSC[3]	79	79	6

Flex Max901e Trunk, 1002 MHz, 42/54 Split, 32 dB Spaced, Same Tilt Trunk and Bridger (cont'd)

Characteristic	FORWARD		RETURN	
	Trunk	2 O/P Bridger	Trunk & 2 O/P Bridger	
Operating Levels (recommended)				
Frequency, MHz	1002/870/750/550/54		42/5	
Input, dBmV, min.[4]	11/10.5/10.0/9.4/11.4		17/17	
Output, dBmV[5, 6, 7]	43/40.5/38.5/35/26	52/49.5/47.5/44/35	35/35	
Performance Specifications @ Recommended Levels (Temperature Range: –40 to 60°C)				
Carrier-to-Interference Ratio, dB[8]				
Composite Triple Beat	84	75	80	
Cross Modulation (per NCTA std.)[9]	76	67	74	
Composite 2IM	79	73	82	
Composite Intermodulation Noise CIN[10]	80	66	—	
Composite Intermodulation Noise CIN[11]	86	72	—	
Noise, 4 MHz, 75 Ohms[2]	62/61.5/61/59.4/59.4		62	
Noise Figure, dB (without EQ)[12]	8/7/7/8/10		14	
Full Gain, dB (without EQ and ALC)	37	46	19	
Factory Alignment (with ALC Reserve, without EQ)				
Cable Loss, dB @ 1002 MHz[13]	22	22	—	
Flat Loss, dB	11	20	19	
Gain Slope, dB	–0.5 to 1.0	–1.0 to 1.0	—	
Flatness (@ Gain Slope), ±dB[14, 15]	0.75 P-V	1.0 P-V	0.5	
Return Loss, dB min., All Entry Ports	16	16	16	
Testpoint Accuracy[16]				
–20 or –25 dB Forward Input TP, dB	±1.0		—	
–20 or –25 dB Forward Output TP, dB	±0.5 (54 to 550), ±1.0 (551 to 1002)		—	
–20 or –25 dB Return In & Out TP, dB	—		±0.5	
Powering Requirements, Max./Typ.[17]			**With Active Return**	
AC Voltage, 60 Hz			@ 90 V	@ 60 V
AC Power, Watts			53.5/49	53/48
AC Current, mA			735/700	970/880
DC Current, mA @ 24 V ± 0.5 V			1955/1775	1955/1775
Level Control				
Range, dB @ 1002 MHz	+4/–5 dB		—	
Accuracy (–40 to 60°C)	±0.5 dB		—	
Output Level Range[18] (from nominal)	+5/–3 dB		—	
Pilot Frequency Band[19] (recommended)	499.25 MHz (Single Channel)		—	
Gain Control				
Plug-in PAD[20]	NPB–XXX		NPB–XXX	
Equalization to Compensate for Cable Loss				
Plug-in Equalizers for Additional Equalization	SEQ-750-XX SEQ–870–XX SEQ-1G-XX		MEQ–42–XX	
Chrominance/Luminance Delay, Max.				
Channel 2, ns/3.58 MHz	33		—	
Channel 3, ns/3.58 MHz	14		—	

Flex Max901e Trunk, 1002 MHz, 42/54 Split, 32 dB Spaced, Same Tilt Trunk and Bridger (cont'd)

Characteristic	FORWARD		RETURN
	Trunk	2 O/P Bridger	Trunk & 2 O/P Bridger
Channel 4, ns/3.58 MHz		7	—
Channel 5, ns/3.58 MHz		3.6	—
Return Group Delay, Max.			
5.5–7 MHz, ns		—	52
10–11.5 MHz, ns		—	6
35–36.5 MHz, ns		—	10
38.5–40 MHz, ns		—	19
Hum Modulation (Time Domain @ 15 A)			
5–10 MHz, –dBc		—	55
11–750 MHZ, –dBc		60	60
751–1002 MHz, –dBc		55	—

Specification Document Number 1502211 Rev D

1. Spacing at highest frequency with Forward EQ installed. Return spacing includes losses due to housing, diplex filters, and MEQ–42–X.
2. The specifications are based on the amplifier configured (with two SPB–0) as a 2–output bridger with distribution outputs on Ports 3 and 6. When using distribution plug-ins SS–1000–2, SDC–1000–8 or SDC–1000–12, levels should be derated accordingly based on the accessory specifications.
3. NTSC video channels occupying the appropriate frequency spectrum per specified number of channels.
4. Recommended minimum forward input levels at 1002 MHz including loss due to equalizer.
5. Recommended maximum return output level at 42 MHz including loss due to equalizer.
6. Forward trunk output levels achieved by installing an NPB-000 into the interstage PAD location and a GEQC-1 GHz-090 in the O/P EQ location. Forward bridger output levels are achieved by installing an NPB-020 in the bridger EQ/PAD location.
7. Bridger output: At specified operational tilt the maximum output level for 870 or 1002 MHz loading is 56.5 dBmV HF.
8. Distortion performance is derated accordingly to take into account the influence of the digitally compressed channels operating at levels 6 dB below equivalent video channels.
9. Cross modulation specification number indicates typical cascade performance.
10. Systems operating with digitally compressed channels or equivalent broadband noise from 550 to 1002 MHz at levels 6 dB below equivalent video channels will experience a composite distortion (CIN) appearing in the 54 to 550 frequency spectrum.
11. Systems operating with digitally compressed channels or equivalent broadband noise from 550 to 870 MHz at levels 6 dB below equivalent video channels will experience a composite distortion (CIN) appearing in the 54 to 550 frequency spectrum.
12. The Noise Figure and C/N specifications are typical within specified passband.
13. The cable loss includes both the factory alignment cable loss of 13 dB at 1002 MHz and the cable equivalent loss of the GEQC-1 GHz-090 (9 dB) for a total of 22 dB.
14. The forward bridger port gain and flatness is 9 ±1.0 dB as referenced to the trunk port.
15. The return bridger port gain and flatness is 0 ±0.5 dB as referenced to the trunk port.
16. All testpoints are directional and referenced to their associated RF port. For "H" output option, all forward and return testpoints are internal and only accessible with the housing lid open. For "P" output option, all forward testpoints are external and all return testpoints are internal.
17. Power requirements indicated are with the HEPS790–2.3 power supply 122027–05. See 333995–17 for additional information. For 60VAC Powering: AC Power consumption in Watts divided by a factor of
    43 = Amps required. For 90VAC Powering: For ≤ 67VAC, 1.03 x (AC Power consumption in watts divided by voltage) = Amps required. For 67 - 90VAC, AC Power consumption in watts divided by 65 = Amps required.
18. ALC pilot level range is based on a nominal pilot level of 34 dBmV for pilot frequencies ≤ 499.25 MHz or 31 dBmV for pilot frequencies > 499.25 MHz. ARRIS recommends that if the pilot level, from a design standpoint, is more than +2/-1 dBmV from nominal, the ALC PAD should be changed to optimize the ALC pilot level range. This should alleviate any possible ALC setup and/or operation issues due to typical system level variations caused by system components flatness characteristics. See the equipment manual (P/N 1502154) for correct selection of ALC PAD value to insure proper ALC setup and operation.
19. For ALC pilot frequencies of ≤ 499.25 MHz, the ALC pilot filter is a single channel device. This means that the adjacent channels will have no affect on the RF power level that the RF detector is measuring. For ALC pilot frequencies > 499.25 MHz, the ALC pilot filter is not a single channel device. This means that the adjacent QAM channels will have an affect on the RF power level that the RF detector is measuring. ARRIS recommends that the adjacent QAM channels be present on the system before the ALC system of the amplifier station is balanced. This will avoid station re-balance in the future when those QAM channels would be added to the system.

20. ARRIS accessories should be used for guaranteed performance; using third party accessories may result in degraded and/or intermittent performance.

Flex Max901e Trunk, 1002 MHz, 55/70 Split, 33 dB Spaced, Different Tilt Trunk and Bridger

Characteristic	FORWARD		RETURN
	Trunk	2 O/P Bridger	Trunk & 2 O/P Bridger
General			
Passband, MHz	70–1002		5–55
Housing, MHz	1002		—
AC Current Passing, A			
Ports 1, 3, 4, 6	15		15
Ports 2, 5 ("H" and "P" options)	13		13
Typical Operating Conditions			
Operational Gain, dB[1, 2]	33	43	18
Channels, Number of NTSC[3]	76	76	6
Operating Levels (recommended)			
Frequency, MHz	1002/870/750/550/70		55/5
Input, dBmV, min.[4]	9/8.4/8.4/7.6/9		17/17
Output, dBmV[5, 6]	42/41/39.5/37.5/33	52/49.5/47.5/44/35.5	35/35
Performance Specifications @ Recommended Levels (Temperature Range: –40 to 60°C)			
Carrier-to-Interference Ratio, dB[7]			
Composite Triple Beat	84	75	80
Cross Modulation (per NCTA std.)[8]	76	67	74
Composite 2IM	79	73	82
Composite Intermodulation Noise CIN[9]	80	66	—
Composite Intermodulation Noise CIN[10]	86	72	—
Noise, 4 MHz, 75 Ohms[2]	59/59.4/59.4/57.6/57		62
Noise Figure, dB (without EQ)[11]	8/7/7/8/10		14
Full Gain, dB (without EQ and ALC)	38	48	19
Factory Alignment (with ALC Reserve, without EQ)			
Cable Loss, dB @ 1002 MHz	13	13	—
Linear Equalization[12]	—	7.1	—
Flat Loss, dB[13]	21	31	19
Gain Slope, dB, typical[14, 15]	–0.4 to 0.4	0 to 1.25	—
Flatness (@ Gain Slope), dB, typ.[14,16, 17]	0.75 P-V	1.5 P-V	0.5
Return Loss, dB min., All Entry Ports	16	16	16
Testpoint Accuracy[18]			
–20 or –25 dB Forward Input TP, dB	±1.0		—
–20 or –25 dB Forward Output TP, dB	±0.5 (70 to 550), ±1.0 (551 to 1002)		—
–20 or –25 dB Return In and Out TP, dB	—		±0.5

Powering Requirements, Max./Typ.[19]	**With Active Return**	
AC Voltage, 60 Hz	@ 90 V	@ 60 V
AC Power, Watts	53.5/49	53/48
AC Current, mA	735/700	970/880
DC Current, mA @ 24 V ± 0.5 V	1955/1775	

Flex Max901e Trunk, 1002 MHz, 55/70 Split, 33 dB Spaced, Different Tilt Trunk and Bridger

Characteristic	FORWARD		RETURN
	Trunk	2 O/P Bridger	Trunk & 2 O/P Bridger
Level Control			
Range, dB @ 1002 MHz		+4/–5 dB	—
Accuracy (–40 to 60°C)		±0.5 dB	—
Output Level Range[20] (from nominal)		+5/–3 dB	—
Pilot Frequency Band[21] (recommended)		499.25 MHz (Single Channel)	—
Gain Control			
Plug-in PAD[22]		NPB–XXX	NPB–XXX
Equalization to Compensate for Cable Loss			
Plug-in Equalizers for Additional Equalization		SEQ–1G–XX	MEQ–55–XX
Chrominance/Luminance Delay, Max.			
Channel 5, ns/3.58 MHz		14	—
Channel 6, ns/3.58 MHz		9	—
Return Group Delay, Max.			
5.5–7 MHz, ns		—	52
10–11.5 MHz, ns		—	7
52–53.5 MHz, ns		—	21
53.5–55 MHz, ns		—	36
70–71.5 MHz, ns		21	—
71.5–73 MHz, ns		15	—
Hum Modulation (Time Domain @ 15 A)			
5–10 MHz, –dBc		—	55
11–750 MHZ, –dBc		60	60
751–1002 MHz, –dBc		55	—

Specification Document Number 1502466 Rev C

1. Spacing at highest frequency with SEQ–1G–XX installed. Return spacing includes losses due to housing, diplex filters, and MEQ–55–X.
2. The specifications are based on the amplifier configured (with two SPB–0) as a 2–output bridger with distribution outputs on Ports 3 and 6. When using distribution plug-ins SS–1000–2, SDC–1000–8 or SDC–1000–12, levels should be derated accordingly based on the accessory specifications.
3. NTSC video channels occupying the appropriate frequency spectrum per specified number of channels.
4. Recommended minimum forward input levels at 1002 MHz including loss due to equalizer.
5. Recommended maximum return output level at 55 MHz including loss due to equalizer.
6. Bridger output: At specified operational tilt the maximum output level for 870 MHz or 1002 GHz loading is 56.5 dBmV @ HF.
7. Distortion performance is derated accordingly to take into account the influence of the digitally compressed channels operating at levels 6 dB below equivalent video channels.
8. Cross modulation specification number indicates typical cascade performance.
9. Systems operating with digitally compressed channels or equivalent broadband noise from 550 to 1002 MHz at levels 6 dB below equivalent video channels will experience a composite distortion (CIN) appearing in the 70 to 550 frequency spectrum.
10. Systems operating with digitally compressed channels or equivalent broadband noise from 550 to 870 MHz at levels 6 dB below equivalent video channels will experience a composite distortion (CIN) appearing as noise in the 70 to 550 MHz frequency spectrum.
11. The Noise Figure and C/N specifications are typical within specified passband.
12. Difference in linear loss between 70 MHz and 1002 MHz.
13. Total flat loss at 1002 MHz which includes insertion loss of linear EQ.
14. 'Typical for the forward bridger ports is measured without reference to the trunk port (i.e. from input port to bridger port).
15. Forward trunk port 'worst case' slope is –0.5 to 1.0 dB. Forward bridger port 'worst case' slope is –1.0 to 1.0 dB as referenced to trunk port. Return trunk port 'worst case' slope is –0.5 to 0.5 dB. Return bridger port 'worst case' slope is –1.0 to 1.0 dB as referenced to trunk port.
16. The forward bridger port gain and flatness is 11 ±1.0 dB as referenced to the trunk port with an NPB-000 installed in the Bridger EQ/PAD location.

17. The return bridger port gain and flatness is 0 ±0.5 dB as referenced to the trunk port.
18. All testpoints are directional and referenced to their associated RF port. For "H" output option, all forward and return testpoints are internal and only accessible with the housing lid open. For "P" output option, all forward testpoints are external and all return testpoints are internal.
19. Power requirements indicated are with the HEPS790–2.3 power supply 122027–05. See 333995–17 for additional information. For 60VAC Powering: AC Power consumption in Watts divided by a factor of 43 = Amps required. For 90VAC Powering: For ≤ 67VAC, 1.03 x (AC Power consumption in watts divided by voltage) = Amps required. For 67 - 90VAC, AC Power consumption in watts divided by 65 = Amps required.
20. ALC pilot level range is based on a nominal pilot level of 37 dBmV for pilot frequencies ≤ 499.25 MHz or 32 dBmV for pilot frequencies > 499.25 MHz. ARRIS recommends that if the pilot level, from a design standpoint, is more than +2/-1 dBmV from nominal, the ALC PAD should be changed to optimize the ALC pilot level range. This should alleviate any possible ALC setup and/or operation issues due to typical system level variations caused by system components flatness characteristics. See the equipment manual (P/N 1502154) for correct selection of ALC PAD value to insure proper ALC setup and operation.
21. For ALC pilot frequencies of ≤ 499.25 MHz, the ALC pilot filter is a single channel device. This means that the adjacent channels will have no affect on the RF power level that the RF detector is measuring. For ALC pilot frequencies > 499.25 MHz, the ALC pilot filter is not a single channel device. This means that the adjacent QAM channels will have an affect on the RF power level that the RF detector is measuring. ARRIS recommends that the adjacent QAM channels be present on the system before the ALC system of the amplifier station is balanced. This will avoid station re-balance in the future when those QAM channels would be added to the system.
22. ARRIS accessories should be used for guaranteed performance; using third party accessories may result in degraded and/or intermittent performance.

Flex Max901e Trunk, 1002 MHz, 55/70 Split, 32 dB Spaced, Same Tilt Trunk and Bridger

	FORWARD		RETURN
	Trunk	**2 O/P Bridger**	**Trunk & 2 O/P Bridger**
General			
Passband, MHz	70–1002		5–55
Housing, MHz	1002		—
AC Current Passing, A			
Ports 1, 3, 4, 6	15		15
Ports 2, 5 ("H" and "P" options)	13		13
Typical Operating Conditions			
Operational Gain at 1002/870 MHz, dB[1,2]	32/30	41/39	18
Channels, Number of NTSC[3]	76	76	6
Operating Levels (recommended)			
Frequency, MHz	1002/870/750/550/70		55/5
Input, dBmV, min.[4]	11/10.5/10/9.4/11.5		17/17
Output, dBmV[5, 6, 7]	43/40.5/38.5/35/26.5	52/49.5/47.5/44/35.5	35/35
Performance Specifications @ Recommended Levels (Temperature Range: –40 to 60°C)			
Carrier-to-Interference Ratio, dB[8]			
Composite Triple Beat	84	75	80
Cross Modulation (per NCTA std.)[9]	76	67	74
Composite 2IM	79	73	82
Composite Intermodulation Noise CIN[10]	80	66	
Composite Intermodulation Noise CIN[11]	86	72	—
Noise, 4 MHz, 75 Ohms[2]	62/61.5/61/59.4/59.5		62
Noise Figure, dB (without EQ)[12]	8/7/7/8/10		14
Full Gain, dB (without EQ and ALC)	37	46	19
Factory Alignment (with ALC Reserve, without EQ)			

Flex Max901e Trunk, 1002 MHz, 55/70 Split, 32 dB Spaced, Same Tilt Trunk and Bridger (cont'd)

	FORWARD		RETURN	
	Trunk	2 O/P Bridger	Trunk & 2 O/P Bridger	
Cable Loss, dB @ 1002 MHz[13]	22	22	—	
Flat Loss, dB	11	20	19	
Gain Slope, dB	–0.5 to 1.0	–1.0 to 1.0	—	
Flatness (@ Gain Slope), ±dB[14,15]	0.75 P-V	1.0 P-V	0.5	
Return Loss, dB min., All Entry Ports	16	16	16	
Testpoint Accuracy[16]				
–20 or –25 dB Forward Input TP, dB	±1.0		—	
–20 or –25 dB Forward Output TP, dB	±0.5 (70 to 550), ±1.0 (551 to 1002)		—	
–20 or –25 dB Return In and Out TP, dB	—		±0.5	
Powering Requirements, Max./Typ.[17]			**With Active Return**	
AC Voltage, 60 Hz			@ 90 V	@ 60 V
AC Power, Watts			53.5/49	53/48
AC Current, mA			735/700	970/880
DC Current, mA @ 24 V ± 0.5 V			1955/1775	
Level Control				
Range, dB @ 1002 MHz	+4/–5 dB		—	
Accuracy (–40 to 60° C)	±0.5 dB		—	
Output Level Range[18] (from nominal)	+5/–3 dB		—	
Pilot Frequency Band[19] (recommended)	499.25 MHz (Single Channel)		—	
Gain Control				
Plug-in PAD[20]	NPB–XXX		NPB–XXX	
Equalization to Compensate for Cable Loss				
Plug-in Equalizers for Additional Equalization	SEQ-750-XX SEQ–870–XX SEQ-1G-XX		MEQ–55–XX	
Chrominance/Luminance Delay, Max.				
Channel 5, ns/3.58 MHz	14		—	
Channel 6, ns/3.58 MHz	9		—	
Return Group Delay, Max.				
5.5–7 MHz, ns	—		52	
10–11.5 MHz, ns	—		7	
52–53.5 MHz, ns	—		21	
53.5–55 MHz, ns	—		36	
70–71.5 MHz, ns	21		—	
71.5–73 MHz, ns	15		—	
Hum Modulation (Time Domain @ 15 A)				
5–10 MHz, –dBc	—		55	
11–750 MHZ, –dBc	60		60	
751–1002 MHz, –dBc	55		—	

Specification Document Number 1502465 Rev B

1. Spacing at highest frequency with Forward EQ installed. Return spacing includes losses due to housing, diplex filters, and MEQ–55–X.

2. The specifications are based on the amplifier configured (with two SPB–0) as a 2–output bridger with distribution outputs on Ports 3 and 6. When using distribution plug-ins SS–1000–2, SDC–1000–8 or SDC–1000–12, levels should be derated accordingly based on the accessory specifications.
3. NTSC video channels occupying the appropriate frequency spectrum per specified number of channels.
4. Recommended minimum forward input levels at 870 MHz including loss due to equalizer.
5. Recommended maximum return output level at 55 MHz including loss due to equalizer.
6. Bridger output: At specified operational tilt, the maximum output level for 870 MHz loading is 56.5 dBmV @ HF.
7. Forward trunk output levels achieved by installing an NPB-010 in the interstage PAD location and a GEQC-1 GHz-090 in the O/P EQ location. Forward bridger output levels are achieved by installing an NPB-000 in the Bridger EQ/PAD location.
8. Distortion performance is derated accordingly to take into account the influence of the digitally compressed channels operating at levels 6 dB below equivalent video channels.
9. Cross modulation specification number indicates typical cascade performance.
10. Systems operating with digitally compressed channels or equivalent broadband noise from 550 to 1002 MHz at levels 6 dB below equivalent video channels will experience a composite distortion (CIN) appearing in the 70 to 550 frequency spectrum.
11. Systems operating with digitally compressed channels or equivalent broadband noise from 550 to 870 MHz at levels 6 dB below equivalent video channels will experience a composite distortion (CIN) appearing in the 70 to 550 frequency spectrum.
12. The Noise Figure and C/N specifications are typical within specified passband.
13. The cable loss includes both the factory alignment cable loss of 13 dB at 1002 MHz and the cable equivalent loss of the GEQC-1 GHz-090 9 dB) for a total of 22 dB.
14. The forward bridger port gain and flatness is 9 ±1.0 dB as referenced to the trunk port.
15. The return bridger port gain and flatness is 0 ±0.5 dB as referenced to the trunk port.
16. All testpoints are directional and referenced to their associated RF port. For "H" output option, all forward and return testpoints are internal and only accessible with the housing lid open. For "P" output option, all forward testpoints are external and all return testpoints are internal.
17. Power requirements indicated are with the HEPS790–2.3 power supply 122027–05. See 333995–17 for additional information. For 60VAC Powering: AC Power consumption in Watts divided by a factor of
43 = Amps required. For 90VAC Powering: For ≤ 67VAC, 1.03 x (AC Power consumption in watts divided by voltage) = Amps required. For 67 - 90VAC, AC Power consumption in watts divided by 65 = Amps required.
18. ALC pilot level range is based on a nominal pilot level of 34 dBmV for pilot frequencies ≤ 499.25 MHz or 31 dBmV for pilot frequencies > 499.25 MHz. ARRIS recommends that if the pilot level, from a design standpoint, is more than +2/-1 dBmV from nominal, the ALC PAD should be changed to optimize the ALC pilot level range. This should alleviate any possible ALC setup and/or operation issues due to typical system level variations caused by system components flatness characteristics. See the equipment manual (P/N 1502154) for correct selection of ALC PAD value to insure proper ALC setup and operation.
19. For ALC pilot frequencies of ≤ 499.25 MHz, the ALC pilot filter is a single channel device. This means that the adjacent channels will have no affect on the RF power level that the RF detector is measuring. For ALC pilot frequencies > 499.25 MHz, the ALC pilot filter is not a single channel device. This means that the adjacent QAM channels will have an affect on the RF power level that the RF detector is measuring. ARRIS recommends that the adjacent QAM channels be present on the system before the ALC system of the amplifier station is balanced. This will avoid station re-balance in the future when those QAM channels would be added to the system.
20. ARRIS accessories should be used for guaranteed performance; using third party accessoires may result in degraded and/or intermittent performance.

Flex Max901e Trunk, 1002 MHz, 65/85 Split, 33 dB Spaced, Different Tilt Trunk and Bridger

	FORWARD		RETURN
	Trunk	**2 O/P Bridger**	**Trunk & 2 O/P Bridger**
General			
Passband, MHz	85–1002		5–65
Housing, MHz	1002		—
AC Current Passing, A			
Ports 1, 3, 4, 6	15		15
Ports 2, 5 ("H" and "P" options)	13		13
Typical Operating Conditions			
Operational Gain, dB[1, 2]	33	43	18
Channels, Number of PAL[3]	60	60	6

Flex Max901e Trunk, 1002 MHz, 65/85 Split, 33 dB Spaced, Different Tilt Trunk and Bridger

	FORWARD		RETURN
	Trunk	**2 O/P Bridger**	**Trunk & 2 O/P Bridger**
Operating Levels (recommended)			
Frequency, MHz	1002/870/750/600/85	1002/870/750/600/85	65/5
Input, dBmV, min.[4]	9.0/8.4/8.4/7.6/9.7		17/17
Output, dBmV[5, 6]	42/40.5/39.5/38/32.5	52/49.5/47.5/45/35.5	35/35
Performance Specifications @ Recommended Levels (Temperature Range: –40 to 60°C)			
Carrier-to-Interference Ratio, dB[7]			
Composite Triple Beat	84	75	80
Cross Modulation (per NCTA std.)[8]	76	67	74
Composite 2IM	79	73	82
Composite Intermodulation Noise CIN[9]	80	66	—
Composite Intermodulation Noise CIN[10]	86	72	—
Noise, 4 MHz, 75 Ohms[2]	58/58.4/58.4/56.6/56.7		62
Cenelec Performance Specification[11,12]			
Output Level for 60 dBc CTB Performance[13]	55 dBmV(115 dBµV)		
Output Level for 70 dBc CSO Performance[12]	55 dBmV(115 dBµV)		
Noise Figure, dB (without EQ)[14]	8/7/7/8/10	8/7/7/8/10	14
Full Gain, dB (without EQ and ALC)	38	48	19
Factory Alignment (with ALC Reserve, without EQ)			
Cable Loss, dB @ 1002 MHz	13	13	—
Linear Equalization[15]	—	7.5	—
Flat Loss, dB[16]	21	31	19
Gain Slope, dB	–0.5 to 1.0	–1.0 to 1.0	—
Flatness (@ Gain Slope), ±dB[17,18]	0.75 P-V	1.0 P-V	0.5
Return Loss, dB min., All Entry Ports	16	16	16
Testpoint Accuracy[19]			
–20 or –25 dB Forward Input TP, dB	±1.0		—
–20 or –25 dB Forward Output TP, dB	±0.5 (85 to 550), ±1.0 (551 to 1002)		—
–20 or –25 dB Return In and Out TP, dB	—		±0.5
Powering Requirements, Max./Typ.[20]			**With Active Return**
AC Voltage, 60 Hz			@ 90 V / @ 60 V
AC Power, Watts			53.5/49 / 53/48
AC Current, mA			735/700 / 970/880
DC Current, mA @ 24 V ± 0.5 V			1955/1775 / 1955/1775
Level Control			
Range, dB @ 1002 MHz	+4/–5 dB		—
Accuracy (–40 to 60°C)	±0.5 dB		—
Output Level Range[21] (from nominal)	+5/–3 dB		—
Pilot Frequency Band[22] (recommended)	499.25 MHz (Single Channel)		—
Gain Control			
Plug-in PAD[23]	NPB–XXX		NPB–XXX
Equalization to Compensate for Cable Loss			
Plug-in Equalizers for Additional Equalization	SEQ–1G–XX		MEQ–65–XX

Flex Max901e Trunk, 1002 MHz, 65/85 Split, 33 dB Spaced, Different Tilt Trunk and Bridger

	FORWARD		RETURN
	Trunk	2 O/P Bridger	Trunk & 2 O/P Bridger
Chrominance/Luminance Delay, Max.			
Channel S2, (PAL), ns/4.43 MHz		5	—
Channel S3, (PAL), ns/4.43 MHz		4	—
Channel 95, (NTSC), ns/3.58 MHz		10	—
Channel 96, (NTSC), ns/3.58 MHz		7	—
Return Group Delay, Max.			
5.5–7 MHz, ns		—	52
10–11.5 MHz, ns		—	8
62-63.5 MHz, ns		—	21
63.5-65 MHz, ns		—	34
85–86.5 MHz, ns		13	—
86.5–88 MHz, ns		11	—
Hum Modulation (Time Domain @ 15 A)			
5–10 MHz, –dBc		—	55
11–750 MHZ, –dBc		60	60
751–1002 MHz, –dBc		55	—

Specification Document Number 1502528 Rev C

1. Spacing at highest frequency with SEQ–1G–XX installed. Return spacing includes losses due to housing, diplex filters, and MEQ–65–X.
2. The specifications are based on the amplifier configured (with two SPB–0) as a 2–output bridger with distribution outputs on Ports 3 and 6. When using distribution plug-ins SS–1000–2, SDC–1000–8 or SDC–1000–12, levels should be derated accordingly based on the accessory specifications.
3. PAL video channels occupying the appropriate frequency spectrum per specified number of channels.
4. Recommended minimum forward input levels at 1002 MHz including loss due to equalizer.
5. Recommended maximum return output level at 85 MHz including loss due to equalizer.
6. Bridger output: At specified operational tilt the maximum output level for 870 MHz or 1002 GHz loading is 56.5 dBmV @ HF.
7. Distortion performance is derated accordingly to take into account the influence of the digitally compressed channels operating at levels 6 dB below equivalent video channels.
8. Cross modulation specification number indicates typical cascade performance.
9. Systems operating with digitally compressed channels or equivalent broadband noise from 600 to 1002 MHz at levels 6 dB below equivalent video channels will experience a composite distortion (CIN) appearing in the 85 to 550 frequency spectrum.
10. Systems operating with digitally compressed channels or equivalent broadband noise from 600 to 870 MHz at levels 6 dB below equivalent video channels will experience a composite distortion (CIN) appearing as noise in the 85 to 600 MHz frequency spectrum.
11. According to EN50083-3, 42 channel Cenelec loading and 8 dB slope.
12. Cenelec testing performed with NPB-020 installed in the bridger EQ/PAD location.
13. With bridger port 3 output levels at 55/47 dBmv, the trunk output (port 4) will be 46/38 dBmV. At the 46/38 dBmV output level, the trunk output performance will be 82 dBc minimum (CTB) and 78 dBc minimum (CSO).
14. The Noise Figure and C/N specifications are “typical” within specified passband.
15. Difference in linear loss between 85 MHz and 1002 MHz.
16. Total flat loss at 1002 MHz which includes insertion loss of linear EQ.
17. The forward bridger port gain and flatness is 11 ±1.0 dB as referenced to the trunk port with an NPB-000 installed in the bridger EQ/PAD location.
18. The return bridger port gain and flatness is 0 ±0.5 dB as referenced to the trunk port.
19. All testpoints are directional and referenced to their associated RF port. For “H” output option, all forward and return testpoints are internal and only accessible with the housing lid open. For “P” output option, all forward testpoints are external and all return testpoints are internal.

20. Power requirements indicated are with the HEPS790–2.3 power supply 122027–05. See 333995–17 for additional information. For 60VAC Powering: AC Power consumption in Watts divided by a factor of 43 = Amps required. For 90VAC Powering: For ≤ 67VAC, 1.03 x (AC Power consumption in watts divided by voltage) = Amps required. For 67 - 90VAC, AC Power consumption in watts divided by 65 = Amps required.
21. ALC pilot level range is based on a nominal pilot level of 37 dBmV for pilot frequencies ≤ 499.25 MHz or 32 dBmV for pilot frequencies > 499.25 MHz. ARRIS recommends that if the pilot level, from a design standpoint, is more than +2/-1 dBmV from nominal, the ALC PAD should be changed to optimize the ALC pilot level range. This should alleviate any possible ALC setup and/or operation issues due to typical system level variations caused by system components flatness characteristics. See the equipment manual (P/N 1502154) for correct selection of ALC PAD value to insure proper ALC setup and operation.
22. For ALC pilot frequencies of ≤ 499.25 MHz, the ALC pilot filter is a single channel device. This means that the adjacent channels will have no affect on the RF power level that the RF detector is measuring. For ALC pilot frequencies > 499.25 MHz, the ALC pilot filter is not a single channel device. This means that the adjacent QAM channels will have an affect on the RF power level that the RF detector is measuring. ARRIS recommends that the adjacent QAM channels be present on the system before the ALC system of the amplifier station is balanced. This will avoid station re-balance in the future when those QAM channels would be added to the system.
23. ARRIS accessories should be used for guaranteed performance; using third party accessories may result in degraded and/or intermittent performance.

Flex Max901e Trunk, 1002 MHz, 65/85 Split, 32 dB Spaced, Same Tilt Trunk and Bridger

Characteristic	FORWARD		RETURN
	Trunk	2 O/P Bridger	Trunk & 2 O/P Bridger
General			
Passband, MHz	85–1002		5–65
Housing, MHz	1002		—
AC Current Passing, A			
Ports 1, 3, 4, 6	15		15
Ports 2, 5 (“H” and “P” options)	13		13
Typical Operating Conditions			
Operational Gain at 1002/870 MHz, dB[1,2]	32/30	41/39	18
Channels, Number of PAL[3]	60	60	6
Operating Levels (recommended)			
Frequency, MHz	1002/870/750/600/85		65/5
Input, dBmV, min.[4]	11/10.5/10/9.4/10.9		17/17
Output, dBmV[5,6,7]	43/40.5/38.5/36/26.5	52/49.5/47.5/45/35.5	35/35
Performance Specifications @ Recommended Levels (Temperature Range: –40 to 60°C)			
Carrier-to-Interference Ratio, dB[8]			
Composite Triple Beat	84	75	80
Cross Modulation (per NCTA std.)[9]	76	67	74
Composite 2IM	79	73	82
Composite Intermodulation Noise CIN[10]	75	66	—
Composite Intermodulation Noise CIN[11]	81	72	—
Noise, 4 MHz, 75 Ohms[2]	61/60.5/60/58.4/57.9		62
Noise Figure, dB (without EQ)[12]	8/7/7/8/10		14
Full Gain, dB (without EQ and ALC)	37	46	19
Factory Alignment (with ALC Reserve, without EQ)			
Cable Loss, dB @ 1002 MHz[13]	22	22	—
Flat Loss, dB	11	20	19
Gain Slope, dB[14,15]	–0.5 to 1.0	–1.0 to 1.0	—
Flatness (@ Gain Slope), ±dB[16,17]	0.75 P-V	1.0 P-V	0.5
Return Loss, dB min., All Entry Ports	16	16	16

Flex Max901e Trunk, 1002 MHz, 65/85 Split, 32 dB Spaced, Same Tilt Trunk and Bridger (cont'd)

Characteristic	FORWARD		RETURN	
	Trunk	2 O/P Bridger	Trunk & 2 O/P Bridger	
Testpoint Accuracy[18]				
–20 or –25 dB Forward Input TP, dB	±1.0		—	
–20 or –25 dB Forward Output TP, dB	±0.5 (70 to 550), ±1.0 (551 to 1002)		—	
–20 or –25 dB Return In & Out TP, dB	—		±0.5	
Powering Requirements, Max./Typ.[19]			**With Active Return**	
AC Voltage, 60 Hz			@ 90 V	@ 60 V
AC Power, Watts			53.5/49	53/48
AC Current, mA			735/700	970/880
DC Current, mA @ 24 V ± 0.5 V			1955/1775	
Level Control				
Range, dB @ 1002 MHz	+4/–5 dB		—	
Accuracy (–40 to 60° C)	±0.5 dB		—	
Output Level Range[20] (from nominal)	+5/–3 dB		—	
Pilot Frequency Band (recommended)[21]	499.25 MHz (Single Channel)		—	
Gain Control				
Plug-in PAD[22]	NPB–XXX		NPB–XXX	
Equalization to Compensate for Cable Loss				
Plug-in Equalizers for Additional Equalization	SEQ-750-XX SEQ–870–XX SEQ-1G-XX		MEQ–65–XX	
Chrominance/Luminance Delay, Max.				
Channel S2, (PAL), ns/4.43 MHz	5		—	
Channel S3, (PAL), ns/4.43 MHz	4		—	
Channel 95, (NTSC), ns/3.58 MHz	10		—	
Channel 96, (NTSC), ns/3.58 MHz	7		—	
Return Group Delay, Max.				
5.5–7 MHz, ns	—		52	
10–11.5 MHz, ns	—		8	
62-63.5 MHz, ns	—		21	
63.5-65 MHz, ns	—		34	
85–86.5 MHz, ns	13		—	
86.5–88 MHz, ns	11		—	
Hum Modulation (Time Domain @ 15 A)				
5–10 MHz, –dBc	—		55	
11–750 MHZ, –dBc	60		60	
751–1002 MHz, –dBc	55		—	

Specification Document Number 1502529 Rev D

1. Spacing at highest frequency with Forward EQ installed. Return spacing includes losses due to housing, diplex filters, and MEQ–65–X.
2. The specifications are based on the amplifier configured (with two SPB–0) as a 2–output bridger with distribution outputs on ports 3 and 6. When using distribution plug-ins SS–1000–2, SDC–1000–8 or SDC–1000–12, levels should be derated accordingly based on the accessory specifications.
3. PAL video channels occupying the appropriate frequency spectrum per specified number of channels.
4. Recommended minimum forward input levels including loss due to equalizer.
5. Recommended maximum return output level at 85 MHz or 1002 MHz including loss due to equalizer.

6. Bridger output: At specified operational tilt, the max. output level for 870 MHz loading is 56.5 dBmV @ HF.
7. Forward trunk output levels achieved by installing an NPB-000 in the interstage PAD location and a GEQC-1 GHz-090 in the O/P EQ location. Forward bridger output levels are achieved by installing an NPB-020 in the Bridger EQ/PAD location.
8. Distortion performance is derated accordingly to take into account the influence of the digitally compressed channels operating at levels 6 dB below equivalent video channels.
9. Cross modulation specification number indicates typical cascade performance.
10. Systems operating with digitally compressed channels or equivalent broadband noise from 600 to 1002 MHz at levels 6 dB below equivalent video channels will experience a composite distortion (CIN) appearing in the 85 to 600 frequency spectrum.
11. Systems operating with digitally compressed channels or equivalent broadband noise from 600 to 870 MHz at levels 6 dB below equivalent video channels will experience a composite distortion (CIN) appearing in the 85 to 600 frequency spectrum.
12. The Noise Figure and C/N specifications are "typical" within specified passband.
13. The cable loss includes both the factory alignment cable loss of 13 dB at 1002 MHz and the cable equivalent loss of the GEQC-1 GHz-090 (9 dB) for a total of 22 dB.
14. "Typical" for the Forward Bridger Ports is measured without reference tothe Trunk Port (i.e. from Input Port to Bridger Port).
15. Forward trunk port "worst case" slope is –0.5 to 1.0 dB. Forward bridger port "worst case" slope is –1.0 to 1.0 dB as referenced to trunk port. Return trunk port "worst case" slope is –0.5 to 0.5 dB. Return bridger port "worst case" slope is –1.0 to 1.0 dB as referenced to trunk port
16. The forward bridger port gain and flatness is 9 ±1.0 dB as referenced to the trunk port.
17. The return bridger port gain and flatness is 0 ±0.5 dB as referenced to the trunk port.
18. All testpoints are directional and referenced to their associated RF port. For "H" output option, all forward and return testpoints are internal and only accessible with the housing lid open. For "P" output option, all forward testpoints are external and all return testpoints are internal.
19. Power requirements indicated are with the HEPS790–2.3 power supply 122027–05. See 333995–17 for additional information. For 60VAC Powering: AC Power consumption in Watts divided by a factor of
    43 = Amps required. For 90VAC Powering: For ≤ 67VAC, 1.03 x (AC Power consumption in watts divided by voltage) = Amps required. For 67 - 90VAC, AC Power consumption in watts divided by 65 = Amps required.
20. ALC pilot level range is based on a nominal pilot level of 34 dBmV for pilot frequencies ≤ 499.25 MHz or 31 dBmV for pilot frequencies > 499.25 MHz. ARRIS recommends that if the pilot level, from a design standpoint, is more than +2/-1 dBmV from nominal, the ALC PAD should be changed to optimize the ALC pilot level range. This should alleviate any possible ALC setup and/or operation issues due to typical system level variations caused by system components flatness characteristics. See the equipment manual (P/N 1502154) for correct selection of ALC PAD value to insure proper ALC setup and operation.
21. For ALC pilot frequencies of ≤ 499.25 MHz, the ALC pilot filter is a single channel device. This means that the adjacent channels will have no affect on the RF power level that the RF detector is measuring. For ALC pilot frequencies > 499.25 MHz, the ALC pilot filter is not a single channel device. This means that the adjacent QAM channels will have an affect on the RF power level that the RF detector is measuring. ARRIS recommends that the adjacent QAM channels be present on the system before the ALC system of the amplifier station is balanced. This will avoid station re-balance in the future when those QAM channels would be added to the system.
22. ARRIS accessories should be used for guaranteed performance; using third party accessories may result in degraded and/or intermittent performance.

Flex Max901e Trunk, 1002 MHz, 85/105 Split, 33dB, Spaced. Same Tilt Trunk and Bridger

Characteristic	FORWARD		RETURN
	Trunk	2O/P Bridger	Trunk & 2O/P Bridger
General			
Passband, MHz	105–1002		5–85
Housing, MHz	1002		—
AC Current Passing, A			
Ports 1, 3, 4, 6	15		15
Ports 2, 5 ("H" and "P" options)	13		13
Typical Operating Conditions			
Operational Gain, dB[1, 2]	33	43	18
Channels, Number of NTSC[3]	71	71	6
Operating Levels (recommended)			
Frequency, MHz	1002/870/750/550/105		85/5

Flex Max901e Trunk, 1002 MHz, 85/105 Split, 33dB, Spaced. Same Tilt Trunk and Bridger (cont'd)

Characteristic	FORWARD		RETURN	
	Trunk	2O/P Bridger	Trunk & 2O/P Bridger	
Input, dBmV, min.[4]	9/8.4/8.4/7.6/10.2		17/17	
Output, dBmV[5,6]	42/39.5/47.5/37/33	52/49.5/47.5/44/36	35/35	
Performance Specifications @ Recommended Levels (Temperature Range: –40 to 60°C)				
Carrier-to-Interference Ratio, dB[7]				
Composite Triple Beat	84	75	80	
Cross Modulation (per NCTA std.)[8]	76	67	74	
Composite 2IM	79	73	82	
Composite Intermodulation Noise CIN[9]	80	66	—	
Composite Intermodulation Noise CIN[10]	86	72	—	
Noise, 4 MHz, 75 Ohms[2]	59/59.4/59.4/57.6/58.2		62	
Noise Figure, dB (without EQ)[11]	8/7/7/8/10	8/7/7/8/10	14	
Full Gain, dB (without EQ and ALC)	38	48	19	
Factory Alignment (with ALC Reserve, without EQ)				
Cable Loss, dB @ 1002 MHz	13	13	—	
Linear Equalization, dB[12]	—	7.5	—	
Flat Loss, dB[13]	21	31	19	
Gain Slope, dB[14,15]	–0.4 to 0.4	0 to 1.25	—	
Flatness (@ Gain Slope), Typ.±dB[14,16,17]	0.75 P-V	1.5 P-V	±0.5	
Return Loss, dB min., All Entry Ports	16	16	16	
Testpoint				
–20 or –25 dB Forward Input TP, dB	±1.0		—	
–20 or –25 dB Forward Output TP, dB	±0.5 (105 to 550), ±1.0 (551 to 1002)		—	
–20 or –25 dB Return In and Out TP, dB	—		±0.5	
Powering Requirements, Max. /Typ.			**With Active Return**	
AC Voltage, 60 Hz			@ 90 V	@ 60 V
AC Power, Watts			53.5/49	53/48
AC Current, mA			735/700	970/880
DC Current, mA @ 24 V ± 0.5 V			1955/1775	1955/1775
Level Control				
Range, dB @ 1002 MHz	+4/–5 dB		—	
Accuracy (–40 to 60°C)	±0.5 dB		—	
Output Level Range[18,19] (from nominal)	+5/–3 dB		—	
Pilot Frequency Band[20] (recommended)	499.25 MHz (Single Channel)		—	
Gain Control				
Plug-in PAD[21]	NPB–XXX		NPB–XXX	
Equalization to Compensate for Cable Loss				
Plug-in Equalizers for Additional Equalization	SEQ–1G–XX		MEQ–85–XX	
Chrominance/Luminance Delay, Max.				
Channel 98, ns/3.58 MHz	15		—	
Channel 99, ns/3.58 MHz	9		—	

Flex Max901e Trunk, 1002 MHz, 85/105 Split, 33dB, Spaced. Same Tilt Trunk and Bridger (cont'd)

Characteristic	FORWARD		RETURN
	Trunk	2O/P Bridger	Trunk & 2O/P Bridger
Return Group Delay, Max.			
5.5–7 MHz, ns		—	52
10–11.5 MHz, ns		—	7
82–83.5 MHz, ns		—	15
83.5–85 MHz, ns		—	20
105-106.5 MHz, ns		15	—
106.5-108 MHz, ns		13	—
Hum Modulation (Time Domain @ 15 A)			
5–10 MHz, –dBc		—	55
11–750 MHZ, –dBc		60	60
751–1002 MHz, –dBc[22]		55	—

Specification Document Number 1502468 Rev C

1. Spacing at highest frequency with SEQ–1G–XX installed. Return spacing includes losses due to housing, diplex filters, and MEQ–85–X.
2. NTSC video channels occupying the appropriate frequency spectrum per specified number of channels.
3. Recommended minimum forward input levels at 1002 MHz including loss due to equalizer.
4. Recommended maximum return output level at 85 MHz including loss due to equalizer.
5. All testpoints are directional and referenced to their associated RF port. For "H" output option, all forward and return testpoints are internal and only accessible with the housing lid open. For "P" output option, all forward testpoints are external and all return testpoints are internal.
6. Power requirements indicated are with the HEPS790–2.3 power supply 122027–05. See 333995–17 for additional information. For 60VAC Powering: AC Power consumption in Watts divided by a factor of 43 = Amps required. For 90VAC Powering: For ≤ 67VAC, 1.03 x (AC Power consumption in watts divided by voltage) = Amps required. For 67 - 90VAC, AC Power consumption in watts divided by 65 = Amps required.
7. Systems operating with digitally compressed channels or equivalent broadband noise from 550 to 1002 MHz at levels 6 dB below equivalent video channels will experience a composite distortion (CIN) appearing as noise in the 105 to 550 MHz frequency spectrum.
8. Cross modulation specification number indicates typical cascade performance.
9. The specifications are based on the amplifier configured (with two SPB–0) as a 2–output bridger with distribution outputs on Ports 3 and 6. When using distribution plug-ins SS–1000–2, SDC–1000–8 or SDC–1000–12, levels should be derated accordingly based on the accessory specifications.
10. The Noise Figure and C/N specifications are typical within specified passband.
11. Distortion performance is derated accordingly to take into account the influence of the digitally compressed channels operating at levels 6 dB below equivalent video channels.
12. Forward Bridger Port 'worse case' flatness is ±1.0dB as referenced to Trunk Port. The 'worst case' Trunk Port flatness is ±0.75dB. All measurements are with NPB-000 installed in Bridger EQ/PAD location.
13. Reverse Bridger Port 'worst case' flatness is ±0.5dB as referenced to Trunk Port. The 'worst case' Trunk Port flatness is ±0.5dB.
14. ALC pilot level range is based on a nominal pilot level of 37 dBmV for pilot frequencies ≤ 499.25 MHz or 32 dBmV for pilot frequencies > 499.25 MHz. ARRIS recommends that if the pilot level, from a design standpoint, is more than +2/-1 dBmV from nominal, the ALC PAD should be changed to optimize the ALC pilot level range. This should alleviate any possible ALC setup and/or operation issues due to typical system level variations caused by system components flatness characteristics. See the equipment manual (P/N 1502154) for correct selection of ALC PAD value to insure proper ALC setup and operation.
15. Difference in Linear Loss between 105 MHz and 1002 MHz.
16. Total Flat Loss at 1002 MHz which includes Insertion Loss of linear EQ.
17. Systems operating with digitally compressed channels or equivalent broadband noise from 550 to 870 MHz at levels 6 dB below equivalent video channels will experience a composite distortion (CIN) appearing in the 105 to 550 MHz frequency spectrum.
18. Bridger Output: At specified Operational Tilt, maximum Output Level for 870 MHz or 1 GHz loading is 56.5 dBmV at HF.
19. For ALC pilot frequencies of ≤ 499.25 MHz, the ALC pilot filter is a single channel device. This means that the adjacent channels will have no affect on the RF power level that the RF detector is measuring. For ALC pilot frequencies > 499.25 MHz, the ALC pilot filter is not a single channel device. This means that the adjacent QAM channels will have an affect on the RF power level that the RF detector is measuring. ARRIS recommends that the adjacent QAM channels be present on the system before the ALC system of the amplifier station is balanced. This will avoid station re-balance in the future when those QAM channels would be added to the system.
20. 'Typical' for the Forward Bridger Ports is measured without reference to the Trunk Port (i.e. from Input port to Bridger Port).

21. ARRIS accessories should be used for guaranteed performance; using third party accessoires may result in degraded and/or intermittent performance.
22. Forward Trunk Port 'worst case' slope is -0.5 to 1.0 dB. Forward Bridger Port 'worst case' slope is -1.0 to 1.0 dB as referenced to Trunk Port. Reverse Trunk Port 'worst case' slope is -0.5 to 0.5 dB. Reverse Bridger Port 'worst case slope is –1.0 to 1.0 dB as referenced to Trunk Port.'

Flex Max901e Trunk, 1002 MHz, 85/105 Split, 32dB, Spaced. Same Tilt

Characteristic	FORWARD		RETURN
	Trunk	2O/P Bridger	Trunk & 2O/P Bridger
General			
Passband, MHz	105–1002		5–85
Housing, MHz	1002		—
AC Current Passing, A			
Ports 1, 3, 4, 6	15		15
Ports 2, 5 ("H" and "P" options)	13		13
Typical Operating Conditions			
Operational Gain, dB[1, 2]	32/30	41/39	18
Channels, Number of NTSC[3]	71	71	6
Operating Levels (recommended)			
Frequency, MHz	1002/870/750/550/105		85/5
Input, dBmV, min.[4]	11/10.5/10/9.4/10.6		17/17
Output, dBmV[5,6]	43/40.5/38.5/35/27	52/49.5/47.5/44/36	35/35
Performance Specifications @ Recommended Levels (Temperature Range: –40 to 60°C)			
Carrier-to-Interference Ratio, dB[7]			
Composite Triple Beat	84	75	80
Cross Modulation (per NCTA std.)[8]	76	67	74
Composite 2IM	79	73	82
Composite Intermodulation Noise CIN[9]	80	66	—
Composite Intermodulation Noise CIN[10]	86	72	—
Noise, 4 MHz, 75 Ohms[2]	62/61.5/61/59.4/58.6		62
Noise Figure, dB (without EQ)[11]	8/7/7/8/10	8/7/7/8/10	14
Full Gain, dB (without EQ and ALC)	37	46	19
Factory Alignment (with ALC Reserve, without EQ)			
Cable Loss, dB @ 1002 MHz	22	22	—
Flat Loss, dB[12]	11	20	19
Gain Slope, dB[13,14]	–0.5 to 1.0	–1.0 to 1.0	—
Flatness (@ Gain Slope), Typ.±dB[14,15,16]	0.75 P-V	1.0 P-V	±0.5
Return Loss, dB min., All Entry Ports	16	16	16
Testpoint			
–20 or –25 dB Forward Input TP, dB	±1.0		—
–20 or –25 dB Forward Output TP, dB	±0.5 (105 to 550), ±1.0 (551 to 1002)		—
–20 or –25 dB Return In and Out TP, dB	—		±0.5

Flex Max901e Trunk, 1002MHz, 85/105 Split, 32dB, Spaced. Same Tilt (cont'd)

Characteristic	FORWARD		RETURN	
	Trunk	2O/P Bridger	Trunk & 2O/P Bridger	
Powering Requirements, Max. /Typ.			**With Active Return**	
AC Voltage, 60Hz			@ 90V	@ 60V
AC Power, Watts			53.5/49	53/48
AC Current, mA			735/700	970/880
DC Current, mA @ 24V ± 0.5V			1955/1775	1955/1775
Level Control				
Range, dB @ 1002MHz	+4/–5dB		—	
Accuracy (–40 to 60°C)	±0.5dB		—	
Output Level Range[17,18] (from nominal)	+5/–3dB		—	
Pilot Frequency Band[19] (recommended)	499.25MHz (Single Channel)		—	
Gain Control				
Plug-in PAD[20]	NPB–XXX		NPB–XXX	
Equalization to Compensate for Cable Loss				
Plug-in Equalizers for Additional Equalization	SEQ–1G–XX SEQ–870–XX SEQ–750–XX		MEQ–85–XX	
Chrominance/Luminance Delay, Max.				
Channel 98, ns/3.58MHz	15		—	
Channel 99, ns/3.58MHz	9		—	
Return Group Delay, Max.				
5.5–7MHz, ns	—		52	
10–11.5MHz, ns	—		7	
82–83.5MHz, ns	—		15	
83.5–85MHz, ns	—		20	
105-106.5MHz, ns	15		—	
106.5-108MHz, ns	13		—	
Hum Modulation (Time Domain @ 15A)				
5–10MHz, –dBc	—		55	
11–750MHz, –dBc	60		60	
751–1002MHz, –dBc[21]	55		—	

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1. Spacing at highest frequency with FWD EQ installed. Return spacing includes losses due to housing, diplex filters, and MEQ–85–X.
2. NTSC video channels occupying the appropriate frequency spectrum per specified number of channels.
3. Recommended minimum forward input level at including loss due to equalizer.
4. Recommended maximum return output level at 85MHz including loss due to equalizer.
5. All testpoints are directional and referenced to their associated RF port. For "H" output option, all forward and return testpoints are internal and only accessible with the housing lid open. For "P" output option, all forward testpoints are external and all return testpoints are internal.
6. Power requirements indicated are with the HEPS790–2.3 power supply 122027–05. See 333995–17 for additional information. For 60VAC Powering: AC Power consumption in Watts divided by a factor of 43 = Amps required. For 90VAC Powering: For ≤ 67VAC, 1.03 x (AC Power consumption in watts divided by voltage) = Amps required. For 67 - 90VAC, AC Power consumption in watts divided by 65 = Amps required.
7. Systems operating with digitally compressed channels or equivalent broadband noise from 550 to 1002MHz at levels 6dB below equivalent video channels will experience a composite distortion (CIN) appearing as noise in the 105 to 550MHz frequency spectrum.
8. Cross modulation specification number indicates typical cascade performance.

9. The specifications are based on the amplifier configured (with two SPB–0) as a 2–output bridger with distribution outputs on Ports 3 and 6. When using distribution plug-ins SS–1000–2, SDC–1000–8 or SDC–1000–12, levels should be derated accordingly based on the accessory specifications.
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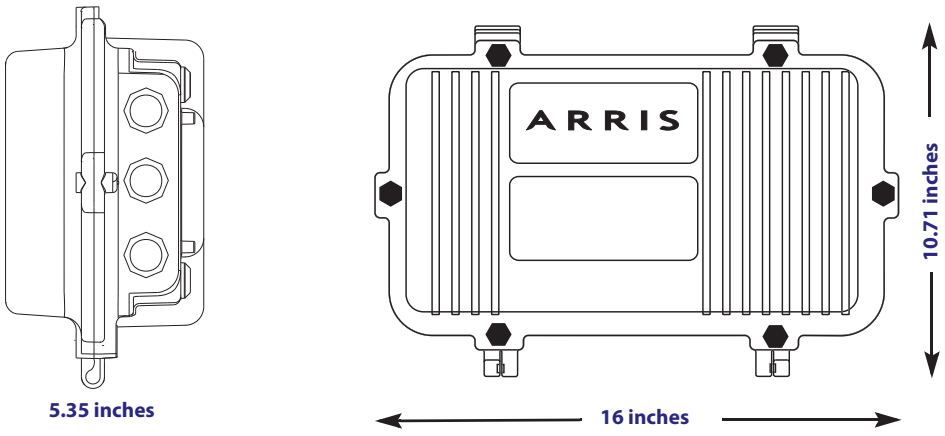
Refer to the Flex Max901e Technical Overview Document (FM901e_TOD_date) or the Flex Max901e Equipment Manual (P/N 1502154) for complete specifications. Specifications are subject to change without notice.



Flex Max901e Dimensions

Characteristic	Specification
Uncrated (H x W x D)	10.7 x 16.0 x 5.3 inches (27.2 x 40.6 x 13.6 cm)
Crated (H x W x D)	12.0 x 18.0 x 6.0 inches (30.5 x 45.7 x 15.2 cm)
Crated weight, approx.	13.24 lbs (6.01 kg)

Ordering Information

To configure a product that meets your specific needs, or for any questions, please contact your ARRIS Sales Professional. You may also use our Product Wizard, located at **support.arrisi.com** (User ID and password required). If you do not have a user ID and password or have forgotten your password, please use the Sign In Help section indicated.