FRANCHISE AGREEMENT

For and in consideration of the provisions and conditions herein contained and the mutual benefits to be derived herefrom, the City of Bedford, Virginia, hereinafter known as the City, acting through its duly elected City Council pursuant to Section 15.1-23.1 of the Code of Virginia of 1950, as amended, and Cable Equities of the Virginias, Ltd., d/b/a Bedford CableVision, hereinafter known as the Company, do hereby enter into this Agreement, intending by the signatures of their duly authorized representatives appearing below to be bound by the provisions hereof.

I. Franchise Grant.

The City hereby grants to the Company, its successors and assigns, a non-exclusive Franchise to erect, operate and maintain throughout the entire City poles, cables, and all other electrical equipment, structures, or fixtures necessary and incidental to the construction, operation and maintenance of a Cable Television System, and to utilize such Cable Television System so constructed, operated and maintained to provide Cable Service and Other Communications Services for the use of the residents and citizens of said City and the persons, firms and other entities doing business therein, in accordance with and limited by the provisions of this Agreement and the Ordinance of the City known as the "Cable Television Franchise Ordinance," and any duly enacted amendments thereto, for a term as specified below.

II. Franchise Acceptance.

The Company hereby accepts the Franchise granted herein by the City and agrees to erect, operate, and maintain a Cable Television System and to provide Cable Service in accordance with and as specified and required by this Agreement and the aforesaid Cable Television Franchise Ordinance, and any duly enacted amendments thereto.

III. Term of Franchise Grant.

The Franchise hereby granted shall have an Initial Term of THREE YEARS; provided, however, that subject to demonstration by the Company, prior to expiration of such Initial Term, of substantial compliance with the provisions of this Agreement, including without limitation completion of timely Cable System rebuild and compliance with the Public, Educational and Governmental requirements set forth herein, and upon the City's finding that the Company has so substantially complied, which finding shall not unreasonably be withheld or untimely made, the Company shall have the right to continue serving as a Franchisee hereunder for an Additional Term of SEVEN YEARS immediately following the expiration of the Initial Term and the Franchise granted hereunder shall be extended for such Additional Term.

IV. Cable System Rebuild.

The Company currently owns, maintains and operates a Cable System that provides Cable Service to Subscribers located within the City. The Company agrees that it will, as stated in its "Proposal for the Renewal of a Cable Television Franchise to the

City of Bedford, Virginia," dated July 1994 (hereinafter the "Renewal Proposal"), within three years following the grant of this Franchise, complete a rebuild (the "Rebuild") of its Cable System in a hybrid fiber-coaxial cable configuration, whereby after completion of such Rebuild the Cable System will have both upstream and downstream capability, with a 550 MHz bandwidth capacity and the capability of simultaneously carrying no less than 77 video channels.

Technical specifications for the Company's Cable System as it is to be rebuilt (hereinafter "Specifications") are as set forth in Attachment A hereto, which Specifications are hereby incorporated in and made a part of this Agreement. Any changes from the aforesaid Specifications that would result in a material degradation of the performance characteristics set forth therein are prohibited unless approval for such changes has been requested in writing by the Company and the City has consented thereto, which consent shall not unreasonably be withheld; provided, however, that in no event shall such consent be given by the City for any change proposed by the Company absent written certification by the Company that such change will not result in reduced bandwidth capability or video channel capacity or lesser quality of Subscriber service than that specified by FCC rules in effect as of the date of such request for consent to such change.

Without relieving the Company of its responsibilities to conform to all material aspects of the Specifications, subject to such changes as may be consented to by the City, the Company

agrees that it shall, not more than six months following the grant of this Franchise, provide at its headend an emergency back-up or stand-by generator to ensure uninterrupted Cable Service during power outages to Subscribers not affected by such outages, and shall maintain such capability throughout any remaining Term of the Franchise.

In connection with the Rebuild of the Company's Cable System, the Company shall provide to the City Manager monthly written progress reports, with the first progress report to be due no later than the first day of the third calendar month following the grant of this Franchise.

If requested, the Company agrees that it shall periodically present to the City Council such information concerning the status of the Cable System Rebuild as the City Council may reasonably require.

The Company agrees that it shall, to the maximum extent reasonably possible, provide advance notice to affected Subscribers of any planned Cable Service outages caused by the Cable System Rebuild and shall keep the City's Electric Director apprised of areas within the City where Rebuild activities are in progress.

During the course of the Cable System Rebuild, the Company agrees that it shall, to the extent reasonably possible, minimize disruption to or interruption of Cable Service provided to Subscribers and maintain all regularly provided programming and other services.

Recovery of that portion of the Company's Rebuild costs

properly attributable or allocable to regulated cable services shall be in accordance with the FCC's rules established for Cable Rate Regulation.

V. Additional Channel Requirements

The Company agrees and acknowledges that its provision of the services, facilities and equipment as set forth below, all of which, unless otherwise specified, shall be on a no-cost basis to the City, is not and shall not be deemed as an in-kind equivalent to any Franchise Fee payment unless required by pre-empting federal law or regulation. Unless otherwise specified below, the Company agrees to and shall comply with all additional channel requirements described in this Section V upon the earlier of completion of the Cable System Rebuild or at such time as System channel capacity is available therefor, and agrees that it shall exert reasonable efforts to so comply at the earliest possible date.

A. City Government Channel. In support of the City's Public, Educational and Governmental ("PEG") channel requirements, the Company shall provide and make available for use by the City one separate activated channel for City government use, which channel shall be designated as the City Government Channel. The City Government Channel shall at all times be carried as part of the basic programming tier offered by the Company, and the Company's Subscribers shall at all times be able to receive as part of their lowest cost subscription service the programming offered thereon.

The City Government Channel shall be used for the carriage of programming to be determined by the City, including live videocasts of City Council meetings, video-taped or live public safety programming, and other events or programming of City-wide interest as determined by the City.

Signal insertion capability for the City Government Channel shall be provided at the City's Municipal Building, and all interconnection facilities needed for activation of said Channel and signal insertion from the Municipal Building shall be provided by the Company. No later than three months following any request therefor by the City, signal insertion capability for the City Government Channel shall also be provided at such additional location or locations (not exceeding three in number) as are designated by the City.

B. City Information Channel. In support of the City's PEG channel requirements, the Company shall, within three months following written notification of the requirement therefor, but not before System channel capacity is available, provide and make available for use by the City one separate activated channel, which shall be designated as the City Information Channel. When activated, the City Information Channel shall at all times be carried as part of the basic programming tier offered by the Company, and the Company's Subscribers shall at all times

be able to receive as part of their lowest cost subscription service the programming offered thereon.

The City Information Channel shall be configured to permit the introduction of live and video-taped programming onto such Channel, and access to and use thereof shall be as provided by reasonable rules to be set by the City prior to activation of said Channel.

Signal insertion capability for the City Information Channel, if activated, shall be provided at one location within the City to be designated by the City, and all facilities needed for activation of said Channel and signal insertion from such location shall be provided by the Company. Notwithstanding that the City shall have direct signal insertion capability for the City Information Channel, a default mechanism shall be implemented to cause to be inserted on said Channel the Company's "Community Bulletin Board", or such alternative as is acceptable to the City, during all times when said Channel is not being utilized for the transmission of educational or informational material from any City signal insertion location.

The Company may use for the provision of the City's Information Channel such channel capacity as would otherwise be utilized for the Community Bulletin Board or acceptable alternative.

C. <u>The Data Channels</u>. The Company shall provide for two-

way data access, retrieval and transmission two separate 6 MHz wide channels which shall be designated as the Data Channels and shall be activated and maintained by the Company in an operational status for the intended uses specified herein. The Data Channels shall be capable of being utilized from Users' facilities, using appropriate computer hardware, software and modems, and other appropriate equipment, for the purpose of allowing two-way data transmissions between or among multiple User locations interconnected by the Cable System.

The Company shall have no responsibility for providing equipment necessary for User utilization of the Data Channels, but shall have the right to provide such equipment for a fee to Users. The Company may establish reasonable fees for use by non-governmental Users of channel capacity on the Data Channels. In no event shall any fee be charged to any governmental User (including agents of such governmental Users acting in their official capacity) for any utilization of the Data Channel. All fees charged and collected by the Company for use of or in connection with the Data Channel shall be deemed as part of the Company's Gross Revenues for Franchise Fee determinations.

Channel capacity provided for the Data Channel shall not for any purpose be considered as part of the basic tier of Cable Service, nor shall the costs incurred by

the Company in connection with the provision or use of such channel capacity be deemed as within the purview of FCC Rule §76.985(a). No Person desiring to utilize the Data Channel shall be obliged to subscribe to any tier of service other than basic Cable Service.

D. Consultative Assistance. The Company agrees that it shall provide to the City, commencing immediately following the Company's acceptance of the terms of this Agreement, such consultative assistance as the City may reasonably require to allow the City to maximize the utility of and benefit from the City Government Channel, the City Information Channel and the Data Channel.

E. Facilities Requirements. Within six months following a request by the City, but no later than the time of activation of the City Government Channel, the Company shall provide, in support of the City's PEG channel requirements, a complete set of new broadcast quality video and other equipment necessary for local origination production to be accomplished by the City (referred to as a "local origination equipment set-up") and to allow the City to place, from any one activated and operational signal insertion point, live and video-taped programming on the City Government Channel, consistent with the above-described intended use for such Channel. If requested by the City, the Company shall, not more than six months following such request, provide to the City a

second new and complete local origination equipment set-up, to be used in conjunction with and in support of the City's PEG channels. A list of items to be provided by the Company for each complete local origination equipment set-up is as set forth in Attachment B hereto, which listed equipment the Company warrants is sufficient to accomplish the usage objectives set forth herein for each such Channel; provided, however, that substitutions may be made by the Company if necessary or appropriate to accommodate technological changes or due to obsolescence or unavailability of specified equipment, subject to the requirement that the substituted equipment shall be comparable or superior in performance to that specified. However, notwithstanding any requirement stated herein for the Company to provide to the City the above-described local origination equipment set-ups, the City shall always have the right to require, in support of the City's PEG channel requirements and in partial or complete satisfaction of the Company's aforesaid requirements to provide such local origination equipment set-ups, that the Company provide:

(i) such substitute equipment as may be specified by the City, provided that the cost therefor when combined with any remaining equipment listed on Attachment B shall not exceed $30,000 in the aggregate, and provided that the time within

which the Company shall be obligated to provide such substitute equipment shall be subject to the commercial availability thereof; or

(ii) payment of cash to the City, not to exceed $30,000 in the aggregate, in lieu of equipment specified in Attachment B, provided that no payment of more than $15,000 shall be required in any one calendar year and that, if total payments of less than $30,000 in the aggregate are required by the City, then the City may also require the in-kind provision of equipment with a cost that when combined with any cash payments made by the Company will not exceed $30,000, and provided, further, that if any cash payments are required in lieu of equipment, the Company agrees that such payments shall not ever be deemed or claimed as an offset against any franchise fee payment obligation.

The Company shall also provide for the City's use on the City Government Channel, at the time of its activation, scrambling and descrambling equipment to permit the City to transmit on a secure basis, not subject to reception by non-designated persons, for reception and descrambling at a specified location, such public safety or other sensitive programming as the City chooses to place on the City Government Channel.

In addition, in support of the City's PEG Channel requirements, at such time as the City Government Channel is activated, the Company shall provide and install at a suitable location to be specified by the City a Trainable Satellite Dish Receiver and incorporate the downlinked feed therefrom into the City Government Channel so that, at the City's option, satellite programming or local programming (i.e., videotaped or live programs) may be inserted on such Channel; provided, however, that at such time as the City requires activation of the City Information Channel, the Company agrees, if requested by the City, to relocate and remount the aforesaid Trainable Satellite Dish Receiver, and to re-direct the feed therefrom, to allow satellite programming to be inserted on the City Information Channel.

VI. Incorporation by Reference.

The above-cited Cable Television Franchise Ordinance, including the Definitions set forth or referenced therein, is hereby incorporated herein and made a part hereof as if fully set forth herein, and the City and the Company do hereby agree to be bound by the terms, conditions, and provisions set forth therein and to be bound by the terms, conditions, and provisions of any duly enacted amendment thereto. In addition, all terms and conditions of the Company's Renewal Proposal, unless superseded by or in conflict with the provisions of this Agreement, are

incorporated herein by reference, and shall be binding in all respects upon the Company. The Company, by its acceptance of the Franchise hereby granted, acknowledges that the incorporation of the Cable Television Franchise Ordinance in this Agreement constitutes written notice of the City's intention to enforce the Customer Service Standards set forth in FCC Rule §76.309(c).

IN WITNESS WHEREOF, we, the authorized representatives of each of the parties, this 18th day of JULY, 1995 have set our hands and seals to this Agreement below.

CITY OF BEDFORD, VIRGINIA

By: _____
Mayor

ATTEST:

_____
City Manager

CABLE EQUITIES OF THE
VIRGINIAS, LTD.
d/b/a Bedford CableVision

By: _____

Title: VP of the Gen. Ptr.

ATTACHMENT A

Technical Specifications for Bedford, Virginia

Amplifier Specifications:

Type - Scientific Atlanta 550 MHz Dual PHD System Amplifier II.

The Dual Output System II Amp uses two output parallel hybrid amplifiers (PHD) to provide 3 db to 4 db higher output levels than a single distribution amplifier, the main output amplifier provides an output that can be used as trunk output, while the second output amplifier provides up to two auxillary outputs that can be used as feeders. A plug in passive (jumper, splitter or coupler) is used to control these auxillary outputs. This allows more flexibility and efficiency in system design.

Operating Levels:

Amplifier Type:	550/54 MHz Output Levels	Input Levels
Manual Dual SA-II	40/31	14.1/12.6
AGC Dual SA-II	41/32	15.1/13.6

Type - Scientific Atlanta 550 MHz Line Extender II Amplifier (LE II)

The Line Extender II is used to extend the distance that can be served by feeder lines versus the extension of trunk lines. The LE-II is a PHD (parallel hybrid) amplifier utilizing a high efficiency power supply and the option of an auto control module. This allows more flexibility and efficiency in system design.

Operating Levels:

	550/54 MHz Output Levels	Input Levels
LE-II	41/32	11.9/10.4

ATTACHMENT A

Page 2

Technical Specifications for Bedford, Virginia

Amplifier Specifications continued:

Type - Scientific Atlanta 5 - 30 MHz Reverse Amplifier.

The Scientific Atlanta 550 MHz Dual PHD System Amplifier II utilizes a plug in reverse amplifier board, a high pass filter and a reverse combiner for reverse applications.

Operating Levels:

Amplifier Type:	5/30 MHz Output Levels	Input Levels
Manual or AGC Dual Sa-II	36/36	17/17

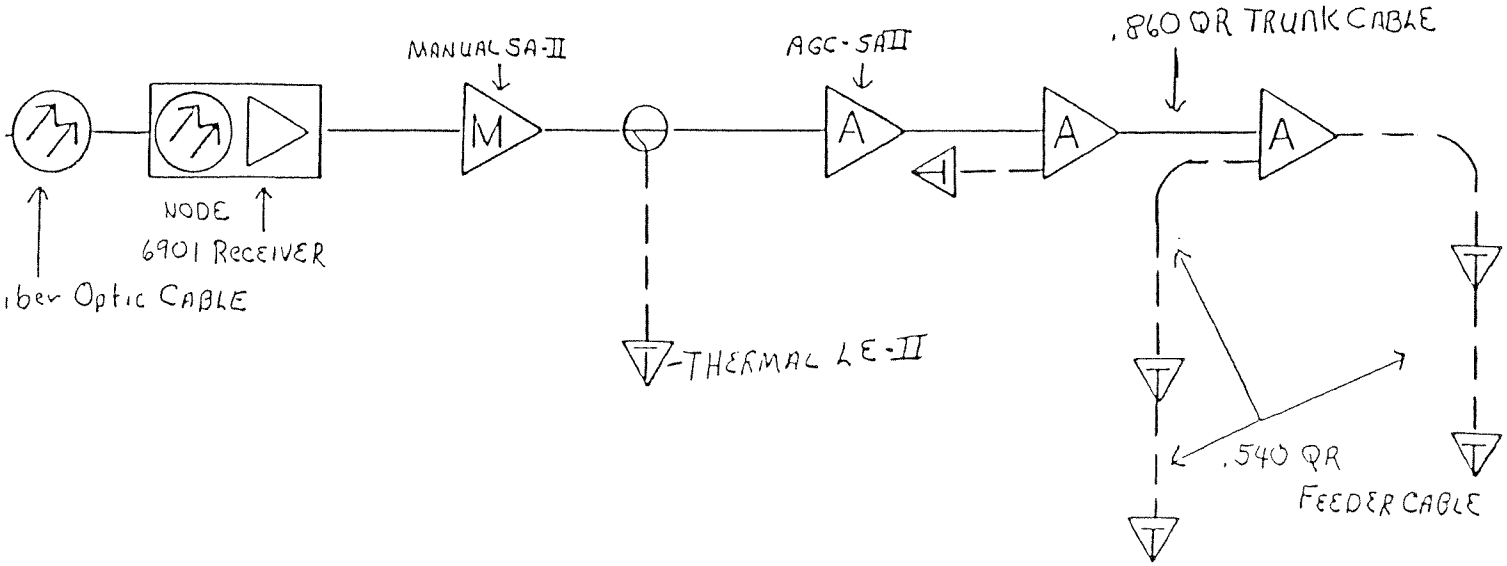
Design Parameters:

Maximum Trunk Spacing: 22 db @ 550 MHz (referenced to 68 degrees Fahrenheit).

Maximum Trunk Cascade: 4 +/-

Maximum Line Extender Cascade: 2 +/-

System Architectural Overview Block Diagram:



ATTACHMENT A

Page 3

Technical Specifications for Bedford, Virginia

Power Supply Data:

Voltage : 60

Maximum Load: 80%

Amperage : 15

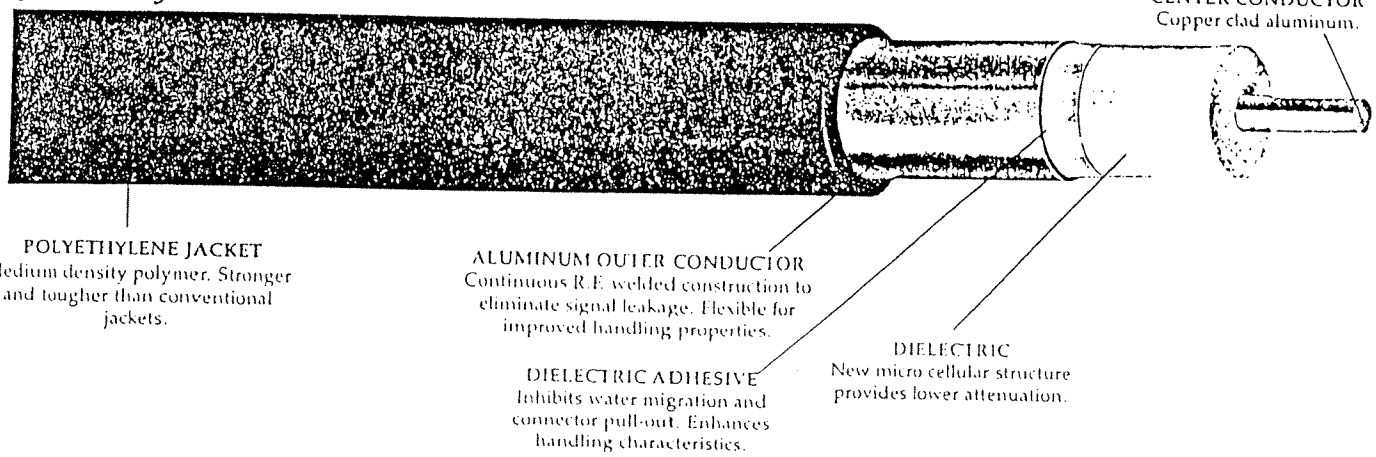
Minimum Load: 30%

Cable Specifications:

Type: CommScope .860 Quantum Reach

QUANTUM REACH®

QR-860JCA



QR-860JCASS

Similar in construction to QR-860JCA (above) except with Migra-Heal® flooding compound.

ATTACHMENT A

Page 4

Technical Specifications for Bedford, Virginia

Cable Specifications continued:

Type: Commscope .860 Quantum Reach

Physical Dimensions Component	Inches	mm
Nominal Center Conductor Diameter	0.203	5.16
Nominal Diameter Over Dielectric	0.828	21.03
Nominal Diameter Over Outer Conductor	0.860	21.84
Nominal Outer Conductor Thickness	0.016	0.41
Jacket Versions		
Nominal Diameter Over Jacket	0.960	24.38
Nominal Jacket Wall Thickness	0.050	1.27
Armored Versions		
Nominal Diameter Over Corrugated Armor	1.030	26.16
Nominal Shield Thickness	0.008	0.20
Nominal Diameter Over Outer Jacket	1.110	28.19
Nominal Thickness of Outer Jacket	0.040	1.02

Mechanical Characteristics		
Minimum Bending Radius:		
(No Armor)	7.0 in.	17.8 cm
Maximum Pulling Tension:	450 lbs.	204 kg_f

Electrical Characteristics		
Capacitance	15.3 ± 1.0 pf/ft.	50 ± 3.0 nf/km
Impedance	75 ± 2 ohms	
Velocity of Propagation	88%	

Maximum D.C. Resistance (@ 68° F (20° C))		
(Inner conductor)	0.406 ohms/1000 ft.	1.33 ohms/km
(Outer conductor)	0.318 ohms/1000 ft.	1.04 ohms/km
(Loop)	0.724 ohms/1000 ft.	2.37 ohms/km

Specifications subject to change without notice.

Attenuation (@ 68° F (20° C)) Frequency (MHz)	Maximum dB/100 ft.	Maximum dB/100m
5	0.09	0.30
30	0.24	0.79
45	0.29	0.95
50	0.31	1.02
55 (Ch. 2)	0.32	1.05
83 (Ch. 6)	0.40	1.31
108	0.46	1.51
150	0.54	1.77
181	0.59	1.94
193	0.60	1.97
211 (Ch. 13)	0.64	2.10
220	0.65	2.13
250	0.70	2.30
270	0.72	2.36
300	0.76	2.49
325	0.80	2.62
350	0.83	2.72
375	0.86	2.82
400	0.88	2.89
425	0.92	3.02
450	0.95	3.12
500	1.00	3.28
550	1.06	3.48
600	1.10	3.61
750	1.24	4.07
865	1.33	4.36
1000	1.44	4.72

ATTACHMENT A

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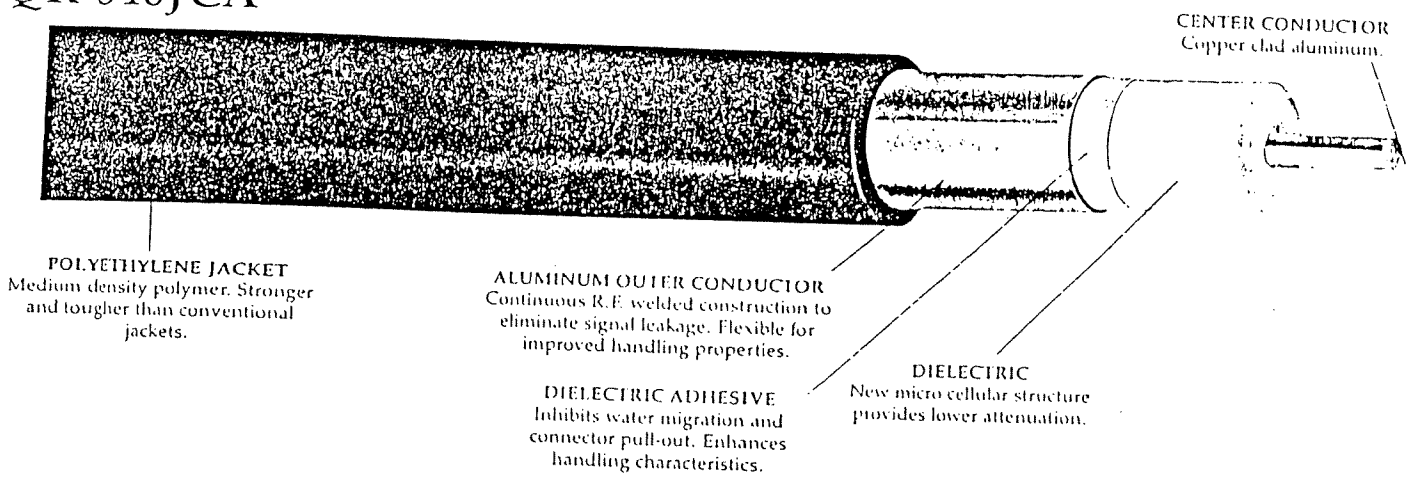
Technical Specifications for Bedford, Virginia

Cable Specifications continued:

Type: CommScope .540 Quantum Reach

QUANTUM REACH®

QR-540JCA



QR-540JCASS

Similar in construction to QR-540JCA (above) except with Migra-Heal® flooding compound.

ATTACHMENT A

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Technical Specifications for Bedford, Virginia

Cable Specifications continued:

Type: CommScope .540 Quantum Reach

Physical Dimensions Component	Inches	mm
Nominal Center Conductor Diameter	0.124	3.15
Nominal Diameter Over Dielectric	0.513	13.03
Nominal Diameter Over Outer Conductor	0.540	13.72
Nominal Outer Conductor Thickness	0.0135	0.343
Jacket Versions		
Nominal Diameter Over Jacket	0.610	15.49
Nominal Jacket Wall Thickness	0.035	0.89
Armored Versions		
Nominal Diameter Over Corrugated Armor	0.685	17.39
Nominal Shield Thickness	0.008	0.20
Nominal Diameter Over Outer Jacket	0.765	19.43
Nominal Thickness of Outer Jacket	0.040	1.02

Mechanical Characteristics		
Minimum Bending Radius:		
(No Armor)	5.0 in.	12.7 cm
Maximum Pulling Tension:	220 lbs.	100 kg_f

Electrical Characteristics		
Capacitance	15.3 ± 1.0 pf/ft.	50 ± 3.0 nf/km
Impedance	75 ± 2 ohms	
Velocity of Propagation	88%	

Maximum D.C. Resistance (@ 68° F (20° C))		
(Inner conductor)	1.02 ohms/1000 ft.	3.34 ohms/km
(Outer conductor)	0.59 ohms/1000 ft.	1.94 ohms/km
(Loop)	1.61 ohms/1000 ft.	5.28 ohms/km

Specifications subject to change without notice.

Attenuation (@ 68° F (20° C)) Frequency (MHz)	Maximum dB/100 ft	Maximum dB/100m
5	0.14	0.46
30	0.35	1.15
45	0.41	1.35
50	0.44	1.44
55 (Ch. 2)	0.47	1.54
83 (Ch. 6)	0.58	1.90
108	0.67	2.20
150	0.79	2.59
181	0.88	2.89
193	0.90	2.95
211 (Ch. 13)	0.95	3.12
220	0.98	3.22
250	1.03	3.38
270	1.08	3.54
300	1.14	3.74
325	1.20	3.94
350	1.23	4.03
375	1.30	4.27
400	1.33	4.36
425	1.37	4.49
450	1.41	4.63
500	1.50	4.92
550	1.58	5.18
600	1.66	5.45
750	1.86	6.10
865	2.00	6.56

ATTACHMENT A

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Technical Specifications for Bedford, Virginia

Coupler Specifications:

Type: Regal 1 GHz Splitters

Features

- 1 GHz bandwidth with low loss characteristics
- Glass epoxy printed circuit board
- Faceplates interchangeable with 600 MHz passives
- Power routing path printed on PC board
- 1/2" long entry ports
- 360 aluminum alloy housings with two polyurethane coatings

2-Way Line Splitter Specifications

Maximum insertion loss (dB)
- 5-10 MHz: 4.3
- 10-50 MHz: 4.2
- 50-300 MHz: 4.6
- 300-400 MHz: 4.6
- 400-500 MHz: 5.0
- 500-600 MHz: 5.2
- 600-900 MHz: 5.4
- 900-1000 MHz: 5.7

Minimum return loss (dB)
- 5-10 MHz: 16
- 10-50 MHz: 18
- 50-300 MHz: 19
- 300-400 MHz: 20
- 400-500 MHz: 20
- 500-600 MHz: 18
- 600-900 MHz: 17
- 900-1000 MHz: 16

Minimum isolation (dB)
- 5-10 MHz: 23
- 10-50 MHz: 28
- 50-300 MHz: 25
- 300-400 MHz: 25
- 400-500 MHz: 23
- 500-600 MHz: 23
- 600-900 MHz: 20
- 900-1000 MHz: 18

Hum modulation at 10 Amps
- 60 dB minimum

EMI shielding
- 100 dB

3-Way Line Splitter Specifications

Maximum insertion loss - port 2, 3 (dB)
- 5-10 MHz: 4.4
- 10-50 MHz: 4.3
- 50-300 MHz: 4.8
- 300-400 MHz: 4.8
- 400-500 MHz: 5.2
- 500-600 MHz: 5.4
- 600-900 MHz: 5.7
- 900-1000 MHz: 6.0

Maximum insertion loss - port 4 (dB)
- 5-10 MHz: 8.0
- 10-50 MHz: 8.0
- 50-300 MHz: 8.2
- 300-400 MHz: 8.4
- 400-500 MHz: 8.5
- 500-600 MHz: 8.7
- 600-900 MHz: 9.0
- 900-1000 MHz: 9.2

Minimum return loss (dB)
- 5-10 MHz: 16
- 10-50 MHz: 18
- 50-300 MHz: 19
- 300-400 MHz: 20
- 400-500 MHz: 19
- 500-600 MHz: 18
- 600-900 MHz: 17
- 900-1000 MHz: 16

Minimum isolation (dB)
- 5-10 MHz: 23
- 10-50 MHz: 28
- 50-300 MHz: 23
- 300-400 MHz: 21
- 400-500 MHz: 20
- 500-600 MHz: 20
- 600-900 MHz: 19
- 900-1000 MHz: 86

Hum modulation at 10 Amps
- 60 dB minimum

EMI shielding
- 100 dB minimum

ATTACHMENT A

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Technical Specifications for Bedford, Virginia

Coupler Specifications continued:

Type: Regal 1 GHz Directional Coupler

Mfg. No.	5-10 MHz	10-50 MHz	50-300 MHz	300-400 MHz	400-500 MHz	500-600 MHz	600-900 MHz	900-1000 MHz
Tap loss (dB)								
RLDC10-08	8.0 ±1.5	8.0 ±1.5	8.0 ±1.0	8.0 ±1.0	8.0 ±1.0	8.0 ±1.0	8.0 ±1.0	8.0 ±1.0
RLDC10-12	12.0 ±1.5	12.0 ±1.5	12.0 ±1.0	12.0 ±1.0	12.0 ±1.0	12.0 ±1.0	12.0 ±1.0	12.0 ±1.0
RLDC10-16	16.0 ±1.5	16.0 ±1.5	16.0 ±1.0	16.0 ±1.0	16.0 ±1.0	16.0 ±1.0	16.0 ±1.0	16.0 ±1.0
Maximum insertion loss (dB)								
RLDC10-08	2.4	2.4	2.7	2.8	2.9	3.2	3.7	4.1
RLDC10-12	1.7	1.6	2.0	2.1	2.4	2.5	2.9	3.5
RLDC10-16	2.2	1.6	2.0	2.1	2.4	2.5	2.9	3.5
Minimum return loss (dB)								
RLDC10-08	15	15	16	18	20	18	17	16
RLDC10-12	15	15	16	18	20	18	17	16
RLDC10-16	15	15	17	18	20	18	17	16
Minimum isolation (dB)								
RLDC10-08	28	30	28	27	24	21	18	18
RLDC10-12	28	28	28	27	25	23	18	18
RLDC10-16	25	25	27	27	27	24	19	18
Hum modulation at 10 Amps (dB)								
RLDC10-*	60	60	60	60	60	60	60	60
EMI shielding (dB min.)								
RLDC10-*	100	100	100	100	100	100	100	100

ATTACHMENT A

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Technical Specifications for Bedford, Virginia

Multitap Specifications:

Type: Regal 1 GHz 2 Port Taps

	5-10 MHz	10-20 MHz	20-400 MHz	400-500 MHz	500-600 MHz	600-900 MHz	900-1000 MHz
Isolation (dB) tap-to-tap	18	23	23	23	20	19	18
Return loss (dB min)	15	18	20	18	17	16	15
Hum Modulation 6 Amp	70	70	70	70	70	70	70
EMI shielding (dB min)	100	100	100	100	100	100	100
Power rating	6 Amps AC/DC, 60 Volts, 60 Hz						

		Insertion loss (dB)								
ANTEC No.	Mfg. No.	5-10 MHz	10-50 MHz	50-300 MHz	300-400 MHz	400-500 MHz	500-600 MHz	600-700 MHz	700-800 MHz	900-1000 MHz
REG 140400	RMT102-4	T	T	T	T	T	T	T	T	T
REG 140401	RMT102-8	3.7	3.7	3.9	4.0	4.1	4.4	4.5	4.6	4.8
REG 140402	RMT102-11	1.9	1.7	2.0	2.1	2.2	2.4	2.8	3.1	3.7
REG 140403	RMT102-14	1.4	1.3	1.4	1.5	1.7	1.8	2.0	2.3	3.1
REG 140404	RMT102-17	1.1	1.1	1.1	1.2	1.4	1.4	1.6	1.8	2.2
REG 140405	RMT102-20	0.8	0.7	0.9	0.9	1.0	1.1	1.4	1.6	1.7
REG 140406	RMT102-23	0.8	0.7	0.9	0.9	1.1	1.1	1.4	1.6	1.7
REG 140407	RMT102-26	0.8	0.7	0.9	0.9	1.1	1.1	1.4	1.6	1.7
REG 140408	RMT102-29	0.8	0.7	0.9	0.9	1.1	1.1	1.4	1.6	1.7
REG 140409	RMT102-32	0.8	0.7	0.9	0.9	1.1	1.1	1.4	1.6	1.7
REG 140410	RMT102-35	0.8	0.7	0.9	0.9	1.1	1.1	1.4	1.6	1.7
				Out-to-tap isolation (dB)						
REG 140400	RMT102-4	T	T	T	T	T	T	T	T	T
REG 140401	RMT102-8	18	25	25	23	22	21	–	–	18
REG 140402	RMT102-11	18	25	25	23	22	21	–	–	18
REG 140403	RMT102-14	20	20	23	21	20	20	–	–	18
REG 140404	RMT102-17	30	30	30	30	30	30	–	–	25
REG 140405	RMT102-20	30	30	30	30	30	30	–	–	23
REG 140406	RMT102-23	35	37	35	33	33	32	–	–	27
REG 140407	RMT102-26	38	40	35	34	33	30	–	–	25
REG 140408	RMT102-29	40	42	42	42	40	39	–	–	27
REG 140409	RMT102-32	42	43	44	44	42	41	–	–	31
REG 140410	RMT102-35	45	46	46	46	44	43	–	–	32

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Technical Specifications for Bedford, Virginia

Multitap Specifications Continued:

Type: Regal 1 GHz 4 Port Tap

	5-10 MHz	10-20 MHz	20-400 MHz	400-500 MHz	500-600 MHz	600-900 MHz	900-1000 MHz
Isolation (dB) tap-to-tap	19	23	23	23	23	20	18
Return loss (dB min)	15	18	20	18	17	16	15
Hum Modulation 6 Amp	70	70	70	70	70	70	70
EMI shielding (dB min)	100	100	100	100	100	100	100
Power rating	6 Amps AC/DC, 60 Volts, 60 Hz						

		Insertion loss (dB)								
ANTEC No.	Mfg. No.	5-10 MHz	10-50 MHz	50-300 MHz	300-400 MHz	400-500 MHz	500-600 MHz	600-700 MHz	700-800 MHz	900-1000 MHz
REG 140399	RMT104-8	T	T	T	T	T	T	T	T	T
REG 140398	RMT104-11	3.7	3.7	3.9	4.0	4.1	4.4	4.4	4.6	4.9
REG 140397	RMT104-14	1.9	1.7	2.0	2.1	2.2	2.4	2.8	3.0	3.7
REG 140396	RMT104-17	1.4	1.2	1.4	1.5	1.7	1.8	2.0	2.4	3.1
REG 140395	RMT104-20	1.1	1.1	1.1	1.2	1.3	1.4	1.5	1.8	2.2
REG 140394	RMT104-23	0.9	0.9	0.9	1.0	1.2	1.3	1.4	1.6	1.8
REG 140393	RMT104-26	0.9	0.9	0.9	1.0	1.2	1.3	1.4	1.6	1.8
REG 140392	RMT104-29	0.9	0.9	0.9	1.0	1.1	1.1	1.4	1.6	1.8
REG 140391	RMT104-32	0.9	0.9	0.9	1.0	1.1	1.1	1.4	1.6	1.8
REG 140390	RMT104-35	0.9	0.9	0.9	1.0	1.2	1.3	1.4	1.6	1.8
				Out-to-tap isolation (dB)						
REG 140399	RMT104-8	T	T	T	T	T	T	T	T	T
REG 140398	RMT104-11	18	25	25	25	23	22	–	–	18
REG 140397	RMT104-14	20	20	23	21	20	20	–	–	18
REG 140396	RMT104-17	26	26	23	23	21	20	–	–	18
REG 140395	RMT104-20	35	35	35	35	33	33	–	–	28
REG 140394	RMT104-23	35	37	35	33	33	32	–	–	27
REG 140393	RMT104-26	38	40	35	34	33	30	–	–	25
REG 140392	RMT104-29	40	42	42	42	40	39	–	–	27
REG 140391	RMT104-32	42	43	44	44	42	41	–	–	31
REG 140390	RMT104-35	45	46	46	46	44	43	–	–	32

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Technical Specifications for Bedford Virginia

Multitap Specifications continued:

Type: Regal 1 GHz 8 Port Tap

	5-10 MHz	10-20 MHz	20-400 MHz	400-500 MHz	500-600 MHz	600-900 MHz	900-1000 MHz
Isolation (dB) tap-to-tap	18	23	23	23	20	19	18
Return loss (dB min)	15	18	20	18	17	16	15
Hum Modulation 6 Amp	70	70	70	70	70	70	70
EMI shielding (dB min)	100	100	100	100	100	100	100
Power rating	6 Amps AC/DC, 60 Volts, 60 Hz						

		Insertion loss (dB)								
ANTEC No.	Mfg. No.	5-10 MHz	10-50 MHz	50-300 MHz	300-400 MHz	400-500 MHz	500-600 MHz	600-700 MHz	700-800 MHz	900-1000 MHz
REG 137533	RMT108-11	T	T	T	T	T	T	T	T	T
REG 137534	RMT108-14	3.7	3.7	4.0	4.1	4.2	4.4	4.6	4.7	4.9
REG 137535	RMT108-17	1.9	1.9	2.0	2.1	2.4	2.5	2.7	3.1	3.5
REG 137536	RMT108-20	1.4	1.3	1.4	1.5	1.7	1.9	2.0	2.2	3.1
REG 137537	RMT108-23	1.2	1.1	1.1	1.1	1.3	1.7	1.7	1.7	2.2
REG 137538	RMT108-26	1.1	0.9	0.9	1.0	1.2	1.3	1.4	1.6	1.8
REG 137539	RMT108-29	0.9	0.8	0.9	1.0	1.2	1.3	1.4	1.6	1.8
REG 137540	RMT108-32	0.9	0.8	0.9	1.0	1.2	1.3	1.4	1.6	1.8
REG 137541	RMT108-35	0.9	0.8	0.9	1.0	1.2	1.3	1.4	1.6	1.8
				Out-to-tap isolation (dB)						
REG 137533	RMT108-11	T	T	T	T	T	T	T	T	T
REG 137534	RMT108-14	18	25	25	25	23	22	–	–	18
REG 137535	RMT108-17	20	20	23	21	20	20	–	–	18
REG 137536	RMT108-20	26	26	23	23	21	20	–	–	18
REG 137537	RMT108-23	35	35	35	35	33	33	–	–	28
REG 137538	RMT108-26	35	37	35	33	33	32	–	–	27
REG 137539	RMT108-29	38	40	35	34	33	30	–	–	25
REG 137540	RMT108-32	40	42	42	42	40	39	–	–	27
REG 137541	RMT108-35	42	43	44	44	42	41	–	–	31

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Technical Specifications for Bedford, Virginia

Power Inserters:

Type: Cable Innovations CLPS 35PI

A.C. Power Insertion - 35 AMP capacity, more on power suppression.

R.F. - Passes in either direction from 5 MHz to 1 GHz

Insertion Loss - 1 DB @ 1 GHz

Isolation - Greater than 60 DB

Return Loss - 18 DB @ 1 GHz

Power Suppression - Overvoltage Protection, Continuous at 35 Amps, 8.3 Milliseconds at 500 Amps, 1 microsecond at 1000 Amps.

In Line Equalizer:

Type: Regal 550 MHz Line Equalizer

Bandwidth - Return Path: 5 - 30 MHz

Forward Path: 54 - 550 MHz

Return Loss: 5 - 30 MHz less than 20 DB

54 - 200 MHz less than 18 DB

200 - 450 MHz less than 20 DB

450 - 550 MHZ less than 18 DB

Nominal Cable Equalization: 8 DB

Equalization (slope) Linearity: +/- 0.5 DB

Insertion Loss: 5 - 30 MHz less than 0.5 Db

54 MHz 6.0 +/- 0.5 DB

550 MHz less than 0.8 DB

Current Passing: 6 Amps (continuous maximum)

Isolation: Greater than 100 DB

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Technical Specifications for Bedford, Virginia

Symbology Usage:

Type: RF/COAXIAL - NCTA (National Cable Television Association) and SCTE (Sociegty of Cable Television Engineers) recognized standards.

STANDARDIZED SYMBOLOGY IDENTIFICATION AND ABBREVIATIONS

RF/COAXIAL

SYMBOL	ABBR.	DESCRIPTION
	TrAmp	TRUNK AMPLIFIER
	TrBr	TRUNK BRIDGER HIGH LEG DOT
	1-S/A	TYPE 1 - SINGLE ACTIVE
	2-D/A 2A-D/M	TYPE 2 - DUAL ACTIVE TYPE 2A - DUAL MINI
	3-T/A 3A-T/M	TYPE 3 - TRIPLE ACTIVE TYPE 3A - TRIPLE MINI
	TermBr	INTERMEDIATE OR TERMINATING BRIDGER
	LE	LINE EXTENDER
	Dir Coup	DIRECTIONAL COUPLER
	2 3 Splt	2 - WAY SPLITTER 3 - WAY SPLITTER
	2PTap	2 PORT TAP
	4PTap	4 PORT TAP
	8PTap	8 PORT TAP
HT	HtTap	HOT TAP
	Term	TERMINATOR
	STerm	SELF TERMINATOR
	Spl	SPLICE
	Eq	IN - LINE EQUALIZER
	OGuy	OVERHEAD GUY
	P/PGuy	POLE-TO-POLE GUY
	Church	CHURCH (NO NAME)
		SCHOOL

SYMBOL	ABBR.	DESCRIPTION
	PI	POWER INSERTER
PS	PS	STANDBY POWER SUPPLY
PS	NPS	NON-STANDBY POWER SUPPLY
( )	PB	POWER BLOCKS
	ELS	END OF LINE SIGNAL
	HE	HEADEND HUB
	Hub	HUB
	TP	TELEPHONE POLE
	PP	POWER POLE
	JP	JOINT POLE
	TranP	TRANSFORMER POLE
	JTranP	JOINT TRANS. POLE
	CP	CATV POLE
S	SP	STEEL POLE
C	ConP	CONCRETE POLE
DP	DP	DROP POLE
	PuP	PUSH POLE
	EA	ENTENSION ARM
R	Riser	RISER
	Ped	PEDESTAL/ENCLOSURES (INPUT PED SIZE)
	Vlt	VAULT (FLUSH MOUNT)

SYMBOL	ABBR.	DESCRIPTION
	LP	LIGHT POLE
	House	HOUSE COUNT
	House A/P	HOUSE COUNT ACTUAL/POTENTIAL
	Com Drop	COMMERCIAL DROP COUNT BUILDING
	MDU	MULTI-DWELLING UNIT BUILDING
	ComB	# OF COMMERCIAL BUSINESSES
	Ank	ANCHOR - EXISTING
	AnkNew	ANCHOR TO BE PLACED
	SWAnk	SIDE WALK ANCHOR - EXISTING
	SW AnkNew	SIDEWALK ANCHOR TO BE PLACED
	TAnk	TREE ANCHOR
	RAnk	ROCK ANCHOR
	BAnk	BUILDING ANCHOR
NS	NoStrn	SPAN NOT STRANDED
DS	DStrn	DUAL STRAND
	PSpan	POLE SPAN
	SSpan	SLACK SPAN
* * *	AStrn	AERIAL STRAND W/FTG
	LBox	LOCKBOX

ATTACHMENT A

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Technical Standards for Bedford, Virginia

Symbology Usage:

Type: Fiber Optic - NCTA and SCTE recognized standards.

FIBER OPTIC

SYMBOL	ABBR.	DESCRIPTION	SYMBOL	ABBR.	DESCRIPTION	SYMBOL	ABBR.	DESCRIPTION
F #	Opt Cable	OPTICAL CABLE W/# OF FIBERS	2 Way	OptSplO	OPTICAL SPLICE LOCATIONS (BOX)		OptHub	OPTICAL HUB LOCATION #
	Opt Node	OPTICAL RECEIVER/NODE	3 Way				Opt FigEight	OPTICAL FIGURE EIGHT
	OptTran	OPTICAL TRANSMITTER	4 Way			USII	Opt Cable Spl	OPTICAL CABLE SPLICE ENCLOSURE
	FusSpl	FUSION SPLICE						
	Mech Spl	OPTICAL MECHANICAL SPLICE						

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Technical Specifications for Bedford, Virginia

Fiber Optics:

Type: Scientific Atlanta Model 6901 Fiber Optic Receiver

Fiber Optics

Optoelectronic Receiver
Model 6901

Description

The Scientific-Atlanta Model 6901 Optoelectronic Receiver houses one or two optical receiver modules and one return laser transmit module in the proven four-port DA style modular housing. The housing can be mounted on a strand or pole, in a pedestal, or in an indoor location. The receive and transmit modules are equipped with fiber pigtails for direct fusion splicing or optical connector terminations. The fiber(s) interface with the housing via a sealed flexible conduit or through direct entry of Maxi-bundle™ or LXE™ cable. A special customized fiber handling tray simplifies fiber handling inside the housing.

The Model 6901 Receiver employs an RF bypass switch that monitors the fiber input and automatically switches to a backup RF input in the event of an outage in the fiber path. The unit is factory-tuned with no exposed adjustments and limited entry to prevent tampering, and it contains all necessary filtering, combining and RF circuitry. The plug-in module design offers the flexibility needed to simplify field servicing and to optimize fiber system designs, while permitting a migration path to higher bandwidths.

Specifications

Optical receivers
  1 or 2
RF output level (up to 80 channels)*
  20 dBmV (min)
Output impedance
  75 Ω
Power
  60 V ac, 50 Hz to 60 Hz
Power consumption
  20 W
Dimensions
  12.5 in. H x 9.5 in. W x 5.5 in. D
Operating temperature
  -40°C to 60°C
Relative humidity
  5% to 100%
RF test points (each receiver)
  -20 dB ±1.0 dB
Output flatness (46 MHz to 550 MHz)
  ±1.0 dB
Output return loss (46 MHz to 550 MHz)
  15 dB (min)
Through-loss in bypass mode
  2 dB (max)
Isolation in bypass mode
  >70 dB

*Contact Applications Engineering if higher RF outputs are desired.

Specifications and product availability are subject to change without notice.

Maxi-bundle is a trademark of Siecor Inc.
LXE is a trademark of AT&T.

Technical Specifications for Bedford, Virginia

PROJECTED PERFORMANCE FOR BEDFORD @ 550 MHz OPERATION

Type	6901 Rcvr	Manual Dual SA-II	AGC Dual SA-II	Thermal LE-II	Projected Performance	FCC Requirement
Length	9db	1	3	2	-	-
Input	-	14.1/12.6	15.1/13.6	11.9/10.4	-	-
Gain	-	25.9	25.9	29.1	-	-
Output	20/20	40/31	41/32	41/32	-	-
CNR-h	50	65.7	61.9	61.4	49.3	43.0
CNR-L	50	64.0	60.2	59.4	49.0	43.0
CTB	65	72.1	60.6	65.5	52.8	51.0
CSO	60	67.2	61.4	66.4	56.7	51.0

This performance analysis is based on criteria as provided by Scientific Atlanta on 11/24/94. CNR and CSO were combined on a 10 Log basis and CTB on a 20 Log basis. Any changes in single station performance will alter this analysis. CableVision reserves the right to change levels, cascades, vendors or other parameters in order to optimize efficiency while still meeting FCC Technical Standards, Part 76, Sub-Part K.

Technical Specifications for Bedford, Virginia

GLOSSARY

6901 Rcvr - 6901 Optoelectric Receiver, listed in equipment list, see Model 6901 Optoelectric reciever attachment.

Manual Dual SA-II - Manual 550 MHz Dual PHD System Amplifier II, does not utilize AGC (automatic gain control), version listed on equipment list, see System Amplifier II attachment for amplifier description.

AGC Dual SA-II - AGC (Automatic Gain Control) 550 MHz Dual PHD System Amplifier II, does utilize AGC for levels stability, version listed on equipment list, see System Amplifier II attachment for amplifier description.

Thermal LE-II - Thermal (employs a thermal control circuit vs. an automatic gain control circuit) 550 MHz Line Extender II Amplifier, version on equipment list, see Line Extender II attachment for description.

Projected Performance - The mathmatically calculated response at the end of the specified cascades. The cascade is the number of amplifiers in line with each other. For example, in Bedford, one (1) Manual Dual SA-II + three (3) AGC Dual SA-II's + two (2) Thermal LE-II's equals a combined cascade of six (6) amplifiers. The combined or projected performance of the system is based on this cascade figure.

FCC Requirement - These figures represent the minimum acceptable standards as written in Part 76, Sub-Part K of the FCC Technical Standards.

CNR - Visual carrier to noise ratio, the ratio of the RF visual level to the system noise level. The FCC Standard is a 43 db minimum, the visual signal level must be at least 43 db greater than the noise level. The noise level is directly proportional to the amount of "snow" that can be seen in a picture. The 43 db ratio is equivilent to a "snowless" picture.

CNR-h - Visual carrier to noise ratio at the highest design frequency. (Bedford 550 MHz)

CNR-L - Visual carrier to noise ratio at the lowest design frequency. (Bedford ch. 2)

CTB - Composite Triple Beat, this is a third order distortion or beat resulting from three carriers on a cable system and falling at a frequency of the algebraic sum and or difference of the three carriers. These products generally fall within +/- 15KHz of the video carriers and can be seen as lines in the picture. The FCC Standard is that these beats must remain at least 51 db below the visual signal level which will be imperceivable to consumers.

CSO - Composite Second Order, this is a second order beat or distortion that is the product generated by the direct addition or subtraction of fundamental carrier frequencies. These products normally fall at +/- 750KHz or +/- 1.25 MHz from the

GLOSSARY continued

visual carrier. They generally appear as diagonal lines in the picture. The FCC Standard is that these beats remain at least 51 db below the visual signal level which will be imperceivable to consumers.

ATTACHMENT B

Local Origination - Video Equipment

Below is a list of video equipment listing manufacturer, model numbers, etc. that CableVision will provide to the City for local origination programming, playback of local access programming and playback of programming from the library media center. CableVision reserves the right to subsitute any or all equipment listed below should any of the equipment become unavailable for any reason.

Video Equipment and Accessories:

Sony	DXC-325L	3-CCD Camera, including: Camera Head, Camera Adaptor, 1.5" Viewfinder, Tripod Adaptor, Case, Shoulder Pad, and Cable
Cannon	PH10X8BKRS	10X Servo Zoom Lens
Sony	BC-1WB	Charger/AC Adaptor
Sony	NP-1A	Battery
JVC	TM-R9U	9-inch color AC/DC Monitor
JVC	BR-S405U	Portable S-VHS Deck
JVC	AA-G10U	Charger/AC Adaptor
JVC	NP-G1U	Battery
JVC	SA-S11U	Battery Holder
Mathews	TH-40B	Tripod
Mathews	D40B	Dolly
Lowell	VP-98	Light Kit

ATTACHMENT B
(Continued)

Character Generator:

CableVision will provide the city with one (1) EL155 Elite Text Pro Jr. Character Generator. A substitute will be made if equipment becomes unavailable.

Scrambling and Descrambling Equipment:

CableVision will provide the City with three (3) Regency Scramblers as a means to scramble video or live broadcasts and twenty (20) converters to descramble the video or live broadcasts to defined locations.