

GLOSSARY

1. **access** — the ability or right to use production and distribution facilities of a cable system. The Federal Communications Commission no longer requires that a community be provided with access to production and programming facilities. Access has been an important bargaining issue between cable companies and communities seeking cable service. There are generally four types of access.
 - a. **public access** — facilities are available to local talents to produce, direct and perform their own programs to be shown on the public access channel. It is often used as a forum to express public opinion.
 - b. **educational access** — local educational institutions develop programming to enhance the learning process.
 - c. **government access** — local government is able to disseminate information to the public, including town meetings, school cancellations, public hearings, roads closed down due to construction, snow emergencies, etc.
 - d. **leased access** — the cable company has an option to sell time to independent programmers at a fixed rate on a commercial basis. Leased access programmers are allowed to sell advertising and perhaps profit from their endeavors.
2. **access cablecasting** — the procedure for transmitting access programming through the cable system.
3. **aerial plant** — cable that is suspended in the air on poles that are often leased from the local telephone or power company.
4. **amendments to the application** — part of the licensing procedure. Each cable license applicant is allowed to submit an amended application after receiving the issuing authority's report on system specifications. The amendments are the applicant's response to the specific needs and requirements of the municipality.
5. **amplifier** — a device used to boost the strength of an electronic signal. Amplifiers are spaced at intervals throughout the cable system to increase the strength of television signals, which weaken as they pass through the cable network.
6. **antenna** — a device used to receive or transmit broadcast signals.
7. **attenuation** — the weakening of a television signal as it travels through the cable from the source to the receiver.
8. **bandwidth** — the amount of space necessary to send electronic waves on the electromagnetic spectrum. Waves are measured in Hertz (Hz) or cycles per second. A TV channel requires 6 million cycles per second (6 MHz). Some cable systems today may utilize bandwidths up to 350 MHz, usually 50 to 400 MHz.
9. **broadband** — a general term used to describe wide bandwidth equipment or systems which can carry a large portion of electromagnetic spectrum.
10. **broadcaster's service area** — the geographical area covered by a station's signal.
11. **broadcasting** — transmission of electronic signals through the air in all directions over a broad geographical area. Broadcast signals can be picked up by suitable receivers.
12. **cable TV** — a communications system that distributes broadcast signals, original programs and other services by means of a coaxial cable. Cable originated in the 1940s in communities that were unable to receive "over the air" broadcast signals. They used an antenna placed where it *could* receive the signals and attached cables and other electronic equipment to it to redistribute those signals to subscribers' homes.

13. *cablecasting* — any programming on a cable system that is not the retransmission of broadcast signals. It usually refers to origination and access programs.
14. *carriage* — the retransmission of a program being broadcast by a television station on a cable system. The FCC has rules that determine the broadcast signals a station must or may carry.
15. *channel* — the space on the electromagnetic spectrum allocated to a broadcast or cable facility for transmitting their signal. For instance, a television signal requires a 6 MHz section of the spectrum.
16. *channel capacity* — the maximum number of 6 MHz channels which can be simultaneously carried by a cable TV system.
17. *closed circuit TV* — a television system that links the originating equipment with the receiving equipment directly by wire or microwave. Closed circuit TV usually refers to a television system used by a single organization.
18. *coaxial cable* — a cable of two concentric conductors separated by an insulator, usually with a copper or copper sheathed aluminum core and an outer conductor of braided copper wire or seamless aluminum. It is designed to reduce attenuation and provide a more efficient conductor.
19. *common carrier* — communications services that have facilities available to the general public for the transmission of private messages (e.g. telephone and telegraph). In 1934, the Communications Act exempted broadcasting from common carrier status. Recent Supreme Court decisions have affirmed the same ruling for cable. Therefore, cable is not required to provide common carrier service.
20. *community antenna relay service (CARS)* — microwave service using frequencies between 12.75 and 12.95 GHz for the transmission of broadcast signals to cable system headends.
21. *converter* — a device used to convert television signals from one frequency to another frequency. Cable users need converters to make UHF signals compatible with cable's VHF transmission. Set-top converters expand the capacity of the home television receiver beyond 12 VHF channels.
22. *cross ownership* — ownership of two or more kinds of communication outlets by the same or affiliated individuals or businesses. The FCC has set cross ownership limits to protect against monopolization.
23. *digital signals* — information transmitted in discrete impulses rather than continuous signals. Digital technology is still being explored and has great potential. Currently, some cable systems use digital systems to transmit data like consumer information, news, and computer printouts.
24. *distant signals* — TV signals which originate at a point too far away to be picked up by ordinary reception equipment; also signals defined by the FCC as outside a license area. The number of distant signals cable systems could carry was, until this year, limited by the FCC. The FCC has suspended its distant signal rules, and that action has been upheld in Federal court.
25. *distribution plant* — the hardware of a cable system (amplifiers, trunk cable and feeder lines) attached to utility poles or fed through underground conduits like telephone and electric wires.
26. *downstream* — signals travelling from the headend to subscribers' homes.
27. *dual cable* — a method of doubling channel capacity by using two cables installed side by side to carry different signals.

28. *direct broadcast satellite* — a new television delivery technology, a direct satellite-to-home broadcasting service different from traditional broadcast technology. The subscriber actually installs a receiving dish on his or her property and receives the signal directly from the satellite. This technology is still in the developmental stage.
29. *earth stations* — electronic facilities that use antennas and associated electronic equipment to transmit, receive and process communications via satellite. Most earth stations can only receive signals. Future cable systems may use earth stations to interconnect through domestic communications satellites, creating regional and national cable networks.
30. *exclusivity* — the contractual right to be the sole exhibitor of a program in a particular area during a particular period of time. Until this year, FCC rules required cable operators to delete syndicated programs from imported distant signals if the programs were subject to a local station's exclusivity agreement. The FCC has suspended these rules, and its action has been upheld in Federal court.
31. *facsimile transmission* — the electronic transmission of printed material, pictures, charts, graphs, etc. With special facsimile equipment, a home television receiver may be able to receive mail and newspapers by cable.
32. *feeder line* — an intermediate cable distribution line connecting the main trunk line to the smaller house drops that lead into residences.
33. *fiber optics* — long and very thin glass fibers which have the property of transmitting light signals with very little distortion and attenuation. Light signals can be modulated to carry information such as data or television signals. The potential capacity of fiber optics system is very large — perhaps as many as 1,000 or more TV channels in a single glass fiber.
34. *filter* — a component or circuit that passes the signals of desired channels, and blocks others. Used in trunk and feeder lines for special cable services such as two-way operation.
35. *final license* — the written document issued by the municipality which authorizes the cable licensee to construct and operate a cable system within the municipality. Some of the terms of this document are mandated by statute; others are negotiated by the parties.
36. *grade A contour* — the line encompassing a television station service area in which a good picture is estimated to be available 90% of the time at 70% of the receiver locations.
37. *grade B contour* — the line encompassing a television station service area in which a good picture is estimated to be available 90% of the time at 50% of the receiver locations. The Grade B Contour is larger than and surrounds the Grade A Contour.
38. *grandfathering* — exempting cable systems from regulatory or legislative enactments because (1) they were in existence or operation before the rules, or (2) substantial investments were made before the laws were passed.
39. *hardware* — the equipment involved in production, storage, distribution or reception of electronic signals. In cable it means the headend, the coaxial cable network and production equipment.
40. *headend* — the electronic control center of the cable system. At the headend, the broadcast signals are processed to subscribers' homes. Some communities have multiple headends, depending on the system design.

41. *hertz* -- the unit of frequency or bandwidth of electrical signals. One Hertz is one cycle per second, one MegaHertz is one million cycles per second.
42. *high VHF band* -- the area of electromagnetic spectrum allocated to channels 7 through 13 (174 - 276 MHz).
43. *house drop* -- the coaxial cable that connects each building or home to the nearest feeder line of the cable network.
44. *hub* -- one of two or more interconnected headends that may be needed to provide cable services over a wide area.
45. *in-kind benefits* -- an offer of services or other valuable consideration from a cable company to a community which may or may not bear a direct relationship to the provision of cable television services.
46. *interactive mode* - (see *two-way capacity*)
47. *interchangeability* -- the ability to exchange tapes between different manufacturers' videotape recorders with no appreciable degradation of the playback image.
48. *interface* -- energy which tends to interfere with the reception of desired signals, such as signals on the same or adjacent channels, or "ghosting" from reflecting objects such as mountains, buildings and airplanes.
49. *issuing authority* - the city manager of a city with a plan D or E charter, the mayor or any other city, or the board of selectmen of a town. Under Massachusetts law the issuing authority decides whether to issue a license and selects the licensee.
50. *issuing authority report* -- the document prepared by the issuing authority which sets forth recommended system specifications and which establishes the criteria for assessing applicant qualifications.
51. *license* -- (see *final license* and *provisional license*).
52. *line extension* -- the addition of cable trunk and distribution facilities to an area within the municipality which was previously outside the service area of the operator. (See *service area*.)
53. *local distribution system (LDS)* -- a broadband microwave system capable of transporting a number of television signals simultaneously, often used to interconnect cable system headends.
54. *local origination channel* -- a channel on a cable system which is programmed by the cable system and subject to its exclusive control.
55. *local signals* -- television signals that are received at locations within the station's grade B contour. Cable systems carry "significantly viewed" local stations in their service area.
56. *low VHF band* -- the part of the frequency band allocated by the FCC for VHF broadcast television, including television channels 2 through 6 (54 - 88 MHz).
57. *microwave* -- a technology used for land-based point to point signal transmission. Microwave is used as a relay system for distant programming between cable and broadcast facilities.
58. *mid band* -- the part of the frequency band that lies between television channels 6 and 7, reserved by the FCC for air, maritime and land mobile units, FM radio and aeronautical and maritime navigation. Mid band frequencies, 108 to 174 MHz, can also be used to provide additional channels on cable television systems.
59. *network* -- any interconnected group of communications facilities. Network programming may become prominent among regional cable systems.

60. *pay TV* — television programming available on cable that is paid for on a per-channel or per-program basis. Motion pictures, sports events and other special entertainment events are examples of pay TV made available via satellite or microwave transmission.
61. *penetration (saturation)* — in reference to a cable system, the ratio of the number of subscribers to the total number of households passed by the system. Penetration is an important factor in a system's potential profitability.
62. *performance standards* — the minimum technical requirements that must be met by cable systems, consistent with standards set by the FCC or the local license.
63. *pole attachment agreement* — an agreement between a cable company and a power or telephone company which allows the cable company to attach its cables to the existing poles used by the utility.
64. *pole permit* — the permission to erect poles, which is granted by the municipality.
65. *portapak* — a generic term referring to the portable camera, video recorder and various accessories of a portable videotape system. Portable videotape equipment and technology is used largely by news gatherers for broadcast TV. Its advent has made video production widely available. Many access studios in cable systems have portapaks for public use.
66. *program nonduplication* — an FCC policy which gives a local station priority when a program is being shown on the local station and on a distant station that is brought in by the cable. It is intended to protect the local station's audience ratings.
67. *provisional license* — the written document granted to the successful applicant by the municipality. The provisional license is valid for no more than one year, during which time the applicant is expected to fulfill the requirements set forth in the CATV licensing regulations Section 3.05(1). It expires with the issuance of the final license or the failure of the applicant to comply with the licensing requirements within one year.
68. *regional system* — a technically integrated cable system operating in two or more municipalities sharing certain facilities and operated by a single cable company.
69. *satellite communications* — a new technology for signal transmission. Satellite transmissions have increased the potential of broadcasting while decreasing the costs of long distance relays.
70. *service area* — areas within the community that are proposed to be wired in the final license.
71. *signal to noise ratio* — a ratio used to determine the relative strength of a signal and the amount of interference in the signal's reception. The signal to noise ratio is used to determine the effectiveness of the signals in the area and provide a basis for signal carriage requirements.
72. *software* — programming and programming materials like video tape, slides, scripts or computer printouts.
73. *sports blackout* — the FCC requirement that cable systems delete or "black out" live local professional sports events carried on distant signals.
74. *subscriber* — a person who pays a fee for cable services.
75. *super band* — the frequency band from 216 to 300 MHz, used for fixed and mobile radios and additional television channels on a cable system.

76. *syndicated program* — a program that is sold to individual television stations in more than one market. Syndicated programs are contrasted with network programming.
77. *tap* — a device that connects the feeder cable to the subscriber drop line.
78. *television market* — a geographical area served by commercial television stations and recognized by the FCC as a unit. Television markets are ranked according to size and are used to determine advertising rates. Market delineation is important for cable signal requirements and non-broadcast channel use.
79. *translators* — device used for relaying distant or blocked signals and converting them to another broadcast channel to avoid interference.
80. *terminal* — the subscriber's control box. As technology develops, it may become more than a channel selector and converter, but an actual computer terminal for two-way transmission.
81. *transponder* — a transmitting/receiving device used in satellite communications.
82. *trunk line* — the major distribution cable. The backbone of the cable distribution system that branches off to feeder and drop lines.
83. *two-way capacity* — the ability of a cable system to transmit information in both directions of signal flow. Two-way capacity has important implications for cable system design. It multiplies the potential services of a cable system. It also raises the issue of privacy of the subscriber. Many cable companies offer two-way capacity.
84. *upstream* — signals traveling from subscriber to headend. (See *two-way capacity*.)
85. *UHF* — ultra high frequency; the range of frequencies extending from 300 to 3,000 MHz; television channels 14 to 83.
86. *VHF* — very high frequency; the range of frequencies extending from 30 to 300 MHz; television channels 2 to 13.
87. *VTR* — abbreviation for videotape recorder. A VTR is a machine similar to an audio recorder in technology, yet is capable of recording pictures as well as sound.

A. Service Area and Construction Schedule

Nashoba will make a cable drop available to all individual residences in Belmont including apartment, condominium, cooperative or association buildings, except in the following cases: (i) we are unable to obtain reasonable access, (ii) it is commercially impracticable to provide service, or (iii) all subscribers therein have outstanding charges against their accounts, including service drop charges, and Nashoba's decision not to provide service does not contravene applicable state law. Nashoba's construction plan is nondiscriminatory and will make service available to households of all income levels.

1. Provide a map of the areas to be served coded to indicate the order in which areas will be constructed. (See maps at the end of the section).
 - a. Is the area to be served the entire Town of Belmont? yes. If "yes," will the municipality be divided into cable districts, each served by its own headend? no
If "yes," how many districts are contemplated? N/A
 - b. If the area to be served is not the entire Town of Belmont, define the service area by communities, neighborhoods, etc. N/A
 - c. Is the area to be served included in a regional system? no If "yes," provide a list of the other communities to be included in the regional system and indicate in which communities headend(s) will be located.
 - d. Does applicant plan to make cable service available to certain subscribers on a selective basis? yes If "yes," indicate the techniques to be used (for example, discrete addressing on a system-wide basis or geographical division of the subscriber base).

Please see Section IV.B., question 10, for a discussion of addressability.

2. Construction Schedule by Miles

MONTH

Category	3	6	9	12	15	18	21	24
a. *Aerial plant miles	10	49						
b. Underground plant miles with conduit								
c. *Underground plant miles without conduit	15	15	10					
d. Total plant miles (for month specified)	25	64	10					
e. Cumulative plant miles completed (inception to date)	25	89	99					
f. Cumulative percentage completed (inception to date)	25	89	100					

Total construction period: nine months from date of license grant.

*NOTE: The first month begins upon the grant of the final license. Aerial plant will be constructed within six months from the signing of pole releases. Underground plant will be constructed within nine months from the signing of the final license. This does not include periods during which construction cannot be completed due to weather or other conditions beyond our control.

3. Does the applicant foresee any problems in extending service to all portions of the proposed service area? no If the answer to the foregoing question is "yes," please describe the potential problems.

4. Please indicate whether all commercial areas of the Town will be served. If not, please describe your line extension policy for commercial areas and/or buildings.

We do not plan to serve all commercial areas of the town at this time. If commercial users outside the residential service area wish to have the cable system extended to their places of business, our line extension policy will be to charge for these extensions at a rate of our cost plus a reasonable profit. It should be noted, however, that a number of commercial areas will be included in our proposed service area, since we will need to go through commercial areas to reach residential areas.

B. System Construction Practices

1. (a) Will construction be undertaken by a turnkey contractor? Yes _____ No X
- (b) If the answer to (a) is "yes," has the turnkey contractor been selected? Yes _____ No _____
- (c) If the answer to (b) is "yes," please identify the turnkey contractor. _____
2. Discuss the availability of work crews and equipment as it pertains to meeting the construction schedule completed above. Detail outstanding agreements with construction companies or equipment suppliers. Supply copies of any commitments regarding construction of the Belmont cable system.

Nashoba has contracted with several contractors and equipment suppliers for the construction of our cable systems. At the end of this section is a list of firms we have used in the past; we will most likely select firms from this list to build and supply equipment for the Belmont system. We do not anticipate any problems with availability of either work crews or equipment.

We would not plan to finalize contracts with construction firms or equipment suppliers until we are ready to schedule construction, since these agreements are subject to a bidding and/or negotiation process.

3. Discuss proposed construction standards dealing with safety and reliability. List construction codes with which the contractor will comply.

Nashoba's construction standard (see Appendix) is intended to serve as a guide to unify the construction practices and procedures now in effect throughout the CATV industry. The illustrations contained herein comply with rules of the National Electrical Safety Code and construction practices established as acceptable by our engineering department, and are not intended to supersede local telephone or power company standards.

This manual is intended for authorized persons, firms or corporations placing our plant on poles and for use by the local power company and telephone company to establish CATV standards.

The list of specification changes entered in this manual preceding the illustrations serves as amendment to the illustrations for the purpose of compliance with local telephone company and power company specifications.

This manual is intended to establish standard construction procedure within the company and will be amended in the future in order always to maintain the best construction standards available.

The system will be constructed and maintained in accordance with the following safety requirements and procedures:

- o National Electrical Safety Code (NESC)
- o National Electrical Code (NEC)
- o Occupational Safety and Health (OSHA)
- o National Cable Television Association Safety Manual (NCTA)
- o All Federal, state and municipal construction safety requirements as applicable
- o Utility safety requirements
- o Nashoba's internal safety policies and procedures

4. List or discuss standards utilized in tower construction, marking and lighting.

The following is a description of the Rohn Model 80 Guyed tower designed for Zone B wind load per EIA Standard RS-222-C. This tower is designed to support the following antennas spaced evenly from the 100' level to the 140' level.

- o One J55 (2-6)
- o Two J105 (7-13)
- o One D1338BB
- o One Cushcraft 5 element yagi, YFM5
- o One Cushcraft YUHF-B, not exceeding 5 sq. ft. of projected area and 50 lbs.

This tower is designed to support:

- o One 10' dish with radome at the 140' level
- o One 10' dish with radome (future) at the 155' level
- o One Jerrold Search antenna at the top.

It is assumed that each antenna will use 7/8" transmission line.

Material consists of:

- o All necessary 80 sections with tapered base
- o All necessary guying material with torque near the dish levels
- o One anchor ground kit
- o Two base ground kits
- o One dish mount
- o Step bolts for climbing

5. Do you have a manual of construction practices to be followed by construction crews? Yes X No

If the answer to the above question is "yes," attach a copy of the manual as an appendix to this application.

(Please see Appendix)

6. Do you adhere to the NCTA standards of good construction practices? Yes X No

LIST OF I-NET DROP LOCATIONS

1. Town Hall
2. Town Hall Annex
3. Police Station
4. Light Dept.
5. School Administration Building
6. Leonard St. Fire Station
7. Main Library, Concord Ave.
8. High School
9. Wellington School
10. Burbank School
11. Middle School
12. Payson Park School
13. Fairview Ave. Fire Station
14. Water Dept.
15. Town Garages
16. Kendall School
17. Waverly St. Fire Station/Branch Library
18. Butler School
19. Winn Brook School
20. Branch Library, Oakley Rd.



B. Consumer Complaints and Repair Procedures

1. Describe in detail the applicant's policy for handling consumer complaints, inquiries and repair requests and implementation thereof.

Nashoba's customer service policies are as follows:

- a. Nashoba shall expeditiously investigate and resolve complaints regarding the quality of service, equipment malfunctions and similar matters. Office hours and telephone service are described later in this section. On-call technicians will carry beepers to alert them to problems; routine problems shall be taken care of in less than 24 hours.
- b. Nashoba shall respond to all service calls within 24 hours and correct malfunctions as soon as is reasonably possible under the circumstances. Nashoba shall maintain a competent staff of employees sufficient to provide adequate and prompt service to its subscribers. If the subscriber is not at home, we will leave a card and re-schedule the service appointment.
- c. Nashoba does not charge for repair service. In the event the customer requires repeated service deemed unnecessary or due to negligence, supervisory staff will contact the customer for the purpose of correcting the situation.
- d. Nashoba's policy for service technicians in responding to a complaint by a subscriber is as follows:
 - o At the time the subscriber initially contacts the company with a request for repair service, the company dispatcher will ask the subscriber several questions to identify the nature of the problem.
 - o Uniformed service technicians shall promptly contact the subscriber who is experiencing a service problem. Service calls are scheduled on a first-come, first-served basis.
 - o The service technician will discuss the nature of the service problem with the customer. After identifying the problem or its source, Nashoba's technician will explain to the subscriber the method by which the problem will be corrected.

- o Service technicians will carry a television set to allow subscribers to observe a normal cable picture in the event that the subscriber is experiencing a television receiver problem and believes the cable is causing the picture problem.
 - o Supervisory assistance will be available to accommodate a further level of service response if required.
 - o If the service technician traces the problem to the cable trunk, a trunk maintenance technician will be dispatched immediately to investigate and correct the malfunction.
 - o Subscribers will receive a brief re-education by the technician concerning fine tuning the converter, changing channels, and other service-related areas.
- e. Upon request of the Cable Television Advisory Committee, Nashoba shall, within seven days of receiving such request, send a written report to the CTAC with respect to any complaint. Such report shall provide a full explanation of the investigation, findings, and corrective steps taken.
- f. Any problem or complaint not properly resolved on the customer service representative level will be referred directly to the General Manager for immediate attention. In the unlikely event that the General Manager fails to resolve the complaint, the General Manager will refer the issue to Nashoba's top management. Should our top management fail to resolve the problem, Nashoba will refer the matter to the Issuing Authority or its designated representative for their intervention. If the Issuing Authority cannot reach a solution, the matter will be referred to the state CATV Commission whose decision will be final.
- g. Except where an emergency situation exists which necessitates a more expedited procedure, Nashoba may interrupt service for the purpose of repair or upgrading of the cable communications system. The interruption will occur only during periods of minimum use, and only after a minimum of 48 hours notice to subscribers.

h. At the time of initial subscription, Nashoba shall give each new subscribing household a notice of complaint procedures and a copy of the complaint form in this Section. The notice shall list Nashoba's local telephone number where complaints and inquiries will be received and acted upon. The subscriber shall also be informed of the existence of the CTAC, which will aid in the resolution of subscriber complaints that the Licensee has been unable to resolve. The address and telephone number of the CTAC also shall be listed on the notice.

i. Priority for service is established in the following order:

- 1) System outage
- 2) Distribution outage
- 3) Individual no-picture
- 4) Individual poor picture on all channels
- 5) Individual single channel problems

All routine service shall be handled on a first-come, first-served basis. Every effort will be made to satisfy customer complaints during the initial visit.

j. Records of each service call or complaint will be maintained for 12 months. Nashoba will maintain a daily service complaint and installation log for all its service calls or complaints. We will comply with Federal, state and local requirements concerning service call reporting. Filing of complaints in accordance with the Massachusetts Cable Television Commission will be fulfilled by the company on a quarterly basis.

k. Nashoba will perform its own computerized billing for Belmont. Thus any questions arising over billing can usually be resolved over the phone within a few minutes.

l. Subscribers who are without all cable service for more than 24 hours will receive a credit for this loss of service. Service disruptions for less than 24 hours will be dealt with on a reasonable and individual basis.

- m. Nashoba will periodically air special consumer programs that feature subscriber information regarding billing, customer complaints, and inquiries.
- n. Nashoba will follow CATV Commission regulations with respect to billing procedures.
- o. In addition to the above, Nashoba will commit to the following standards as set forth in Section 9 of the provisional license negotiated with the town earlier this year:
 - 1) Nashoba's customer service policies will conform to the policies set forth in Exhibit C to the license; this exhibit will be taken from Nashoba's application to the town.
 - 2) Nashoba will send notice annually to customers informing them of (i) the complaint procedure, (ii) the address and telephone number of the CTAC, (iii) all programming, rates and deposits, and (iv) procedures for parental lockout and connection of video cassette recorders to the CATV system.
 - 3) Nashoba's billing complaint resolution policies will comply with 207 CMR 10.00 and, as required thereunder, Nashoba, in consultation with the Issuing Authority, will establish procedures for prompt investigation of any billing dispute registered by a subscriber. In accordance with such procedures, subscribers will not be required to pay the disputed portion of a bill until the earlier of (i) resolution of the dispute, or (ii) sixty (60) days after the billing date provided that the Licensee has complied with the billing complaint resolution procedures.
 - 4) Nashoba will not delay or deny service or use of CATV facilities or otherwise discriminate against customers or users on the basis of age, race, creed, religion, sex, handicap, national origin or marital status. The foregoing covenant is not intended to impact programming decisions by Nashoba.
 - 5) Nashoba will meet the following telephone and installation service standards during the term of the final license:

- o All calls to the general information number during business hours will be answered by a human operator; and
 - o Once construction is completed and installation has been formally offered in all areas of the town, 90% of all customer installations, except where a later date is requested by the customer, will be completed within twenty (20) working days after customer request.
- 6) Nashoba will utilize best efforts to complete repairs to the satisfaction of the complainant within 24 hours of notice of complaint. If Nashoba fails to consistently complete repairs within 24 hours of notice of complaints, it will, in consultation with the CTAC, add additional staff or take other appropriate measures to restore its repair record to the above standard. Repairs not completed to the satisfaction of the complainant within 24 hours of notice of complaint despite Nashoba's best efforts or during extraordinary circumstances, such as power outages, will not be counted against Nashoba's repair record.

2. Describe the method by which the applicant will notify subscriber of its complaint, billing, payment, collection, service and maintenance procedures, and provide a sample of each such notice.

Nashoba will provide all subscribers with details of its complaint, billing, payment, collection, service and maintenance procedures at the time of subscription to cable service. New subscribers will also be provided with a complaint form, although they will be advised that complaints may be submitted by telephone or in person at Nashoba's office.

Nashoba uses several methods to ensure that subscribers are aware of all procedures regarding their cable service. First, sales representatives are responsible for providing potential and new subscribers with all pertinent information regarding billing, complaints and service. Secondly, installers provide new subscribers with information about the operation of their

cable service, and advise them of conditions which might require them to call for repair service (as opposed to those which can be solved by fine tuning). Next, a customer service representative calls each new subscriber after installation has been completed to make sure the work was handled properly and to answer any new questions the subscriber may have. Finally, information is provided periodically to subscribers via bill stuffers and alpha-numeric messages on the Community Bulletin Board channel. Sample forms are included at the end of this section.

Complaint Form

Nashoba has adopted the complaint form included at the end of this section. The subscriber will fill out the form in triplicate and send 2 copies to Nashoba Communications (which shall provide one copy to the Issuing Authority), and retain one copy. If desired, one of Nashoba's customer service representatives will complete the form on the telephone. If at any time the town wishes to modify the form, Nashoba will comply with any reasonable request.

3. The applicant will keep the following office hours:

Mondays - Fridays:	<u> 9 </u> am to <u> 5 </u>
Saturdays:	<u> 9 </u> am to <u> 1 </u>
Sundays & Holidays:	<u> </u> am to <u> </u>

For the convenience of Belmont subscribers, we will make available installation and service appointments on Saturday mornings plus one evening per week.

4. What is the required response time after a trouble call is received?

Response by the applicant may take the form of telephone contact by a service employee with the subscriber for purpose of arranging an appointment, or a visit to the premises by a service employee (including use of a doorknob hanger if no one is home).

Within 24 hours: (X)
 Same Day: ()
 Close of next business day: ()
 Within _____ hours: ()
 Other: ()

5. How will trouble calls be received outside normal business hours?

Company employee on 24 hour shift: ()
 Electronic recording: ()
 Answering service: (X)

6. Describe the applicant's plans for responding to system outages.

When there is a major service disruption affecting a significant number of subscribers or an outage affecting the whole system, the following steps will be taken:

- o The chief technician (during business hours) or the on-call service technician (after business hours) will be notified by a dispatcher (during business hours) or Nashoba's answering service (after business hours) that there is a major service disruption.
- o During business hours, all customer service representatives will be informed of the system problem, will provide subscribers who contact the offices with the pertinent information and expected time of resolution, and will record names and telephone numbers of those subscribers who call. After business hours, the answering service will take calls and will advise callers about the nature of the problem and expected time of repair.
- o The technician, with the aid of other service staff, will locate and identify the problem.

- o If the problem is determined to be a computer problem, the 24 hour computer repair service will be contacted. Nashoba Communications maintains 24 hour computer repair contracts for all of its systems.
- o If the problem is other than a computer problem, then the system personnel will resolve (repair) the problem as quickly as possible, with the aid of Nashoba regional staff if needed.
- o The customer service representatives (during business hours) or the answering service (after business hours) will call several of the customers who called in to see if the problem has been corrected, and if it has not, will continue to service the equipment until full service has been restored.
- o All customers who called in will be called back by the customer representatives.

7. How soon will individual trouble calls received outside normal hours be passed on to a repair or service person?

A "no-picture" problem will be regarded as an emergency situation and will be taken care of as soon as possible by an on-call technician. Other service problems will be given to technicians on the morning of the next business day (which includes Saturdays).

8. Where will the applicant's office for the Belmont cable system be located?

Nashoba will locate a facility in Belmont. We have not chosen a location, since the projected occupancy date is not known at this time. It should be noted that a number of regional functions serving Belmont will take place in our corporate office; for example, Belmont marketing and sales activity will be supervised by our corporate marketing manager and sales manager; accounting and financial services will be performed there, as will other appropriate services.

9. Describe the applicant's plans for notifying local residents of initial construction in their neighborhood.

Prior to initiating underground construction, we will notify neighborhood residents in writing, either by mail or by notices left at residents' homes. We will also make construction information available through local newspapers.

COMPLAINT FORM

To be completed by subscriber or non-subscriber:

name _____

date _____

address _____

daytime phone no. _____

evening phone no. _____

account no. _____

date of incident _____

Description: _____

To be completed by Nashoba:

date received _____

date of resolution _____

Above completed by subscriber
 staff

Handled by:
 CSR _____
 Supervisor _____
 Manager _____

sub satisfied?

Yes No

Action taken: _____

Subscriber follow-up contact: date _____ by _____

telephone

letter (attach copy)

talked to: _____

date sent: _____

C. Billing Practices

1. Please describe in detail billing practice procedures and policies (e.g., type of billing form to be used for early and late payments, rebate policy). Include a billing form sample. If an independent billing agent is expected to be engaged, identify the agent and the type of billing system to be used.

Nashoba's billing procedure is an important feature of our proposal to the Town of Belmont. By investing in our own in-house billing system, Nashoba has virtually eliminated customer complaints regarding billing. With software custom designed and tailored for Nashoba, our DEC VAX 730 mainframe computer has been fully interfaced with our addressable control computer. Any desired change in a customer's service is entered into our billing computer, and the change is simultaneously and automatically updated on the addressable control computer.

This single step process represents a vast improvement over the standard two-step operation, where billing changes must be "batched" or processed on a time-shared system. In a batch system, billing changes are only processed every two weeks.

In contrast, Nashoba's subscribers will always have immediate, up-to-date answers to any billing question which might arise. Our subscribers are assured of receiving accurate, real-time invoices that will always represent exactly those services received during that billing period.

We believe that customer service is as important an aspect of cable television as programming. Because Nashoba's customers receive clear and accurate invoices, our phone lines are clear of billing inquiries. The efficiencies brought about by our in-house billing system free our customer service representatives to focus on other areas, such as providing programming information and arranging for service calls.

Subscribers to Nashoba's cable system all have access to their billing file for personal review during business hours. Nashoba shall provide all new subscribers with full details of our billing procedures, as well as our credit policy regarding disruption of service and disconnect policy for non-payment.

Nashoba may terminate service to any subscriber at any time for good cause, including non-payment of fees and charges, unauthorized tampering with cable equipment, and abuse or destruction of cable property. Nashoba may levy reasonable collection and/or interest on accounts which are seriously delinquent.

At the end of this section are copies of Nashoba's billing policies and information sheets which are provided to all subscribers.

D. Customer Service Performance Evaluation

1. Please describe in detail the methods and standards the town could utilize to evaluate consumer service performance with respect to such matters as service calls for repairs, telephone response time and initial installation. An example of an evaluative standard would be that 90 percent of the time repair calls would be answered on the same day.

We would suggest that the town use our policies and procedures, described in detail in response to the questions in this section, as a starting point for evaluation of our performance. We will assist with this process in several ways: first, we will survey our subscribers periodically to determine their satisfaction with our service and will make survey results available to the town. Second, we will keep records of customer complaints and resolutions to problems, as required by Massachusetts state law, and make these records available to the appropriate authorities.

Nashoba uses an independent firm to conduct surveys of our subscribers. The firm employs a very detailed, four-page questionnaire to determine our subscribers' satisfaction with every aspect of Nashoba's cable service, and provides us with an in-depth analysis of survey results. We in turn use these results to refine and improve our programming and service policies.



QUALITY CONTROL: FOLLOW-UP

Subscriber: Name _____ Date _____
Address _____ Installed _____
Account Number _____ Phone _____

To: _____ From: _____ Date: _____

Problem/Request

Action Taken:

Date: _____

Quality Control 2nd follow-up:

Date: _____

Subscriber comments:

Upgrade:

Previous Service Level: _____

Service(s) Added: _____

New Billing Information: _____

Date Added: _____

qc8/86
8/86 1.5K

CUSTOMER NAME _____
CUSTOMER ACCOUNT # _____
ADDRESS _____
(Premises to be Serviced)
CITY _____
PHONE _____

	CONVERTERS	PROM
#		
#		
#		
Total Remote Controls Received		

This Agreement constitutes the sole and entire Agreement between the undersigned Customer and Nashoba Cable (hereinafter NC). No other terms, conditions, warranties or representations (implied or express), shall be binding on or imputed to NC except as expressly included herein.

The parties agree as follows:

- General.** NC shall provide cable television service to the Customer and the Customer shall pay NC for the cable television service the fees, rates and charges established by NC.
- Right to Install.** NC shall have the right to install, maintain, service, repair and replace any and all components of the system for the purpose of this Agreement on the premises to be serviced. If Customer is not the owner of the premises specified to be serviced in this Agreement, he or she shall indemnify and hold NC harmless from any and all claims of the premises' owner or any other interested parties which arise out of the performance of this Agreement. Customer represents that either as owner or tenant of the premises, Customer is fully authorized to enter into and perform this Agreement and to authorize NC to enter into said premises.
- Access to Customer Premises.** Customer agrees to allow representatives of NC access to Customer's premises at all reasonable times to inspect and maintain the equipment and, upon the termination of this Agreement, to remove the converter and remote unit from the premises, provided however that failure of NC to remove the converter and remote unit shall not be deemed an abandonment thereof.
- Ownership of Converter and Remote Unit.** The Converter(s) and Remote Unit(s) delivered and installed hereunder or pursuant to any subsequent installation shall at all times remain the property of NC. NC may at its sole option supply new or reconditioned converter equipment which Customer and NC agree has a unit value of \$250.00 and a remote unit which has a value of \$50.00. Customer hereby agrees to pay for any and all repairs or replacement of the converter and remote unit except such repairs or replacement as may be necessary by reason of normal and ordinary wear or by reason of defects of material or workmanship therein. Customer is responsible for remote control(s) battery replacement.
CUSTOMER AGREES THAT IF THE CONVERTER(S) AND REMOTE UNIT(S) ARE NOT RETURNED IMMEDIATELY AFTER TERMINATION OF THE AGREEMENT THE CUSTOMER SHALL BE LIABLE TO NC IN THE AMOUNT OF \$250.00 FOR EACH CONVERTER AND \$50.00 FOR EACH REMOTE UNIT. CUSTOMER SHALL CONTINUE TO BE LIABLE FOR CONTINUING MONTHLY CHARGES UNTIL THE CONVERTER AND REMOTE UNIT ARE RETURNED.
- Repairs and Modifications During Service.** All repairs and modifications of the system shall be made only by NC or its authorized agents. Customer agrees not to disturb, tamper with, re-route or in any way interfere with any component of the system. Customer further agrees that he will not attach any electronic, or other type device thereto except a standard television or FM radio receiving set. Any unauthorized connection or modification of said installation will be considered a breach of the Agreement and thus cause for disconnection, and NC shall be entitled to recover damages for such tampering including, but not limited to, the value of NC's services obtained without payment, the cost of repair of service, plus reasonable collection costs. Any unauthorized tampering or interfering with the cable television system is a criminal violation of Chapter 166A, Section 21 of the General Laws of Massachusetts.
- Taxes.** The Customer agrees to pay all federal, state and local taxes, if any, which may in the future be imposed or levied on, or with respect to service and installation charges for all equipment except converters.
- Breach of Agreement.** In the event of any breach of this Agreement by Customer, whether deemed material or immaterial, or in the event of failure of Customer to abide by the rules and regulations of or to pay the rates of NC, the service may be disconnected at any time without notice and, at the option of NC, the converter and remote unit, if applicable, removed. Failure of NC to remove its converter and remote unit or any equipment shall not be deemed an abandonment thereof. Customer shall do all things reasonably necessary to facilitate NC's removal of the converter and remote unit. If NC is prevented from recovering its converter and remote unit because of Customer's act or failure to act, Customer hereby agrees to pay NC \$250.00 per converter and \$50.00 per remote unit. If service is disconnected by reason of Customer's breach of the payment provisions of the Agreement, NC shall reconnect only upon payment by Customer of all delinquent fees and charges, reasonable collection expenses and reconnection charges. If service is discontinued for reasons other than non-payment, the connection shall be at the option of NC.
- Complaint Procedure.** Any questions about installation, billing, equipment or the service being received should be brought to the attention of the NC Customer Service Department serving the Customer's area. If the matter remains unresolved and the Customer does not receive a satisfactory response within thirty (30) days after a written complaint is filed with NC, the written complaint should be brought to the attention of the official designated by the Franchising Authority to administer these complaints. If the matter still remains unresolved, a meeting will be held with a representative of the Franchising Authority and a representative of NC to further discuss and resolve the matter.
- Costs and Attorney Fees.** The Customer agrees to pay reasonable costs and attorney's fees arising out of any course of action to collect any monies due by the Customer to NC as a result of a breach of this Agreement.
- Assignment.** This Agreement is not assignable by Customer. Any attempt by Customer to sublet, assign or transfer any of the rights, duties, or obligations of Customer under this Agreement without written approval of NC is prohibited.
- Pay Options.** It is understood that NC's premium channels are optional services which entitle the Customer to certain premier and encore movies, sporting events and specials each month by payment of an additional fee as established by NC.

By delivery of a copy of this Agreement and installation of the converter(s) and remote unit(s) NC agrees to the terms and conditions of this Agreement as set forth above.

NASHOBA CABLE

The undersigned Customer confirms installation of the above numbered converter(s) and remote unit(s), acknowledges having read this Agreement (a copy of which he or she acknowledges receipt), and in consideration of the installation of the converter(s) and remote unit(s), the Customer agrees to and will abide by, the terms and conditions of this Agreement as set forth above.

COMPANY REPRESENTATIVE

CUSTOMER

THINGS YOU SHOULD KNOW ABOUT YOUR CABLE INSTALLATION

**Nashoba
Cable**
■■■■■

To insure that you receive the most efficient and timely installation, please consider the following suggestions prior to the arrival of the cable installer.

- The installation is scheduled as an AM, PM or all-day appointment. Please leave yourself a reminder of exactly the date and time you will be installed. If for any reason your plans change and you cannot be present for the scheduled installation time or date, please call the Nashoba office prior to your appointment.
- "AM" is from 8 am to 1 pm; "PM" is from 12 noon to 6 pm and "all day" is from 8 am to 6 pm. While AM, PM, and Saturday installation dates are available, they fill up fast. We can generally schedule your installation for an earlier date if it is scheduled for an "all day" during the week.
- If you are having cable stereo service (FM) installed as part of one of our packages, please have your receiving equipment located next to the TV set.
- Please remove all valuables and/or breakables from the top of your TV set to avoid accidental breakage.
- Plan for the location of your TV set in advance. Remember to have any additional TV sets which are to be installed in place prior to installation. Each converter installed must be connected to a TV. Converters cannot be moved from room to room.
- You may wish to leash your pet during installation.
- If inclement weather exists, you may wish to place newspapers or another floor covering over carpeted or newly waxed areas. If severe weather conditions exist, we reserve the right to cancel the installation in the interest of safety for our installers.

* * * *

The following is a brief description of the installation process which is usually completed within 60-90 minutes. Your installer will be able to answer any questions you may have regarding the actual procedure.

- Cable service is installed by running a cable line from the utility pole to a point in your home. Then, just like the installation of your telephone line, the cable enters the home through a small hole about ½ inch in diameter. The cable is run to the back of the TV set and is connected to the channel selector, or "converter." Another cable connects the converter to the TV set. Your installer will give you a hands-on demonstration of how the converter works.

- A maximum of six feet of cable will be provided behind the TV.
- If you want your VCR connected to cable, be sure to discuss with your sales person which of the four Nashoba VCR options best suits your needs. The installer will only connect the option you have selected on the sales order.
- In standard installations, wiring will be exposed, but placed out of sight when possible. Nashoba's installers are not authorized to conceal or "fish" the cable within the walls. If this type of installation is desired, you can, prior to installation: run the cable yourself, consult with your own outside contractor, or Nashoba can give you an estimate for a custom installation. Nashoba will provide the cable in advance for subscribers who wish to have this type of work performed.
- An additional installation charge will be incurred for non-standard installations. These include long drops (the feed from the main cable to the house) and underground drops in aerially fed areas. Such charges will be collected prior to installation.

Nashoba Cable requires the presence of a responsible household adult (not a neighbor) over 18 years of age in order for an installation to be done, and to sign a service agreement.

Nashoba Cable

NASHOBA CABLE BILLING PROCEDURES

All subscribers are billed for service monthly. Prior to installation, and usually at the point of sale, Nashoba requires an advanced payment of one month's cable service to be applied to the subscriber's first bill. Each bill is for cable service to be provided during the calendar month in which the bill is received. The first bill for a new subscriber, or the first bill after an additional service has been installed, may include a partial month charge for the month's advance service. Payments for current charges are due and payable as of the "due date" listed on the bill, usually the 10th day of the month billed. Upon disconnection of all or a part of the cable service, an amount from the date of disconnection to the last day of the month billed in advance will be credited to the subscriber's account. All subscribers are billed from the date they are installed to the date they are disconnected.

SERVICE ADDITIONS AND DELETIONS - Subscribers may change services during normal business hours by calling or visiting Nashoba's Customer Service Department. Service charges may also be requested in writing, in which case the change shall take effect within 48 hours of receipt of the written notice. The appropriate pro-rated charge or credit will be made simultaneous with the service change, or not later than 48 hours after receipt of the request for the change. Therefore, Nashoba reserves the right to require 48 hours advance notice to effectuate a change of services or to disconnect total service, and the subscriber remains liable for service until the change is made or disconnection occurs. The credit or charge normally will be reflected in the next month's bill. However, a change in service level made after the office billing assessment is conducted within a given month will not be reflected until two bills hence. A service charge for adding a premium channel, or for exchanging one premium channel for another, may apply. This charge will be included in the subscriber's next bill.

DELINQUENT ACCOUNTS - A subscriber is delinquent if full payment for the amount billed is not received by Nashoba within 30 days from the due date of the bill. Nashoba will send a notice by mail to a subscriber whose bill is outstanding for 30 days stating the amount due, and its intent to disconnect service if payment for the outstanding balance is not received within eight (8) business days from the mailing date of this delinquency notice. Once service has been discontinued, a reconnect fee will be levied for restoration of service. Nashoba will not terminate service solely for non-payment of a disputed portion of the bill. Subscribers who have been disconnected for non-payment must pay the outstanding balance plus all reconnect charges, late charges, and returned check charges prior to reconnection.

LATE CHARGES AND RETURNED CHECKS - Nashoba will charge a late charge of five (5) percent of the balance due for a delinquent bill that remains unpaid eight (8) business days from the mailing date of the delinquency notice. This late charge is in addition to any reconnect fee which is charged. In addition, Nashoba will also charge a service fee for each returned check.

SERVICE VISIT CHARGES - Nashoba will not charge for cable-related service calls. Nashoba may charge for service calls when it is determined that the service call was generated by a problem not arising from delivery of the cable service, such as work on VCRs, TV set problems, and other non-cable equipment.

LOST, STOLEN OR DAMAGED EQUIPMENT - The subscriber is responsible for all Nashoba-installed cable equipment including, but not limited to, the converter and the remote unit. In the event the equipment is lost or stolen, the subscriber will be charged for the equipment. Stolen equipment should be reported to the police immediately, and to our office by the next business day. In the case of damaged equipment, the cost to repair plus administrative costs will be charged to the subscriber. Upon service termination, the subscriber remains liable and will be charged for the converter and remote unit until these items are returned to Nashoba Cable.

CREDITS - A subscriber who experiences an interruption in service for 24 continuous hours may request a credit for the appropriate pro-rated portion of the bill. The request may be made to the Customer Service Department by phone, in person, or in writing. The credit will appear on the next month's bill. The service interruption must be the fault of Nashoba and not the subscriber's television and the request for credit must be made within 15 business days of the service interruption.

BILLING DISPUTES AND COMPLAINT PROCEDURES - Subscribers who wish to dispute a bill must do so within 30 days from the due date of the bill. The subscriber shall remit to Nashoba the undisputed portion of the bill. Failure to remit said undisputed portion of the bill within 30 days from the due date shall cause the subscriber to forfeit any rights to dispute any portion of the bill. Nashoba shall promptly investigate any complaint, and will give an explanation to the subscriber within 15 working days of receipt of the complaint. Upon Nashoba's informing the subscriber of the disputed amount that Nashoba determines is owed, that amount shall be immediately due and payable. If this disputed amount is not paid within 10 working days, the portion of the bill represented by this amount is considered delinquent and is subject to the above disconnect procedure. A subscriber who is dissatisfied with Nashoba's explanation may contact the Issuing Authority to inquire about any complaint resolution mechanisms available through the cable license or Issuing Authority. If, following these steps, the dispute remains unresolved and involves amounts of \$400 or less, the subscriber can petition the Massachusetts Community Antenna Television Commission within 30 days of the final action of any above-mentioned party. The Commission may proceed to resolve the dispute if all parties agree in writing to submit the dispute to the Commission and agree to be bound by the Commission's decision.

Reporting Procedure

Bi-annually, we will photograph the frequency response of any amplifier. We will indicate the absolute calibration of one vertical line on the photographs. We will also photograph the responses at 2 dB/CM vertical sensitivity with frequency markers on, and include the photographs with the weekly report. Using the same techniques, we will photograph the response of the most extreme amplifier for every trunk run and include it in the report for the week of its maintenance. We will include input/output pilot levels, pad and equalizer values, AC and DC levels, cascade depth, amplifier number and approximate temperature on all photographs.

At System Extremities

We will measure the carrier-to-noise ratio for the highest and lowest channels on a monthly basis to pinpoint performance changes. In addition, each month we will take proof-of-performance readings at at least three extremities to monitor system performance. If for any reason these tests show changes from the original performance reading, a more frequent photographing schedule may be adopted and corrective action taken.

Headend Maintenance Procedures

The following procedures will be used for sweep response testing to ensure optimum headend performance. They will be performed bi-annually. Some of these tests will be performed annually during the FCC proof-of-performance.

- o Nashoba shall designate a field strength meter as the system standard test meter and all meters will be referenced to it. The person performing the maintenance shall check the headend levels daily with this meter. The amplitude calibration of the receivers used for the maintenance measurements must agree within 1 dB of the system standard, the field system meter in the headend and the instrument used to measure the daily levels.
- o We will measure return loss on all antennas. We will take this measurement when the station(s) received by that antenna is/are off the air, if at all possible.
- o We will correct signal levels from antennas for down-lead loss to show antenna output level.
- o According to the manufacturer's recommended procedures, we will sweep each processor, modulator and receiver bi-annually to determine frequency response flatness. We will record the input level to the processor. We will examine the output of each unit for spurious signal on a spectrum analyzer from 5-440 MHz with 60 dB dynamic range to ensure that any beats, intermod, or image of IF products will be of sufficiently low level so as not to cause degradation in other portions of the spectrum.

- We will sweep all the headend mixing network including interconnecting cables for flatness and return loss, and sweep directional couplers and splitters for isolation. We will check to see that radiation and ingress are not discernible.
- We will determine that all levels, both input and output, are correct and that no spurious products or noise originate in the FM equipment.
- We will check to see that C/N from the headend is +58 dB or greater.
- We will visually inspect the tower for defects and other faults. In addition, annual checks of the tower will be conducted by an outside tower specialist.

Schedule For Signal/Noise and Other Measurements on Longest Trunks

These measurements will be taken monthly.

Satellite Station Maintenance Procedures

Nashoba will adopt the following procedures and schedules with regard to maintaining satellite earth stations:

- The earth stations will be visually checked bi-monthly for structural defects.
- We will check the power levels of the LNBS every month using the spectrum analyzer. This level will be recorded to check any change in received power levels.
- Bi-annually, we will perform a center of the box satellite alignment in order to maximize fade margin. Using this procedure, the dish is aligned with the satellite when it is in the center of its geosynchronous orbit.

- o When there has been an ice storm or snowfall, the satellite dishes will be cleared as soon as possible of any accumulated precipitation in order to maintain antenna performance.

Distribution System Maintenance Procedures

Aside from the amplifier maintenance procedures set forth above, we will undertake the following distribution system maintenance procedures:

- o The entire system will be continuously patrolled by service vehicles equipped with leakage detection equipment to determine egress from any part of the system.
- o In addition, every six months all trunk extremities of the system will be swept with a Wavetek 1855B/1865B CATV system sweep.
- o The technical staff will visually inspect the system on a daily basis as service calls are made, for faults in the cable, taps, drops and connectors. Any sighted defect will be reported to the system engineer for corrective action.

Fault Isolation Techniques

The following two fault isolation techniques will be utilized:

- o Detection of kinks and minor structural damage will be isolated by the use of the bi-annual system sweep we proposed above.
 - o Detection of underground and aerial cable breaks will be detected and isolated by the use of a Visual Time Domain Reflectometer (TDR). This piece of equipment gives the technician a visual display of the cable being tested. It will indicate faults in the cable as either opens, shorts, or discontinuity in the cable.
17. Provide a plan for interconnecting access channels with the other cable systems serving the area.

Nashoba will actively cooperate with all neighboring cable operations to achieve interconnections. The company will utilize standard industry specifications to facilitate interfacing and will share interconnection costs on a reasonable basis with other cable companies.

18. Describe the financial commitment of the applicant to interconnection.

We plan to interconnect Belmont's cable system with neighboring communities and have included sufficient funds under our distribution budget to accomplish this aim.

19. Describe any additional system features not described elsewhere.

N/A

20. Please describe the interactive capacity of the system and when it will be operational.

Nashoba proposes to build a cable system which is fully capable of two-way interactivity. This two-way design contemplates the availability of services such as pay-per-view, home security, medical monitoring, and home banking and shopping. Nashoba will monitor the development of these interactive services, and will offer them to Belmont's subscribers as they become economically and technologically feasible.

The separate Institutional Network which we propose for Belmont will be two-way activated from day one. This will provide interactive capability to municipal departments, schools and other institutions and businesses.

21. Specifically describe a plan for radio frequency noninterference. The plan must comply with all applicable technical rules contained in Part 76 of the Rules and Regulations of the Federal Communications Commission (47 C.F.R. Part 76) including, but not limited to, cable radiation limits established by the FCC in Section 76.605(a)(11) of its rules.

Nashoba is aware of the concerns of ham radio operators, as well as agencies which use radio transmissions for public safety and other uses, with regard to interference that can be caused by improperly constructed cable systems. We will propose avoidance of certain frequencies likely to conflict with Belmont use of FCC authorized free space radio communication services.

Quite apart from our willingness to avoid use of channels which may conflict with free space radio communication services, we will also use the most stringent construction practices to minimize or eliminate any potential mutual radio interference. These practices include the following:

- o We will use RG 6 and RG 11 tri shielded drop cable. This cable is 100 percent shielded. This compares with the 67 percent shielded drop which is most often used in the industry. RG 11 tri shielded drop is the standard cable used by Nashoba in all of its cable installations. It is Nashoba's belief that if a cable operator ever desires to activate two way capability, utilization of tri shielded drop cable is an absolute necessity to prevent unwanted interference.
- o We will use high pass-band filters in the ground blocks. Again, unlike many other cable companies, we have made these filters part of our standard installation practice. The use of these devices enables us to filter out any interference at the 5-30 MHz return band caused by a subscriber's poorly matched television system. The only time we will use a standard ground block is where the return frequency is being used by the subscriber.
- o As we have done elsewhere, we will terminate all F ports at the taps with locking terminators. In addition, all F ports on taps will be siliconed to reduce corrosion of the taps. This helps prevent ingress and egress of spurious signals in the system.
- o As in all our builds, we will use RF shielded line connectors, which also insures signal integrity. These connectors are also protected by the use of heat shrink, which helps maintain mechanical tightness of the connectors.
- o All exterior connectors will be protected by weather boots--another construction practice which is standard for Nashoba. This practice minimizes the opportunity for water ingress and prevents corrosion at connection points.

- o All F connectors installed in Belmont will be fastened to the cable with the use of crimpers. These are the tools which securely fasten the fittings to drop cable. This is the most effective way of securing F fittings.
- o All line equipment, both active and passive, will have RF shielding. This standard practice will, of course, provide additional protection against potential interference.
- o Our construction standards require the maintenance standards of expansion loops at every pole at every piece of equipment. This practice is critical to long-term system tightness.
- o All of our construction and technical staff are trained in proper tightening techniques.

22. If any equipment or facilities will be located outside of Belmont, describe in detail.

Belmont will be served by Nashoba's billing computer which is located in Westford. There is also a possibility that Belmont would be served by a headend located outside the town, although we expect to choose a site in Belmont. In addition, as described elsewhere in this application, some customer service functions and corporate activities (accounting, etc.), will be provided by our corporate staff in Westford. In all other respects, we anticipate that Belmont will be a self-contained system.

5. Describe any ancillary services to be provided, and, in the case of town services (e.g., emergency alert) from where the services will originate. Also, indicate the number of channels available for ancillary services.

The Override Alert System proposed by Nashoba, shown on "Figure 1," provides a method of complete channel carriage interruption with an audio transmission. The Override Alert System is activated via the Touch-Tone telephone system. Each Commander IV Jerrold unit in the channel carriage is overridden at the IF stage with an auxiliary IF source (C4M-IF-HI). The built in IF relay of each Commander unit is controlled by an external tone decoder through the Commander's back-panel, terminal block connections.

The Override Alert System may be upgraded with a video signal by simply connecting a source (for example: an alphanumeric generator) to the video input of the C4M-IF-HI. The activation of the system, however, is still audio dependent.

The Emergency Alert System hardware will be located at the headend. Keyboard units which can be utilized to provide messages on all cable channels can be placed at locations throughout the Town of Belmont, such as Town Hall, police and fire stations, and the school administration building.

The Touch-Tone feature of this system may be programmed for either a manual or timed deactivation for the user's convenience. Manual deactivation can override a preset time limit. We recommend a 25 second time limit which can be shortened simply by depressing a single digit on the phone keypad. The time limit is a safeguard in case someone forgets to deactivate the override system after transmitting a message. Upon deactivation, all Commanders will return to their original state.

Override Alert can be utilized on all cable channels.

6. Please include as an appendix to the application any signal and site surveys conducted.

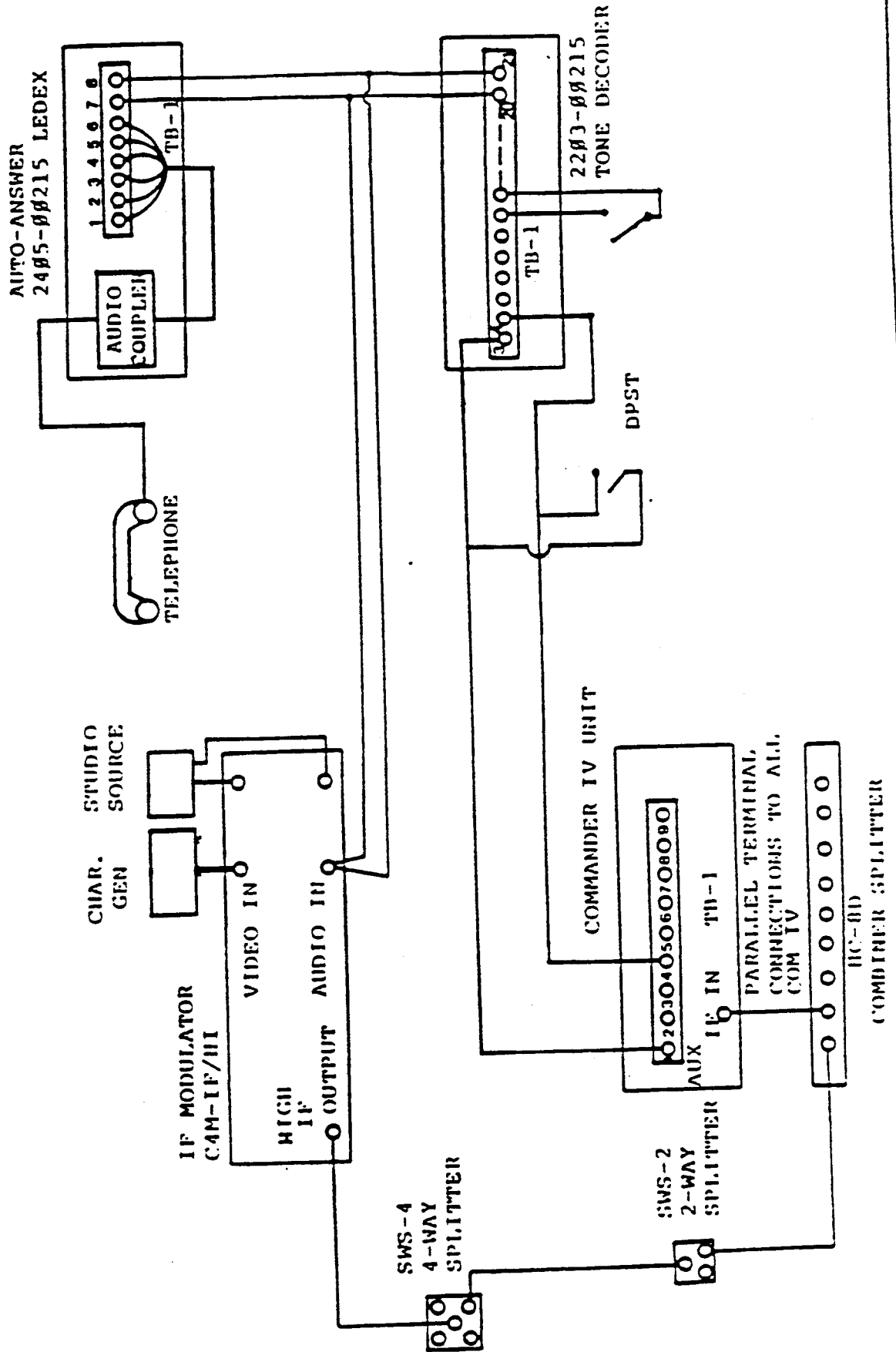
N/A (headend site not yet determined)

7. Will battery standby power be provided? If "yes," will it be provided at every station? If it will not be provided at every station, where will it be provided? Describe the standby power units proposed to be used.

FIGURE 1

COMMANDER ALERT SYSTEM

(AUDIO VIA TELEPHONE WITH STATIC VIDEO DISPLAY)



Nashoba will construct the Belmont cable system with provision for standby power in the headend and with standby capable power supplies, provide standby power throughout the I-Net as needed, and make provision for status monitoring as it deems appropriate. Descriptions of the systems we propose to use are set forth below.

Nashoba proposes to use Powervision 113 power supplies on all principal trunk runs on the Residential Network and on all trunk runs throughout the I-Net. These power supplies are fully uninterruptable, and provide up to 900 watts of power at 115 VAC, 60Hz. In the event of power failure, the inverter operates from a 36 volt battery pack for up to five hours on a 720 watt load. This time period of five hours is approximately double the operation of the standard stand-by power supply. Power vision is produced by a subsidiary of C-Cor and is fully compatible with the C-Cor status monitoring equipment we propose to use. The ability to monitor stand-by power supply vitals is a recent development.

8. Identify and describe standby power facilities other than cable power supplies (e.g., headend, TVRO).

15 KW Onan propane-fired stand-by generator will be located at the headend.

9. Will automatic status monitoring be provided?

A key technical feature in Nashoba's distribution network is C-Cor's Status Monitoring System. This computer-controlled, addressable, interactive system can pinpoint problems in the Residential and Institutional Networks as they occur. The exact location and nature of the problem are alarmed on a CRT screen at the office, so Nashoba's maintenance crew can be dispatched directly to the source of trouble without making a costly and time-consuming pole-by-pole search of the system. The status monitoring system has two elements: a status controller at the headend and a status transponder in each trunk station. The status controller includes an RF modem, computer, and peripheral equipment required to automatically or selectively poll each trunk amplifier. The controller alerts Nashoba's engineers and technicians to significant status data. The transponder is a remotely located device which measures signal levels and

powering status, and performs certain control functions. Up to 1,024 transponders can be controlled by a single status controller. Complete updated status on each trunk amplifier in the system can be logged as often as once each minute to provide rapid and efficient system performance information.

Status monitoring measures not only various performance parameters of the trunk stations but also the standby power supplies. The importance of continuing testing of standby power supplies is not to be underestimated. First, these supplies utilize a back-up battery system. The viability of the batteries is continuously tested by the status monitoring system. Further, in many systems, power outages are more common than amplifier failures. Instantly knowing where and when the system has gone into a standby mode can make the critical difference between relative calm and a flood of phone calls from subscribers.

Status monitoring is also an important facet of any system which contemplates the utilization of data transmission, since this function demands a high degree of reliability. If the I-Net is used for this purpose, status monitors will be installed as needed to meet the requirements of I-Net loading.

10. Will the applicant offer a non-converter service tier?

Nashoba Communications will utilize addressable converters for all subscribers, regardless of which tier of service is selected.

Each converter will be assigned an "address" code and tied into a Microvax 11 Addressable Control Unit, which in turn will be interfaced with Nashoba's in-house Microvax billing computer. This combined computing power will allow Nashoba's office personnel to respond almost instantaneously to subscriber requests for changes in service, and to answer any billing questions as they arise.

Addressable converters will not only mean greater convenience for the consumer but also will result in certain operating efficiencies for the system. For example, it will not be necessary to dispatch a service technician to the home of a subscriber desiring a change in service; premium services can be

added to the system without costly pole mounted "trap" rearrangements; lower maintenance costs will be achieved due to the higher reliability of digital technology (no buttons); theft of service will be minimized since only authorized converters will work on the system; a subscriber's billing record can be maintained on a more current basis; and pay-per-view programs, not easily available to non-addressable systems, can be provided.

Addressable converters also make possible a number of innovative cable applications requiring selective program distribution, such as cablecast of educational programs to homebound students, the delivery of specialized training programs to fire fighters' homes at a particular time of day or evening, the transmission of nationally syndicated medical programs, via satellite, to Belmont physicians and health professionals, or the dissemination of educational programs among schools.

Addressable converters will allow for personalization of the local cable system to the particular needs and interests of Belmont, its residents and community institutions. It is a technology which releases the potential of cable television to offer an expanding array of communications possibilities.

A. Channel Capacity

1. What is the overall system capacity in MHz? 450 MHz
2. What is the number of downstream channels?
60 450 MHz Channels
3. What is the number of upstream channels?
4 450 MHz Channels
4. What is the number of institutional channels proposed? 67
Downstream: 30 450 MHz Channels
Upstream: 37 450 MHz Channels
5. If all of the above channels will not be activated at the time the system is placed in operation, please describe which channels will not be activated at such time and provide a timeline for their activation.

We plan to activate two channels on the I-Net initially, with the rest activated as needed.

Following is a detailed description of our proposed cable system for Belmont.

System Description

Nashoba proposes to construct a two-way capable 450 MHz addressable system providing 60 downstream and four upstream channels on the Residential Network. The Residential Network will provide service for every resident requesting service. In addition, we will construct a 67 channel two-way interactive Institutional Network to serve the public institutions and private businesses in Belmont. The built-in capacity and flexibility of the proposed Residential Network anticipate the addition of various interactive features as they became economically feasible, such as burglar and fire alarms, data transmission, home shopping and banking, and subscriber polling. The Institutional Network will be designed to provide immediate bi-directional service and will link municipal departments, the schools, and other public buildings in Belmont.

Headend Site

Nashoba has identified a number of locations inside and outside of Belmont that would be suitable as headend locations, and we anticipate no difficulty in making a final site selection. Two of these sites, McLean Hospital and Middlesex Hospital, appear to be particularly viable options at this time. We have not listed other sites where discussions are still in progress, as it might be premature to do so. Preliminary engineering studies indicate that each of these sites will produce a high quality signal throughout Belmont. In addition, we have left open the possibility of leasing signal from a headend in a neighboring community.

Tower

The tower will be constructed to the wind loading requirements of the region. Attached to the tower will be antennas to pick up UHF/VHF/FM signals.

Satellite Reception

Nashoba proposes to use Andrews 4.5 satellite receivers, which will be capable of simultaneous reception of all the satellites in a 74 degree range. The Andrews receivers will allow Nashoba to pick up specialized programming, such as the National Fire Protection Association's training series, for use in Belmont. Low noise amplifiers with block converters will be added to pick up specific programs.

Headend Building

The building to house the equipment will be built in consideration of the land environment. In addition, Nashoba will meet all zoning and other applicable requirements.

Overall System Performance Specifications

System Description

The system shall be capable of carrying 60 TV channels plus the entire FM band within a passband of 54 MHz in the forward direction.

- o Trunk amplifier stations shall be spaced in the system for bi-directional operation and contain return amplifier modules and filters.
- o Since bi-directional operation shall be implemented, from the start of operation any single trunk line in the distribution system shall be capable of carrying four TV channels from trunk system locations to the system origination point within a passband of five to 30 MHz.
- o Line extender amplifiers shall contain filters splitting forward and return signal paths and return amplifier modules.
- o Since bi-directional operation shall be implemented, from system turn on, any single feeder line emanating from any trunk amplifier location shall exhibit a passband of 5 to 30 MHz in the return direction from subscriber tap ports to the trunk return system. The passband shall be designated to carry one TV channel or equivalent data loading, anywhere within the passband, through any one feeder return path. Up to four TV channels, or equivalent data loading, may be returned through the feeders by using a separate feeder return path for each channel.

System Performance

- o As of the start of construction, all system performance specifications contained herein meet or exceed all FCC rules and standards, adopted February 2, 1972.
- o The feeder cable system shall be designed to provide at 70 degrees F. a level of not less than +6 dBmV at 54 MHz and not less than +11 dBmV at 450 MHz by more than 5dB as measured at the output ports of any RCA tap. Terminating taps shall be utilized where required. The feeder level at 120 degrees F. shall not be less than +5 dBmV at 54 MHz and not less than 9 dBmV at 450 MHz as measured at the output ports of the tap.
- o Within the forward passband, the total system performance shall be equal to or better than the following:

	<u>TOTAL SYSTEM</u>
Carrier-to-thermal noise ratio	45.0 dB*
Carrier-to-synchronous cross modulation ratio	53.5 dB*
Peak carrier to peak-to-peak hum ratio (1%)	42.0 dB*
Gain vs. frequency response across any 6 MHz TV channel	+1.0 dB*
Carrier-to-single beat ratio (second order)	63 dB*
Carrier-to-composite triple beat ratio dB**	51

When measured at the output of any trunk amplifier station at the last balance temperature, the gain versus frequency response across the passband shall not exceed $(N/10 + 1)$ dB where N is the number of trunk amplifier stations in cascade from the trunk system origination to the point of measurement.

