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ABSTRACT

Intended to provide a general understanding of the opportunities and problems associated with low power television (LPTV), this report deals with the legal, technical, financial, and marketplace issues that should be methodically assessed in order to establish an LPTV service. The three chapters in Part 1 address basic issues and provide a brief history of LPTV and the translator service that preceded it, outline Federal Communication Commissions regulations governing LPTV, and discuss transmission, channel selection, and alternative studio designs for local program origination. The market analysis of LPTV presented in Part 2 emphasizes small-market applications for nonprofit operators. Individual chapters describe a survey of nonprofit groups that have applied for LPTV licenses; review competitive technologies such as cable, direct broadcast satellite, and full-power subscription television; treat station/programming models for LPTV, including commercial and noncommercial applications; and analyze potential revenues for station/programming models. A concluding chapter discusses issues associated with the implementation of an LPTV station. Appended materials include lists of program and information resources. (LMM)

An Assessment of Low-Power Television for the Nonprofit Community

A Report for
The Benton Foundation
&
Corporation
for Public Broadcasting

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Preface

This report provides an introduction to low-power television (LPTV), with particular attention to nonprofit groups investigating low-power television for their communities. Such groups would include those who seek to build and own a station as well as those who would provide programming for a low-power station. The report, including technical, regulatory and marketing issues, is intended for the general reader who seeks an understanding of the opportunities and problems associated with LPTV. The information and analysis here should not be viewed as a substitute for engineering and legal counsel that are required for any individual or group planning to develop a low-power TV station.

Low-power television offers an exciting opportunity for many nonprofit groups to reach wider audiences and serve community needs. It can bring television broadcasting into the hands of community colleges, local government agencies, school districts and civic associations that cannot afford to own or manage full-power broadcast stations.

Establishing an LPTV service requires methodical assessment of legal, technical, financial and marketplace issues. This report deals with all of these issues. It is divided into two parts. Part I has three chapters on basic issues. Chapter 1 provides a brief history of low-power television and the translator service that preceded it. Chapter 2 outlines the Federal Communication Commission's (FCC) regulations governing low-power television. Chapter 3 discusses transmission, channel selection, and alternative studio designs for local program origination.

Part II provides a market analysis of LPTV, emphasizing small-market applications for nonprofit operators. Chapter 4 describes a survey of nonprofit groups that have already applied for low-power licenses. Chapter 5 reviews competitive technologies such as cable, direct broadcast satellite (DBS), and full-power subscription television (STV). Chapter 6 treats station/programming models for LPTV, including commercial and noncommercial applications. Chapter 7 analyzes potential revenues for the station/programming models developed in Chapter 6. The concluding chapter discusses issues associated with the implementation of an LPTV station. Appendix materials include lists of program and information resources.

This report was prepared for the Benton Foundation and Corporation for Public Broadcasting. The opinions and views expressed, however, are those solely of the author. I wish to thank and acknowledge the many helpful comments and suggestions provided in relation to an earlier draft of this report by Robert Bednarek, Philip Rubin, Caroline Sachs and Steven Symonds. In addition, I wish to acknowledge several individuals and groups whose work provided valuable resources for the report. In particular, the analysis herein draws from a report prepared by Block, Butterfield and Riely, *Prospects For Noncommercial Low-Power Television*, and a Corporation for Public Broadcasting report, *The Low-Power Television Guidebook*. Publications of the American Newspaper Publishers Association, National Federation of Local Cable Programmers, Fayetteville Open Channel, and the National Institute for Low-Power Television were also most helpful. Finally, the report benefits from the published works of Kathleen Criner, Terrell Lamb, Jean Rice, Jerry Richter, Parry Teasdale, Pat Watkins and Mary Wright.

John Carey

Part I:
The Basics

Part I
The Basics

Introduction

In simple terms, a low-power television station transmits its signal with less power output than a regular "full-service" station, hence reaching a smaller geographic area than a full-service station. On average, an LPTV signal can extend up to ten miles from the transmitter; a full-power station may extend 50-60 miles.

Low-power television is a simpler and less expensive way to broadcast television programming. Generally, construction costs are less than one-quarter those of a full-power station, and fewer operating personnel are required. In addition, the FCC has established a special set of rules for low-power stations that are intended to make it easier for groups to build and manage such stations.

Along with the benefits of LPTV, there are some restrictions. For example, LPTV has been designated a secondary service by the FCC. The signal of an LPTV station may not interfere with a viewer's reception of regular, full-power stations, and further, the low-power station will be subject to loss of license if a new full-service station is licensed to operate in an area where the LPTV signal causes interference. Secondary status is less of a problem in rural areas where an LPTV operator could change channels to avoid interference with a full-service station. In major cities, however, very few TV channels are available. Consequently, the LPTV operator might have to shut down if it were "bumped" from a channel by a new full-service station licensed to operate on a related frequency.

In many other ways, low-power TV and full-service TV have much in common: Programs may come from rented video tapes, originate locally or be fed by a satellite; studio and production costs may be inexpensive, moderate or very expensive; revenue sources are varied and uncertain; and competition from other new technologies is likely to be keen. For all these reasons, the development of a low-power TV station requires the same careful analysis and planning as a full-service station.

The Origins of LPTV

Low-power television is an outgrowth of television translator stations, which have been in operation since the late 1940s. A television translator (often located at a high elevation) receives a distant TV signal from another station and retransmits it simultaneously on a different channel to reach a wider audience. An LPTV station is set up much like a translator except that it can originate programming as well as retransmit the signal of another station.

By the mid-1950s, nearly 1,000 translator stations were operating in the U.S., mostly in rural parts of the western states. These early translator stations were "extra legal" in FCC terms. That is, they were established without a license from the FCC. Efforts were begun to license translators and adopt a set of rules for their operation. Translators were restricted to 14 upper UHF channels (70-83), and power output was limited to ten watts. These rules did not stop illegal operators. Moreover, court actions and political pressure led the FCC to issue many waivers.

In 1966, the Board of Cooperative Educational Services (BOCES) in New York State received a waiver to tape incoming programs from various stations and rebroadcast them later in a mixed format, thus moving beyond the simultaneous rebroadcast of a single, distant station. Subsequently, in 1973, the Alaska Educational Broadcasting Commission (AEBC) and Corporation for Public Broadcasting (CPB) received a waiver to construct low-power "mini-TV stations" in Alaskan villages. The FCC considered them "miniature" television stations. These stations evolved into a large network of LPTV stations serving rural Alaska. In 1974, the Roundup TV Tax District in Roundup, Montana, was authorized to use a translator station for rebroadcasting programs received directly from a satellite, rather than a distant TV station. These evolutionary forces led to low-power TV.

By spring 1983, more than 4,000 translator stations (in the traditional sense) were operating in the U.S. Approximately 65 per cent of these operate on VHF channels and 35 per cent on UHF. In additon, more than 200 low-power stations are operating. The greatest concentration of LPTV stations is in Alaska, and nearly all are in rural areas.

More than 12,000 applications for LPTV licenses have been filed at the FCC. Each of these potential stations, as well as existing translator and LPTV stations, are governed by the final FCC rules that were released in April 1982. Chapter 2 presents these rules.

FCC Rules Governing LPTV

The FCC issued rules governing low-power television on April 26, 1982.[1] This chapter should not be read as a legal interpretation, nor an exhaustive treatment. Many details are omitted, particularly those relating to engineering requirements for transmission. In addition, the final rules are subject to petitions for change, alterations by Congressional legislation and interpretations by the courts. The treatment here is intended to provide a reasonable overview of the major regulations governing low-power television. A group that intends to apply for a license should seek legal and engineering counsel.

The process of becoming an LPTV operator involves four steps: (1) filing an FCC application; (2) issuance of a construction permit; (3) application for issuance of a license after the station has been built; and (4) day to day operation of a station.

General inquiries to the FCC regarding LPTV regulations should be directed to—

Mass Media Bureau
Federal Communications Commission
1919 M Street N.W.
Washington, D.C. 20554

General Principles

The FCC rules for low-power television, very much in line with recent deregulation trends, provide a minimum of regulation compared to full-service television and are intended to let "marketplace forces" exercise strong influence on the development of LPTV services. Nonprofit low-power applicants receive no benefits under the rules, but minority and rural license applications do receive preferential treatment. In addition, applicants owning fewer than three other mass media properties will receive preferential treatment, as long as those other properties are not in the same market as the low-power applicant.

While the rules governing ownership and operation of an LPTV station are simple and straightforward, technical rules about selecting a channel are detailed and tough. In addition, many of the rules deal with the procedures governing license applications. The complexity of these rules reflects in part the large number of applications that has been received at the FCC and the equally large number that is anticipated.

Channel Selection and Interference

An LPTV station may occupy any VHF or UHF channel between 2 and 69, except 37.[2] The station may transmit at a power output up to ten watts VHF and up to 1,000 watts UHF. VHF channels include 2-13. UHF includes 14-69. In addition, a station may transmit at 100 watts VHF if the channel selected is in the Table of Assignments.[3]

Low-power TV has been authorized as a *secondary* service. A series of general rules and specific guidelines, relating to interference, accompany this status. The general rules include—

- LPTV will not be authorized where it will cause objectionable interference to reception of a full-service station.
- If a low-power station causes interference to a full-service station, the LPTV operator must correct the cause of the interference or go off the air. This obligation holds even when the LPTV station is licensed before the full-service station.
- Interference must be proved by the complaining party. The full-service station must, however, then cooperate (e.g., by conducting joint tests) with the LPTV operator who attempts to find a solution to the interference problem.
- LPTV, as a secondary service, cannot take action at the FCC against a full-service station or other primary service (e.g., land mobile radio) if the latter, while operating under the terms of its license, causes interference to the low-power signal.

[1] The rules are printed in the *Federal Register*, Volume 47, No. 96, pp. 21468-21528. Those seeking a copy may obtain one at a library that receives the *Federal Register*. Alternatively, a copy may be purchased from Downtown Copy Center, 114 21st St. N.W., Washington, D.C. 20036 (202) 452-1422.

[2] Channel 37 is reserved for radio astronomy. In addition, there are some restrictions for channels 14-20 in areas where land mobile radio licensees operate.

[3] The FCC Table of Assignments is a published list of channels dating back to the early 1950s. It allocates specific channels to specific regions. The table attempts to divide available channels in the U.S. fairly by allocating more channels to densely populated regions. Thus, major cities received many channels while rural areas were assigned fewer channels. Today, however, nearly all channels on the Table of Assignments designated for major markets are being used. Some Table of Assignment channels are available in smaller markets.

These general rules are translated into specific guidelines when one is applying for a license. The FCC provides guidelines for choosing a channel that is not likely to cause interference. But the LPTV station bears the ultimate burden of not causing interference to any full-service signal on any TV set that picks up the station. An LPTV station that complies with all FCC rules and nonetheless causes interference to a full-service signal must eliminate the interference or go off the air.

The FCC has established a two-level set of rules for choosing an available channel. If the applicant meets or exceeds the first-level rules (presented in Table 1), there will be no problem in the processing of the application and, probably, no interference problems in the operation of the station. Under these circumstances, an applicant need not be concerned with the second level of rules, which deals with protected contours of existing stations.

Table 1

First-Level Rules for Channel Selection

Full-Power Station	Distance From Low-Power Station
VHF co-channel (no offset)	210 miles
VHF co-channel (offset)	150
VHF +/− one channel	90
UHF co-channel (no offset)	210
UHF co-channel (offset)	150
UHF +/− one channel	75
UHF +/− 2, 3, 4, or 5 channels	20
UHF + 7 channels	60
UHF − 14 channels	70
UHF − 15 channels	75

Source: FCC

Note: These guidelines assume that the low-power transmitter is not unusually high power—above 20 kw UHF ERP or 100 watts VHF ERP—and that the transmitting antenna height is not greater than 500 feet above the average terrain.

Using the First-Level Rules

In order to use these rules, an applicant must investigate all existing full-service stations within 210 miles of the proposed transmitter site. If an applicant proposes to transmit on channel 4, any existing full-service station on channel 4 (i.e., co-channel) should be at least 210 miles away if there is no offset in the station transmission.[4]

An LPTV transmitter may be located closer to a co-channel or adjacent channel full-service station than the Table 1 rules suggest, if the LPTV channel does not interfere with a full-service station within its Grade B contour. This is the second level of rules for channel selection and must be met by all applicants. Those who meet the first-level rules, (Table 1), however, are presumed to meet second-level rules. The Grade B contour is an area within which the signal of a station can be received at a defined level of strength. It is the weakest area of television signal coverage. The area which receives the strongest signal strength is called City Grade, while the area with moderate signal strength is called Grade A.

The Grade B contour, which must be protected, includes those areas receiving the following signal levels:

Channels 2-6=47 dBu
7-13=56 dBu
14-69=64 dBu

An LPTV applicant must not interfere with existing low-power stations and translators. Here, the FCC has adopted a seniority system which protects licensed stations against signal interference from new LPTV stations. The protected levels for a low-power station are the following:

Channels 2-6=62 dBu
7-13=68 dBu
13-69=74 dBu

These protected contour levels apply only to interference from another low-power station. Two low-power stations also may, upon mutual agreement, accept interference from each other. Under these circumstances protected contour levels are irrelevant.

In order to apply protected contour levels to the

[4] Offset transmission means that the station broadcasts slightly off a normal frequency, in order to reduce potential interference with a co-channel, distant station. If there is an offset in either station's transmission, the co-channel LPTV station should be 150 miles away. An adjacent channel, 3 or 5 in the example above, should be at least 90 miles away. The UHF rules are somewhat more complicated since higher frequency transmission can interfere with a larger number of adjacent channels, but the chart is read in the same way.

selection of a channel, a series of calculations is required, which is beyond the scope of this report.[5]

Stations Near Mexico and Canada

Agreements with Mexico and Canada concerning low-power stations near their borders are pending. If a proposed low-power station is beyond 250 miles from either border, the existing FCC rules apply with no further qualifications. A proposed station within 250 miles of either border may be affected by the agreements depending on the proposed power output of the station and its position on the VHF or UHF band. Those rules, however, were not finalized when this report was being prepared.

Cable TV

In general, the LPTV station is responsible for any interference it creates for a cable operator or subscriber when the cause of the interference can be traced to a violation of FCC rules by the low-power operator. As long as the low-power operator stays within the rules, the cable operator will *generally* be responsible for solving interference problems at the cable head-end or in subscriber homes.

The FCC will deny an LPTV application if a cable operator can demonstrate that the low-power signal will interfere with the cable system's off-the-air reception of a distant TV signal. For example, a cable system that is at the edge of the Grade B contour for a full-service station may claim that the low-power signal will interfere with its (the cable system's) off-the-air pickup of the full-service channel. When such interference occurs after an LPTV license is issued, the FCC recommends that the parties resolve the problem privately; the FCC will intervene only as a last resort. If the problem is not resolved, the FCC will use a seniority system in determining who is at fault. That is, the operator (cable or LPTV) who was first in the area will receive protection.

Similarly, a cable operator who uses an empty channel (e.g., channel 3) to input the signals from a converter box may petition the FCC to deny a low-power license that might interfere with channel 3 in the cable area. The seniority system, however, will favor a low-power operator who precedes the cable system in the area.

Land Mobile Radio

Land mobile radio shares some spectrum space with television broadcasting. Therefore, interference issues arise between land mobile radio and television.

Lower-power TV is a secondary service in relation to land mobile radio. LPTV cannot cause interference to land mobile radio and must accept interference from such services operating within FCC rules. Potential interference from land mobile radio is more acute in large markets where such services are very active.

An LPTV applicant should exercise caution in applying for channels 4-7, 13-21 and 69. These channels may receive interference from land mobile radio as well as point-to-point and FM radio stations. Investigation of this potential interference should be one of the tasks undertaken by the consulting engineer. In addition, a potential applicant for a low-power station near the Gulf of Mexico should investigate special channel restrictions and potential interference in that area.

Application Standards, Processing Procedures & Selection Criteria

The FCC rules governing applications, processing and selection are complex. Two points should be emphasized:

1. An application must be free of errors and complete, or it will be returned.[6] This tough standard, adopted in April 1982, affects all new applications and existing applications that had not been processed at that time.

   If an application is returned by the FCC and later resubmitted, the applicant will lose his place in line and may even be rejected if a published cut-off date has passed.

[5] The interested reader is referred to FCC Broadcast Rules Section 73.699. In addition, engineering issues relevant to transmission which have been omitted here, including Terrain Shielding, Receiving Antenna Front to Back Ratio, Offset Operation and Frequency Tolerances, and Circular Polarization, are covered in the *Federal Register*, Vol. 47, No. 96, Tuesday May 18, 1982, pp. 21477-21478.

[6] The FCC notes that it is particularly important to include details about the transmitting antenna(s), with model number(s), a correct polar diagram including the total polar plot, accurate Height Above Average Terrain (HAAT), and precise coordinates for the proposed site.

2. Applications from rural areas have many advantages. They are exempt from the application freeze in place since April 1981. Moreover, they will be processed before applications from larger markets.

Three general areas are critical to the LPTV application process: the tier system; cut-off lists; and comparative criteria for selection.

The Tier System

The FCC has been deluged with LPTV applications. To deal with this overload, the Commission has divided applications into three groups or "tiers" based on size of the market[7]:

- Tier 1 represents rural areas and many small towns. It includes applications for LPTV transmitters to be located more than 55 miles from any of the top 212 TV markets.
- Tier 2 represents smaller cities and some suburban areas. It includes applications for LPTV transmitters to be located less than 55 miles from the center of TV markets 101-212.
- Tier 3 represents large-and medium-size cities as well as some of the larger suburban areas. It includes applications for LPTV transmitters to be located within 55 miles from the center of the top 100 TV markets.

Tier 1 applications are being processed now. This group is exempt from the freeze on applications in place since April 1981. Thus, new Tier 1 applications can be filed.

Processing of Tier 2 applications is expected to begin in late 1983 or early 1984. The processing of Tier 3 applications will follow Tier 2 and will likely be delayed until 1984 or 1985. Tier 2 and Tier 3 applications are frozen. No new applications will be accepted, with one exception to be mentioned.

Cut-Off Lists

After an application is accepted by the FCC, it is eventually placed on an "A" cut-off list. The publication of this list includes a date within which others may offer competing applications. Indeed, competing applications must be filed before the cut-off date or lose the opportunity to apply for the competing channel space. This notice also provides the "exception" to the application freeze discussed earlier. That is, if a Tier 1 application is placed on a cut-off list, a Tier 2 or Tier 3 applicant in a nearby market can apply, if the channel they seek in the Tier 2 or Tier 3 market would be eliminated by the FCC granting a license to the Tier 1 channel.

After the "A" cut-off list deadline passes, the original applications and acceptable competing applications are placed on a "B" cut-off list. After publication of the "B" cut-off list, competing applications for the channel will not be accepted. An application placed on the "B" cut-off list, however, is still subject to Petitions to Deny. Petitions to Deny are important for the LPTV applicant since they provide an opportunity for cable operators, full-service stations and other potential competitors to raise objections before the FCC.

Many of the applicants on the "B" cut-off list will be mutually exclusive, i.e., in granting a license to one group, the FCC must deny a license to another applicant or applicants who seek the same channel or adjacent channels in a given geographic area. Indeed, a majority of applications on file at the FCC are mutually exclusive with one or more other applicants on technical grounds.

The Lottery

In order to deal with the large volume of mutually exclusive LPTV applications, the FCC has instituted a lottery for awarding construction permits. Each month, beginning in fall 1983, the FCC designates several geographic areas where construction permits will be issued. Rural areas are to be processed first. Each application that has been accepted by the FCC and placed on the cut-off list for a designated region is put into the lottery pool. Certain applicants receive a weighted preference in the pool.

- A 2 to 1 preference is given to applicants that own no other mass media properties. This means that such a group has two chances to be picked in the lottery, whereas a group with no preference has one chance.
- A 1.5 to 1 preference is given to applicants owning one or two broadcast properties, but no preference is given if any of the properties are in the same market at the low-power applicant.
- A 2 to 1 preference is given to applicants that have more than 50 percent ownership by a

[7] A list of the top 212 TV markets is published in FCC Public Notice #07820, *Television Channel Utilization* and available at the Downtown Copy Center, 114 21st St. N.W., Washington, D.C. 20036.

minority individual or group. Ownership is broadly defined. There is no requirement that the owner(s) operate the station.

Many additional preference criteria that were proposed or discussed (e.g., nonprofit status, noncommercial programming, and first-filed applications) have been rejected. Although the lottery will speed up the awarding of construction permits, it likely will require three years for the backlog of existing applications to processed. Moreover, successful lottery winners in major markets should anticipate challenges by existing full-service stations and cable operators on interference grounds. These challenges could delay or lead to a denial of the LPTV license by the FCC.

Ownership and License Restrictions

Ownership Restrictions

There are no ownership restrictions per se. Proposals to limit ownership of LPTV by networks, cable operators and other media groups in the same market have been rejected. In addition, there are no limitations on how many channels a group may own in one area or nationally. Further, LPTV stations may operate individually or as part of an LPTV network.

Construction Timetable

FCC application Form 346 is an application for a construction permit, not a license. Once a construction permit is issued, a group has one year to build the station, obtain a license, and begin operations. If the group fails to do so, it runs the risk of losing its claim on the assigned channel.

Upon completing construction, a group must formally apply for a license, which is awarded with minimal review, as long as the construction has met the standards in the original application. Upon issuance of a license by the FCC, the group must then begin operations.

License Terms

A license is issued for five years. No distinction is made between a translator station and an LPTV station *in terms of the license.* The way a station operates will affect whether and how other rules come into play, but this does not affect the license designation. Further, no distinction is made between a commercial license and a noncommercial license. This may have important implications for nonprofit, noncommercial groups. If a potential source of funding requires a group to hold a "noncommercial broadcast license," the LPTV license will not qualify.

Trafficking in Licenses

There are minimal restrictions on the buying and selling of LPTV licenses. Transfer of ownership is permitted one year after the license is issued. Further, the sale is not considered a "major modification" to the license. This means that it will not come under close scrutiny by the FCC unless a third party files a petition to deny the transfer.

Other License Modifications

Two additional license modifications merit mention. One is a minor modification; the other is major.

- A translator station that seeks to become an LPTV station,[8] e.g., in order to originate programming, can do so by a simple petition to the FCC. This is a minor modification and should encounter no problems as long as the station is not changing its transmission power, antenna site or other major engineering feature.
- A licensee that seeks to change the transmission power, frequency, transmitter location or other major engineering feature of the station will be subject to more rigorous review. Such changes are considered major and will be treated virtually like a new license application. The application will be put on an "A" list where it will be subject to competing applications and petitions to deny.

Station Operators

FCC rules governing the operation of an LPTV station are considerably relaxed compared to a full-service station and enable groups to reduce operating costs. For example, daily operation of an LPTV station requires minimal engineering personnel.

All transmission equipment, however, must meet FCC standards. Further, the transmission must not

[8] In a formal sense, the distinction between a translator station and an LPTV station is disappearing. The terms, however, are still used commonly to distinguish a station that merely retransmits a distant broadcast station (a translator) vs. one which originates programming or carries taped materials and satellite services (LPTV).

violate FCC rules governing interference that an LPTV signal causes to the reception of a full-service station's signal. Violation of these rules can force the LPTV station off the air. Among the most important rules are—

- A translator station with a modulator (i.e., an LPTV station *capable* of originating a broadcast) must be monitored for ten continuous minutes per day. This observation of the off-the-air signal can be done remotely.
- During local origination from an LPTV station, an operator must be present. This person must hold at least a Restricted Radio Telephone Operator's permit. The operator may be present at the transmitter site, a remote control point, or the location from which the program is originating. In addition, the station must broadcast its identification call letters during local origination. There is no need to broadcast the (LPTV) station ID when retransmitting the signal of another over-the-air station.
- Stations are required to conduct engineering tests once a year to ensure that transmission equipment is meeting the terms of the license. In addition, an LPTV station must keep maintenance logs.
- There are no specific rules concerning the quality of the broadcast signal in terms of transmitted sync pulse, blanking wave forms, color burst and audio distortion. Consequently, more inexpensive production equipment can be used in LPTV programming.
- An LPTV station must conform to the rules of the Emergency Broadcast System (EBS) when functioning in a local origination mode. But the operator does not have to purchase the special tone generator used by full-service stations during EBS tests or an actual emergency.

Auxiliary Services

An LPTV operator is eligible to apply for auxiliary broadcast frequencies, e.g., microwave frequencies for studio-to-transmitter links (STLs), intercity relays, and remote pickups from on-the-scene reporting.

Programming

There are no specific program requirements. An LPTV station is not required to provide any local programming, or to ascertain community needs and serve those needs. Further, there is no minimum number of hours per day during which LPTV stations must be on the air, and no program logs are required. But, a station that goes off the air completely for 30 days stands to lose its license.

Low-power TV may provide any form of programming authorized for *broadcast* use. Thus, private communications are prohibited. For example, an LPTV station cannot use its transmission for point-to-point telephone or data communications. New broadcast services such as teletext are permitted under FCC rules.

Statutory Content Rules

Certain statutory rules governing broadcast content will apply to LPTV. These include prohibitions and restrictions relating to obscene materials, plugola, payola and lotteries.

The Fairness Doctrine will apply to LPTV in a limited way. Briefly, the Fairness Doctrine requires broadcasters to cover controversial issues in such a way as to present more than one side or opinion. In addition, a broadcaster may be required to give free, equal time to a group claiming that its position on a controversial issue was not presented or was presented unfairly. LPTV will come under the Fairness Doctrine only in relation to its method of operation and the involvement of station management in content. For example, some LPTV stations will offer satellite-relayed movies on a subscription basis. They are not likely to be affected by the Fairness Doctrine. If an LPTV operator provides local origination on controversial subjects, the operator may have to cover the issue in a balanced manner or give air time to an opposing group. The group seeking air time, however, would be required to submit its materials in a format that is compatible with the station equipment and method of operation.

Similarily, an LPTV operator who accepts local advertising will be required to sell political time to candidates during an election. The candidate seeking time must conform to the station's equipment limitations and method of operation.

Network Affiliation

An LPTV station may become a network affiliate. The same rules governing full-service network affiliates apply to LPTV.

Mandatory Cable Carriage

Currently, a cable operator is required to carry on his system all full-service stations in the local area. The new LPTV rules *do not* require mandatory carriage of a low-power station by a local cable operator.[9]

An LPTV operator who seeks to be carried on a local cable system must negotiate privately with the cable operator.

Subscription Television (STV)

An LPTV operator may offer a subscription television service, or pay TV. In this instance, the station scrambles the signal. To receive programs, homes must have a special box attached to their TV and pay a monthly fee. The special box may be sold to subscribers or leased as part of their monthly fee.

LPTV may operate an STV service in any market. There are no limitations such as the "complement of four" rule that applied to full-service STV operators until recently.[10] In addition, there are no requirements to offer free services (i.e., programs that are not scrambled and therefore can be viewed by nonsubscribing homes).

Copyright Liability

An LPTV operator shares the same copyright liabilities as a full-service station. The operator must negotiate contracts with those who hold the rights to copyrighted materials in order to broadcast those materials.

Contracts for prerecorded programming (e.g., a documentary film or an old TV series) are reasonably straightforward, with a rental fee based upon number of users and relative size of market. Contracts for satellite services (e.g., a pay movie service) are likely to be more "fluid" until such time as LPTV industry precedents exist. Chapter 6 will cover this issue.

To retransmit the signal of a nearby full-service station, an LPTV operator must obtain consent from that station. The FCC states that consent cannot be unreasonably denied. In practice, however, a station may say that it does not have the legal right to grant such consent since it does not own the programming. In the past, full-service stations have often taken the position that they cannot grant consent, but would not object to retransmission. In essence, the letter of the law was not met but no legal consequences followed.

The issue of rebroadcast consent will become more complex for LPTV under the new rules. If the LPTV operator seeks to substitute some commercials in a rebroadcast transmission, consent must be obtained from the originating full-service station. The full-service operator has some incentives to negotiate since he will benefit from the extended reach of station programming and commercials. In many instances, however, the commercials are part of a national feed from a network. The local station does not have the right to negotiate over such programming. Moreover, in the case of prerecorded materials leased by the full-service station, those who hold the rights to such materials may object to an LPTV operator who substitutes commercials, even if the full-service station "looks the other way."

It may become difficult for a commercial LPTV operator to use programming from nearby full-service stations, unless the programming is owned by the station (e.g., local news or sports). The copyright laws, it appears, will encourage LPTV operators to obtain programming directly from those who hold the rights to it.

Applying for a Station

The initial document required to apply for an LPTV license is FCC (Revised) Form 346, available from the Forms Distribution Office at the FCC. An applicant may file for any number of stations, but only one channel may be assigned to each station, and a separate application is required for each station.

Most applicants will require legal, engineering and financial counsel in filing Form 346. This is particularly the case under the new rules in which an application must be error-free and complete, or it will be returned. But it is possible for nonspecialists to do much of the leg work required in Form 346 and thereby reduce the cost of outside consultants.

Who Can Apply Now?

Those who seek a license in an area more than 55 miles outside the top 212 TV markets are eligible to file, that is Tier 1 applicants. Such applications are exempt from the partial freeze in effect since April

[9] Readers should be aware of some proposals being considered in the Congress, which could affect this.

[10] The complement of four rule stated that a full-service STV station could operate only in markets where at least four regular stations were operating. The FCC has eliminated this rule for all STV operators, full-service as well as LPTV.

1981. In addition, two other forms of applications are exempt and can be submitted:

- Applications by existing translator license holders to *change* their transmission from channels 70-83 to a channel below 70. Many translator stations were authorized to use these high channels, but the FCC now wishes to free those channels for land mobile radio uses.
- Applications by license holders who wish to resolve an interference problem with a full-service station.

Finally, there is a special group of Tier 2 and Tier 3 applications: applications for channels that are mutually exclusive with a Tier 1 channel applicant. Such mutually exclusive, competitive applications can be filed by a Tier 2 or Tier 3 group only when a cut-off list of Tier 1 applications is published.

The First Step

If a group is interested in obtaining an LPTV license and it is located outside the major cities, a reasonable first step, along with a general market analysis, is to seek the counsel of an engineer who will do the following:

1. Determine if your area falls under Tier 1.
2. Conduct a frequency search. This will determine which channels in your area are available for LPTV transmission. At the same time, the engineer can ascertain if any pending applications at the FCC are mutually exclusive with channel(s) you seek.
3. Determine if any of the pending, mutually exclusive applications at the FCC have been put on published cut-off lists. If they have been placed on such a list and the deadline for competitive applications has passed, you cannot apply for a mutually exclusive channel.
4. If a channel or channels are available in your area and they have not been published on a cut-off list, obtain application Form 346 from the FCC and begin the process of planning/designing/applying for a license.

If a group determines that it is in Tier 2 or Tier 3, it may still follow through with the second and third steps above. But it is not able to apply for a license until the freeze is lifted for its Tier group. One exception: the channel sought is mutually exclusive with a channel on a published cut-off list of Tier 1 applicants. To determine this, one must monitor the published cut-off lists. A number of consulting groups are available to perform this service.[11]

Form 346

Form 346 contains seven sections, three of which will be covered here. The other four sections—general information about the applicant, citizenship and legal qualifications of the applicant, equal employment statement, and certification of the application—are reasonably straightforward.

1. *Financial Qualifications.* An applicant must demonstrate that he has the financial resources to construct the low-power television station and operate it for the first three months. If loans, grants, donations, or other promissory funding for the station are relied upon, there should be some written evidence of their availability. Typically, this would be in the form of loan commitment letters, pledges in writing from people who have agreed to make donations to the station or, in the case of grant requests made to government agencies, a copy of the grant application submitted to the agency.
2. *Program Service Statement.* The applicant is required to outline what types of programming will be provided. If the station will operate as an STV service, this should be stated, along with a detailed description of the proposed STV system and a statement about the manner in which decoders will be provided to the public (i.e., sold or leased).
3. *Engineering Data and Antenna/Site Information:* The engineering section of the application requires detailed, accurate information. The design of the system and selection of an available channel requires an experienced engineer. With sufficient cooperation between the applicant and the engineer, the engineer need not visit the site.

Other Forms and Documents

An environmental impact statement may be required with the application for an LPTV facility. In general, if the tower does not exceed 300 feet and the

[11] For a list of consulting attorneys and engineers, see *Television Factbook* (Service Volume), Television Digest, Inc., 1836 Jefferson Place N.W., Washington, D.C. 20036.

station is not located in certain prohibited areas, the construction of the station will not require this statement.

The FCC is not the only agency concerned with the building of a low-power station. An applicant frequently must deal with local zoning and permitting authorities and get approval from the Federal Aviation Administration (FAA). FAA approval may be necessary if the station will use a new tower, or if the height of an existing tower is increased by the installation of a low-power transmitting antenna. The matter of local zoning and permits can be handled by the applicant at the local level. The applicant's consulting engineer can usually determine whether a tower constitutes an airspace problem, requiring notice to the FAA. Alternatively, the applicant can obtain an opinion on whether notice is required by consulting a regional FAA office. If notice is required, the procedure is relatively simple: a one page form (7460-1) with a few exhibits. If the proposed tower does have an impact on air safety, obtaining FAA approval can be a lengthy process.

If a low-power station plans to use a microwave link from studio to transmitter, or station to station, FCC Form 313 must be filed.

Planning and Building an LPTV Station

This chapter covers several factors that may influence channel selection; where to place a transmitter; power output and antenna options; large and small studios; on-the-scene production equipment, satellite receiving dishes, and microwave links; and equipment needed for pay TV. It is important to assess all of these options, as well as the final package of equipment in terms of four questions:

- What does it cost?
- Will it increase the reach of the station and the quality of the signal?
- Does it help in providing programming that the community needs and wants?
- Can it be supported by anticipated revenues?

An LPTV operation consists of a transmitter, a transmitting antenna on top of a tower or building, a building to house the transmitter, an FCC license, and a source of programming. Following are options for each of these components or descriptions of add-on equipment to enhance one of the basic station components.

Transmission Options

Selection of a transmission site, tower, antenna, and power output depend on cost, channel availability and station reach. The transmitter, tower and transmitting antenna must be located together. The location should be as high as possible, and there should be a clear path from the antenna to the service areas. Tall buildings and mountains that block the signal will reduce the station's coverage.

The simplest and most economical location for a low-power station is at an existing radio or television station. Although such locations may eliminate some otherwise available channels for the LPTV operator, there are three major advantages in sharing a site with an existing station:

- The LPTV operator will not have to build a new tower for the transmitting antenna.
- It may be possible to share space in the existing station's building. There could be savings in the sharing of technical staff.
- An existing station's tower will already have environmental and FAA clearances.

Coverage

The coverage of a low-power station will depend largely on the power of the station, the type of transmitting antenna used, and the height of the antenna over the surrounding area.

The FCC limits the transmitter power output of LPTV stations to 1,000 watts for UHF channels, ten watts for VHF channels not on the Table of Assignments. None of the Table of Assignment Channels is available in major cities, but some are available in rural areas. The difference in power levels does not give a particular advantage to UHF since higher frequencies require more power to achieve the same coverage as lower frequency channels.

No FCC limits are placed on the height of an antenna, but significant costs are associated with building a tall tower. For this reason, there is a strong incentive to share a tower with an existing station or locate a small tower on a tall building or nearby mountain. Table 2 illustrates how antenna height can affect station coverage when all other factors remain constant.

Table 2

Effect of Antenna Height (Above Average Terrain) on Station Coverage

Signal Strength UHF (ERP)	Antenna Height Above Average Terrain	Approx. Station Coverage (Grade B Contour)
1000 watts	100 feet	5 miles
	300	8.5
	500	12
	1000	16

Source: FCC

Note: The Grade B contour in Table 2 represents the outer limits of coverage. Station coverage for most households (e.g., those with no outdoor antenna) is less than Grade B contour limits.

Antenna type also can have a strong impact on the reach of a station. The transmitting antenna has the potential to concentrate the signal, thereby multiplying the transmitter power output to a higher value. This multiplication ability is called "gain." For example, using a transmitting antenna with a gain of 10 with a 1,000 watt transmitter yields a station power of 10,000 watts (or 10 kilowatts). This power—the product of transmitter output, potential line loss, and the antenna gain—is referred to as *effective radiated power* (ERP). Station "power" usually refers to the ERP. Antenna height and ERP most directly influence station coverage.

Table 3 illustrates how transmitter power output, antenna gain and antenna height can affect the reach of a station.

The elements in Table 3 are not the only ones affecting station reach. The terrain, specific channel assignment, and percentage of homes with outdoor receiving antennas also will affect reach. Nonetheless, Table 3 provides a useful, if simplified, model of three major elements affecting station coverage. One additional element deserves mention: propagation pattern of the antenna.

There are two general types of antennas. An omni-directional antenna transmits a signal in all directions. Other antennas can focus the signal in a particular direction. These directional antennas can transmit much farther, but along a narrower path. The choice of an omni-directional or directional antenna will depend, in part, upon the location of the transmitter in relation to the population. For example, if a community is located on one side of a nearby mountain, it might be cheaper to place a directional

Table 3

Illustrative Low-Power TV Station Coverage

VHF (Channels 2-13)	Antenna Gain	ERP	Transmitter Height Above Avg. Terrain	Approx. Useful Station Coverage
1 watt	5	5	100 feet	3.5 miles
1 watt	5	5	500	8.0
10 watts	5	50	100	6.2
10 watts	5	50	500	14.0
UHF (Channels 14-69)				
100 watts	15	1500	100	6.5
100 watts	15	1500	500	12.5
1000 watts	15	15000	100	10.0
1000 watts	15	15000	500	21.0

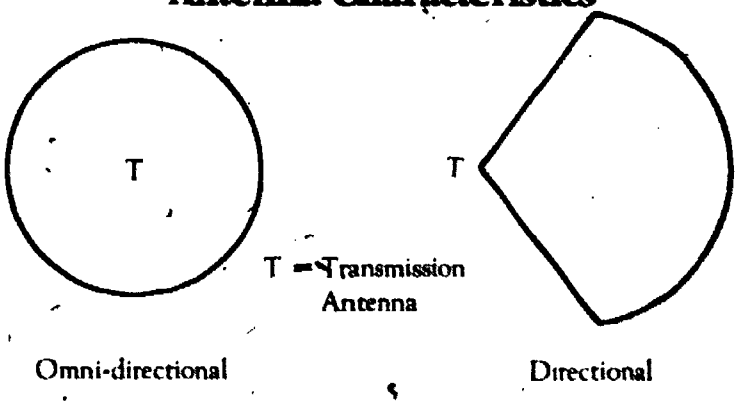
Source: CPB

antenna on top of the mountain—focused down on the community—rather than to construct a tower in the middle of the community and place an omni-directional antenna on top of it.

Figure A illustrates the transmission characteristics of these two antennas.

Figure A

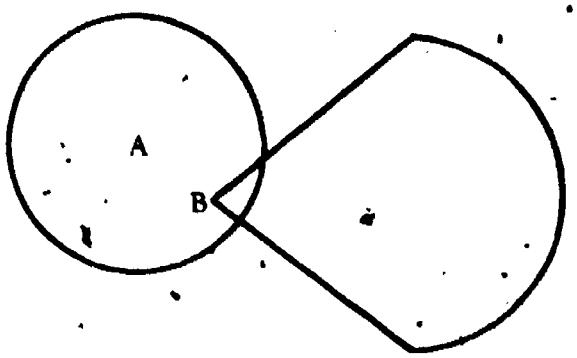
Directional vs. Omni-directional Antenna Characteristics



Site location, antenna gain, propagation patterns and antenna height are important when the service community is scattered across a wide area or bunched in two or three clusters. Some groups have applied for more than one license in an area so that they may reach two or three towns in a general area. Figure B illustrates how two transmitters can be clustered to serve such a population.

Figure B

A Simple LPTV Cluster



A = A five-watt (VHF) LPTV station with a small gain, omni-directional antenna. It is located in the center of a town with 8,000 homes. The station is housed on the campus of a community college and originates programming.

B = A 100-watt (UHF) translator with a high gain, directional antenna. It is located on a mountain and relays the signals from station A to 5,000 homes located along a narrow valley.

Choosing a Channel

In planning a station, there are three general options for choosing a channel, each with advantages and disadvantages:

1. *Vacant unlisted channels.* The strongest option is to find a vacant channel, not listed in the Table of Assignments, that meets all of the interference criteria discussed in Chapter 2.

2. *Vacant channels in the Television Table of Assignments.* This official list of channels is completely occupied by full-service stations in all major markets. In mid-1982, however, approximately 500 of these channels, mostly UHF frequencies in rural areas, were vacant. Further, 60 per cent of the available channels in the Table of Assignments have been designated as noncommercial.

When they are available, vacant channels in the Table of Assignments offer a number of advantages. First, the FCC has already approved these channels as not causing interference to other channels in the Table. Second, an LPTV operator can employ 100 watts on a VHF channel listed in the Table. In addition, an LPTV operator can upgrade at a later point and become a full-service station. Another group, however, could apply at any time for a full-service license on the channel and the LPTV operator could be bumped from the channel. Also, many vacant channels are used by translator stations. Thus, a group cannot use the Table alone to pick an available channel. Further investigation will be required.

3. *Contested channels.* A number of groups monitored the FCC published cut-off lists of channels sought by other groups and filed a competing application. The vast majority of applications currently on file involve groups competing for the same channel or an adjacent, mutually exclusive, channel. In some cases, this strategy may represent an attempt to save money on engineering costs (engineering research having already been performed). In most cases, however, the competitive filings represent the reality of major markets: everyone must compete for the same frequencies.

Most groups who ultimately receive an LPTV license will follow the first choice and apply for a vacant unlisted channel.

If many choices emerge in a channel search, a group may wish to consider two or three additional factors in making a selection:

- In general, higher channels require more energy to transmit the same signal over the same distance.
- Lower UHF channels have somewhat better signal loss characteristics than higher UHF channels.
- VHF is more advantageous than UHF in localities with rough terrain. In mountainous regions, lower VHF channels (2-6) provide optimum coverage.

Transmission Add-Ons

The basic transmission components described thus far link the station to the viewer's home. Additional components can link the station to other stations, remote studios, on-the-scene reporters, and earth satellites.

- *Satellite receive dish.* Most national programming is distributed via satellite. Broadcast stations and cable headends receive this programming from the satellite, then broadcast it locally or transmit it through a cable into homes. Typically, a satellite receive dish is five meters in diameter. However, in some instances a three or four meter dish is acceptable.

Table 4

Cost Estimates for Transmitters, Antennas & Transmission Line

Band	Transmitters Power Output	Approx. Cost
VHF	10 watts	$ 10,000
VHF	100	20,000
UHF	100	20,000
UHF	1000	75,000

Band	Antennas Power Gain	Approx. Cost
VHF	5	$ 1,000
VHF	10	5,000
UHF	5	4,000
UHF	15	10,000

Transmission Line: price varies from $2-$9 per foot depending on the power output of the transmitter. Thus, a 200-ft. transmission line linking the transmitter and antenna will cost $400-$1,800.

Source: CPB and EMCEE Corp.

- *Microwave transmitters/receivers.* Microwave frequencies are used to transmit a wide range of telecommunications: telephone calls, radio, and television programming. A microwave link may be used to transmit a TV signal from one television station to a distant station where it is received and broadcast into homes. It may also link a studio to the transmitter site on a mountain (this is called an STL or Studio-to-Transmitter Link). In addition, a portable microwave transmitter can be mounted on a van in order to link an on-the-scene reporter with the main TV studio. Microwave is a point-to-point communication, the transmitter and the receiver must be able to "see" each other. It is also a private transmission. Homes cannot pick up the signals until the station feeds them into its regular transmitter and broadcasts them over the air.

Costs of Transmission Facilities

Minimal transmission equipment must include a transmitter, transmission antenna, and transmission line. Approximate costs for such equipment are outlined in Table 4.

The costs in Table 4 will vary in relation to the manufacturer and additional characteristics of the component (e.g., directional antennas are more expensive than omni-directional antennas).

In addition to these basic components, an LPTV transmission system may require a tower and a shack to house the transmitter. A 100-foot tower will cost approximately $4,500 installed, while a 200-foot tower will cost approximately $12,000 installed. Very tall towers, e.g., 500-1,000 feet, are extremely expensive and likely to be beyond the financial means of a low-power operator. A simple shack to house the transmitters may be built for $2,000.

The costs of transmission add-ons (i.e., microwave send and receive facilities, and satellite receive dishes) are outlined in Table 5.

In addition to these fixed costs, the transmission system must bear yearly costs of electricity and maintenance. An LPTV operator should estimate $3,000-$10,000 per year for electricity and maintenance of the transmission system. The figure will vary in relation to power output, amount and age of equipment and availability of volunteer help to maintain equipment.

Table 5

Microwave and Satellite Equipment

Item	Approx. Cost
Studio microwave transmitter and receive dish	$ 25,000
Remote microwave transmission facility	16,000
3-4 meter satellite dish	12,000
5 meter satellite dish	25,000

Source: Cablevision

Studio Equipment

In order to originate programming on LPTV, a studio is required. This can range from a $600 videocassette playback unit connected to a $2,000 modulator up to a several-million-dollar studio complex.

For planning purposes, assume that the LPTV operator does require a production studio. Table 6

Table 6

Alternative Studios & Remote Production Units

Level	Description	Approx. Cost
Studio 1	A small but complete studio with two color cameras, video switcher, character generator and simple editing capability	$ 60,000
Studio 2	A larger and more versatile studio, with stronger editing capabilities	125,000
Studio 3	A full production studio with three high quality color cameras, full editing capability and post production facilities	240,000
Remote Unit 1	A single camera, professional recording unit suitable for news reporting and simple on-the-scene coverage	12,000
Remote Unit 2	A complete remote production unit with two cameras and facilities to televise a sporting event or other live action	125,000

Note: In order for either remote production unit to relay programming live back to the studio, a $16,000 microwave link must be added to the package.

Source: Warner Amex

presents three levels of studios and two levels of remote production units. The descriptions in Table 6 broadly outline what the studios or production units can do.

The packages in Table 6 do not exhaust the possibilities for studio configurations. One could easily double or triple these costs for more elaborate studios. Furthermore, it is possible to piece together a bare bones studio for $15,000-$25,000.

Pay TV Equipment Costs

In order to operate as a subscription television service, a station requires a $15,000 signal encoder or scrambler. In addition, an STV box is required in each home. Usually, STV decoders, which cost $115, must be purchased in lots of 100 or more. An STV operator may sell the box to subscribers or lease it as part of the monthly subscription fee.

If an STV operator wants additional, anti-pirate security in the system, an additional $40,000 in station equipment is required. This also raises the price of the home decoder to approximately $185.

Table 7

LPTV Equipment and Facilities Costs (Dollar Figures in Thousands)

Item	(Level 1) Low Range	(Level 2) Mid Range	(Level 3) Upper Range
Transmission Equipment	$ 12	$ 27	$ 85
Tower	4	12	30
Studio Equipment	60	125	240
Remote Production Unit	12	125	125
Microwave Links	16	25	25
Satellite Receive Dish	12	25	25
Pay TV Encoder	15	55	55

Source: Greystone Communications

Adding Up the Costs

A broad range of options means a broad range of costs. A sophisticated LPTV station, fully equipped could equal the cost of a full-service station (the FCC estimates that a conventional full-service station with modest facilities costs $2 million-$3 million, exclusive of the land or building). This report assumes that most LPTV operators will build a station well below the cost of a full-service station.

Table 7 outlines costs for each equipment component described in this chapter. One can exceed the range in each instance and reduce the low estimate in a few instances.

An LPTV station with a mid-range transmission system ($27,000), no tower cost, a small studio ($60,000), and a five-meter satellite dish will cost approximately $112,000 for equipment. This does not include costs associated with a building to house the transmitter and studio or any ongoing costs of operation (i.e., electricity and maintenance).

Four hypothetical examples of community LPTV stations follow, along with an estimate of the equipment costs for each:

Example 1. A town with 3,000 homes concentrated in a relatively small geographic area wishes to

construct a translator station to pick up a distant PBS station and rebroadcast it to the community. No local origination is planned.

Cost Estimate: $14,000. This includes a small transmission system and a shack to house the transmitter.

Example 2. A state college with existing production facilities seeks to build an LPTV station for the college community and the surrounding town of 15,000 homes. They plan local origination, using existing facilities, and require a satellite dish to receive programming from a national ETV network.

Cost Estimate: $65,000. This includes a mid-range transmission system, five-meter satellite dish and small tower.

Example 3. A community with 30,000 homes has two population concentrations separated by a mountain. They seek to build two stations. One station will provide local origination for the entire community. The second station will serve merely as a translator to rebroadcast the signal from the main station.

Cost Estimate: $202,000. This includes a mid-range transmission system, tower and studio at one location, and a small transmission system, tower and shack at a second location.

Example 4. A community with 50,000 homes seeks to build an LPTV station to provide a significant amount of local origination programming, including some live, remote coverage of high school sports. It also intends to provide a pay TV service (a satellite-fed movie channel) during evening hours.

Cost Estimate: $560,000. This includes an upper-range transmitter, moderate-size tower, upper-range studio, mid-range remote studio, microwave send and receive units, five-meter satellite dish, and pay TV encoder.

Part II:
Market Analysis

Part II

Market Analysis

LPTV Applicants

Who has applied for an LPTV license? What types of programming do applicants seek to provide? Among the over 12,000 applications on file at the FCC in mid-1983, most applicants were commercial groups seeking to provide an over-the-air pay TV channel in large television markets.

To date, over 80 per cent of LPTV applications have been filed by commercial groups. A high percentage are also for large TV markets. Only one or two channels, however, are likely to be licensed in the top ten markets, while two or three channels may be licensed in markets ranked 11-100. Consequently, most commercial applicants will never be awarded a license.

To understand what has happened to LPTV applications, it must be noted that no permanent FCC rules existed until Spring 1982. Groups that filed applications before this date did so blindly. They did not know if the forthcoming rules would preclude them from owning a station. At that time, it was relatively inexpensive to file an application, and many large commercial groups were willing to accept the small financial risk weighed against the potential gain of a pay TV channel in a large market. Indeed, many commercial groups filed dozens (in some cases more than one hundred) of applications. Sears Roebuck, Federal Express, Scripps-Howard, ABC and NBC, among others, filed multiple applications for LPTV licenses. Joining them were a number of small commercial groups who filed for the same channel space. As a result, approximately 75 per cent of all applications on file are mutually exclusive. Each of these applicants is competing with one, two or perhaps 15 others.

The market potential of a commercial LPTV station in large cities will be covered in Chapters 5 and 7. It is important to distinguish the thicket of commercial applicants from the smaller, somewhat less entangled group of nonprofit applicants.

Nonprofit Applicants

Block, Butterfield and Riely and the National Federation of Local Cable Programmers conducted a survey of nonprofit applicants. The survey covered all nonprofit applications on file at the FCC before April 1981. Some of the data have been regrouped to reflect the change in status of commercial vs. noncommercial applicants within the FCC rules. In addition, many of the applicants indicated a likelihood of changing their mode of operation based upon the final FCC rules.

Of the 5,048 applications surveyed, only 13 per cent were filed by nonprofit groups. In all, 646 applications were filed by 149 nonprofit groups. This represents an average of 4.3 applications per applicant.

Table 8 examines nonprofit applicants as well as the total number of stations sought, broken down by their intended revenue base: supported by advertising; direct payments by home viewers (subscription TV); noncommercial (subscriber donations, government support, foundation grants, etc.); and not indicated.

Table 8

Nonprofit LPTV Applications
Intended Revenue Base

Revenue Mode	Applicants (149) % of Total	Stations (646) % of Total
Noncommercial	58	43
Advertising	18	37
STV (Pay TV)	7	7
Not Indicated	16	13

Source: Block, Butterfield and Riely; National Federation of Local Cable Programmers

The advertising group in Table 8 represents 18 per cent of applicants but 37 per cent of station applications, which means that the advertiser supported groups have applied for more stations per applicant than other nonprofit groups.

Table 9 reviews sources of funding, other than advertising or pay TV, indicated by nonprofit groups. The figures represent the percentages of all applicants and station applications that intend to seek funding from each of the sources listed.

Table 9 reveals that many nonprofit groups that have applied for a single station are looking toward NTIA (National Telecommunications and Information Administration, a branch of the U.S. Department of Commerce) and private foundations for funding

Table 9

Nonprofit LPTV Applications Selected Sourse of Noncommercial Funding

Source	Applicants (149) % who intend to seek or expect funding from	Stations (646) % who intend to seek or expect funding from
NTIA	20	9
Private Foundations	20	9
Local Gifts & Donations	28	24
State/local Governments	14	22

Source: Block, Butterfield and Riely; National Federation of Local Cable Programmers

support, which they hope to supplement with viewer contributions. Table 9 also indicates that noncommercial multi-station applicants are looking to state and local governments for funding. Table 10 shows that the multi-station group is primarily state-based.

A further indicator of projected funding for nonprofit applicants is their ownership classification. Table 10 plots the ownership of nonprofit applications that declared themselves "noncommercial" under the earlier, proposed FCC rules. This represents a subgroup within all nonprofit applications.

Table 10 reveals that local government and university applicants generally seek only one station. Collectively, Tables 9 and 10 show two broad clusters among nonprofit applicants. Cluster A is composed primarily of private, nonprofit groups, each of whom has filed many applications. This cluster intends to finance the stations, in large part, through advertising, internal funding and viewer subscription fees. In Cluster B are local governments, universities and many community groups that seek one station to be financed by viewer donations, government or university allocations, and foundation grants. Clearly, there are applicants who fall outside of either grants. For example, the State of Alaska has filed many applications, although their funding base is similar to Cluster B.

Programming

The survey of nonprofit applications dealt with two general programming areas: sources of programming and distribution methods from source to station; and programming content categories. Tables 11 and 12 outline these two areas.

Table 10

Proposed Ownership Noncommercial Applications

Ownership	Applicants (97) % of Total	Stations (322) % of Total
Community-based	65	52
State	2	38
[illegible]overnment	13	4
University	20	6

Source: Block, Butterfield and Riely; National Federation of Local Cable Programmers

The content categories listed in Tables 11 and 12 are not exhaustive. Many groups intend to broadcast light entertainment and movies. Further, many intend to mix their sources of programming, means of distribution, and content categories. A sample schedule might feature satellite-fed educational programming during the day, local origination news in early evening, and an STV movie service in prime time.

Construction and Operating Costs

The FCC application form in effect when the survey was conducted had some confusing features. For example, a request for the applicant to estimate construction and initial operating costs was open to interpretation. Some applicants estimated construction plus three months' operating costs while others provided first-year operating costs. Curiously, the estimates are quite similar. Table 13 aggregates the two sets of figures.

Multiple-Station Applicants

Fifteen nonprofit groups applied for ten or more LPTV licenses in the period through April 1981, when the partial freeze went into effect. Most of the multi-station applicants intend to operate in whole or part as a network. Furthermore, nearly all of the stations will make use of some satellite-delivered programming. Three of these multi-station applicants are described briefly below.

- *The State Legislature of Alaska.* The State of Alaska has appropriated several million dollars

Table 11

Nonprofit Applications Selected Sources of Programming and Means of Distribution

Source/Means of Distribution	Applicants (149) % who intend to use	Stations (646) % who intend to use
Local Origination	71	91
Open access	18	25
PBS Materials	18	26
Satellite Distributed Materials	17	49

Source: Block, Butterfield and Riely; National Federation of Local Cable Programmers

Table 12

Nonprofit Applications Program Content

Category	Applicants (149) % intending to offer	Stations (646) % intending to offer
Religious	32	34
Educational	68	79
Cultural	62	72
Children's	13	26
Talk/News/Community Information	23	52

Source: Block, Butterfield and Riely; National Federation of Local Cable Programmers

for the construction and operation of an instructional, noncommercial network throughout the state. A central studio in Anchorage will supply the programming to all other stations via satellite. Programming consists of PBS material and instructional classroom services. When fully implemented, the network will comprise a few hundred stations.

- *Christian Enterprises, Inc.* This group has applied for 14 advertiser-supported, nonprofit stations. It plans a satellite-fed network of religious programming, most of which will originate from the

Table 13

Nonprofit Applications Estimated Construction and Operating Costs

% of Stations	Est. Constr. & Oper. Costs (3-12 months)
60	$ 100,000 or less
35	100,000-200,000
5	200,000 or more

Source: Block, Butterfield and Reily; National Federation of Local Cable Programmers

National Christian Network (NCN). The local LPTV stations in the Christian Enterprise Network will contribute a small amount of local origination as well. Funding to construct the network will come from two radio stations owned by Christian Enterprises. Operating costs will be offset by advertising on the LPTV stations and viewer contributions.

- *United Auto Workers.* The United Auto Workers union has applied for 23 licenses. They plan to develop a national network of stations for their members. Union funds will finance the construction and operation of the stations. The union also intends to involve other community groups in programming, e.g., the League of Women Voters. Like many applicants, the United Auto Workers built flexibility into their applications, so that they could take advantage of the final FCC rules.

The Marketplace

The marketplace for LPTV encompasses cities and towns with high, medium, and low population densities. Do some markets need LPTV more than others? What forms of competition exist in these markets? And how do they operate?

The following analysis has a distinctly commercial focus, since under the new FCC rules, nonprofit groups are free to mix commercial and noncommercial programming on an LPTV station. Later chapters will cover LPTV stations which operate on a noncommercial basis exclusively.

U.S. TV Marketplace

Approximately 98 per cent of U.S. households own one or more TV sets. Access to over-the-air programming, however, varies enormously. Most major cities have nine or more TV stations; towns with 50,000 households may have three or fewer stations. A.C. Nielsen calculates that 12 per cent of U.S. households have access to four TV channels or fewer. The Nielsen figures include stations made available via cable and/or translators.

The availability of TV channels reflects how channels were assigned in the Television Table of Assignments, as well as the influence of population density on those who seek to earn a profit from operating a TV station. Approximately 59 per cent of the U.S. population inhabits five per cent of the land. Conversely, two per cent of the population inhabits 48 per cent of the land. Since full-service TV stations cost so much to build and operate, areas with a dense population attract most of the television business. The U.S. Department of Commerce estimates that a full-service station will have difficulty making a profit in markets with under 135,000 households, unless the station has some means of support other than advertising.

The consumer appetite for television programming is demonstrably keen in all markets, large and small. For example, the early growth of cable TV in rural areas and small towns was based predominantly on a desire for good reception of three to four stations. Similarly, the growth of translator stations, from 230 in 1960 to over 4,000 in 1982, reflects the desire for programming beyond the one to two stations previously available in those areas.

The 1970s brought with them a rapid growth in fee-based services. During this period, pay TV grew at a rate of 182 per cent per year, and videocassette recorders grew at a rate of 85 per cent per year. Finally, the strong demand for programming is reflected in the growth of multiple-set households. In 1970, 35 per cent of U.S. homes had two or more TV sets. By 1975, the figure had grown to 43 per cent and by 1980, 51 per cent of U.S. homes had two or more sets.

This demand, coupled with the number of channels available outside of the major markets and the difficult economics of full-service stations for small markets, suggest that opportunities for LPTV exist in many parts of the U.S. Before judging, however, the potential competition must be examined.

Cable and Satellite Services

In 1983 there were 5,600 cable TV systems in the U.S., providing service to approximately 35 per cent of U.S. households. The average subscriber paid $18 per month for cable, which included an average fee of $8 for basic service plus charges for pay services. Most pay services on cable cost $8-10 per month, per service. A typical new subscriber signed up for 1.4 pay services in addition to basic service. Overwhelmingly, the first pay service choice has been a movie channel. If a subscriber signs up for two pay services, he will likely choose two movie channels or one movie channel and one sports channel.[12]

In spite of the publicity surrounding very large cable systems (i.e., 50 or more channels), 1983 market data show that 55 per cent of all cable systems in the U.S. have a 12-channel capacity. In rural areas, the percentage of small 12-channel cable systems is even higher. This implies that many groups or programmers who would like to be carried on cable systems may find that there is no space. This includes LPTV groups as well as some national satellite services. By the end of 1983, over 70 satellite services are expected to be operating. The inability to penetrate these cable markets may lead to some curious alliances between LPTV and satellite services. That is, LPTV is a strong candidate for local distribution of satellite services in selected markets. Table 14 outlines the satellite services by content category.

The financial relationship between a satellite service and a local distributor (typically, a cable system) varies greatly. In the case of a pay movie channel, the satellite service may charge 30 to 40 per cent of the gross receipts that the local cable operator receives for the channel. Alternatively, a fixed fee per subscriber will be charged (e.g., $3-$4 per month). Nonpay services may be offered free to a local distributor or at a nominal charge of 10 cents per subscriber, per month. These services commonly contain ads. Often, a percentage of the ad time is left blank, enabling the local distributor to sell the time to local advertisers. Finally, satellite services sometimes pay the local cable operator in order to gain channel space on the local system.

[12] These data are drawn from a number of sources, among them Cablevision, Goldman Sachs, and Paul Kagan & Assoc. For a more extensive analysis of new technologies, see John Carey and Mitchell Moss, "A Review of Telecommunications Technologies and Public Broadcasting," Washington, D.C.: Corporation for Public Broadcasting, 1983.

Table 14

Satellite Services (1982)

Content Category	No. of Channels	% of Total
Movies	16	22
Music & Gen. Entertainment	15	20
Public Affairs/News	8	11
Ethnic/Foreign Language	8	11
Religion	8	11
Sports	7	9
Children	3	4
Arts	3	4
Education	2	4
Shopping	1	1
Health	1	1
Women	1	1
Business	1	1

Source: Cablevision

LPTV operators who negotiate with satellite service providers are likely to encounter the full range of these financial arrangements.

As a rule, a cable system requires 30 households per mile of trunk line in order to be viable. This means that many rural areas, with fewer than 30 homes per mile of roadway, are not economically feasible. Cable and LPTV are not likely to compete here. In more densely populated rural areas, where cable and LPTV may compete, the cable system is not required under FCC rules to carry the local LPTV station. The cable operator is required only to carry all full-service stations in the local area. The LPTV operator seeking carriage by a cable system has three options under these circumstances: (1) negotiate with the cable operator; (2) attempt to bring pressure from cable subscribers on the cable operator; and (3) attempt to bring political pressure on the cable operator (e.g., if a new franchise is being negotiated with the town or if the old franchise contract is up for renewal).

LPTV operators and local cable operators will not necessarily be adversaries. Many cable operators will welcome a good local origination LPTV channel. Furthermore, a local cable operator is a potential partner in an LPTV operation.

Subscription Television

Subscription Television (STV) is one form of over-the-air pay TV. Currently, STV uses a full-service VHF or UHF channel that transmits a scrambled signal to subscribing homes.

In mid-1982, there were 27 STV stations operating in the U.S., all in major markets. In addition, 16 stations were authorized but not yet operating, and another 30 applications were pending. Subscription TV has grown very quickly in large cities where cable systems have not yet been built. There were 1.5 million subscribers in mid-1982, paying an average fee of $19.50 per month for the service.

In late 1982 and early 1983, however, STV began to experience a loss in subscriber base due to increases in the cost of operations and competition from new cable systems in several large cities.

In June 1982, the FCC released rules governing STV. The rules open up new markets, permit STV operators to sell or lease decoders and eliminate requirements for providing unscrambled, free programming.

Generally, STV on a full-service station requires 40,000 to 50,000 subscribers to be profitable. Full-service STV can probably be profitable in a noncable market with 300,000 homes. In smaller markets, full-service STV does not appear feasible.

Multipoint Distribution Service

Multipoint Distribution Service (MDS) uses over-the-air microwave transmission to provide such services as point-to-point voice communication, data communication and pay TV channels. The discussion here will be limited to MDS as a pay TV channel.

An MDS pay movie channel operates much like STV. A special antenna and converter are required to receive the service. Monthly fees are typically $15. MDS is cheaper to operate than STV. Therefore, about 12,000 subscribers are required for MDS profitability. Without cable competition, MDS can probably be viable in a market of 40,000 homes.

Direct Broadcast Satellites

Direct Broadcast Satellites (DBS) transmit television programming directly from satellite to home. Each home requires a special receiver, projected to cost $700 initially, dropping to $250 over time. The service can provide four to six channels as a pay package.

In mid-1982, nine companies had formal applications before the FCC to provide DBS and another six companies had pending applications. Most of these groups would offer a pay package with movie channels, sports, cultural programming and teletext. CBS has

proposed to use DBS to broadcast a new high resolution television system.

Some form of DBS will probably be available to the public in 1985; a few groups claim that they will reach the market sooner. Since the signal comes from a satellite, it can reach cities and rural areas alike regardless of population density. Therefore, it would be attractive in rural areas where there are no cable systems and few over-the-air stations. To the degree that DBS and LPTV become competitive, LPTV has two advantages: a chance to enter some markets first and the ability to provide local programming.

Public Television

Approximately 92 per cent of U.S. homes receive a signal from one or more public television stations either over the air or retransmitted through a cable system. Table 15 lists those states needing extended public television service, i.e., at least 15 per cent of the population does not receive a clear signal from a public television station.

Table 15

States With a Need for Extended Public TV Service

Alaska	Missouri	South Carolina
Idaho	Montana	Texas
Indiana	Nevada	Vermont
Kansas	New Mexico	West Virginia
Louisiana	Oregon	Wyoming

Source: PBS

Implications for LPTV

According to this brief review of marketplace demand, needs and potential competition, the major commercial interest in LPTV—providing a pay movie channel in large cities—faces stiff competition. By 1985-86, most major cities will have a large channel cable system as well as pay movie packages offered by DBS, MDS and STV services.

In rural areas, LPTV will face little competition until the development of DBS services in the mid-1980s. Some of the small TV markets (100-212) will offer competition to LPTV from cable, MDS and possibly full-service STV. In this case, LPTV must take advantage of its lower start-up and operating costs in in order to compete effectively. In general, LPTV does not appear to offer strong market opportunities for the provision of pay movie channels.

In both rural markets and small, nonrural markets, an LPTV station may benefit from a partnership with local interests, e.g., a local college, state agency, public television station, newspaper or cable operator. These groups can, in different ways, bring resources that many LPTV operators will not possess and/or cannot afford.

Finally, while the issue of competition is important, it should not obscure the primary marketplace question: Does the station or service provide programming that people need and want?

LPTV Station Models

This chapter reviews the major organizational features of an LPTV station; integrates selected features and options into four practical station models; presents potential advantages and disadvantages associated with content and sources of programming; provides an overview of staff requirements in station operation; and reviews a few existing LPTV stations and local cable-based community channels whose organizational structures may offer guidance to the LPTV planner.

Major Organizational Features

Stand-Alone/Multi-Channel/Network

The first noteworthy feature of an LPTV operation is the number of stations it encompasses and the relationship among those stations. There are three general options, which are not completely exclusive.

- A *single, stand-alone station.* This station may obtain programming from a satellite or a nearby university, but operation and transmission are independent of other stations.
- A *multi-channel, stand-alone operation.* This station broadcasts two to five channels of programming from the same site. Under FCC rules, there are no limits on the number of channels an LPTV operator may seek in one area. A multi-channel operation may function like a small cable system, offering a few channels of basic and pay services. The cost of multi-channel transmission is far less than the cost of transmitting the same number of channels separately. For example, a single channel VHF transmitter costs approximately $12,000, while a four to five channel VHF transmitter costs approximately $25,000.

- *A local, state or national network.* A number of groups propose to form a national network of 10-100 LPTV stations, with programming fed by satellite to affiliates. Full-time lease of a satellite transponder (a channel on the satellite) costs several million dollars per year. By leasing the transponder for a few hours per day, the cost may be reduced to one or two million dollars per year. Costs can be reduced still further if a group uses only off-hours satellite time. In this case, each station would record the satellite feed during the night for broadcast the next day. A second option is a statewide network, with individual stations linked by microwave or, in some instances, a satellite. Many applicants have proposed a local network or cluster of stations in an area. Generally, the local network is formed because the population is spread over a greater area than can be reached by one station. Thus, two or more stations (at different sites) are used to reach the larger community.

Program Sources (Transmission)

The transmission method—how programs arrive for broadcast—deserves careful consideration. There are five categories of program transmission. Most stations will employ more than one of these methods. These methods are assessed here from a business and market planning perspective.

- *Broadcast retransmission.* Existing translator stations use an antenna to receive a normal, over-the-air signal from a distant station. The signal is then amplified and retransmitted. Costs associated with such reception are generally low (e.g., $100) unless the antenna must be located on a tower other than the station's transmission tower or at a distance from the transmission site.
- *Satellite receiver.* A satellite receive dish enables the station to receive signals from a satellite. The cost of a satellite receiver will vary from $12,000-$25,000 depending upon the quality of the signal, location of the station within the "footprint" or transmission beam of a satellite, and amount of interference in a particular area. If an LPTV station wishes to pick up signals from more than one satellite, costs will be 10 to 15 per cent higher.

  Satellite "uplinks" enabling a station to transmit signals to a satellite are very expensive and beyond the means of individual LPTV stations. A group intending to operate an LPTV network with satellite transmission will need to lease the facilities of an existing satellite uplink and find a way to "move" their programming to the uplink facility.
- *Microwave transmission and reception.* Microwave transmission moves programming from a remote studio to a transmitter; an on-the-scene reporter to a studio or transmitter; and from one station to another. Microwave transmission is line-of-sight. The path from transmitter to receiver must not be blocked. Thus, intermediate links are sometimes necessary to move the signal around an obstruction. The cost of each send/receive point varies between $15,000-$25,000. If a special tower is required for the microwave dish, costs will be higher.
- *Land lines.* Video transmission can be sent over special land lines, available from AT&T. This form of transmission is very expensive and likely to be beyond the means of LPTV operators.
- *Mail.* Many prerecorded programs are sent to stations by regular mail or one of the overnight package delivery services. This form of program transportation is often called bicycling.
- *Local origination.* Live, in-studio programming and playback of locally recorded materials do not require special transmission to the station. Costs are associated with the traffic management of local prerecorded materials, particularly if the programming comes from a variety of local sources.

The selection of transmission method from source to station is closely related to content and existing sources for programming. During the planning stage, transmission costs, availability and operational implications must be considered simultaneously with proposed programming content. This includes assessing existing transmission systems in the area, which, with facility sharing, could realize considerable savings.

Ownership

Ownership patterns for nonprofit LPTV may differ somewhat from the current pattern of public television station ownership. Table 16 outlines the ownership pattern for public television stations.

Low-power TV encompasses the ownership groups for public television plus a number of small, private nonprofit groups, e.g., those who have become involved in community cable channels. In addition,

Table 16

Public Television Station Ownership (1982)

Ownership Group	Licenses % of Total	Stations % of Total
Community	41	29
University	34	26
State Authority	15	40
Local Authority	10	6

Source: CPB

LPTV lends itself under current FCC rules to joint ventures between nonprofit agencies and commercial entities, as well as a consortium of nonprofit agencies.

A private, nonprofit group seeking to operate an LPTV station may wish to investigate the strengths provided by a joint venture with one or more of the following local groups:

PBS affiliate	Newspaper
Two- or four-year college	Cable operator
Civic associations	TV repair shop
Village or town agencies	Radio station
State agencies	Commercial TV station

A PBS affiliate can help an LPTV operator by providing or joining in the production of local programming and by securing access to PBS programming not otherwise available to an LPTV operator. The LPTV station and the PBS affiliate also could share studio facilities.

Many PBS stations have applied for LPTV licenses. In addition, many public television stations (e.g., KCTS in Seattle, Nebraska ETV Network, KSPS in Sprokane and WSJK in Knoxville) have developed a second channel for cable and/or secondary distribution channels such as ITFS and LPTV.

Local colleges, civic associations and government agencies may assist with funding, provide volunteer staff and build community support. Many of the best models for such relationships can be found in community cable channels.

In many communities, the local newspaper is a strong potential partner since it already functions as a supplier of local news and information. Moreover, it can handle advertising and billing (for an STV operation) for the LPTV operator. A local radio station, cable operator and commercial TV station can provide some of these resources as well.

Four Station Models

The following four models are presented as practical examples for review and analysis, not as ideal or recommended ways to organize an LPTV operation. The cost estimates are for equipment only.

1. An existing translator station retransmits the signal of a nearby PBS affiliate. The translator is owned by a public authority in the area.[13] Working in conjunction with a consortium of local groups—the PBS affiliate, the public library, the League of Women Voters, and the Kiwanis Club—they build a Level 1 Studio (see Chapter 3). The studio is financed in part by the same public authority that built the translator station and by the local groups who join the LPTV consortium. The new LPTV station continues to retransmit the PBS affiliate and provides 30 minutes of local news each night. While the consortium begins with a small amount of local origination, they have built a capability to grow over time. Cost estimate: $60,000.

2. A four-year college with a media department and studio facilities decides to build an LPTV station to serve the local community, provide training for their students and enhance the college's educational outreach program. They build a moderate-power transmission system but do not require any new studio facilities. In addition, they install a satellite receive dish and arrange to broadcast some telecourses provided by a national ETV network. The station is funded entirely by the college and run by students with professional supervision. The content of the station is predominantly educational, with some local news and talk shows on community issues. Cost estimate: $57,000.

3. A private nonprofit group builds an LPTV station with a Level 1 studio and a satellite receive dish. They seek to provide a mixture of daytime educational programming, national and local news and entertainment. They secure funding through a series of state and foundation grants, along with a bank loan.

   The station transmits an educational satellite service during the day, a national satellite news service from 5-6 p.m., local origination news from 6-7 p.m., and a satellite movie in the evening, with subscribers paying $20 per month for the service. In order to operate

[13] Most translator stations (83 per cent) are owned by a government agency, public authority or civic association. Comparatively few are privately owned.

this STV service, the nonprofit group forms a profit-making subsidiary with a local TV repair service. The TV repair service installs and maintains the home equipment while the nonprofit groups handles the billing. Cost estimate: $185,000.

4. A local PBS affiliate forms a partnership with a newspaper to provide an LPTV channel in the same area where the PBS affiliate broadcasts. The LPTV channel shares studio facilities with the full-service public television station. With these facilities, they provide a strong local origination service: news, talk shows and sports, along with syndicated entertainment programming. Some channel time is leased to local groups. All of the programming contains advertising. The station is built with capital from the newspaper and a profit-making subsidiary of the PBS affiliate. Cost estimate: $115,000.

Content and Needs

The programming on an LPTV station will undoubtedly reflect the interests of those who own and operate it. It is important, as well, to assess the needs, interests and wants of the community to be served by the station. The FCC rules do not require ascertainment of community needs by an LPTV operator. Such an assessment, however, is in the business interest of an LPTV operator as well as the public interest.

A community needs/wants assessment has two components: household content needs and institutional needs. An LPTV operator can gain a reasonable understanding of what people want most from the station through a simple questionnaire passed out at shopping centers, churches and public parks. The design, implementation and tabulation of the survey can be done with the help of a local political science or sociology professor. The survey can be supplemented by informal discussions with people.

The institutional needs assessment addresses the interests of the local library, high school, churches, civic associations and businesses. Where possible, it is advantageous to conduct this assessment in person. By visiting and talking with community groups and business organizations, an LPTV operator can learn about their problems and needs while building support for the station.

After completing the household and institutional needs assessment, determine what content/programming exists in the area, including TV stations, cable, radio and newspapers. Such a list can help the LPTV planner decide if other media are addressing the same needs and wants identified in the LPTV needs assessment. The choice of programming also depends on whether the LPTV operator or consortium has the resources to provide that type of programming and whether the provision of such content can be supported by existing or anticipated revenues.

Evaluating Sources of Programming

Many programming sources have advantages and disadvantages from a business and market planning perspective. These are reviewed below. A list of some program suppliers is found in Appendix A.

Renting/Leasing Programs

Many syndicated program packages are available for the independent television station operator. These include old movies and reruns of TV series. The costs tend to be high for a small LPTV market ($75-$100 per hour). Furthermore, they do not provide strong audience appeal unless there are no other choices available.

Many educational and documentary materials are available at lower prices, particularly when leased as part of a package. These materials vary from excellent to mediocre. The LPTV operator must shop for programs with the same concern for quality as in shopping for equipment.

PBS has a large body of prerecorded materials and has supplied some of the early, experimental LPTV stations. Leased programming is made available through PBS Video, 475 L'Enfant Plaza S.W., Washington, D.C. 20024

Simultaneous Retransmission of a Distant Station

In retransmitting a distant station, the problems associated with substituting local ads for the distant station's commercials are not insignificant. These problems may be negotiated if the distant station is transmitting programs that it owns (e.g., local news) rather than a network feed. For this reason, LPTV operators may wish to plan the simultaneous retransmission of a distant station for a small part of their LPTV program day (e.g., local news from the distant station).

Some groups have considered retransmitting the signal of a PBS affiliate and adding clusters of commercials at the end of the programs. They have

noted several public television stations experimenting with commercials in cluster formats, under special Congressional authorization. These commercials are indeed experimental, and they do not set a precedent for LPTV operators. The contracts for public television specify that they will be used for noncommercial broadcast. Unless the public television system changes its program contracts and formally alters its policy on commercials, an LPTV operator cannot retransmit a PBS affiliate's signal and add commercials.

Satellite Services

A number of large ETV networks transmit their programming in whole or parts via satellite. These include Appalachian Community Service Network; Central Educational Network; Eastern Educational Television Network; Pacific Mountain Network; and Southern Educational Communications Association. Since policies toward LPTV differ from organization to organization, an LPTV group wishing to affiliate with one of these networks should contact them directly.

PBS also transmits its national feed via satellite. PBS policy does not allow an LPTV operator, who is not a full-service PBS member, to receive and retransmit the satellite feed directly, unless the LPTV operator serves an area that is not currently served by any full-service PBS member station. The LPTV operator in most instances must deal with a nearby PBS affiliate.

Commercial satellite service providers are likely to vary in their attitudes toward LPTV. Some may refuse to deal with LPTV, viewing it as a competitor to the satellite service's cable interests. But many others will view it as a commercial opportunity. Indeed, one satellite service, SIN, the Spanish International Network, has set up two translator stations to broadcast its service in Washington, D.C., and Denver. Other satellite services, e.g., the Financial News Network and Cable News Network, are actively pursuing relationships with LPTV operators.

Local Origination

The value of locally produced programming should not be underestimated. It may be the strongest asset of LPTV. Evidence from a variety of sources supports this argument. For example, local news is a major source of revenue in all TV markets, so much so that local network affiliates have strongly resisted network attempts to take local news time away and substitute longer national news programs. Similarly, the success of small city newspapers in covering local news and the relationship of these newspapers to their readers merit close examination by an LPTV operator.

A National LPTV Network

A number of nonprofit groups have applied for multiple LPTV licenses in the hope of forming a national network. The economics of such an operation, without a strong external funding base, do not appear attractive. The costs of satellite leasing and production of many hours of original programming are significant and problematic. Moreover, these groups will in some cases sacrifice local origination for national programming, which may have less appeal.

If LPTV represents only one means of local distribution for a group (i.e., they will also distribute their programming to cable systems and full-service stations), a national network is more viable. Here, the audience base may be sufficient to support the high cost of program production and satellite distribution.

In addition, a national network for selected special interest groups (e.g., members of a large union or the large Spanish-speaking community in the U.S.) may be feasible. This form of targeted network requires a strong funding base and programming that will appeal to the audience.

Auxiliary Services

Several auxiliary services offer ways to meet audience needs and/or provide revenues for the station. These include—

- *Text services.* There are two forms of text service on television: teletext and open channel text. Teletext is a service in which frames or "pages" of text and simple graphics are piggybacked on broadcast transmission without interfering with regular programs. Viewers in their homes require a special decoder (estimated to cost $200) to separate teletext frames from the broadcast transmission. A simple teletext system costing approximately $50,000-$75,000 enables a station to create and transmit a 100-page teletext service. Teletext can include brief news stories, sports scores, weather, community bulletin board information, and advertising.[14]

[14] Several publications on teletext are available from Alternative Media Center, New York University, 725 Broadway, New York, New York 10012.

Two national teletext services were begun in 1983. Decoders, however, will probably not be available on a large scale until 1985. Therefore, an LPTV operator with an interest in teletext may wish to plan a 1985 start for such a service.

Another form of text service uses the full broadcast channel to transmit alphanumeric and graphic information. Here, the text service is transmitted *instead of* regular programming. Some stations have explored such a service before or after their normal broadcast day. This form of text service does not require any decoders in the home. The viewer watches it like a regular program. Equipment to create an "open channel" text service already exists in many studios. Alternatively, an LPTV operator can obtain such a capability for approximately $15,000. As in the case of teletext, open channel text can be used to generate advertising revenues, in particular, classified ads.

- *Teleconferencing.* An LPTV operator with a simple studio and satellite receive dish can serve as a reception point for one or more of the national video teleconferencing services. In video teleconferencing, a group in one location communicates via sound and television pictures to one or more groups located throughout the country. The Public Service Satellite Consortium, Western Union, among many others, offer video teleconferencing services. An LPTV operator may contact these groups and negotiate a relationship as one end point in their network.

  It may be possible to generate other revenue through a form of local teleconferencing. In this situation, the LPTV operator would lease the studio and channel to a group (e.g., a union) to meet with members who are scattered throughout the area. The group at the station would be seen and heard by everyone. Participants in their homes could only call in and be heard.[15]

- *Slow-scan TV and telephone communication.* Transmitting video signals via satellite is expensive. Alternatively, a still video image, called slow-scan television, can be transmitted over a regular telephone line. Equipment to send/receive slow-scan TV images costs under $5,000 per site. With slow-scan TV and audio (the audio can be transmitted on a second telephone line), an LPTV station can create interactive television programming with other stations or groups throughout the country. This form of interactive programming is suitable for content that does not require full-motion video. For example, it would be suitable for a *MacNeil-Lehrer* format, or an interactive chess show in which local players challenge a master chess player in another city.

  In addition, it is possible to send a slow-scan picture with audio as a broadcast subchannel. This does not disturb the normal broadcast program. In effect, it creates a second channel piggybacked on the main channel. Such an auxiliary channel might be leased to a local school district.

- *Interactive microwave.* An LPTV operator with a microwave send/receive dish may be able to use an existing state microwave network to create full-motion interactive video among selected sites throughout the state. While such a network would be expensive to build, the LPTV operator can investigate its availability. Interactive television can be very effective in extending educational resources and increasing citizen participation in government (e.g., interactive town meetings).

- SCA *(Subsidiary Communications Authorization).* SCA is an audio subchannel. It enables an FM audio transmission to piggyback a second signal on the normal broadcast transmission. SCA may be used for a second voice channel or for data transmission.

  The audio portion of a television signal is FM, just like radio FM. For this reason, it is possible to transmit an SCA signal with the normal television transmission without interfering with the TV picture or audio. An LPTV operator may be able to lease an SCA frequency to a third party for voice or data transmission (e.g., Muzak and radio paging services use SCA). Alternatively, the station's SCA may be used to provide a talking books program and news services for the visually handicapped. This service requires an SCA radio in each home (cost: under $100).

Staff and Operating Costs

Clearly, the costs of staff and operations will vary in relation to the size and complexity of a station, as well as the amount of volunteer help, but it is possible to develop estimates.

[15] Under FCC rules, LPTV broadcast signals cannot be used for private communication; however, as long as a teleconference can be viewed by everyone, it would not likely be considered private communication.

Table 17

Programming Budgets of Community Cable Channels (1982)

Channel or Group	Annual Budget for Program Operations	Hrs. Per Week Programming
Community Video Center San Diego, CA	$ 12,000	N.A.
TKR Cable Warren, NJ	200,000	9
WELM East Lansing, MI	80,000	41

Source: Cablevision

Operating Costs - Transmission

It is reasonable to estimate $3,000-$10,000 per year for electricity and maintenance of transmission equipment at a single channel LPTV station. A ten-watt VHF station is likely to approach the low end of this estimate, while a 1,000-watt UHF station is likely to approach the high end.

Staff and Program Operations

Until many LPTV stations are operating and data are collected about them, it may be useful to analyze the staff and operating costs of community cable channels. A Cable Television Information Center (CTIC) survey of several cable-based community channels found that they created a range of 30 to 40 hours of programming per week with a paid staff of two to five persons plus two to ten volunteers. Reports from individual channels reveal a range of operating budgets. Table 17 provides a few examples.

Table 18 outlines the monthly operating budget of Fayetteville Open Channel, a community cable channel in Fayetteville, Arkansas. Some of the figures have been rounded off and grouped together.

Working in the mid-range of community channel operating budgets listed in Tables 17 and 18, it is possible to derive an estimate of the operating budget for a nonprofit LPTV station that produces a moderate amount of local origination per week with a combination of paid and volunteer staff. Table 19 represents two estimates.

Table 18

Monthly Operating Budget Fayetteville Open Channel

Item (Annual Budget = $37,380)	Cost
Salaries	$2,000
Office Supplies	55
Postage	30
Rent	450
Utilities	80
Printing	40
Insurance	200
Telephone	160
Miscellaneous	100
Monthly Total	**$ 3,115**

Source: Fayetteville Open Channel, 1982

Lessons from the Field

The management and organization of existing LPTV stations and successful community cable channels provide appropriate lessons for planning. Four channels or systems are particularly instructive:

- *Berks Community TV.* This community channel on a cable system in Reading, Pennsylvania, has pioneered in the development of interactive programming for the local community. Use of advanced technology (two-way cable, microwave, and a planned LPTV channel) is supported by a strong organizational framework. The channel has developed a diverse mixture of revenue sources—state, federal and foundations, with spaghetti dinner fund raisers and viewer contributions. In addition, a strong relationship exists with the City Council and the local cable operator, both of which include the channel as a line item in their budgets.

  Berks Community TV emphasizes local origination and content tied to community interests and concerns. Moreover, the staff (a mixture of paid and volunteer workers) devotes a great deal of time to building relationships with local institutions—hospitals, schools, churches, etc. This organizational work represents a departure from most commercial television operations. That is, Berks community TV has worked to become as much a community institution as the fire department and high schools.

- *Eagle Bend, Minnesota.* Channel 45 in Eagle Bend, Minnesota, is an experimental system with

Table 19

Estimated Annual Operating Budget
LPTV With Moderate Local Origination

Item	Lower Mid-Range	Upper Mid-Range
Electricity and Equip. Maintenance	$ 4,000	$ 7,000
Staff and Program Operations	38,000	80,000
Equipment Amortization & Program Materials	10,000	20,000
Totals	**$ 52,000**	**$ 107,000**

Source: Greystone Communications

low-power and Instructional Television Fixed Service (ITFS) transmission. The channel covers a 20-mile radius in a sparsely populated dairy farming region. It is an educational channel with additional programming about local events. Seventy per cent of the content is local origination. Further, the channel uses interactive microwave to produce programming that extends limited resources, e.g., a German language class. Non local programming is supplied principally by Children's Television Workshop.

Channel 45 is managed by three school districts. Students perform nearly all production duties. A broad funding base includes federal, state and foundation grants. The strength of the station lies in its providing educational services. Limited resources are extended to serve more people.

- *Open Channel, Fayetteville, Arkansas.* Open Channel is a community cable channel with a remarkable viewership. Approximately one-third of the cable subscribers in Fayetteville watch Open Channel for one or more hours per day. The channel has many of the same strengths as Berks Community TV—strong community organization, training workshops for volunteers and local fund raising. Much of this organizational work is described in their *Focus Manual.*[16]

Open Channel has successfully identified local issues of strong concern to viewers and built programs around those issues, including general topics (parenting, alcoholism and consumer legal issues) as well as timely ones (the suspension of ambulance service in Fayetteville). Open Channel uses a call-in format in many programs and stretches the limits of low-budget equipment by training volunteer production crews. The Fayetteville channel demonstrates that effective management is just as important for a nonprofit, community service as it is for a large, commercial business.

- *Alaska LPTV Network.* Currently, the State of Alaska owns and operates a system of more than 100 low-power stations. The system began ten years ago under a special authorization from the FCC. The early "mini-stations" were built for $8,000 each to provide television service in rural areas. Prerecorded tapes were bicycled to the stations. Subsequently, satellite receive dishes were installed to receive programming from Satcom II. Currently, programming is a mix of entertainment, news, education and community health programs. In addition, the network has teleconferencing capability and regularly conducts statewide town meetings.

The Alaska system meets a critical need; the villages have no other source of programming. The programming has responded to local needs and wants, i.e., a mixture of entertainment, education, news, and health programs. The cost per station has been kept low, in tune with the realistic audience reach of each station, and the system started small and expanded slowly over time.

Revenue Options

Several revenue options may be available to low-power operators. They vary according to the mode of operation (e.g., commercial vs. noncommercial), geographic area and competition in the market.

While it is very easy to present revenue options on paper, it is much more difficult to investigate the practicality of a given revenue source. A planner must weigh the effects of various revenue sources on content and community service; the cost of managing a station from a particular revenue base; and the time and effort required to build the revenue base. For example, the potential of advertising revenues must be weighed against their inevitable impact on program content, increased costs of managing the station, and

[16] This publication is available from Fayetteville Open Channel, 309 B West Dickson, Fayetteville, Arkansas 72701.

the considerable effort required to build a strong base of advertisers.

The following presentation is directed primarily toward nonprofit groups. A full range of commercial and noncommercial revenue opportunities are treated since, under the FCC rules, a nonprofit group can engage in the same commercial activities as profit-making groups. It must be noted, however, that the FCC rules do not supersede federal, state and local laws or regulations regarding the commercial activities of a nonprofit group. In particular, existing tax laws may limit the commercial activities of a nonprofit group. These laws vary widely and require investigation by any nonprofit group considering commercial applications for an LPTV station. Similarly, a nonprofit group operating a commercial LPTV station must consider how those activities might affect revenue opportunities from foundations and many federal, state and local agencies whose policies may restrict grants to noncommercial groups only.

Noncommercial Revenue Options: A Public Television Model

It is useful to begin analysis of noncommercial revenue options by examining how the current public broadcasting system is financed. Table 20 summarizes all sources of funding for all public broadcast stations.

Table 20

Sources of Funding for Public Broadcasting (1982)

Source	% of Total	
Nonfederal Tax-Based (e.g., state & local governments including state colleges	35.5	Public Tax-Based Support=59.1%
Federal	23.6	
Viewer Subscriptions	16.7	Private Support = 40.9%
Auctions, Private College Support and Other	10.9	
Corporate Underwriting	10.7	
Foundations	2.6	

Source: CPB Preliminary Data

The figures in Table 20 vary in relation to type of public broadcast station. In addition, the percentages will shift somewhat in the period 1984-85. However, it is important to note a fundamental pattern: Noncommercial public broadcasting relies heavily on tax-based support. Under most circumstances, a noncommercial LPTV station will also require a strong level of support from tax-based funds.

Federal Funding

The total amount of federally based money available to public broadcasting will shrink during the next several years. Under the Public Broadcasting Act, low-power licensees are not eligible for Community Service Grants, the only program CPB maintains to provide annual operating support for public broadcasting stations. Under 47 U.S.C. §397(6), a public broadcast station is defined as a television or radio station which "under the rules and regulations of the Commission [FCC] in effect on the effective date of this paragraph, is eligible to be licensed by the Commission as a noncommercial educational radio or television broadcast station..."

Low-power licensees fail to meet this statutory definition for two reasons: (1) The FCC has refused to issue noncommercial licenses in the low-power service; and (2) even if the FCC ultimately adopts regulations providing for noncommercial LPTV licenses, the statute only provides for CSG funding for stations eligible to be licensed "under the rules and regulations of the Commission in effect on the effective date" of the paragraph defining public broadcast stations. That effective date was November 2, 1978.

In addition to the statutory limitations, CPB faces reduced appropriations of funds through 1986. With this reduced level of funds, CPB has been forced to cut back its support of existing public broadcasting services. Sufficient funds do not exist for CPB to support new services, such as low-power television.

Although its resources are severely limited, CPB will continue to provide technical advice to the extent possible to low-power television stations that will provide noncommercial services.

The National Telecommunications and Information Administration (NTIA), a branch of the U.S. Department of Commerce, administers the Public Telecommunications Facilities Program that provides money for equipment. The Facilities Program is explicitly mandated to extend public telecommunications services to unserved areas. Indeed, many

translator stations have received funding through the Facilities Program.

If LPTV stations do qualify for NTIA Facilities Program funding, they should be aware of statutory and regulatory restrictions on the use of equipment funded under this program. In particular, they restrict commercial uses of this equipment.

Most of the funding available through the U.S. Department of Education is allocated through its Division of Educational Technology (DET). Their funding programs include Basic Skills, Educational Television and Radio Programming and the Emergency School Aid Act. Each of these programs is concerned with improving the quality and availability of education. Grants are made on the basis of proposals to create a series of programs or provide a particular service. An LPTV group involved in educational programming should contact DET directly and follow Request for Proposal announcements that appear in *Commerce Business Daily*.

An LPTV operator may investigate the funding programs of the National Endowment for the Arts (NEA) and the National Endowment for the Humanities (NEH), which fund media programs and special projects. It is best to contact NEA and NEH directly for information on guidelines and applications. A number of other federally funded agencies sponsor programs that may be relevant to LPTV, although federal support of these programs fluctuates greatly. Information on funding opportunities is available from trade publications on educational broadcasting and from CPB and PBS.

State and Local Tax-Based Funding

State and local tax-based funding constitutes the largest source of money for public broadcasting. State funding is allocated in several ways. First, many public broadcast stations are state-owned. The majority of these stations operate within state educational television networks, which are part of the state's education system. States also provide significant funding for many university-owned public broadcast stations, particularly those owned by state universities and colleges.

For state and university licensees, the basis for state support is direct or indirect state ownership of the station, and/or provision of state-related educational services by the station. States also provide funds to some community licensees that provide state educational services.

In addition, states may provide unrestricted funds to public broadcast stations (e.g., Florida, Pennsylvania and New York).

These funding patterns suggest three ways in which an LPTV station may be able to obtain state funding:

- The state or state-owned college holds the LPTV license.
- The LPTV station joins the state ETV network and/or provides educational services in direct support of the state's educational system.
- The LPTV station lobbies for unrestricted funds earmarked for public broadcasting.

Generally, local government funding for public broadcasting is allocated in two ways: A local authority owns the station and receives funds to provide educational services, and/or tax district funds are allocated to a station.

A number of local school districts own public television stations. In addition to CPB Community Service Grants and other nonlocal funding, such stations receive county, city or township funding to provide instructional programming for the district's educational needs.

In 21 states, local tax districts are authorized to provide funding for public broadcasting. These tax districts work much like streetlight or sewer districts. They use general obligation or revenue bonds, property and other forms of direct taxes to support public broadcasting services. Approximately 30 per cent of existing translator stations are funded through tax districts. This suggests two principal ways in which an LPTV station might receive local government funding:

- A local authority owns or shares the license for the LPTV station.
- An LPTV station qualifies for tax district funding.

In addition to general state and local funding sources, many states have specific programs in agriculture, health and social services that may apply to an LPTV station. For example, six states (Delaware, Florida, Indiana, Michigan, Missouri and Pennsylvania) have Neighborhood Assistance Programs or Community Improvement Programs offering substantial tax credits to companies that support nonprofit organizations, especially if the nonprofit agency provides service to low income and minority groups.

County or state legislators can be contacted for information on potential funding from state and local governments. Public interest groups also help nonprofit organizations identify sources of government funding.

Corporate Funding

Corporate funding provides moderate revenue for public broadcasting and is directed primarily toward large community stations in the form of program underwriting. Furthermore, corporations tend to support major projects such as *NOVA* and *Masterpiece Theatre.*

An LPTV group may therefore wish to adopt corporate funding strategies akin to those of other small nonprofit groups (e.g., a community center or a volunteer fire department) rather than those of large public television stations.

Foundation Funding

Foundation grants are another source of moderate revenue for public broadcasting.

Low-power stations may be able to obtain some foundation funding. In general, foundations have shown considerable interest in providing seed monies for promising new services. It is important to identify foundations whose objectives are compatible with the programming and services that an LPTV group intends to provide. A useful resource for this is the *Foundation Directory*, found in many libraries, which lists all foundations and the type of work they support. Before applying to foundations for funding, obtain information about their current funding programs, applications procedures and deadlines for submitting proposals.

Viewer Contributions

Viewer contributions are a moderate but growing source of revenues for public broadcasting. On the average, 10-12 per cent of those who regularly view public broadcasting contribute money to the station. Typical viewer contributions range from $25-$35 annually. The percentage of viewers who contribute and the amount each contributes has grown in the past two years.

Most LPTV groups, particularly those in underserved television areas, can expect moderate revenues from viewer contributions. A reasonable goal in the first two years of operation is $20-$25 per year from five to ten per cent of households that regularly view the station. It may be possible to exceed these goals, particularly after three to five years of operation. Viewer fund raising takes a good deal of time and effort, and successful fund raising strategies vary from station to station. An LPTV group may have to learn by trial and error which methods are best suited to its station.

One useful technique in fund raising is to offer a gift or premium for contributions exceeding a fixed subscription rate. In the case of LPTV, this could be an outdoor antenna which is often needed for clear reception of an LPTV signal.

Many stations also supplement direct viewer contributions with auctions, picnics and other activities to generate revenues. While experience will provide the best indication of which activities to offer, a good starting point is to talk with other nonprofit groups in the area about the activities that work well for them.

Commercial Revenue Options

The following commercial revenue options for LPTV are treated without consideration of policy issues or tax status implications for nonprofit groups. Before considering commercial revenue options, nonprofit LPTV stations should examine the potential tax consequences.

Advertising

There are two principal models for advertising: national advertising on full-service television and local advertising through area media services, such as a local cable channel or a newspaper.

The national model is appropriate for LPTV groups that intend to operate as a national network. The local model lends itself better to an independent station with local advertising. The following examination of both models is from the revenue perspective of an individual station, whether it operates as part of a network or independently.

The national model, through a network, is efficient; a small sales group can represent many stations. In addition, advertisers will often pay a premium to reach a high percentage of their target audience, something an LPTV network can "deliver" through specialized programming. An LPTV network can offer more attractive packages of commercial time and flexible scheduling. Longer and experimental commercials also may be appropriate for LPTV.

National advertising on LPTV, however, must meet several advertising industry requirements. Each station must document that a spot has been aired.[17] Traffic management and monitoring of spots can

[17] See *Confirmation Contracts For Commercial Spot Television and Radio.* American Association of Advertising Agencies, 1970.

absorb 15 to 25 per cent of sales revenues (the higher percentage applies to smaller stations[18]). Furthermore, national advertisers require a numerical and demographic breakdown of the station's audience. Survey organizations, such A.C. Nielsen and Arbitron, provide this data to some small markets for $15,000 a year. In many rural markets, the data are not gathered, and a station must undertake its own research.

An LPTV network will likely need a firm to handle national spot sales. Typically, such firms charge a 12 per cent commission on sales revenues. In addition, the advertising agency, which purchases the time for their clients, receives a 15 per cent commission on sales.

A national LPTV network faces strong competition from existing broadcast networks, cable networks, and magazines for national advertising dollars. Further, advertisers and agencies have been very conservative in moving into new technologies. In 1981, over 90 per cent of advertising-based, national cable services failed to show a profit. A national LPTV network would require a large marketing budget to sell a significant amount of advertising.

These elements are compiled below in a revenue scenario for a ten-station, nonprofit LPTV network with advertising.

Revenue Scenario # 1

Advertising Revenues for Ten-Station LPTV Network

A ten-station network of LPTV stations provides educational programming during the day with no advertising. During the evening, 7-11 p.m., the network carries a general entertainment channel from one of the existing satellite services. The LPTV network does not pay for the programming since it contains commercials. As part of the contract with the satellite service, the LPTV network is allowed to insert four minutes of commercials per hour in the programming. This advertising time is sold by a national sales firm which represents the LPTV network. The network charges advertisers a premium price of $6 per thousand households watching its stations.

[18] See *Television Financial Report*. National Association of Broadcasters, 1981.

The average market size for each of the stations is 25,000 households. (Only rural areas and small markets are likely to receive licenses in 1983-84.) Half of these markets have cable where 10 per cent of households watch the LPTV station at any given time, while 20 per cent are watching in noncable markets. This yields an average viewership of 15 per cent of households for the network as a whole.

- With 15 per cent viewership in a 25,000 household market and a rate of $6 per thousand, the price for a 30-second spot on each station would be $22.50.
- At $22.50 per spot and 32 spots per evening, the potential gross revenues for the ten-station network would be $2,628,000 per year.
- In the first year, it is estimated that the network could sell approximately 30 per cent of this commercial time, yielding gross revenues of $788,400.
- From these gross revenues, the sales representative's commission and the ad agency commissions must be subtracted, as well as the costs associated with spot traffic management and logging. This yields $443,475.
- Other costs include amortization of spot insertion equipment, research to demonstrate audience reach in each market, and a promotion campaign to sell national advertising time. With minimal expenditures in each of these areas, the net profit for the network would be $236,333.
- Estimated profit per station in the first year would be $23,633.

The LPTV network scenario could yield more profits, particularly in years two to five of the service. It is also possible, however, to construct a scenario in which the service loses money from its advertising efforts in the first five years of operation. For example, if the LPTV network created its own programming and leased satellite time in order to reach the network affiliates, it would incur significant costs beyond those described in Scenario # 1. While the network would be able to sell more commercial time, it would be difficult for revenues to match costs.

Local Cable Model For Advertising Revenues

A second way to approach LPTV advertising is to adapt an economic model from local cable channels that advertise. A helpful example is TCI Cable in Orangetown, New York. TCI consists of two nearby cable systems with a total subscriber base of 18,500. TCI employs 1.5 sales people and a half-time technician who handles the insertion equipment. Their advertisers are predominantly local, e.g., local car dealers, etc. TCI does not produce commercials, which are handled by another local group charging $450 for a simple, 30-second spot.

TCI inserts local spots in satellite-delivered programs, e.g., Entertainment Sports Programming Network and Cable News Network. They offer three packages to local advertisers. The advertiser's 30-second spot will be played 36 times during one month for $900; 20 times during one month for $600; and 10 times during one month for $350. These packages are sold in three-month contracts. Thus, a car dealer who purchased the second package would have the spot played 60 times over a three month period, for $1,800. Using this approach, TCI generates $160,000 per year in gross advertising revenues.

Among the advantages of a local advertising approach are reduced need for audience research, and formal documentation of spots being aired. Scenario #2 adapts this model to an independent LPTV operator.

Revenue Scenario # 2

Advertising Revenues for Independent LPTV Station

An independent LPTV station provides educational programming during the day with no advertising. During the evening, 7-11 p.m., the station carries a satellite news channel. In accordance with their contract, the local LPTV station can insert four minutes of commercials per hour. This advertising time is sold locally by 1.5 sales people. In addition, a part-time technician inserts commercials.

The station reaches 25,000 households in a rural community with no cable. There is one competitive over-the-air station in the same market. During prime time, 20 per cent of households watch the LPTV station. The station offers a variety of package plans for spot time. These plans average $25 per 30-second play.

- With 32 spots per evening at a rate of $25 per play, the potential gross revenue per year would be $292,000.
- If 30 per cent of this commercial time were sold in year one, the gross revenue would be $87,600.
- From this gross figure, the salaries and overhead associated with salespersons and technician must be subtracted. Costs associated with amortization of insertion equipment and some promotion will reduce the profits.
- Estimated profit for the station in the first year would be $33,386.

It is possible to calculate ways in which net revenues for local advertising would be greater or smaller. It appears that a local advertising approach is less likely to lose money, since costs can be controlled more readily. Furthermore, if the local station produces commercials and sells spot time, additional revenues might be realized by leasing studio time.

Newspaper Model

A third advertising revenue estimate may be constructed by adapting a newspaper model to LPTV In Scenario #3, the LPTV operator forms a partnership with the local newspaper. All advertising sales would be handled by the newspaper and would consist of simple, character-generated text ads. The newspaper could manage the text ads as a supplement to its normal print ad business by using its sales force and billing department.

Revenue Scenario # 3

Advertising Revenues LPTV Station & Newspaper Joint Venture

An independent LPTV station provides educational programming during the day with no advertising. During the evening,

7-11 p.m., the station carries a satellite service. The station can insert four minutes of commercials per hour. These consist entirely of text ads created and sold by the local newspaper. In addition, the station broadcasts a special half-hour classified ad show (consisting entirely of classified ads) from 8-8:30 a.m. The station reaches 25,000 households in a rural, noncable market.

The newspaper offers a variety of packages to advertisers. These average $6 per "play" of the text ad. Each text ad is displayed for 20 seconds.

- The station can play 138 text ads per day. At $6 per play, this could yield a potential gross revenue of $302,220 per year.
- Since the newspaper has a customer base and considerable experience in selling classified ad space, it is estimated that it might sell 40 per cent of the advertising space in the first year. This would yield $120,888 gross revenues in year one.
- From these estimated revenues, the cost of two typists (to create the text commercials) and a part-time technician (to manage insertion equipment) must be subtracted. In addition, the amortized costs of the character generator equipment and insertion facilities at the station must be deducted.
- Estimated profit in the first year would be $56,531. This revenue would be shared by the newspaper and LPTV station.

In this scenario, an LPTV station might realize smaller revenues than from the local cable model. At the same time, there is less risk for the LPTV operator and no requirement to sell advertising space. For the newspaper, it also represents a small revenue potential. The newspaper can use its existing sales and billing personnel, while other costs may be controlled, in relation to sales volume.

Pay TV

Analyses of over-the-air pay TV (STV) suggest that it is not likely to be profitable in markets with fewer than 300,000 households and even less likely if there is competition from a cable system. The high costs associated with a sales force, promotion, and full-service broadcasting are among the reasons why STV requires larger markets for profitability.

Multipoint Distribution Service (MDS) is a less expensive way to operate an over-the-air channel. But MDS market studies suggest that a minimum of 40,000 households in a noncable market is required for MDS profitability.

A pay LPTV channel could be profitable in markets with fewer than 40,000 households, if sales and promotion costs were kept at moderate levels. In these small markets, the presence or absence of cable is likely to be crucial to the viability of an LPTV pay channel. In addition, the availability of Direct Broadcast Satellite (DBS) programming is another competitive factor. If DBS is available to a rural market before the LPTV station is built, it will be difficult for the low-power pay channel to compete.

Revenue Scenario #4 outlines a revenue option for an LPTV channel in a market with 30,000 households. The scenario examines a market with and without cable but does not consider potential competition from DBS. The analysis focuses on year three because it is assumed that the service would lose money in years one and two, when the customer base would be smaller.

This analysis does not deal with pay LPTV in major markets. Although the bulk of LPTV applicants seek to offer a pay LPTV channel in large markets, it is unclear why. Pay LPTV will not be able to enter large markets until 1985-86, at which time the consumer demand will have been tested by large capacity cable systems, full-power STV, MDS, and direct broadcast satellites. See chapters four and five of this report.

Revenue Scenario #4

Pay LPTV in a 30,000 Household Market for Year Three Revenues

An LPTV station offers educational programming during the day to all homes in a market. During the evening, the station scrambles its signal and offers a pay movie channel. Subscribers are charged $20 per month for the service. This includes the service and lease of the decoder equipment.

Fixed Monthly Costs Per Subscriber

Program Cost (40% of subscription fee)	$8.00
Decoder lease and repair contract	5.00
Program Guide	.75
	$13.75

Net Revenues per subscriber, per month = $6.25

	Cable Market	Noncable Market
Est. # Subs	1,500	6,000
Est. Revenues Per Month	$ 9,375	$ 37,500
Monthly Station Costs		
Advertising & Promotion	3,000	3,000
Sales & Technical Personnel	8,000	12,000
STV Equipment, amortized over 7 years	1,000	1,000
Overhead	1,500	1,500
Total Station Costs Per Month	13,500	17,500
Est. Net Profit Per Month	$ -4,125	$ 20,000

Source: Greystone Communications

Leased Channel Space

Channel space leasing is reviewed below along with some general pricing guidelines and, where appropriate, revenue estimates.

- *Leased access for programming.* A station may lease channel time to a group that seeks to present program materials. Where this is made available, e.g., on some cable systems, charges are usually nominal in order to encourage nonprofit public service uses of the channel. A station might charge $25-$50 per half hour for leased access.

- *Leased channel for a third-party pay TV operator.* An LPTV group could lease the entire channel during the evening to a pay TV operator. A basis for pricing can be adapted from MDS. In a town of 40,000 households, it is reasonable to charge $3,500 per month plus 65 cents per subscriber to the pay service. If the pay TV service attracted 6,000 subscribers, this would yield $7,400 per month to the LPTV licensee.

- *Shared channel leasing.* An LPTV group which seeks to use the channel in the evening, e.g., to bring a distant PTV station's signal into the community, could offer the channel in the daytime to a consortium of public users, e.g., the school district, a private college and a hospital. In this form of leasing, the station would attempt to meet its yearly operating costs through the leasing charge. For example, a station might charge $15,000 per year to each member of a four party public consortium. The consortium would then allocate daytime use of the channel among its members.

Leased Facilities and Auxiliary Services

- *Leased production facilities.* An LPTV station with a studio may be able to lease the studio production facilities. Pricing on an hourly basis would likely run $50-$250 per hour, depending upon the studio's capabilities. In some instances, the overhead and management costs of hourly leasing exceeds potential revenues. Under these circumstances, an LPTV operator may consider a long-term studio sharing arrangement with an appropriate group. For example, some LPTV operators could lease their studio three to four hours per day to a local community college for television production classes and preparation of course-related audio/visual materials. The station would charge a yearly fee and attempt to recover a percentage of operating costs.

- *Video teleconferencing drop.* LPTV stations with a satellite receive dish may be able to realize a small amount of revenue by serving as a local "drop" for a national video teleconferencing service. Typically, a local reception point for such a conference charges $300-$400 per hour for use of the studio and satellite receive dish.

- *SCA lease.* In a small market, the leasing charge for an SCA channel is approximately $300 per month. A radio paging service or Muzak are the most likely commercial groups to lease an SCA channel.

- *VBI lease.* During 1984-85, some national groups and local newspapers may seek to lease the

vertical blanking interval (VBI) of independent stations throughout the country in order to provide a teletext service. While there is no precedent for leasing charges, it is reasonable to assume that it would have the same value as an SCA subchannel, i.e., $300 per month.

- *Local teleconferencing.* Under certain conditions, an LPTV operator may be able to offer local teleconferencing services. For example, if two LPTV stations (20 miles apart) are linked by microwave, they may be able to lease their studios to a nearby corporation (with plants or offices in each of the two markets) for teleconferencing meetings. While video teleconferences are commonly seen as linking sites thousands of miles apart, some of the most successful applications of video teleconferencing involve a link of 15-30 miles. For example, the Department of Energy links its Washington office with a suburban office in Maryland, 25 miles away. The Department of Energy pays $5,000 per month for the microwave link, exclusive of room costs at each end.

  This form of teleconferencing also may be broadcast from each of the stations to homes or offices in the area. Under this condition, the issue of private communication may come into play. The FCC does not permit the use of *broadcast* services (point-to-point microwave does not come under broadcast rules) for private communication. Thus, a broadcast teleconference that is scrambled and received only be employees of a corporation would not likely be permitted. But, if the teleconference involved a corporate employee training program on stress relief, typing, or microcomputers—and all homes in the area could view it—the issue of private communication most likely would not arise.

Other Revenue Opportunities

An LPTV station in a small market may discover a broad range of revenue opportunities that cannot be anticipated in this report. Indeed, a keen entrepreneurial [illegible] may be the strongest asset of an LPTV operator. An LPTV group is likely to be identified by customers as generally skilled in new technologies. In some markets, this may suggest opportunities for spinoff businesses such as a video store, a microcomputer software dealer or a telephone store. Such a profitmaking subsidiary can help support noncommercial activities at the station.

Conclusion

This assessment of low-power television suggests that the strongest opportunities lie in those areas for which LPTV was intended: underserved TV markets. Furthermore, the strongest long-term programming asset of LPTV in rural areas and small towns is local origination: local news, provision of community services (e.g., education, town meetings and health services) and coverage of local events (e.g., high school sports). In the short term, STV in rural areas also may have strong appeal. By the mid 1980s, however, direct broadcast satellites will compete for rural pay TV services.

Low-power television opportunities appear to be weaker in major markets. By 1985-86 there will be a great deal of competition from large-channel cable systems as well as MDS, full-service STV, and DBS. Low-power commercial stations may find that they are entering a saturated market.

Noncommercial LPTV in major markets will be challenged to identify groups whose needs are not being served by cable channels. It may be noted first that many of the "target" groups discussed in relation to major market LPTV, e.g., women, blacks, Hispanics, and senior citizens, also have been targeted by cable service providers. Cable services, however, will have a much smaller penetration among low-income groups. Thus, LPTV in major markets may be suited to a target group that is identified by its economic circumstances, rather than race, language, sex or age. Among the many needs of the poor in the middle to late 1980s will be information that is available to others who can afford all of the emerging communication technologies. LPTV may be the only "new technology" that the poor can afford.

It appears that LPTV in rural areas and small towns will require a secure financial base to support a large share of operational costs. In most instances, this base will come from tax dollars at a federal, state or local level. Beyond the financial base, LPTV stations must develop a variety of additional funding sources, e.g., viewer subscriptions, auctions, public institution contributions, and underwriting from local companies.

Nonprofit groups mixing commercial and noncommercial activities must weigh carefully the potential revenues from commercial activities. The analysis in this report has suggested that supplementary commercial activities can provide only moderate revenues. An STV operation during the evening appears to be the most promising of these alternatives. But, the presence of cable in a market and the uncertain timing of DBS cast a cloud over pay LPTV in rural markets. Other part-

time commercial activities (e.g., advertising) can provide some revenues, but it does not seem likely that they will be able to support the station entirely.

Getting Started

Each market has specific characteristics that will present unique problems and opportunities. Moreover, LPTV is a newly emerging service whose shape will be forged over time by those who operate stations and their audiences. For these reasons, an early market assessment, such as this report, can and should serve only as an aid in getting started and reducing some of the uncertainties surrounding LPTV. With this in mind, a few general points may be offered to a nonprofit group planning to build an LPTV station:

- The investigation of potential funding sources will require a good deal of time and effort.
- The intended station programming and mode of operation must be viable in terms of audience needs and wants, anticipated revenues, geographic area, and competition. All of these elements must be considered.
- In many instances, a local partnership with a commercial group or a consortium of nonprofit agencies will make good sense for an LPTV operation. It will be difficult for any one group to gather all the resources necessary for a successful LPTV station.
- There is danger in looking to commercial television for programming models and methods of operation. A nonprofit LPTV station in a small market may learn more by studying successful community cable channels and other nonprofit community services (e.g., a volunteer fire department) for raising money, serving citizen needs and organizing staff.
- There are sound business reasons why more full-service stations have not entered small markets—revenues cannot support operation costs. An LPTV group must continuously monitor costs and keep them in line with those revenues that can be generated.
- Some good trade literature about LPTV is available, but it often contains hyperbole. A reader should apply critical judgment to all assessments of LPTV.
- Assessing community needs and organizing local support are major, time consuming tasks. But they are just as vital as quality of programming in building the station into a community institution.

Implementation

In addition to the general points above, a few specific suggestions may be helpful to a group that is planning to operate a station.[19]

- The construction of a station and start of operations nearly always takes longer than expected. A rule of thumb is to add one third to whatever reasonable timetable has been estimated. It is also important to anticipate delays that may arise because of permits, environmental impact studies and other outside approvals that are required.
- In purchasing equipment, consider how it will be repaired. If a piece of equipment must be shipped to another city for repair, what back-up equipment can be used to keep the station functioning normally?
- There is safety and value in starting small and building programming over time. Indeed, some groups have taken several years to implement a large scale service fully.
- Promotion is an important element in launching new services. Furthermore, this need will continue throughout the life of the station. Some groups prepare an initial promotional effort, then periodically reintroduce smaller efforts (e.g., every six months).
- Unanticipated problems and opportunities require flexibility in management style. It is unlikely that after three years an LPTV station will operate precisely as the planners anticipated. This is a problem only if management takes a rigid position toward changing circumstances.

A Parting Word

This assessment of low-power television has deliberately taken a tough stance since a group seeking to develop a low-power station must face a series of crucial financial, legal, marketplace and technical issues. None of these elements can be overlooked. At the same time, low-power television offers genuine opportunities for many nonprofit groups to become involved in television and to serve their communities. Furthermore, LPTV represents an exciting challenge for those with strong entrepreneurial spirit and community commitment to give shape and direction to low-power television in the United States.

[19] Martin Elton and John Carey, *Implementing Interactive Telecommunications Services*. New York: Alternate Media Center 1981.

Appendix

Appendix
Programming and Information Resources

General Information

Consumer Assistance Office
Federal Communications Commission
1919 M Street N.W.
Washington, D.C. 20554
(202) 632-7000

For Copies of FCC Documents

Downtown Copy Center
114-21st Street N.W.
Washington, D.C. 20036
(202) 452-1422

Low-Power Television Equipment Manufacturers*

Transmitters and Transmitting Antennas

Acrodyne Industries, Inc.
516 Township Line Road
Blue Bell, Pa. 19422

Bogner Broadcast Equipment Corporation
401 Railroad Avenue
Westbury, N.Y. 11590
(516) 997-7800

EMCEE Broadcast Products, Inc.
P.O. Box 68
White Haven, Pa. 18661
(717)443-9575

Eitel Electronics
P.O. Box 830
Prescott, Ariz. 86302
(602) 445-0691

Lance Industries
13001 Bradley Avenue
P.O. Box 4156
Sylmar, Calif. 91342

Rodelco Electronics Corporation
356-A Comac Road
Deer Park, N.Y. 11729
(516) 643-5110

Satcom
1756C Junction Avenue
San Jose, Calif. 95112
(408) 286-6000

Scala Electronics Corporation
P.O. Box 4580 Medford, Ore. 97501
(503) 779-6500

SITCO Antennas
10330 N.E. Marx Street
P.O. Box 20456
Portland, Ore. 97220
(503) 253-2000

Television Technology Corporation
5970 W. 60th Avenue
Arvada, Colo. 80003
(303) 423-1652

Thomson-CSF Broadcast, Inc.
37 Brownhouse Road
Stamford, Conn. 06902
(203) 327-7700

Townsend Associates
79 Mainline Drive
Westfield, Mass. 01085
(413) 562-5055

Versa-Count, Inc.
553 Lively Boulevard
Elk Grove Village, Ill. 60007
(312) 593-0208

Low-Power Television Trade Groups

American Community Television Association
1 Court Square
Montgomery, Ala. 36111
(205) 265-4444
A recently formed LPTV trade association.

*This is a partial listing of transmitter, antenna and satellite receiving equipment manufacturers. A more complete listing of vendors of this and related low-power equipment (studios, STV decoders, etc.) can be obtained by consulting trade publications such as the Services Volume of Television Factbook (1836 Jefferson Place N.W., Washington, D.C. 20036).

Independent Community Television Alliance
7432 E. Diamond
Scottsdale, Ariz. 85257
(602) 945-6746
ICTV is a membership organization aimed primarily at representing and sharing resources among small, independent LPTV entrepreneurs.

National Association of Broadcasters
1771 N Street N.W.
Washington, D.C. 20036
NAB is the membership organization representing U.S. radio and television broadcasters.

National Federation of Local Cable Programmers
Low-Power Hotline
906 Pennsylvania Avenue S.E.
Washington, D.C. 20003
(202) 544-7272
Provides LPTV information and services for non-profit organizations.

National Institute for Low-Power Television
International Center
454 Broome Street
New York, N.Y. 10013
(212) 966-7526
An organization devoted to developing publications and seminars on LPTV.

National Translator Association
University of Utah
Media Services Department
104 Talmage Building
Salt Lake City, Utah 84112
(801) 581-6180

NTA represents the translator industry—low-power facilities that rebroadcast television stations but do not originate programming. It is likely that NTA also will become the primary organization representing LPTV stations.

Selected Programming Sources

Agency for Instructional Television
Box A
Bloomington, Ind. 47401
Educational programming.

Appalachian Community Service Network
1200 New Hampshire Avenue N.W.
Washington, D.C. 20036
Large instructional television network with satellite distribution.

Downtown Community Television
87 Layfayette Street
New York, N.Y. 10013
Cultural and documentary programming.

Great Plains National TV Library
P.O. Box 80669
Lincoln, Neb. 68501
Educational programming.

Independent Cinema Artists and Producers
625 Broadway
New York, N.Y. 10012
Broad range of independently produced programming.

Modern Talking Picture Service
5000 Park Street
St. Petersburg, Fla. 33709
Broad range of programming available on a free loan basis.

National Audio Visual Center
General Services Administration
Washington, D.C. 20409
Broad range of government-sponsored programming.

Public Broadcasting Service
475 L'Enfant Plaza S.W.
Washington, D.C. 20024
Broad range of PTV programming.

Consulting Attorneys and Engineers

See *Television Factbook*
(Service Volume)
Television Digest, Inc.
1836 Jefferson Place N.W.
Washington, D.C. 20036

Other Publication and Information Sources

American Newspaper Publishers Association (Telecommunications Department)
Box 17407
Dulles International Airport
Washington, D.C. 20041
(703) 620-9500

Cable Television Information Center
1800 N. Kent Street, Suite 1007
Arlington, Va. 22209
(703) 528-6846

Corporation for Public Broadcasting
1111 16th Street N.W.
Washington, D.C. 20036
(202) 293-6160

Public Broadcasting Service
475 L'Enfant Plaza S.W.
Washington, D.C. 20024
(202) 488-5000

Newsletters

LPTV Reporter
The Television Center
P.O. Box 1567
Washington, D.C. 20013
(202) 822-9290
$45/year; monthly

LPTV Currents
National Institute for Low-Power Television
17 Washington Street
Norwalk, Conn. 06854
$48/year; monthly

Lo-Power Community TV Magazine
Lo-Power Community TV Publishing
7432 E. Diamond
Scottsdale, Ariz. 85257
(602) 945-6746
$50/year; monthly

Corporation for Public Broadcasting
1111 16th Street N.W.
Washington, D.C. 20036