



Television translators and the second class TV citizen : a Montana case study, 1955-1970
by Jeffrey Allen Sinnott

A thesis submitted in partial fulfillment of the requirements for the degree Of Master of Arts in History
Montana State University
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Abstract:

This is an initial study into the infrastructure of rural television, looking at the local, regional, and national forces that have shaped rural viewing. Specifically, it takes the rebroadcast device of the television translator station, and through a case study in Montana during the approximate period of 1955 to 1970 of actions affecting translator use, brings us closer to understanding how television has served rural Americans. It follows the actions and policies of the Federal Communications Commission (FCC), the regional and later national organization known today as the National Translator Association (NTA), the U. S. Congress, and concerned special interest groups. It necessarily focuses on FCC policies toward translator operators, small market television broadcasters, and Community Antenna Television (CATV) system operators.

This study makes extensive use of the papers of Montana broadcaster Edmund B. Craney, which include records of the NTA, the FCC, local translator associations, and other television interest groups. It also utilizes television industry periodicals and recent historical works concerning television programming and regulation during the period.

This study finds that rural television viewers had a marginal status compared to those in more densely populated areas, with fewer choices in programming, little or no local access to television air time, and an increased dependence on television as a source of news and entertainment, particularly in geographically isolated areas.

The FCC had a shortsighted view of the role of translators in disseminating television signals to the greatest audience, and an inconsistent policy as to how to regulate different technologies in order to expand television service to rural areas.

This study concludes that the marginal status of rural television viewers was due to the dichotomy governing FCC regulation of broadcast services, treating television as both a business and an essential public service. For the most part, commercial interests have dictated FCC policies toward the dissemination of television services. Free market forces, therefore, have placed rural viewers in such a marginal status.

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of a thesis submitted by

Jeffrey Allen Sinnott

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2 December 1991
Date

Mary Murphy
Chairperson, Graduate Committee

Approved for the Major Department

12/2/91
Date

Myshell
Head, Major Department

Approved for the College of Graduate Studies

12/27/91
Date

Henry Parsons
Graduate Dean

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CHAPTER 1

INTRODUCTION

It is indisputable that television has been a powerful social force in the United States since the inception of network broadcasting in 1948. By 1960, 87% of American homes had television receivers, and the average viewer watched over five hours of television each day.¹ In the late 1950s and the 1960s network profits bloomed as advertisers discovered in television a remarkably effective way to present goods and services to eager consumers. The three television networks--the National Broadcasting Company, the Columbia Broadcasting Service, and the American Broadcasting Company--dominated air time on local stations, particularly during prime time evening hours. It is only logical, therefore, that network television programming, and its effects on Americans' behavior became major subjects of historical and psychological study over the last several years. Television as a medium has become part of our social fabric--a source of common experience that has bound Americans more closely together as a people. Television has been both a reflection of society and a shaper of it, as millions of Americans have sat down each night to watch a common body of prime time network offerings. Even with the expansion of sources for television viewing today, with special format cable channels, public and educational stations, premium movie channels, and video cassette

recordings among others, network television remains a powerful draw for many Americans.

This author acknowledges the impact that television has had on this society, and encourages study into the medium and its positive and negative effects on viewers. Television historians, however, have thus far tended to focus too much on programming, and very little on the infrastructure of television--the means by which the medium reaches the great mass of its viewers, from metropolis to isolated ranch house. Television service did not just magically happen. In the case of rural areas in the Mountain West, it was brought through the concerted efforts of rural citizens who decided to overcome the technical and physical barriers that excluded them from television viewing.

The following study is an initial look at rural television and the local, regional, and national forces that have shaped it. Specifically, it takes the rebroadcast device of the television translator station, and through a case study in the state of Montana of actions affecting the use of translators, brings us closer to an understanding of how television has served rural Americans, for good or ill.

Montana is an ideal place to center this story, because of its extremes of distance and terrain, its low population density, and because of the primacy of translator organizations founded in the state. What is now known as the National Translator Association (NTA), representing operators of TV and FM translators around the country, began in Helena in 1959 as the Tri-State TV Repeater Association, representing local translator groups from Montana, Idaho, and Wyoming.

The forces bearing on the proliferation of television stations and translators in Montana and the Mountain West included local groups supporting their own translators, the regional and later national organization of the NTA, the regulatory agency of the Federal Communications Commission (FCC), and the U. S. Congress, along with various competing interest groups. These interests included broadcasters in small television markets under 50,000 persons in size, operators of Community Antenna Television (CATV) systems, and television equipment manufacturers. This study will necessarily focus on the policies of the FCC toward television translator operators, small market TV station broadcasters, and operators of CATV systems otherwise known as cable television, and attempt to explain some of the commission's official actions.

The picture that develops from this examination of television shows us the many unpleasant realities of the medium in the rural West, realities that caused some TV viewers to refer to themselves as "Second Class TV Citizens."² These realities included a more limited choice of programming than in other more populous regions, little or no local access to television air time, virtually no influence on network programming, and a much increased dependence on television as a source of news and entertainment, particularly in geographically isolated areas. Both economic and geographic forces contributed to the marginal status of the rural viewer, forces that even the maximum possible use of translator stations could not have changed. The truth is that rural Montanans understood the limitations of the television medium in their state and region, and decided to use

any means possible to receive television in their homes, legal or otherwise. Like the majority of their fellow Americans, this rural populace wanted commercial television and what it had to offer, regardless of its shortcomings.

The policies of the FCC in the 1950s and 1960s reflected a cautious, conservative, and shortsighted view toward the role of translators in disseminating television signals to the greatest viewing audience. Overly cautious concerns for preventing interference between translators and regular TV stations and other radio services caused less than adequate limits on transmitting power levels for translators. FCC policies also added up to an inconsistent position on the proliferation of television services to the greatest number of viewers. The commission could not put together an integrated approach to the role of different technologies in this goal of an expanded viewership. In the end, small market TV stations, CATV systems, and television translator stations were all used, sometimes in competition, sometimes not, to cater to the rural viewer, and not always in the public interest. The objective that the commission had tried to honor of fostering program choice through increasing the number of television stations on the air was effectively killed through its own inconsistency. As it turned out, Congress, as well as the commercial nature of television in the country, also contributed to the failure of television as a universal medium.

The following study will look at several aspects of the complex history of television translator stations and rural viewing in the crucial developmental period from about 1955 to 1970. These include

the FCC's sixth report and order of 1952 which defined the allocation system for television channels; early rebroadcast devices in Montana; the FCC inquiry into television in small markets in 1958; the Montana Legislative Assembly of 1959; and the Senate Communications Subcommittee hearings on CATV and VHF booster and repeater stations (terms often used interchangeably) in 1959. A second chapter will look at individual issues during the 1960s in television and translator regulation and operation, and how their handling reflected the attitudes and policies of the FCC and the NTA, as well as affected the quality of rural television.

Before beginning, however, it will be helpful for the reader to have some basic knowledge of the function of the FCC, and the technical standards and regulations for television in the United States, especially those concerning television translators.

The Federal Communications Commission, established by the Communications Act of 1934, "is an independent Government agency charged with regulating interstate and international communications by radio, television, wire, satellite and cable." The commission, during the period under study, was directed by seven presidentially appointed commissioners serving seven year terms. These appointments have often been made on a political basis rather than for technical or legal expertise in the communications field. The agency is responsible directly to Congress, and is subject to oversight not only by that body, but by the presidential administration and the federal courts. The FCC makes decisions concerning communications services through simple majority votes of its commissioners. In the

case of broadcasting, the agency sets all rules and regulations, and approves all licenses for station construction, operation, and renewal.

Television technical standards are essentially the same today as they were in the mid-1950s when network broadcasting in the West began. Television receiver sets produce a picture with 525 lines of resolution at a speed of 30 frames per second. Signals are broadcast over six megahertz (MHz) or megacycle wide channels using frequency modulation (FM) as the method of sound reproduction. The radio frequencies assigned to American television include 12 Very High Frequency (VHF) and 70 Ultra High Frequency (UHF) channels. Low band VHF channels 2-6 are located at 54 to 88 MHz below the FM radio band, and high band VHF channels 7-13 are located at 174 to 216 MHz. UHF channels 14-70 are located at 470 to 890 MHz. Currently only UHF channels 14-69 are being used to transmit television signals as the FCC reassigned channels 70-83 to land mobile service in 1971. However, television receivers are still manufactured with tuners capable of picking up all 70 UHF channels.⁴

Two rebroadcast devices are now used to extend the coverage areas of television stations. One is the television translator station, defined in the Television Engineering Handbook as

a station operated to retransmit the signals of a television broadcast station without significantly altering any characteristic of the original signal other than its frequency and amplitude to extend coverage and service to the general public.⁵

In other words, the translator receives a broadcast signal, converts that signal to another frequency to minimize the possibility of interference with other television signals, and retransmits the signal

at a strength capable of producing a satisfactory picture from a receiver in its service area. The other device is the translator signal booster, defined as a

station . . . operated for the sole purpose of retransmitting the signals from a UHF translator station by amplifying and reradiating the signals received through space, without significantly altering any characteristic other than its amplitude.

Translators and translator signal boosters become necessary when the distance between television transmitters and receivers is too great or when "intervening terrain barriers," such as mountains, block signals. In the Mountain West, translators are used for both these reasons, though most particularly for the latter. VHF television translator stations have transmitting power limited to 10W (watts) effective radiated power (ERP) West of the Mississippi River, while UHF translators are limited to 100W ERP. These power limits are much lower than the maximum allowed for regular broadcast stations, which are in the several kW (kilowatt) range. Also, UHF translators are now being assigned to channels 55-69. Another class of high powered translators exists for communities listed on the FCC's Table of Assignments for regular broadcast service. In this case a community which cannot support its own broadcast station, can rebroadcast the signal of another, with a limit on power of 100W VHF or 1,000W UHF. Apart from distance separation and antenna height requirements for television stations, these are the essential standards and regulations for television use at present.⁷

How these technical regulations were arrived at and why is part of the purpose of this study. In the following section, we will look at

the FCC's sixth report and order of 1952, which set up most of the current allocations for the entire country and had grave repercussions for rural television in the West.

CHAPTER 2

THE ACCEPTANCE OF TELEVISION TRANSLATORS

The Sixth Report and Order

On April 11, 1952, the FCC issued its sixth report and order, setting up a Table of Assignments for television stations throughout the United States. The commission, in carrying out its responsibility to license broadcast stations, had frozen the licensing of new television stations in September 1948. The basic reason for the freeze was that television had been limited to only the twelve VHF channels, placed in close proximity to other radio services. As a result, unacceptable levels of tropospheric interference between stations were taking place. It was therefore the duty of the FCC to find a solution to ease interference problems with the new medium and devise rules for the dissemination of television services to the country as a whole.¹

In the West the stakes were high, as only large metropolitan areas such as Los Angeles had television service. Even Denver, Colorado had no pre-freeze television stations. Montana, along with thirteen other mostly western states, had no stations broadcasting until after the licensing freeze.² However the FCC decided to allocate television frequencies, the new western broadcasters would

have to live with the commission's decisions for the foreseeable future, as broadcasters would be eager to set up stations and compete for profits in post-freeze television.

The FCC's first priority in setting up the new allocation scheme "was to provide at least one television service to all parts of the United States."³ This egalitarian commitment toward offering television to all Americans had fateful consequences for people in the rural West. The order gave frequency assignments to communities even with very small populations or television markets. Montana was assigned 18 station allocations, though most were in markets much smaller than the 50,000 persons thought necessary to support a station easily.⁴ The prospects for local television service in these small markets would be poor, and many such towns would remain without regular broadcast stations on their assignments.

To make their generous commitment to expand television service possible, the commission had to expand the number of channels available for assignment. The commission accomplished this through the use of UHF frequencies. The hope was that more stations would contribute to greater program choice. Television historian Andrew F. Inglis asserts that "the commission was attempting to achieve two conflicting objectives," through UHF allocations to commercial television. It was both "seeking to extend the interference-free coverage of the VHF channels and thereby improve service to rural areas," while also hoping "to increase competition among broadcasters by authorizing more stations." The problem with the FCC's plan to increase both coverage areas and station competition was that it was

all based on a UHF television technology that had no commercial history behind it. Any new UHF station would have to compete with proven VHF stations and a dominant VHF technology. What is more, UHF had several disadvantages compared to VHF television. Shorter wavelength UHF signals are "attenuated more rapidly by terrain, buildings, and vegetation."⁵ UHF receiving antennas did not work as well as VHF antennas. UHF transmitters required much more power than those in the VHF band to cover the same area. Also, no current television receivers had tuners to pick up UHF channels, and would need costly conversion kits to receive them.⁶ In effect, the commission was risking the success of its entire allocation plan on an unproven, more expensive, and technically inferior UHF technology, one that would encounter built-in resistance from the television industry and the public. The commission's decision to use UHF channels had direct bearing on the development of rural television as the regulatory agency devised policies to aid UHF stations and equipment in the 1950s.

In 1955, the commission permitted, on an experimental basis, the operation of UHF on-channel boosters to fill in areas of coverage of UHF stations blocked or shadowed "by intervening terrain and so deprived of service." In a previous move to aid UHF, the commission in August 1954, had authorized the operation of satellite stations, which would essentially rebroadcast the programming of a controlling parent station, thus saving the expense of constructing and running extensive studio facilities while still broadcasting with the same power as a regular station.⁷

In May 1956, the commission authorized the operation of the first television translators. They called this "new type of broadcast station . . . a UHF 'translator' station." Their purpose was to bring service to small rural towns and sparsely populated areas, primarily in the West, where TV signals were not received because of distance or intervening terrain features. These translators were to take the signals of existing UHF or VHF stations and convert them to the 14 highest UHF channels--70 to 83. The commission limited the new translators to a low power of 10W, and reasoned that placing their frequencies in the uncongested upper UHF range would minimize the possibility of interference with other radio services.⁸

As will be seen, UHF translators were not as popular or as affordable as the FCC hoped. Most westerners preferred the use of boosters and translators in the more economical and effective VHF band. While the commission resisted the licensing or legalization of such devices, political and economic realities were at work to force the acceptance of these VHF devices, realities that would not and could not be ignored.

Early Television Boosters and/or Repeaters in Montana

The history of early television booster and translator stations is a hazy picture of individual and group efforts dedicated to bringing television into rural homes using any and all means available.

Montanans, like other westerners, were ready and eager for the miracle

of television reception, and if it was at all possible, they would work and expend their hard-earned money to get it. Although rural Montanans preferred to operate within the laws and rules of the FCC and the state, the lure of the new medium proved too great to allow petty bureaucratic policies to deny them what was in their grasp. Television was coming their way, and if they needed to force the issue, they would.

The FCC began to consider the feasibility of low power VHF translators on an official basis on July 29, 1957. The commission, "On behalf of the Governors of a number of Western States, . . . proposed to consider" the use of what it called "'repeater' stations since they would pick up the programs of outside stations and 'repeat' or retransmit them locally on VHF or UHF channels." At about the same time on June 27, 1957, the commission ruled that on-channel signal boosters in the VHF band were not feasible because of "Interference and other technical problems." UHF boosters might be permitted only to fill in or improve the signals of UHF stations in their primary service areas.⁹ Because of the commission's actions, existing VHF boosters and repeaters remained in an illegal or unsanctioned status. These VHF devices would remain in legal limbo in 1959, when the commission estimated there were as many as "a thousand or more" such installations in existence. The commission continued the official sanction of UHF translators rather than VHF boosters or repeaters because of the risk of interference with other radio radio services and offered a grace period for their operators to apply for UHF licenses.¹⁰

The FCC position did not decrease the demand for VHF rebroadcast stations, however, and the commission finally decided to look toward licensing them. The commission, led by Chairman John C. Doerfer, maintained that it was prohibited by law from licensing "broadcast facilities constructed without prior Commission authorization." Therefore, it would require Congressional amendment of the Communications Act of 1934 to permit the FCC to license the stations. The commission then submitted to Congress proposed amendments to Sections 318 and 319 of the Communications Act to permit licensing, and to allow station operation by less qualified, unlicensed operators.¹¹ The proposed amendments were controversial because neither was absolutely necessary to legalize VHF booster operation. Commissioner Rosel Hyde, who visited Montana in 1959, believed the boosters could be "dismantled and reassembled" under commission requirements as new stations, thus avoiding violation of the Communications Act.¹² It may also have been possible for the commission to have licensed radio operators to maintain these devices, provided they passed some limited qualification test. The commission's position did not seem so unreasonable, however, in view of the extreme scrutiny the agency was under at the time--circumstances that will be addressed later.

At this point, it is necessary to look at developments within the State of Montana to illustrate the attitudes and actions that made VHF booster or repeater stations a reality. In retrospect, the prospects for television reception outweighed concerns with the legality of the means used to obtain that reception. In the mid-1950s

commercial television was a reality in Montana, but only a limited one. By 1959 there were only 8 stations broadcasting within the state--less than the 18 allotted in the Table of Assignments. There were single stations in Butte, Missoula, Helena, and Glendive, along with two stations each in Great Falls and Billings. Two other stations transmitted signals into the state from Lethbridge, Alberta and Williston, North Dakota.¹³ Together, these ten stations provided a patchwork of television coverage in Montana, but one filled with many holes..

As television signals travel from transmitter to antenna or receiver in a basically line-of-sight path, there were many obstacles to satisfactory television reception. Intervening mountains, hills, or dense vegetation blocked signals. In many cases, in eastern as well as western Montana, small communities or residences were located in mountain or river valleys, and thus did not have direct reception from station transmitters. Especially in the east, some areas were too far from the nearest station, and the signals that reached them were too weak to provide a decent television picture. In order for people to receive television in these areas, they needed an electronic means to direct and amplify television signals.

Fortunately, such means were available in the form of low power VHF on-channel boosters or frequency converting repeaters, as well as the officially sanctioned UHF translator stations. While UHF translators were sometimes used, as witnessed by East Butte TV Club's operation of two such devices serving Shelby, this practice was not common.¹⁴ Although UHF translators performed satisfactorily, their

increased cost to purchase and maintain placed them out of the price range of most organizations. VHF devices, with their longer wavelengths, simpler components, and lower cost became the tools of choice throughout the state and the West. The main reason was economic, since the number of viewers boosters or repeaters served varied widely from a few households to small towns of 2,000 people or more. Therefore, the funds available for operation also varied greatly. The emphasis was always on economy, although television picture quality was an important issue.

VHF rebroadcast devices, which the FCC still considered illegal and refused to license, were not difficult to obtain regardless of their officially illicit status. A local TV club or booster group could purchase a VHF booster or repeater from an area electronics or electrical retailer without fear of prosecution. Large manufacturers of television transmitting equipment built and sold such equipment freely and without reservations. They were simply satisfying the demands of a growing market for their products. As a result, these devices gained a de facto legitimacy that no FCC policy could change. Such equipment was affordable, available, and increasingly in service throughout the West.¹⁵

Not all rural Montanans could afford even the cheaper manufactured boosters and repeaters, however, and resorted to building their own equipment. During the mid-1950s it was well known that Edmund B. Craney, the owner-operator of KXLF-TV in Butte and a supporter of VHF booster use, provided packets of information on the construction of such antennas and equipment. It is impossible to estimate just

how many people received this information or built their own devices. In the following years many unlicensed and unsanctioned boosters would go into operation in Montana. In geographically isolated areas there were booster operators who never sought official licensing from the FCC. To them it was an unnecessary inconvenience, for the only way that their existence would come to the attention of FCC authorities would be if someone suffering interference from such a booster wrote the agency and complained about its operation. Even then, official sanction or shut-down was unlikely.¹⁶

In addition to acquiring or building affordable equipment, finding an adequate signal to boost or translate, raising funds for equipment and maintenance, and actually erecting the facility and providing maintenance to it, were necessary to make booster operation a reality. Some histories of rural TV organizations holding membership in the Tri-State TV Repeater Association in 1959 are instructive in providing insight into just how VHF booster stations went into operation shortly after television came to Montana.

After acknowledging the desirability of receiving television, rural citizens had to find a suitable location to place a transmitting antenna, one where the signal was strong enough to amplify and direct toward the receiving area or community. This was perhaps the most difficult task facing a potential operator. Someone had to move test equipment from point to point measuring signal intensity. Different methods were employed to accomplish this task. In Harlem, citizens mounted "an antenna on a twenty foot mast, and using a pickup truck roamed the hills on the valley rim north of Harlem,

searching for a suitable signal."¹⁷ (see Figure 1) In the Martinsdale-Lennep area "some local people mounted an antenna on a four-wheel-drive truck." Using a portable power plant and receiver placed in the back of the truck, they were able to make "extensive searches . . . of the high ground in the surrounding area for signals."¹⁸ (see Figures 2 and 3) In other localities suitable locations were more easily found on hills or mountains with unobstructed signals.

After finding an appropriate spot for a booster, a local group raised money to buy, erect, power, and maintain the equipment. A VHF repeater might cost anywhere from about \$500 to \$1,500, and some areas required a series of boosters to bring in a signal. Erecting and maintaining a booster entailed acquiring or providing a variety of equipment and services. Receiving and transmitting antennas would need to be mounted on metal towers or wooden poles, and small buildings constructed to house and protect the electronic components of stations. Power had to be supplied to the station either from a portable generator, as might be done temporarily, or by using permanent power lines. In the case of the Buffalo Mountain repeater station serving Gardiner, the local repeater association employed a gas-powered generator until a public power line could be constructed. The Gardiner Community TV Association located their repeater seven miles from town and local residents used horses or a jeep to bring fuel up the mountainside to the station each day.¹⁹ (see Figure 4) Power also needed to be turned on and off each day either manually, or automatically using a time clock. Periodic maintenance was necessary to ensure a booster performed correctly. Antennas might need

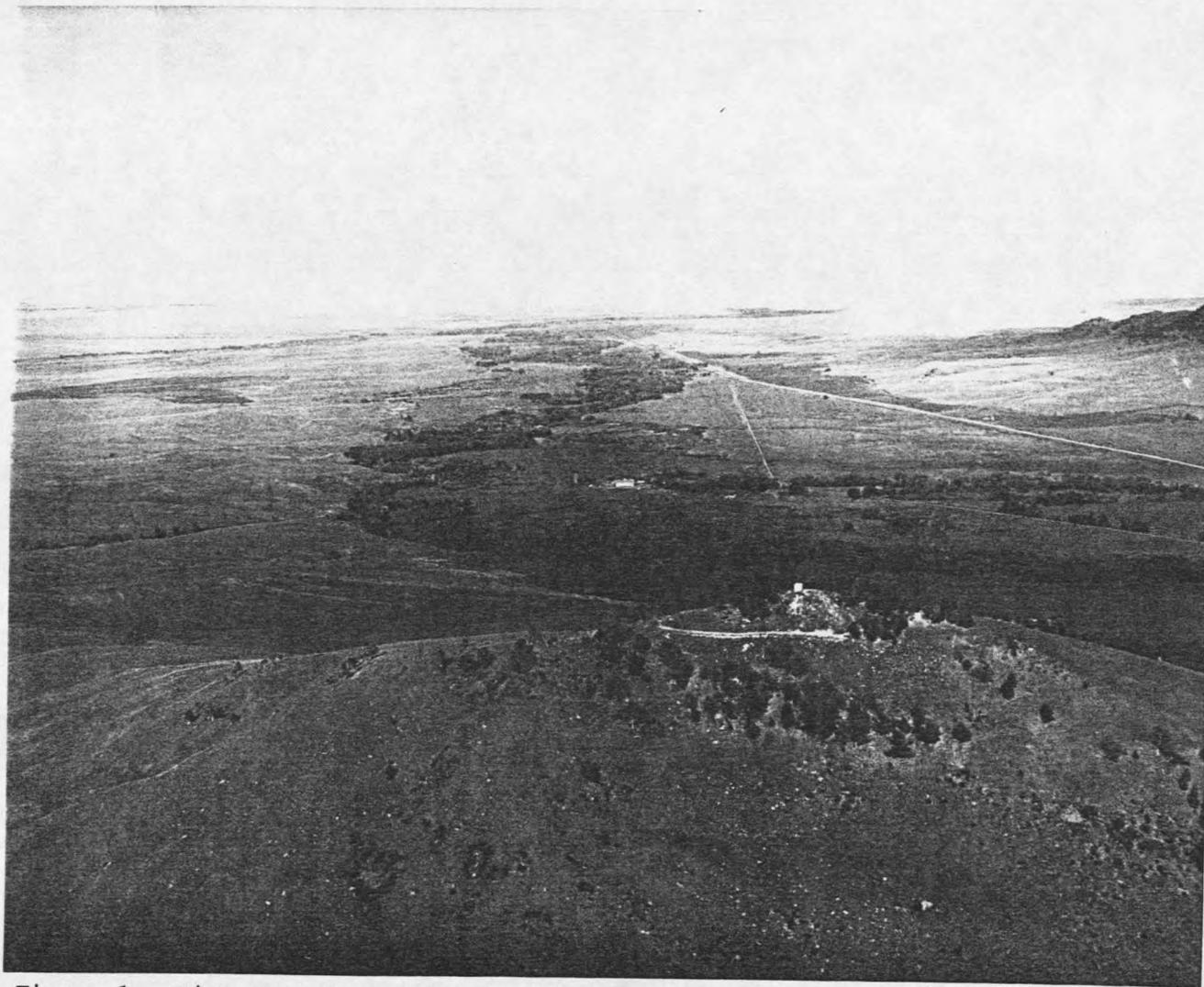


Figure 1. View from Translator Station Near Harlem, ca. 1959.
(Montana Historical Society, PAC 80-88, folder 34)

