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A DESCRIPTION AND ANALYSIS OF THE EARLY DIFFUSION
OF COLOR TELEVISION IN THE UNITED STATES

DISSERATION

Presented in Partial Fulfillment of the Requirements for
the Degree Doctor of Philosophy in the Graduate
School of The Ohio State University

By

Thomas Herman Smith, B.S., M.A.

* * * * * *

The Ohio State University
1970

Approved by

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Adviser
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PLEASE NOTE:

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University Microfilms
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When this adventure toward an advanced degree began Professor Richard M. Mall offered the wisdom and understanding to spur its completion.

As my adviser and friend, thanks "Doc."

-- T.H.S.
March, 1970
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INTRODUCTION

The very nature of radio waves has been responsible for the elaborate systems of control which are conceived and enforced in the United States by the Federal Communications Commission (FCC). Assignment of broadcast channels to radio operators requires the electronics industry to produce receivers which detect and amplify specific frequencies while rejecting others. It is this lock-and-key relationship which requires that absolute standards be established and maintained.

Radio manufacturers, mindful of this requirement, were approaching the dawn of a new medium toward the end of the 1930's. Invention had led the way to the Radio Manufacturer's Association asking the FCC on September 10, 1938, to consider a set of engineering standards for television. That association gathered the following month and heard David Sarnoff, president of the Radio Corporation of America (RCA), declare that television was "technically feasible." It was RCA's position "that the problems confronting this difficult and complicated art can be solved only from operating experience, actually serving the public in their homes."  

A few months later the FCC appointed its Television Committee charged with investigating the readiness of television as a new communications medium.

In the spring of 1939 the World's Fair opened in New York. On April 20th the RCA Exhibit Building was formally dedicated and
television was unveiled for public examination. Within ten days a limited number of receivers were available to consumers and the first regular telecasting began. Provision for this experimental broadcasting of pictures had been authorized several years before by the Federal Radio Commission—predecessor to the FCC.

While public reaction to this visual innovation was enthusiastic, industry support was slow to develop; vested interests in a booming radio business and fear of RCA's dominance of this new communication tool set the stage for an intra-industry battle which, when concluded, would have to be fought anew with the advent of color.

The Radio Manufacturer's Association had endorsed RCA's technical standards for television and recommended them in testimony before the Commission during its public hearing in January of 1940. Opposition was vehement, but in vain. September 1, 1940, was set as the date for the commencement of "limited commercial" operation. Jubilant in success, RCA initiated a publicity campaign which began with full-page advertisements being placed in the New York Times (See Figure I) and the New York Herald Tribune. These announcements offered a television and radio receiver combination at a price "that the average American family can well afford." The cost was $395. The text went on to urge the residents of the New York metropolitan area to "acquaint themselves with the interesting television program service" which was being initiated by the National Broadcasting Company.

On March 23, 1940, three-days after the advertisements ap-
A Statement by
The Radio Corporation of America on
TELEVISION
for the Home!

It is now possible for the RCA to announce
the commercialization of television, to provide, for
the first time, a regular television program service in the
New York area; and, second, the offering to the public of
reception sets at moderate prices within the reach of
the average American family. And third, the
novel way in which the construction of a new and
important new industry is in the nature of
interconnecting wireless transmission for
commercial broadcast service to
and from other communities.

An improved program service has been worked
out by the National Broadcasting Company
and is now available throughout the New York area
within the transmission range of the RCA station
at the Empire State Building. As soon as
arrangements have been reached, the National Broad-
casting Company will provide a program service
for other communities. This trial service will be
available to other broadcasting companies de-
siring to operate television programs.

During the past two months RCA Victor Tele-
vision Receivers have been sold throughout the
United States and around New York City. The
number of these sets, more than 100,000, is a
measure of the public response. They are evidence of
the technical and operational feasibility of television
and provide a fine example of the quality and
reliability of the RCA product.

In order to provide every facility for the expan-
sion of television service throughout the nation.
RCA has formulated plans to accommodate the
needs for television sets and equipment. The
facilities of RCA laboratories are being utilized
for the development of television receiving sets and
transmitters. RCA research and development
are proceeding at a rapid pace to bring the
results of RCA's long years of experience in
radio to television.

RCA, through its Victor division, is engaged
in the manufacture of television receiving sets and
equipment. RCA's long experience in the field of
radio will be utilized to bring to television
reception sets of the highest possible quality
and reliability.

RCA's television stations are now in operation
throughout the United States, providing a
unique service to the public.

The RCA television receivers are designed
for ease of installation and operation. They
are easy to use and require little attention once
installed.

RCA's television receivers are equipped
with a variety of features that enhance
clearness and enjoyment of the program.

RCA's television stations are
broadcasting a wide variety of programs,
including news, sports, dramas, and
music. These programs are
available to all RCA television
receivers in the New York
area.

RCA's television receivers are
designed to provide the public
with the best possible television
experience. They are easy to
install and operate, and offer
a wide variety of programs.

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the FCC ordered that the Television Hearing be reopened. The Commission's Chairman, James Lawrence Fly, openly condemned the proposed television service as a bid for "monopoly." In rescinding its approval of "limited commercial" telecasting, the FCC stated:

The current marketing campaign of the Radio Corporation of America is held to be a variance with the intent of the Commission's television report of February 29. Such action is construed as a disregard of the Commission's findings and recommendations for further improvement in the technique and quality of television transmission before sets are widely sold to the public.

In reversing its previous decision the Commission requested that a special engineering committee review the entire question of technical standards. Accordingly, an industry-wide organization was created. This was the first National Television System Committee (NTSC) and was presided over by Dr. W.R.G. Baker of the General Electric Company. Such an organizational creation was unprecedented, and came in response to the idea that "television . . . primarily needs a team attack by individuals who are highly trained in the different branches of science related to television and whose skills complement each other."

One hundred and sixty-eight individuals representing the electronics industry were either on the Committee or one of nine separate panels setup to achieve mutually satisfactory transmission standards.

The completed NTSC report was sent to the FCC in January of 1941, with recommendations for fundamental system changes. Whereas the RCA system composed television pictures from 441 lines, the NTSC proposal was for 525. Further, the sound portion was changed from
amplitude modulation (AM) to frequency modulation (FM).  

Before the FCC responded to the Committee's report, the prospect of even greater change of the technical structure of television was posed. On August 29, 1940, then Chief Engineer of Television for the Columbia Broadcasting System, Dr. Peter Goldmark, announced his invention of a color television system. The genealogy of its design goes back as far as the mid-seventeenth century when Sir Isaac Newton discovered that a beam of sunlight made to pass through a glass prism would produce a spectrum of colors.  

Another television pioneer, John Logie Baird, had experimented with the same principle in England. In 1928, he was laboring with color and stereoscopic television.  

By April of the following year Baird demonstrated his first transmission of color television using a color wheel within the camera; another such device was mounted in the receiver and rotated in synchronization with the former. This concept of synchronously rotating color wheels became the heart of Dr. Goldmark's proposed system.  

The Commission had heard testimony through the NTSC on five different color systems, three of which were tested in the summer and fall of 1940. The CBS offering prompted FCC comment:  

The three-color television system demonstrated by the Columbia Broadcasting System during the past few months has lifted television broadcasting into a new realm in entertainment possibilities. Color television has been known for years but additional research and development was necessary to bring it out of the laboratory for field tests. The three-color system demonstrated insures a place for some scheme of color transmissions in the development of television broadcasting.  

The Commission urged other broadcasters to test the CBS system.
for a period of six months and to make their findings a matter of record. There was no follow up. The only report received by the FCC was from CBS which had been conducting experimental color transmission every weekday afternoon. For the moment, the color issue was dead.

On May 3, 1941, the NTSC black-and-white recommendations were approved with the FCC authorizing unrestricted commercial television to begin on the first of July.  

July 1 came and four advertisers (Sun Oil Co., Lever Brothers Co., Procter & Gamble Co. and Bulova) became the first full TV sponsors in broadcast history. Television had begun! But before mass production and expanded program schedules could be achieved, World War II curtailed virtually all activity.
INTRODUCTION NOTES


3 Hubbell, p. 135.

4 Lyons, pp. 53-4.


6 Lyons, p. 54.

7 Hubbell, p. 145.


10 Lyons, p. 56.

11 Hubbell, p. 151.


15 Hubbell, p. 152.

16 Lyons, p. 56.

17 Broadcasting, July 2, 1951, p. 54.
The demands of war had effectively crippled any possibility of immediately developing a viable television system. Postwar material shortages were retarding the prospect of any rapid and immediate expansion. Few stations were on the air (licensing did not resume until 1945) and a modest number of receivers were in the hands of the public. CBS seized the opportunity to once again advance its color system for FCC approval.\(^1\)

As a result of extensive experimental laboratory work and on-the-air testing, CBS formally petitioned the Commission to adopt the standards of its so-called "field sequential" system. Coming in the early fall of 1946, this request was for more than the commercialization of color television. Acceptance of the petition would necessitate a fundamental change in the allocation of spectrum space for this visual medium.

In the fall of 1944, hearings had been opened to review the allocations of bands of frequencies. At that time evidence indicated a need for 20-megacycle channels for the transmission of color signals. In contrast, monochrome channels are only 6 megacycles wide.\(^2\) The "field sequential" system required a minimum of 16
megacycles in which to transmit the additional video information required for color. In effect, CBS was seeking a shift of television frequencies from the Very High Frequency (VHF) band to the Ultra High Frequency (UHF) band.\(^3\) For only in the latter was there sufficient space to provide for a multiplicity of 16-megacycle channels. This concern for more space in the radio spectrum was to later result in a prolonged series of Commission hearings.

The CBS "field sequential" system received its name from the method by which the several lines which comprise a picture—or field—are transmitted. In broadcasting color pictures with the system developed by Dr. Goldmark, the scene was broken down into three color components—red, blue and green—by the use of filters mounted on a revolving disc. The red filter would register only the red elements of a scene while not allowing the other colors to pass through to the camera pickup tube. Similarly, the blue and green filters obstructed all but those colors, respectively. By inserting a like set of filters in the receiver and spinning them in synchronization with the filter disc in the camera, colors were rendered. Each color was captured—scanned—and transmitted separately in sequence. First, reds were sent, then blue and finally green.\(^4\)

As in all systems of moving pictures, speed in presenting images— one-after-another—gives the appearance of motion and continuity. The filter disc was driven by a motor turning at 1440 RPM resulting in the transmission of 8,640 color images per minute. This was sufficiently rapid that the eye could not detect individual color
fields. The result was a smooth blend of tinted images.\(^5\)

So convinced was CBS that this color system was ready for commercial application that in the mid-40's the network was advising its affiliates to hold off on securing TV licenses and instead to apply for FM construction permits.\(^6\) Such a recommendation attests to CBS' conviction that all television channels would have to be moved to the as yet unopened UHF bandwidths to accommodate color. And color would render black-and-white obsolete.

The CBS petition forced many of the industry's engineers to concede that the color system did, indeed, produce good quality pictures. Objections were further lessened by a refinement of the system which reduced the needed channel width to 12 megacycles from the previously indicated sixteen.\(^7\)

But as there had been opposition to early monochrome standards, there was now a good deal of animosity toward what was being described as the "mechanical" color system. At the FCC's first color inquiry in 1940, RCA had demonstrated an electronic color system using no color wheels. Little could be said for the quality of the pictures other than the fact that they were colored.\(^8\) By October of 1946, the development of an electronic system at RCA was keeping "more men and more dollars engaged than any other project."\(^9\) And on October 30th, at a public demonstration in the company's laboratories in Princeton, N.J., reporters were told of two significant developments. RCA flatly stated that all-electronic color TV was entirely feasible. Further, this new system was said to be "compatible"—that is, the color images could be received on conven-
tional receivers without any distortion or adaptation necessary. Conversely, the CBS "field sequential" system, because of its unusual method of scanning, could not be received on ordinary, monochrome receivers. It was this issue of compatibility around which the great color controversy would be waged in the coming years.

While RCA did not formally propose its new system before the Commission, it—obviously—did not support the CBS request for commercialization of color. FCC hearings lasted for two months, concluding in February of 1947. At that time the Commission was sufficiently convinced that no system was good enough to be approved. The CBS petition was rejected in March. And in 1948 the company claimed that it had curtailed extensive research on its color projects. The chief rival, RCA, took the opportunity to increase even further its commitment to the full development of an electronic, compatible system.

The tempo of telecasting activity picked up markedly in the late 40's and in doing so created serious engineering and policy questions. Clearly, the FCC required a little breathing space—time to assess the several claims and questions which were being raised with regard to television channel assignments. On September 30, 1948, the Commission issued a Report and Order (FCC 48-2182), commonly referred to as the "freeze order" which suspended further applications for the construction of stations. One of the major orders of business during this period was another examination of color systems.
In September of 1949, the FCC opened its color television hearings. For sixty-two hearing days, continuing for eight months into May of 1950, the Commission, en banc, heard the bitter testimony of rival commercial interests. Those hearings produced nearly ten-thousand pages of testimony. Reflecting on this unprecedented endeavor, Wayne Coy, former chairman of the FCC stated that the color television question "consumed the time of the Commission and the industry, too—or, as far as the Commission was concerned, to the exclusion of other problems that had to be put aside."

With comparative color demonstrations slated to begin, it was now RCA who wanted more time and clearly sought advantage from delay. This time, unlike the struggle for black-and-white standards, fellow manufacturers in the Radio Television Manufacturers Association were—without dissent—backing RCA's position. Fighting time, RCA research teams were pressed into the exhausting mission of rapidly developing a presentable electronic color system. As Fortune stated in 1955: "... they were probably subjected to heavier pressure than any industrial-research group has ever known in peacetime."

Prior to entering the competitive demonstration before the Commission, CBS had perfected the means for compacting its system into the 6-megacycle bandwidth. The problem of incompatibility, however, remained. On regular monochrome receivers the CBS transmission appeared as a series of rolling horizontal bars or as four small, multiple images.
The CBS color signal was sent via cable to New York City and back to the Nation's Capitol to demonstrate the adequacy of present AT&T facilities for distributing the system.\(^\text{13}\)

Succinctly, the CBS demonstration was highly successful.

RCA made its first showing to the FCC in October using a three-tube projection system in the receiver: red, blue and green images were overlaid to produce a single, multicolored picture. Company officials told the Commission that a direct-view, single tube would be ready within six months.\(^\text{19}\) But the promise of an improved system didn't alter RCA's showing. Pictures were poor; alignment of the images and color smearing were critical problems.\(^\text{20}\)

A third entrant to display its system was Color Television, Inc. (CTI). The system was fraught with difficulties and readily dismissed as a serious contender.\(^\text{21}\)

Concurrently with the FCC hearings, the Senate of the United States was gathering information of its own on the color matter. It appointed a Senate Advisory Committee on Color Television to examine the technical aspects of the problem. Known as the Condon Committee (Dr. E.U. Condon, Director of the National Bureau of Standards was appointed as chairman), it issued its technical report on July 10, 1950, but offered no recommendations. The statement, nevertheless, cautioned that a decision "must include consideration of many social and economic factors not properly the concern of the technical analyst."\(^\text{22}\) This was an obvious reference to the estimated seven million monochrome receivers operating in American homes, incapable of receiving "field sequential" signals
should that system be adopted. In effect, the Condon Report saw public interest being served more justly through approval of the compatible, RCA system.

The FCC, however, dismissed the Committee's report since its findings were technically off the record.

**RCA Denied -- But Not Discouraged**

On September 1, 1950, the FCC announced its conclusions in the "First Report" on color tv. Unanimously, it found that the CBS system was at least as fully developed as monochrome television had been in 1941. The Commission did not formally adopt the system, but indicated that set manufacturers should build into their black-and-white receivers a converter enabling the reception of otherwise scrambled CBS-type transmissions.

When compliance with the Commission's directive to manufacturers was not forthcoming, a "Second Report" was issued October 10, 1950. The latter unequivocally adopted the CBS system, denied rehearings to RCA and CTI, and authorized the Columbia network to begin commercial colorcasting on November 20th.

The decision drew angry rebuff in a press statement from David Sarnoff:

> RCA disagrees with today's action by the Federal Communications Commission and with the reasons it has given for the adoption of an incompatible, degraded color-television system.

> We regard this decision as scientifically unsound and against the public interest. No incompatible system is good enough for the American public. The hundreds of millions of dollars that present set owners would
have to spend and the future set owners would have to pay to obtain a degraded picture with an incompatible system reduces today's order to an absurdity. Using a publication of its Department of Information, Radio Age, RCA declared the FCC's order to be "illegal, void and beyond the power, authority and jurisdiction of the Commission." To advance its argument the Radio Corporation alleged that the Commission's decision was in violation of Section 303 (g) of the Communications Act of 1934. That section is construed as encouraging the larger and more efficient use of radio in the public interest.

Within ten days of the regulatory decision RCA filed suit in the U.S. District Court for the Northern District of Illinois seeking a suspension of the FCC order. When the Court had not reached a verdict four days before the proposed starting date for CBS color, a temporary restraining order was issued.

In a two-to-one decision on December 22, 1950, a ruling was handed down which upheld the Commission's order. It did, nevertheless, extend the restraining order until April 1, 1951--or until terminated by the U.S. Supreme Court.

As anticipated, RCA appealed to the Highest Court, "arguing that the FCC abused its discretion in an arbitrary and capricious fashion." The Supreme Court would not overrule the administrative decision of the FCC and thereby upheld the adoption of the CBS system. As the New York Times commented: "The Supreme Court's decision did not pass on the merits of the Columbia and RCA systems but merely upheld the legality of the Commission's
exercise of its administrative discretion in choosing between the two."  

In spite of, or perhaps more because of its legal defeat, RCA entered a new phase of promoting its system. This time the case was to be taken directly to the people. Board Chairman, Brigadier General David Sarnoff, presented the FCC with a position often to be reiterated: "Let the public decide." He badgered the Commission by reminding them that they could "... make a right decision as well as a wrong one." The Corporation found it difficult to reconcile as in the public interest the expenditure of approximately $500,000,000 by set-owners to adapt their receivers to an incompatible system.

On October 20, 1950, all RCA Victor distributors received a letter regarding the color issue. Hoping to assuage the concern of its sales organization, the communique made the following points:

First, [the] public will be hesitant to install cumbersome, gadgetry converters and adapters because of expense involved, limited number programs broadcast, and limited size degraded quality of picture received. Color pictures can be no larger than 12 1/2 inches and definition is reduced from 525 lines to 405 lines. Same thing applies to new sets. Leading manufacturers have indicated reluctance to risk resources, reputations by rush production of high-priced receivers for questionable broadcasting system that will not give satisfaction in the home and will probably soon be obsolete.

In the meantime, RCA is working intensively toward perfection of all-electronic color broadcasting system compatible with present sets, with demonstrations of progress scheduled for early December.

The public showing referred to was held in Washington during
the first two weeks of December and resulted in wide acclaim by the industry and press. In this display the three color tubes in the receiver were replaced with a single, tri-color tube—revolutionary in design.*

**CBS Colorcasting Begins**

As RCA began formulating plans for increased public exposure of its recent innovation, CBS was nearing the inauguration of its color service. Sixteen sponsors had been signed for the first commercial, "field sequential" colorcast on June 25, 1951. For one hour, beginning at 4:30 PM, a network of five stations (WCBS-TV, New York; WTOP-TV, Washington; WNAC-TV, Boston; WCAU-TV, Philadelphia; and WMAR-TV, Baltimore) carried the star-laden program, "Premiere." The Network estimated that between thirty-five and forty thousand persons witnessed the spectacle. The number is left in question, however. At the time of the broadcast none of the "major" set manufacturers had approached CBS for patent licenses to construct receivers. 36

At a pre-broadcast luncheon, CBS president, Dr. Frank Stanton, told newsmen that major manufacturers who had refused to build CBS-type sets "will either change their mind because the public and the television dealers will insist that they do, or they will no longer be large manufacturers." 37

The following day the Columbia network began its regular color

*Chapter III provides a detailed account of the invention and refinement of the direct-view, tri-color tube.
schedule with the prospect of gradual expansion to twenty hours per week. Mass production of sets was not expected to begin until September 1.  

The enlistment of affiliates willing to alter their transmitters to broadcast CBS color was also slow to develop. With the initiation of college football telecasts in color at the end of September, only eleven stations (including WCBS-TV) were properly equipped.  

Though progress toward conversion to color was sluggish, CBS was giving international exposure to its technique. Dr. Goldmark had travelled to Geneva for conferences with the International Telecommunications Union. Later, demonstrations were conducted in Paris under the sponsorship of the French government. An Associated Press news story reported that as a result of that showing France would adopt the "field sequential" system. But further developments in the United States, the invention of a French color concept in 1958 and a German bid in 1963 prevented any European country from formally adopting a color system for many years.

As Columbia's domestic plans for colorcasting were being unfurled, RCA began originating half-hour daily color telecasts in New York City. July 9, 1951, marked the beginning of an extensive campaign to enlist public and press support for a compatible color system. The company placed advertisements in New York papers telling set-owners that "You can help test RCA COLOR TELEVISION... now!" The ad asked viewers to tune to the NBC station (WNBT-TV, Channel 4) at 10 AM any day of the week and then to
report on the quality of reception of color transmissions as received on their black-and-white sets. A continuing deluge of mail in response was reported. Meanwhile, newsmen seeing closed circuit colorcasts in their natural hues were reporting a vast improvement over previous viewing experiences.  

At this time CBS had still not begun to deliver color receivers to distributors. The delay was blamed on the long tooling-up process required. In response to public showings of the rival system, Adrian Murphy, president of CBS network's Laboratories Division voiced contempt saying: "The same people made the same promises during the 1947 color hearings and also in the 1949-50 hearings, but they have not yet come up with a compatible system."  

Undaunted, full-page ads were placed by RCA to notify New Yorkers that they could— for the first time— be allowed to view color programs in the city's Center Theatre which had been specially equipped for the purpose. Restricted by the FCC to a single color transmission daily, the demonstrations began on October 9. Congressmen, diplomatic representatives and other high government officials, Armed Forces representatives, Washington radio attorneys, consulting engineers, and all but one of the FCC Commissioners plus about two hundred staff members joined the public in witnessing the improved design for color programming.  

Looking toward 1952, CBS was planning to build 250,000 color sets and/or adaptors. That production effort would have required the construction of the same number of fractional horsepower motors needed to revolve the color discs. Motors require an extensive
amount of copper—a metal which had been placed in short supply by the Korean War. Before a CBS plea for copper allotments could be heard by the appeals board of the National Defense Authority, the Office of Defense Mobilization requested the suspension of color tv manufacturing for "the duration of the emergency," The "order" came on October 19, 1951, at the beginning of the second month of Columbia's twenty-fifth year as a network.

In swift response to the notification, CBS President, Frank Stanton replied:

In the national interest, CBS and its manufacturing units will comply immediately with ODM's request . . . . CBS Television will also suspend its regular schedule of color broadcasts in view of the fact that there will not be a sufficient number of color receivers in the hands of the public to warrant such a broadcast service.

Thereby, a national color television system was again denied—giving to RCA the precious commodity, time.

The Second National Television System Committee

For electronic, compatible color, time had an ally. The most recent FCC hearings on color evidenced many of the same considerations which had led to the formation of the National Television System Committee in 1940. Consequently, the Board of Directors of the Radio Television Manufacturers Association initiated the formation of a successor committee.

A group of the industry's leading scientists and engineers was assembled under the leadership of Dr. W.R.G. Baker, chairman of the first NTSC. An Ad Hoc Committee was established on November
20, 1950, to "make an up-to-date appraisal of the state of the
art." The committee examined the entire historical background
of multicolored television with emphasis on the systems proposed
to the Communications Commission. CBS declined to participate;
however, Dr. Goldmark requested and received permission to observe
some of the investigative effort.

After examining work being conducted on the subject in the
laboratories of several manufacturers, a report was submitted on
April 19, 1951, calling for the formal creation of a second NTSC.
The suggestion was accepted and the new Committee—composed of
several members from the original—held its first meeting June
18, 1951.

This NTSC was nearly twice as large as the first. Three hun­
dred and fifteen persons served on one or more of the ten panels
and fifty-five subpanels. These contributors had a secondary
goal which was vital to their central purpose. They sought a
perspective which might overcome the obstacle encountered in the
1940 hearings when it became evident that

The positions of the different companies . . . cannot be viewed with total disregard of the patent inter­
est of competing manufacturers which find expression in
a desire to lock the scientific levels of the art down
to a single uniform system based in whole or in part upon
such patents.

In this respect the Committee's work proved less effective than
its technical achievements.

By November of 1951 the NTSC had derived a satisfactory set
of signal specifications for compatible color and began to field
test the system. In January of the following year the transmission formula was approved and testing continued.

Early in 1953, Senator Ed Johnson (D—Colorado) charged that "powerful influences" were seeking a delay to the introduction of color. Responding to the allegation, Republican Charles Wolverton, chairman of the House Interstate and Foreign Commerce Committee, announced the opening of an inquiry into the matter. Responding to Congressional concern, the National Production Authority revoked the ban on color tv equipment manufacturing on March 26, 1953.53

The following month, members of the Wolverton Committee witnessed NTSC color demonstrations at the David Sarnoff Research Center in Princeton, N.J.54 As the early champions of electronic, compatible color, RCA was calling the NTSC system its own. For the most part, it must be conceded, the system was RCA's; but several significant refinements were products of the intra-industry cooperative effort.

More exhibitions followed as a prelude to RCA and NBC's petition for standards, June 25, 1953. Filed with the FCC for consideration, the 697-page document spoke of the petitioners' investment of almost twenty-one and a half million dollars in research and development work on color television. Again, the issue of compatibility was foremost. On page three the petition stated:

The RCA color television system is a compatible color system and programs broadcast using the RCA system can be received in natural color on color receivers and in high definition black and white on more than 24,000,000 black and white receivers already in the hands of the American public without changing these black and white receivers or adding to them in any way.55
Contrary to the difficulties encountered by CBS, National Broadcasting Company affiliates seemed eager to participate in colorcasting:

Forty-one NBC affiliated television stations have already amended their network affiliation agreements to provide that they will, on approval of the proposed standards, make the relatively minor modifications to their transmitting apparatus to enable them properly to commence broadcasting network color television programs.\(^56\)

The RCA-NBC request proceeded by one month the final report and petition of the NTSC which was approved by its membership on July 21. Independent petitions by Philco, Sylvania, General Electric, Motorola and a letter from the Hazeltine Corporation to the FCC urged federal approval of the NTSC specifications.\(^57\) The will of the major manufacturers had been made clearly known.

Lacking industry support, CBS publicly stated that its non-compatible system of color television no longer was feasible in view of the number of monochrome receivers then in existence.\(^58\) Dr. Stanton placed the blame on the long delay imposed by the National Production Authority restriction. But he declared that CBS would support any system which it could conscientiously approve.\(^59\)

On August 7th the FCC issued a notice of proposed rule-making (FCC 53-1015) relative to the authorization of NTSC specifications. The twenty-two page report and order was unanimously adopted by six of the seven Commissioners. Present, but abstaining from the vote was Frieda B. Hennock--dissenter to the "Second Report" on color tv in 1950.\(^60\)

The Commissioners gathered in mid-October and examined multi-
hued programs on thirteen different makes of sets conforming to the NTSC signal specifications. Chairman Rosel H. Hyde described the showing as "very impressive." Jack Gould, radio-television critic for the New York Times aptly stated: "[The] industry demonstration was the first in the hectic history of color television that was free from argument over basic technical standards."61

December 17, 1953, standards for color television proposed by the National Television System Committee were approved by the FCC and ordered to go into effect thirty days after publication in the Federal Register.62 On the 18th the waiting period was waived and color given the unrestricted privilege of commencing immediately, provided only that the Commission be notified in advance of proposed colorcasts during the interim.63

Thirteen years, five FCC inquiries, massive expenditures, a false start, bitter accusations, and caustic countercharges culminated in a cooperative experiment which finally led to the virtually uncontested acceptance of standards for commercially transmitting and receiving color images in the United States. In the wild optimism of the moment few would forecast that another twelve years lay ahead before sales or programming would vindicate the labor of the previous thirteen.
CHAPTER I NOTES


3. Ibid., p. 111.


10. Ibid.


15. Ibid., p. 3.


23. Ibid., pp. 75-6.


37. Ibid., p. 60.

38. Time, July 9, 1951, p. 60.


40. Broadcasting, July 2, 1951, p. 55.
27

41 Broadcasting, September 24, 1951, p. 84.


43 Robertson, Bruce, "RCA Color," Broadcasting, July 16, 1951, p. 64.

44 Broadcasting, September 24, 1951, p. 69.

45 Broadcasting, October 8, 1951, pp. 74, 85.

46 Broadcasting, October 29, 1951, p. 25.

47 Broadcasting, October 22, 1951, pp. 5, 6.

48 "Final Report of the National Television System Committee," pp. 6, 7.


51 Ibid., p. 2.


54 Radio Age, July 1953, p. 31.


56 Ibid., p. 4.


59 Business Week, April 4, 1953, p. 28.

60 Broadcasting, December 21, 1953, p. 27.


CHAPTER II

THE PROBLEM OF DIFFUSION

Renewal of Manufacturer Rivalry

Color television opens a new era in electronic communications and adds a new dimension to the entertainment arts. It supplies a new power to advertising and greatly increases its merchandising possibilities. It adds realism to journalism, intensifies television as a social and educational force, and opens the way for a significant advance in service to the public.

The day on which the FCC approved standards for the commercial broadcasting of compatible color television will be remembered in the annals of communications.

For David Sarnoff it was the moment of triumph as he made this press statement. The FCC decision appeared to have ended the long period of development, controversy and uncertainty.

As it had in 1940, RCA ran full-page advertisements (See Figure II) heralding the Commission's decision. No mention was made of the NTSC efforts in the assertion: "RCA Wins Fight for Compatible Color Television; FCC Decision Benefits Public and Television Industry." Seeking maximum benefit for all of its corporate entities, the ad declared that

RCA and NBC have the know-how to broadcast color programs, to build equipment for color broadcasting, and to build sets that will receive these programs. In addition, we have trained personnel ready to do the job.

Unlike the situation in 1940, this advertisement did not
RCA Wins Fight for Compatible Color Television; 
FCC Decision Benefits Public and Television Industry.

Seven years ago—on May 2, 1946—David Sarnoff, Chairman of the Board of the Radio Corporation of America, stated:

"If a modern and practical color television system for the home is to be available, RCA will have it."

The Public Will Benefit

On December 17, 1953, the Federal Communications Commission approved compatible standards for color television broadcasting. This is a great victory for RCA. But it is an even greater triumph for the public and the entire television industry.

Color is a new dimension that will greatly increase the public's enjoyment and appreciation of the wealth of events, entertainment, and education available on television sets.

By the end of March 1954, we will have spent more than $14,000,000 in research and development of this color television system. Rarely in the history of the electronic industry have we spent so much money on a single project.

RCA's new color television set will feature a high-quality color picture that can be received in full color on your own set.

RCA Color Television is well on the way to making color television practical and affordable. Within a few months, after 15 years of research and development, high-quality color television sets will be available to the public.

This new color television set will feature a high-quality color picture that can be received in full color on your own set.

In introducing color, RCA is following the same policy of making its inventions available to the entire industry as it did in radio broadcasting and black-and-white television.

There are approximately 150 competing set manufacturers and 79 competing tube manufacturers in the television industry. More than 1,000 competing television stations now are on the air. The opportunity to advance with color television is available to all of them.

When Will Color Television Be Available?

Color television sets will begin to come off the production lines in small quantities within approximately six months from today. It will probably be an additional year before mass production is reached.

The first color set manufactured by RCA will have a 15-inch screen and will be priced between $100 and $150.

Considering the relative value of the dollar, this compares favorably with the price of the first black-and-white television sets introduced in 1939.

When mass production of color receivers begins, prices will come down, so that color sets will sell for approximately the same price as black-and-white sets.

When Will Color Programs Be Available?

NBC has completed plans for its color television station's introductory year that will be open to NBC's regular program schedule. The network will operate as a separate unit, with color sets priced for sale to the public.

RCA and NBC have the know-how to broadcast color programs, to build equipment for broad-casting, and to build sets that will receive those programs. In addition, we have trained personnel ready to do the job.

RCA and NBC will invest an additional $15,000,000 during color television's introductory year to establish new services on a solid foundation.

The Industry Will Benefit

In the development of any great new service to the American public, many team members must take roles of leadership and honor the capital expense required to start a new industry. RCA has done this better than any other broadcasting and black-and-white television company.

This new color television set will feature a high-quality color picture that can be received in full color on your own set.

In introducing color, RCA is following the same policy of making its inventions available to the entire industry as it did in radio broadcasting and black-and-white television.

RCA has pioneered in color television broadcasting and programming, and now it is the only company that can bring a new service to the American public...for the benefit of the people everywhere...a privilege of leadership.
FACTS

the American People Should Know About COLOR TELEVISION

THE FEDERAL COMMUNICATIONS COMMISSION is to be congratulated for approving the National Television System Committee standards for color television. These standards will give the American public the finest black and white and color television service in the world.

These standards were developed by the leading scientists of the electronics industry. They are NOT the work of ANY ONE COMPANY. In the words of the Federal Communications Commission: "The accomplishment of a compatible color television system that can operate within a 6 megacycle bandwidth is a tribute to the skill and ingenuity of the electronics industry."

Here are the names of some of the organizations whose combined knowledge and strength are responsible for the system that won FCC approval:


Capehart-Farnsworth - Chromatic Television Laboratories - Color Television Inc. - Columbia Broadcasting System - Crosby - DuMont


Holland - Mangonez - Mallory - Motorola - Philco - Pilot - Raytheon - RCA - Remington-Rand - Scott - Soden - Stewart-Warner

Strandberg-Carlson - Syracuse - Technicolor - Tele-King - Warwick - Wells Gardner - Westinghouse - Zenith

In 1953, after previous attempts of individual companies to develop a compatible color system were turned down by the Commission as technically inadequate, the industry as a whole formed the National Television System Committee at the suggestion of the Chairman of the FCC. Their objective was to develop the standards for an all-electronic system which would meet the requirements of the Commission.

Hundreds of scientists of the electronic industry combined their efforts, developed one set of standards after another, all of which were subjected to rigorous field tests until the major problems were overcome and the final result achieved... the color system which the industry committee recommended to the Commission with confidence in July, 1953. This is the system the P.C.C. has now adopted and made official. Every electronic laboratory, every television manufacturer, large or small, who participated in this gigantic undertaking can rightfully share in the credit for the final result. It is a thrilling story of the cooperative strength of American industry in the solution of a highly-complex peace-time problem.

By developing these standards, the industry has protected the public's investment in the seven billion dollars of television sets now in use, since you will receive all future color programs in black and white on your present set without adding one cent of additional cost.

You should understand that much work still remains to be done, and color receivers will not be available in quantity for a long time. Now that the standards have been approved, manufacturers can proceed with the problem of developing color television receivers with viewing screens large enough in size to interest the buying public and at prices they can afford to pay. At present, the industry has developed only small screen color tubes with approxi-mately 11 1/2 inch viewing screens giving only 89 square inches of picture, which will cost from $200 to $1000 each. Contrast this with today's 21 inch black and white set with an approximate 250 square inch picture which sells for as little as $300.

This information is being published so that the public may be more fully and more accurately informed. We believe that the American people, who enjoy the world's highest standard of living, are interested in the fact that the entire electronic industry joined hands to bring them also the highest standards of color and black and white television in the world.

We congratulate the scientists of the entire television industry for their great achievement.

PHILCO CORPORATION

PHILADELPHIA, PA.

result in a withdrawal of commercial authorization. Instead, these claims—particularly that of sole credit for invention—quickly drew angry criticism from other manufacturers who had participated in the NTSC's achievement.

On December 23, 1953, the Philco Corporation which had performed intensive experimentation with color, placed a full-page counter advertisement headlined: "Facts the American People Should Know About Color Television" (See Figure III). Its central purpose was to make it absolutely clear that the standards adopted were "NOT the work of ANY ONE COMPANY." It is interesting to note the touch of cynicism in the statement as found in the alphabetical listing of those companies which participated in the NTSC. All organizations with the exception of the Radio Corporation of America have their names spelled out in full; an understandable minimization after RCA's promotional splash. But the resentment did not stop there.

Commodore E. F. McDonald Jr., president of Zenith Radio Corporation sent FCC Chairman Rosel H. Hyde a letter at the end of December charging RCA with trying to create the impression that it alone developed the compatible system. Zenith was also taking swipes at RCA's tri-color tube, heart of the compatible system, calling it "a Rube Goldberg contraption."

The General Electric Company also participated in the derogation of RCA's claims. A company representative remarked: "If you have a color set, you've almost got to have an engineer living in the house."
There was even a humorous side to the jibes. Having been asked how color television works, comedian Bob Hope replied: "Simple, General Sarnoff stands behind your set with a box of crayons in his hands." 4

It readily became obvious that manufacturers were anything but in agreement on the future of color as a revenue producer.

The Economic Climate for Color

At the end of 1953, fifty-eight percent of the nation's families (27,506,500) owned television receivers. 5 In the same year—the first calendar year following the "freeze"—two hundred and twenty-five stations made their debut. 6 In doing so, television was extended to geographical areas previously unserviced by video signals. The sale of monochrome receivers picked up handsomely in the immediate "post-thaw" period, only to dip dramatically during the summer of 1953. One cause of the lack of buying was said to be the record volume of consumer credit outstanding. 7

Another was the question of color. Dealers were reportedly fearful that the public, knowing multihued tv was coming early in 1954, were deferring purchases. Consequently, "manufacturers [were] doing everything in their power to convince the public that immediate purchase of a black-and-white set [was] an investment." 8 The Philco advertisement furthered the same position, arguing that color required additional development before the public would become interested.
Television retailers preferred that the FCC would have delayed its color decision, not approving standards until after the Christmas shopping season. Over a third of the year's sales are usually made during this period. One research organization forecast that at least 400,000 prospective buyers would withhold purchases awaiting the debut of color receivers. In this regard, the climax of the struggle for standards was a mixed blessing.

From a handful of receivers in 1946, black-and-white sales had zoomed to nearly seven-and-a-half million within four years. Few manufacturers predicted any possibility that color would achieve a parallel acceptance. For one thing, color represented a less dazzling advance over monochrome television than the latter did over radio. Color TV was viewed as an improvement of an old service, not as a new medium.

Several set makers were arguing that decreased profit margins from black-and-white sales was an additional reason for not introducing a color line until public reaction would be accurately gauged.

Sensing the arduous battle ahead, RCA—before approval of the NTSC specifications—began to educate the industry and the public on color television. Unquestionably, RCA—more than any other company—had the prospect of tremendous reward from mass acceptance of multicolored TV. Seven different industries would benefit from full scale production of items associated with colorcasting. Of these industries, RCA had representation in six: picture tubes, receiving tubes, set manufacture, local station origination, net-
working and studio and transmitter equipment. The only area outside of RCA's interests being the production of glass bulbs, the shells for picture and receiving tubes.\textsuperscript{13}

\section*{Focus of the Study}

RCA was entering a new phase of pioneering.

General Sarnoff had declared on May 7, 1946: "When a modern and practical color television system for the home is here, RCA will have it." But having a system is only part of the struggle. As Frank M. Folsom, RCA president stated: "Someone must take the risks of leadership and incur the necessary initial capital expense required to start a new industry."\textsuperscript{14} Accepting this challenge, the company began a campaign which is commonly referred to as the Pioneering Stage of advertising. Promotional activities during this stage are aimed at developing a new level of expectation, changing habits, implanting a new custom and setting new standards of living in order to generate a desire for the product offered. Color would have to be shown as antiquating black-and-white; assurances would be necessary that the system really worked.\textsuperscript{15} Color television had become RCA's principal product for diffusion.

In this work, "diffusion" is regarded as the process by which an innovation spreads from its source of creation to ultimate adopters--users of the product.\textsuperscript{16} In this instance, an intricate web of interrelated parties were, to varying degrees, anxious to have the public quickly adopt or reject color television.
For much of the consumer market, David Sarnoff and color TV were synonymous. His frequent press statements and aggressive, untiring fight for a compatible system unavoidably bound his name to the innovation. As a consequence, he was color's most prominent advocate, lending the prestige of his name and position to diffusion efforts. In an excellent examination of innovation entitled *Innovation: The Basis of Cultural Change*, author H.G. Barnett deals extensively with the role of the advocate:

Professional advocates are experts in persuasion. Their activities, more than anything else, support the popular fancy that inventions are prompted because people need them.\(^{17}\)

The diffusion of color television could not be attained if advocacy were to remain singular. All of the components of the broadcast industry would be called upon to lend their support to adoption. As Barnett indicates: "The technique of the advocate is to overwhelm the objector by summoning a mass verdict the logic of which, just because it is a consensus, is alleged to be irresistible."\(^{18}\)

As with many technological innovations, diffusion had to occur at two primary levels: within the industry and outside of it—to the public. This research undertaking examines both levels of diffusion. The activities of manufacturers, networks, advertisers, program suppliers and local stations are assessed to determine the point at which support of colorcasting developed into a consensus. The events leading to wide advocacy are carefully chronicled and evaluated.
Chapter VII shifts the emphasis to the consumer—object of the broadcast industry's efforts. In retrospect, the American buyer is analyzed along the lines of his reactions to appeals for consideration and ultimate purchase of a color receiver. Everett M. Rogers in his work, *Diffusion of Innovations*, isolates five stages in the adoption process: 1) Awareness, 2) Interest, 3) Evaluation, 4) Trial and 5) Adoption (or Rejection). Each stage is brought under review in the creation of a profile of the mechanisms by which color television finally evidenced a rapid advancement toward universal adoption in the United States.

Black-and-white started slowly right after the war because of what might be called the circle of interdependence: Consumers withheld purchases until set prices came down and until there were more shows on the air; advertisers withheld buying time until there were more sets in consumer hands; broadcasters had to wait for advertising revenue; and manufacturers couldn't reduce prices until consumer demand for sets allowed mass production.

Many claim the same thing will happen all over again.20
CHAPTER II NOTES


18. Ibid., pp. 327-8.

19. Rogers, pp. 81-86.

CHAPTER III

THE MANUFACTURERS

The "Shadow-Flask" Tube--Heart of the Color System

In conventional, monochrome television receivers, a stream of electrons is discharged from a "gun" in the neck of the display tube (cathode-ray tube). These electrons, differing in the intensity of their electrical charges, strike phosphor dots on the face of the receiver tube and thereby produce various degrees of brightness--ranging from a complete lack of light (black) to full intensity (white). Between these extremes, various shades of gray are produced. The rapid movement of this stream of electrons is called scanning. Line-after-line--five hundred and twenty-five in all--is scanned, producing a complete image. One image complete, the electron cycle is begun anew and another image formed. This incredibly fast reproduction of one image after another produces the moving television picture.

In the CBS color system, a wheel of colored filters rotated in front of the cathode-ray tube in synchronization with a similar disc in front of the camera pickup tube. Red, blue and green color information was transmitted separately. As a consequence, the signals could not be interpreted into pictures by normal, black-and-white receivers. This made the "field sequential" system non-compatible
and the subject of severe criticism and little support. David Sarnoff, in an address before the Harvard Law School Alumni Association commented:

... incompatible color receivers demonstrated before the Commission, used a mechanical windmill which, hitched to an electric motor, had to be placed in front of the television set in order to show color pictures. This mechanical method limits the size of the television picture to approximately 10 or 12 inches.¹

To overcome these limitations, RCA had been experimenting with several methods of displaying color images. As early as 1938, it was recognized that clusters of properly-colored phosphor dots could render color images in much the same way that monochrome tubes function. The major problem was one of directing electron beams to the correct color dot with unfailing accuracy. To achieve this required precision, a "shadow mask" was employed. The design of such a device was initially the work of RCA's Alfred N. Goldsmith. His patent application was filed August 5, 1944, and granted eight-and-a-half years later (U.S. Patent 2,630,542).²

With some alteration of this basic innovation of display tubes, it was first exhibited by RCA on March 29, 1950, in Washington, D.C. There were 351,000 color dots—or 117,000 for each color.³ To improve the quality of the color image, the number of dots was raised to approximately 600,000 for a showing in December of the same year which drew industry-wide acclaim.⁴

While this display system proved that compatibility could be achieved by means of an all-electronic system, there were major problems which remained to be corrected. This RCA tube contained
as the shadow-mask

... a flat metal plate with hundreds of holes, which plate was tightly secured to a large heavy steel frame. Immediately behind this flat metal plate was a flat glass plate, or screen, bearing trios of phosphor dots. The phosphor dots and the tiny holes on the metal plate were so positioned with respect to one another that the holes effectively prevented the beam from any of the three electronic guns from activating a dot of the wrong color. Experience soon established, however, that a high percentage of the electronic energy from the electronic beams struck and, therefore, heated the metallic shadow mask. Because of the well-known fact that metal expands when heated, the heating of the flat metallic plate carried with it enough lateral movement of the tiny holes to cause a misalignment between the holes and the phosphor dots. This misalignment, or 'lack of registry,' as it is called in the jargon of the industry, caused the production of undesirable colors, smears of color, etc.  

It was obvious that the tube needed refinement. CBS Laboratories Division vice president, Dr. Peter Goldmark compared the "shadow-mask" tube to his revolving disc method noting that

The difference is not slight, but of the day and night variety, from every aspect—color, contrast and detail.

He continued:

Even if this tube were comparable in price with the color wheel, we still would not use it because of its inferior picture quality.  

Several different approaches to color television picture tubes have been theoretically and experimentally attempted. One of the most famous was invented by Dr. Ernest O. Lawrence of the University of California. The Lawrence design (U.S. Patent 2,692,532)—formally called the Chromatron tube—used a single electron gun and required no shadow mask. The patent was assigned to Lawrence's Chromatic Television Laboratories, Inc., with licenses
granted to two American and one foreign company. Large scale production plans were periodically announced for the Chromatron tube, but application of the one-gun design has remained limited to military and industrial applications for the most part. Its use in home receivers did not become practical until circuitry problems were overcome by the Japanese Sony Corporation in 1964.

The RCA three-gun tube was chosen for the NTSC system as a compromise in receiver design. The Lawrence tube, while costing less to manufacture, presented a radiation hazard requiring greater precision in the building of the set chassis. The RCA tube required that maximum precision be built into the tube itself. Simpler circuits and minimum radiation were considered assets.

Ironically, a solution to the major problems with RCA's design came out of the CBS laboratories. Normal F. Fyler and William E. Rowe were assigned U.S. Patent 2,690,518 on September 28, 1954. These two men conceived the idea of constructing the shadow-mask as a segment of a sphere rather than from a flat plate. Being spherical, "it would expand radially rather than laterally as its temperature rose from the impingement" of the electron beams. This design change cancelled the misalignment problem. Further, this concept made it possible to deposit the phosphor dots directly on the face of the picture tube itself.

RCA acquired the license from CBS to manufacture this improved design November 20, 1954, and added to it a more exacting method for depositing color phosphor on the tube face. Originally,
In a typical twenty-one-inch tube three electron guns (a), one for each of the primary colors used in the NTSC system, are arranged together in the neck of the picture tube. Each gun carries messages of brightness or intensity for only one color and its electrons must hit only the phosphor dots of that color.

The red, blue and green dots which glow when stimulated by an electron beam are arranged in triads—over 340,000 in all. To insure that only the designated phosphor in a given triad is stimulated, a shadow mask (b) is placed about a half inch behind the tube face (c). The mask is manufactured from a steel plate six-thousandths of an inch thick and perforated with more than 340,000 holes about .009 of an inch in diameter.

Through a single hole in the shadow mask, the blue gun—for example—can hit only one blue dot. Electrons from the green gun, because it shoots from a slightly different location, pass through the same hole but strike an adjacent green dot. The red gun functions in the same manner.

To produce color images using these color dots, electrons from the three color guns, matched with the color signals from the television camera, scan all of the dots on the tube face thirty times a second. The tube practically produces every color and tint by mixing the basic colors in different degrees of intensity.

---

a silk screen process had been employed; it was both time consuming and subject to uneveness. The improved technique adhered phosphors by a photographic process.13

This amalgam of inventions resulted in the color picture tube which all major American set makers employ today (See Figure IV).

For several years the color tube remained the center of manufacturing headaches. It was the most costly element in multihued receiver production. For every three tubes contracted in 1954 two had to be rejected as unacceptable.14 Gradually, rejection rates decreased and picture sizes became larger. Economies of production permitted RCA—the major manufacturer to tubes—to reduce its prices to other set makers early in 1955. Twenty-one-inch round tubes which had been selling for $175 were cut by forty-three percent to an even $100. In announcing its action, RCA was hoping that the reduction would "encourage competing manufacturers in the industry to go into production promptly in the field of color television." 15 The same year, a major construction change was effected. As a result of Fyler and Rowe's patent the tube stem could now be manufactured as a glass bulb rather than the metal casing which RCA's basic patent called for. A substantial weight reduction was achieved.16

By 1964, RCA was selling its tubes to more than twenty-five other set producers.17 The company was also starting pilot production of a 25-inch receiver of rectangular design.18 Only three
other manufacturers were then producing tubes: Sylvania, Rauland Corporation (subsidiary of Zenith) and National Video Corporation whose total output went to Motorola.

The only major improvement of color tubes in the 60's is attributed to Sylvania Electric Products, Inc. The company introduced Europium, a rare earth element having certain natural luminescent qualities which tend to bring out brighter reds. Previously, brilliant reds were unobtainable with the tri-color tube. When color sales finally registered a sharp upward move, the tri-color tube became the only factor limiting even greater sales. Those among the industry who had relied upon RCA to supply their tube needs when sales had been slow were confronted with an RCA declaration at the end of April, 1965:

There are . . . other sources to whom manufacturers now can and should look to meet their color-tube requirements. Under these circumstances R.C.A. will not supply other manufacturers with color tubes at the cost of curtailing its own set production to such an extent that it loses position in the industry which it pioneered.

This blunt announcement shocked many in the industry. But for RCA it symbolized the assured, steady expansion of color receiver sales—the history of which follows.

1954—The Introductory Year for Color Sets

The television industry was not unanimous in its predictions for color's success. Conservative estimates of the number of receivers to be produced in 1954 called for around 50,000; the highly optimistic suggested as many as 300,000.
Dr. W.R.G. Baker, chairman of the NTSC and vice-president of the General Electric Co. was one of the least enthusiastic. He sharply delineated the differences between a system's feasibility and its applicability at a given point in time:

... the industry actually is leaderless and will remain so until, by costly experience and perhaps many mistakes, it achieves the standardization in tubes and circuitry which it enjoyed in monochrome in 1946.

... at the present time, the industry has outrun its known technology. It has permitted itself to be trapped by expediencies and pressures into announcing a service and promising 'immediacy,' before it was technically in a position to fulfill the promise.  

This point of view was embellished by an executive of Zenith Radio Corporation who maintained that "aside from space vehicles, color television sets are probably the most difficult product man has ever attempted."

But the fear of having no color line and thus no experience in trial production was greater than the concern for not having a market for the product. Consequently, most of the major set producers began tooling up for production shortly after the FCC's final color decision.

Westinghouse was the first to introduce a receiver for consumer purchase and had sets on display in the New York-New Jersey market in February of 1954. A major sales campaign followed which produced thirty sales, chiefly to advertising agencies and Westinghouse competitors.

According to the company, even the original retail price of
$1,295 (quickly reduced to $1,100) didn't begin to cover the cost of making the sets, actual cost having been closer to $3,000 each. The gamble was taken for the "prestige of being first" and for the more important prospect of enhancing its position in the sale of black-and-white sets. The color receivers were used as bait in attracting customers to retail outlets.

On March 26, RCA announced that it had begun commercial production of color receivers at its plant in Bloomington, Indiana. The facility was geared to produce two thousand sets a month, but initial production plans anticipated only ten thousand receivers by year's end. Priced at $1,000, the receiver was fitted with a 15-inch tube which produced a picture equivalent in size to a 12 and one-half-inch black-and-white set. While experimental models had as many as one hundred tubes, the production models contained thirty-six, including the tri-color kinescope.

All of the sets which were introduced in 1954 were similar in configuration. Since RCA was the sole picture tube manufacturer at the time, each contained the same 12 1/2-inch screen. Other similarities arose from RCA's action late in 1953 which gave to all set producers the full details on the design and performance of its basic color receiver.

One manufacturer, Emerson Radio and Phonograph Corporation, revealed plans in March not to sell but to rent color tv's to the public. The company's president stated that the plan had been adopted because his organization did not believe that purchasers of early sets would be getting their money's worth. Rentals began in
April with a $200 fee for the first month—covering delivery, installation and operating instructions; monthly rental thereafter was $75 per month which included servicing. Most rentals were to clubs, hotels and other organizations in major cities. When it became clear that the public was highly reluctant to participate, the plan was withdrawn in August.

Sylvania Electric Products, Inc. had a receiver in distributors' hands in March which retailed for $1,150. The General Electric Co. announced a price of $1,000 which included a ninety-day warranty on the picture tube and parts.

Zenith, a major force in the black-and-white set market, demurred. It preferred to stay out of the color market until a "practicable and workable" single-gun tube could be developed. This corporate decision may have been motivated by the success which the Crosley division of Avco Manufacturing Corp. was having with the introduction of a 17-inch monochrome portable. The second-set market appeared to hold more promise than the rapid diffusion of the fledgling, color.

As the first color sets made their bid to attract consumer attention, a second tube manufacturer was preparing a nineteen-inch color tube—more in line with the popularly-sized black-and-white viewing screens. In June of 1951, the Columbia Broadcasting System consumated the acquisition of Hytron and its subsidiary, Air King Products Co., Inc.—maker of tv and radio sets. Columbia purchased Hytron as a manufacturing arm for "field sequential" color receivers when it appeared certain that the CBS system had been the clear victor in the color controversy. Facilities were now being
used to produce conventional receivers and tri-color tubes. The latter were of a unique design which effectively improved the RCA concept and permitted the construction of greater viewing surfaces.

The improved shadow mask of this new tube brought other set makers into the competition. Motorola introduced a line with 19-inch receivers selling for less than $1,000. A console model was priced at $995, a consolette for a hundred dollars less. Admiral Corp. began promoting the first 21-inch color set to be available by Christmas.

Public announcements of increased tube sizes at lower costs put pressure on RCA's introductory model. Consequently, on August 9, 1954, the cost of color tumbled to less than $500. Set owners who had purchased the thousand-dollar-sets received a rebate of $505 in a move similar to that made shortly after the introduction of black-and-white sets at the World's Fair in 1939. Four days earlier, Emerson Corp. had discontinued its leasing plan for color sets, and in doing so decided to sell their receivers for $695. The pace of events pointed to the conclusion that the fifteen-inch tube should never have been made.

Mid-year production figures for 1954 indicated that fewer than eighty-five hundred color tv receivers had been produced. Further, production of all sets in that period declined twenty-six percent from the year before.

The latter half of the year was characterized by a battle of the tubes. CBS introduced 19-inch receivers priced under a thousand dollars in late August. To induce purchases, the company offered
to accept any black-and-white set at cost value in trade-in on a CBS-Columbia color receiver. By mid-November RCA was in production of twenty-one-inch tubes and taking orders from other manufacturers. The rapid succession of press statements created a tempo for color activity which signaled its first warning in December.

Two weeks before Christmas, Emerson announced a temporary discontinuance of color set production. Concurrently, CBS had completed the production of its first three thousand sets and put further production plans up for review. Additionally, an unexpectedly sharp upturn in monochrome units purchased in the second half of the year firmly established the reasoning that as long as the consumer would be willing to buy black-and-white sets in record numbers, dealers were not going to push color too hard.

As color's introductory year closed, the Electronics Industry Association reported a 55.7 percent saturation of television receivers in American homes. The figure represented nearly thirty-three million sets-in-use of which only five thousand were color—well below the most pessimistic projections.

Part of the trouble with color—was color! When the first receiver was introduced by Westinghouse, Consumer Reports, the publication of an independent organization engaged in testing consumer products, published its findings. The magazine noted that the set was bulky, taking up roughly the same floor space as a refrigerator; it used 550 watts of power at an operating cost nearly three times that of a typical black-and-white set. In a later issue which com-
pared the Westinghouse and RCA receivers, the latter was appraised as being a "little (but not much) better." In most respects the two sets were similar. Color "fringes" appeared on both when black-and-white pictures were transmitted and there was "blurring of small or rapidly moving objects." The report concluded by stating that

... on the basis of the evidence at hand, it appears that only an inveterate (and well-heeled) experimenter should let the advertisements seduce him into being among the very first to own a color TV set. 51

The New York Times' radio and television critic, Jack Gould, pronounced a somewhat less negative attitude. He encouraged the purchase of color by those with sufficient funds and wanting the latest thing but also having the patience to learn how to operate it. 52 Several additional knobs with critical tuning characteristics were requisite to the new receivers.

Clearly, the problems which color receivers themselves betrayed were contributing heavily to the lack of public acceptance.

1955-1956: A Call for Solidarity

The second year of manufacturing failed to produce a single major achievement. The twenty-one-inch set experienced its debut and the--by then--customary price cutting shortly thereafter. RCA reported an "unprecedented demand" for color receivers which it attributed largely to intensive advertising and the telecasting of the World Series in color. 53 In spite of the heavy promotional commitment, a mere twenty thousand more color sets were put into residential use during the year.
RCA advertising funds had been going into national advertisements with newspaper campaigns on a cooperative basis. Most efforts were concentrated in the New York, Chicago and Los Angeles markets with typical headlines reading: "If you earn $5,200 a year . . . or more--your family is ready for color TV." The ads featured time payments of as little as three-dollars-a-week with three years to pay, trade-in allowances, free home trials, set rentals and low cost service contracts. The latter presented a crucial problem with the advent of color.

Before production models were released, RCA began conducting "color clinics." They were arranged to instruct distributors and servicemen in the repair techniques that would be needed. But it was quickly evident that repairmen were fearful of the new receivers and believed that it would be too difficult and time consuming to perform needed services. Consequently, qualified servicemen were at a premium and contracts for repairs and replacements frequently added more than one hundred dollars to set costs.

Disappointment with color began having a profound effect. As quickly as they had entered, major manufacturers began to cease further production. Remembering the history of black-and-white's success which occurred only after prices were reduced, pictures became larger and nearly all manufacturers were in production, RCA moved to revitalize color-set building. On April 16, 1956, the company offered to share its color television know-how with all other manufacturers on a licensing basis. Frank M. Folsom, president of RCA declared to industry representatives:
Many of you will recall that in August, 1947, we turned over to other manufacturers in the radio industry complete engineering and manufacturing information on the first table model black and white television receiver. This receiver became the foundation upon which was built today's vast television market.

Now we shall do the same thing with our big-screen color television receivers. We shall turn over to you R.C.A.'s latest color television receiver blueprints, our technical know-how, production details and bills of materials. Our color television manufacturing facilities are open to your inspection.57

For its own part, the company strove to stimulate demand with increased price reductions. Two hundred dollars was shaved off the price of the twenty-one-inch set bringing it down to slightly under $500, the price which the industry had long been saying was required before the public would buy in quantity.58 To support its position, RCA executives pointed to a special survey which indicated "nearly 1,000,000 persons who are ready and able to buy color television sets at the $495 price level—now."59 But only fifty thousand color receivers were sold in 1956, not a sufficient number to stir industry skeptics.

Additional proof of color's lack of profitability appeared in RCA's year-end statement in which it was estimated that the company would lose about $6.9 million on color television set making and broadcasting for the year. David Sarnoff, however, dismissed the deficit in saying:

This is certainly a reasonable expenditure to lay the foundation for a business that promises substantial profits in the near future.

RCA's goal for 1957 is to produce and sell 250,000 color sets, to double the number of color programs on the air, to attract sponsors to the new and productive
medium and to encourage others to enter the field. Sarnoff went on to express his impatience with the critics of color. He identified them with those who had entered black-and-white production only after success appeared evident, and in doing so had "reaped where they had not sown." 60

1957-1958: Time to Re-evaluate

New year spirits were quickly dampened for the Radio Corp. with the filing of a 150 million dollar suit by the Philco Corporation against "monopolies" in electronics. The petition was against RCA, GE, AT&T and two of its subsidiaries. Among other things, Philco contended that its black-and-white sales were "substantially lessened" by RCA's persistence in offering its color television sets for sale despite the fact that they are not perfected, and persistence in advertising that RCA has pioneered and developed the compatible color television system. Additionally, the petition claimed that RCA was attempting to "eliminate" Philco's competition in color television "by charging unreasonably low prices for its approach to color television sets and picture tube." 61

Whether prompted by the suit or not, RCA raised retail prices on its nationally advertised color models from $45 to $50 within two weeks, claiming the rise was necessitated by "the continuing upward trend in the cost of materials and labor." 62 A few months later the company filed a countersuit against Philco asking for treble damages alleging infringement on RCA patents. 63
With the entangling legal machinery set in motion, attention turned to new promotional techniques aimed at exposing color to seventy-five percent of the American public who had not yet witnessed a demonstration. The first in a series of nation-wide sales campaigns was initiated in Milwaukee in the spring of 1957 and spread to fifty-three cities during the late summer and fall.

Milwaukee was chosen for its having been a leader in black-and-white sales and for being a major market with both network and local color tv outlets, two daily newspapers and seven radio stations.

During the campaign the sale of color receivers averaged 106 a week, 783 percent above an average twelve-week period before the campaign began. Sales approaches included telephone and door-to-door solicitations and home demonstrations. Important for demonstration purposes was the seven-and-a-half hours per week of color-casts--more than any ever presented anywhere during a comparable period.

Children became instrumental tools in the campaign. A contest was begun in which children filled in an outline drawing of the NBC peacock--the network's color insignia. To qualify for prizes the children were required to bring their parents into a dealer's store.

Working on another front, RCA was trying to enliven dealer interest by making them aware of the large profit inherent in the sale of a big-ticket item. At the time the average color set sold for $645, on which the dealer had a $200 gross margin. Home demon-
stations reportedly resulted in sales of two-out-of-three homes with the net cost to dealers for each demonstration about $25 after RCA and the distributor shared the major financial burden. The point was being made: color could be very profitable.

The extensive campaign—at a cost to RCA of approximately $150,000—was highly successful. But the letdown following was nearly as dramatic. Almost immediately following, sales dropped back to about thirty sets a week.

There were no more than 350,000 color sets in U.S. homes according to industry estimates and at least 300,000 were RCA models. With television to be found in nearly eighty percent of the country's households, color might have appeared overdue for success. Nevertheless, at the onset of 1959, CBS had terminated the color tv operations of its electronics division and General Electric had been out of production for some months with no intention to resume color production. Zenith remained on the sidelines with no concrete plans. And by mid-year Admiral had terminated production.

A significant development occurred in October. On the 28th, RCA signed a consent settlement which stripped away restrictions which RCA had been enforcing on the use of an estimated 12,000 key patents for radio and television equipment. Justice Department spokesmen called the settlement "one of the most important antitrust cases in history." It required RCA to put one hundred of its most important color tv patents into a "patent pool." These patents were then to be made available to all manufacturers contribu-
ting patents of their own to the pool. Those companies having no color television patents were to be allowed access to the pool without the payment of royalties. Both the Federal Government and RCA voiced belief that the pool idea would overcome the reluctance of some manufacturers to make color sets. 71

A legal dispute of less practical concern also came to light in 1958 with the Federal Trade Commission's attempts to stop Harry G. Kriegel. What color sets the industry didn't sell, Harry did! For some time the New York man had been placing newspaper ads expressing thanks to "a great German scientist, Hanz Koeppel," for inventing a color "converter" which could now be had for the sum of $4.98.

Ten thousand dollars worth of the "converters," which in fact were pieces of transparent plastic colored green at the bottom, amber in the center and blue at the top, had been sold. So effective were his advertisements that the manufacturer of the filters bought one on the strength of the claims. He surely was dismayed upon reading the enclosed "installation chart" which consisted of a one-line printed sentence which read: "Apply Scotch tape to four corners of film." 72

1959-1960: A Turning Point

It became evident to the industry in 1959 that black-and-white television was no longer an expanding business. Instead, it was being sustained primarily by the demand for replacement sets, two-thirds of which were economical, low profit portable receivers.
With eighty-six percent of the nation's homes equipped with receivers—over fifty-four million in all—a boom for color would infuse the electronic world with new life.

To this end, color receivers had undergone substantial design changes which effectively simplified tuning, rendered color more stable and eliminated many of the engineering "bugs" which had plagued previous models.73

The slow but steady progress of sales culminated in a surprise for many when David Sarnoff announced late in December that RCA would make a profit on its sales of color television sets during 1959 for the first time since their introduction as a product line in 1954.74 This revelation didn't immediately draw reaction from other domestic set makers. Instead, it appeared to prompt the influx of imported color receivers. Hitachi, Ltd. of Tokyo had begun mass production of twenty-one-inch sets under an RCA license and was preparing to become the first receiver import.75

For the promotion of its own brand of receivers, RCA initiated a change of advertising agencies in 1960. Whereas the 1959 campaign had been built around consumer advertisements showing various "fashionable" owners of color receivers, the first ad from J. Walter Thompson Co. was designed with a more "down to earth" theme. As one of the agency's executives explained:

Our research showed that a surprisingly high percentage of people have seen color tv through the past years, and many saw it under unfavorable conditions—in a bar or hotel or store window. Many of these people were naturally unimpressed. They're the ones we want to tell about the changes in color tv—improvements in sets, programs, prices.76
The new theme was carried out in ads featuring Perry Como's bronzed and beaming face—in color. Headlines exclaimed: "Look what's happened to color TV since you last saw it!" And some five hundred school, church, club and social groups sat through a free movie entitled: "The Wonderful World of Color" produced by RCA for more than $50,000.

At point of purchase, the dealer's display room, a specially designed instrument attached to a color set split the screen in two—half showing color, the other half a black-and-white picture. The number of "key dealers"—those displaying at least four color tv models—tripled during the year. Sales success was demonstrated by a forty-percent gain in sales by distributors to stores in the first quarter which prompted RCA to double production output at a time when only two other manufacturers were having any market influence.

Color television had turned the corner as a $100 million-a-year business. By contrast, it had taken the auto business 112 years to reach the same mark, the aircraft industry twenty-five and the petroleum industry forty years.

The magnitude of color's accelerating growth was punctuated by David Sarnoff's 1960 year-end statement putting RCA profits from color TV sales at at least one million dollars. This report came at a time when industry sales of consumer durables had eased off and monochrome tv had dropped seven percent.
From the receiver standpoint, 1961 was color television's breakthrough year. It was the result of several gradual and cumulative trends and one sudden one.

In February, Zenith, the nation's number one maker of monochrome sets, after eight years of research and development work, announced it was preparing a "completely new and unique" line of receivers for the fall. The revelation came less than a year following a remark by the company president that color television "isn't business yet--when it is, we'll be in it in a big way." 83

Zenith's entry exerted heavy pressure on all other manufacturers. As one anonymous company representative remarked:

We are forced into color this year. We didn't want to make color sets but we had to listen to the demands of our dealers. They want color, if only to attract customers to the showrooms. Also, heavy sales of portable television sets have cut into dealer's profit margins and they want to recoup some of it in color where there is a high markup. So, rather than lose our dealers to another manufacturer, we made a color model this year. 84

By the end of the year, there was only one major manufacturer holding out against color--Motorola.

There was an easy way to enter color and most set makers chose this path which required little capital investment: let RCA make it. The company's Bloomington, Indiana, plant was preparing sets for Admiral, DuMont, Emerson, Magnavox, Olympic, Philco and others, along with its own RCA Victor line. The few making their own receivers included Zenith, Packard Bell and General Electric--and even they relied heavily on RCA for parts and subassemblies. 85
It is thought that RCA's long monopoly of color picture-tube manufacturing forced the company to sell a certain share of its color tubes for fear of antitrust sanctions. In doing so competitors were being given an interim in which to develop their own color tube techniques.\textsuperscript{86}

As a result of the increased output RCA reported that November's dollar volume of factory shipments had exceeded that of black-and-white for the first time.\textsuperscript{87} The year climaxed with the sale or more than 150,000 multihued sets.

The color set boom had begun!

\textbf{1962-1965: Sales Momentum Continues}

As brisk consumer demand was sustained, RCA placed its second tube manufacturing facility into operation and greatly expanded the first.\textsuperscript{88}

At the bottom end of the line, the company was building a $495 set with what admittedly was the cheapest cabinet we know how to build.\textsuperscript{89} It was so unglamorous that one retailer insisted "No one buys it but taverns." Most families were purchasing sets in the $600 to $800 bracket; these yielded thirty percent profit margins to dealers.

Early in 1963, resolve finally came to the Philco and RCA suits of six years earlier. The decision required, among several considerations, that RCA receive non-exclusive licenses under all Philco and Ford--the new parent company--patents and patent applications in the U.S. relating to radio and television equipment.\textsuperscript{90} The decision
served to encourage greater competition in the design and construction of color receivers.

Prices continued to come down. Sears, Roebuck & Co. brought out a receiver for under $400. Color kits priced at $398 sold surprisingly well for the Heath Company after their introduction. As one dealer remarked:

Suddenly everybody wants a color TV set. In my thirty-six years in business, I've seen many products like refrigerators and automatic washers go through the same stage. But I've never seen a product catch on as suddenly and as dramatically as color TV is now.

It had been a protracted wait for General Sarnoff who triumphantly addressed the 46th annual meeting of RCA shareholders on May 4, 1965:

Today, the question is not whether color has taken hold but how soon supply can catch up with demand. Consumer interest is at the stage that characterized the boom years of black and white, and the output of color picture tubes and sets simply cannot keep pace. A new industry is now firmly rooted as the fastest growing business in the consumer sector of the economy, and before the next five years are ended, it will triple its present billion-dollar status.

Color sales for 1965 were 101 percent greater than the previous year. Two and three-quarter million sets were sold as color television began its drive toward total diffusion.

As the preceeding historical account has indicated, the sale of color receivers progressed in an evolutionary fashion (See Table 1). Its growth was slower than monochrome's had been, but that becomes even more understandable as other industry sectors are examined.
### TABLE 1
A COMPARISON OF SEVEN-YEAR TRENDS IN BLACK-AND-WHITE AND COLOR SET PRODUCTION

<table>
<thead>
<tr>
<th>Year</th>
<th>Monochrome Set Production</th>
<th>Color Set Production</th>
</tr>
</thead>
<tbody>
<tr>
<td>1947</td>
<td>178,000</td>
<td>110,000</td>
</tr>
<tr>
<td>1948</td>
<td>975,000</td>
<td>185,000</td>
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<tr>
<td>1949</td>
<td>3,000,000</td>
<td>438,000</td>
</tr>
<tr>
<td>1950</td>
<td>7,463,000</td>
<td>747,000</td>
</tr>
<tr>
<td>1951</td>
<td>5,384,000</td>
<td>1,458,000</td>
</tr>
<tr>
<td>1952</td>
<td>6,096,280</td>
<td>2,746,618</td>
</tr>
<tr>
<td>1953</td>
<td>7,215,827</td>
<td></td>
</tr>
</tbody>
</table>


*bReports on color TV set production started in 1964. Previous figures are industry estimates.*
Summary

It is axiomatic that color had to be sold to manufacturers before it could be sold to consumers. Numerous accusations crippled the industry before a cohesive sales effort could be mounted. Among the arguments: color was brought out too soon; early pricing was wrong; small color tubes should never have been introduced; and, the approach to selling color was not known. To varying degrees each claim had merit. Suits involving allegations of patent infringements, of restraint of trade, and of conspiracy to hold back the development of color television further complicated any progress.

The principal spur to color set manufacturing was the heavy saturation of monochrome receivers resulting in decreased output and lower profit margins. Color was not a compromise, but a cure for an economic ill in the electronics industry.
CHAPTER III NOTES


13. Ibid., p. 472.


21 Sponsor, December 28, 1953, p. 27.
24 Business Week, April 24, 1954, p. 43.
26 Business Week, April 24, 1954, p. 46.
29 New York Times, October 8, 1953, p. 43.
38 Business Week, May 12, 1951, p. 21.
45 Television Age, February, 1956, p. 42.


54. Printers' Ink, November 2, 1956, p. 80.


56. Printers' Ink, January 10, 1958, p. 22.


CHAPTER IV

THE NATIONAL TELEVISION NETWORKS

Initial Color Programming

The work of the Second National Television System Committee was conducted under the watchful eye of the Bell System. As a result, when compatible color was given the go ahead in December of 1953, transmission circuits were already in a high state of development. AT&T, which had previously carried out experiments with CBS to determine the requirements of the "field sequential" color system, switched to cooperation with NBC and RCA, and later with the NTSC.

A demonstration before the Commission was made on November 6, 1953, which tested both coaxial and radio-relay facilities between New York and Washington. Twelve days later a transcontinental closed-circuit transmission of over 4000 miles was provided from New York to Hollywood. The success of these demonstrations encouraged the Commission in setting forth its final decision on color the following month.

Prior to that acceptance, in its petition before the FCC, the Radio Corporation of America and NBC pledged its television networking facilities to the rapid start of color programming:

Petitioner National Broadcasting Company, Inc., will commence broadcasting compatible color television programs which it will offer to commercial sponsors.
and its affiliated stations throughout the United States. Forty-one NBC stations have already amended their network affiliations agreements to provide that they will, on approval of the proposed standards, make the relatively minor modifications to their transmitting apparatus to enable them properly to commence broadcasting network color television programs. 2

The National Broadcasting Company also disclosed that it had worked out a rough schedule of colorcasts to originate from the Colonial Theatre in New York, and Studio 3H in the Radio City studios—the only two color-equipped facilities at the time. 3

The former had previously been the site of the last of the silent movie producers to succumb—Vitagraph. Located in Brooklyn, the studio had been refurbished to serve as a training ground for technical personnel. 4 Studio 3H was selected for conversion to color because, having been a monochrome production facility, it was equipped with many of the services required for color operation. The studio had been designed in 1933 as a radio broadcast facility and later converted to television in 1935. 5

At the time of the adoption of color standards, CBS had been broadcasting weekly programs in color since early September. Columbia had acquired the RKO Theatre on 81st Street and Broadway in New York for conversion into a CBS-TV color television studio with the anticipation of being in operation by April of 1954. The color schedule was to be expanded by the formula set forth by Dr. Frank Stanton:

... CBS will broadcast a regular daytime color series. In scheduling our color programs, we will take into consideration the schedules of other networks in order to avoid duplication so the public can have the
benefit of the maximum number of hours possible of color. The rate of additional expansion of network color programming by CBS Television will depend on the rate of color receiver production.

... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ...

CBS is prepared to bring visually into the homes of the American people the more complete information and greater reality that can only be conveyed by the added dimension of color. We confidently expect the very rapid introduction, during the coming year, of this most exciting new development. CBS pledges its every effort to achieve this objective.6

No immediate word of color programming plans came from either of the other two networks, the American Broadcasting Company (a division of Paramount Theatres) or the DuMont Television Network. But since the FCC rules did not specify a minimum number of hours during which tv stations had to transmit color programs, it was expected that both would engage in colorcasting to some degree.

Historians are always mindful of "firsts" but often overlook the runners-up. One of the color "personalities" was a five-foot-six-and-a-half-inch "live test pattern." The girl with the "natural complexion" who (for two years) remained voiceless from midnight until as late as five in the morning, was Marie McNamara. She patiently sat before color cameras in the NBC studios of WNBT-TV in New York as technicians laboriously tested color resolution and compatible broadcasting.7 But Miss McNamara will be thoroughly forgotten in the future as students of broadcasting recall the first network star to be seen in full color on an intercity network -- Howdy Doody, on June 26, 1953.

Other pre-color-decision programming from NBC included a
Kukla, Fran and Ollie special in which they were accompanied by the NBC Symphony Orchestra in an original operetta, St. George and the Dragon, on Sunday, August 30.8

October 31, from 5:30 to 6:30 PM the network had received permission to colorcast Carmen. There were some misgivings about this ambitious effort: the director of the opera thought that the extra lights demanded by color would cause discomfort for his singers and perhaps even prevent completion of the play.9 But the actors withstood the test and so did the system. New York Times critic, Jack Gould, watched on one of the first color sets to be released for home use and pronounced "The doom of black-and-white TV seems only a question of time."10 Gould went on to voice a note of caution to producers of programs in color: "The addition of color may help but cannot save an inferior production. . . . Red, blue and green are not replacements for a show."11 Throughout the early years of color programming he continually revived the statement—and usually with good cause.

The first colorcast following the FCC's decision occurred at 5:32:17 PM, Thursday, December 17, 1953. Originated by NBC-TV, it was termed the "first authorized color signal," and showed the NBC trademark in the three primary colors accompanied by the traditional chimes.

The first full program was aired by CBS-TV starting at 6:15, concluding just before NBC-TV initiated its primal program at 6:30. Ironically, the latter included a filmed statement by Brig. Gen. David Sarnoff—shown in black-and-white!12
Before the color standards had become official, thirty-days after publication in the *Federal Register*, several programs were colorcast. The first of these was Gian-Carlo Menotti's Christmas opera, *Amahl and the Night Visitors* sponsored on NBC by Hallmark Cards. As the first commercially sponsored program in color (December 20, from 5 until 6 PM), it was characterized as "a succession of Yuletide Cards come to life." Jack Gould poured forth lavish praise:

The quality of the color literally beggared description. The mixture of hues varied from a poignant delicacy to a festive liveliness that was different from Technicolor, different from the theatre, different from a printed picture. As one scene of complete visual loveliness followed another, a viewer actually saw color tell its own story in a way impossible before the advent of electronic tints.

On Christmas Eve, the first sponsored showing of a color film—a program in the *Dragnet* series, appeared on NBC. Unlike the comments which "live" color had received, the film transmission was soundly criticized:

Sad to relate, it was by far the worst completely electronic color TV to be seen in many a day—roughly comparable, in fact, to the ragged experiments of several years ago.

Thus, the first approved commercial telecasts of compatible color appeared to run the gamut from excellence to inferiority. The mixed-press had little effect on the general public who, having no receivers of their own, were about to be baited with increased colorcasting as a stimulus to set purchases.
Confronted with the question of how best to promote the sale of color sets, RCA early came to the conclusion that the obvious method would be to give the television viewer ample tinted programming to whet his color appetite. In doing so it accepted the financial loss against the prospect of a long-range return, hoping in the interim that the other networks would speed the day with color programming of their own.

As a prelude to color's first year, a special production unit at RCA's Camden, N.J., factory operated on a full-day basis, seven-days-a-week, turning out the station equipment necessary for the rebroadcast of network color programs. Five crews of specially trained technicians travelled by air with the shipments in readying twenty-three stations for the January 1 colorcast of the Pasadena Tournament of Roses Parade. Eighteen of the twenty-three actually carried the parade in color.

The parade was the first prolonged presentation of color video under circumstances where, unlike a studio show, neither lighting nor movement could be controlled. The results were judged to be "exceedingly good."

By March of the first year nearly every major type of television program had been offered in natural tints at least once: drama, The Circle Theatre presentation of "Evening Star" and Dragnet; quiz show, Judge For Yourself with Fred Allen; news, Camel News Caravan; discussion, Meet the Press; children's pro-
grams, Howdy Doody (done for one week in color) and Ding Dong School; educational program, Zoo Parade; musical spectacles, Amahl and the Night Visitors and The Hit Parade; and, the remote broadcast of the New Year's Day Tournament of Roses. During the same period CBS was colorcasting special, sustaining programs every Friday from 5:30 until 6:00 PM.

NBC was, by far, offering the heaviest color schedule. But the weekly CBS presentations were critically acclaimed as "much better entertainment," indicating that the former's efforts were principally color-for-color's sake.

The annual stockholder's meeting of the Radio Corporation of America was held outside of New York for the first time in the company's history on May 5, 1954. The main session was conducted in Burbank, California, site of NBC's Westcoast network operations, and sent over a three thousand mile closed-circuit television link—in color. The cross-country wire facilities cost the company $50,000, but the flamboyant exhibition served to acquaint stockholders with the innovation which had been (and would continue) eating heavily into corporate profits.

A way of bringing color exhibits to those less interested in profit-and-loss statements came in June. What was billed as color television's "first studio on wheels"—a two-truck mobile unit—began a ten-city tour through the Midwestern and Eastern United States for a series of outdoor color features. Visits included an examination of the Ohio Governor's mansion in Columbus. There, as in the other cities, leading department stores were equipped with
RCA color tv sets on which the public was able to view the live pickups.23

As fall approached, the American Broadcasting Company still had not announced any definite plans for color. Unlike NBC, CBS and DuMont, ABC had no manufacturing facility; consequently, its stake in the success of color was virtually nonexistent. DuMont's New York City station, WABD-TV, was occasionally showing color films, but more as a test of its projector design than for programming reasons.24

The third-quarter of the year is traditionally marked with a flurry of claims and achievements heralding the advent of a new network season. Plans for the 1954-55 schedules reflected an intensification of programming in color. One reason for greater enthusiasm was the progress made by AT&T in extending its network of color channels to forty-seven cities and a total of sixty-five stations putting seventy-eight percent of the nation's tv homes in reach of a color signal.25

NBC had earlier planned but now confirmed the presentation of thirty-three color extravaganzas, once-a-month, each budgeted for more than a quarter-of-a-million dollars. Betty Hutton was to lead off the "spectaculars" on Sunday, September 12 in an original comedy, Satins and Spurs. The first regularly scheduled color film series featured the Ford Theatre, already being programmed in black-and-white. Additionally, Monday nights each month included an hour-and-a-half color show.

The Columbia Broadcasting System had slated more than sixty
color programs for the new season. Beginning August 22nd, Ed Sullivan's *Toast of the Town* turned to tint. In September, the network originated its first program from Hollywood, *Life With Father*. Every fourth Wednesday, *The Best of Broadway* presented dramas and musical comedies in color.26

The season opened for NBC with the "spectacular"—a new word in television's lexicon—being publicized more grandiosely than the arrival of color had been. Each program received as much publicity as a regular, important weekly show got in an entire year. A sold-out schedule of the high-budget offerings was reported and predictions were made of a Nielsen rating of 50 for the premiere program. Instead, it racked up a comfortable, but unsensational 38.7.27

The most glowing success in the series of spectacles was aired on March 7, 1955, to an estimated audience of sixty-seven million viewers. This was the first complete Broadway show to be telecast in color—*Peter Pan*, starring Mary Martin. At the time it was the greatest audience for a single network show in the history of television.28 It is interesting to note that in magazine advertisements which followed the program, no mention was made of the fact that it had been presented in color!

On a forty-eight acre site in the San Fernando Valley (Burbank, California), NBC constructed the first studio designed and built for color at a cost of $3,716,400.29 "Color City"—as it was called, was officially dedicated on March 27, 1955. The new facility, with still others planned, aided the network in meeting its expanding color schedule.
Dwight D. Eisenhower, the first President of make extensive use of television, was also the first to appear in color. On June 7th he delivered the West Point commencement address from the United States Military Academy. But Presidential addresses and extraordinary programming were not selling color receivers to the public.

Following the colorcast of *The Chocolate Soldier* as an NBC studio spectacular, Jack Gould commented:

When color TV failed to catch on as expected with the public, the network broadcasters understandably decided on pleasing the huge existing black-and-white TV audience which only makes good sense. But in doing so, they have taken most of the loveliness and attractiveness out of color video. As it is now being shown on the screen, color TV no longer can be recommended as the best viewing. Black-and-white is better.

In spite of the lackluster sales and critical accusations, NBC announced a schedule for the 1955-56 season to include five times the previous year's color offerings. There would be a continuation of the fifteen-minute morning color strips being shown three-days-a-week featuring Matt Dennis and Vaughn Monroe. A new *Matinee* series of daily, hour-long dramas from 3:00 to 4:00 marked a network first. On Tuesday and Thursday nights—a new series of plays and pageant shows prevailed. Early afternoons continued to include the *Home Show* while *Howdy Doody* captured late afternoons and spectaculars enlivened evening programming on a rotational basis. Finally, all seven games of the 1955 World Series from Yankee Stadium and Ebbets Field in New York were colorcast.

The essential reasoning behind the greatly diversified schedule was to provide dealers with showroom color demonstrations at
convenient times each weekday. That philosophy is reflected in the statement of RCA's executive vice-president, Robert Sarnoff: "RCA and NBC are pledged to make color TV a truly mass medium as rapidly as possible. We expect the new NBC color schedule to be a powerful force in that direction." To achieve its goal the network offered thirty-seven hours of color in October, forty-one in November and thirty-eight in December.33

Whereas CBS had broadcast nineteen color programs during the first full season, it was preparing to expand its offerings to seventy-three. The dramatic show Climax was to be telecast for the first time in 1955-56 season. So, too, were The Rod Skelton Show, Shower of Stars, Jubilee and Omnibus. The network would present a minimum of two weekly shows in color and occasional spectaculars—about one-fourth of the total of NBC's color programming.34

As color television's second calendar year ended, receiver sales remained extremely sluggish. It was, nevertheless, a rewarding year for television financially. The FCC reported that for the first time, television had made more money than its older colleague, radio, and the broadcasting industry entered the realm of a billion dollar business for the first time.35

Since color production was an added cost accruing no additional revenue, there was a real question as to whether the networks would continue to diminish profits with colorcasts.
1956-1958: CBS Retreats from Color

In 1956, to further test its mobile television capabilities, NBC camera units were used on location for dramatic color episodes in the afternoon series, Matinee Theatre. The network also scheduled one show from each of its black-and-white studios to test their color capability. In addition, NBC made its color mobile units available to affiliates to further promulgate color service. WCAU-TV in Philadelphia was the first station to avail itself of the service and telecast the Mummers Parade on New Year's Day.36

While inducing affiliates to color equip, the network continued to embellish its schedule. The Tennessee Ernie Ford Show, Pinky Lee Show, Truth or Consequences, and Wide, Wide World all received tint on an experimental basis.37 By March, several more programs were regularly being broadcast in color including The Dinah Shore Show, Jimmy Durante Show, This is Your Life, and Lux Video Theatre.

Meanwhile, CBS was fulfilling its color programming plans and rumors indicated an increase for the fall months.38

ABC's president, Robert Kintner, was telling his affiliates that the network had set aside ten million dollars to equip its owned-and-operated stations with color facilities, but no regular colorcasting would commence until the fall of 1957 at the earliest.39

DuMont, no longer a full-scale network, began equipping its New York and Washington stations with studio color cameras, but continued to place emphasis on showing multi-hued films.40
In recognition of the fact that network color alone would not be the ultimate spur to color's success, NBC announced that its Chicago station, WNBQ (now WMAQ), would become the world's first full-color station on April 15, 1956. By the end of the year the station was telecasting a total of fifty hours of color per week, about fifteen more than when it inaugurated its color policy. (Chapter VI examines the color activities of other major stations in the United States during the years of conversion from black-and-white.)

At the spring meeting of the National Association of Broadcasters in Chicago, Robert Sarnoff delineated the network's color plans:

[In the fall, NBC will have] color every evening on a regular basis. And it means that on the Saturday, Sunday or Monday when a spectacular is scheduled, we can have as much as two and a half solid hours of attraction programming in color. The networks, the stations, the dealers and distributors can really promote this sort of fixed color schedule. The public will be able to depend on color as a regular event, and the habit of color can be established and developed.

In the early part of 1957, NBC was presenting on a regular basis, in color, Robert Montgomery Presents, Perry Como Show and Kraft Theatre. CBS was colorcasting the highly-rated Arthur Godfrey Show on Wednesday nights and—on a rotational basis—most of the programs which featured its stable of stars.

The prospect was exciting. How could color sets not sell with most of the popular shows now being colorcast?

Programming remained much the same through the first half of
the following season. But then CBS liberally began deleting color programs from its lineup. By the time the paring process had ended, only The Red Skelton Show remained, and it disappeared during the summer months leaving the Columbia network devoid of color. With the announcement of the new fall season, no regular color was included.\(^\text{i4}\) The network went on record as being ready to present programs in tint, but only when market conditions warranted, when advertisers were willing to meet the extra costs involved. CBS had no formal rate card on color but company officials insisted that they did not intend to "give away color."\(^\text{i5}\)

Color signals were now reaching nearly half-a-million families that owned receivers. To watch color during 1958 they were literally forced to watch NBC which provided approximately 668 hours of tinted programming; CBS irregularly programmed 6 1/2 hours and ABC remained on the sidelines.\(^\text{i6}\)

Though NBC's lavishly produced Matinee Theatre faded from the afternoon schedule, a strong line-up of regular offerings prevailed during the 1958-59 season: **Northwest Passage, Arthur Murray Dance Party, Milton Berle, $64,000 Challenge, Ellery Queen, Tic Tac Dough, George Gobel Show, Eddie Fisher Show, The Price is Right, Tennessee Ernie Ford Show, Perry Como Show and Haggis Daggis** plus a lengthy list of special and occasional programs.

In buying these color shows, sponsors were not charged extra for color time, but did pay from ten to fifteen percent more for production costs.\(^\text{i7}\) (Chapter V examines advertiser acceptance of color and the reasons for increased usage to reach particular aud-
ence segments.)

Up until this time, NBC had used a simple identification at the open and close of each program broadcast in color calling attention to the fact. But the announcements were regarded as being innocuous and not successful as a promotional device. Therefore, in 1958, the most-seen color commercial of all time was produced—the NBC peacock. Produced by Elektra Film Productions of New York, the ten-second color signature took two months to produce—enough time to film a medium-budget feature movie—and ran to a five-figure cost.

As 1958 ended the other two national television networks elected to leave color to the "birds"!

1959-1961: A Singular Effort

During the pre-Christmas weeks of 1959, CBS-TV made viewers a present of six hours of color tv, two hours of which were filled by its presentation of the film, The Wizard of Oz; another half-hour was devoted to a holiday feature and the remainder was accounted for by the presentation of The Red Skelton Show in color on a now-and-then basis (largely because the comedian was a strong adherent of color).

Throughout the latter half of the year and the early part of the 60's, color set sales were booming, prompting NBC to add twelve more hours of color programming a week to its schedule including The Jack Paar Show, Play Your Hunch and The Jan Murray Show.

But it was the fall of 1961 that provided a major stimulus to colorcasting. The Eastman Kodak Company decided to leave The Ed
Sullivan Show on CBS—which it had sponsored for four years—in favor of Walt Disney's Wonderful World of Color co-sponsored with R.C.A. Kodak's vice-president for domestic sales and advertising explained the move:

> We are moving to Walt Disney's new show because color television has now come of age. Color is important to photography and has been a significant factor in the growth of our industry. It is our belief color will be of even greater importance in years to come.®

The defection moved CBS to launch an experimental month of color program availabilities from February 17 to March 19, 1962. During that period twelve hours of color in several program categories were offered to seventeen advertisers at a surcharge ($7,500 per hour) which—CBS said—would have represented a cost increase of less than four percent to the average advertiser. The fact that only three picked it up served to confirm the network's belief that large-scale sponsorship of colorcasting still lay in the future.®

At the third network, ABC, Oliver Treyz had been deposed as president of the network and replaced by Thomas W. Moore. The change in management also brought about a policy change which included the posture toward color.

1962-1964: Just a Matter of Time

Beginning in the fall of 1962, ABC would begin to telecast a limited number of filmed programs in color including The Jetsons, The Flintstones and Mattie's Funnies with Deaney and Cecil—all animated cartoons. Also, some of the Sunday night movies were to appear
in tint for the first time at no added cost to sponsors. It was a modest beginning compared to NBC's projection of two-thirds of its total nighttime schedule in color for the new season, but it was a promising start.

CBS offered a few shows, including A Tour of Monaco with Princess Grace, but promoted none of its offerings as being in color. The programs it did offer in tint were at the specific request of the advertisers.

Nevertheless, the defections continued. The Shell Oil Company left CBS for NBC and colorcasting of Shell's Wonderful World of Golf. But, at CBS, the policy remained the same: "In a nutshell, if the advertiser won't even make a token payment for color at this time we don't think we should give it away free."

The vice-president in charge of affiliate relations and engineering said that CBS had spent more than thirteen million dollars in color since 1950—but the network had held down its outlay since the late 1950's when it felt that the growth of color was slower than expected. Noting that only two percent of American homes were equipped with color, he emphasized that the network had no intention of subsidizing colorcasts. It is important to remember in this regard that CBS no longer had a consumer products manufacturing facility and did not stand to profit from increased sales of color receivers.

In April of 1964 RCA again returned to a World's Fair. In 1939 the occasion had been used for the introduction of television per se, now the dimension of color was being demonstrated. A million-and-a-
quarter dollars worth of equipment was put into use with five-
minute, live telecasts each hour and five-minute national news-
casts every two hours. The periods between were filled with inter-
esting vignettes detailing the spectacles of the fair. It proved
to be an excellent opportunity to give wider exposure to color.

Not the fair, but the increasing growth of color receivers--
now estimated at over one million--prompted a reappraisal of the
CBS color policy for its affiliates:

Despite a natural reaction to jump on the color
bandwagon for fear of being left behind, we think
that a flexible conservative approach is the wisest
for us and for you. We don't intend to get caught
at the starting gate when color becomes a signifi-
cant factor and we are willing to go all out on
color when this seems necessary.

Inspite of its adamance to enter color in a major fashion, CBS
persisted as the most profitable network in TV. But the traditional
lead showed conclusive signs of failing. For the two weeks ended
November 22, 1964, CBS had an average rating of 19.43 and an aver-
age share-of-audience of 31.4. Importantly, in contrast, during
the same period the year before, CBS had a rating of 21.9 and aud-
dience share of 36.4--five percentage points higher. The reduction
of CBS' lead showed up in the lists of top shows for the period.
The network had eleven shows of the top twenty as compared with six-
teen the year before.

Even though forty-five percent or more of the public's dollar
investment in new tv receivers was going into color, the network
appeared unwilling to budge from its often avowed position. This
prompted Jack Gould to remark that
Under such circumstances it would not seem amiss for the F.C.C. to insist that broadcasters provide a minimum of color TV in evening hours. The controversy over color TV no longer is the parochial trade matter that it was for so many years; the public's stake is now paramount. Regular color programming every night of the week clearly is in order on the network level, both to keep faith with present purchasers of color sets and to hasten general introduction of an exciting new form of TV.\(^6\)

Another dimension was added to the ratings struggle with the release of an American Research Bureau (ARB) survey conducted between November 5 and 25, 1964, throughout every county in the United States (based on a sample of 4546 color TV homes, plus 4546 matched b&w homes). The survey, titled "The National Color Television Audience," was the first national color ratings study. The booklet summarized its findings into five separate categories:

1. NBC nighttime color programs earned ratings 80 percent higher in color TV homes than in those with b&w reception only;

2. NBC-TV discovered 'a substantial rating advantage' for its b&w programs in color homes;

3. It was inferred that people in color homes preferred to view color programs whether or not those programs proved 'popular' in b&w homes; in fact, color programs were given greater preference 'in every time period' even when the programs received 'the lowest rating' in b&w homes;

4. In color-equipped homes, color daytime programs also rated higher—62 percent during standard weekday viewing periods and 90 percent higher during children's viewing periods and 90 percent higher during children's viewing on Saturday mornings;

5. NCAA football coverage in color rated 66 percent higher in color-equipped homes than in those with b&w TV receivers.\(^6\)

The net result of color-set owners' viewing habits gave to NBC
an average rating of 19, or almost one rating point (between 0.8 and 0.9) higher than would be achieved if all programs were broadcast in black-and-white only. 62

1965-66: Ratings Force Full Color

Though authorities at ABC and CBS protested the data, NBC was obviously enthusiastic and set about to further increase its percentage of nighttime color programming. For the 1965-66 season the amount rose to 96 percent; by the end of 1965 twenty-seven of twenty-nine programs were in color for rebroadcast by 197 color-equipped affiliates. The increase gave rise to the phrase, the "Full Color Network." The phrase was nearly factual in that eighty-eight percent of daytime programming was also in tint, with plans for virtually one hundred percent in 1966. Almost all news film was being shot in color and the Today Show and The Huntley-Brinkley Report were converted to color. 63 For a comparison of color hours broadcast by the three networks on a yearly basis, see Table 2.

CBS experienced the loss of another sponsor when Armstrong Cork Company pulled out of The Danny Kaye Show to move to ABC where it could get color as half sponsor of Gidget and alternate week sponsorship of The Big Valley. 64

Armstrong's decision preceded an announcement by CBS that it intended to present two one-hour shows in color in the fall of 1965, including Danny Kaye and The Red Skelton Show. Also, the Thursday feature movies would be colorcast. 65

Then in the second week in March, a management shake up at CBS
TABLE 2
YEAR-BY-YEAR COMPARATIVE GROWTH OF COLOR PROGRAMMING

<table>
<thead>
<tr>
<th>YEAR</th>
<th>NBC</th>
<th>CBS</th>
<th>ABC</th>
</tr>
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<tbody>
<tr>
<td>1954</td>
<td>68</td>
<td>46</td>
<td>0</td>
</tr>
<tr>
<td>1955</td>
<td>216</td>
<td>46</td>
<td>0</td>
</tr>
<tr>
<td>1956</td>
<td>486</td>
<td>74</td>
<td>0</td>
</tr>
<tr>
<td>1957</td>
<td>647</td>
<td>53</td>
<td>0</td>
</tr>
<tr>
<td>1958</td>
<td>668</td>
<td>24</td>
<td>0</td>
</tr>
<tr>
<td>1959</td>
<td>725</td>
<td>10</td>
<td>0</td>
</tr>
<tr>
<td>1960</td>
<td>1,035</td>
<td>5</td>
<td>0</td>
</tr>
<tr>
<td>1961</td>
<td>1,650</td>
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<td>0</td>
</tr>
<tr>
<td>1962</td>
<td>1,910</td>
<td>0</td>
<td>35</td>
</tr>
<tr>
<td>1963</td>
<td>2,150</td>
<td>4 1/2</td>
<td>120</td>
</tr>
<tr>
<td>1964</td>
<td>2,135</td>
<td>4</td>
<td>200</td>
</tr>
<tr>
<td>1965</td>
<td>4,000</td>
<td>800</td>
<td>600</td>
</tr>
</tbody>
</table>

Source: NBC Color Information Department

reversed the longstanding policy of color avoidance. John Schneider replaced the controversial James T. Aubrey as the president of CBS' network operations. Within a week of his appointment he made it known that color did make a difference and that CBS was losing advertisers because of its negative color policy. In Schneider's words:

The level of color television set ownership now warrants color broadcasts on a weekly basis this fall on CBS Television Network. In addition, we intend to schedule a number of special broadcasts in color throughout the coming season.

As Merchandising Week titled its article on the decision:

"CBS Blessed RCA's Baby Last Week." 66

There was little doubt that the CBS move would have a psychological effect on both viewers and advertisers out of proportion to
the network's actual color schedule. And the effect was as much on CBS as it was on the rest of the industry. By May the network acknowledged that it would be all-color at night in 1966.

During the initial week of the new season, NBC led the ratings battle—as predicted—with an 18.5 Nielsen initial rating based on thirty markets to CBS' 16.9. The results of the first over-all national rating raised the CBS figure by one full percentage point, but also added two-tenths of a point to NBC.

As further affirmation of the influence of color, NBC released results of a study by Trendex which showed NBC's rating advantage in color homes to be close to the approximately 80% level indicated by the ARB study. Other validations of these figures came from the processing of A.C. Nielsen diaries and privately sponsored market studies.

With 9.5 percent of all television homes having color receivers, and sales running at record levels, color programming could no longer be forestalled.

Summary

Along with the refinements in color receiver design and the price reductions, sufficient programming was required to stimulate public enthusiasm. Therefore, the slow, steady growth of sets coupled with the American Research Bureau's November of 1964 national color survey, triggered the awaited splash of tinted video.

The effect was a reciprocal one. Ratings could not be affected
as they were until the number of color families became a significant part of the nation's total television families. The scheduling of more and more programs in color promoted the sale of receivers and their presence in the home affected ratings as the circuitous cause-effect-cause relationship propelled a color "boom."

While color sets and color programming were probably the two most influential agents in promoting consumer purchases, three other broadcast components played complementary roles. The first of these to be examined will be advertisers.
CHAPTER IV NOTES


3 Ibid., p. 89.


17 Journal of the SMPTE, p. 283.

20 Broadcasting, February 1, 1954, p. 68.
28 Sponsor, March 21, 1955, pp. 8, 9.
32 Business Week, August 6, 1955, p. 60.
33 Bill Greeley, "For Color TV...Another Dry-run This Fall," Printers' Ink, August 26, 1955, p. 21.
34 Sponsor, June 27, 1955, pp. 29, 30.


41 Sales Management, December 7, 1956, p. 48.


43 Television Age, February 25, 1957, p. 69.

44 Broadcasting, March 2, 1959, p. 76.


46 Sponsor, May 9, 1959, p. 32.

47 Advertising Age, September 15, 1958, p. 81.


51 Advertising Age, March 6, 1961, p. 3.

52 Printers' Ink, February 8, 1963, p. 7.

53 New York Times, April 1, 1962, p. 84.


55 Advertising Age, January 21, 1963, p. 54.


58 Broadcasting, May 11, 1964, p. 44.


63. NBC Year-End Report—1965, passim.

64. Advertising Age, March 15, 1965, p. 140.


CHAPTER V

THE ADVERTISERS AND AGENCIES

Advertisers Await Tint

The advertisers are going to be the chief beneficiaries of color TV. Every product seen thus far has been infinitely more attractive in color than in monochrome. Color makes for true product identification in a way all the words of an announcer cannot equal.1

Major television advertisers like Procter and Gamble, General Motors, DuPont and several others anxiously awaited and planned for color television in the months immediately before the long-delayed acceptance of standards.2

By far, however, most broadcast executives were cautiously guarded with their predictions for a heavy schedule of color commercials. It was believed that color ads would be distributed over television schedules in much the same manner as they were scattered in predominantly black-and-white magazines.3

But if advertisers were going to demand color at the onset, then agencies would need to be ready to plan and implement within the bounds of color’s new dimensions. And there was a real question as to their readiness; for only 1.6 percent of advertising lineage in the United States newspapers was in color in 19524—meaning that few agencies had ready experience with color skills.
Additionally, it could be assumed that those agencies without previous color experience were reluctant to urge television color for their clients. Since sponsors and broadcast stations had a ready-built audience of approximately twenty-nine million black-and-white receivers, what need was there to build a color television audience? Therefore, conditions for launching color TV as an advertising vehicle were far different from those when black-and-white was first introduced.

Some foresighted advertisers planning to utilize the multihued medium found it expedient to redesign their packages for better color identification. Among the most early to do so were Drene shampoo, Gleem toothpaste, Bromo Seltzer and Marlboro cigarettes.

To aid manufacturers in this and other transitions, both NBC and CBS were prepared to service affiliates on color questions. Local or regional advertisers wishing to obtain information about the color TV potential of their package design could contact the affiliate who would then forward the concept to New York for analysis by network color specialists.

Some local stations telecasting live color conducted "color clinics" to assure the proper use of color television by advertisers. One of these, WDSU-TV in New Orleans, held day-long demonstrations including color film, slides and live commercials for the client's products. Results were very encouraging.

Though the national use of color commercials was slow to develop due to the lackluster sale of receivers, color television was
sparking a closer communication between advertising agencies and designers. Also, a generally greater awareness of the importance of color itself developed which encouraged color psychology studies, new applications, influences, effects and a keener awareness of the need for all types of research, including buyer motivation studies.

Advertisers were encouraged to examine the value of color in all media and came to several firm conclusions. Among these, color afforded better package identification and realistic appearance. The quality of the product could be emphasized and the enjoyment of the surroundings could be transferred to and identified with it. On the other hand, there were disadvantages: the quality of color was poor, the number of sets remained limited and production costs were definitely higher. CBS estimates in 1954 placed the cost-per-thousand homes reached with a one-minute commercial at $1.31 for a black-and-white spot as compared to $2.54 for a color spot. Rehearsals for a half-hour program added an additional $2,400 to the cost of the production.

One of the first sponsors to use color was Hallmark Cards. The company's initial color commercials were aired on its Hallmark Hall of Fame program in November of 1954. The 1956-57 season marked the first when all of the company's commercials were aired in color. Hallmark sought to reach "opinion leaders" in the community (the very people most apt to have color tv sets), reasoning that others would follow their example. The company was selling its reputation as much as cards ("When you care enough to send the very best."). Thus, to be identified with full-color "cultural spectacles" meant enhance-
ment of its position as a progressive leader in the field.\textsuperscript{12}

Through its experience with Hallmark commercials, the agency of Foot, Cone & Belding alerted other sponsors to expect budgets to run twenty to twenty-five percent higher than similar commercials in black-and-white.\textsuperscript{13}

By 1959 there were seventy-three sponsors using color commercials on NBC on a fairly regular basis with Kraft Foods in the vanguard. Having first used color in 1956 with the Kraft Theatre, the company signed for sixty-six hour-long Perry Como shows to be aired during the '60-'61 seasons. So enthusiastic was Kraft about its commitment that its advertising manager remarked: "When there is color in every home we'll send out bibs to viewers to use when watching our commercials."\textsuperscript{14}

During the same 1959 season J. Walter Thompson Co. had scheduled six hundred minutes of color tv commercials for clients—or the equivalent of seven feature-length movies. Previously, the agency had taken part in three hundred hours of color, network programming and had been one of the first to equip its own studios with color gear for instructional and demonstrative purposes.\textsuperscript{15}

Advertisers were stressing the idea that color set owners comprised a high income market. Ford Motor Co., a frequent sponsor of color shows, explained its use of color as "for the guys who buy Falcons and Thunderbirds as second cars." The same Ford spokesman commented that "We don't know why, but we get more black-and-white viewers when our shows are in color."

It was the opinion of NBC officials that sponsors wanted the
prestige of putting on a color show and thereby attracting critics and other influential viewers.\textsuperscript{16}

Irrespective of the various reasons, the greatest user of color commercials in the 1959 season was the automotive manufacturer. More than sixty-percent of the color programming was paid for by car makers.\textsuperscript{17} The remainder was composed chiefly of food products, household appliances, toiletries and drugs.\textsuperscript{18}

Most agencies, however (with the exception of J. Walter Thompson, William Esty and N. W. Ayer), were not pushing color to their clients as "a matter of practical dollars and cents. Color is not a mass medium yet; it's for very specialized selling."\textsuperscript{19}

At the end of 1961, NBC estimated that the extra production costs of a color show averaged between seven and eleven percent against twenty percent a few years earlier. But, while the reduction was important, another fee continued to keep the cost of color transmission high. NBC persisted in paying such extras as the $50-a-month transmission charge levied by AT&T against each of its local stations receiving network color.\textsuperscript{20} CBS, offering no regular color to its affiliates in 1961, emphasized that its policy was not one of being anti-color.

\begin{quote}
It's just a question of the advertiser paying the price. We're not dragging our feet. We have the equipment and we're happy to use it for a sponsor who wants to pay the additional production and line charges. Since we're not in any way exploiting color, it is for us a service that must be paid for by the advertiser.
\end{quote}

Additional charges, mainly below the line, mean that color will cost an advertiser 15\% to 25\% more than corresponding b\&w productions. There are no additional charges for time.
Nobody could fault CBS for its position when the network's number one sponsor, General Foods, went on record with the position that "Because of the small number of color tv sets, color tv is not an efficient advertising medium" in the marketing of their products. As a consequence, CBS notified advertising agencies that color would cost $1,750 more per hour for network facilities than black-and-white. The AT&T tariffs cost CBS an extra $32,000 for feeding the first hour of color per month to its one hundred and twenty color-equipped affiliates and another $1,200 for each additional hour in the same month.

CBS Television Network Vice-President, William Lodge, summed up the network's policy stating:

After all, our affiliates are in business, too, and they don't want to give something away that costs more money, something that you want to charge for later.

At ABC, affiliates had to pay the AT&T loop charges and other line costs.

For the insertion of color commercials within programs, NBC attached no extra fee. The exception was the Jack Paar Show where color inserts cost $25 more than black-and-white. For live and tape color the facilities charge was also higher than for monochrome--usually from $75 to $125 more.

Apparently the pricing policies at NBC were attractive as two hundred and forty-five advertisers used multihued tv programs on a network, regional, or local basis in 1961, whereas the medium only had six color sponsors in 1954.
The Shift from Novelty to Necessity

As set manufacturing picked-up with an accompanying rise in the newspaper advertising lineage for color sets,24 the number of sponsors using the color medium also increased. Whereas twenty-six sponsors had used network color in 1962, thirty-six were doing so in 1963. Sixty percent of all the commercials on NBC prime-time color shows were in color to take advantage of one or more of the following benefits ascribed to color:

1. Color provides a better display for a colorful product.
2. Color has an added dimension that adds impact.
3. The commercials can be utilized in many promotional ways.
4. Color reaches a small audience in terms of numbers, but a large one in terms of dollars.
5. The added cost of making color commercials is relatively small.
6. Color commercials complement 4-color magazine strategy.
7. The number of color set sales and program hours is rising steadily, creating an opportunity to reach a potentially-large and dedicated audience.25

As further inducement to color, in the summer of 1963, NBC reduced charges for its color production facilities and at the same time the charge for a live daytime color ad was cut from $250 to $180 per one-minute commercial. Studio charges also were reduced.26

Additionally, general production costs to produce the spot announcement on film were becoming less. J.Walter Thompson figures released by Eastman Kodak referred to a typical one-minute tv film commercial for a household product in color, instead of black-and-
white. It was figured that about 2500 feet of 35mm color, raw stock would be used to produce an end product costing just ten percent more than a monochrome version of the same commercial. Of the seventy million dollars spent on filmed tv commercials in 1964, 18% went for color messages according to the Film Producers Association—an increase of three percent over the previous year.

With the announcement by CBS of its renewed commitment to color programming in 1965, NBC decided to adjust the cost of renting its cameras, studios and other equipment for the production of color commercials, upping the cost of black-and-white and lowering the cost of color to put both on the same level.

At the same time an interesting claim was being made for NBC's superiority over either of its rival networks. The contention was for technical superiority resulting from the tuning of antennas for orientation with NBC stations which were—for the most part—in color before the others. Though the assertion spawned a great debate, and many homes probably did receive better color signals from NBC outlets, no economic advantage has been traced to this phenomenon.

Film producers were finding that color added about $9,000 or nearly 13% to the average $70,000 estimated cost for half-hour nighttime network shows. But for comparative purposes, the added color costs of TV were running less than 20% while the premium for magazine color was closer to 50%.

By the middle of what became television's most colorful year since its origin—1965—NBC-TV had no extra charge for color, ABC
required a $15 to $20 handling fee and CBS charged either $125 or $250 depending on the time period.32

By late 1965 in all commercials being made, advertisers were either using color or at least considering it.33 It was also the year that marked the end of the era in which a commercial could win attention simply by being in color. The trend moved away from vivid hues, especially for a product in which color was not an inherent factor, and toward a quieter, more subdued and more natural use of the new medium.34

Approximately 80% of the commercials coming out of such heavy-broadcast billing agencies as J. Walter Thompson Co., McCann-Erickson and Batten, Barton, Durstine & Osborne were in color by the first of December. The stampede at virtually all the agencies was slowed only by technical bottlenecks, primarily at processing labs, and by the longer period required to turn out a fine color production. Color tape was (and is) faster and less expensive than film, but there was a shortage of tape production facilities, mobile units, station playback equipment, and multiple prints from color negatives remained a problem.35

A marked upturn occurred in areas other than television with respect to color. In newspapers, technological developments were pushing breakthroughs, particularly in the area of preprints. Traditionally, a color leader in both quality and quantity, the big mass-circulation magazines hiked their lineage to the point where more than half was in color in 1965. A jump from 29.2% at the end of World War II.36
Thus, the color revolution in television had its counterparts in other media. Undoubtedly, one influenced the other in creating an upward spiral of increased usage.

The fanfare attendant to color television's struggle for position among advertisers desiring multichrome images served to call attention to the inherent visual differences of color. Aside from guaranteeing life-like identification of the product at a dealer's point of display, color influences apparent proportion and the perceived shape of objects. As a consequence product packages used on tv were (and often still are) touched up and simplified for the camera. Color correction required a specialist who took "five days to do his work." These considerations, while not working particular hardships, did require significantly more preplanning by agencies designing color spots for their clients.

But with all color considerations appraised, color was able to boast real advantages in terms of delivering more viewers (or readers) and with greater recall of the advertiser's message. When NBC asked some of its big color users why they were sold on color, Hallmark Cards—for example—a company which helped to pioneer network color said that in addition to the extra "dimension of beauty and spectacle" provided, "it costs us no more than a tenth-of-a-cent per color set to present our message in color."

Color's ability to "create appetite appeal" was the reason given by J. Walter Thompson Company for using tint in Kraft commercials. Speaking out for Pall Mall cigarettes, an agency representative said, "We use color commercials on television for the same reason we use
color ads in magazines. Color ads impact, vitality and naturalness ... it emphasizes our packages."

One reason why Colombian coffee turned to color was that the commercials also were going to be shown in theatres throughout Europe. Corning Glass, among others, also stressed the importance of non-broadcast usage of their ads, including showings at sales meetings and other intra-industry sessions.

Research Finds Provide the Catalyst

Undoubtedly, though, one of the most influential spurs to color advertisements on television came with the release of conclusions from a major color study completed for the Crosley Broadcasting Corporation (now Avco) by Burke Marketing Research of Cincinnati. The Crosley findings—released in May of 1960—showed:

1. Color-set owners' interest in viewing is twice that of b&w owners.
2. The over-all persuasiveness of color commercials is two-and-one half times that of b&w.
3. Commercial points recalled from color commercials are three times those from b&w.

For the study an average group of color-set owners in the Cincinnati, Ohio, area was selected with a balancing group of black-and-white-set viewers. Respondents came from the same strata of society, many from the same neighborhood, similar income groups, family size, education, etc.

Using the personal interview technique, studies were undertaken on three national network programs—The Perry Como Show, The Dinah Shore Show, and the Hallmark Hall of Fame. A widely viewed local
program, the Ruth Lyons 50-50 Club, was also studied.

One of the basic conclusions estimated that an advertiser would have to buy 3,600 to 3,800 black-and-white homes to impress the same number of possible customers as he would reach if he bought 1,000 color homes. 39 This was a persuasive auger for increased color programming—including color commercials.

The first Burke Report, less comprehensive in scope, consisted of 3,192 telephone calls to two separate samples of homes. Half were color-tv set owners, the other half were not. 40 The competitive advantage which that report attributed to color programs led to the more extensive research and findings capsulized above. Both reports had the effect of increasing research to validate or repudiate the findings of the single market, Cincinnati.

In tests made for General Mills by Schwerin Research Corp., a television commercial in color "out-sold" the black-and-white version of the same message by almost 50%. The color commercial registered more solidly, producing higher recall of sales ideas (63% as against 41% for the black-and-white). 41

The Audience Measurement Division of the NBC Research Department served as the major confirmation of the Crosley Study. The NBC study was designed to determine the viewing level of color tv shows in color-set homes compared to monochrome homes under conditions of minimal demographic differences by means of a standard audience-measurement technique. The survey was conducted by Trendex and made in five markets—Boston, Chicago, Milwaukee, Omaha and Philadelphia—and revolved around four NBC-TV color programs: Perry
Como, Steve Allen, Dinah Shore and Arthur Murray Shows.

The results of the survey were based on a sample of approximately 8,000 homes. In each city 200 color homes were called for each program, with simultaneous calls made to 200 homes with monochrome sets. Rather than picking black-and-white homes at random, the next-door neighbor of color-set owners was called to achieve a demographic balance (the validity of which is open to serious question). The NBC researchers found the ratings of multichrome programs in color homes to be nearly double the ratings of the same shows in black-and-white homes. The average rating in the latter group was 16.9, while the same programs achieved a 30.4 rating in color tv homes—80% above the level of the b&w category. Not only was the rating discovered to be higher in color homes, but there was also a greater number of viewers per one hundred tv homes for color programs studied—(85.5 for color homes compared to 42.4 for non-color homes). 42

In a special American Research Bureau Omaha study for KMTV and NBC in 1962 (based on 167 diaries from color tv homes and 173 from homes having only black-and-white sets 43), data was presented not for specific color programs at certain broadcast times, but for the entire network and local schedule throughout a complete week. In general, the conclusions derived from the survey material reinforced those already enumerated. The average rating for all color programs in daytime hours was nine in homes which saw the show in b&w, fourteen in homes which viewed in multichrome. Nighttime ratings on colorcasts were twenty-two in monochrome homes, forty in
Research by the Schwerin Research Corporation in 1962 led DuPont to sponsorship of *Show of the Week* and the first color commercials for apparel. The research findings indicated that for the same commercial shown to viewers, once in black-and-white and once in color, the average recall for black-and-white was twenty-seven percent; for color, forty-three. According to a company spokesman:

"We also learned that 50% more of the viewers, according to Schwerin, desired the product when it was shown in color. Moreover, the average color show is seen in 300,000 homes by close to 1,000,000 viewers; color viewers stay tuned longer than b&w viewers; and the NBC Trendex average audience ratings are 80% to 100% higher for color than for b&w programs."

DuPont's minute color commercials in *Show of the Week* (a dramatic series) cost between $9,000 and $9,500 each; the comparable b&w figure was $7,500.

In the Impact Study conducted by William Esty Company and NBC on January 25, 1961, color commercials in black-and-white programs proved there were sponsor benefits to advertising products in color on black-and-white programs.

These and other less prominent findings served to attenuate industry skepticism and advance the rate of color commercial planning and production. In 1965, the March edition of "Grey Matter"—monthly publication of Grey Advertising stated:

"In 1965-66 (assuming no rise or only a minimal rise in cost of transmission in color) there will be only a 12% differential in reaching a thousand color homes via color commercials compared to the cost of reaching all homes using a b&w commercial on a one-time basis. In 1963-64, it was 53%."
The accumulation of arguments and evidence brought nearly all major advertisers into color in 1965. General Foods Corporation, one of TV's biggest spenders had most TV commercials in tint by the end of the year —and for good reason. The eastern annual conference of the American Association of Advertising Agencies produced some persuasive arguments. These included the fact that color-set penetration in the fall of the year would reach eight to nine percent; color shows opposite black-and-white programs would thereby enjoy a ratings advantage of approximately 78%. Further, the higher rating in color shows would result in a more favorable cost per 1,000 homes reached. For a roughly twenty-rated program—for instance—the cost per thousand was $3.72; for color, $3.49. This favorable cost climate was further enhanced by greater remembrance. In conclusion, the association admonished its members to "learn now—before saturation of color becomes even greater."

Predictions quickly turned to fact! With the release of a Trendex rating for the period of September 13 to October 10, 1965, in twenty-six cities, NBC's color programs were rated nearly 77% higher in color than black-and-white homes. NBC had this comment on the significance of the network standing in color homes:

At the 5,000,000 color TV set level, which will be achieved in a month or so, the average NBC color show will be adding 700,000 homes due to being in color. This is irrespective of color competition. The average CBS and ABC color program adds about 200,000 homes due to being in color.

While color commercials may 'stand out' in b&w programs, there are very few color TV homes viewing b&w programs on CBS and ABC so that these commercials simply are not viewed in color. The only b&w programs
with a significant color tv audience are on NBC, again because of NBC's color content.  

The advantages accruing to tinted announcements raised the prospect of charging extra for color time. Norman E. Cash, president of the Television Bureau of Advertising was a major proponent of such action:

Because television does not charge extra for color, this represents a one-quarter to one-third of a $1 billion gift to the advertisers—dollars that would come to television if we were to charge the premium rates for color that magazines now charge.  

However, any earnest effort to impose time charges for color's increased reach diminished with the release of a Schwerin Research Corp. report in March of 1966, which—on the basis of Schwerin Competitive Preference Scores—showed that audience reaction to the same commercial shown in black-and-white versus color had declined from a color advantage of fifty-one percent in 1957 to twelve percent in 1965. On a basis of brand identification, however, the color advantage in 1965 was but one percent. A Gallup and Robinson study revealed similar conclusions.  

Color commercials were no longer a novelty, but had become an integral part of the financial structure of American broadcasting. The addition of chroma to talent production budgets increased the cost of a live or tape show by three to five percent at NBC. At CBS, The Ed Sullivan Show (sometimes tape, sometimes live) went from a $150,000 to $164,000 weekly budget with the network absorbing the extra cost. In cases where advertisers were more directly involved in the production and/or financing of shows, they paid the
additional costs of color production ranging from 10% to 30%. The incremental cost paid for added electricians, for more elaborate lighting, greater care in color coordination, costumes and set preparation as well as color films and opticals became accepted as routine.  

Summary

The heavier saturation of color commercials paralleled the increased reliability of receivers and reduced prices which provided a broader base of consumer acceptance. Network programming had passed the fifty-percent mark; set penetration was nearing a level requiring serious media consideration and, except for commercial production costs, color usage was priced about the same as black-and-white. Although the comparative rating advantage was diminishing with time, color continued to afford persuasive values not achievable with monochrome images. Sponsors, as a major element of the broadcast industry's interdependent components, were provided with sufficient media research to demand color vehicles in which to showcase their products to advantage. Thereby, tint offerings accelerated and further receiver sales were prompted.

Local stations and other program originators were, to varying degrees, responsive to the prospect of increased commercial participation through color programming. Instrumental in promoting the widespread diffusion of color television, these agents will be reviewed in the following chapter.
CHAPTER V NOTES


14. Sponsor, May 9, 1959, p. 32.


29. Printers' Ink, April 9, 1965, p. 32.


34. Printers' Ink, January 10, 1958, p. 35.


36. Ibid., p. 109.


38. Advertising Age, October 26, 1964, p. 76.


40. Television Age, February 23, 1959, p. 34.


42. Television Age, June 29, 1959, pp. 28, 29.

43. Broadcasting, November 16, 1964, p. 82.

44. Television Age, June 11, 1962, p. 32.


49 Advertising Age, November 1, 1965, p. 46.
50 Advertising Age, November 15, 1965, p. 28.
CHAPTER VI

THE LOCAL STATIONS AND PROGRAMMING

Local Color

The steady increase in color hours broadcast since 1954 was materially enhanced because many local broadcasters were strong adherents of tint. Individual stations began experimenting with color several years before network service began, and some were specifically built for colorcasting two years after the FCC's approval of compatible standards.

A total of seventy stations, including NBC's five owned-and-operated outlets, quickly announced their intention to equip for broadcasting with the new technology. And in December of 1953, color gear was being rushed to several cities in the nation with the hope of completing installation before the Rose Bowl Parade on New Year's Day.

Broadcasters across the country distinguished themselves in the following months with color "firsts." While the accomplishments were often of magnitude, seldom were there large numbers of viewers to witness the events. Too, efforts were sporadic. An informal survey by Sponsor magazine during 1954, revealed that less than two percent of the country's authorized stations were prepared to broadcast local, live color. By July of the following year that per-
percentage had doubled, but indicated that only one in twenty of the 386 stations telecasting in 259 cities in the United States were able to transmit color.

The most significant splurge for color came with the announcement by the National Broadcasting Company in November of 1955, that its station in Chicago, WNBQ (now WMAQ-TV), would begin televising all live programs in tint on April 15, 1956. In making the announcement, David Sarnoff commented that the lessons learned in Chicago's pilot operation would be made available to other stations interested in advancing color operations. The first piece of information detailed the cost of color equipping the station and surely served to dampen some enthusiasm. The total outlay for the installation in the Merchandise Mart studios roughly totaled $1,250,000.

In several ways 1956 was a formative year for local color planning. NBC's WRCA (now WNBC-TV) in New York was among the first stations to publish a color rate card. Most, however, had not as yet devised formal rate structures; instead, increased costs were reflected in a facilities charge—not a time tariff.

In February the NBC-owned television outlets began offering a five-minute shopping program, Window. The show was formatted to demonstrate to retailers the advertising possibilities of color. It was scheduled adjacent to popular daytime colorcasts and integrated commercials with informative editorial material.

Twenty-nine stations had at least one studio color camera by mid-year—about six-percent of the nation's 461 stations. Chicago's WNBQ-TV was in its eighth month of colorcasting by year's end and
presenting a total of fifty hours per week in color. The new experience was proving to be a profitable one. The station reported that local, national and spot sales by late summer had risen twenty-five percent over the similar three-month period of 1955. It was the opinion of WNBQ's newly created "Color Sales Development Department" that tint was receiving a "uniformly enthusiastic reception" from all sponsors.\(^3\)

The success of the Chicago "experiment" encouraged NBC to begin construction of color facilities in their other broadcast properties. A four million dollar plant was slated for Washington's WRC-TV\(^9\) and three-and-a-half million was allocated for expansion of the facilities in New York and Hollywood, California.\(^10\)

Four years after the FCC's decision on compatible standards—1953, and front-runners with a liberal schedule of local offerings were distinguishing themselves. Aside from WNBQ-TV's precedent setting efforts, WNBH-TV in Boston and WRCV-TV in Philadelphia were also broadcasting all live shows in color. KMTV in Omaha boasted ninety percent color and WLWT in Cincinnati—in conjunction with other Crosley-owned stations—presented about twenty-nine hours per week in color.\(^11\) WLW's color pioneering will be examined in greater detail.

As the 50's closed there were twenty-five stations extremely active in colorcasting—many of them airing twenty hours a week and more of locally originated shows.\(^12\) The reasons why the vast majority of stations had not been committed to color were numerous. Station management at WVRC-TV in Norfolk, Virginia cited:
the unfortunate transmission problems.

... the cable from Washington, D.C. to Richmond was so bad that dealers, if they wanted to, wouldn't take the chance of showing color sets with the type of reception involved.

In Springfield, Mass., the complaint was with the dealers and distributors (with the exception of RCA representatives) who had not given color any kind of a send-off. But for the most part, the problem was still one of justifying the expenditure in relation to the number of receivers (or potential receivers) in the market. A million dollars or more to excite color phosphors on a handful of sets just wasn't good business!

Chicago continued to pace the nation with color offerings as the city's independent station, WGN-TV, stepped up its color activity. In 1960 the station pledged itself to telecasting every daytime home game of the Chicago Cubs of the National Baseball League and the American League White Sox games—one hundred and twenty games in all. Because of the total air time involved, the station could legitimately call itself the "World's Most Colorful Station."^^

Among the network affiliates, 23 of NBC's could boast live facilities (studio color cameras), while at CBS and ABC the numbers were 8 and 6, respectively. However, of stations which could offer some form of local color (slides, film or tape), the numbers were considerably greater. Fifty-two of NBC's 208 affiliates were so equipped, of CBS' 218, 34 had some form of color other than network re-transmission, and 24 of ABC's 217 stations were color equipped. These figures embrace an overlap of secondary network affiliations, but accurately reflect the greater emphasis on color for NBC affili-
ated stations. Of all of the independents, upon whom there is
greater pressure to compete for programming and advertising dollars,
merely two of the thirty-four on the air had studio color cameras and
only thirteen could transmit any form of color in 1960. 15

In many cities the "have" and the "have nots" coexisted with
firm belief in the correctness of their positions. Los Angeles was
one such city. There, KRCA-TV (now KNBC), the NBC owned-end-operated
station, had been stepping up its color schedule over a five-year
period until 1961 when it was carrying all of the network's color
programming plus a total of 74 live shows for the year. Able to
handle color commercials on tape or film, KRCA was receiving a sig­
nificant amount of tint advertising. At the same time, KNXT-TV, the
CBS O&O in Los Angeles felt that the area, with forty thousand sets,
was not yet ready for color television as a practical proposition.
Although equipped for color, the station broadcast only one multi­
hued show in 1961. The program was originated by Red Skelton in his
own studio and seen only locally as a test. These diametric positions
were, of course, mirrors of the larger corporate philosophies. Having
no East Coast ties, KCOP-TV, the independent, enthusiastically plunged
into color. 16

The color-oriented broadcasters didn't stop with airing their
color shows; they promoted them and thereby, directly or indirectly,
promoted the sale of color receivers. The effect was a self-vindi­
cation of the decision to colorcast.
Prominent among early advocates of color television and unparalleled for its promotional activities was the major station in the Crosley (now Avco) Broadcasting chain, WLWT in Cincinnati. The station was not one of the first to buy studio color cameras, but upon electing to join the venturesome did so with total commitment.

WLWT began its association with NBC in April of 1948 by becoming its second affiliate in the nation. Network kinescopes were used until the coaxial cable was operative in October of 1949. With a heavy emphasis on local, live programming, the station was recognized in 1952 as the number one independent originating center of network programming.

With that kind of emphasis on programming innovation it was logical for WLWT to become a major proponent of color. The station's intent became clear when it signed as the first NBC color affiliate. The contract was validated in May, 1953. Southwestern Ohio residents were among the few in the country to whom tint coverage of the 1954 Tournament of Roses Parade was transmitted. Not until 1957, however, did the Crosley Broadcasting Corporation make its all-out pledge to colorcasting. In April of that year a color mobile unit was purchased: the first to be owned by an independent station. Then, on August 9th, Cincinnati's first local color program, Ruth Lyons 50-50 Club, was originated. A day later the Midwestern Hayride—a program with deep roots in early radio—was colorcast.

Concurrently, the company launched a new phase of its intensive campaign to promote color. Live fashion shows were presented in the
station's studies in cooperation with local department stores. Members of the talent staff were supplied for personal appearances to talkup color. Various "see yourself on color television" promotions were conducted in retail outlets and in the busy lobby of the Cincinnati Gas and Electric Company Building. One of the most successful campaigns involved the installation of color receivers in taverns so that baseball fans could see the Cincinnati Reds in color. Tavern owners were presented with an offer by the Appliance Buyers Credit Association which provided a color receiver and installation for no more than seventy-one cents per day. Service contracts were negotiated separately with one plan providing a one-year policy and antenna at a combined price of $99.95.

The concept of using taverns as promotional outlets had its genesis in the early demonstrations of monochrome sets. The same formula for achieving high visibility began to work for color.

To further encourage set purchases by tavern owners, posters and streamer kits were provided, the names of the establishments were listed in weekly newspaper ads, emergency service was made available through a fleet of radio-dispatched repair trucks, and free advertisements were given as part of a regular series of one-minute station promotions which were aired liberally throughout the broadcast week. Avco Broadcasting files contain the comments of several enthusiastic business operators who participated in the promotion. One related that his color set accounted for an extra hundred dollars each time a baseball game was aired in color.

Using baseball telecasts as the primary promotion vehicle,
WLWT sent letters to set owners, to RCA dealers and bar owners, and provided table tents and truck posters of game schedules. Over 250 cab covers were purchased, 500 car cards for Cincinnati buses and 360 buses in surrounding areas as well as TV Guide and on-air promotional announcements. Interestingly, the Southern Ohio Edition of TV Guide was not equipped to run color advertisements in the fall of 1959. However, the heavy emphasis on local color and the impending National Color Month caused a policy change which permitted two-color pages for the first time. The magazine required at least twenty-six two-color pages within a contract year at a cost of $900 per page—exactly double the one-color rate.

RCA cooperated on the costs of several promotionals and included a tag line: "See it better on a RCA color set." The set manufacturer also bought partial sponsorship of the Cincinnati Redlegs colorcasts. RCA Service Company trucks carried signs and posters proclaiming each of the color games.

Ohio Appliances (the RCA distributor in the area) ran a special ad campaign and offered bonuses to dealers selling a color-set to a public place. By October of 1959, three hundred sets had been placed under the promotional plans.

When WLW commenced its local colorcasts, the broadcast week consisted of 8 1/2 hours of local color and nine hours of network offerings. To would-be advertisers on or adjacent to these shows, the station stipulated that they would not be allowed to present their commercial messages in black-and-white. Though not charging for color, management noted that the extra costs incurred by the
station were heaviest in the areas of cameras, added maintenance and engineering time but that was "slight enough to be absorbed."

Thus, Crosley's key to unlocking the future for color was primarily a matter of exposure and concentrated promotion: program color and sell color! As John T. Murphy, now president of Avco Broadcasting recalls:

> If enough sets were to be sold to make color broadcasting of additional worth to our sponsors, and therefore to us, we had to make it possible for our viewers to see and compare color tv with the black-and-white they were accustomed to watching. And this is exactly what we did.

> We held client and sponsor parties to view our shows in color. We persuaded bars, restaurants, country clubs and other gathering places that an investment in a color set would soon pay off in increased customer patronage to view it. More and more of them did just this as the word got around.

> Our color shows were sold out, with sponsors standing in line to get in. For the color shows to which we invited a studio audience, we had waiting lists of up to three years. Yes, we are happy with the fine success we have enjoyed over the years broadcasting in color.

In recognition of the station's color schedule, RCA saluted WLBW program hostess, Ruth Lyons, in 1959, as the "Most Colorful TV Personality" during the observance of National Color Month. She recorded her 116th week of colorcasts dating-back to August 9, 1957--amassing 52,200 minutes over that two-year span: a mark unequalled by a single personality in the entire industry. By contrast, Perry Como, one of the earliest network stars to "go color" had accumulated about 135 hours of color in a 3 1/2 year period.

One of the company's major contributions to colorcasting came
in the form of a technical find. Since color's advent, program producers had lamented the abundance of light needed to produce quality color pictures. This requirement had prevented the color-casting of any night or indoor news or sporting events. Challenged by the problem and seeking alternative forms of live, color programming, Robert Dunville, then president of Crosley Broadcasting, working with Howard Lepple, Chief Engineer, asked the General Electric Company in the summer of 1959 to perfect a camera tube requiring less light to render an acceptable picture. The solution to the task came not in the form of invention, but of discovery. General Electric had built a low-light-level pick-up tube suitable for reconnaissance work by the Army. The adaptation of this tube (employing an extremely thin and fragile target material made of magnesium oxide) to the standards of broadcast equipment proved to be the answer. The first test was made on September 25, 1959, with what were termed "good results." Optimally, the experimental tube (type Z-5351) could render usable color pictures with only forty foot-candles of light compared with four to five hundred needed for the standard image orthicon tubes. Generally, however, the light requirements were cut by two-thirds, and as a result of the design the operating life of the tube was increased nearly two fold.

The production model of the tube (GL-7629) with a price of $2,025 was announced to the broadcast industry coincident with the beginning of National Color TV Month, November 1, 1959. For its efforts, General Electric was recognized in 1960 with an Emmy Award for outstanding engineering for technical achievement in the field of
television. In turn, G.E. honored WLWT with a special gold plaque commemorating the cooperative venture.

The initial on-air use of the new tube occurred when WLWT colorcast the first indoor sports event in the history of television. On Saturday, November 21, 1959 (and again on Sunday), the Cincinnati Royals of the National Basketball Association versus the Minneapolis Lakers game was fed to the NBC network from the Cincinnati Gardens.

During the month of November, WLWT broadcast a total of 143 hours of local and network color to an estimated four thousand color sets in the Greater Cincinnati area. The University of Cincinnati Bearcats became the most colorful college basketball team in the country when four of their games were telecast in tint the following month.

The station had inaugurated colorcasts of major league baseball on a local and regional basis in the summer of 1959, and now had the capacity to colorcast night baseball. Consequently, on May 16th of 1960, the first night, major league baseball game (the Reds versus the San Francisco Giants) was broadcast and fed to NBC. The station went on to telecast ten color, night games during the remainder of the season.

Another milestone occurred in April of the same year when WLWT televised the first, indoor church service. That was followed a week later by Easter Sunday services which could be viewed nationally.

The introduction of the low-light-level tube not only brought about a revolution in color programming. It substantially lowered
the basic operating expense connected with colorcasting. The need for less light also alleviated the need for massive air conditioning units which had been a must for indoor transmissions. For stations which had been delaying color, the potential savings was estimated at nearly $200,000.

Cincinnati had become a model market for the advocates of color and was dubbed "Color Town, U.S.A." by RCA and advertising agencies in 1960. From a practical standpoint the experiences in Cincinnati were further proof of the efficacy of RCA's basic faith that color tv sets are sold by color programming. Essentially, the same philosophy was expressed by Crosley's past president, Robert Dunville:

We believe sincerely that COLOR television cannot be an 'exclusive affair' with a few scattered spectacles and specials, but rather a regular program fare. The most important factor in the development of monochrome was to make television available in places where it could be sampled by many. This is a truism and so it must be with COLOR television. It is for this reason that we felt that telecasting of the Cincinnati Redleg games would lend itself to this concept.

Before WLWT began color programming about six percent of RCA television sales in Cincinnati were color sales. Shortly after local tint shows were started, the figure jumped to fourteen percent. Twenty percent of RCA sales in the city were color by 1959. In the following year an increase of better than one thousand percent was posted. To lure customers, dealers were featuring two main gimmicks: higher trade-in offers on old sets and a free set-christening party, courtesy of the dealer from whom the set was purchased. The party was held in the buyers home with a guest list of his choice.
Ohio Appliances, the RCA distributor for Southern Ohio, reported the sale of one thousand color television receivers during twelve business days of a 1960 campaign. This merchandising achievement was the product of the extraordinary and continuing promotional strategy at several levels. Involvement by NBC included the mailing of daily color bulletins to fifteen hundred newspapers in the country detailing color schedules, special stories, features on personalities, and periodic summaries of color tv's development. Thirty-five broadcasting industry trade magazines were supplied with elaborate information. And NBC network programs included the use of color descriptions by personalities to spur sales. Additionally, stations were supplied with promotional kits—slides, air announcements, etc.

With the dawn of the 60's thirty percent of WLWT's program schedule was in color, but more importantly, five percent of the homes in the market had color sets (approximately forty thousand sets). This saturation figure had been accomplished in a three-year period. For those who were impressed another persuasive figure pertained to the same time span: WLWT sales figures showed an increase of 34.4%—much of which management attributed directly to colorcasting. In the words of Robert Dunville, former Crosley Broadcasting president:

Some of the network shows don't do so well in other markets as they do here. We think color is responsible. Advertising shows a similar influence. Formerly, for instance, a local bank, gas and electric company and telephone company split its [sic] advertising money among the three stations in Cincinnati. Now we're getting 95%. I think color is the reason.
WLWT added three more color cameras to the original four in 1961. At that time color saturation was just shy of six percent while the national average was flirting with the two percent figure. Forty-six thousand of the area's three quarter million homes were among the early adopters of the chromatic innovation. It is interesting to note here that color-set ownership in the Midwest accounted for fifty-four percent of all color sets sold in the nation. Other cities in the order of set saturation included Philadelphia, 4.3%; Milwaukee, 4.0%; Omaha, 3.7%; San Francisco, 3.5%; Chicago, 3.3%; Los Angeles, 3.1%; Minneapolis-St. Paul, 3.1%; New York, 3.0%; and Columbus, Ohio, 3.0%.

Crosley Broadcasting further distinguished itself with color research efforts (Bruke Marketing Research Reports) previously unmatched among local station owners. The results of those studies, indicating that the added audience plus the added persuasiveness made color tv about three-and-a-half times as effective as black-and-white, are detailed in the proceeding chapter.17

Color Town, U.S.A. is now just another market with a high color-set saturation. But the early years of programming and promotion served as a model for the more rapid diffusion of color receivers nationally. This brief overview of WLWT's pioneering is an important component in understanding the pace of colorcasting's chronological growth.

Of the several other stations well-known for successful local colorcasting, five basic strategic reasons were usually stressed:

Color brings added local prestige and identifies
the station with a new advance in mass communication.

Color attracts non-network clients because regional and local advertisers see color TV as an increasingly useful merchandising tool.

Higher local-level program ratings result from color programs.

Local retail color promotions build a strong viewer image of a station, and also create excellent relations with merchants—which in turn develop new TV spot business.

Stations, like other businesses, can't stand still—and color represents a new frontier.18

To further those ends enumerated above and thereby, its own, RCA was working with independents as well as network affiliates to increase the number of hours of colorcasting by local stations. RCA distributors would approach station managers with the intent of analyzing their local program schedule and make recommendations as to the availability of live and film features in color. In many instances the company actually paid the extra cost for color film prints (about $35 to $40 more than black-and-white for a thirty-minute feature). When RCA began the promotional stratagem in the winter of 1957 only 140 hours of regularly scheduled color shows appeared on local stations monthly. In March of 1961 the company's survey showed that 336 hours were being aired.19

Part of the rise in programming hours for color presentations was attributable to the fact that the number of stations equipped to originate color was also rising—but more modestly than had been expected. In 1958, ninety-one local outlets were providing some sort of local, live color. The five years which followed provided a
38% increase—bringing the number of color-equipped stations to 126. The last six-months of that period—the latter-half of 1963—saw color set circulation climb 41.5 percent over the previous six-month period. It is at this juncture then that the consumer's immediate interest began to exceed that of the broadcaster. The nationwide average penetration had risen to 4.3% (Cincinnati continued to lead the averages with 9.0%) and the major breakthrough appeared to be just ahead. It was.

At this time most television broadcasters were expressing a desire to take part in what could properly be called the color "experiment," but lacked sufficient funds or faith to make the enormous outlay required to originate color.

Several inventions were introduced in the mid-50's with the prospect of lowering equipment costs, but none proved to be as functional as the RCA three-tube camera and complementary equipment. One of the attempts at a new camera, developed under the direction of Dr. Peter Goldmark, modified a conventional monochrome camera in much the same manner as had been done to produce field sequential color. The signal was then fed into a "Chromacoder" to produce the standard NTSC signal. The concept quietly faded.

Out of the Allen B. DuMont Laboratories came a camera which was just the reverse of standard tv equipment. In the "Vitascen," the room remained dark! Instead of receiving light through a lens, the camera had a scanner that projected a flying spot of light over the stage. The system found limited use in department store promotions but never became a serious contender for broadcast use.
The most revolutionary development of the fifth decade was the perfection of video tape recording. The first transmission of a color program recorded on magnetic tape was achieved by RCA and NBC on May 12, 1955, and opened a new era in electronic photography. The public became a witness for the first time on October 23, 1956, when a color tape was inserted as part of a regular Jonathan Winters program. RCA's color video recorder became available to the industry at the end of 1958 at a cost of $63,000.

A most significant advance in camera pickup tubes came with the introduction of the "Plumbicon" camera in 1965. A product of the North American Philips Company, Inc. of Mount Vernon, New York, affiliated with N.V. Philips and Gloeilampenfabrieken, Eindhoven of the Netherlands. It became the first major challenge to RCA's traditional dominance in the field of color camera manufacture.

The sharp upturn in set production was accompanied by a similar rush by stations to acquire color capabilities. By the end of 1964, over three-fourths of the nation's 588 television stations were color carriers. However, a scant 11%—63 stations—were studio live.

In the months which followed color gear disappeared from inventories at a furious pace. The stock market embraced equipment manufacturers and rewarded stockholders with enormous gains. Meanwhile, the color-doubting broadcasters, now anxious to board the bandwagon, were bidding for early delivery dates. For the few who hadn't modified their transmitters, the outlay was $13,533. Add to that the cost of basic color control and test equipment ($23,271) and the nucleus was intact. A color film island with projector for film and
slides—$93,290 more. One live color camera—$76,542. And a single tape machine—$52,750. The total cost, more than a quarter of a million dollars.28

Availability of Color Programs

To program color in the 50's and early 60's, broadcasters without live or network facilities were at the mercy of program suppliers. Several independent and motion-picture-associated film companies were the major sources of television programming. And the question was quickly raised as to whether these companies would lead color offerings by increased shooting in tint or whether the networks and stations would have to demand color prints. There was no ready resolve for this concern. Color film footage and production costs were definitely higher and the reluctance of CBS and ABC to systematically advance their color schedules in spite of the low percentage of tint receivers kept most program producers from taking what was obviously an economic gamble. Too, color per se was one of the last major strongholds for theatrically-produced movies and any color-set buying scramble would surely bite deeply into the public's amusement spending money. Thus, the climate was similar to that of the early days of television when theatres were compelled to take a defensive posture to protect attendance. Nevertheless, Hollywood could no longer point to color movies as being something television couldn't duplicate. As a New York Times columnist observed in 1953: "The cold fact is that color television, even in its present experimental
stage, is the equal, when seen under ideal circumstances, of the best quality color movies to be seen in theatres."

To capitalize on this economic threat, movie producers began releasing their black-and-white films previously held back from tv hoping to take advantage of the distribution fees while tv still used monochrome, chiefly. 29

*Sponsor* magazine surveyed sixty film companies in 1953 to find out how many intended to begin producing series in color. Of those responding, more than sixty percent said that they had one or more series being shot in tint but to be first run in black-and-white. They reportedly viewed color as an investment to be recouped at a later date.

One of the most "bullish" production houses was Ziv Tv—the first major tv producer to shoot in color. According to John Sinn, then president of the company:

As far back as 1948, we were shooting Cisco Kid on 16mm. Kodachrome. Last year, about 65% of our production footage was in color. This year, the figure will be about 90%. We're confident that the present color tv system is such that any good 16mm. color print will give good color pictures on a home color receiver. Meanwhile, of course, we are delivering black-and-white prints made from our color negatives at black-and-white prices. 30

At the time of the FCC's final decision on color standards, Ziv-Tv was starting to shoot the fifth year of The Cisco Kid, Mr. District Attorney and Favorite Story episodes in color. 31 Episodes of the latter—at this writing—are still being shown in some markets.

Ziv's colorful visions were, however, almost singular. By 1955, color filming en masse in the syndicated field just hadn't material-
ized. A modest twenty-percent of the new film products were being shot in color.  

An unusual exception to monochrome offerings appeared in the spring of 1956. The Southern Baptist Convention—the largest church body in the South—had authorized a budget of $350,000 to produce thirty half-hour color dramas. The series titled "This is the Answer" became the first color production designed for television by a church group.

Less spirited and more earthly concerns brought another institution into the fold of those informing with color. The Internal Revenue Service produced a color movie especially designed for TV viewing in 1960. Complete with a two-minute gap to allow for commercials, the film's purpose was to show the efficiency of the tax gathering agency.

Aside from the occasional public service film or series shot in color, the station desiring a syndicated product in color had to be content with an off-network production (and there were few in color) or the trickle of cartoon series, travel-action programs and documentaries which had long been available but usually telecast in monochrome. Not until after the "boom" in color—latter 1964—was there a rush to prepare programs for syndication in "living color."

Summary

The local station, as the consumer's most intimate contact with the broadcast industry, was a major impetus in advancing prospective buyers through the stages of awareness and interest to actual eval-
uation and trial of color. As such, they acted as the chief cata-
lysts in promoting adoption of color receivers on a mass scale.

The consumer, focal point of the broadcast industry's discord-
ant push for acceptance of color as the standard mode of viewing,
will be analyzed in the following chapter.
CHAPTER VI NOTES


2. Sponsor, July 12, 1954, p. 82.


7. Sponsor, July 9, 1956, p. 162.


15. Sponsor, August 1, 1960, p. 121.


17. For the information contained in this section the author gratefully acknowledges the cooperation of the Avco Broadcasting Corporation and its officers and the Ohio Appliance Company, regional distributor of RCA products. Personal interviews and access to their historical files provided the basis for a profile of Cincinnati's pre-eminence in color television during the late 50's and early 60's.


CHAPTER VII

THE CONSUMER -- ADOPTER OF INNOVATION

The advanced publicity for color television was of a mixed nature. The intra-industry competition to develop an acceptable color system and resulting court and FCC decisions generated substantial interest in the controversy which boiled over into the public sector. The Radio Corporation of America actively enlisted public support for its system through repeated demonstrations and newspaper advertisements. RCA propaganda extolled the magnificence of compatible color images while critical appraisal harshly questioned the readiness of the innovation for mass production. A Congressional sub-committee was told that color tv receivers were so complicated that "a little technician" should go along with each one sold. While doing little to stimulate strong desires for color television, such dialogue did much to enhance a widespread recognition of a product development.

A day after the FCC announced plans to authorize a new compatible color system (August 7, 1953) the front page of the New York Times proclaimed that NBC and CBS were planning to start color broadcasts "right away" following a finalization of the new engineering standards. RCA was quoted by national press services as expecting to have color sets on the market within six to nine months.
Thus, there is little doubt that the vast majority of consumers were aware that color receivers and programs were soon to be available. But the passive knowledge of a product does not necessarily lead to the involvement which acceptance or adoption requires. The remainder of this chapter is devoted to an understanding of some of the mechanisms believed to have been operating in the decision-making process which ultimately led millions of American consumers to embrace color television as a desirable product worthy of their consideration and purchase.

**Essentials of the Adoption Process**

Previous chapters have focused on components of the broadcast industry which in varying degrees acted as agents of change from the status quo, monochrome television. Everett M. Rogers in his work, *Diffusion of Innovations*, defines a "change agent" as:

> . . . a professional person who attempts to influence adoption decisions in a direction that he feels is desirable. A change agent usually seeks to secure the adoption of new ideas, but he may also attempt to slow the diffusion and prevent adoption of certain innovations.3

The change agents under review have been segments of the broadcast industry--often corporate bodies rather than individuals. The primary concern of this chapter will be the adoption process: defined as a decision to continue full use of an innovation. This process differs from the diffusion process in that it is concerned primarily with the acceptance of a new idea by one individual, while the diffusion process "deals with the spread of new ideas in a social system,
or with the spread of innovation between social systems or societies.\textsuperscript{4}

The diffusion process will be examined in the concluding chapter as a means of cohering the several facets of this study.

Essentially a mental process through which a member of a social system passes from first being exposed to the existence of an innovation to his final acceptance, adoption is a highly individualized sequence of events. Of the several identifiable stages in the process, five appear common to most innovations and may be plotted on a time continuum. These stages are as follows:

(1) **AWARENESS STAGE** -- the individual is exposed to the innovation but has not been supplied with sufficient information on develop a predisposition.

(2) **INTEREST STAGE** -- the individual is motivated to seek further information.

(3) **EVALUATION STAGE** -- the individual mentally orders the worth of this innovation in his hierarchy of needs and desires and then decides whether or not to try it.

(4) **TRIAL STAGE** -- the individual uses the innovation on a small scale to better determine its value.

(5) **ADOPTION STAGE** -- the individual decides to continue full use of the innovation which in this instance would constitute purchase of a color receiver.\textsuperscript{5}

Since the time expended by individuals in a progression through the stages of the adoption process varies, adopter categories may be established for the purpose of identifying the relative rates of adoption by members of a social system.

Adopter distributions are believed to follow a bell-shaped curve over a period of time and approach normality. (See Figure V.) Thus, the curve is conveniently segmented into five adopter cate-
categories: innovators, early adopters, early majority, late majority and laggards "on the basis of the two parameters of the normal distribution, the mean and the standard deviation."6 Innovators are those members of a society characterized as venturesome in their early acceptance of an idea or invention whereas the laggards enter the mainstream of acceptance only after the innovation has met with the majority's approval. Laggards are often viewed as being traditionalists.

With these concepts as a framework for examining the early adoption of color television in the United States, it is possible to identify characteristics of those individuals who moved through the stages to adoption.
Since the scope of this study is limited to the early years of diffusion, the adopter profiles as drawn from an historical perspective are essentially confined to innovators and early adopters. This limitation is real only insofar as it excludes the majority of consumers who rarely function in leadership positions and hence are less vital to an understanding of the processes by which innovations are initially diffused. Their later-stage role as consumers is seen more as a legitimizing of acceptance leading to what might be called a "bandwagon effect."

The Early Adopters

Accepting awareness of color television as a universal given for the literate population of the U.S. following the FCC's final authorization for color transmission standards, interest motivating appeals were marshalled by the agents of change. To effectively achieve their ends the extraordinary qualities of color had to be communicated. What advantage would accrue from tint which the monochromatic image lacked? RCA and NBC launched a massive campaign using as the primary theme the concept of "living color." This appeal to a viewing experience approximating the world as seen by the normal, color-visioned eye served to call attention to the physically unreal reproduction of objects and people in shades of gray. Beyond the choice of this effective theme was the general appeal to innate curiosity—a cognitive quality believed to be dominant among innovators.
Set manufacturing and programming were essential for displaying and thereby luring prospective buyers to the electronic innovation. Special "Color Nights" were instituted to coincide with the peak periods of the fall retailing season. As many as three-and-a-half hours of colorcasts were scheduled and promoted as a means of encouraging color tv dealers to offer in-store demonstrations. But the painful truth of the early years was that color programs were generally few and far between—not more than one or two shows a week spotted the television lineups of the mid-50's. Macy's and Wanamaker's, major New York department stores were leaders in the promotion of color receivers, but could only report one set sold between them by March 1, 1954. The fact that there were so few offerings, coupled with the lavish praise of acknowledged critics of the medium (e.g., "... the quality of the best color television is literally breathtaking when seen in the home."10) probably served to heighten the novelty status of color even if it didn't initiate sales!

In order to better gauge the degree of interest in color tv, the advertising agency of Batton, Barton, Durstine and Osborne (through the facilities of Advertest Research) began to include color statistics as part of its continuing survey of viewing patterns. The findings, generally known as the "Color Town Summary"* compared non-color owners who had seen color to those who had not in 1956 and then compared the figures with findings from the previous

*Color Town was a continuing, panel type study based on a probability sample of 4,000 respondents.
year.

In its initial report based on studies in December, 1955, and February, 1956—before the $500 color set was introduced—color's owners were characterized as being influential people with a high degree of interest in activities such as art, music, theatre and sports. They were shown as belonging to many organizations, taking an active part in charity drives and civic affairs. A comparison of organization memberships per one hundred persons found twice as many color set owners belonging that owners of B&W. Five times the number were involved in fund-raising and civic affairs. These findings were considered by the sponsors of the survey as an index of the influence of color set owners in the community. 11

Also noted was a steady improvement in public attitudes toward color:

Comparing non-color owners in December 1955 to the same non-owners in May 1956: twice as many said they were 'likely to buy in the next few years,' 78 per cent more believed 'color is perfected now,' 46 per cent more thought 'it is as good as Technicolor and 45 per cent more felt there are 'plenty of color programs.'

Commenting on the findings, Dr. Thomas E. Coffin, NBC Director of Research, concluded that:

Early set-sales were concentrated in upper-income homes. Opportunity to view these sets and exposure to word-of-mouth comment by owners tended to be limited to friends of owners, hence to other upper-income people.

Accordingly, the newly announced set-price of $500 was seen as opening the larger and essentially untapped middle income market.

However, those who were owners of color-sets when the survey
was made, the innovators or venturesome, were in some measure in disagreement with a belief that the general consumer was ready for color. Several set owners responded that color tv was too expensive for the "average family" or the "general public." This was an obvious indication that they neither considered themselves average nor general.

The findings also tended to confirm the idea that consumption patterns (in this instance, color television) operate as prestige symbols to define class membership, which is a more significant determinant of economic behavior than mere income.

Certainly, though, family income was an important part of decision-making to purchase or not purchase a color receiver. The table below is revealing when it is remembered that the first sets had a price tage in excess of a thousand dollars.

**TABLE 3**

**MEAN AND MEDIAN INCOME BEFORE TAXES WITHIN OCCUPATIONAL GROUPS—1954**

<table>
<thead>
<tr>
<th>OCCUPATION</th>
<th>MEDIAN</th>
<th>MEAN</th>
</tr>
</thead>
<tbody>
<tr>
<td>Professional and semi-professional</td>
<td>$6,020</td>
<td>$7,380</td>
</tr>
<tr>
<td>Clerical and sales</td>
<td>$3,980</td>
<td>$4,420</td>
</tr>
<tr>
<td>Skilled and semi-skilled</td>
<td>$4,390</td>
<td>$4,500</td>
</tr>
<tr>
<td>Unskilled and service</td>
<td>$2,810</td>
<td>$2,990</td>
</tr>
</tbody>
</table>

A profile began to emerge for the buying patterns of color television within occupational groups which was generally in line with income. In the Survey of Color Television conducted by Market Facts, Inc. in December of 1959, the percentages were as follows:

**TABLE 4**

PERCENTAGE OF COLOR TELEVISION OWNERSHIP BY OCCUPATION -- 1959

<table>
<thead>
<tr>
<th>OCCUPATION</th>
<th>COLOR OWNERS</th>
<th>UNITED STATES POPULATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Professional</td>
<td>13%</td>
<td>10%</td>
</tr>
<tr>
<td>Proprietors, Managers, Officials</td>
<td>48%</td>
<td>10%</td>
</tr>
<tr>
<td>Clerical, Sales</td>
<td>13%</td>
<td>19%</td>
</tr>
<tr>
<td>Draftsmen, Foremen</td>
<td>14%</td>
<td>12%</td>
</tr>
<tr>
<td>Retired, Unemployed</td>
<td>11%</td>
<td>6%</td>
</tr>
<tr>
<td>Not Reported</td>
<td>1%</td>
<td>-</td>
</tr>
<tr>
<td>Other:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Agriculture</td>
<td>-</td>
<td>9%</td>
</tr>
<tr>
<td>Service</td>
<td>-</td>
<td>8%</td>
</tr>
<tr>
<td>Household</td>
<td>-</td>
<td>3%</td>
</tr>
<tr>
<td>Laborers</td>
<td>-</td>
<td>6%</td>
</tr>
</tbody>
</table>

*Sources: Sponsor, September 11, 1961, p. 80.*

*Sources: Bureau of Census, Population Reports, 20 June, 1960.*

Of all the families owning color sets in 1959 according to the survey, 41% earned over fifteen thousand dollars annually. The average was $13,123 against the country's average of $5417. Only 9% of color set owners had family incomes of less than $5000, compared with the national average of 45%. To further illustrate the
affluence of early color set owners, 51% owned two or more cars when the national average was only 13%. 14

The direct influence of these innovators became apparent in an Elmo Roper and Associates survey in the late 50's which found that two out of three color buyers became so as a result of watching tint programs on the sets of friends or on the recommendations which they proffered. 15 Judging from many accounts of dealer displays, the home easily outdistanced most retail outlets as a persuasive viewing climate for color. The sets were difficult to tune properly; color adjustments were critical and highly selective. New York Times columnist Jack Gould summarized this major fault in the merchandising of color television:

. . . many dealers and technicians are pathetically inexperienced in tuning color receivers, they often do not know how to demonstrate the devices. Showing a color set under daylight conditions is foolhardy; the color is simply washed out and the prospective purchaser is understandably disappointed in the new medium. 16

Responding to color tv purely as a technical innovation, media representatives were acting in a supportive role as a poll exposed in 1959. Ninety-six percent of the critics were "favorably impressed with color." 17

An unusual approach to deciphering the extent of interest in color was undertaken in 1960. A sample of one thousand men and women in the New York metropolitan area, chosen by The Pulse, Inc., ranked tint tv fairly highly on a list of things that they would buy if they were unexpectedly given a $1,000 to spend freely. A color set ranked sixth out of sixteen items with the would-be pur-
chasers inspite of the fact that only slightly more than half of them (50.8%) had ever seen a television program in color.

The respondents gave a variety of reasons for their reticence to purchase color tv's. The single most frequent reason for not planning to purchase was not surprisingly, economic: 48.2% of those responding who had viewed color mentioned the expensiveness of the purchase as their principal reason for delaying. Only ten percent more—52.8%—of those who had yet to see color claimed they were not disposed to purchase color receivers in 1960. Here are the results of the survey question: "If you do not plan at present to purchase a color television set during 1960, what are your main reasons?"

**TABLE 5**

RESPONSES GIVEN FOR NOT BUYING COLOR TV IN 1960

<table>
<thead>
<tr>
<th>RESPONSES</th>
<th>RESPONDENTS WHO HAD VIEWED COLOR TV</th>
<th>HAD NOT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Too expensive</td>
<td>48.2%</td>
<td>52.8%</td>
</tr>
<tr>
<td>Color poor</td>
<td>8.7%</td>
<td>1.0%</td>
</tr>
<tr>
<td>Not perfected</td>
<td>27.3%</td>
<td>9.1%</td>
</tr>
<tr>
<td>Not enough color programs</td>
<td>5.2%</td>
<td>3.1%</td>
</tr>
<tr>
<td>Satisfied with b&amp;w</td>
<td>15.1%</td>
<td>18.0%</td>
</tr>
<tr>
<td>No need for it</td>
<td>9.1%</td>
<td>17.0%</td>
</tr>
<tr>
<td>Miscellaneous</td>
<td>2.9%</td>
<td>1.7%</td>
</tr>
<tr>
<td>Total responses</td>
<td>116.5</td>
<td>102.7b</td>
</tr>
<tr>
<td>Total respondents</td>
<td>484</td>
<td>483</td>
</tr>
</tbody>
</table>

*Source: Television Age, November 16, 1959, p. 37.

bTotals over 100% due to multiple responses.
The responses were significant in that three times as many people who had seen color TV as opposed to those who had not were of the opinion that it was not yet perfected. Regarding the viewing experience (without actual ownership) as a trial encounter with tint, post evaluation apparently caused substantial numbers of prospective buyers in 1960 to lose interest and await further inducements for another trial. This interruption of the adoption process—presumed to have been the result of an unacceptable exposure to the innovation—may have played a prominent role in delaying more rapid diffusion and the establishment of an early majority of adopters in the early 1960's.

Service costs were believed to be a corollary expense for color. *Television* magazine in its December issue of 1963 alluded to current studies as showing the color-set prospect as leery of high repair bills and uncertain of the quality of color reception. The people were described as "holdovers from color's admittedly shaky days of inferior performance." To circumvent these fears the service contract was designed to appear as a safeguard for anticipated difficulties. In order to back warrantee pledges more than one hundred and twenty thousand service people were color-trained in mass production systems before 1960. This was at a time when the average color set required two-and-a-half service calls within ninety days of installation as compared to two for a black-and-white model.

A *Wall Street Journal* story in 1962 quoted a repairman as saying that "color sets require about a third more service than black-and-white, but by no means double or triple like some of the wild tales
you hear." House calls by repairmen in most cities were estimated at between $7.50 and $8.00 against $5.00 for monochrome receivers.

The constraints on color's popular adoption were obviously numerous. Interest in the innovation was dampened by evaluation. And trial generated even greater uncertainties. If a "Who needs it!" attitude prevailed, it was understandable. But for set manufacturers --and others--this was no exclamation. It was the key question in determining persuasive stratagems to broaden the consumer base of support. Efforts in that direction established highly revealing composite portraits of the innovators and early adopters.

The Omaha Nebraska market, like Cincinnati in that color-set penetration was outdistancing the nation, was the focal area for a special color study. A month-long examination of the viewing habits of color tv set owners compared to those with conventional receivers was conducted between mid-February and mid-March, 1962. At that time, the Omaha metropolitan district was comprised of 129,500 television homes of which 3.5% were identified as color owners. Findings were extracted from 167 diaries in those homes and 173 from homes with b&w receivers. The NBC affiliate (KMTV) was the only station in the market broadcasting programs in color during the survey period. Included among the findings was the report that:

Color families were ... more mature, better educated and with higher incomes. Income differentials were especially marked--where black and white homes had an average yearly income of $6,210, color homes averaged $7,965. And where 38% of the black and white homes reported incomes of $7,000 yearly or more; more than double the color homes (77%) reported this.

This demographic image of color set owners in Omaha was cor-
robated in a study conducted by R.H. Bruskin Associates, New York. In this investigation a series of probability-sample studies was conducted in November of 1962 and again in January of 1964. Findings were based on a total of 378 color set owners out of a total sample of 17,665 adult respondents. The Bruskin report revealed an interesting shift in the profile of color adopters between the two sampling periods when comparing veteran and recent

### TABLE 6

DEMOGRAPHIC CHARACTERISTICS OF COLOR TELEVISION

SET OWNERS VS. NON-COLOR OWNERS
NOVEMBER 1962 - JANUARY 1964

<table>
<thead>
<tr>
<th>CHARACTERISTIC</th>
<th>NON-COLOR OWNER</th>
<th>VETERAN OWNER</th>
<th>% DIFF. VS. NON-OWNERS</th>
<th>RECENT OWNERS</th>
<th>% DIFF. VS. NON-OWNERS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average Age (Yrs.)</td>
<td>42.3</td>
<td>43.3</td>
<td>+2</td>
<td>41.3</td>
<td>-2</td>
</tr>
<tr>
<td>% of Families with 5 or More Members</td>
<td>26.6</td>
<td>28.3</td>
<td>+6</td>
<td>34.2</td>
<td>+29</td>
</tr>
<tr>
<td>% of Families with Annual Income of $10,000 or More</td>
<td>14.7</td>
<td>29.6</td>
<td>+101</td>
<td>27.4</td>
<td>+86</td>
</tr>
<tr>
<td>Average Family Income</td>
<td>$6,468</td>
<td>$8,308</td>
<td>+28</td>
<td>$8,162</td>
<td>+26</td>
</tr>
<tr>
<td>% With Some College Education or More</td>
<td>25.4</td>
<td>29.6</td>
<td>+17</td>
<td>28.7</td>
<td>+13</td>
</tr>
<tr>
<td>% of Household Heads in Professional, Technical or Managerial Positions</td>
<td>24.5</td>
<td>37.2</td>
<td>+52</td>
<td>36.5</td>
<td>+49</td>
</tr>
<tr>
<td>Number of Minutes/Day Spent with TV</td>
<td>139</td>
<td>159</td>
<td>+29</td>
<td>159</td>
<td>+29</td>
</tr>
</tbody>
</table>

*a Source: H.R. Bruskin Associates, (Reprinted in Broadcasting, November 16, 1964, p. 82.)*
While several salient facts appear, of particular note are the changes with respect to age and family size. Those buying color-sets in the survey interim were (on the average) younger and had larger families than the so-called veteran color-set owner. The findings appeared to signal the commencement of an important shift in adopter characteristics.

Other demographic information, several additional dimensions of the early adopters were revealed as the tempo of research on color ownership began to quicken. Brand Rating Index (B.R.I.), under the direction of NBC Research, undertook a project in 1965 to answer the question "What are the characteristics of people in color television homes today." The conclusions are capsulized here.

People in color homes were seen as "venturesome" in that they tended to use the newer products--movie film rather than snapshots, electric toothbrushes rather than the conventional. Status was found to be important to tint owners and they had a marked tendency to buy products which reflected this concern. As an example, they owned four times the national level of ownership of such high-priced cars as the Cadillac, Continental and Thunderbird. They preferred wall-to-wall carpeting and were more likely than the rest of the population to prefer Scotch or Bourbon to Rye.

Other characteristics of domesticity are in line with these examples. Further, color owners were found to do substantially more investing in income securities than the general public. Specifically, they had relatively greater interest in mutual funds than in
buying stocks and bonds singularly. B.R.I. looked upon the buying
of mutual funds as a "convenience" method and compared this to a
strong orientation by these early adopters to convenience products
and services. The point is emphasized in the finding that dry dog
food was used by 32.1% of the color owners, as against 23% of all
homes. Credit card holders accounted for 171% more color home men
than card holders among all men.

The findings had major implications for television advertisers—
particularly for new products or unique, time-saving packaging.22

The only research project of value to this study that this
writer was able to uncover which was not commissioned or conducted
by a broadcast oriented agency was reprinted in the Winter 1966-67,
Journal of Retailing. This elaborately detailed study is titled
"What Influences Purchases of Color Television?" and was made with
a random sample of ninety-two customers of the largest television
dealer in northwest Texas. Generally recognized statistical method­
ology was employed to obtain the results which are summarized here.

It was found that the mean age of black-and-white trade-ins
was 8.5 years (the median, 8.4; the modal age, 9.0) which suggested
that the buying of color sets was mainly a matter of replacing ob­
solescent black-and-white sets as they began requiring expensive
repairs.

Sales were mainly to families whose total income exceeded
$8,000 per year.

In the overall findings, 52 percent of the respondents cited
availability as an important factor in the purchase of a color-set
and 76% had a specific make of color television preference before purchasing. However, at point-of-purchase, the question prevailed as to whether color was "really perfected."

In the opinion of the salesman, the wife usually made the decision to purchase or not. But, generally, customers were pre-sold on color and on a particular brand when they entered the store. The reasons most commonly cited were either advertising and/or previous ownership.

Interestingly, the explanation of a service policy was seldom requested.23

Summary

The subtle, elusive considerations which impelled innovators and early adopters to embrace color television cannot be clearly understood from the findings available at the time of this study. Indeed, it may be asserted that the "true" reasons were not assessable at the actual time when individual decisions were made. Since the formal attempts to diffuse color were forms of persuasion—verbal and written messages—the internalizations (or means by which these messages were individually supported) are impossible to measure from an historical perspective.*

Nevertheless, the adopter profiles which are available provide clues for making assumptions about the personal and environmental

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*For a detailed account of these considerations, see: Wallace C. Fotheringham, Perspectives on Persuasion (Boston: Allyn and Bacon, Inc., 1966), Chapter 9.
conditions which generated behavior in concert with the persuaders' goals. Additionally, the findings tend to support the utility of preserving adopter categories as a means of clustering individuals with essentially similar behavioral characteristics. Color television, being a high-cost item with considerable durability, was most readily adopted by individuals who evidenced an unusually high degree of acceptance of comparatively low-cost, convenience product innovations. For some, consistency of innovative behavior appears likely.

Further, the findings serve as a validation of the (Two-step Flow) concept that "opinion leaders" play an intermediary role in inducing greater numbers of other individuals to at least begin movement on the adopter continuum. The influence of these individuals is seen in their occupational roles and community involvement. They are more likely to constitute a comparative reference group, thereby providing behavioral cues for other members of the society.

As greater numbers with lesser socio-economic prominence became adopters of color television (which the Bruskin report indicated as occurring between 1962 and 1964), the opportunities for a favorable trial of the innovation were greatly enhanced. This exposure and inter-personal involvement undoubtedly activated further evaluation of the desirability of buying color. But, again, the actual dynamics of decision-making on a case-by-case basis cannot be uncovered at this writing. While more sophisticated experiments are bringing us closer to understanding some of the mechanisms involved in choice, most findings pertinent to the adoption process
are still reflective. An enormous body of literature could be brought to bear on this question but would only serve to introduce a broad variegation of possible influences affecting individual evaluation of innovation. In this writer's opinion, a closer examination of the diffusion process—the province of the concluding chapter—will reveal many of the causative agents relating to adoption.
CHAPTER VII NOTES


4. Ibid., pp. 17-18.

5. Ibid., pp. 76-120.

6. Ibid., p. 192.

7. Ibid., p. 170.


19. Sponsor, May 9, 1959, p. 32.


CHAPTER VIII

CONCLUSIONS

Diffusion — An Integrated Effort

When Brigadier General David Sarnoff stormed into the RCA laboratories in Princeton, N.J., and demanded "Get something going. . . . I'll be back tomorrow!", he was responding to an economic threat being imposed by CBS' bid for recognition of its color system. A revolutionary change for a still infant medium.

Sarnoff's ultimatum was not rewarded with a receiver suitable for contention, but, instead, with a principle—electronic color. As he recalled: "There was only one little trouble. The bananas in the picture were green and the monkeys were purple."\(^1\)

The question was not with color, but with the means of achieving it—mechanically or electronically? Patents and prestige for whom CBS or RCA?

The pressure of competition may inspire innovation in several ways. If it does no more, it always accentuates the rivalry situation by polarizing the differences between the contestants. It sets them apart and prepares the way for reciprocally interacting withdrawal mechanisms that are characterized by greater or less novelty in their conception. Sometimes the only new thing that develops is a magnification of some original distinction between the rivals, a quantitative elaboration of something that already exists.\(^2\)
It is not necessary to repeat here the related events which occurred between 1940 and late 1953. When electronic color television was adjudged ready for the nation on December 17, 1953, a social context had been established for that innovation's diffusion. Its place was assured by the FCC as a regular part of the limited spectrum of broadcast channels. This is an important consideration directly related to the prospect for trial (a normal requisite to adoption) of color on a national basis. The fact that television's financing by commercialization was well established presumed revenues to absorb any additional costs associated with programming in color.

That compatible color prevailed may be ascribed to the empirical notion that "The likelihood that a new idea will develop is enhanced if several individuals are simultaneously and cooperatively exploring the same possibility."³ This was the functional effect of the Second National Television System Committee. But the united venture ceased and private gain was pre-eminent following the recognition of transmission standards.

As Melvin DeFleur asserts in *Theories of Mass Communication* (1966):

In some ways, one of the most crippling of the social conditions surrounding the early development of radio was the concept of private ownership and the profit motive. Every minor and major invention was immediately patented in the United States, in Britain, and in other countries as well. It became nearly impossible to make needed improvements in radio components or to market equipment thus improved without falling into bitter court entanglements over patent claims.⁴
Color found no sanctuary from these stifling individual interests.

An innovation is thought to flourish in an "atmosphere of anticipation of it. If the members of a society expect something new it is more likely to appear that if it is unforeseen and unheralded." Forseen and heralded it was, but color television had the misfortune of appearing in the midst of a challenging economic climate. In the early part of 1953 only 58% of the nation's families owned black-and-white receivers. Sales, however, were running far behind projections with a resultant bulge in inventories of unsold monochrome receivers. As the Philco Corporation advertisement on December 23, 1953, pointedly declared in an effort to counter RCA's claim to victory in the adoption of color standards and simultaneously quell any heightened anticipation for refined color receivers in the near future:

You should understand that much work still remains to be done, and color receivers will not be available in quantity for a long time. Now that the standards have been approved, manufacturers can proceed with the problem of developing color television receivers with viewing screens large enough in size to interest the buying public and at prices they can afford to pay.

Though nearly all major manufacturers were in limited production of color receivers in 1954 (each being roughly of the same configuration), their development of a product line was more from fear of being left behind than through optimism for the prospect of color's mass diffusion. They recognized the need for color experience, but demanded immediate consumer confirmation in order to make participation a matter of serious contention. As CBS'
president commented in 1956:

If color is to get started as a mass medium it must be stimulated by an all-industry all-out effort. If the industry makes a concerted drive in all phases of production, sales, merchandising and promotion, color television can really get started in 1956. 7

The industry didn't -- and color didn't!

RCA was characterized as embracing the philosophy that the appeal and novelty of color were sufficient to get color off the ground. Prospective early customers were expected to be the affluent, advertising agencies, sponsors, private clubs and public places such as taverns. 8 These expectations were fulfilled, but the influence of innovative consumers didn't muster the essential reinforcement which broadcast industry segments generally failed to supply.

As has been documented elsewhere, manufacturers defected from set production for a variety of reasons: important among them being an upswing in black-and-white sales; advertising agencies generally had little or no experience with color and were hard-pressed to provide sponsors with a persuasive dollars-and-cents case for tint; local stations were struggling with the question of advertiser and/or network support of sufficient magnitude to justify equipment costs; and color programming was at first spotty and at best sparse.

Color was far from approaching the status of being the medium's standard. The market for black-and-white receivers was becoming one of replacements and aiming more and more at increasing the number of multi-set families. The monochrome trend was to
portability and miniaturization. Against this direction was color tv—big in size and price!

"Innovations require an advocate of some description if they are to make any social impression," for those without advocates are held to be mistakes or misguided ventures. 9

Professional advocates are experts in persuasion. Their activities, more than anything else, support the popular fancy that inventions are prompted because people need them. 10

In his role as the most highly visible professional advocate of color tv, David Sarnoff reflected: "I guess this may have been the toughest fight of my life." 11 The General was facing the merchandiser's opponent—the consumer—with broken ranks within the communications industry. If he had one big gun, it was RCA's programming arm—the NBC network. And so the barrage began intensifying: 68 hours of color programming in 1954, 216 the following year and nearly 500 in 1956, as the progression to total color spiralled upward. Advances on the technical front were encouraging. So much so that one of color tv's severest critics, Zenith Radio Corporation, announced its entry into set manufacturing in 1961. As the nation's largest manufacturer of monochrome receivers, Zenith's pronouncement was of major importance. A crucial ally had entered the battle.

Zenith's decision was most certainly influenced by the saturation rate of monochrome receivers in American households. From fewer than one million in 1949, the figure rose to twenty-five million in 1953 and doubled that number in seven years thereafter. 12
Also significant at this juncture was the shift of dealer support from the traditional receiver with a low profit return, to the color set which was (on the average) three-and-a-half times more profitable.\textsuperscript{13}

Zenith represented competition, to be sure—but it was welcomed:

> Competition is a potent incentive when mutually desirable rewards are allocated on the basis of performance. In such situations it is productive not only of increased effort but also of distinctly new kinds of effort to achieve greater shares of reward. It stimulates innovation as well as prolonged and intensified effort along conventional lines. It can do this, not only in struggles for economic rewards, but in contests for favors, prestige, adherents, and power.\textsuperscript{14}

The result was more aggressive promotion of receivers at the manufacturer and retail levels and heightened sponsor interest. Sets were decidedly better: color tuning had been simplified, service costs slashed and picture tubes were brighter than previously.\textsuperscript{15}

RCA's factory sales of color tv sets in the last quarter of 1962 were eighty percent higher than in the final 1961 period. In 1962 about fifty percent of the company's tv receiver dollar sales came from color sets.\textsuperscript{16} Financially, the corner had been turned. Ahead lay the prospect for rapidly accelerating diffusion. The actual number of color-set owners was still comparatively small, but as diffusion literature indicates: "Supporters of a new idea need not constitute a majority or even approximate it. They need only give the impression that they are or must inevitably be-
come the majority." 17

In charting the progress of a new product a flattened "S" curve is usually employed. On such a curve, color had advanced along the base in 1959 to a point just before the sharp rise. 18

The S-shaped curves for newspapers, films, radio and television appear to have followed the same general regularities during their periods of adoption by their relevant populations as such unrelated items as hybrid corn, instant coffee, hair spray, and oral contraceptives . . . . 19

The six-year base-formation likely could have been shortened. The desirability of such action was clearly a matter of self-interests. Color was not merchandised in such a way as to standardize its want until it offered a real advantage to manufacturers, dealers, advertisers, networks, program suppliers and local stations. The rating edge which the American Research Bureau survey (November, 1964) forecast for NBC provided the catalytic force which set into irreversible forward motion the circular cause-and-effect relationships among the several interrelated programming components of the broadcast industry. Commitment to color in one dictated commitment in another. Industry-wide adoption of color created a unified campaign which had the effect of legitimizing the readiness of color television for mass acceptance.

The major events leading to that readiness were sequenced in the following manner:

1. A lack of monochrome television buying in the summer of 1953 (attributed to a record volume of consumer credit outstanding and to an anticipation of color) caused the FCC's final
authorization of compatible color standards to meet with a mixture of enthusiasm and caution.

2. After an open battle challenging RCA's assertion of credit for perfecting an acceptable national color system, major set manufacturers (with the exception of Zenith) started limited production and promotion of color receivers. Generally, a feeling prevailed that manufacturing was not so much for a defined market at this time as it was for the knowledge of production techniques.

3. NBC and CBS approached programming with vigor, accepting color as an adventure, applying it to all existing program forms. For NBC the programming function played a supportive role to manufacturing: to display color sets, ideally, color had to be abundantly available. By 1959, CBS had ceased production of color receivers and two-years later the network had defected as a supplier of tinted video. The importance of this type of economic interrelationship in the broadcast industry cannot be overstressed as it applies to the prospect for an innovation's success.

4. The signing of a consent decree by RCA on October 28, 1958, created a patent pool into which the company put one hundred of its most important color tv patents. This action came at a time when it was evident that black-and-white television no longer was an expanding business.

5. RCA indicated a profit on color tv set sales for the first time in 1959. The company then made a major shift in its advertising emphasis: from the appeal to fashionability to a
plea for public reevaluation of a much improved product.

6. In February of 1961, Zenith announced its entry into the color field for the first time. This move literally forced other manufacturers back into color-set production with much of the pressure coming from dealers who were now ready to push color since black-and-white sales—primarily of low-cost portables—were becoming less profitable.

7. Advertiser support of color began to increase markedly in the early 60's with the release of research findings comparing the characteristics and viewing habits of demographically similar individuals in homes with color versus those with traditional receivers. Sponsor defections from CBS to obtain color vehicles for their messages intensified the interest in color as a persuader. Then, the American Research Bureau findings of November, 1964, removed all doubts about the competitive advantages of tint.

The history of color is remarkably similar to that of black-and-white in several important respects. The quotation which appears at the conclusion of Chapter II bears repeating here:

Black-and-white started slowly right after the war because of what might be called the circle of interdependence: Consumers withheld purchases until set prices came down and until there were more shows on the air; advertisers withheld buying time until there were more sets in consumer hands; broadcasters had to wait for advertising revenue; and manufacturers couldn't reduce prices until consumer demand for sets allowed mass production.20
Critical Observations

Color television might have experienced a dramatically more rapid diffusion had certain pre-conditions been met. Most importantly, monochrome set saturation was not sufficiently high at the time color was officially approved to cause most major set manufacturers to divert their merchandising skills to stimulating high consumer demand. This was not the case in September of 1960, when the Japanese adopted color standards (NTSC) as a stopgap measure to rescue their electronics industry from an ominous slump. A virtual saturation of black-and-white sets had been achieved among families who could afford a receiver on that island nation. Britain sought early adoption of a color system in Europe for essentially the same reason.

It was precisely at that juncture in American television set manufacturing—when total saturation was nearing reality (few receivers were sold in 1960 than had been sold in any single year since 1951)—that color ceased being an electronic novelty and took on the mantle of a product whose mass diffusion (here and abroad) would assure continued growth for set manufacturers.

Color, not unlike many other consumer products (e.g., stainless steel razor blades, radial-design tires) went through an adoption process on two levels: intra-industry and individual. The former, as has been demonstrated, can be as or more lengthy than the latter. Giving the appearance of social acceptability and product worthiness to an innovation is a formidable task when total
industry support is wanton. The influence of innovators and early adopters did not, in the case of color, appear to be sufficiently great to motivate an early majority until a united front of industry propaganda appeared as reinforcement in the early 60's. If this is behavior indicative of the broadcast industry's approach to innovation, then it may be predicted that future developments in the electronic media will achieve mass acceptance only after the self-interests of manufacturers are imperiled by adhering to the status quo.

It took legislation to assure mass reception of ultra-high-frequency television channels. Frequency modulated (FM) radio stations have in large measure begun to experience profitability, but the future of their economic survival has long been tenuous. It would be presumptuous to assert here that legislation affecting manufacturers should have been taken to hasten color's diffusion. What does warrant more extensive investigation is an examination of the social and commercial readiness of innovations which come under the direct approval and control of the Federal Communications Commission.

Laser technology has opened the way to three-dimensional color images; stereophonic sound is a feasible addition to the television signal. Even more significant is the technological promise which sophisticated multi-channel distribution systems (as presently embodied in CATV installations) hold for varied video and other electronic services.

There are formidable assurances that the revolution in com-
munication will succeed technologically; there is far less evidence to indicate that regulatory controls or social institutions will stimulate the orderly and rapid diffusion of these devices. The role of the Federal Communications Commission in implementing greater use of spectrum space is necessarily one of promoting and/or protecting public interest. In doing so, determinations ought not to stop with the mere approval or rejection of an innovation which falls within the Commission's purview. There is the greater obligation to provide safeguards which insure the availability of already existent innovations—thereby protecting the consumers' investment. Historically, this has been a consideration influencing the authorization of products and services which come under federal approval and control. Certainly, it was a principal argument for deciding against non-compatible color in 1953. Its adoption would have made several million sets obsolete, forcing modifications at further expense to owners. Would it be inappropriate to build such consumer safeguards into adoption decisions for new communication forms? The experiences with UHF and FM provide adequate proof of the efficacy of such a proposal. As this pertains to color television it would have meant, for example, that the FCC require a graduating scale of minimum weekly hours of color transmissions following a station's decision to color-adapt its transmitter. The profusion of color programming (with all networks participating) would likely have initiated a chain-reaction among the industry's participants. The effect of such a stimulus-response-stimulus would probably have shortened the adoption time for many of color's
consumer candidates. The effect on manufacturers would likely have been to hasten research and development of the refinements which appeared following their commitment to merchandising color.

If, however, color television has not achieved a near saturation level of U.S. households and if no action is taken to create assurances for the general availability of the new electronic innovations, it may then be concluded that the experience with color will be replicated.
CHAPTER VIII NOTES


3. Ibid., p. 43.


10. Ibid., p. 298.


19. Defleur, p. 75.


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