

TELEVISION IN COLOR

F. C. C. Approval of Columbia's Method Starts an Involved Controversy

By JACK GOULD

TELEVISION today is in a state of unprecedented turmoil and confusion. The action of the Federal Communications Commission in approving the color transmission method of the Columbia Broadcasting System has started what bids certain to be a major and protracted controversy.

The stakes in the controversy could hardly be higher. At a conservative estimate the public's investment in television now stands at \$2,000,000,000. The television industry itself has at least as much invested. The billions of dollars involved in the future of TV are virtually incalculable.

The F. C. C. decision, which in effect finds the Federal government and one private company, C. B. S., pitted against the combined resources of the rest of the television industry, is going to be fought out on three main fronts:

(1) In the courts. A determined effort to upset the F. C. C. decision is being made by the Radio Corporation of America, the principal opponent of C. B. S. It does not intend to stop short of the United States Supreme Court. R. C. A. already has been joined in taking recourse to the courts by the Pilot Radio Corporation, though the suits are separate.

(2) In the field of public opinion. The major manufacturers opposed to C. B. S. already have agreed to contribute \$1,000,000 for an educational campaign designed to reassure the public that existing sets will be useful for the foreseeable future. In turn, C. B. S. will put its not inconsiderable resources behind a drive to convince the public that color transmission in motor. This disk is placed directly in front of the camera and receiving tubes.

(3) In the political field. Repercussions of the controversy will echo in Congress. The functions of the F. C. C., together with its exercise of broad discretionary

major emphasis since the commission's approval of C. B. S. color on Oct. 11.

Why the F. C. C. Action Causes Such Strong Reaction: C. B. S., which is not a manufacturer of either receiving or transmitting equipment, played a lone hand in the color hearing. The overwhelming preponderance of engineers and set manufacturers were against the C. B. S. system on both technical and economic grounds.

The causes underlying the conflict are these:

The C. B. S. Color System: Basically, the C. B. S. system is technically incompatible with the television that is broadcast today. To receive a C. B. S. color picture in black and white on a present set it is necessary to have an adapter. To receive a C. B. S. color picture in color on a present set it is necessary to have first an adapter and then a converter. The adapter alone would run to about \$35; the adapter and converter, at least \$100 and very possibly substantially more.

An adapter is a device which electronically alters the circuit of a set so that it can accept in black-and-white a picture transmitted by C. B. S. in color. Without the adapters the color image appears on a present set only as meaningless lines.

The converter is the device which introduces the actual color. Its physical appearance and operational characteristics have been major points of controversy. Under the C. B. S. system, the primary TV colors of red, blue and green are injected by means of a filter disk which is spun at high speed by a small motor. This disk is placed directly in front of the camera and receiving tubes.

The disk is a limiting factor on the picture size. Since only half of the disk passes in front of the tube at a given moment, it must be roughly twice as large as the picture. From the practical standpoint the disk is limited to about 25 inches, which gives a picture of 12½ inches, already an outdated size in today's sets. With a magnifying lens it can be brought up to 16-inches, a more popular size.

It is possible, however, to use the rotating disks with larger screens, such as the 19-inch, etc. But the maximum picture still will be 12½ inches before magnification.

The C. B. S. system, however, is not dependent on the spinning disk as such. When the primary colors are introduced by electronic means, this means can be incorporated in the C. B. S. system, thus eliminating the disk.

Apropos the C. B. S. converters, one manufacturer in favor of the Columbia system is planning a device which would enclose an adapter, converter and separate tube in a single cabinet. This separate cabinet would hide the unattractive spinning disk.

The R. C. A. Color System: This system is designed to be compatible with present television. To receive an R. C. A. color program in black and white on a present receiver no adapter is necessary. The same transmission from a single station will produce a black-and-white image on a black-and-white receiver and a color image on a color receiver.

To receive an R. C. A. color program in color on a present black-and-white receiver a converter must be employed. The heart of both the system and this conversion process is an electronic tri-colored receiving tube which injects red, blue and green. The tube would provide both color and black-and-white pictures, electronically projecting on the screen whichever of the two types of transmission happened to be employed by a station.

The R. C. A. conversion might cost about \$175, including the labor of the skilled service man required to do the job. This figure, however, admittedly is only a guess, since the R. C. A. conversion process will not even be demonstrated until December.

In adjoining columns will be found a detailed explanation of how the C. B. S. and R. C. A. systems work and their technical differences.

The F. C. C. Reasoning: The commission has been anxious to authorize color. Its advent is regarded by all parties concerned as inevitable. The F. C. C. wanted to make the move with least inconvenience and expense to the public.

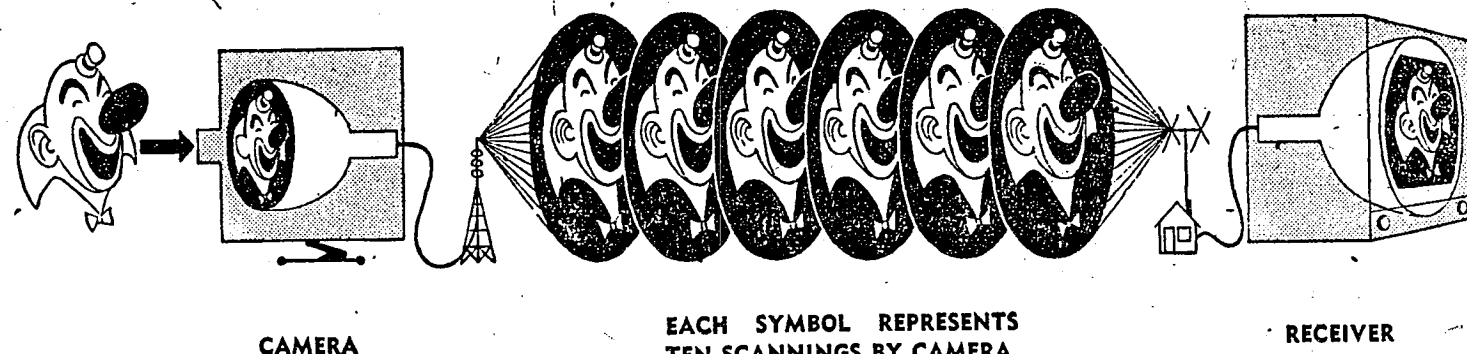
Primarily, the F. C. C. was of the opinion that the R. C. A. and other all-electronic systems would take an unspecified period of time to be brought to the state of perfection of C. B. S. color. Even then, it was not sure that such electronic systems would be free from operating difficulties. By strong implication, at least, it has suggested that the anti-C. B. S. manufacturers were indulging in delaying tactics so that the public first could be sold black-and-white receivers and then color sets.

Accepting these premises—and each is vigorously disputed by the set manufacturers—the F. C. C. was thinking more in terms of what might happen to tomorrow's theoretical 80,000,000 set owners than today's 8,000,000. If it kept postponing a decision, the problem merely might be magnified many-fold.

The Reasoning of the Major Manufacturers: The manufacturers hold that the F. C. C. is unrealistic and

HOW THE VARIOUS TELEVISION SYSTEMS OPERATE

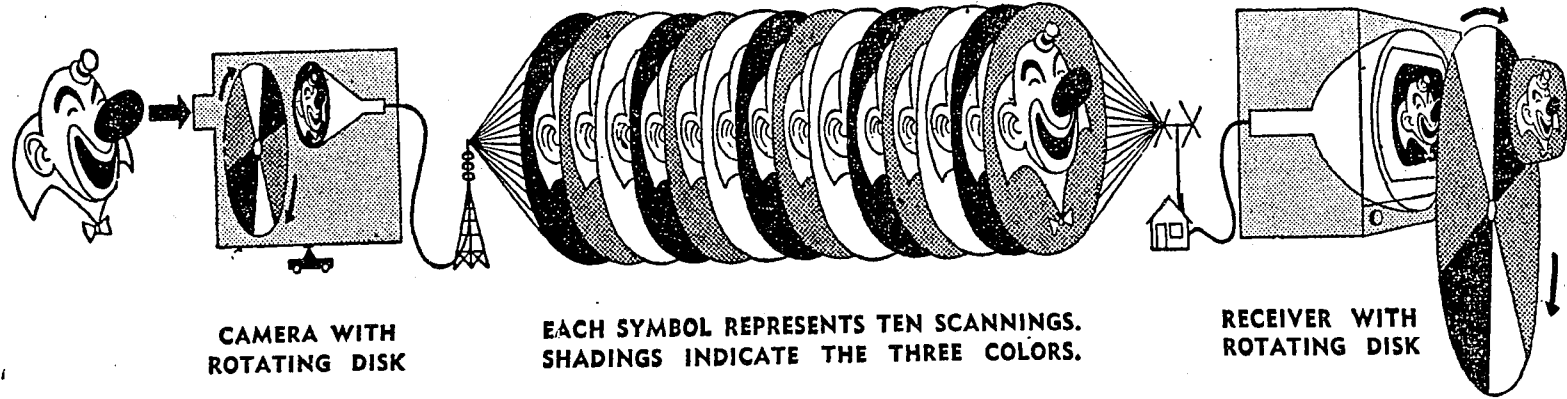
BLACK-AND-WHITE TRANSMISSION



The figure of the clown is scanned by the camera tube. In black-and-white there are sixty scannings per second which are sent out on the air in the form of a sequence of black and

white impulses. At the receiver these impulses recreate the original image in the studio and the scannings are projected directly on the screen of the black-and-white set in the home.

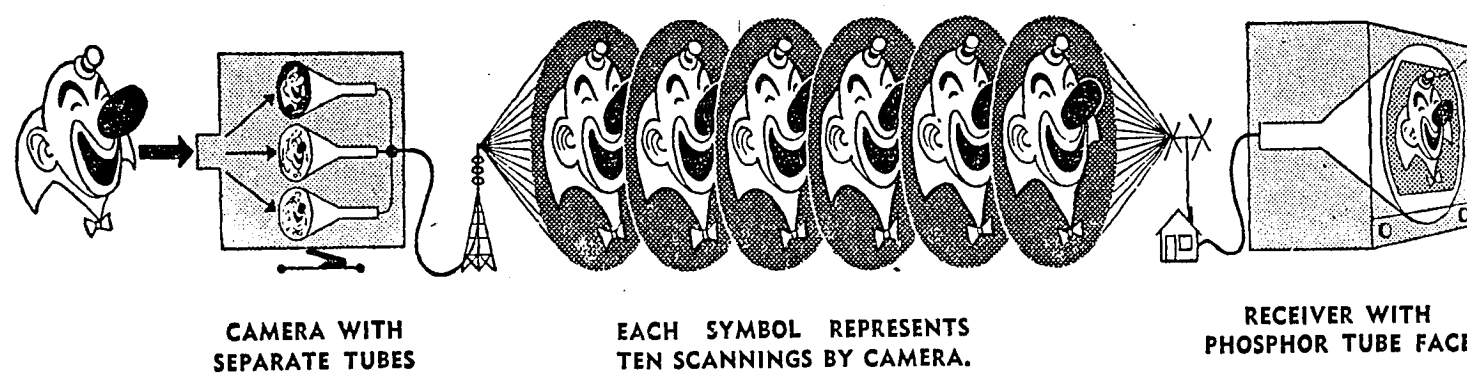
COLOR AS TRANSMITTED BY C.B.S.



The figure of the clown is scanned by the camera. The image passes through a rotating disk containing red, blue and green filters. There are 144 scannings per second, with each individ-

ual color scanning being sent out in sequence. At the receiver these scannings pass through a second filter disk, synchronized with the first, which gives the picture in three colors.

COLOR AS TRANSMITTED BY R.C.A.



The figure of the clown is scanned by the camera. There is a separate tube for each color. There are sixty scannings per second, each scanning containing its own components of red, blue

and green. At the receiver these scannings activate small phosphors of red, blue and green on the face of the tube. When viewed as a whole the tube gives the complete color picture.

Drawings by James Lewicki



The C. B. S. color converter.

powers upon which the fate of television hangs, appear certain to be re-examined.

If the public is bewildered and bothered by all the many facets to the controversy, it has every right to be. Seldom has a dispute embraced so many complex issues, each one of which has the makings of a good row in itself. These issues cover extraordinarily complicated engineering factors, economic problems, fundamental concepts as to the role of government vs. free enterprise, and, last but by no means least, the individual who is or expects to be, watching television.

Under such circumstances, pat and glib statements as to what the color controversy means to John Doe are unwise. The best that can be done is to take up the controversy step-by-step.

What the F. C. C. Is: The Federal Communications Commission was set up by Congress to deal with the involved engineering problems upon which it was impractical to legislate.

The commission's fundamental responsibility is to see that broadcasting is conducted in "the public interest." Its power lies in the license which a station must have to use a wave length that belongs to the public as a whole.

What the F. C. C. Did in Regard to Color: The commission conducted lengthy hearings to investigate the merits of several color systems, of which the most publicized have been those of C. B. S. and R. C. A.

The F. C. C. finally decided that the C. B. S. system gave pictures which were sufficiently perfected to be introduced commercially. That the pictures are extremely good and far superior to black-and-white cannot be denied; they are. This all-important point has been rather seriously overlooked in the general controversy to date.

Until there are additional demonstrations of the C. B. S. color, it must be acknowledged that the general public has not seen with its own eyes what the F. C. C. has endorsed. Despite the manufacturing industry's unfavorable reaction to the F. C. C. approval, the public's reaction to watching C. B. S. color has yet to be registered.

As for the R. C. A. system, the commission decreed that it was inferior in quality and not easily operated by the average layman. It also expressed doubt that certain technical difficulties could be overcome.

The F. C. C.'s primary objective has been to bring about the introduction of a service in color. It generally has been less concerned with the maintenance of a service in black and white, upon which most manufacturers have placed

impractical. They offer the analogy that if one wants to improve service on the railroads one concentrates on building a new type of engine; one doesn't change the gauge of the tracks so that none of the present coaches will be useful without "adapting" their wheels to a new base.

In effect, they maintain that the F. C. C. has seriously retarded color because the C. B. S. system does not provide for the simultaneous maintenance of black-and-white service while color is introduced.

From the economic standpoint, they argue, the F. C. C.'s protection of the public's pocketbook is largely illusory. The cost of converting an existing set still must be met by the consumer, who even after this additional outlay, doesn't have the latest, most attractive, most efficient set—a new, factory-made receiver.

The manufacturers offer further that protection of the public must be seen from the long-range point of view. C. B. S. color is not going to stop developmental work on a compatible system, they say, and there is a possibility of two transitional upheavals instead of only one. Technically, they add, the spinning disk was tried and discarded in the early days of black-and-white and they foresee the same course of events with C. B. S. color, as even C. B. S. acknowledges may happen. Then a C. B. S. disk converter itself will become obsolete, they note.

In short, the manufacturers insist that the ultimate potentialities of compatible all-electronic color outweigh whatever immediate practical gains the C. B. S. system afford. And they state further that, unlike either the F. C. C. or C. B. S., they must cope with all the retooling, competitive merchandising and employment problems which are the lot of a major manufacturer.

The Tentative Schedule for C. B. S. Color: The F. C. C. order authorized C. B. S. to begin color on a commercial basis on Nov. 20.

Under present plans C. B. S. intends to start with perhaps a half-hour of color between 6 and 8 P. M. and a half-hour after the conclusion of the evening's commercial schedule. The balance of the twenty hours will come during the daytime.

How soon C. B. S. Color Can Be Seen in the Home: Barring legal delays, the first converters and adapters may be on the market by Christmas or Jan. 1. They will come from comparatively small manufacturers, but they will be aggressively merchandised.

Until such time, C. B. S. intends to intensify the interest in color by a series of public showings, details of which will be announced later. Such showings may begin around Nov. 1.

Why Present Sets Will Have Extended Usefulness: Both the manufacturers and C. B. S. are agreed on one point: The set now in use will give service for a number of years to come. It will not become a piece of junk to be put out with the morning trash.

The reasons for this are many, primarily economic. Under the C.

B. S. system, it will be necessary to build up a color audience from scratch.

But with production costs constantly mounting, it is not logical to assume sponsors of major programs will sacrifice the present total potential audience of 30,000,000 for the comparative handful of families who at the start may purchase converters. C. B. S. concedes that it will have an uphill fight to take its color system over this transitional hurdle, particularly since many individual stations are still operating at a loss.

The Position of the Prospective Set Buyer: The jackpot question in the color controversy is what the buying public will do. What the public should do is a matter on which there will be many opinions for days to come.

The major manufacturers, for the reasons cited, say that a set

may be purchased with confidence at this time. They advance the argument that a buyer now will receive his money's worth in entertainment before color TV becomes a personal problem.

On the other hand, C. B. S. has cautioned prospective purchasers that, if they do buy, they should demand positive assurances that the receiver can be adapted for the C. B. S. system. The network's president, Frank Stanton, also has hinted that money could be saved by waiting for six months for a complete color receiver.

Inevitably, the uncertainty created by these conflicting recommendations has caused a drop in set sales. Coming just before the Christmas buying season, when high inventories are the rule, the possible consequences cannot be minimized economically.

In this connection the Federal Communications Commission is

open to some legitimate criticism. Since it is the representative of the public, the welfare of which must take precedence over other considerations, the F. C. C. has an obligation going beyond its decision per se.

Neither the public, the set manufacturer nor C. B. S. have a very clear idea of where they are. It is time that the F. C. C. commissioners spelled out how they intend to implement their approval of C. B. S. color, which presumably they now are bound to do, and for once told in straightforward, everyday language what lies ahead as they now see it. It is not reasonable that they should expect everyone but themselves to live with their decision.

The F. C. C. must act in the public interest, convenience and necessity by clarifying promptly the momentous step which it has taken.