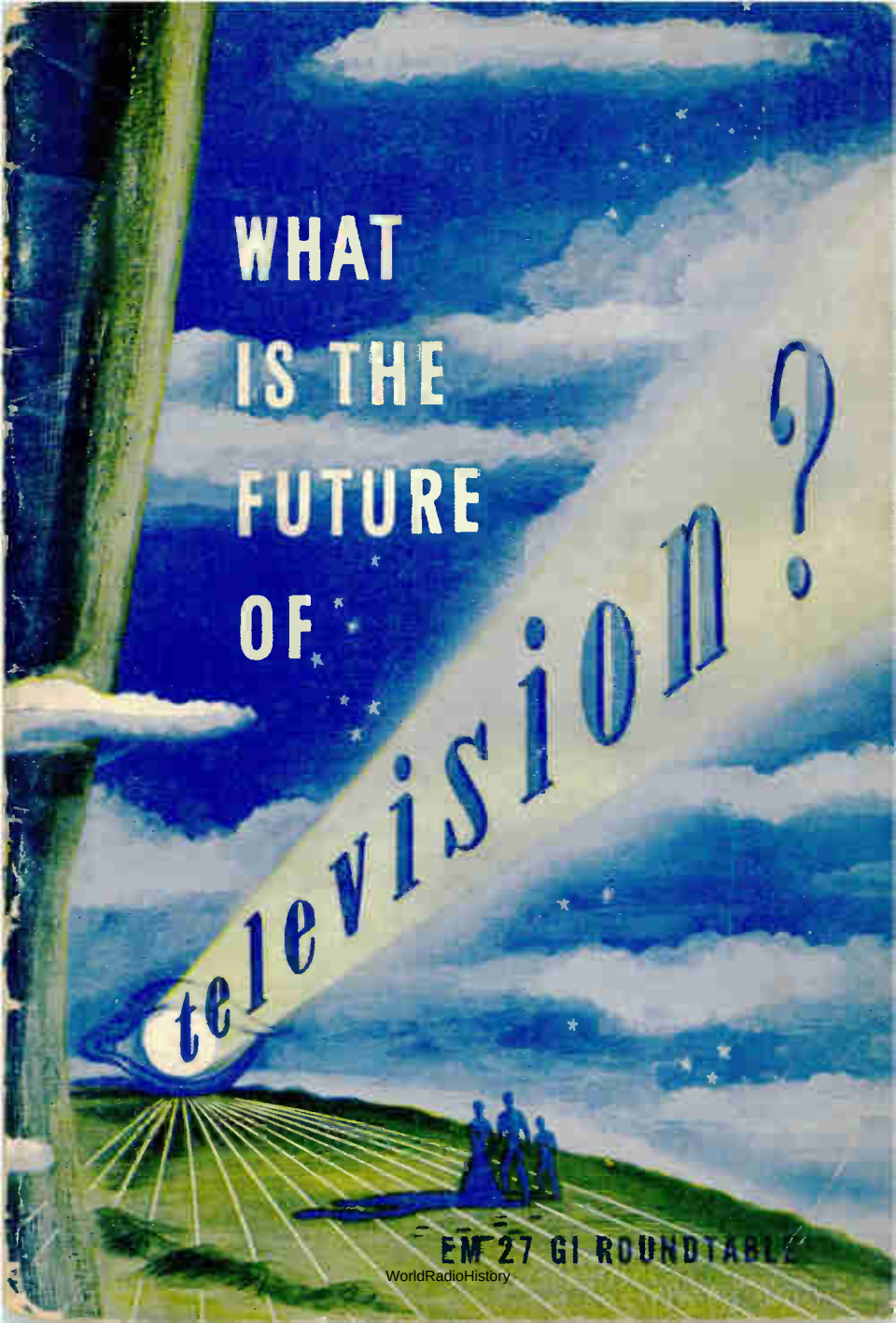

Prepared for
THE UNITED STATES ARMED FORCES
by

## THE AMERICAN HISTORICAL ASSOCIATION

This pamphlet is one of a series made available by the War Department under the series title *GI Roundtable.* As the general title indicates, *GI Roundtable* pamphlets provide material which information-education officers may use in conducting group discussions or forums as part of an off-duty education program, and which operators of Armed Forces Radio Service outlets may use in preparing GI Radio Roundtable discussion broadcasts.

The content of this pamphlet has been prepared by the Historical Service Board of the American Historical Association. Each pamphlet in the series has only one purpose: to provide factual information and balanced arguments as a basis for discussion of all sides of the question. It is not to be inferred that the War Department endorses any one of the particular views presented.

*Specific suggestions for the discussion or forum leader who plans to use this pamphlet will be found on page 45.*

WAR DEPARTMENT
WASHINGTON 25, D. C., 2 Aug 1945
[A.G. 300.7 (2 Aug 45).]
EM 27, *GI Roundtable: What Is the Future of Television?*

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IS TELEVISION READY FOR THE PUBLIC?

UNCLE SAM LOOKS AT TELEVISION

WHO ARE THE LEADERS IN THE FIGHT?

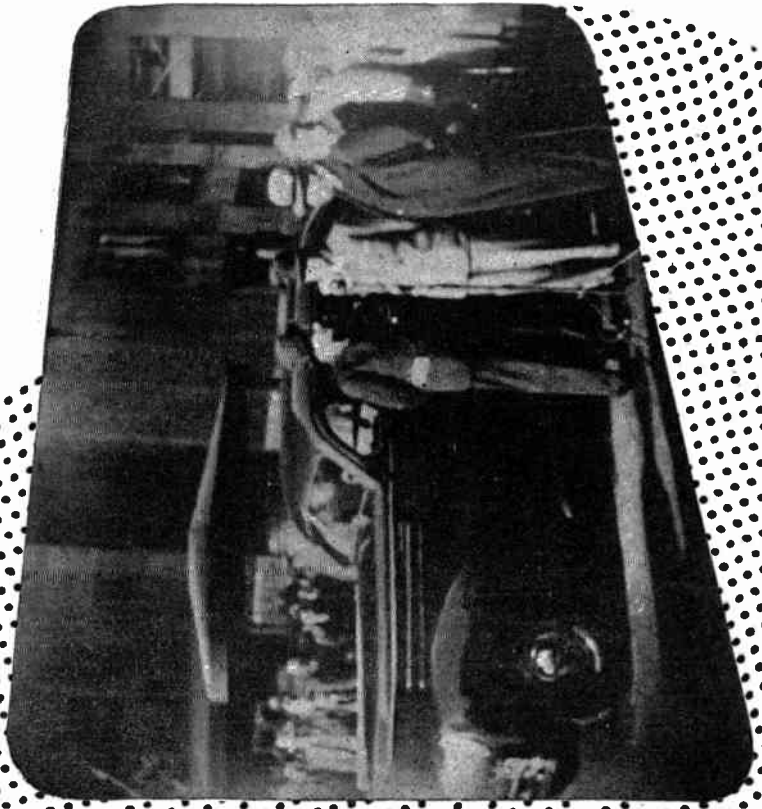
TELEVISION AND FAMILY LIFE


WHAT KIND OF TELEVISION?

SCIENCE WHERE MAGIC FAILED

A PICTURE BECOMES A PARADE

MOVIES AND TELEVISION



# WHAT IS THE FUTURE OF television?

WHEN THE BOMB BAYS of a B-29 swing open above Tokyo,* a dense fog may cover the city. The bombardier couldn't see the ground if he tried. But he doesn't try. It makes no difference to him for he uses radar to find his target, fog or no fog.

Clouds through which the human eye cannot see are no barrier to the echoing electronic waves of radar. And radar is closely akin to television. Wartime experience with radio direction and range finding is helping to answer many of the technical questions involved in television. The answers

**SCENE at the National Automobile Show in New York, 1938, photographed from the screen of a home television receiver.**

**This pamphlet was in press when Japan surrendered. Lines appropriate during the war have not been reconverted to peace.*

are bringing closer the day when you may be able to reach out into the ether and pull into your own living room a picture that moves.

## *IS TELEVISION READY FOR THE PUBLIC?*

Before the war about 7,000 television sets had been sold to the American public. The purchasers were all in or near a handful of cities, among them New York, Chicago, Philadelphia, Schenectady, and Los Angeles, where there were television stations broadcasting regularly scheduled programs. Television pictures cannot be picked up much farther away than 50 miles from the transmitter.

The persons who bought these sets paid anywhere from $175 to $600 for a bulky piece of furniture that gave them a blurry, greenish picture about 10 inches square. The programs they saw were good, bad, and indifferent. Some of the outstanding ones provided real entertainment. Among these, baseball, football, basketball, and hockey games have become regular television fare. There were also such special broadcasts as the circus, a performance of the opera *I Pagliacci* with stars of the Metropolitan, and a condensed version of the Broadway play *Susan and God* with Gertrude Lawrence.

Since the beginning of the war, television research has continued, and programs are being sent out by 6 commercial television stations and 3 experimental stations. Some stations are attempting "live" television shows with actors and actresses going through their paces in front of television cameras. However, most of the entertainment today consists of "canned" programs, or sound movies. Most of these are third-rate pictures that you wouldn't knowingly pay to see. Television studios cannot get good feature pictures from

the film studios because Hollywood fears that if it lets television show good pictures, people will stay home and not go to the movie theaters. In rebuttal, some television promoters have threatened to start making feature-length movies with big-name stars especially for television use.

### *The industry predicts*

Few industries are as ready to discuss publicly their postwar plans as are the television equipment manufacturers and the broadcasters. Newspaper and magazine advertisements are now being used to tell you what kind of television you'll be able to buy after the war and how much it will cost you.

The television industry is split into three groups, each of which has taken a definite stand. First, there are those who say television is ready for the public now. They want a green light so that television sets can replace other electronic equipment on the production lines as soon as wartime production slackens.

There are others who say that television is not ready for the public. They believe that the television picture you see on the present receiver can be improved by further experimental and laboratory work. Therefore, they say, a better picture should be developed before television sets are produced and offered for sale.

Finally, there are those who say nothing, publicly. These people have their own plans and ideas which they are keeping very much to themselves.

Is television ready for the public? The decision on that question rests chiefly with three groups. First, the United States government's Federal Communications Commission (FCC), which allocates the radio frequencies television will use. Second, the television industry — both manufacturing and broadcasting. Finally, you and the folks next door, the people who will accept or reject television.

*Should motion-picture studios make their good feature pictures available to television? Should television broadcasters produce their own motion pictures for the exclusive use of television? Would you, without knowing more about it, go out and buy a television receiver today, if you could afford it, just to have one?*

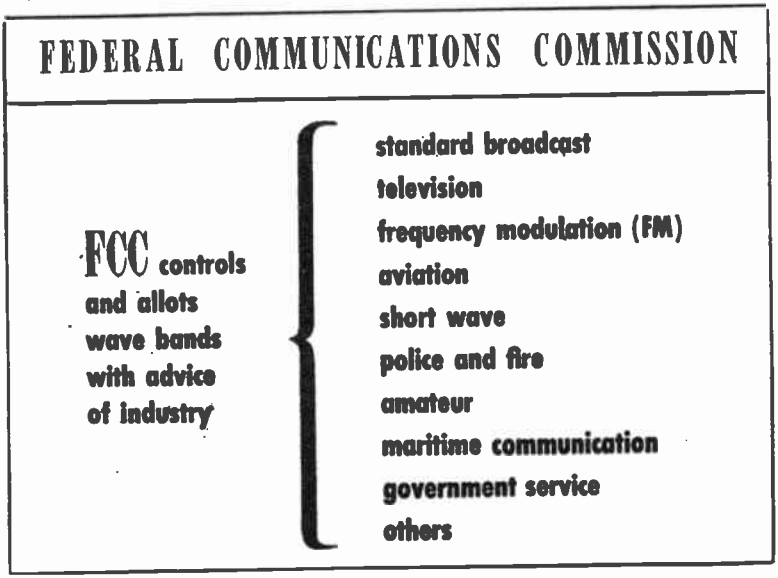
## *UNCLE SAM LOOKS AT TELEVISION*

The tall man with the whiskers and the red, white, and blue suit plays an important role in any consideration of television. When and what kind of television you can expect depends fundamentally on the frequencies used for transmitting television sound and pictures — and Uncle Sam's Federal Communications Commission allocates the frequencies.

It is FCC's job to decide, on the basis of television's importance as a public service in relation to the importance of other bidders, which frequencies should be assigned to television and which to the other services making use of the air waves. The other bidders include standard broadcasting (AM), frequency modulation (FM), aviation, short wave, police and fire, maritime communication, government services, and others who have a claim to a share of the radio "spectrum," as the whole range of frequencies is called. (See chart on p. 33.)

In the decisions handed down in May 1945, FCC assigned commercial television to the "lower" frequencies and proposed that it stay there for the time being. Meanwhile, however, FCC is encouraging research and experimentation which may show that better television pictures can be transmitted via the higher frequencies.

FCC maintains a staff of engineers and advisers to help it in making its decisions. It is their duty to make a thorough study of all claims to a share of the wave spectrum. The




communications industry has also set up a Radio Technical Planning Board (RTPB) comprised of leading engineers. Their job is to uncover as many facts as possible regarding all the various services desiring to make use of the spectrum, and to make recommendations to FCC for assigning frequencies to the various services.

Although FCC recognizes that much laboratory and experimental work remains to be done to improve television standards, it has kept the way open for commercial television at low frequencies. The 1945 allocations decisions left the commercial television broadcasters the lower frequencies already in use, but indicated that in the end these might be turned over to FM broadcasting and other radio services. In all its recent reports, FCC has put increasing emphasis on experimental work in the higher frequencies, with the intent of moving all television broadcasting "upstairs" later.

The commissioners have assigned commercial television to the lower frequencies where it now is because they believe it is in the national interest to have television get under way soon after the war. They don't want to do anything to slow up this new industry that unquestionably shows considerable promise. Also, it is an industry which, if given its head, may offer employment to thousands in the postwar years.

### *Why the controversy then?*

Right about here, someone usually struggles to his feet and asks, "Well, if no one knows what kind of a picture we are going to get on our television receivers because the space in the spectrum has not yet been definitely assigned, why do such leaders in the television industry as RCA and Philco say that the present picture is good enough for us, and why do others, like CBS and Zenith, recommend that better pictures be developed before television receivers are put on sale?"

Well, you might look at it this way. Some people like the present television pictures and recommend that everybody buy receivers built to present standards. Others think that better pictures can be produced and urge you to wait. If you happen to be a television set manufacturer or dealer, you are likely to recommend the present television pictures wholeheartedly. If you happen to be a broadcaster, your television programs and your ability to sell television to commercial advertisers depend upon the quality of pictures that your listeners can view in their homes. So you are likely to be a let-us-wait-awhile enthusiast. Of course you might happen to be both a manufacturer and a broadcaster, like General Electric. In that case it probably won't make any difference to you whether people get television now or next year — except that you will want to get back your investment in television research as soon as possible.

### *Battle in the spectrum*

Before the war, television was given permission to operate in the portion of the spectrum between 50 megacycles and 300 megacycles. Of course, television today doesn't have exclusive claim to this part of the spectrum; it has to share the spectrum with other services, such as government radio, ship-to-shore communications, and so on. Now one faction of the radio industry, headed by CBS, Zenith, and the Cowles Broadcasting Company, wants television to be moved upstairs in the spectrum. Television broadcasting on the ultrahigh frequencies above 400 megacycles will make possible, they believe, a wide-band, fine-screen system that will give you better pictures in your home.

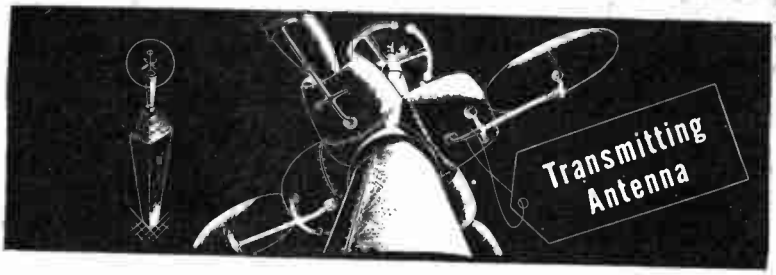
At the same time, wartime scientific research has shown that these same high frequencies are useful for ship-to-shore, ship-to-ship, ship-to-airplane, and other maritime and aviation services.

And so what was once the empty attic of the spectrum, now becomes a battleground. It is not a certainty that postwar television will be far enough advanced to make use of this portion of the spectrum.

*Should FCC have waited for engineering probabilities to become certainties before allocating channels for television in the radio spectrum? Would you crowd maritime and aviation services in the high frequencies to make room for commercial television? Should manufacturers be forced to wait until improvements are made in television before they start manufacturing sets, thus postponing any return on their investment in research and development?*

## *WHO ARE THE LEADERS IN THE FIGHT?*

The organizations engaged in manufacturing television sets and in broadcasting are intelligent and hard working. They




are trying to find ways to make money out of television and at the same time render a public service. Many of them are wealthy and have good records of public service in the radio field.

The speed with which television develops will depend to a great extent upon the companies involved. Like most fields, there are leaders who spearhead the movements. Leading the faction that says television will be ready for the public right after the war is the Radio Corporation of America. On the other side of the fence is the movement to have a better picture produced before sets are made available. This group is headed by the Columbia Broadcasting System.

RCA has tremendous engineering and manufacturing facilities and controls many basic patents. One of the two major radio networks, the National Broadcasting Company, is its subsidiary.

CBS is exclusively a radio network and its only link is with the Columbia Record Corporation, manufacturers of popular and classical phonograph records.

### *The go-ahead-now group*

The RCA-NBC group says that the present television picture is a good picture. They further say that improvements in studio apparatus, cameras, transmitters, and receivers, made possible by wartime inventions, will give a postwar

television picture much better than the prewar picture. They predict pictures larger than the present 9 x 12 inch ones since television receivers which project a picture on a fairly large screen, like a home movie, have been developed.

The RCA-NBC camp has held emphatically that the public should not be deprived of good television immediately after the war, in the hope that better television may be available somewhere from two to ten years later. They comment that television immediately after the war will supply jobs to thousands of people at a time when soldiers are returning from battle and people are being let out of war plants.

RCA-NBC technicians state that it has never been scientifically proved that television can be transmitted via the higher frequencies, and they pose the question, "What would have happened to the radio industry, or any other industry, if it hadn't put its products on the market until they were absolutely perfect?" Their answer is that we would probably *still* be waiting for radio to come along.

### *The wait-for-better-pictures bunch*

Looking at the other side, CBS and those companies that agree with it say flatly that the present picture is not good enough. They continue by saying that although it is not an engineering fact that television transmitted at high frequencies will produce better pictures, it is a strong possibility. They argue that an industry should develop the best product in its power before offering that product for sale to the public.

The strong point of the CBS contention is that 7,000 television receivers representing a public investment of about $2,000,000 and transmitting equipment representing a broadcaster investment of $20,000,000 are now in use. It's bad enough, they say, to nullify those investments, but it

would be far worse to let the public investment in sets run up to some $200,000,000 and the broadcaster investment up to a possible $50,000,000. If that should happen, television standards may be frozen at their present level and it may be a long time before the public gets better television. They point out that current models of television sets, once the standards are changed, become completely useless.

Continuing their argument, the CBS group states that if, as they believe, new television standards are inevitable, the quicker they come, the better for the entire country.

Furthermore, they point out, with mediocre reception, people might never buy enough sets to provide an economic base for broadcasting television. A truly fine picture may make the difference between eventual success and failure of the entire industry. If national advertisers who can pay for expensive and entertaining programs are to be attracted to television, it must deliver a picture as good as newspapers, magazines, and billboards, they state. The research necessary to prove the feasibility of this improved picture can be completed in one year of concentrated effort. And a year, in their opinion, is not too long to wait.

There you have it, the arguments lined up on both sides. Now let's see what some of the other people interested in television have to say about these arguments.

### *All problems solved*

All the important technical problems of television are either known or solved, according to an engineering official of the Farnsworth Television Corporation. Farnsworth, he states, is going to go ahead and manufacture television equipment for sending and receiving pictures immediately after the war.

The head of the DuMont Laboratories replies to the CBS arguments by saying that Columbia is not in a position to know of the many improvements in *present* transmitting

and receiving equipment that have been made since the beginning of the war. DuMont not only manufactures television equipment but operates a television station, WABD, in New York City, and has been broadcasting television several evenings a week for more than a year. CBS, however, has its own research staff and its transmitter located in Grand Central Station in New York.

Large shares of stock in DuMont Television are owned by the Paramount Pictures studio. Film producers are greatly concerned over television and are keenly interested in the possibility of showing television in theaters. Several of the other movie studios, including Twentieth Century–Fox, own stock in television manufacturing companies and broadcasting stations. Later on we'll look into this interest the movies have in television.

Over on the CBS side of the fence is at least one manufacturer, Zenith Radio Corporation. The press seems to lean toward the better-pictures-before-selling-sets idea.

### *The silent actors*

A great majority of the interested organizations have not been outspoken as to the future of television, but have simply proceeded with their plans. Typical of this group is General Electric. GE has been aggressive not only in the development of transmitting and receiving equipment but also in progressive programming and reviewing audience reaction to various types of television programs.

Several other manufacturers, including Westinghouse, Stromberg-Carlson, and the Crosley Corporation, have filed applications to operate television stations. Others, such as Emerson Radio, have indicated no plans for broadcasting but will probably manufacture receiving sets.

The Balaban and Katz theater chain in Chicago and the Don Lee West Coast radio network are building or operat-

ing television stations but have no interest in the manufacture of sets.

Newspaper publishers are becoming actively interested in television too. The *Milwaukee Journal* has a construction permit for a commercial television station, and the *New York Daily News* has filed an application to operate one.

The American Telephone and Telegraph Company (Bell Telephone) will probably have a say about television in connection with the development of television networks. One of the satisfactory ways of carrying television pictures from one transmitter to another is through a coaxial cable, produced and installed by AT&T.

During the war no more than six commercial television stations have been in operation, though three more have construction permits and await only the release of vital materials to be completed. Twenty-five experimental stations have been in operation, three of them with regular programs, and the construction of 20 more has been authorized. About half of the "experimental" stations are relay transmitters or portable pickup units used in connection with fixed broadcast stations.

FCC has a file of applications for new stations that early in 1945 totaled well over 100 for commercial stations, 7 for experimental, and 19 for relay stations.

Puzzling over the interests of broadcasters and receiver manufacturers and trying to figure, on the basis of their interests, whether they are working to speed up or slow down the coming of television into the home is like doing a jigsaw puzzle with about a third of the pieces missing. Only the individual companies know their real aims. How the puzzle is going to come out no one can predict today.

### *The last word*

In its allocation of frequencies to television in May and June

1945, FCC attempted to settle the "upstairs" or "downstairs" question of television for the time being.

The commission is convinced that wartime developments in the electronic art make possible a wide-channel television broadcasting system such as requested by CBS, Zenith, and others. It believes that better black and white as well as color pictures can be transmitted. It also points out that all the improvements made possible by these recent developments cannot be utilized in the 6-megacycle-wide television channel, asked for by RCA-NBC and others.

FCC does not believe, however, that broadcast service via 6-megacycle channels, plus improvements now available over low-frequency prewar television, should be abandoned, nor that commercial television should be held in abeyance until a wide-channel system in the ultrahigh frequencies can be developed and proved. It has endeavored, therefore, to assign as many 6-megacycle-wide channels below 300 megacycles as possible. In doing so it takes into account the needs of other services for frequency space in the same part of the spectrum.

It has been proposed to assign a total of 12 channels to television in the downstairs part of the spectrum. This will make it possible for as many as seven television stations to operate in one city.

In order that a television broadcast system may be developed for transmitting color pictures and better black and white pictures through the use of wider channels, a space has been made available in the upstairs portion of the spectrum for *experimental research*.

In their official report, the commissioners of FCC stated, "The time which may elapse before a system can be developed to operate on wider channels in these ultrahigh frequencies is indefinite and primarily dependent upon the resourcefulness of the industry in solving the technical

problems that will be encountered in this portion of the spectrum."

*Should John Q. Public be asked to buy a television set right after the war, with the full knowledge that it may become obsolete in a short time? Should the people who advocate better pictures before television sets are offered for sale be given a year to prove their point, and possibly come up with better pictures? Why would motion-picture studios be actively interested in television? If you were a broadcaster would you advocate going ahead with television, or would you prefer to hold off for better pictures? Was FCC fair to the CBS-Zenith-Cowles group in deciding to allocate to television frequencies in the lower part of the spectrum, rather than waiting or giving them a chance to prove their point?*

## *TELEVISION AND FAMILY LIFE*

You can reasonably expect some changes in your family life when a television receiver becomes a household appliance. A member of the old Federal Radio Commission, predicts that when television receivers become as generally used as radios and telephones are now, family cars will stand idle, saving gasoline and tires. Movies, best-selling novels, detective stories, and lengthy telephone chatter will be sacrificed, he says, as the family group gathers to watch news, drama, sports, and travel scenes on the television screen in the living room.

Even home decorations may be affected. Furniture in the future may be chosen with a view to being readily rearranged to form a family audience group facing the television screen. Living room curtains may be selected with an eye to blocking out daylight during the telecast of afternoon football games.

Family buying methods may be affected when the household can see articles demonstrated over the air. What will happen when little Johnny looks at the television screen and sees a pretty little blonde girl taking a dose of chocolate-flavored cod-liver oil? "Yum-yum," she smiles and says, "It tastes better'n a choc'lat soder, and it does me lots of good too!" Will mom or dad have to rush right down to the drugstore and buy a quart of the stuff?

### *No advertising?*

Some people believe that there should be no advertising on television — that it should be government operated just as radio and television are now in England. Generally speaking, these are the same people who want all commercial advertising eliminated from the radio. There may be some noncommercial television stations supplying educational programs to the television audience, but it is quite likely that the commercial advertiser is going to pay the bills in this new entertainment medium just as he now foots them for the radio.

It should be remembered that there is no hard and fast rule that commercial sponsors must pay the bill of television. An attempt may be made to have the government subsidize television. Under such a system, set owners would pay a part of the bill through a nominal yearly tax on their sets, just as they pay a tax on their automobiles. Given the present close alliance between radio and television, with advertisers paying the way of radio, it is probable that advertisers will pay the way of television too. Set manufacturers, like General Electric and Philco, are already wooing advertisers by giving practical demonstrations of television commercials.

Broadcasters point out that there would be no Bob Hope, Philharmonic Symphony, Information Please, or William L. Shirer on the air if it were not for the commercial

advertiser. Radio stations or networks could not afford to pay the fees of these top-flight artists without the income from sponsored programs.

Subscription television, like subscription radio, has been suggested. In this system the listener pays the bill so that he can enjoy good programs without advertising plugs. A private commercial company would lease a "de-jammer" for a nominal sum. With one of these de-jammers attached to your television set you would be able to pick up special television programs broadcast at special frequencies. On the ordinary set, without the de-jammer, the picture would be picked up only as a distorted blur and the sound as a pig-squeal.

Since there are only a limited number of frequencies in the radio spectrum for the use of all radio services, including television, it seems unlikely that FCC will allocate frequencies for subscription television or radio. Neither makes a contribution to the safety of life and property nor serves a substantial public need. Most authorities, therefore, do not consider them as being in the public interest.

Powerful interests are behind the subscription radio plan, however. A leader in the field is the Muzak Corporation, which at present provides music for restaurants and public gathering places on a leased-wire basis. Interests just as powerful may one day back subscription television.

### *What you'll be seeing*

Television entertainment will include three basic types of programs. One is the studio presentation, that is, anything which is enacted in the studio. Second, is the outdoor event, including baseball games, rodeos, ice shows, boxing and wrestling matches, which will be picked up by remote-control equipment. The third type of program will be made up of sound motion pictures. Due to their low cost, many of the

television programs being sent out today rely on sound movies for entertainment. Live talent costs money.

Many advertisers believe the old Chinese proverb that "one picture is worth ten thousand words" and are already taking an active interest in television as a possible sales promoter. A cosmetics manufacturer sponsors a program showing women how to apply liquid stockings to their legs (even the men look at this advertising plug). A soft-drink bottler presents a hillbilly show. A plastics manufacturer uses television to give potential customers a peek at his postwar offerings. And a maker of sporting ammunition presents a wildlife forecast of interest to hunters.

Several schools and colleges, planning extension courses, hope to use television to bring the classroom into the home. Television may at some future date make it possible for people to see and hear Congress in action or have a ringside seat at important criminal trials, big government conferences, and other public events. Medical students will be

able to watch surgical operations that are being performed several hundred miles away.

### *Charlie McCarthy or the Chicago Roundtable?*

Like radio, however, television will probably serve primarily as an entertainment rather than an educational medium. A comprehensive survey of radio program types made in 1942 by *Broadcasting* magazine shows that over 70 per cent of the nighttime radio programs were of a noneducational nature (humorous, audience participation, variety, popular music, comedy drama, and the like). Probably only a small percentage of the remaining programs (commentators, news, talks, classical and semiclassical music, straight drama, melodrama) could be called "educational" in any strict sense.

The "educational uplift" value of television may prove much more limited than many people, including some educators, believe. There is little reason to suppose that Joe and Josephine Doaks will watch a laboratory demonstration of the manufacture of synthetic rubber in preference to a performance by Robert Taylor and Hedy LaMarr. After all, they don't now listen to the University of Chicago Roundtable in preference to Charlie McCarthy or Dinah Shore.

Much has been done in recent years to make education entertaining—in radio through such programs as *Cavalcade of America,* and in motion pictures with such epics of history as *Abe Lincoln in Illinois, Wilson,* and the *This Is America* short subjects. Walt Disney has learned to teach by cartoons, and his animated cartoon *Reason vs. Emotion* is a good example of bringing science within the range of the man in the street. These same techniques, plus a wise selection of subject material, may bring to television more educational programs than radio now enjoys.

Some believe that television will be utopia by the fireside.

They feel that it is destined to provide knowledge to large numbers of people, truer perception of the meaning of current events, more accurate appraisal of men in public life, and a broader understanding of our fellow human beings. This may be a lot of hot air. On the other hand, when television receivers become as popular as radio sets, television will probably have a definite influence on our way of living and will become a valuable new tool for mass education.

*Do you agree that television will have a revolutionary effect on family life? If television advertising makes people want to buy more products, would this have a good or bad effect on our economy immediately after the war? Should advertisers be prohibited from using television to sell their wares? Would you study some academic subject in a television classroom? In the light of the limited number of frequencies that exist, should FCC allocate space in the spectrum to subscription television? Is it desirable for FCC to put into the hands of a commercial company the privilege of using such radio space when that group plans to shut out potential listeners?*

## *WHAT KIND OF TELEVISION?*

To the television set owner the most important thing is the kind of picture he is going to have to look at. Today's picture is made up of 525 lines and appears on a screen generally measuring not more than 9 x 12 inches. To get a better idea of what this means, imagine a sheet of paper the size of the present television screen. Streams of electrons "paint" a picture on it in varying shades of light and dark. The painting is done one line at a time, in much the same way that a page is typed on a typewriter.

A complete new picture — like a new page of 525 lines, each line a fraction of an inch lower than the preceding

one — is painted 30 times a second. When the 525th line is completed at the bottom of the screen, a new picture is instantaneously started at the top of the screen. With 30 new pictures every second the viewer gets the same effect of motion as he would get by running 30 frames of movie film through a projector every second.

To get some idea of how fast television pictures are painted, we can recall that the average typewritten page, single-spaced, has 2,000 characters including letters and punctuation marks, but not including spaces. One television picture has 260,000 characters, equal to about 130 pages of typewriting.

The Bible contains 3,500,000 letters and punctuation marks. Television transmits that number of characters in half a second.

If science is able to perfect the transmission of television pictures at high frequencies, more lines can be put on the screen. A 1,000-line picture would contain 585,000 characters and presumably be twice as good. In order to produce a 1,000-line picture, it will be necessary to alter completely the 525-line system. This means that in the event of a switch-over all receivers manufactured for 525-line television will become obsolete.

As a result of the FCC's allocation proposals, manufacturers will go ahead after the war and produce sets for receiving the 525-line picture, and some, if not all, broadcasters will send out programs that can be picked up by these sets.

### *War improvements cut costs*

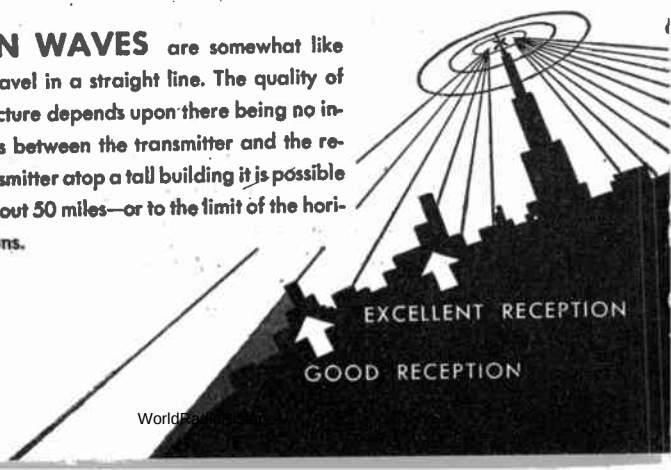
Facilities for manufacturing electronic devices for wartime use will be available when peace comes for the production of television receivers and equipment. This will bring down the price you will have to pay for your television set. For

example, the prewar cathode-ray tube, the electronic tube that takes electrons and makes them paint a picture before your eyes, costs about $60. After the war this tube will cost only $20.

According to manufacturers, the first television sets will cost anywhere from $75 for table models to $600 for de luxe television-phonograph-radio combinations. The cost of a television receiver depends largely on the size of the picture, since the larger the picture, the more tubes and gadgets are needed. Prewar sets with a 9 x 12-inch picture had about 27 tubes for television reception only. After the war, it is expected that sets will show 18 x 24-inch pictures, large enough to be viewed comfortably in the average living room.

Systems of mirrors and lenses are now being developed to project on a screen television pictures picked up from the receiving tube. One such system consists of a spherical front mirror and an aspherical lens. The mirror looks like a shallow bowl; the lens is flat on one side, and the opposite side has a special surface contour. The mirror arrangement follows the principle of the reflecting telescope, used by astronomers for many years.

The projection system in the illustration on page 39 is mounted near the bottom of the receiver cabinet and it projects the image straight up onto a flat mirror inclined at




**TELEVISION WAVES** are somewhat like light waves and travel in a straight line. The quality of reception of the picture depends upon there being no intervening obstacles between the transmitter and the receiver. From a transmitter atop a tall building it is possible to send pictures about 50 miles—or to the limit of the horizon—in all directions.

45 degrees. The mirror throws the image onto the screen or onto a translucent plate of glass built into the front of the cabinet. This arrangement presents the advantages of compactness, and the cabinet need not be much larger than the present floor-model radio console.

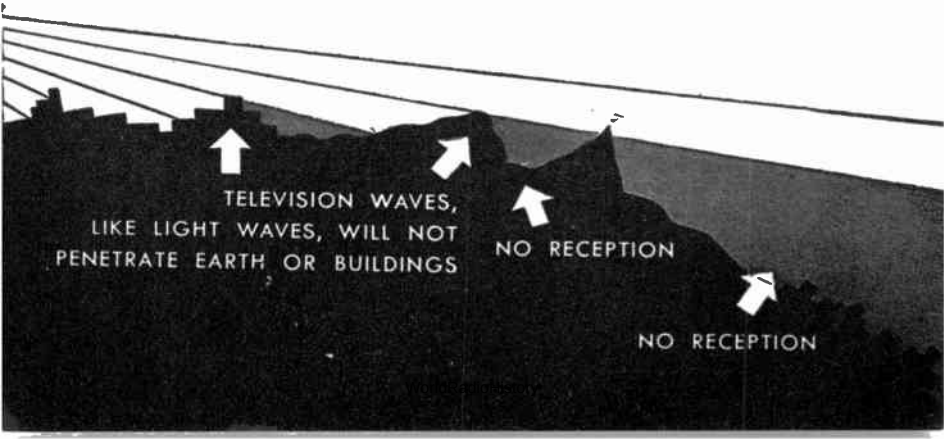
Prewar television pictures had a disagreeable greenish cast, caused by the fluorescent screen of the cathode-ray tube. Wartime research has created a new kind of fluorescent screen that gives a black and white picture almost as good as a newspaper half-tone.

The flat cathode-ray tube, used in 1941, made it necessary for the spectator to stand directly in front of the screen in order to see an undistorted picture. A new rounded tube has been developed during this war that throws the picture on a curved surface. This new tube gives a clearer picture that may be viewed from many comfortable angles.

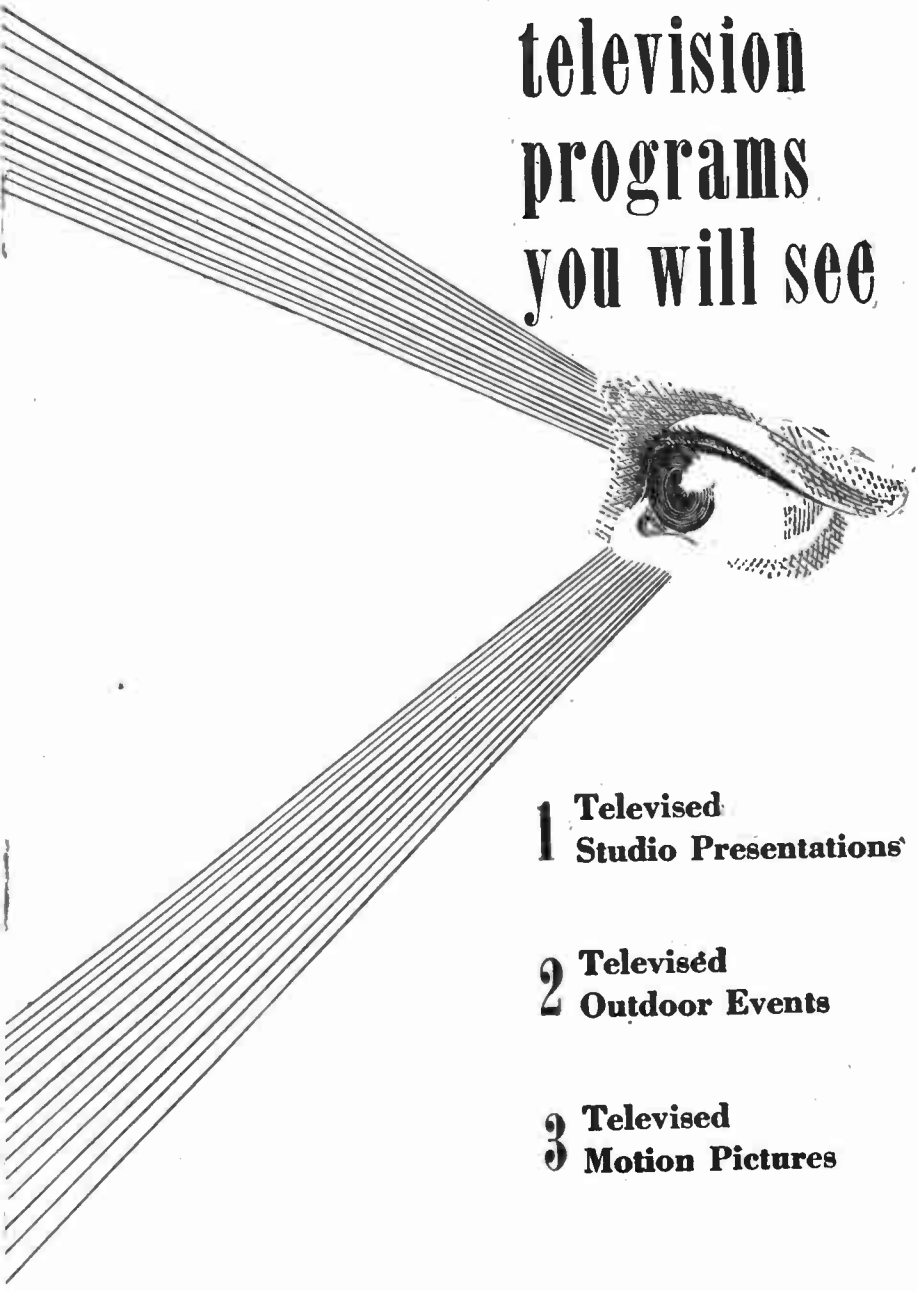
### *Look before you buy*

Unless you live 50 miles or less from New York, Chicago, Washington, Philadelphia, Schenectady, or Hollywood, you cannot, at the present moment, receive pictures on a television set. So don't rush out and buy one right away or order one from a mail-order house as soon as they are available. First you had better make sure that you are within the transmitting area of a television station.

During wartime there are six commercial and three ex-



# television programs you will see



1 Televised Studio Presentations

2 Televised Outdoor Events

3 Televised Motion Pictures

perimental television stations broadcasting regular programs and covering an area in which about 27,000,000 people live. Plans are under way for at least one national television network linking the major centers of population throughout the country. This network is not expected to be in operation before 1950, however.

Radio waves at television frequencies act somewhat like a powerful searchlight. Most picture-carrying waves will not follow the curve of the earth's surface, nor will they go through a hill or even a building, like the radio waves which now carry sounds. Therefore, the service area of a single television transmitter is limited.

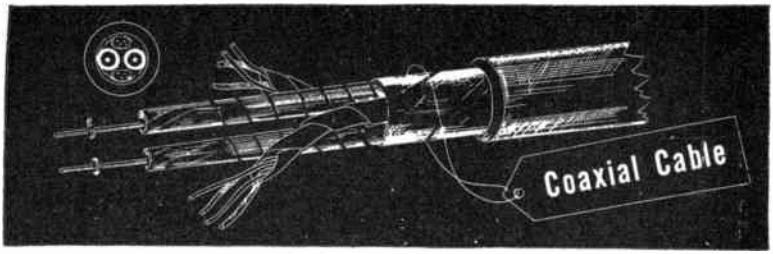
The quality of the picture reproduced on your set depends upon there being no intervening obstacles between it and the transmitter. It is desirable, therefore, to have both the sending and receiving antennas as high up in the air as is conveniently possible.

From a transmitter atop the Empire State Building it is possible at present to send pictures a distance of about 50 miles. Of course there are places not 5 miles from this transmitter where no pictures can be received or where reception is very poor because there are obstacles between the transmitting and receiving antennas.

### *Network possibilities*

Because of the very high frequencies involved, television programs cannot be transmitted by wire.

This means that we cannot have a national network of television stations linked together by ordinary telephone wires as radio stations are. A solution to this problem may be found in the coaxial cable, a special wire that can carry high television frequencies. However, these cables are expensive. One well-known radio man estimated that a cable connecting New York and Los Angeles would cost nearly




half a billion dollars. Plans are under way, nevertheless, for developing such a network.

Another possible solution to the problem of developing a television network may be a system of relay stations. Under this system, a program sent out by one station is picked up by another station 50 miles away. The second station rebroadcasts the program to a third station, which in turn rebroadcasts it to a fourth station, and so on.

There is every likelihood that by using the coaxial cable or the relay system, or a combination of the two, we will one day have a national television network. Today the television signal likes to stay near home, but science will find ways to make it venture out and eventually cover the world.

All this boils down to the fact that if you live in a smaller town, you'll probably have to wait until a television station is set up nearby or until your town is made a link in a television network. If you live in a big city, you may start shopping for a set as soon as they come on the market.

### *Buy wisely*

Buying a television set is going to be like making an investment in a washing machine or an automobile. It will set you back from $100 up, and you'll want to be sure of getting your money's worth.

Before you start looking for a receiver, check up on the television station in your area and find out whether its pro-

grams interest you. What's the use of buying a television set if the only programs you can get are ones you don't like?

The first time you see a television picture, your enthusiasm for the novelty of it will probably cause you to believe it a little better than it actually is. Don't let the salesman double talk you into buying one before it is demonstrated in your home. Who knows, you may be living in a "dead spot" where it is not possible to pick up television pictures.

Before you buy, sit down and watch television programs in your own home for at least one hour. Decide for yourself whether you think the picture is good enough and get some notion of exactly how much eyestrain is involved.

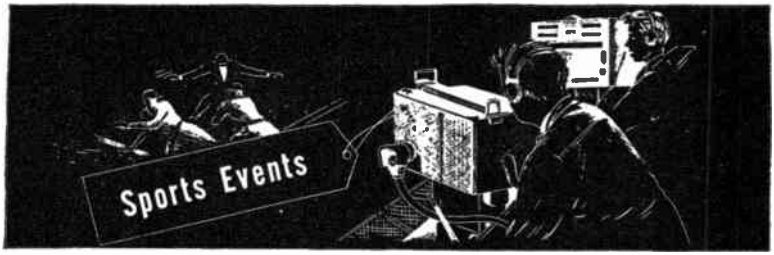
You should also find out how long it is likely to be before the set you are going to buy will become obsolete. It is not likely that reputable television set manufacturers, like those mentioned earlier, will risk public good will by offering for sale sets that may be obsolete in anything less than two years.

### *Color television*

We haven't talked about color television up to now because, although the authorities don't agree, color television seems a long way off. Color television is to black and white television what technicolor is to ordinary motion pictures. It is still in the research laboratory, but one day the complex problems will be solved and you'll be able to see telecasts in natural colors. In the meantime, black and white television will be the order of the day.

A number of methods of transmitting pictures in natural color have been demonstrated. The most recent method makes use of a whirling transparent disc in the television camera in the studio and a similar disc in the receiver at home.

Both discs are divided into three segments, one tinted




red, another yellow, and the third blue. In operation, the color disc on the camera televises one picture in red, the next in yellow, and the next in blue, then it starts back with red again. The disc at the receiver end successively colors the pictures red, yellow, and blue as they are received on the screen. Persistence of vision on the part of the viewer assembles the red, blue, and yellow pictures into a completely colored image.

The big disadvantage of this method is the inconvenience of having to look through a whirling disc in order to view the color pictures.

Another method of producing color television paints the pictures electronically. The electronically painted color picture contains more than three times as many elements as the black and white picture. It blends about 900,000 tiny characters into each picture. Only 20 pictures a second can be transmitted, compared to the 30 pictures a second sent by black and white television.

Color television is definitely on the way. When it does come, it will give added realism and emotion to the television screen in addition to the new factors of warmth, life, and beauty that black and white pictures do not possess.

*What is the most important thing to you in buying a television set — quality of picture, kind of programs available, or color pictures? Surveys show that 83 per cent of the*

*people in the United States want television sets in their homes. Is $100 too much to ask them to pay for a set? Should they be denied television until improved pictures are available? Will projection television be more popular than direct view television? Should sets be built so that you can switch from one to the other? Will the establishment of television stations in the bigger cities cause people to move in from areas where television is not available? Will color television render previously sold black and white transmitting and receiving equipment obsolete? Should television be held up until color is perfected?*

## SCIENCE WHERE MAGIC FAILED

Where magic has failed, science succeeds. For centuries, man has dreamed of being able to see things happening hundreds of miles away. Sorcerers concocted magic brews, soothsayers gazed long and hard into crystal balls, and magicians tossed mystic powders into pools of clear water — all to no avail. Not until the development of television, was man able to see as well as hear distant events in his own home as they happen.

How is this possible? How can these pictures and sounds move invisibly through space, then suddenly become visible to us on a fluorescent screen?

### *The wave is quicker than the eye*

Let's imagine that we have a pool of water and a stone. If you toss the stone into the water, ripples or waves travel outward from the place where the stone entered the water in ever-widening circles. These ripples or waves diminish in height as they get farther away from the starting point.

Sending and receiving sound and pictures through the air consists of creating and detecting *electromagnetic waves* in a great pool of space.

If we look at those ripples on the water more closely we notice that there is a *definite distance* from the crest of one ripple to the crest of the next. This is called *wave length.* Even though they are not visible, electromagnetic waves have a wave length, or a definite distance from crest to crest. Scientific instruments measure the distances in meters and centimeters.

The *frequency* of a wave is the number of waves which occur in a second. If a wave is said to have a frequency of 10,000 cycles a second, it means that 10,000 of these waves will pass a given point in one second. We cannot send or receive sound or pictures without considering both the wave lengths and their frequency.

### *The electronic highway*

Ordinary alternating electric current used in homes reverses its direction of flow in the wires 60 times a second. Therefore, we can say that such a current produces an electromagnetic wave of 60 cycles a second.

This is too low a frequency for radio or television because at this frequency electromagnetic waves travel only very short distances. By increasing the frequency to about 10,000 cycles (10 kilocycles) a second, we find waves suitable for transmitting radio programs. We can use the range up to 300,000,000 cycles (300 megacycles) and higher for sending sound and pictures.

We can keep going along the electronic highway until the waves increase in frequency to a point where they begin to have a heating effect, at about 1,000,000 megacycles per second. These are heat waves or infra-red rays.

When the frequency reaches 375,000,000 megacycles, electromagnetic waves become visible, and we have light waves. Beyond 750,000,000 megacycles we can no longer see these waves for they become ultra-violet rays, which

cause a healthy sunburn if you are exposed to them long enough.

Just for the fun of it, we can keep going along the electronic highway to a point where we come to rays which can penetrate the body and metals and wood. We call them X rays. As we move along, the frequency becomes even greater and we reach the gamma rays, such as radium produces. Finally we reach cosmic rays at the known end of the electronic highway. These waves have frequencies as high as 10,000,000,000,000,000,000,000,000 cycles per second.

### *Dissecting the spectrum*

From this journey up the electronic highway we can see that only a small part of the highway is used for radio and television. This portion, from 10,000 cycles (10 kilocycles) to 30,000,000,000 cycles (30,000 megacycles), is called the radio spectrum.

If we think of this part of the electronic highway as having a definite length, like five inches measured on a yardstick, the problem becomes apparent. Since each radio and television station occupies a certain portion of the highway rather than just a point on the dial, clearly there is space in the radio spectrum for only a certain number of them.

The amount of space turned over to any one service will depend upon the importance and the extent of the service. There is a constant clamor for parts of the radio spectrum. Not only do radio broadcasters want as much space as they can get, but marine, aviation, FM, television, police, government, fire, and amateur broadcasters want as much space as they can use.

In the United States, as we pointed out earlier, nongovernmental users of space in the radio spectrum receive

# THE PRESENT ELECTRONIC HIGHWAY

Allocations in the radio spectrum are roughly those in force June 1, 1945. Divisions in the upper part of the highway are approximate.

1000 cycles (C) equal 1 kilocycle (KC)

1000 kilocycles equal 1 megacycle (MC)

| | |
|---|---|
| 1,000,000,000,000,000 MC | COSMIC RAYS |
| 10,000,000,000,000 MC | RADIUM GAMMA RAYS |
| 10,000,000,000 MC | X RAYS |
| 750,000,000 MC | ULTRA-VIOLET RAYS |
| 375,000,000 MC | VISIBLE LIGHT |
| 1,000,000 MC | HEAT WAVES (INFRA-RED RAYS) |
| 300,000 KC | EXPERIMENTAL RADIO & RESEARCH |
| 170,000 KC | TELEVISION BROADCASTING |
| 108,000 KC | POLICE, FIRE, GOVERNMENT AND MISC. SERVICE |
| 42,000 KC | TELEVISION AND FM BROADCASTING |
| 1600 KC | SHORT WAVE BROADCASTING AMATEUR, AVIATION, POINT TO POINT POLICE, FIRE, AND MARINE RADIO |
| 550 KC | STANDARD BROADCAST |
| 200 KC | GOVERNMENT RADIO |
| 10 KC | LONG WAVE RADIO |
| 60 C | HOUSE CURRENT |

RADIO SPECTRUM

their allocations from FCC. However, the United States is not the only nation using radio. Progress in the field of communications has been greatly accelerated within the last two and a half years, and soon after the war it will be necessary for all nations to participate in a world communications conference to discuss the allocation of radio wave bands to television, FM, and other radio services.

Otherwise, for example, Great Britain might set aside a certain section of the radio spectrum for the use of maritime radar anticollision devices, and the United States might set aside the same section for television. A British ship entering New York harbor on a foggy night and using the radar detector at British frequencies would disrupt the local television programs, and television would gum up the radar device. This is just one illustration of the difficulties ahead unless an international conference determines just what portions of the radio spectrum will be set aside for the various types of communication.

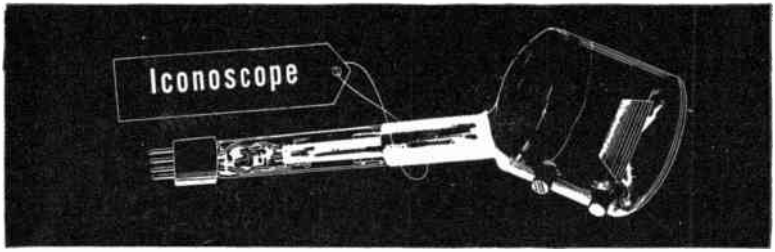
*How important is television compared to standard broadcasting? Will television eventually take the place of regular radio? Should radio set and television equipment manufacturers wait until a world conference has been held before going ahead and producing their products?*

## *A PICTURE BECOMES A PARADE*

Now, we're going to find out how television works.

Let's start in the television studio. Suppose we want to televise Linda Darnell. Television has three main jobs to do to bring Linda Darnell in motion into your living room. It must take a continuous series of pictures of her, it must send them through space, and it must reproduce them for you.

The studio from which Miss Darnell is to be televised looks very much like a movie studio. There are a large and




experienced crew of technicians, cameras, big lights, sets, props, microphones, and so on.

### *The iconoscope*

The television camera, which looks like a studio motion-picture camera, is wheeled up in front of Miss Darnell. The picture is lined up, just as a movie photographer would do it. The sound technician swings a microphone above Miss Darnell's brunette head, close enough to pick up the sound of her voice, but out of the range of the camera's lens.

The light reflected from Linda Darnell's face and figure passes through a system of lenses into the inside of the television camera, which engineers call the "iconoscope."

Inside the iconoscope, Miss Darnell's image is projected onto a rubidium metal plate. This plate is called a "mosaic" and is mounted inside the cathode-ray tube.

Although it is smaller than a penny post card, the mosaic contains several hundred thousand electric eyes. Every time a ray of light falls on one of these, it stimulates a minute electric charge, the amount of the charge varying in proportion to the intensity of the light falling on the electric eye.

By this means we have converted the light waves of Miss Darnell's image into electric charges of varying intensity.

### *The electron gun*

The problem now is to pick these electrical impulses from

the mosaic, arrange them in order so that they can be broadcast, and put them back together in your television set so that you will be able in your home to see Linda Darnell as she appears in the studio.

This job is done by the smallest thing yet discovered in the world—the electron. In the neck of the cathode-ray tube, there is an "electron gun" that shoots a steady stream of rapidly moving electrons onto the mosaic. This is called the cathode beam.

Controlled by magnets which bend it from side to side and gradually downward, the cathode beam "scans" the mosaic in successive horizontal lines. One by one and row by row it spotlights the cells of the mosaic just as you are scanning the words on this page right now. The main difference is that the electron beam moves a great deal faster than your eye. If there were 525 lines of type on this page, instead of about thirty-five, and if you could read thirty of these pages a second, then the comparison would be exact.

As the cathode beam passes over each cell in turn it releases the tiny charge built up in each one. Remember that where the image is bright the charge is stronger than where the image is dark. The resulting series of small electrical impulses is picked up by a second plate sandwiched to the back of the mosaic and led out of the cathode-ray tube as a current of varying strength. It is this fluctuating current that goes to the television transmitter to be amplified and broadcast.

If television were as simple as this description sounds, we would probably have had it years ago. Actually it took scientists almost a century to develop a satisfactory iconoscope, once the idea for it had been born. The mathematics of what goes on inside the cathode-ray tube is by itself complicated enough to send an Einstein off to the seashore for a vacation.


### *The kinescope*

After Linda Darnell's picture has been transmitted from the mosaic to the television broadcasting station, it is amplified and sent out into space in a parade of about 10,000,000 impulses a second. These impulses finally reach the television antenna on the roof of your house. They march down the lead-in wire of your set, where they are again amplified by electronic tubes and sent into another funnel-shaped cathode-ray tube called the "kinescope."

The kinescope has a cathode beam shot from an electron gun just like the one in the iconoscope back in the television studio. But at this end the intensity of the beam, instead of being steady, varies in accord with the incoming impulses.

Instead of a mosaic, the kinescope has a screen at the end of the funnel. This screen is coated with a fluorescent material that glows when electrons strike it. A set of magnets, working in harmony with those of the iconoscope, swings the kinescope's cathode beam back and forth across the screen at the same time that the electrical impulses are transmitted from the mosaic in the studio miles away.

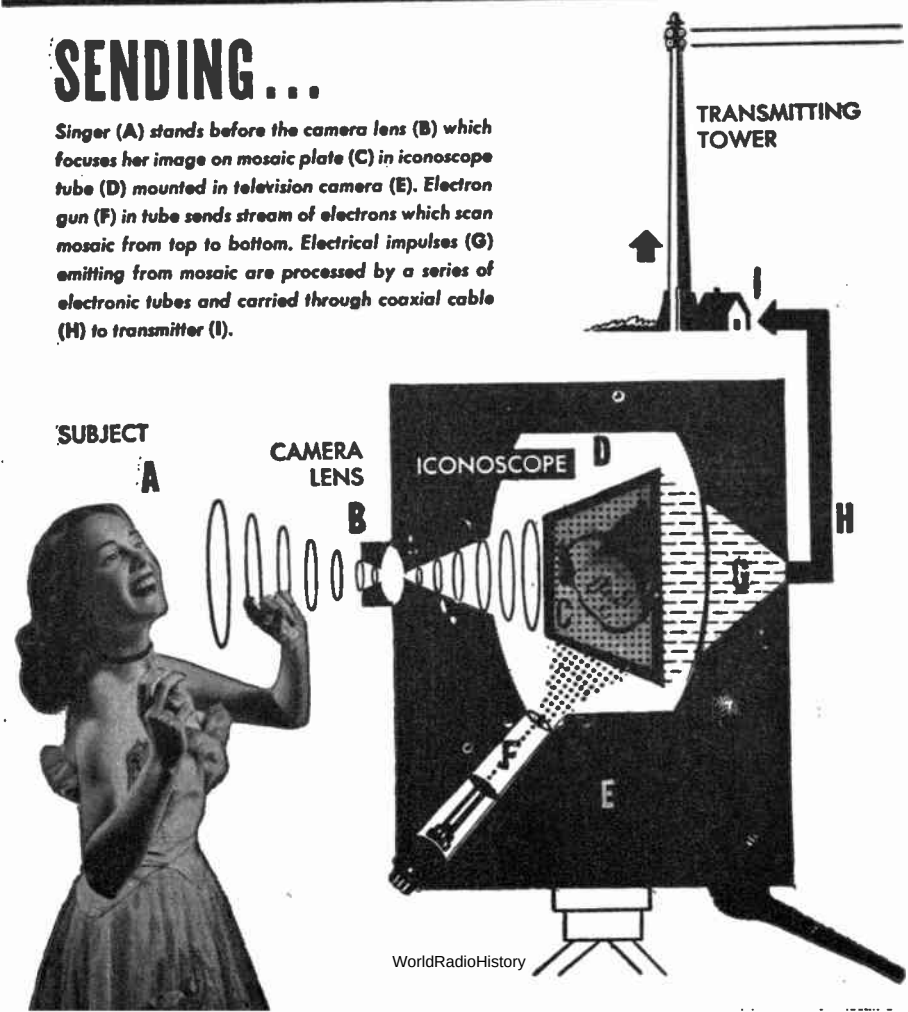
Depending on the strength of the electron beam, each of the little pieces of Linda Darnell's picture glows light or dark on the screen. The result is a picture of her that is renewed 30 times every second — a continuous series of pictures of her for you to enjoy just as a motion picture.

**How television works** The television camera or televisor, consists of the iconoscope, an electric tube, which converts the light image into an electrical signal. The camera is trained on the person or scene and the image is focused on a photo-sensitive plate at the back of the tube. The tube converts the image into a series of electrical impulses which are amplified and shaped into wave forms by vacuum tubes. The impulses are carried by cable to the antenno and there transmitted.

The television receiver picks up the television waves, retranslates them into a

# SENDING...

*Singer* (A) *stands before the camera lens* (B) *which focuses her image on mosaic plate* (C) *in iconoscope tube* (D) *mounted in television camera* (E). *Electron gun* (F) *in tube sends stream of electrons which scan mosaic from top to bottom. Electrical impulses* (G) *emitting from mosaic are processed by a series of electronic tubes and carried through coaxial cable* (H) *to transmitter* (I).



stream of electrons which plays across a fluorescent screen in the large end of a kinescope tube. Electrical impulses are converted by the tube into light. The varying degrees of light form the image of the person or scene on the screen of the television receiver. Actually a series of still pictures are being broadcast at the rate of 30 per second which, when observed, form a smooth continuity of action similar to motion pictures which operate at 24 frames a second.

At the same time, the sound waves are broadcast and received through a radio which is part of the television set, so that you both see and hear the program.


*The receiving antenna (J) picks up television waves which are carried to receiver (K) in which kinescope (L) transposes the electrical impulses into light image on a fluorescent screen (M) which is at the large end of the glass tube. Reflecting surface (N) projects image on larger screen (O).*


The high speed with which these pictures change gives you very little flicker. The glowing television screen is fairly bright, but the pictures show up best when viewed in a darkened room.

The voice of Linda Darnell, to accompany the picture, is broadcast over another radio system and is received through a separate radio in the same cabinet with the television receiver.

Scientists are working to improve and perfect a method of sending both sound and pictures together. By turning the voice into electrical impulses and projecting it onto the mosaic at the same time that the picture is picked up, sound could be carried along with the picture like a sound track on motion-picture film.

### *Mobile television*

We have followed the image of Linda Darnell from the studio to your living room. But television is not confined to indoor or studio programs alone. Mobile field units, consisting of a power supply, camera, and microphone, and a low-power transmitter have been designed to pick up pictures of outdoor scenes. These units will make news and special events a primary source of television programs.

After the war, you won't need to have a sports commentator tell you that the ball has been put in play, the pass

completed, the tackle made, and so on. If you have a television set, you'll see it all, as it happens, with your own eyes.

Several television stations have mobile transmitters in use today. The University of Pennsylvania football games have been telecast for several years, and television audiences have enjoyed Madison Square Garden events—rodeos, ice shows, tennis tournaments, and boxing bouts. Television audiences have also witnessed political conventions, speeches by the president, the feeding of seals at the Bronx Zoo, Fifth Avenue parades, and other events.

Portable camera and transmitter units may be set up for special events anywhere within a ten-mile radius of the main transmitter. Ten miles is the maximum effective range of the portable relay transmitter. This range is long enough, however, to permit the pickup of most locations within a big city.

*What types of programs might be best suited for studio presentation? For remote presentation? Would there be enough interest in such features as feeding the seals at the Bronx Zoo to warrant the expense of setting up mobile equipment?*

## *MOVIES AND TELEVISION*

Every movie producer has some interest in television, even if it is only indirect. Paramount Pictures, Twentieth Century–Fox, Metro-Goldwyn-Mayer, and other film companies are watching television development with a careful eye and laying their own plans in a very hush-hush way. The film companies are interested in television because they have much at stake in the production of motion pictures, in their ownership of theaters, and in their relations with independent theater owners.

Many film producers will not sell or rent their pictures

to television broadcasters at all. Some movie companies are asking as much as $400 for a single showing of a feature picture that is eight or ten years old, even if it is only going to be viewed by a few television set owners.

Their reason for this action can be seen in the following resolution passed by the Independent Theatre Owners' Association:

> "Be it resolved, that the Independent Theatre Owners' Association is unalterably opposed to producers or distributors of motion pictures allowing any of their product to be used for television production in any way, shape or manner, inasmuch as reproduction would be in direct opposition to motion picture theatres with no admission fee being charged and would thus consist of unfair competition."

Television is still in its infancy as far as programming is concerned, and in time these theater owners may change their views toward the use of motion pictures in television programs. Without letting the exhibitors know too much about it, the movie studios are going ahead to develop television on their own hook, through experimental operation.

The president of NBC has declared that if the movie studios do not cooperate with television, the broadcasters will set up their own film production units and make feature pictures especially for television use. This is probably a long way off, however, since as yet there is no heavy money backing the development of such an organization among the broadcasters.

### *Television in theaters*

The war has halted progress in theater television. The Roxy and Paramount theaters in New York, however, as well as theaters in other key cities already have made plans to install equipment for showing television pictures after the war.

Much of the "know-how" of theater television has been developed in Great Britain by the Scophony Corporation,

Ltd. For a number of years this firm has been giving theater demonstrations of television. About five years ago they televised a prize fight on a screen 18 feet wide in the Odeon Theatre at Leicester Square in London. More than 2,000 persons jammed the theater, paying about $5 each for their tickets.

In 1942 NBC televised a prize fight between Billy Soose and Ken Overlin at Madison Square Garden. The giant television screen was set up on the stage of a legitimate playhouse, the New Yorker theater. Horse races have also been televised in this country.

At the frequency allocation hearings of FCC during the fall of 1944, a representative of the Society of Motion Picture Engineers appeared on behalf of theater television. He requested a total of 75 clear channels, each 20 megacycles wide, for theater television — a space in the spectrum 1,000 times as broad as the 106 present standard broadcast channels occupy.

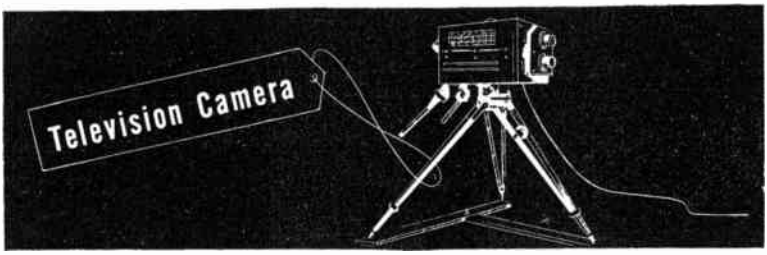
He stated that theater television would be presented to the public in black and white, with the picture quality about as good as that possible on 35-millimeter film. He also stated that color television, when perfected, would be used.

In its May 1945 frequency allocations, FCC did not allocate any space in the spectrum for the regular and permanent use of theater television. Experimental use was allowed, however, on the understanding that the lower experimental frequencies would be reassigned to television broadcasting if and when needed, in which event theater television would move farther up the scale.

Television is faced with a vicious circle as far as entertainment is concerned. Until enough sets are sold, important money-spending national advertisers will not be too interested in buying time or sponsoring costly television programs. But until such programs are telecast, entertainment

on television will be mediocre, and television sets will be slow in selling. As time goes on, more people will become interested in television, however, and the entertainment you will be able to pick up will gradually improve.

*Are the independent theater owners farsighted in their stand on television? Are the movie studios playing fair with the theaters by going ahead with television development? Will the movie theaters lose business when television becomes popular? Would you buy a television receiver if the only entertainment you could get on it was motion-picture features five to ten years old?*



# TO THE DISCUSSION LEADER

Why does television challenge every forward-looking American? Is it one of the greatest contributions science has made to democracy? Does it promise a new era in communication of ideas and information?

Everybody has opinions about the innumerable uses of television as soon as scientists have improved it and manufacturers have produced receiving sets at prices average Americans can afford. The idea of sitting at home and *seeing* important events hundreds of miles away *while* they are happening stirs the imagination. Television is new, also, and most people have enough pioneer spirit to be intrigued by the novelty and adventure in newness.

Not even the scientists can say just what lies ahead for television. It has been sufficiently developed, however, to give rise to some very practical and important problems—personal, social, economic, and political. These are the problems that members of your group are likely to be most interested in discussing.

### *Reading and preparation*

As discussion leader, you have a double task: presenting information from the front lines of television research and then encouraging an exchange of ideas by members of your group. This is one GI Roundtable subject that challenges *you*. You cannot turn to a map and say, "This is television." You cannot draw television on a blackboard. It will be unusual if you have a member of your group to whom you can turn and say, "John, tell us about your experiences in television." Chances are that John has not even seen a television receiving set.

Your own careful preparation is particularly necessary to make your discussion of television a success. It is suggested that you study this pamphlet thoroughly. Place copies in libraries, dayrooms, service clubs, and other reading centers. Call attention to it in advance publicity about your program. This may accomplish two important things for your meeting: stimulate more individuals to attend, and give them background information for more intelligent participation in the discussion.

You will find at the end of this pamphlet suggestions for further reading on television. Libraries to which you may have access may have other good materials. From their periodical indexes you may find interesting and valuable material on the subject in recent magazines. Perhaps your librarian would arrange a special display of this material so it could be used by interested readers.

### *What type of discussion?*

You will find detailed suggestions on techniques of conducting discussion meetings in War Department Education Manual, EM 1 GI Roundtable: *Guide for Discussion Leaders*. Suggestions on radio discussion techniques are available in War Department Education Manual, EM 90: *GI Radio Roundtable;* this will help you greatly if you wish to broadcast your discussion program over radio stations or sound systems of the Armed Forces Radio Service.

Television could be discussed by any of the methods described in the discussion *Guide*—forum, panel, symposium, debate, or informal discussion. You can best judge which type will best suit your situation. Factors to consider in making this decision are the size of your group, the facilities of your meeting place, the availability of one or more speakers who have valuable firsthand knowledge of television and its postwar possibilities.

This pamphlet discusses television under eight major headings: Is television ready for the public? (pages 1-4); Uncle Sam looks at television (pages 4-7); Who are the leaders in the fight? (pages 7-14); Television and family life (pages 14-20); What kind of television? (pages 20-30); Science where magic failed (pages 30-34); A picture becomes a parade (pages 34-41); and Movies and television (pages 41-44). These may help you in outlining your program.

Whatever type of discussion you decide to use, your objective is twofold: to present important facts that inform members of your group about the developments of television and emphasize the pros and cons of its future possibilities; and to engage members of your group in a lively, enthusiastic discussion of television's future.

In any type of discussion, your role as leader is to keep the thinking of the group on the more important issues. Television may tempt trivial discussion. A hot debate could be developed, for example, on whether actress X possesses more televising appeal than actress Y; but this would waste a lot of valuable time. Members of your group have gathered for more important things. Don't disappoint them.

### *Questions for discussion*

You have no doubt noticed that questions for discussion have been arranged at the end of each of the eight major sections of this pamphlet. In preparing an outline for your discussion, you may wish to use some of these questions and to add others of your own. If you arrange for other speakers to appear on your program, get their suggestions for further questions. Members of your group will undoubtedly ask their own questions as the discussion progresses, but it is well to have a carefully arranged list before you.

### *Hints to help leaders*

You will be host and chairman combined in your role as discussion leader. Whether your meeting will be an enthusiastic success or a boring failure will depend largely on how well you plan your program, present the subject to your group, and keep the train of discussion on the main track. Here are some hints that you may find helpful:

1. Publicize your meeting adequately in advance.
2. Outline and prepare your program carefully.
3. Rehearse, if possible, with all persons taking part in talks.
4. Place three or four major questions on a blackboard or chart before the meeting.
5. Start your meeting *on time*.
6. Make everyone feel comfortable, relaxed,. "at home."
7. Keep the discussion lively; don't be afraid to use humor.
8. Maintain an open-minded attitude toward *all* points of view.
9. Clarify the purpose of the meeting and then carry out that purpose.
10. Phrase questions that challenge members of your group to express their views.
11. Invite full participation of everyone, but embarrass no one by a cutting remark because that person's idea may sound ridiculous.
12. Don't let one or two loquacious or prejudiced individuals dominate the discussion and turn it into a debate or a quibble.
13. Make your whole discussion personal, enthusiastic, informal.
14. Allow three minutes for summarizing major points of view discussed.
15. Don't let the program ramble wearily overtime; close it *on time*.

# FOR FURTHER READING

These books are suggested for supplementary reading if you have access to them or wish to purchase them from the publishers. They are not approved nor officially supplied by the War Department. They have been selected because they give additional information and represent different points of view.

4000 YEARS OF TELEVISION. By Richard W. Hubbell. Published by G. P. Putnam's Sons, 2-6 West 45th St., New York 19, N. Y. (1942). $2.25. This is a historical survey of scientific discovery and research down to the prewar days. The author is associated with CBS.

INTRODUCTION TO TELEVISION. By C. J. Hylander and Robert Harding, Jr. Published by Macmillan Company, 60 Fifth Ave., New York 11, N. Y. (1941). $2.25. A well-written guide for the person who wants to know more about the technical side of television. It starts at the beginning and in simple language brings you up to 1941.

TELEVISION: THE REVOLUTION. By Robert E. Lee. Published by Essential Books, 270 Madison Ave., New York, N. Y. (1944). $2.00. An interesting book that gives a clear statement of some of the problems involved in television. A large section of the book is devoted to television entertainment.

TELEVISION BROADCASTING: PRODUCTION, ECONOMICS, TECHNIQUE. By Lenox R. Lohr. Published by McGraw-Hill Book Company, 330 West 42nd St., New York 18, N. Y. (1940). $3.00. A businessman's book on television with emphasis on the contributions made by RCA and

NBC. The author was president of NBC at the time he wrote the book.

MODERN RADIO. By Kingdon S. Tyler. Published by Harcourt, Brace and Company, 383 Madison Ave., New York 17, N. Y. (1944). $2.50. A general, current review of the problems of television is given in easy-to-understand language in four chapters of this book, which also covers broadcasting, FM, and radar. Of special interest is the chapter on color television.

Free literature on television may be obtained by writing to the concerns listed below. In writing, mention that you are conducting a GI discussion group on the subject of television.

Columbia Broadcasting System, 485 Madison Ave., New York, N. Y. Att.: Mr. Paul Kesten.

Electronics Department, General Electric Company, Schenectady, N. Y.

Allan B. DuMont Laboratories, Passaic, N. J.

National Broadcasting Company, 30 Rockefeller Plaza, New York, N. Y.

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## *OTHER GI ROUNDTABLE SUBJECTS*

Introductory copies of each new *GI Roundtable* pamphlet are automatically issued to information-education officers in the United States and war theaters. Additional copies are authorized on the basis of two to a company or similar organization. Pamphlets may be requisitioned from the United States Armed Forces Institute, Madison 3, Wisconsin, or from the nearest USAFI Oversea Branch. List EM number, title, and quantity. New subjects will be announced as published. *GI Roundtable* subjects now available:

EM 1, GUIDE FOR DISCUSSION LEADERS
EM 2, WHAT IS PROPAGANDA?
EM 10, WHAT SHALL BE DONE ABOUT GERMANY AFTER THE WAR?
EM 11, WHAT SHALL BE DONE WITH THE WAR CRIMINALS?
EM 12, CAN WE PREVENT FUTURE WARS?
EM 13, HOW SHALL LEND-LEASE ACCOUNTS BE SETTLED?
EM 14, IS THE GOOD NEIGHBOR POLICY A SUCCESS?
EM 15, WHAT SHALL BE DONE ABOUT JAPAN AFTER VICTORY?
EM 20, WHAT HAS ALASKA TO OFFER POSTWAR PIONEERS?
EM 22, WILL THERE BE WORK FOR ALL?
EM 23, WHY CO-OPS? WHAT ARE THEY? HOW DO THEY WORK?
EM 24, WHAT LIES AHEAD FOR THE PHILIPPINES?
EM 30, CAN WAR MARRIAGES BE MADE TO WORK?*
EM 31, DO YOU WANT YOUR WIFE TO WORK AFTER THE WAR?
EM 32, SHALL I BUILD A HOUSE AFTER THE WAR?
EM 33, WHAT WILL YOUR TOWN BE LIKE?
EM 34, SHALL I GO BACK TO SCHOOL?
EM 35, SHALL I TAKE UP FARMING?
EM 36, DOES IT PAY TO BORROW?
EM 40, WILL THE FRENCH REPUBLIC LIVE AGAIN?
EM 41, OUR BRITISH ALLY
EM 42, OUR CHINESE ALLY
EM 43, THE BALKANS—MANY PEOPLES, MANY PROBLEMS
EM 44, AUSTRALIA: OUR NEIGHBOR "DOWN UNDER"
EM 45, WHAT FUTURE FOR THE ISLANDS OF THE PACIFIC?
EM 46, OUR RUSSIAN ALLY
EM 90, GI RADIO ROUNDTABLE

*For distribution in the United States only.