



by **WILBERT T. PETERSON**

Illinois State Police Dept.

### Chicago Police and FM

**T**HE advantages an FM police radio system offer a large metropolitan city is remarkably displayed by the new Chicago police FM system now in operation under the able guidance of Fred Schnell, W9UZ, chief radio engineer for the department.

Exhaustive tests with both AM and FM showed that FM, because of its noise reduction capabilities, proved itself far superior in this city where man made interference is always a serious problem.

The original plans for two-way communication in Chicago, included AM transmitters with seven remote receiving positions adequately to cover the city.

With the new FM system, only one receiving position, located in the *Field Building* on the shores of Lake Michigan, is necessary!

The receiving antenna is atop the *Field Building*. Two frequencies are used, 35,100 kc. and 35,220 kc., with 75 cars on one frequency, and 75 cars on the other.

The FM mobile transmitters are *REL* equipment, running about 25 watts from a single 807. The maximum swing is held down to about 26 kc.

Directional characteristics of the transmitting antenna, which are usually bothersome in mobile installations, have been elim-



*REL* FM police mobile transmitter.

inated by the use of a tuning unit built into the base of the *REL* antenna.

Three low frequency transmitters, WPDB, WPDD, WPDC on the north, south and west side of the city are remotely controlled from Central headquarters and operate on 1,714 kc.

The two remote FM receivers are brought into headquarters by telephone lines. The squelch circuit of these receivers are remotely controlled at headquarters on the same line. This novel system is a simple remote sensitivity control placing a battery bias on the RF and IF tubes by means of a pot and "C" battery on the same pair of wires with the necessary isolating chokes and condensers.

Plans are now under way to install three other receiving positions at the three transmitting stations. These will act as auxiliary receivers in case of breakdown in the *Field Building* receiver.

At present the longest haul from car to receiver is from the far south-east side to the *Field Building*, a distance of about 20 miles. Reliable communication is always maintained from the cars in this area. In fact very little difference is noted when a car is transmitting under Wacker drive! What does Fred Schnell think of his new system? He replies, "Why didn't someone think of this before."

### State Police Channels Reallocated

**T**HE FCC has reallocated several state police frequencies to clear up interference between state stations on the same channel. Through the cooperation of the

*APCO* frequency allocation committee under the chairmanship of Robert L. Batts of the *Indianapolis Police* and Col. Edwin L. White of the *FCC* these changes were worked out.

The two new frequencies recently made available to the police service 1,722 kc. and 1,730 kc. have been allocated to Arkansas and Ohio respectively. At present these two states have a clear channel on these frequencies.

North Carolina is now working on 1,658 kc.; Georgia on 1,666 kc.; Michigan and Tennessee on 1,642 kc.; South Carolina on 1,714 kc.; Missouri on 1,675 kc.; Kentucky on 1,682 kc.

With the changing of 1,712 kc. to 1,714 kc., an 8 kc. separation of all the state police channels is now obtained.

### Radio Telephone Relay

**T**HERE is considerable controversy by various police departments in the interpretation of the radio telephone relay provision in *Sec. 10.125 of the FCC Rules* governing emergency services. Part of this section reads: *Municipal police stations shall not engage in point to point radio communication beyond the good service range of the transmitting station. The transmission or handling of messages requiring radio telephone relay or the relaying of such messages is prohibited.*

This definitely states that if one phone station gives another a message, the second one cannot give it to another phone station which, of course, would mean a relay. This second station may give the message to a third station by radio telegraph, that is, if it is so licensed, but not by radio telephone. However (this is where the thing clouds up), a provision now follows the last quoted section: *Provided, however, that after proper showing and in unusual circumstances, the Commission may in specific instances authorize communication routes involving such relays.*

Now what can be classified as "Unusual circumstances"? Just what are these "specific instances" in which the *Commission* will allow a radio telephone relay?

These two questions probably will receive the more diversified explanation than any other that might come up in the rules and regulations governing emergency services.

The general assumption seems to be that a phone station may receive a message from another phone station, and then in turn dispatch it to a car or a receiving station without obtaining an acknowledgment, but he cannot give it to another station who may, or has the facilities for acknowledging it.

After chatting with several *FCC* inspectors, we have learned that the ruling may be interpreted as follows:

Since the purpose of the ruling is to keep the phone circuits open for emergency traffic only such as urgent despatches or messages, and eliminate the interference that the relaying of unimportant messages would cause to other stations on the same channel, municipal police stations should not accept traffic if they cannot get it to its destination without relaying. This, of course, does not pertain to urgent messages or where public service facilities are not available. In other words, police stations are *emergency* stations and should be operated with the proper discretion, not to see how many carrier hours they can put out.

In the case of a squad car cruising in its patrol area who may call its municipal sta-

(Continued on page 58)



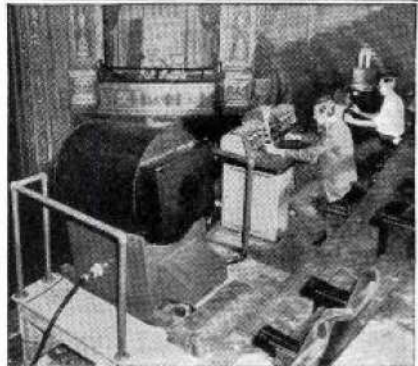
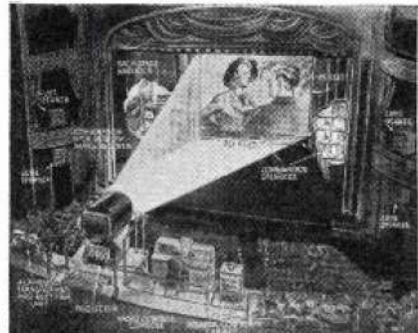
by **Samuel Kaufman**

**"S**TEP up, folks! See the world's greatest show—television! It's here, folks!"

If any barker began yelling the above, he'd be offering an honest "come-on" spiel. In the *Video Reporter's* opinion, television is the greatest show on earth and, further, it is already a practical means of home entertainment that is handicapped only by the absence of *Federal Communications Commission* sanction to proceed.

And, in effect, the *Video Reporter* received the barker's invitation when the *National Television Systems Committee* conducted a series of demonstrations by all leading laboratories for the edification and information of the members of the *FCC*. We decided to tag along with the *Commission* members at the demonstrations and we got back home tired but convinced that this thing called television will be here to stay once someone gets up enough courage and etiquette to invite it in out of the cold.

It should be noted at the outset of this record of our impressions that there is not too much accord among the firms that shared the conference table at *NTSC* sessions. While 441 lines are recommended to the



Above: Pictorial diagram of the wide screen video setup. Below: How it actually looked in the N. Y. theatre.

*FCC* in the committee's report, this is by no means unanimous and it seems that while television men, like all good Americans, endorse the message of peace on earth, there is little hope for peace on air—particularly the television air.

The television tour started at the *Allen B. Du Mont* New York headquarters where all

(Continued on page 62)

still, they need more qualified students. For those who do not have the price for a complete aviation radio course and who desire to help Defense may obtain courses in the subjects just mentioned at no cost whatever to them. Those who finish any one of the courses will not only benefit themselves, but they will benefit our preparations for National Defense as well, because they will be able to do a specific job well!

The qualifications are general but exacting and they cover: high school education, a sound body, a clear mind, and the will to do!

### Odds 'n Ends

**T**HOSE light planes often seen around the average airport, which are usually classified in the "light plane" classes, and which contain radio equipment, need not be shielded as well as their "big brothers," in order to eliminate radiated interference. It has been found that spark plug shields placed over unshielded plugs, and braided shielding placed over high tension leads from the magneto to the plugs, will eliminate 98% of the interference encountered. It is to be remembered, however, that each plane presents its own problem. Shielding and bonding the electrical installations (low and high tension) in the Ryan, Aeronca, and Cub, is not altogether similar. By utilizing the probe antenna (discussed some time ago), it is possible to track down interference right to the source on these small jobs, because the propeller wash is not so strong that it requires "up-rights" for holding the antenna steady.

Conducted interference from constant speed propellers (Curtiss-Wright) has been encountered by the average aircraft radio serviceman at one time or another. This interference can be eliminated by installing 50 microhenry chokes in the low feeder inputs (battery and propeller circuits) and bypassing these to ground. (Choke input to propeller circuit with condenser input to battery through second choke.) The values of

the condensers: 1 to 2 microfarads.

Those of you who are having trouble with UHF marker beacon receiver operation, are reminded that vibration is the largest contributing "bug-a-boo." Even though internal tuning elements are "locked" externally by the technician, vibration will cause "off-second" tuning, resulting in mal-operation. Due to the fact that these receivers operate in the 75 mc. channel their tuning is critical.

Some receivers are adjusted for 3000 foot operation, some for 4000 and still others are adjusted for 6000 foot operation. It takes about five minutes to check the ordinary marker receiver if a reliable frequency meter and output meter are used. If a "split wire" antenna is used as a part of the system, it would be wise to check insulator suspension, transmission line connections, and power input. Sometimes, a pilot will report the receiver "out," but in reality he was "out." He was either flying too high (usually the case) or didn't look at his facility chart for the purpose of determining his position with respect to the marker transmitter.

Each marker receiver should be flight tested checked at least once a week. Tubes should be tested every 60 hours or every sixty days, depending upon which comes first.

Many letters have been coming into the column requesting information; they have all been answered. Readers are reminded that this column will endeavor to obtain the information they desire if they enclose a stamped, self-addressed envelope.

### Video Reporter (Continued from page 28)

the demonstration time was given over to a plea for a 625-line standard. So much attention was put into propaganda for this high-definition picture that little initiative was evident in exhibiting the qualities of *Du Mont's* television receiver. The time was consumed in a talk (seen and heard on the

video screen) by a *Du Mont* engineer and by a separate motion picture demonstration. The lack of showmanship in showing the *Du Mont* apparatus was realized a few days later when widespread invitations were sent out asking the guests back for another visit to see a more complete and revealing test of the method.

Next stop on the *FCC* television tour was *Radio City* where was revealed the latest home-model receiver which projects the cathode-ray image on a translucent screen measuring 18 by 13½ inches. This demonstration was followed by an *RCA* test of a theatre-sized television method at the *New Yorker Theatre*. Both the home-model and theatre systems were effectively demonstrated and the tests were further enhanced by multiple television relays which showed great promise for future video networking. The theatre-sized television picture was accomplished by a huge steel-barreled projector on the theatre-balcony.

The *Bell Telephone Laboratories* later in the day showed the *FCC* tests of its coaxial cable by having television impulses routed to Philadelphia and back to New York over a total of 180 miles of coaxial wire.

The following morning, the two-day *FCC* television show prepared by the *NTSC* came to a close with a demonstration of another television method and *Scophony's* theatre-sized television system.

So, once again, all the facts relative to television's status are in the hands of the *FCC* and it is anticipated that an early Spring hearing will be followed by a delay—perhaps until Fall—when the *Commission* will have some definite plans formulated for the next step television may take.

And, it is our view that the next step should be the sanctioning of commercial telecasting!

**I**NCCLUSION of a *Scophony* demonstration in the *NTSC* series of tests for the *FCC* was a sort of added attraction that was not announced until the guests were gathered at

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*Radio News—May*

the last scheduled stop on the television tour. But just a short time before, *Scophony Limited*—a British firm now maintaining New York offices—had given a press demonstration that was well-attended.

We heard a lot about *Scophony's* progress abroad and looked forward eagerly to the New York demonstration. It was fairly impressive in size and detail but somewhat lacking in illumination. Perhaps this can be easily overcome. But, at any rate, the demonstration was far below the standards of the RCA theatre-sized television show.

**T**HE television lads have been going to town in the manner in which they've been conducting color video demonstrations in recent months. The head men worked out a sort of basic script that served, with amendments and alterations, for the press, the *Federal Communications Commission*, the *National Television Systems Committee*, and the *Institute of Radio Engineers* and various other groups.

The basic theme of each demonstration was a systematic display of fabrics, a revolving globe, a color chart, a chemistry experiment, and other simple pick-ups that can be achieved in a small camera range. These flashes, accompanied by intelligent narration, served as good exemplary illustrations of what has been achieved. There is more interest and sparkle to film pickups in color. Of course, there's less of a thrill to the televisioner in seeing a canned program, which the film represents, than in witnessing an actual event while it is taking place. But a filmed color television show that can give the home look-and-listener a wide theatre of action instead of just head-and-shoulder stuff is a lot better than a spinning globe or a woman's hands trying on gloves.

The *Video Reporter* asked one of the television aides when big live scenes in color could be picked up. He replied that it's practical "right now" but that the studio space was too limited to move the camera back sufficiently to pick-up the larger scene.

We couldn't help but think that the reason was a poor one. Certainly with all the facilities at the command of the networks and the readiness with which it expands in many, many directions, there couldn't be a great problem involved in getting deeper studio space to pick-up larger color scenes.

Further, one network is constantly presenting arguments in favor of color. Yet, the *Video Reporter*, while personally agreeing that true-life colors can enhance the entertainment value of a television program, cannot locate a television enthusiast who sees the practicability of color pickups in a work-a-day role until they can offer something other than films in a manner more adequate than has been shown to date. The mechanical disk the set requires is not as awful a bogey as some critics think. But the return to mechanized television must be compensated for by much better program potentialities than has been able either to be implied or produced.

**M**R. JOHN LOGIE BAIRD, too, has been tinkering with color television of late. Word comes from London, that, despite the suspension of telecasting, laboratory progress is being made with all tests and demonstrations conducted over wire lines. And Mr. Baird, an early color television follower, has shown a home model television receiver (combined with a radio and phonograph) that can receive color on a screen measuring two-and-a-half by two feet, utilizing a 600-line scanning method.

Mr. Baird uses mirror reflection to magnify the image to those dimensions and his receiver employs a two-color disk instead of a three-color one as in use here. The Baird set's lenses, mounted in a whirling wheel in front of the cathode-ray receiving tube are blue-green and orange-red.

**T**ELEVISION has been showing progress in Schenectady, New York, home of the famous *General Electric* laboratories.

W2XB, the *G.E.* video station, has taken over a large clubhouse as a television studio building. The new main television studio, upon completion, will be 70 feet long, 46 feet wide and 18 feet high. With great strides in video pick-up technique, this large chamber can be utilized as a miniature Hollywood, with many changes in sets possible.

Great thought has been given to video illumination problems and the use of three-phase water-cooled mercury lights will provide 1000 foot-candles of illumination at any desired program-originating point of the studio.

**T**HERE will be a great new demand for two-colored typewriter ribbons when the new field of television continuity writing is further developed. We base this premise on the sample television scripts distributed to the FCC and press attending the recent *NTSC* demonstration. It seems as if the second color comes in mighty handy to distinguish the cues and acting directions from the spoken lines.

Incidentally, there's a tremendous new field for writing in television. We hear that many participants are anxious to look over new program ideas and scripts well in advance of commercialization. The main obstacle to this quest for material is that television is not yet able to pay adequate fees for program brainstormers.

### Technical Review

(Continued from page 41)

"hams," amateur operators of short wave radio, have formed in the past few years an unofficial network of communications all over the world. Here is the first book which tells of their amazing adventures on the air waves, of the heroic part they play in maintaining communications during fires, floods, disasters, and all sorts of emergencies, when other means of communication have failed. The book makes interesting reading not only for the amateur or prospective amateur, but for anyone interested in non-technical aspects of amateur radio. Price \$2.00.

### Manufacturers' Literature

(Continued from page 40)

complete selection of phonograph and recording accessories.

Twenty-five 1941 *KNIGHT* Sound Systems are listed in the big rotogravure Public Address section. These systems make use of the most recent developments in P.A. design and are available in ranges from 7 to 75 watts for every type of application. A sensational and exclusive feature is incorporated in two major groups of *KNIGHT* systems. Details have been withheld, but *Allied* engineers have explained that the new development is a practical and effective design for reducing feedback.

For the Serviceman there are over 100 pages devoted to all the latest in test equipment and over 15,000 quality parts from the country's leading manufacturers. Fluorescent lighting comes into its own with a strikingly modern presentation in rotogravure. Of special interest also are the big Bargain Merchandise sections, the Photo Cell Equipment listing and the pages of books and manuals on every subject in radio and electronics.

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