



IN a recent column we noted the experiments concerning railroad yards using radio communication between trains and a central tower. Anent this item, Brother Gott of Milwaukee, Wisconsin, sends in the following communication: Quote . . . *The reason that this item interested me is the fact that I, along with Mr. G. N. Harbourt of Washington St. Tower here have proposed to our officials the installation of Train Directors in the terminal with two way radio communication system for the control of all movements within the terminal. Such a system would call for about 30 stationary installations, in interlocking towers, on drawbridges, at switchtender locations, Yardmaster's offices, Signal Supervisor's office, Asst. Supt.'s office and certain other strategic points. Also on about 25 or 30 locomotives and a like number of way cars.*

Maximum distances would be up to four miles. Most communication being from one half to two miles. Train Director would be in on all cross-communication and would therefore be in constant touch with the progress of every movement, the starting of new movement, etc. He would be in touch with Train Dispatchers in Chicago and would be informed as to main line movements which were coming up and could therefore authorize movements ahead of these main line trains. Levermen on drawbridges would be informed of progress of terminal movements as well as main line trains that were near due or over due and could thus minimize the delay to our trains, because, as you know, boats have preference.

About 40 to 45 crews are in daily operation in the terminal at about \$35 each. About \$1400 to \$1600 per day. Savings of from \$100 to \$300 per day would be assured, due primarily to close co-ordination of movement within the terminal in relation to each other and in relation to main line movements also.

The cost would approximate \$35 per day for three Train Directors, and a maintenance man. The net savings, then, we are convinced, would be very much worth while, to say nothing of the total elimination of wrecks. Just in passing, we had a wreck at Crystal Lake on March 25th, this year, which cost the company between \$50,000 and \$75,000 and which would have been avoided had such a system been in operation.

Knowing something of the costs of material for the construction of sets, also the cost of sets delivered by the retail dealer ready to go, I am convinced that such sets could be manufactured in quantity to deliver for \$50 or less. But knowing the prices the company pays for its signal equipment and most other supplies that it gets, I do not doubt that they would be

asked three or four times that amount.

I believe that you will agree with me that this is the coming thing. The surprising thing is that it has not come before, but I can explain that by telling you that the RRs are the mossbacks of all industry. Airplanes have it, would not think of trying to get along without terminal despatching via radio. Every city and state police department in the country are rushing into line. Milwaukee has motorcycles with two way communication.

FM is just the ticket for such installations. Just a word before I sign off, regarding the jobs that would be created. These jobs would automatically come under the ORT schedule. Men with qualifications and sufficient seniority would bid them in. To be sure, it would create new jobs, and open up room at the bottom. We have taken on exactly 50 new men since March, 1935, when the six day week was instituted. I have reference to the Wisconsin Div'n, and there are 12 others on the C&NW system . . . Unquote. In our opinion we believe that Brother Gott's letter is the finest selling talk that any radiop can give to a railroad in any town. His facts are well-founded and his arguments carry the punch that comes only with definite knowledge of his subject. So go to it, radiotechs, and see what you-all can do with this ammunition.

ALVIN RAMSEY, former radiop USN, now studio electrician for a movie mogul, would like to know the whereabouts of his old buddy, George Amos, who was Pharmacist's mate, First Class, in '23 or '24 when they were stationed at the San Diego Training Station. We've been rather successful on past man hunts but this one seems like a tough assignment inasmuch as neither of these fellers have kept in contact with radiomen. But we've taken on this job and with your cooperation, success may crown our efforts again. Let's go, sleuths!

INCIDENTALLY, CTU-Mardiv announces with justifiable pride the signing of agreements with the entire New England fishing fleet at \$165 per month and one week's annual vacation with pay. Negotiations were under way for many years and the culmination of this arduous task certainly proves that in union there is strength.

THE CTU-Mardiv organization continues to expand. They are opening offices on the West Coast in San Francisco, which certainly should make for increased union activity. Although we can well imagine that competition will be intense, we feel, nevertheless, that the added activity will induce many men who have either not been contacted or who have had a personal

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THE VIDEO REPORTER

by Samuel Kaufman

WITH wars raging in several parts of the globe and with huge defensive measures being taken in the U.S.A., these are times to rally around the colors and that's just what every true American is doing.

And, in recent weeks, even television rallied 'round the colors.

When CBS, after an extended period of silence on its video activities, suddenly came forth with a color television system, there was quite a furor in the industry. "Would black-and-white images be shelved?" was a query on every participant's tongue.

CBS went to town in a big way in revealing the achievements of its chief television engineer, Dr. Peter C. Goldmark. The first demonstration given privately to FCC Chairman James Lawrence, Fly got an exceptionally favorable "press" but despite the high-pressure publicity technique of issuing "quotes" from prominent observers, some succeeding demonstrations didn't quite prove that the CBS system was a thing that would replace black-and-white.

It is true that color images are preferred to black-and-white. But the present simplicity of the latter as compared with the mechanical complications of Dr. Goldmark's 343-line color system still gives it an edge in public preferences.

Getting images as natural as possible is a goal of all television engineers. And putting the pictures in natural colors is a step ahead. But consideration must be given the fact that the potential look-and-listening audience, after being accustomed to black-and-white motion pictures, has come to regard the two-tone images as "natural."

A return to the revolving disk—this time in conjunction with a cathode ray tube—forms the basis of Dr. Goldmark's method. Similar disks, synchronized, are used at both the transmitter and receiver. Blue, red and



Dr. Goldmark shows his color video.

green filters on each disk serve to transmit and receive the corresponding color components of the subject so rapidly that the received image has a natural appearance.

The placing of a whirling disk before the cathode-ray tube of the home receiver cannot be ardently welcomed by those video enthusiasts who hailed the dropping of the old scanning disk in favor of the kinescope. But a big point in favor of Dr. Goldmark's system is that he can achieve color reception within the limits of existing television.

The demonstrations were limited to pickups of color movies. Dr. Goldmark said that there would be a bit of delay until a pickup camera for "live" telecasts in color would be possible. He said the film pickup was actually the more difficult of the two and that's the one he completed first. However true this is, the fact remains that the demonstration would have had much more of a dramatic wallop if live color pickups were shown.

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should be as good as anything written today—and when we find that the opportunity then existed for more deliberate and complete explanations—those places where those explanations appear are even more valuable today than they were at the time of issuance.

Yes sir, many a profitable hour can be spent looking through those old magazines. Well versed as you may be, you'll find something which will catch your eye—something that read over again will clear up some particular point about which you don't think much until it is called to your attention. Periodic review is a marvelous way of keeping old information new and maintaining a well-rounded out knowledge of things radio. Yes, we even recommend spending those spare moments—at least some of them—reading rather than building test equipment. The rest of the spare moments you can loaf, for loafing is a necessary part of every man's existence.

Some day we hope that this radio library of ours is going to be as fine as any in existence in America. And we are going to enjoy spending some time each day looking through and reading old radio periodicals. Crazy as it may sound, there is a thrill in the anticipation.

Beginner's 56 MC Xmtr.

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heads of jacks. 1/2" hole for jacks fitted with rubber grommets. Socket holes cut with a socket punch. Mounting holes for sockets 1 3/8" between centers. Distance between jacks and variable condensers 2 1/2" between centers. Distance between sockets 3 1/2". Holes for standoffs 3/8". All grounds connected together with common ground wire and B—.

Coil Data

Oscillator Grid Coil. 7 Turns, 1 1/2" diameter, 1 3/4" long. Tap at 1 1/2 turns.

Oscillator Plate Coil. 4 Turns, 3/4" diameter, 1" long.

Amplifier Plate Coil. 6 Turns, 3/4" diameter, 1 1/4" long.

Antenna Coil. 3 Turns, 3/4" diameter, 1/2" long. —50—

Video Reporter

(Continued from page 38)

Demonstrations of color television are not too new. But commercializing color methods will be a new step—and a great stride at that. But that hasn't been done yet. However, CBS executives made not-too-definite references to January, 1941 as a possible starting date for a regular color program service.

Dr. Herbert E. Ives, of the Bell Labs, demonstrated color television as far back as 1929 with a fifty-line image produced by a three-color filter arrangement. His system involved optical blending of separate signals transmitted for each primary color.

Most enthusiastic comment on Dr. Goldmark's color system came from Gerald Cock, former BBC television director, now serving as North American representative for the British broadcasting monopoly.

"It is a miracle!" he said.

Much regret was expressed over the necessity to suspend television program service in the London area as an emergency war measure. Yet, we can't help but wonder whether or not television is playing an important technical role in military and naval operations.

—50—

RADIO PHYSICS COURSE

by Alfred A. Ghirardi

A power detector is one that will not overload when very large r.f. input signal voltages are applied to its grid circuit, and which will handle considerable electrical power in its output. Power detectors are usually operated with rather high voltages. Either a grid bias type or a grid leak and condenser type of detector may fulfill the conditions of power detection if they are operated properly.

Receivers built during the early days of radio employed two or three stages of tuned radio-frequency amplification using the three electrode tubes of the 201-A, 226, or 227 type which were the only ones available at that time. It was impossible to secure much amplification per stage with these tubes, because of the difficulty of preventing oscillation due to feed-back in the tubes themselves, and other forms of feed-back coupling. Therefore, the signal was not very strong when it reached the detector, and it was necessary to use at least 2 stages of audio-frequency amplification after the detector in order to make the signal strong enough to operate a loud speaker satisfactorily. Now that it is possible to build high-gain r.f. amplifiers without oscillation troubles, thanks to the screen-grid tube, in modern receivers the signal voltage is first amplified greatly before it reaches the detector. It is not uncommon to use 5 and 6 high-gain amplifier stages before the detector, both to obtain high gain and the necessary number of tuned circuits for satisfactory selectivity. Therefore, the detector must handle quite large signal voltages without distortion, and in most cases feeds directly into a single power output audio stage and then to the loud speaker. It is in receivers of this kind that power detectors must be used, for the signal voltages are entirely too large to be handled by the old forms of detectors. In some cases, the loud speaker may even be operated directly from the output of the detector without employing any audio amplification. Linear and power detectors are very closely related in practice, since they usually go together, although no detector has a perfectly straight-line characteristic. In the usual meaning of the term, "power detector" is used in connection with detection when the r.f. signal voltage applied to the detector input is at least 1 volt or more.

According to the information obtained by Mr. F. E. Terman from several thousand tests on power detectors (the results of which were published in the Dec. 1930, *I. R. E. Proceedings*), power detectors of the grid leak and condenser type can be made to produce satisfactory detection under all conditions, provided the proper values of plate voltage, and grid leak and condenser are employed. The proper values for suitable weak signal detection are different from those for strong signal detection. Some of this data is reviewed here.

"When a radio-frequency signal of at least several volts amplitude is applied to a suitably adjusted grid-leak detector, the action taking place in the grid circuit is different from the action for voltages less than 1 volt.

(To be continued)



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