THE JOURNAL OF THE SOCIETY OF BROADCAST ENGINEERS

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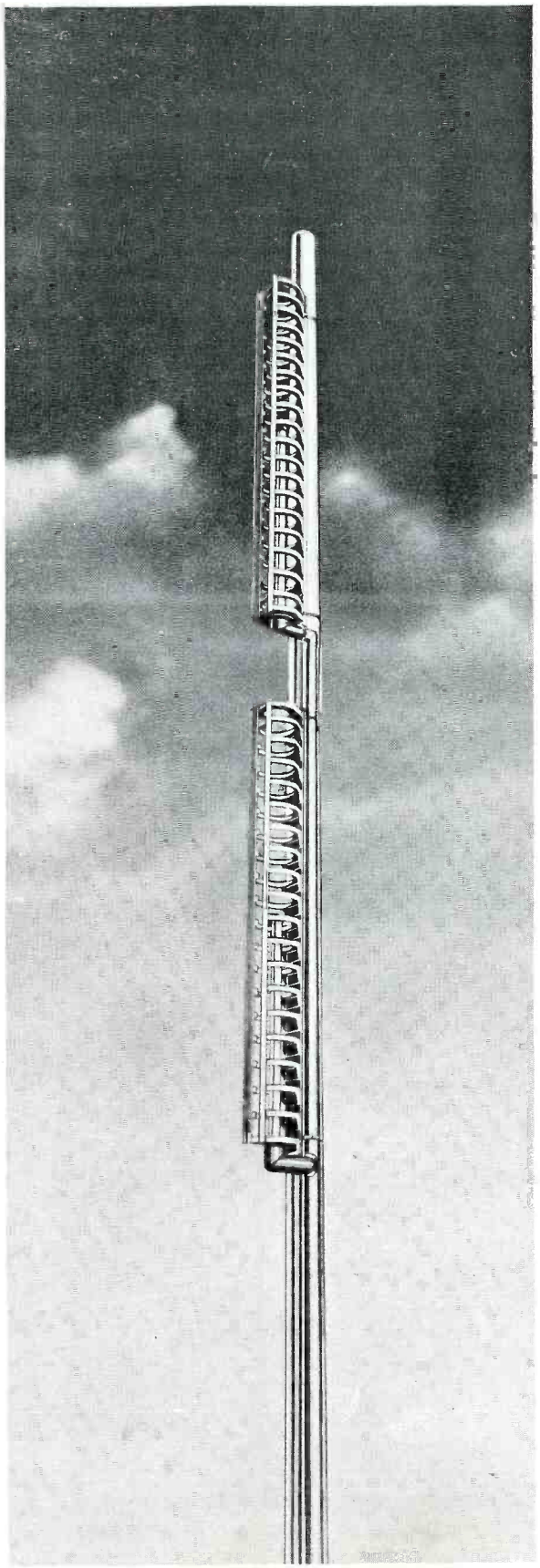

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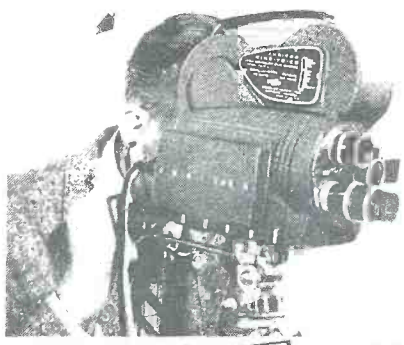

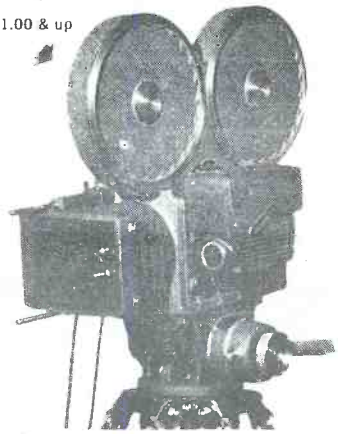

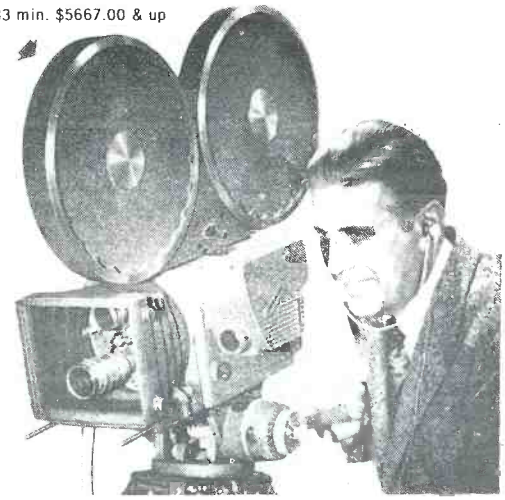

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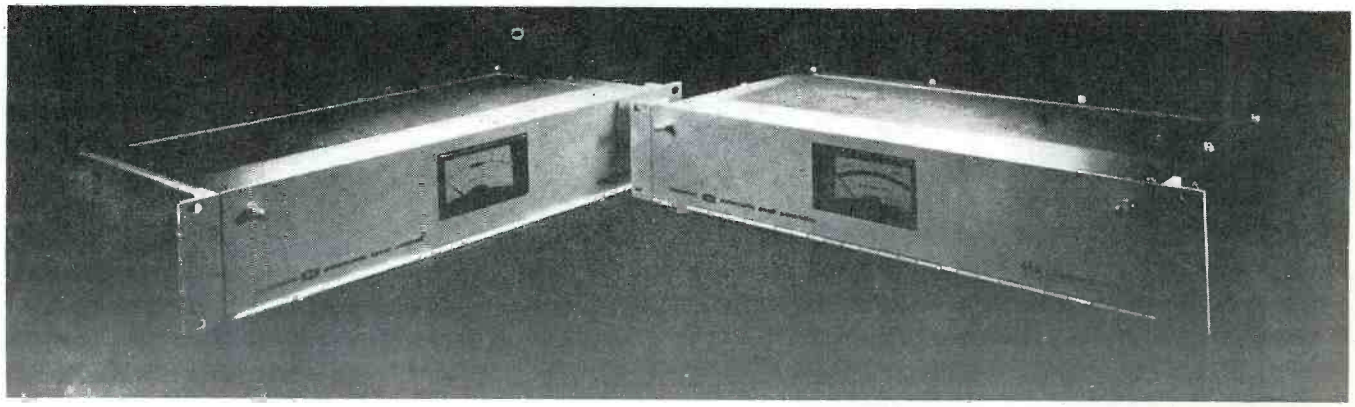

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EDITORIAL CUE LINE

As we write this, Christmas is only about three weeks away. It is just two years since the Society was formed as the Institute of Broadcast Engineers. Its name was changed to the Society of Broadcast Engineers at the first organizational meeting at the NAB Convention in Chicago in 1964. We have progressed a lot since then in membership as well as the JOURNAL. Our new format has attracted considerable favorable comment, as well as new advertisers and more support for our operation. We are growing all the time, but we need more support from our members, and more members. So let's give our Society a Christmas present and go out and enroll one new member each for Christmas. How about it?

MORE PROGRESS

The next issue of JOURNAL that you read will be bigger, better and beautiful. Starting with our March issue (if all goes well) we shall be printing on glossy stock with a four color cover, and increased editorial content. This issue will be out before the NAB Convention and will run 6,000 issues. In fact -- again if all goes well -- we shall be running 6,000 copies every time, and very shortly thereafter we hope to go to an issue every two months. That will mean a greater demand for material for the JOURNAL and more help from members in sending in articles for publication. Speaking of publication brings up a question that we are asked frequently -- Do we pay for material? The answer is no. In keeping with the policies of all professional societies we do not pay for material from members for publication. For one thing we can't afford it,and the prestige of having an article published in one's own society's professional JOURNAL is generally sufficient recompense for the work involved. In many cases too, a member's employer is impressed with the industriousness shown, and rewards the author himself. But the fact remains... we shall require more material for the JOURNAL.

ELECTIONS

This month the directors are planning the slate of nominees for the Positions of President, Executive Vice President and plus four Directors. For ease in handling the election a slate will be proposed by them, and in January every paid up member will receive a ballot for him to indicate his voting preference. But your Board not only invites you, it requests you, to send in your own ideas for election to executive positions. Every name received will be placed before the members for voting. Also, write-in votes from the members will be received and a place for such votes will be provided on the ballot form. This is your Society--vote for it and make it a real Great Society -- even if we don't have medicare!

GROUP INSURANCE

Speaking of medicare brings to mind the numerous requests that we have had from members asking if we have any form of group insurance to offer members similar to that offered by many societies. We do not but if enough interest is shown, and the type of insurance desired is indicated we will certainly look into the provision of such a service to members. It would probably be a very fine thing to have. What do you think?

LAPEL OR TIE PINS

We still have a number of lapel pins; or, as was pointed out recently, now that men's suits do not have button holes in the lapels they can be used as tie tacs. And mighty fine tie tacs they make too! The price is $2.50 each post paid, we would like to see every member wearing one, or even two! Send your order to Box 1841, Annapolis, Md.

MEMBERSHIP CERTIFICATES

It looks as if there has been foot dragging at this end. But there hasn't really! Each attempt made to get a certificate that was worthy of the Society turned out to be no good. Finally we located our own tame artist and more or less designed it ourselves. Having just seen the almost completed certificate we can honestly say it was worthy waiting for, and when our members receive their own certificates we feel sure the sentiment will be echoed. Charter members will we hope be particularly pleased with their Charter designation on the certificate. A small thing but one that we hope will be appreciated is the size of the certificate--so many just don't fit the regular stock size frames--ours is being designed to fit a standard size frame to avoid costly framing charges.

MAILING

Now we come to a very sore point. We just don't know where many of our copies of the JOURNAL go! Some members change their addresses and tell us later when they suddenly realize that they have not received an issue for two or three months; others just don't get their copies. The last mailing was a shambles. Some members waited over five weeks to get their copies, we just don't know what the Post Office does with its mail. Instead of postal service improving with its increased costs it merely gets worse all the time. Among its idiosynchrosies is returning mail that is address to Station XXXX, So and So City, Any State. We had one JOURNAL returned that was sent to the largest station in New York city, marked "unknown". We've complained but it does no good, the usual official form letter goes out and service gets worse. Even a magazine that comes only from Washington to Annapolis with first class newspaper privileges often takes seven days to arrive! So we say to every member "we are sorry the Post Office gives such poor service, we do our best to get out on time. If you haven't received your copy of the JOURNAL by the second week following nominal publishing write us--don't sit and stew blaming us! We'll always send out a replacement copy at first class rates".

NEW SUSTAINING MEMBERS

Our September issue saw a new and very welcome additions to our list of sustaining members in the form of Mosely Associates of Santa Barbara, California, and CBS Laboratories of Stamford Connecticut. We could not welcome them in the last issue because their memberships

came in after the JOURNAL went to press. Welcome aboard--we hope that before long we shall have the pleasure of seeing some very interesting articles by the pens of their engineers,in the pages of the JOURNAL.

NEW SECRETARY

This month we welcome with open arms...literally...Mary Kramer the happy wife of Bill Kramer our treasurer. She has actually volunteered to act as secretary because due to unforseen circumstances Bob Houston had to resign from the position of secretary. If you have unanswered mail that was sent to Bob please rewrite it to Mary. Bob's address changed and some mail is probably being lost in the forwarding. We want to thank Bob Houston for his brief help and wish him well in his new slot. All routine mail concerning memberships, dues, etc. should go to the secretary. JOURNAL material and non-routine matters should continue to come to Annapolis.

DUES

We saved the nastiest editorial until last! Most of our members have paid up for 1965/66, but some still have not. To these few refraining members we say "no payee no certificate early in January!" Please pay up your membership dues when billed, or do as some members have done (true!) and pay two years in advance...it makes bookkeeping hard, but it helps the bank balance! And PLEASE, PLEASE, PLEASE when you pay by company check say who you are! We have about fifteen checks from companies without any indication of the member's name. This means trying to tie in the station with a member; and is time consuming as well as often unsuccessful! If you are billed twice and have already paid,it may be because this happened to you!

J. H. B.

PART II, FCC ROUNDTABLE AT NAB 1965 CONVENTION
(Continued from September Issue)

MR. PARKER: Why is it necessary for the first-class operator to write a narrative statement for the maintenance log? And, why is it necessary for the first-class operator to make an entry that the tower lights are okay? Can a third-class operator be considered qualified to see if the tower lights are burning?

MR. KRATOKVIL: I think he is - especially if he has 20-20 vision we'd have an awful time proving that he wasn't competent. But the entries should still be made by the operator responsible for the particular maintenance log. I suppose he could have this man make the entry, saying "I saw the lights on", and put his initials on there. I don't think we'd quarrel with that.

MR. HANSON: If I may carry on for just a minute, the maintenance is normally done by a first-class man, I believe. And he has to go out there. If the maintenance is to be done, why, he has to do it. If they send a third-class man out there and maintenance has to be done, he has to come back to get the first-class man out there. So I assume you'd send your first-class man in the first place.

QUESTION FROM THE FLOOR: I would like to ask a question about this tower light situation.

Why is it even in the maintenance log, as far as seeing if they are on in daily operation? That's a daily operation, not a maintenance job. And usually, unless you're working all night, the tower lights are not on until after the normal management has gone home.

What I'd like to know is, why can't it be transferred, or why wouldn't the Commission, aside from a daily inspection, which we do on the tower lights, prior to even having it indicate that they're on for the night, put that function over in the operating log, because that's an operational function, I would think?

MR. HANSON: I don't believe, as far as I'm concerned, there is any objection if you do log it in the operating log. And certainly, I think, Mr. Cowperthwait would entertain a petition to amend the rules to change it.

MR. COWPERTHWAIT: Sounds like a good suggestion.

QUESTION FROM THE FLOOR: With respect to the inspection of the lights and wiring the bulbs on the tower, I understand, or I was left the impression, that it goes further than just going out to see whether or not the lights are on or off.

Is it true that it is necessary to go up on the tower, and actually inspect the wiring, the sockets, the bulbs, etc., and is it necessary to have a man with a first-class ticket do this, or can you hire a steeplejack to do it? And if you do hire a steeplejack to do it, who signs the log?

MR. KRATOKVIL: It is not necessary for him to climb the tower. We don't require the first-class operator to climb the tower to actually inspect the physical condition of the filaments, or the connections, or the wiring there.

QUESTIONER: Well, isn't it necessary on a - say, every three months, to have a personal inspection, or a close inspection of the tower?

MR. KRATOKVIL: Yes. But your steeplejack - this guy makes twice, or three or four times as much as your first-class operator anyway - he's risking his neck up there. He'll fix whatever has to be fixed, I suppose, and then report to you. And then it's your responsibility simply to see if they're working.

QUESTIONER: Well, does the steeplejack sign the log or does the operator on duty sign?

MR. KRATOKVIL: I'd say the operator on duty to whom the steeplejack reported would sign. It's a delegated responsibility.

QUESTION FROM THE FLOOR: We have a remote operation, where our transmitter is remotely located from our operating point, and as far as the tower lights go, they are noticed by the operator on duty, not by the man doing the maintenance. The man does the maintenance at the transmitter.

It's been our policy - maybe we're wrong- to put that as an operating function, and not as a maintenance.

MR. HANSON: I think maybe I may have misled you. The rules now require that the lighting entry be made in the maintenance log.

QUESTIONER: But the operator doesn't know whether the lights are on when he signs the maintenance log-especially if he's on duty during the daytime. How can he sign the log?

MR. KRATOKVIL: In life you find you have to take other people's word for things. Now what happens is, your man who is looking out the window, who knows the lights are on, all he has to do is phone out to your transmitter man, who will keep the major part of the maintenance log.

QUESTIONER: But nobody is at the transmitter..it's remote controlled.

MR. HANSON: Most of them are required to have remote indication of whether your tower lights are working or not.

QUESTIONER: If there is no first-class operator on duty, who can sign it?

MR. HANSON: The operator on duty.

QUESTIONER: He opens the door and looks. It's close enough. Besides that, we can measure it by metering. We can tell whether all the tower lights are on, whether the flash is gone. We can tell that by metering. Also, we can observe it. And what we have been doing, since we have no way of knowing from the maintenance man, we've been entering that in the operating log, because I do have a first-class man who is on duty on television and AM at the same time.

MR. HANSON: I don't see any reason why that entry can't be transferred into the maintenance log. You put it in the operating log. Then somebody has knowledge of that happening, and then you transfer it over into the maintenance log.

QUESTION FROM THE FLOOR: I have another question, regarding the new monthly requirement for measuring frequency on TV.

My interpretation is that we should measure both the aural and the visual transmitter. Could we measure just the visual and use our proof monitor to measure the inter-carrier, and then assume that our aural is satisfactory? Do you have to measure on both transmitters?

MR. KELLY: Yes, in effect you do that. But you can do it by some other means, by getting the difference between the two, as you indicated. That would be satisfactory.

QUESTIONER: In other words, what it would means is, that I would get a calibration of my approved monitor with WWVH, and then use that approved monitor to measure the inter-carrier.

MR. KELLEY: That would be all right.

QUESTION FROM THE FLOOR: I would like a clarification of the tower light inspection. Are we talking about two inspections - the three-month periodic condition check versus the daily check?

MR. HANSON: The maintenance log is a daily check presumably. And also, it would require the same thing for your three months.

QUESTIONS FROM THE FLOOR: Regarding tower lights and the daily observation, in the case of a tower shared by probably three or four television stations and also some FM stations, must each licensee observe the tower lights?

The owner of the tower, who is a licensee, has the control of the tower lights, indicating meters, telling how many lights are running and a flasher.

Also, sometimes it's so foggy in San Francisco that we cannot see the tower lights from the building.

MR. KRATOKVIL: Where several stations share the same tower, the one who seems to have the primary responsibility puts it in his log, which he displays to our visiting inspector, also, an agreement among all other stations that he will be responsible for this observation.

In other words, I would presume just an exchange of letters would be sufficient and then we would inspect the one log to see that the tower lights were actually being observed and checked. If there were three of you sharing the tower, all three of you wouldn't have to make that check.

QUESTIONER: Going to the third part of my question, a situation whereby the other people using the tower cannot see the tower lights due to weather conditions quite often, would involve them actually going down to observe an indicating light or a meter in one of the other operator's transmitting rooms, which I don't believe is the Commissions' intent.

Now, we were told at our last inspection, though we are a tenant in the building, we must make an entry each day in our log regarding the tower lights which we do not control.

So in a case where you cannot see the tower lights, are we supposed to follow through by having an operator leave our premises to go downstairs to find out if they are working or not?

MR. PAT SCANLON (Field Offices Division of the Field Engineering Bureau): Let's hypothesize and say you've got stations a, b, c and d. A is the agreed upon station that will maintain the tower and its lights. A makes the log readings, as required, he can see the tower lights. All stations b, c and d do is make an entry in their log - and it need not be made daily, just appear in the log sheets, that maintenance of the tower lighting is the responsibility of station a, and an examination of the logs may be made at station a.

QUESTIONER FROM THE FLOOR: On the aural percentage power, I'm seriously wondering why a six db reduction in aural power is desired over a six db increase in visual power?

MR. COWPERTHWAIT: I think it came about as a result of discussions with one of last year's panels. If you increase the power of all these stations in the country, you'd probably be better off. Everyone would get a little stronger service within their own area, and the interference would stay about the same. The question is, I think, one of economics. Could everyone afford to increase their power?

MR. PARKER: I think this question is a little bit outside the scope of the Panel here.

We're running close to our closing time. I do have one question here which, I think, is of interest and does not require a very long answer:

I have an SCA authorization for 67 kc to transmit background music. I plan to add a store-casting service on another frequency. Do I need special authorization?

MR. HANSON: Yes, you are required to file another application, since each frequency in the SCA service is separate and distinct by itself. So if you have one, two or three SCA channels, it requires one, two and three applications.

BROADCAST STATION HOUSEKEEPING OR

(Can Your Station Pass A Rigid FCC Inspection)

Are You Guilty of Sweeping Dirt
(Fudged Information) Under
The Proverbial Carpet:

by Robert J. Hendrick
Bowling Green, Kentucky

Whether your operation is an AM, FM, or TV station or some combination of these facilities, a vital and perhaps even a life line to your continued healthy existance is how well your house (station) is kept in order.

Present day broadcasters must face a new connotation for the term "housekeeping" as opposed to the usual definition of tidiness, cleanliness, and orderly array. "Housekeeping" has been used rather loosely here to cover a wide area of station operation. Only two categories will be discussed in this article. Other categories were intentionally omitted since they pertain to the less technical phases of the operation and inspection and can best be covered in a separate paper.

The aspects of station housekeeping discussed here are namely; proper maintenance and appearance of the stations physical properties at the studios and transmitter and proper maintenance and operation of all station technical equipment. These categories of station operation and maintenance usually fall to the lot of the technical department. Today, station owners, managers, technical directors, and chief engineers are faced with a considerably changed attitude and policy procedure as far as the FCC regulations and orders are interpeted and enforced by the Commission. The FCC for the most part is taking a longer-harder look at all station operations at license renewal time, and making more numerous spot checks at odd intervals. The inspections almost without exception are more thorough with no phase of the station operation overlooked. In general, the rules and regulations of the FCC have not been changed or revised to any major extent; it is the more rigid, strict, and literal "to the letter" interpetation of the existing regulations (that have been in effect over the years) that are causing many stations a lot of trouble.

Now, let's take a more detailed look at the first category mentioned; the general overall appearance and condition of the stations physical plant. So far as this writer knows, no specific requirement relating to housing facilities for studies or transmitters, painting and state of repair of these structures, and general appearance is mentioned in any of the FCC rules and regulations. Possibly the nearest to a rule relating to any of the above items is contained in Volume III, Part 73 of the regulaions and states that each station shall have suitable facilities for the operators welfare and comfort, and that the studios should be in accordance with the standard practice for the class of station concerned. These rules are found in Section 73.40, d(1) (2) and f (2) for AM stations, Section 73.317, d (1) (2) and g(3) for FM stations, and Section 73.687, g (1) (2) and j(3) for TV stations respectively. Esentially the rules and regulations for each class of station are basically the same.

You may be wondering by now why all of this rambling discussion about areas of station operation and facilities that are not even mentioned in the FCC rules and regulations, or if so in a very general way. The answer is quite simple. An FCC Field Inspector is human. (Really!) Despite all the irresponsible reports and maligning statements, most are "good guys", dedicated to a thankless job. When he enters a clean, neat, orderly (not necessarily expensive or elaborate) office, control room, or transmitter building and is greeted by a friendly, cooperative manager or chief engineer, the inspector immediately realizes that their attitudes are not hostile.

Contrast the above situation, if you will, by an inspector entering a poorly illuminated, dirty, cluttered office, control room, or transmitter building and being greeted by a manager or engineer with a reluctant handshake, a less than friendly hello, and a look of scorn mixed with fear, and at the same time giving his Girl Friday the HIGHSIGN to put everyone on the alert "that the (Big Bad) Inspector has arrived", which means get the program, operators, and maintenance logs in the best order possible, straighten and tidy up a bit if time permits, and above all quit HORSIN' around and try your best to make the place look and sound like a broadcast station. The old adage "first impressions count" could never be more true than in the case of an inspector's entrance into a broadcast station. Conceding that all, or most, of the above facts are not specifically mentioned in the official FCC rules and regulations, the fact still remains that these factors and situations "set the stage" so to speak, for the inspection and a good showing in these areas can certainly do no harm.

The second category of broadcast station housekeeping is no doubt the more important as far as compliance with specific FCC rules and regulations is concerned. Of course this pertains to the Commissions operational and technical performance standards for stations as set forth by the FCC for all commercial AM, FM, and TV, stations.

Sections 73.47 and 73.254 for AM and FM stations respectively, set forth certain minimum equipment performance requirements to be checked and measured by competent technical personnel at least once each year, and in the four month period prior to each license renewal. Since these standards set forth minimum technical performance requirements (which are usually quite easily attained with good equipment, properly installed and maintained), every effort should be made to surpass these standards by a reasonable margin if at all possible. After all, a station's listeners and viewers, judge a station to a great extent by the quality of sound and picture they receive on their sets, particularly in a multi-station highly competitive market.

Although these proof-of-performance measurements are not required to be filed with the Commission, the required records and measurements in proper form must be kept on file at the transmitter and available upon request of the inspector. Needless to say, if these measurements are in order and are properly made there is nothing to worry about. However, here is an area where there may be a temptation to sweep a little dirt under the carpet, or to be more specific (fudge a little) such as...change the previous year's figures a little, and file again, or run only partial check on station equipment and file a full report. Beware of such procedures, they may get your station into embarrassing or even serious difficulties. In recent years the FCC inspection staffs are making more frequent spot checks on station equipment performance, and your station has no assurance it will not be on the list. Suppose the FCC inspector arrives two weeks after you have filed your proof-of-performance report which is inaccurate, and will not approach the figures the inspector obtains on a check using his equipment. Regardless of why your proof "did not hold water" you are certainly in a position that is not good.

Two possibilities exist as a result of his measurements. First, your station's equipment passes the "proof" requirements with the inspector's measurements; but just by the narrowest of margins and far removed from some of the entries in your proof-of-performance file. Second, your stations equipment fails, in part or perhaps on all counts, to pass the inspectors "proof". These wide discrepancies would certainly lead to doubt as to your ability to run a proper "proof" or could even cast suspicion as to the authenticity of your entire proof-of-performance records. Under these circumstances your station's "technical performance image" to the inspector has been given a severe jolt. In the first instance, he will probably give a word of caution and perhaps some helpful suggestions, but in the second instance he has no choice but to give one or more FCC citations as the situation demands.

Although commercial television broadcasting, as we know it today, has been in existance for more than fifteen years, the development of new and improved equipment together with the introduction of color TV has been so rapid, that its Commission has been forced to change and modify rules concerning this medium quite frequently. However, the current technical standards relating to TV stations appear in Section 73.682 and 73.687 respectively, and your equipment is expected to meet these standards and any additional requirements specified in the license authorization. Quite a variation frequently exists from one station authorization to another, dute to equipment availability for studio, transmitter, and test purposes. As a result of the fluid conditions in the television broadcasting industry, TV station inspections are of a necessity less exacting (not less rigid) than those of AM and FM stations. Stabilization of the FCC standards will no doubt develop as the state of the art progresses.

There are other aspects of the technical phase of the operation that are important and should not be over-looked in keeping the station in readiness for an inspection. All AM stations are required to have a fence around the base of the tower(s) with the gate locked as well as having the antenna coupling unit locked, Section 73.40, (b) (3) (iv). This is to prevent unauthorized persons from coming into contact with the radio frequency potential at the base of the tower(s). AM stations must check their remote antenna current meter (s) against the base current meter (s) at least once each week, Section 73.39, (d) (5), and on some authorizations, particularly those of stations with a directional array these meters must be checked each day. Authorizations of stations with directional antennas usually require that monitor point readings of field strength be taken and logged once a week, once a month, or on some of the older authorizations, at less frequent intervals. Here again is a phase of the inspection that can cause an inspector to lift an eyebrow concerning your records even though he has no proof of false entries. As a hypothetical example, suppose in making the check on the base current meters the engineer on duty and the inspector have to walk through waist high weeds that show no sign of being trampled recently, and if that is not enough the engineer doesn't remember which key fits the lock to the fence gate and finally has to return to the transmitter building for hammer and pliers to get the locks unfrozen and the antenna coupling unit enclosure opened. Now the inspector has no proof that your weekly or daily base current checks were not made, but it is highly probable that he thinks a little more (fudging) on records has been going on, (certainly his suspicions are more or less substantiated if your transmitter power output is not within tolerance, and in the case of a directional system, the field strength measurements at the monitorpoints are not within the required limits.

There are other requirements that are easily and quite frequently overlooked by the station engineer, which are important at inspection time. Stations using remote control of transmitters are required to check and calibrate the remote control antenna current meter (s) against the regular meter (s) and enter the results in the operating log once each week, whether manual or automatic logging is used, Section 73.39, (d) (1) (vii). It is just as well that all other meters of the remote control equipment be checked at this time. In the case of automatic logging this information must be entered in the maintenance log, Section 73.113, (b) (3). Also stations using automatic logging equipment at the transmitter are required to check and calibrate these meters against the regular meters and log the results in the maintenance log each week, Section 73.114, (a) (4). See that the tower(s) are kept well painted and clearly marked. Section 17.38, (d) (1) (2) requiring quarterly inspection of tower lighting equipment is very easily overlooked since the inspection periods are so infrequent. The results of these inspections are also to be logged in the maintenance log, Section 73.114, (c). Always be sure that all required equipment interlocks and protective devices are operating properly.

Perhaps the recent FCC regulation requiring, in addition to the usual operating log, a weekly maintenance log with emphasis on many of the above mentioned items will eliminate much of the confusion and oversight. The last requirement mentioned here is probably the most important, as far as escaping citations or more severe punishment, if violated. We are speaking of having a licensed operated on duty when the inspector arrives. It doen't matter whether your station requires an operator with a third class license with broadcast endorsement, or one with a first class radio-telephone license for you class of station, always have him on duty. Incidently, most stations are required to have a first class licensed operator

readily available at all times, although not necessarily on duty at the station. The new rules require all stations to have on duty at all times at least an operator with a third class license with broadcast endorsement. However, it seems that some stations have been unaware of this change in operator requirements, or have ignored it even though the change has been well publicized.

It seems that in spite of all the precautions taken by the FCC and management, a surprisingly large number of stations are operating improperly and subject to citations and possible fines. Within recent years there have been frequent instances of stations being fined quite stiffly, to the tune of several thousand dollars, for technical violations of the FCC rules and regulations. Even more serious, several stations have had their licenses revoked, and others are involved in lengthy, costly hearings concerning license revocation, all due to violation or charges of violation of FCC requirements.

The one thing broadcasting stations can do without is problems with the FCC. For this reason, all station management personnel, particularly engineering personnel as discussed in this article, should take all possible precautions to see that their operation is efficient and according to the FCC rules and regulations.

A SIMPLE SOLUTION TO OVERLOADING

Jim Stevenson
Chief Engineer, WCRM
Clare, Michigan

Some stations, having recently installed new equipment in their audio chain, find, after the installation is completed that the new equipment is not compatable, performance wise, with the existing equipment. Such was the case at this station, where the problem centered around a compression amplifier.

The output of this particular amplifier was rated at 16db, while the audio imput of the transmitter is rated at 6db. This difference in level was causing some serious symptoms; the most serious of which was an unusual pulsing of the modulation level, varying from about 10% to over 100% in 1/2 second cycles. At first the trouble appeared to be in either the modulator or the power supply of the transmitter. After some invesitgation, however, the cause was located. A simple solution was to place an ordinarly 600 ohm, variable "T" pad in the line between the compression amplifier and the transmitter, in the manner shown. This cleared the problem up completely.

A pad constructed of fixed, wire-wound resistors would be sufficient, but we used a variable pad to facilitate calibration of the audio chain.

To calibrate the chain, apply a 400 cycle audio signal to the imput of the console, and adjust the console to indicate 90% modulation of the console meter. At the same time, the compression amplifier should be adjusted to indicate "normal". The final step is to adjust the "T" pad between the amplifier and the transmitter so that the modulation monitor indicates 90% mod. After this adjustment, no matter what the level of audio from the console, the percentage of modulation will always remain at 90%, within reasonable limits.

CHAPTER NEWS

NORTHEASTERN PENNSYLVANIA CHAPTER SOCIETY OF BROADCAST ENGINEERS ORGANIZES, PLANS MEETINGS

On Tuesday November 23 at the studios of WNEP-TV, Wilkes Barre-Scranton Airport, Avoca, Pa., seventeen engineers from area broadcast stations met and decided that there was sufficient interest to organize formally a Northeastern Pennsylvania Chapter, and immediately set a date, Tuesday, Dec. 14th, for the first regular meeting.

Joseph Risse of ICS (International Correspondence Schools) and chief engineer of WUSV-FM University of Scranton is local chairman. Other local-chapter officers include Charles Sakoski, Jr., Vice chairman, WSCR and WBRE-TV; Chester Sawicki, secretary, WNEP-TV; and Charles T. Morgan, treasurer, WARM.

Aside from the chapter officers, those attending the meeting were: Kenneth R. Cooke, Carl Reiner and Adoph Oschman, all of WGBI-WDAU TV; Guy Rauer of WEJL; George Andresky, WBRE-TV; Bill Gittins, WUSV FM; Milan J. Krupa, WBAX; Harry Thomas, Joseph Berish, Paul Evansky, Henry Camp, and Earl E. Grees, all of WNEP TV; and Charles Hallinan of WKOP AM-FM, Binghamton, N.Y. (national executive vice-president of the SBE, chairman of the Binghamton Chapter, and chief engineer of WKOP AM-FM); he talked about activities of the Binghamton chapter and benefits resulting to the professional broadcast engineers in that areas. He also reviewed the purpose of the SBE, being by and for the broadcast engineer, to provide a forum for the exchange of professional discussion of mutual broadcast engineering problems and professional recognition of members and a grouping together of qualified broadcast engineers generally as a professional body to assist in the professional education and raising of the technical standards of the broadcast engineer.

The turnout for the N E Pennsylvania chapter meeting was even greater than anticipated. Several engineers could not attend but asked to be included as being interested and local broadcast engineers look forward to interesting meetings of universal benefit. Anyone interested, (Members or not) will be welcome at future meetings.
(Continued on next Page)

Chapter One held its first meeting of the 1965-1966 season Tuesday, 14 September 1965 at the Colonial Motor Inn, Vestal, New York.

A roundtable discussion was conducted by Mr. James Russell of A.T. & T., Mr. William Hogan and Mr. L. G. Overstrom of the New York Telephone Company with the broadcast engineers attending on the subject of Relations between the Telephone Company and Broadcasters.

The meeting was attended by:

Gino Ricciardelli	WINR	Binghamton, N.Y.
Donald Newman	WINR	Binghamton, N.Y.
Wiley Bates	WCHN	Norwich, N.Y.
James Boyer	Md. College	Scranton, Pa.
Joe Risse	I.C.S. & WUSV-FM	Scranton, Pa.
Art French	WELM	Elmira, N.Y.
Allen Bell	N.Y.-Penn. Microwave	Corning, N.Y.
Thurlow Greene	WSYE-TV	Elmira, N.Y.
Klaus Binder	WNBF	Binghamton, N.Y.
Richard Burden	Burden Associates	MtKisco, N.Y.
Louveer Stantz	WBJA-TV	Binghamton, N.Y.
Eugene Crippen	WKOP	Binghamton, N.Y.
Charles Hallinan	WKOP	Binghamton, N.Y.

A letter was received from Mr. Dave Allen, Engineering Supervisor, Television-Radio Department of Ithaca, College, Ithaca, New York pertaining to the establishment of a student chapter at the college. The letter was read to the membership and enthusiastically endorsed. It is believed that if this materializes, Ithaca College would have the first student chapter of the S.B.E.

Chapter One held its second meeting of the 1965-1966 season Tuesday, 12 October 1965 at the Colonial Motor Inn, Vestal, New York.

A talk was presented by Mr. Arno Meyer, President of Belar Laboratories, Drexel Hill, Pennsylvania on the subject of "FM Exciters". An equipment demonstration was given, followed by a very informative discussion period.

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WHAT IS A LOCAL SECTION?

How to be an Active Member-or Ten Ways to Kill a Group.

1. Don't come to the meetings.
2. If you do come, come late.
3. If the weather doesn't suit you, don't think of coming.
4. If you don't attend, find fault with the work of the officers, and other members.
5. Never accept an office, as it is easier to criticize than to do things.
6. Nevertheless get sore if you are not appointed on a committee, but if you are, don't attend committee meetings.
7. If asked by the chairman to give your opinion regarding some important matter, tell him you have nothing to say. After the meeting tell everyone how things ought to be done.
8. Do nothing more than is absolutely necessary, but when other members roll up their sleeves, and willingly, and unselfishly use their ability to help matters along, howl that the association is run by a clique.
9. If possible, get yourself on the nominating committee so as to be the "power behind the throne".
10. Don't bother about getting new members, let the other fellow do it.

From the ASM Metals Review

Sent in By:

Harry A. Etkin
Staff Engineer
WQAL-FM Phila., Pa.

"ONE MAN'S OPINION"

by "The Horizontal Engineer"
(Fred Hervey, WHKW, Chilton, Wisc.)

I don't know about you fellows, but my experience with 872A and 8008 MV rectifiers has been pretty poor from a cost/hour standpoint, the past couple of years. My station sits on top of a rocky ridge, and the overall ground resistance is an ohm or more. This leads to the sudden demise of solid state rectifiers when we get a thunderstorm, not to mention the Power Companies lightning "arrestors" and transformer bushings, even though they have their three phase neutral grounded at every pole for miles. So - I was stuck with 872's, and getting about 2000 hours out of them. This had to be improved, somehow. Checking with the tube manufacturers showed that there had been changes made in the design of the tube, which may explain the 200 hour life in sockets where they used to run until they were green as an Irishman's necktie on St. Paddy's day. By experimenting around with daubs of temperature-sensitive laquer on the tube envelopes, I found that they were running at the high limits spelled out in the tube manuals, even though the cubicle ventilation was unchanged, and was moving large volumes of air. The only possible solution was to add another blower to the compartment, blowing air at the tube bases. This did the trick! 872's now look like we are going to get over 7500 hours out of them, maybe more. No more outages from arcbacks! It looks as if the procedure in cases of short MV tube life is to simply blow more air at them. Incidentally, a set of JAN surplus tubes made back in 1942 outlasted current production tubes. Design changes are not always for the best....

MV Rectifiers on the way out??

RCA has announced solid-state replacements for the 872a, 8008, 3B28, etc. tubes. Identical, just plug in and fire up. No warm-up required. I wonder what happens when lightning hits???

I see by the tube price lists that 6B4Gs' cost more than T-bone steaks. By adding a 100 ohm 2 watt resistor from plate to screen pins, and running a lead from the cathode pin to fill CT of the original 6B4G supply, you can plug in a 6LGC. Much cheaper, lasts longer. Only minor readjustment needed (regulated power supplies).

It's an old stunt, but whenever I build anything that uses a 5-series rectifier tube, I always wire the fils to 2-7 and pin 8, connect the plate leads to 3-4 and 5-6. Any 5-series rectifier will work in an emergency.

Have you considered leaving tube fils lit on complex, multi-tubed equipment? Tube life is at least doubled. Dropping the filament voltage to 6 volts or a shade less will, in many cases, extend small tube life beyond belief.

I wonder if a good LP filter, chopping off everything above about 7500 cycles wouldn't improve most AM stations. There seems to be nothing in the Rules that says you can't do it, and considering that most of the receivers tuned to the station are not ecactly highfidelity, I doubt if the average listener would know the difference. Theoretically coverage should improve, and probably would at the fringes. If nothing about 100 cycles and above about 5 kc comes out of the receivers, why waste energy, tubes, bandwidth and money to transmit it? This could make for an interesting pro and con discussion, let's have some comment.

If you are looking for help, (or another job!) write the Journal...

Being lazier than "The Armchair Engineer", doyen of another famous publication-and having had one coronary, I am "The Horizontal Engineer"

Don't stand when you can sit, don't sit when you have a swivel chair and can recline gracefully(?) and put your feet on the desk.

Any time you complacently think that you know all you need to know and are getting bored with it all, dig out a good text on Transistors and find out how much you don't know! (GE has the best for the least money-tells me much more than I really want to know about solid state).

PHASED & NON-PHASED COLOR
COLOR DUBBING
AND
SPLICING

by
Joseph J. Brey
WGN Television
Chicago, Illinois

Since the recent surge of interest in color television broadcasting, many stations are equipping for some type of "local" color other than network facilities For many stations the usual method is to start with a color film chain and a color equipped video tape machine. The technicians at many of these stations have had little operational experience with either color or video tape. The purpose of this article therefore, is to give a general background of video tape terms, color "dubs" and the splicing of color video tape.

There are in general use today two types of color recovery systems utilized with video tape machines. These are the Heterodyne, and the Direct Color recovery systems. The later is gradually replacing the heterodyne system so that shortly the former will be of interest only to technical historians.

Although Ampex and R.C.A. have machines utilizing both systems of color recovery, different methods are used to produce the same result. It is not the purpose of this article to detail on these methods but to keep the presentation wide in scope and general in nature.

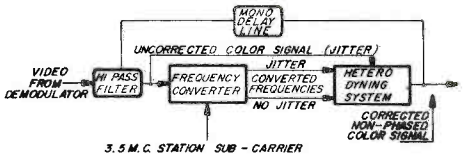

FIGURE 1.

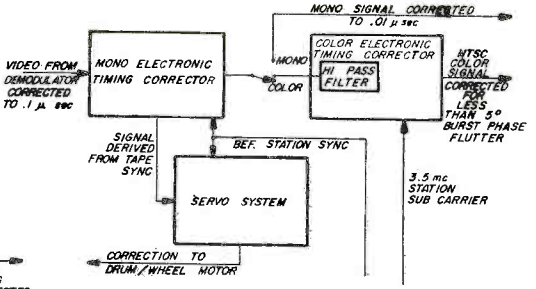

FIGURE 2.

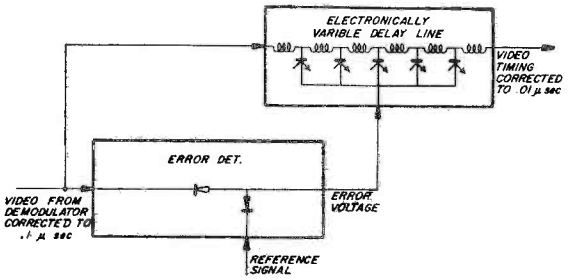

FIGURE 3.

Before the advent of the sophisticated servos now in general use, video tape machines had only one mode of operation. Basically, the machine servo compared its tachometer signal, i.e. photo electric cell or tonewheel output with a 240 cps control track on the tape. This signal occurred once for every revolution of the drum. Therefore, 16 lines of video would be reproduced before the drum's servo would have an indication of a velocity error. It would be reasonable to assume that the reproduced video would have sync mistiming which would make it incompatable with other station signals. Although normal television receivers could cope with such mistiming of the sync due to the "fly-wheel" effect of their horizontal oscillators, a color signal has such a high rate of phase flutter in the burst that it was unacceptable. With this type of servo control, the problem was to process the color information to produce an acceptable color signal for broadcast.

A very ingenius method was therefore developed called the Heterodyne System. The video signal from the demodulator was passed through a high pass filter. The color information containing phase flutter was fed to a "frequency converter" with station sub-carrier containing no phase flutter. The "frequency converter" altered the frequency of both the 3.5 mc sub carrier and the tape color information to a suitable pre-determined frequency. The changed sub-carrier with the color information containing the servo induced "jitter" were then routed to the heterodyning system where both signals were heterodyned, and mixed again with the original tape color information. The result was that the phase jitter cancelled leaving the corrected color signal. This corrected color signal when added to the delayed monochrome signal was capable of producing a composite color signal suitable for broadcast use. Since the heterodyne system used a "cancellation" type of correction, it was relatively insensitive to rapid velocity errors of the servo system, mechanical splices or tape defects. However, there was one major disadvantage of this system which lead to its replacement by the Direct Color Recovery System. The reproduced color signal had lost its dot interlace--in other words, the signal no longer complied with the approved NTSC system of color transmission. This type of signal is termed a NON-PHASED color signal.

Although the original tape had an inherent NTSC signal magnetically impressed on it, the heterodyning action destroys the dot-interlace and the resulting signal when re-recorded produces a dub which is termed a NON-PHASED or NON-STANDARD color dub. This dub can be reproduced on any machine which utilizes the heterodyne system, but will not play on a direct color recovery system unless this machine is equipped to play a NON-PHASED color recording.

Through the years, video tape equipment manufacturers have produced machines with highly sophisticated servo systems. These systems enable servos to compare station sync with reproduced sync. Any discrepancy produced an error voltage which acts to correct the drum velocity. The results are that a video signal is reproduced with a sync mistiming error of only .1 microsecond when compared to station sync. This advancement made video tape signals compatable with other station signals. Further improvement came with the development of the electronically variable delay line.

Essentially, the electronic timing corrector compares the reproduced video with station sync in an error detecting type of circuit. Any deviation of tape sync from station sync produces an error voltage which is fed to an electronically variable delay line. The heart of this delay line is the variable capacitance silicon diode which changes capacity with applied voltage. The delay line then delays or advances each line of video information with the result that the final video sync timing is held to within .03 micro second to .01 microsecond of station sync. In the process, all geometric distortions such as skew, scallop and off-sets are corrected. Thus, a good video tape signal is almost indistinguishable from alive monochrome signal. However, even with this high degree of sync timing, correction of .01 microsecond, the color burst phase flutters through 40 degrees. Since the human eye can detect any color shift beyond 5 degrees, it is obvious that this amount of burst shift would have to be more closely corrected. The problem is resolved by using a second electronic timing corrector to correct the burst. In this unit, it is the color burst that is compared with station sub-carrier as a reference. The error voltage derived drives aothern electronically variable delay line which corrects the burst phase and color information for that line. When the corrected monochrome signal is added to the corrected chroma signal, a composite color signal is produced which ks in full accord with the NTSC system. This is a phased color signal. The entire color signal has been directly recovered through delaying action with no loss of dot interlace. A recording of such a signal will produce an NTSC recorded tape and is termed a PHASED

or STANDARD color dub.

Although the direct color recovery system produces a highly corrected NTSC signal, it is not without undesirable side effects. Since this system uses a delaying type of correction, it is obvious that there would be a limit to the amount of corrective delay available. If snyc timing is found by the error detector to be beyond the electronic delay line corrective capacity, the remaining error for that line remains uncorrected and appears as a line displacement in the final picture. Similarly an error voltage beyond the capabilities of the color timing corrector will produce a color tear in the picture. Usually line tearing, and color tearing occur together.

Since the servo is referenced to both station and reproduced tape sync, any disruption of either, suchas a bad splice, a heavy series of drop-outs or station sync generator fluctuation will probably cause the servo to revert to its simplest mode using the tachometer signal and control track. In such an event, the reproduced signal error would be beyond the correction capabilities of the electronic timing correctors and would remain so until the servo again regained lock-up.

Since the direct color recovery system is highly dependent upon the stability of the station sync generator, it is most important that this reference be really stable. As can be seen, an unstalbe geneartor, or a generator locked to an unstable source can produce serious difficulties in video tape reproduction. Both servo and the electronic time correcting devices regard the pulses from the sync generator as stable. When disturbances occur in this reference signal, both servo and electronic timing correctors translate these disturbances as tape sync or color burst phase errors and produce error voltages to correct these disturbances. The result is instability of the servos and high error voltages in the timing correctors which when combined may make the tape video unusable for broadcast.

COLOR DUBBING

In the making of monochrome dubs two methods can be used; a video transfer or an R.F. transfer. Both have advantages in monochrome applications. However, with the development of direct color recovery tape machines, the R.F. system has more inherent disadvantages than advantages.

R.F. dubbing is considered to introduce less noise in the dubbed recording because the signal is not degraded by switching, demodulation and re-modulation noise. Although this is true, it does not matter how much noise is eliminated if the resulting dub does not play. What is of chief concern is how well the dub reproduces on any tupe of machine. Not only is there a lack of control over the video and chroma levels while making an R.F. dub tub the R.F. signal lacks the correction of the electronic time correcting equipment. The result is that almost all of the servo error in the reproducing machine is added to the servo error in the recording machine. When this dub is reproduced, this error plus the error of the servo in the playing machine is compounded once again, and in all likelyhood will be beyond the capability of the correcting devices.

The chief advantage of making a video transfer lies in the fact that the video is corrected by the electronic timing correctors thus removing most of the reproducing servo system instabilities. Even so, there exists in the reproduced video sync 0.03 to 0.01 microsecond of snyc "jitter" which is transfered to the recording machine. Elimination of this "jitter" on the reproduced sync can greatly reduce the error voltage which would appear when the dub is played. By using a non-composite output of the reproducing machine and inserting station sync, the resulting video becomes free of any instability of the playing machine. When this signal is recorded, the finished dub will have only the error of the recording machine servo.

SPLICING COLOR TAPES

Mechanical splicing of color tape is generally not recommended. A mechanical splice produces a momentary load in the drum which reduces its velocity. If the servo cannot quickly correct for this, the reproduced tape sync will have a greater mistiming error than was present before the splice. The electronic timing corrector, in attempting to correct this mistiming, generates a larger error voltage to be fed to the variable electronic delay line. Frequently the mistiming error is beyond the correction range and it produces line or color tearing, visible in the picture. If the splicing is not skillfully done, het combination of load to the drum and interruption of reproduce sync as the splice passes may cause the servo to lose lock with sync and revert to its normal tachometer mode. Under this condition, all color is lost until the servo can once again relock with sync and bring the mistiming within the range of the timing correctors.

Color video tape cannot be spliced to another color video tape without the possibility of a large color shift in the spliced tape. When the color video tape is optimized for best reproduction on the machine, the operator adjusts the burst phasing control of the machine ot produce the proper colors. Once this has been done, the machine maintains this burst relationship. A different tape in all probability will have a different phase relationship to the machine. The result could be a drastic change of color in the reproduced spliced tape. If, for example, a color com= mercial were spliced into a color tape, a sponsor would be concerned if his product appeared in the wrong color.

If splicing of color video tape becomes necessary, the following precautions should be observed. The splice should only be made within the tape, such as rearranging segments or feleting cuts. No other tape should be inserted unless careful screening indicates that the color shift is within 5 degrees of the playing tape. If it is at all possible, all splices should occur in black to minimize observance of line or color tearing. Finally, the splices should be skillfully done so that loss of servo lock up does not occur.

SUMMARY

The heterodyned system, although generally little affected by splices and poor tape quality, produces a signal not in accord with the NTSC system. This signal when re-recorded produces a NON-PHASED dub which is rejected by recorders utilizing the direct color recovery system unless they have been equipped for NON-PHASED color.

Direct color recovery systems produce an NTSC color signal and can produce a color signal indistinguishable from a live signal; however, this sophisticated type of color recovery requires high stability sync generators, very good video tape and high quality recordings for best operation.

R.F. dubbing, although it produces less noise to the finished dub, introduces the instabilities of the reproducing machine to the new recording. Also, no control can be exercised to correct video or pedestal levels. The dub

is exactly as the original except for the undersirable increased servo error impressed upon its recorded sync.

In video dubbing, the video, pedestal and chroma levels can be corrected. Further, the instabilities of the reproducing machine can be entirely removed from the signal. This dub, in many ways, can reproduce better than the original recording.

Mechanical splicing is generally not recommended for a number of reasons. The presence of the splice reduces head life and causes degradation of the video. Splcing other color tapes to each other generally causes color shifts to appear on the spliced tape which may be objectionable to the viewers.

Splicing should only be done within the same tape and on black video so that line or color tearing is less visible in the picture. Great care should be used in splicing so as to avoid the loss of servo lock-up upon reproduction.

REPORT OF NAB ENGINEERING ADVISORY COMMITTEE REPORT

Many engineers who are employed by stations that are not members of NAB wonder how much value NAB is to the Profession. This brief report from the 1965 Convention, covering only the major NAB Engineering work will give a little idea of the vast scope of NAB work and the tremendous work of NAB membership.

This Committee consists of a group of dedicated individuals, working quitely behind the scenes, who have carefully scrutinized FCC proposals and industry demands and have generally acted as liaison between members and the NAB. These men are: Max Bice (General Manager, KTNT Radio and Television, Tacoma, Washington); Dick Blackburn (Technical Director, Gannett Radio and Television Group, Rochester, New York); Glenn Boundy (Vice President for Engineering, Storer Broadcasting Company, Miami Beach); Bill Duttera (Director, Allocations Engineering, NBC); George Hixenbaugh (Chief Engineer, WMT Radio and Television, Cedar Rapids, Iowa); Tom Howard (Vice President for Engineering, Jefferson Standard Broadcasting Company, Charlotte, North Carolina); Les Learned (Director of Engineering, Mutual Broadcasting System); Carl Lee (Executive Vice President, Fetzer Broadcasting Company, Kalamazoo, Michigan); Frank Marx (President ABC Engineers, American Broadcasting Company); Jim Parker (Director, Transmission Engineering, CBS Television Network).

Some of the more important problems that they have wrestled with in the past are:

1. The AM allocation problems contained in FCC Docket 15084.

   This docket has lifted the "freeze" of AM applications for new or changed facilities. These new rules which were released on July 7, 1964,

   (a) Placed all AM assignments on a go-no-go basis and all applica;tions were required to meet rigid engineering standards.

   (b) Prohibited new daytime assignments that would result in additional intereference with the exception that some assignments may be granted if they provide a first local service to 25 percent of the proposed service area.

   (c) Prohibited nighttime assignments that would result in any increased interference.

   (d) Prohibited nighttime assignments that did not provide a first primary service to at least 25 percent of their interference free area; and

   (e) Required that FM stations did not duplicate their AM programming for at least 50 percent of their time im markets over 100,000 population.

   Class 2A and Class 4 stations would be excluded from the above.

   The Committee felt that the 25 percent white area was the only area of concern since it would severely limit the granting of any nighttime facilities. The NAB has petitioned the FCC for the deletion of the 25 percent rule for the white area requirements for those daytime stations that would like to improve their facilities.

2. Land Mobile Study - FCC Docket 15398

   As most readers know, the demand for RF space is practically at the vanishing point for land mobile users. This docket concerns the feasibility of frequency sharing of television bands and the land mobile service. A study was made by this group and others to see whether the television bands could, indeed, provide additinal space for the land mobile users. The Committee concluded that very little such space was available and took a strong stand against the sharing of television space for such purposes. A special sub-committee is continuing to study this problem.

3. Type-approved FM monitor for SCA and Stereo - FCC Docket 15404.

   This proposal would amend Part 73 of the Rules to requie that FM stations engaged in sterio and/or SCA operations install a type approved frequency and modulation monitor. It was the Committee's unanimous conclusion that a monitor having the requirements in the above proposal would be unduly restrictive and expensive. The NAB has filed an appropriate comment, pointing out where less stringent requirements would be acceptable. The NAB has reported in their comments that the overmodulation problem that could exist on FM stations has a serious bearing on the solution to the approved FM monitor.

4. Television Sound Power Reduction

The Committee had been studying this proposal for several years. Many members made individual measurements and observations of the effect of such sound reduction in their individual station service areas. They have also studied the results of other stations' results and have concluded that such reduction in sound power was not only feasible but it would afford certain technical improvements and a reduction in transmitter operating costs. The FCC has now made it possible for All VHF and UHF stations to operate with powers as low as 1/10 of the visual carrier. The FCC has recently announced that the upper limit of sound power could be as high as 20 percent of the peak visual carrier. This new rule will go into effect for present stations in March, 1966 and for new stations in April, 1965.

5. Logging - FCC Docket 14661

This proposal contained in FCC Docket 14661 related to the subject of new logging rules. A new maintenance log was initiated which meant that stations had to make five maintenance inspections per week with appropriate entries to reflect the condition of the transmitting equipment. Two items in this docket were the subject of much comment. These were: The taking of readings without modulation and the time that these readings had to be taken. For the moment, with the RF meters that are available at today's radio stations, the RF current readings have to be taken during moments of non-modulation. It was felt that in the future meters would be available that were not subject to modulation variations. As for the time that the readings were taken, it was felt that readings every half hour within usual limits would be satisfactory.

6. Loudness Problem - FCC Docket 14904

This notice of inquiry contained in FCC Docket 14904 was one of unusual complexity. Briefly, the problem relates to the apparent loudness of certain commercials and station breaks as compared to the normal loudness of the remaining program. The problem was further complicated by the fact that the average modulation indicator is called upon to measure audio levels with varying degrees of frequency response, the strident delivery of certain announcers, the varying positive or negative characteristics of certain programs, the relationship of the preceding program, the relative efficiency of the receiving device and the room acoustics, and other psychological factors.

This problem is a long way from being solved and the Committee's feeling was that only 10 percent of the problem was engineering and that the other 90 percent was psychological. Many proposed solutions ranging from that of decreasing commercials and station breaks by an arbitrary 6 to 10 db all the way to limiting the amount of compression in the system were considered. This problem is still under active study, but I am sorry to say that an immediate solution is not in sight.

7. The Over-modulation Problems in FM and TV

Many stations have received citations for apparent over-modulation of their FM and TV facilties. It all started when the FCC started using a mobile truck to monitor an FM or TV station, with measuring equipment different from that used by the station. Essentially, the measuring equipment used in the truck was a very carefully calibrated oscilloscope. This oscilloscope did not have the characteristics that the average VU meter has and thus would indicate modulation percentages different from the meter on tet station monitor. Much activity by the Committee has already taken place. Meetings were held in Washington, at the FCC Monitor Station in Laurel, Md. and a field trip was made to WRAL in Raleigh, North Carolina, through the kind invitation of Virgil Duncan, Chief Engineer. At WRAL, The Committee and FCC engineers investigated various types of program material, percentages of modulation, with and without limiters, with limiters before and after pre-emphasis and with a low pass filter in the program channel. A total of six (6) modulation monitors were checked, five (5) for FM and one (1) for TV. The above tests indicated that there was a problem in the correlation between the method used in the FCC truck and the instrument used by the station. The Committee felt that some change in equipment and/or operating procedure was warranted. Field tests at WRAL indicated that up to a 6 db difference could exist between the oscilloscopic method and the monitor flasher and up to a 10 db with respect to the monitor meter. It is felt that the same measuring device should be used by both the broadcaster and the FCC field, monitoring people. All engineers agree that flagrant over-modulation can cause serious degradation in the quality of FM signals. No one will argue that these offenders should be warned. On the other hand investigations have also brought out that many stations with all good intentions could, with normal indication of its monitor, be causing peaks considerably in excess of 100 percent in their operation. The FCC personnel have been very cooperative and both sides are most anxious to come up with a measuring technique which would allow the station to both modulate correctly and at the same time not spill over into adjacent channels.

LETTERS TO EDITOR

What Do You Think?

Inasmuch as things are not getting any simpler, and present FCC Rules allow anybody with a First telephone License to serve as Chief Engineer of any station-and not a full-time at that, what should be done to correct the situation?

Should we petition the FCC for a Rules change to provide for at least ten years of experience, plus ten years of holding a First Phone before a man is qualified to serve as Chief Engineer of any station? Is ten year's experience enough? or too much?

Should we try and buck the NAB and petition for a man with a First Phone on duty at all times?

Or for something simpler-every time I get my ticket number memorized it's time to renew it, and I have another number to remember. Why can't license num-

bering start all over from the bottom, and each renewal keep the same number? I fail to see why a new license number has to be issued every time the ticket is renewed. Should we inquire?

Let's have some commentary from the Membership!

Fred Hervey
WHKW
Chilton, Wisc.

Dear Editor:

Enjoyed the FCC round table discussion article very much. I am looking forward to Part 2 of this article.

Sincerely,

J. A. Risse, Director
School of Electronics and
Chief Engineers WUSV-FM
University of Scranton

BOOK REVIEWS

ELECTRONIC DATA HANDBOOK: Martin Clifford; Gernsback Library, New York, 159 pp. This most recent addition to the Gernsback Library is a veritable box of gems. Martin Clifford has succeeded in collecting into one handy little volume about 90 percent of the formulas, relations, and data that we have all been accustomed to searching five books and our memories for before. Indeed, the stated aim of the book is to minimize the research needed to find specific electronic information", a task it undertakes nicely.

We warn ;you that this book won't supply the equation giving the minimum smapling frequency for pulse modulation or the table of hyperbolic sines, but it will give a nice treatment of impedance-phase relationships in RCL circuits, current gain of a transistor circuit, and basic transmission line and antenna formulas, along with tables covering measures math functions, binary numbers, and a host of others. All in all, a very good book to keep alongside the slide rule on your desk. $2.95.

PRINCIPLES OF ELECTRON TUBES: Gewartowski and Watson; D. Van Nostrand & Company, Princeton, New Jersey, 1965, 655 pp. This extremely thorough and comprehensive treatment of vacuum tubes and their associated communications circuits is based upon notes prepared by the authors for a course in the Communications Development Program at Bell Labs, and is another in a list of thirty some titles that Van Nostrand has published from Bell research.

This book should serve the communications engineer not only as a basic refernce work on electron tubes, but as an excellent text for further study. Chapters are in a very logical order, developing first basic electron field theory, then treating each category of electron tube by itself. The mathmatical and phsyical basis for each device is full developed and explained, and a convenient set of review prbolems top off each chapter. A good engineering brckground is needed before tackling this tome. $18.50

L. B.

PROFESSIONAL CARDS

Rates $ 5.00 per issue (Members)
$10.00 per issue (Non-Members)

EDITOR'S NOTE: In our last issue we failed somehow to acknowledge with sincere thanks the NAB's kindness in making available to the Society the papers that we published in it (and this issue too). The response from our readers fully justifies our presentation of these items, and we hasten to extend our sincere thanks to the NAB. We hope to publish more of the NAB papers from time to time.

CLASSIFIED AND READERS' ADVERTISING

Members who want to find a new job are invited to present their qualifications in 40 words or less, free of charge, on this page. Send notices to the editor. Please note: JOURNAL box numbers are not available, you must use your own address or a P.O. Box.

Employers may run their personnel needs at $1 a line of approximately eight words.

Equipment for swap or sale may be run free, up to 40 words.

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It is with the greatest appreciation that the Society of Broadcast Engineers list the following organizations as Sustaining Members. It is their Support that has helped make these JOURNAL issues possible.

The Alford Manufacturing Company*
299 Atlantic Avenue
Boston 10, Massachusetts

Manufacturers of Antenna Systems, transmission lines and equipment, etc.

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333 West Lake Street
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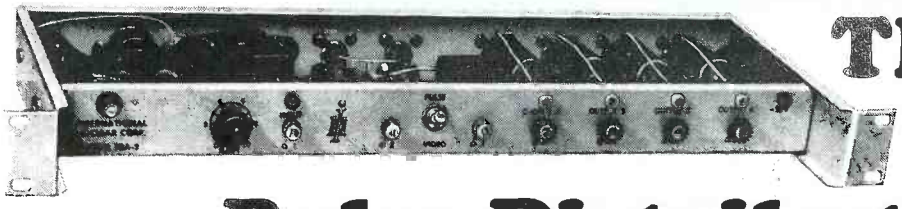

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THE SOCIETY OF BROADCAST ENGINEERS
INCORPORATED
BOX 1841, ANNAPOLIS, MARYLAND
301-263-6860

The original Society was conceived by John H. Battison a consulting engineer, who in 1962 wrote several editorials in the technical press commenting on the lack of a professional technical organization for the broadcast engineer. The response to these editorials was so great that plans were prepared, and at the end of 1963 the first group was formed.

The Society of Broadcast Engineers, Incorporated was actively formed in 1963 as the Institute of Broadcast Engineers. During the 1964 NAB Convention the Society's first general meeting was held; and by popular vote and suggestion the name was changed to its present form. In 1965 the Society was incorporated in Washington, D.C. as a non profit organization.

The membership is now close to 400 and grows daily. This figure includes Canadian as well as US engineers. A number of companies intimately connected with broadcasting have become sustaining members and actively support the Society. There are thirteen regional chapters and the number is also growing.

The Society's aim may be very briefly stated as providing a forum for the exchange of professional discussion of mutual broadcast engineering problems, a means of providing professional recognition of members, and a grouping together of broadcast engineers generally to provide a professional body to assist in the professional education and raising of the technical standards of the broadcast engineer.

Grades of Student, Member, Senior Member, and Fellow are offered. The qualifications for member requires at least possessionof a first class license, and adequate experience. The full requirements for all grades of membership are contained in the "Constitution and By-laws" which is sent to all members on acceptance. Membership certificates and cards are furnished to members, and lapel pins in blue and silver bearing the insignia of the Society are available at $2.50 each post paid.

Elections are held annually immediately prior to the NAB Convention for the positions of President, Executive Vice President, Treasurer and Secretary; write in names and votes are invited and anyone can run for any office. Members are encouraged to offer their services on committees, et cetera.

Membership dues are $10 annually and include subscription to the JOURNAL of the SBE which is published quarterly. Members are invited to contribute material to this publication to help increase its value and interest to readers.

This is an organization that is being built by and for the broadcast engineer. It is only by the active participation of its members in the Society that it can grow and become the great influence that it can be for the prestige and benefit of the broadcast engineer.

SOCIETY OF BROADCAST ENGINEERS

P.O. Box 1841, Annapolis, Md.

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Brief Professional History _____

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Fields of Engineering Activity: Radio ___ Television ___ Transmission ___ Studio ___ Other _____

Two references who are familiar with my work:

Name and address _____

Name and address _____

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SIGNED _____

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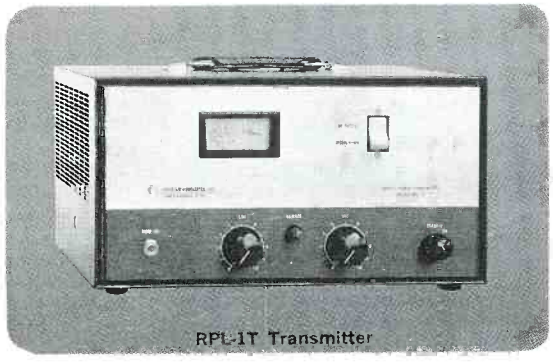
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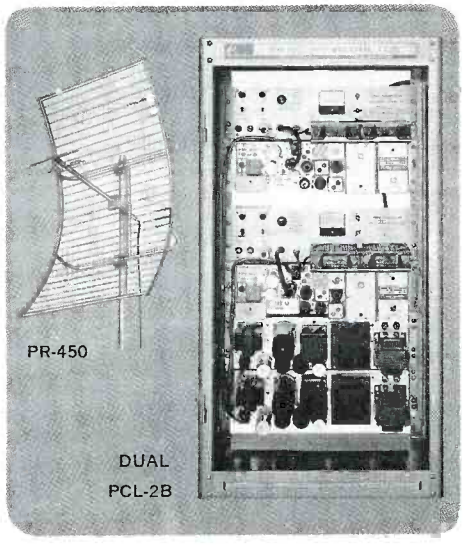

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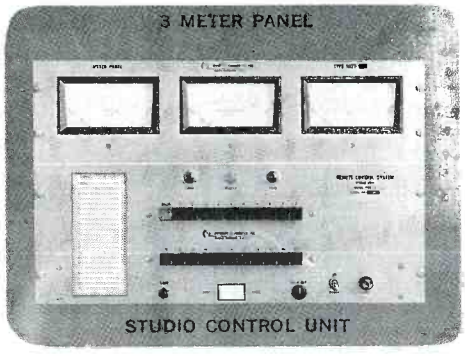

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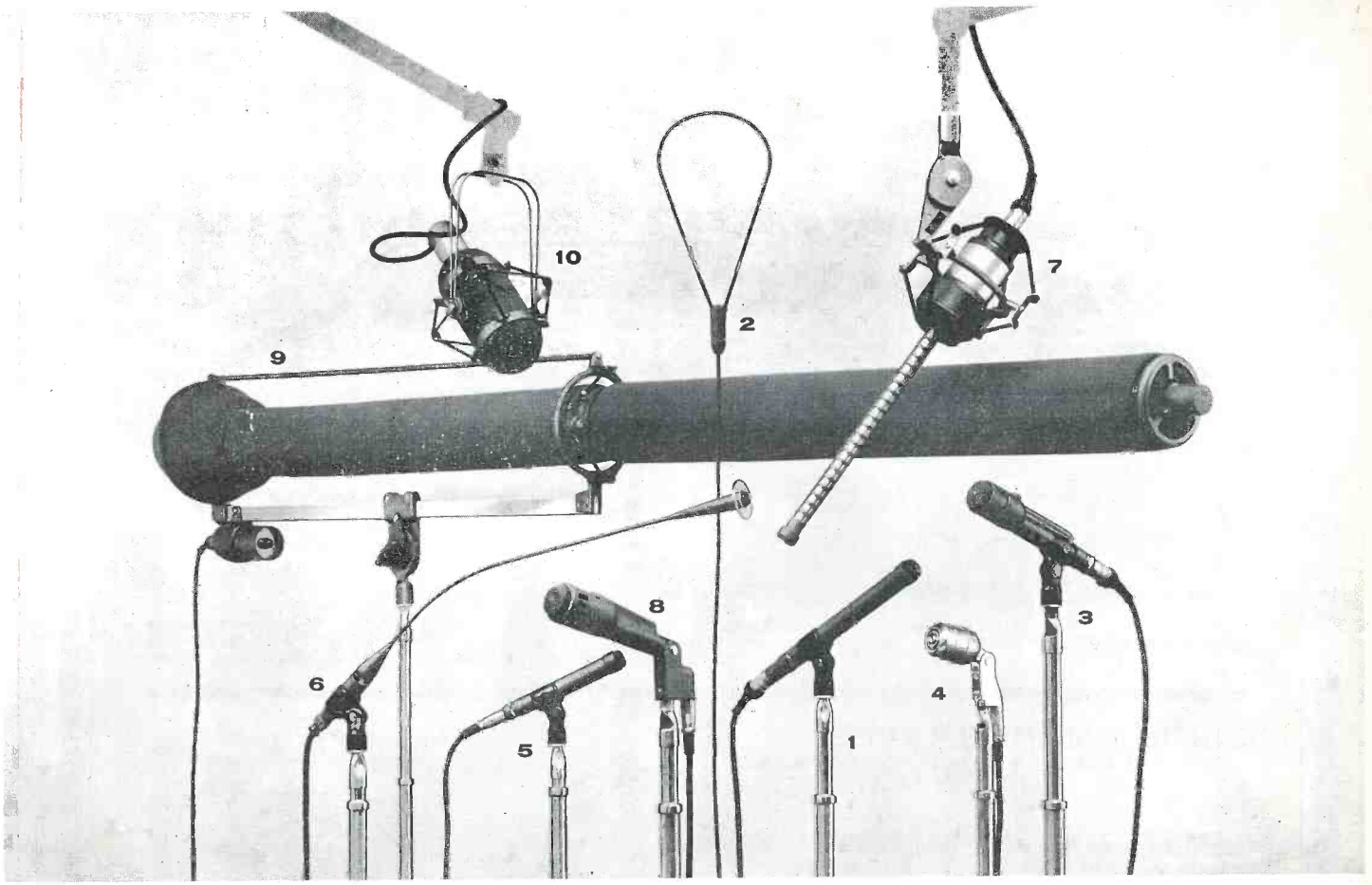

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