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ABSTRACT

For student radio broadcasters to acquire a third class operators permit, they must pass Element 9 of the Federal Communications Commission exam. A course was designed to help these amateurs acquire such technical competencies as meter reading, metric conversions, and familiarity with directional antennas. This course description includes a list of required readings, a description of laboratory workshops, and a brief annotated bibliography of materials relating to Element 9. (EMH)

YOU CAN'T KILL A WASP WITH A POSTAGE STAMP...
OR.
HOW TO TEACH 'EM TO PASS ELEMENT NINE.

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I. The Problem

Compared to the serious and long-range nature of many of the problems we broadcast educators deal with, this one reminds me or a wasp. As long as it's in the same room with you, you can't do anything else until it's gone or dead...preferably the latter. If not, it's liable to come buzzing back.

So too with the Element Nine, or Broadcast Endorsement of the Federal Communication Commission's Exam for the Third Class Operator's Permit. In the spring of 1973 the FCC relieved the First Class Engineer of some of his duties and increased those duties for the Third Class Operator. A year later the Element Nine Exam had been changed to reflect those new responsibilities. The number of questions increased from 20 to 40 and the failure rate increased just as dramatically.

Both the FCC and the National Association of Broadcasters have expressed their concern over the high failure rate, apparently because they have been flooded with requests for help. Both say they are working on the problem, and the FCC says it will publish a new study guide but that it will not be out for some time.

Meanwhile, our students cannot pass this test, mainly because there is little available in study material. It is the purpose of this paper to examine what is available and suggest what you can do to help your students pass this test until better study guides are available.

Let me say first of all that it is not my intention to discuss the pros and cons of making the Third Class Exam a part of your department's curriculum. I personally have no desire to turn any part of my department's offerings into vocational or technical training. But I cannot ignore four factors: (1) Many college radio stations, especially those on FM frequencies, are required to have Third Class Operators. Most frequently that student is the announcer on duty. (2) Frequently local radio stations are anxious to employ students on a part time basis as night time or weekend announcers, or as coordinators for automated FM stations. But they've got to have that Third Class ticket. (3) In all except the larger markets in the country, there are virtually no voc-tech schools which offer a course concentrating on the Third Class Exam only, the expense of which I could hardly justify to my students anyway. (4) And finally, in most markets the FCC examines only a limited number of times. In Omaha, for example, they come four times a year, but because two of those times occur during summer and semester break, my students have only two chances within the academic year to take the test.

For those reasons I feel somewhat obligated to have available to them the means to pass the test. But that's tough to do. This area is not considered a traditional or scholarly study; hence there is little in the libraries. Most of what I've found is the result of rummaging through book stores, speaking to engineers or colleagues and contacting the voc-tech schools, as well as the FCC and the NAB. What I turned up was discouraging and is detailed in the attached bibliography. But with these sources I collected by wits and put together a program of preparation.

II. The Attack in Six Parts

1. I had to educate myself. This meant a quick course in engineering which meant first of all overcoming my own snobbishness. After all, I'm an academician, not an engineer! But I had to face the reality of my situation which probably many of you share: the small college in the medium sized market where my department's engineer works only half-time and could not assume the total instructional responsibilities for this project.

Because I have always utilized the professionals in my market, I had no trouble getting the cooperation of the chief engineers at two of the local stations. They spent a good deal of time tutoring me.

2. Armed with the available sources and my new knowledge, I prepared eight lessons devoted to Element Nine. In the past I had forced the students to rely on rote memory to pass the test; now it was obvious they would have to understand the concepts. The high failure rate is due to several reasons, but most errors are made because students have little concept of directional antenna systems, don't know how to read meters or how to change kilowatts to watts. But there were other topics that had to be dealt with: operating parameters, skywave interference, operator's duties and limitations, normal operating position, modulation, tower lighting, EBS, remote control, operating power, etc. (The NAB released a memo in October, 1975, outlining and detailing several topics and questions that one should know thoroughly before taking the test. That list helped me make sure my lecture material was comprehensive.)

I found the first two chapters of Sidney Head's Broadcasting in America to be the best introduction. From there I prepared lecture material from the Johnson, Ameco (the only book I required the students to buy), FCC and the Mid South publications (see attached bibliography). And from these and other sources I lectured consistently with overhead transparencies, as I found a major problem in understanding was a lack of illustrations. Another major problem I faced in preparing my material was overcoming the weaknesses in the available publications. Although a detailed critique is attached, I can make these generalizations: (1) Most of the material is written by engineers who know little about teaching effectiveness. Not only can they not write, they can't construct effective tests (if anybody can). Most are fraught with errors of grammar and ambiguity. (2) I frequently found conflict of information among the authors. For example,

what one called an "in-phase" reading, another called an "out of phase" reading, or called it nothing at all. Another said log corrections must be made in ink. You won't find that in the FCC Rules and Regulations, but you will find the question on their test! (3) The bibliography is probably not complete. So here's a plea: if you know of others not listed here, I will continue to collect and disseminate the material.

How did I solve these conflicts? I relied heavily on local engineers for interpretation and to a lesser extent on phone contacts to the FCC and NAB. And occasionally I phoned the text's authors, with little success.

3. Since meter reading is easy for someone who's done it but Greek to one who has not, I arranged a studio session with the campus station engineer who demonstrated the use of meters as well as a cathode ray oscilloscope. The students were allowed to practice reading an ammeter, voltmeter, modulation monitor, and so on. This session followed my own lecture on meters with illustrations on overhead transparencies.

4. Next the students were ready for a walk-through of one of the local stations with the chief engineers showing them the entire engineering picture from meters to the transmitter's remote control unit. Ideally this should be done in small groups.

5. Finally the students received a lengthy essay written by the chief engineer which was literally "The Engineering Story of Radio Stations". By then the terms and abbreviations were understood; this put them all together.

6. And if that was not enough, the students had available on a check-out basis, cassettes and overhead transparencies. They usually got together in groups for self-study at a time of the day when I was nearby and available for questions.

A final note: although I chose to incorporate this material into the basic broadcasting course our students take, the emphasis was not so heavy that they had to pass Element Nine to pass the course. Obtaining their Third Class Permits was only one item of the course, which, if passed would boost their final grade a full letter, but would not result in a D or an F grade if failed. If they did not pass it, they had two options: to take the grade achieved through the other work of the course, or to take an incomplete and re-take the FCC test later.

There are, of course, other ways to make the material available, such as entirely through self-study, through mini-workshops conducted by upperclassmen (who may be able to get one-hour education credit for their work), or through a course set up in another department where engineering problems may be more appropriately handled. But those options depend on having adequate self-study materials available, a large enough upper class to run work shops, or an interest from another department.

III. The Success

On the day my students went to take the FCC Exam, I was a nervous wreck. My past record, and that of my colleagues around the city, had been 60 to 70 per cent success in passing last year. This year 21 of the 22 of them came back having passed with flying colors. They were very proud, and frankly so was I. No more wasp!

BIBLIOGRAPHY

Highly Recommended:

Bob Johnson Radio License Training. 1060 Duncan Place, Suite D, Manhattan Beach, California 90266, 1975. $15.00

Advantages: The Bob Johnson FCC License course consists of three cassettes and a 50-page manual which covers Elements 1, 2 & 9. The material covered is comprehensive and detailed, especially Element 9. The cassettes are a useful self-study addition for students and are meant to be played as one progresses through the manual which itself is sub-divided into three sections: (1) illustrations and accompanying explanations in layman's terms (that is, engineering terms are explained); (2) excerpts from the Communications Act and the FCC Rules and Regulations; (3) practice tests, particularly good because they most closely resemble FCC Exam questions and lack the conceptual, if not grammatical, ambiguity found in many other study guides.

Disadvantages: The audio tapes, although helpful, are difficult to listen to because of the displeasing quality of the announcer's voice, and occasional side comments on his part that are overdone and therefore distracting from the material. The written material is poorly reproduced on Apeco copy and inserted in a paper folder, making the $15.00 investment a bit discouraging. And of course the price places it out of the range for individual student purchase.

Recommended (in order of preference):

Commercial Radio Operator's License Guide--Elements 1, 2 & 9. Martin Schwartz. Ameco Publishing Corporation, 275 Hillside Ave., Williston Park, N. Y. 11598, 1975. $1.00

Advantages: The Ameco handbook is within the student's price range and is perhaps the best available for self-study. The Element 9 material has been up-dated to reflect the new duties of Third Class Operators. Especially helpful is an eight-page section on Basic Radio Theory, which although not covered by the FCC test itself, has become essential for interpreting test questions.

Disadvantages: As a basic outline the book serves its purpose well, but is brief in explanations. For example, directional antenna systems, which are covered heavily in the FCC test, are summarized in merely one page here. Also lacking are diagrams and illustrations. The meter diagrams are adequate but not outstanding.

Third Class Broadcast Operator Permit Study Guide. Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402, 1974. 65¢

Advantages: The FCC's study guide is intended only to be an outline and as such serves its purpose well. It could be considered a beginning point for study for the student, especially considering the price. The FCC plans to up-date its guide, but preparation and release "may be some time".

Disadvantages: It would be nearly impossible to pass the Element 9 Exam with the study guide alone because all reference material is listed but no explanatory material or diagrams except meters are included. However, the guide itself states that it is not intended to cover comprehensively the Third Class Operator's duties.

Radiotelephone Third Class License with Broadcast Endorsement Study Guide. Mid-South Publications, P. O. Box 19142, Baton Rouge, La. 70803, 1975. $2.00

Advantages: Both the price and the coverage of the material in layman's terms make this a good start for the individual student. Other especially strong points are diagrams, illustrations, meter reading practice exercises and a written mock-up of a radio station applying all the engineering abbreviations and formulas.

Disadvantages: The material is not comprehensive; some of the self-test questions are ambiguous in nature and the small print will make you cross-eyed!

Not Recommended:

Broadcast Announcer Third Class FCC Study Guide. James Ashe. TAB Books, Blue Ridge Summit, Pa. 17214, 1974. $3.95

Advantages: Comprehensive extracts of Communication Law and the FCC Rules and Regulations are included, and some diagrams and photographs may be helpful to the individual who has never been inside a radio studio.

Disadvantages: Primary objection is that the entire 126-page text is written in offensively simplistic language. The author frequently and annoyingly diverts from the topic with unrelated and often ridiculous anecdotes. Worst of all is the self-test in which one suggested answer to the question, "If a man at your station door identifies himself as an FCC engineer..." is "Slip him a drink." Also the material is out-of-date and does not cover such important areas as directional antenna systems.

Radio Operators License Handbook. Edward M. Noll. Howard W. Sams & Co., The Bobbs-Merrill Co., 1974. $3.95

Advantages: Again, legal extracts are included and some diagrams and photographs are helpful. The book is very much like Ashe's.

Disadvantages: Again the material is not up-to-date and is short on explanations. Worst of all are the ambiguous and overly easy test questions.

FCC Third Class Commercial Broadcast License Study Guide. Warren G. Weagant. Command Productions, Radio Engineering Division, P. O. Box 26348, San Francisco, California 94126, 1974. $3.95

Advantages: Several pages devoted to problem solving for power and antenna base current ratio are detailed and helpful. Also, an 8½ x 11 up-date handout to the booklet has new material.

Disadvantages: For $3.95 this 48-page booklet is a rip-off and covers in skeletal form what other guides do better.

FCC Home Study Course on Tape. Command Productions, P. O. Box 26348, San Francisco, California 94126, 1975. $6.95

Watch out! It doesn't cover Element 9.

Intercollegiate Broadcasting System FCC Third Class Operators Study Guide.

It's free, but it's an exact duplication of the FCC's study guide, minus the meter diagrams.

The National Association of Broadcasters, has not published a study guide since 1972. Two memos have come out of Al King's office this fall, outlining topics that one should know thoroughly before taking the test. It is recommended you send for these memos.

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